

GX2065

6.5 DIGIT DMM / DIGITIZER PXI CARD

- Full featured 6.5 digit DMM
- 3 MHz isolated digitizer with memory
- AC True RMS measurements, 10 Hz to 300 KHz
- Measure 1 μ V to 300 V
- 7 resistance ranges, 100 to 100 M
- Signametrics SMX2040 & SMX2060 compatible drivers
- Extended temperature range option



DESCRIPTION

The GX2065 offers a unique combination of features, resolution, accuracy and speed in a compact, single slot 3U PXI format. Featuring 6-1/2 digit resolution, 0.005% basic DCV reading accuracy and up to 3,500 reading per second (rps) assures you of measurements that are accurate, fast and repeatable. All measurement functions including digitizing functions are isolated from the PXI bus - providing the ability to make true differential, floating measurements. An on-board controller performs all necessary DMM and digitizer calculations, minimizing PXI control bus overhead.

FEATURES

The GX2065 is designed as a universal, multifunction DMM and provides all of the features associated with standard bench top DMMs including V_{DC} , V_{AC} , 2 and 4 - wire resistance measurements, and current measurements. Additionally, the GX2065 features a 3 MHz, 16 bit, isolated input digitizer which allows users to acquire and analyze waveforms. Built in analysis and waveform functions include RMS, average, peak to peak, and peak to average measurements. Up to 8192 samples can be stored in the digitizer's memory. Frequency and period measurements to 500 kHz are also supported. An external TTL trigger via the PXI bus or front panel is available for triggering DMM measurements.

SOFTWARE

The GX2065 is supplied with the GXDMM software package which includes a virtual instrument panel, a Windows 32/64-bit DLL driver libraries and documentation. The virtual panel can be used to interactively program and control the instrument from a window that displays the instrument's current settings and status. In addition, interface files are provided to support access to programming tools and languages such as ATEasy, LabView, LabView/Real-Time, C/C++, Microsoft Visual Basic®, Delphi, and Pascal. An On-Line help file and PDF User's Guide provides documentation that includes instructions for installing, using and programming the board. Signametrics SMX2040 & SMX2060 compatible drivers are also supplied, allowing customers to easily upgrade existing applications to the GX2065. A separate software package - GtLinux - provides support for Linux 32/64 operating systems.

APPLICATIONS

- Automated production testing
- Laboratory automation
- Portable/field test
- Semiconductor and component test

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SPECIFICATIONS

GENERAL SPECIFICATIONS	
Inputs	Hi, Lo, Hi Sense, Lo Sense; floating and isolated from ground External trigger
Input Connectors	(4) Banana, 7-pin DIN
Format	PXI, 3U single slot, hybrid slot compatible
DMM AND DIGITIZER MEASUREMENT SYSTEM FEATURES	
Resolution	22 bits (DMM), 16 bits (digitizer / DAQ)
DMM Sampling Rate (V_{DC} , I_{DC} & R Measurements)	Selectable PLC rate, 0.01 to 10; PLC can be set to 50 or 60 Hz
DMM Reading Rate (V_{DC} , I_{DC} & 2WR (< 10 M ohm))	50 readings/sec @ 6.5 digits, 60 Hz, (1 PLC) 500 readings/sec @ 5.5 digits, 60 Hz, (0.1 PLC) 2500 readings/sec @ 4.5 digits, 60 Hz, (0.01 PLC) 3500 readings/sec @ 3.5 digits, 60 Hz, (0.002 PLC)
Digitizer (DAQ) Clock Rate	Programmable to 3 MHz Range: (3 MS/s) / N, N=1 to 2^{16} Accuracy: 100 ppm
DAQ Measurement Functions	AC / DC voltage and current measurements, frequency
Digitizer Memory	8192 samples
DMM Memory	1 K samples
DMM MEASUREMENT CHARACTERISTICS	
Input Range	100 nV to 300 V
V_{AC} Input Range	3 μ V to 425 V (peak), 300 V_{RMS} 10 Hz to 100 kHz, AC coupled
Crest Factor (V_{AC})	No limitation as long as maximum input signal is below the maximum range value.
V_{DC} / V_{AC} Input Impedance	> 10 G Ω (0.1, 1, and 0 V_{DC} ranges) 400 pF shunt capacitance 10 M Ω for other AC / DC ranges, 400 pF shunt capacitance
Maximum Input (Volt - Hertz)	8 x 10e7 V x Hz Common Mode Input 8 x 10e7 V x Hz (across Hi or Lo input relative to earth ground)
Input Isolation	CATII 300 V
Input Overvoltage Protection	250 V for current input, 300 V CATII for all other inputs
Noise Rejection	V_{DC} : 90 dB, NMRR; 140 dB CMRR 15 readings/s, 1 PLC, 6.5 digit, 10 V range V_{AC} : 70dB, CMRR
I_{DC} Input Range	10 nA to 2 A
I_{AC} Input Range	3 μ A to 2 A RMS, AC coupled 10 Hz to 5 kHz
Crest Factor (AC Current)	No limitation as long as maximum input signal is below the peak range value
AC / DC Input Current Protection	2 A, 250 V, fast blow, sand filled, 1.5 kA breaking
Resistance Range	100 Ω to 100 M Ω
Resistance Measurement Configuration	Selectable, 2-wire or 4-wire

