200 MHz, 1 ns Universal Counter (VMIP™)

Overview

The VM2164 is a high-performance system level universal counter, designed to outperform traditional rack-and-stack and other C-size VXIbus counters, but with a considerably smaller footprint. Being part of the VMIP™ family, the VM2164 can be combined with up to two other high-performance instruments on a single C-Size card.

A powerful combination for any automated test set is our single VXIbus module, VT2000, combining a 6.5 digit system DMM (VM2710A), 1 ns universal counter (VM2164), and a 50 MSa/s arbitrary waveform/function generator (VM3640A).

Performance

For ATE applications, making high-speed precise measurements and passing these measurements back to the host controller is critical. The VM2164 allows over 200 readings per second over the backplane, while providing extensive arming and triggering capability, allowing the VM2164 to be easily synchronized to external events, or other measurement devices. Add a built-in TCXO or OCXO time base option for improved measurement stability.

Features

Frequency:	Frequency
	Frequency ratio
	Freq in Burst
	Burst Rep Rate
Period and Time:	Period [Single]
	Period [Average]
	Positive Pulse Width
	Negative Pulse Width
	Rise Time
	Fall Time
	Time Interval
	Time Interval Avg
Phase:	Phase
Voltage:	Vdc
	Vp
	Vmax
	Vmin
Totalize [Counts]	2nd Ch Start/Stop
	2nd Ch Gate
	Gated by Time
	Ext Arm Start/Stop
	Ext Arm Gate
	TTLT Start/Stop
	TTLT Gate
Positive Duty Cycle	
Negative Duty Cycle	
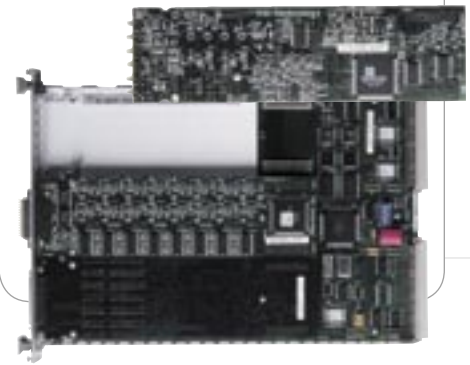
Features

200 MHz Frequency Range for both A and B Channels

1 ns Time Interval Resolution (100 ps with Averaging)

9-digit Resolution in 1 Second Gate Time

Greater than 200 Readings/second Over the VXIbus

Up to 32,000 On-board Readings with Direct Register Access for Fast Data Throughput

Part of the VMIP™ Family, Combine With up to two other Instruments on a Single C-size Card (i.e. DMM/AWG)

Built-in DVM, for Simple Voltage Measurement

Instruments

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Built-in Software Functions

Auto-Set, Auto-level, Pulse Characterization, Period, Frequency, Pos Pulse Width, Neg Pulse Width, Pos Duty Cycle, Rise Time, Fall Time, Burst Characterization, Burst Frequency, Burst Rep Rate, Math [slope, a=mx+b], RPM [Revolutions per Minute], BIT [Built In Test], Clock Out On/Off – IN/OUT

Measurement Storage

[On Board]
1k Measurements	Standard

Arming

Trigger Source:	ChA, ChB, Ext, VXI TTLT
Trigger Slope:	Positive, Negative
Trigger Level:	TTL
Arming Start Delay:	Events/Timed
Hold Off:	Timed
Burst Sync Delay:	Timed

Oscillator Options

No Oscillator	Use VXI 10 MHz
TCXO	High Performance
Aging:	$\pm1\times10^{-6}$/year
Temp Stability:	$\pm1\times10^{-6}$ (0 ˚C to 50 ˚C)
Adj Range:	$\pm3\times10^{-6}$ min.
OCXO	Ultra High Perf
Aging:	$\pm1\times10^{-7}$/year
	$\pm1\times10^{-9}$/day
Temp Stability:	$\pm1\times10^{-7}$ (0 ˚C to 50 ˚C)
Adj Range:	$\pm4\times10^{-7}$ min.
Warm up time:	<3 min.

Front Panel Connectors

Channel A Input, Channel B Input
Ext Arm Input, Gate/Edge
Ext Clock Input/Output

Specifications

Frequency
Input A & B:	500 μHz to 200 MHz
	20 Hz to 200 MHz (ac)
Resolution:	9 digits/s measuring time, max.10 digits resolution

Period
Input A & B:	5 ns to 2000 s
Resolution:	1 ns [single]
	9 digits/s measuring time, max. 10 digits resolution [averaged]

Frequency Ratio
A/B & B/A:	500 μHz to 200 MHz

Time Interval
Range:	2 ns to 1e6 s
Resolution:	1 ns

Positive/Negative Pulse Width
Range:	5 ns to 20 ms
Resolution:	1 ns

Rise/Fall Time
Range:	10 ns to 1000 s
Resolution:	1 ns

Phase
Range:	0.00 ˚ to +360.00 ˚

Totalize
Range:	0 to 10^{10} counts

Peak Voltage
Voltage:	5.00 V, 50.0 V
Resolution:	10 mV, 100 mV

DC Voltage
Voltage:	5.00 V, 50.0 V
Resolution:	10 mV, 100 mV

Coupling:	dc or ac
Signal Operating Range:	+50 V (1 MΩ, w/attn), +5 V (50 Ω)
Trigger Level Range:	+50 V, +5.0 V,
Resolution:	25 mV, 2.5 mV

Trigger Sensitivity
+50 V Range:	200 mV rms Sine wave (up to 50 MHz) 400 mV rms sine wave (50 MHz to 200 MHz)
+5.0 V Range:	20 mV rms (up to Range 50 MHz) 40 mV rms (50 MHz to 200 MHz)

Auto Trigger Level:	Automatically set at 50% of the input signal's Vp value.10% to 90% is used if measuring rise and fall times.
Trigger Hysteresis:	Programmable

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Impedance:	50 Ω 1 MΩ/20 pf 1 MΩ x10/20 pf	**TTL Trigger Bus Arming Input:**	Any TTLT may be selected for arming, by edge or level (polarity is also programmable)
Low Pass Filter:	<50 kHz	**Output:**	Any TTLT may be selected to follow the measurement gate signal (polarity is programmable)
Maximum Input Voltage: 1 MΩ input		**External Reference Input Coupling:**	ac only
<2 kHz:	240 V rms (dc + ac rms), decreasing linearly to +5 V at 1 kHz	**Frequency Range:**	10 MHz
>100 kHz:	+5 V to 200 MHz 1 MΩ input x10 attn	**Voltage Range:**	500 mV rms to 12 V rms
50 Ω input:	5.0 Vrms (dc + ac)	**Impedance External Reference:**	Approx. 1 kΩ ac only
Crosstalk: 100 MHz @ 50 Ω:	<36 dB channel separation	**Output Coupling Frequency Range**	10 MHz
External Arm Input Coupling:	dc only	**Voltage Range:**	TTL/CMOS
Pulse Width:	>50 ns	**Impedance:**	Approx. 50 Ω
Transition Time:	<250 ns	**Gate Time:**	Programmable from 200 μs to 99.999 s
Voltage Range:	TTL or ECL		
Impedance:	Approx. 1 kΩ		

Note: The gate time may be extended by one period of the input signal on frequency A or B and Ratio A/B, B/A.

Ordering Information

VM2164

VM2164	200 MHz Universal Timer/Counter
Option 15	TCXO Oscillator
Option 16	OCXO Oscillator

Instruments