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Burden Voltage (Maximum)	Current Range 20 mA 100 mA 1 A 2 A	Voltage <0.2 V <0.1 V <0.5 V <1.0 V		
TRIGGERING				
Trigger Source	Function: Start measurement Source: PXIbus, software, continuous, external input (DIN connector), timer			
Trigger Output Modes	Functions: Start of measurement, end of measurement Trigger can be routed to the PXIbus or the DIN connector			
Trigger Input Voltage Range	3.3 V CMOS, 5 V Tolerant			
Minimum Trigger Input Pulse Width	50 ns for PXI bus, 250 μ s for external DIN input			
Trigger Input Impedance	4.75 k Ω			
Trigger Input Edge	Selectable, positive or negative			
AC MEASUREMENT PERFORMANCE				
Digits	Reading Rate	Signal Bandwidth		
6½	1 S/s	4 Hz to 4 kHz		
6½	5 S/s	30 Hz to 20 kHz (default)		
6½	375 S/s	300 Hz to 300 kHz		
DC VOLTAGE MEASUREMENT				
Range	Resolution	Accuracy 24 Hours 23°C $\pm 5^\circ$ (% of Reading)+ (% of FS)	Accuracy 90 Days 23°C $\pm 5^\circ$ (% of Reading)+ (% of FS)	Accuracy 1 Year 23°C $\pm 5^\circ$ (% of Reading)+ (% of FS)
100 mV	100nV	0.0030 + 0.0040	0.0040 + 0.0045	0.0045 + 0.0045
1 V	1 μ V	0.0030 + 0.0007	0.0040 + 0.0008	0.0045 + 0.0008
10 V	10 μ V	0.0010 + 0.0004	0.0025 + 0.0005	0.0030 + 0.0005
100 V	100 μ V	0.0030 + 0.0006	0.0050 + 0.0009	0.0060 + 0.0009
300 V	1 mV	0.0030 + 0.0020	0.0045 + 0.0030	0.0060 + 0.0030
DC VOLTAGE MEASUREMENT, DAQ MODE				
Range	Resolution	Accuracy 24 Hours 23°C $\pm 5^\circ$ (% of Reading)+ (% of FS)	Accuracy 90 Days 23°C $\pm 5^\circ$ (% of Reading)+ (% of FS)	Accuracy 1 Year 23°C $\pm 5^\circ$ (% of Reading)+ (% of FS)
100 mV	4 μ V	0.06 + 0.08	0.06 + 0.08	0.06 + 0.08
1 V	40 μ V	0.06+ 0.03	0.06+ 0.03	0.06+ 0.03
10 V	400 μ V	0.06+ 0.03	0.06+ 0.03	0.06+ 0.03
100 V	4 mV	0.06+ 0.03	0.06+ 0.03	0.06+ 0.03
300 V	40 mV	0.06 + 0.01	0.06 + 0.01	0.06 + 0.01

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DC CURRENT MEASUREMENT				
Range	Resolution	Accuracy 24 Hours 23°C ±5° (% of Reading)+ (% of FS)	Accuracy 90 Days 23°C ±5° (% of Reading)+ (% of FS)	Accuracy 1 Year 23°C ±5° (% of Reading)+ (% of FS)
20 mA	10nA	0.0060 + 0.0030	0.030 + 0.0080	0.0500 + 0.0080
100 mA	100 nA	0.0100 + 0.0300	0.0300 + 0.080	0.0500 + 0.080
1 A	1 µA	0.0200 + 0.0030	0.0500 + 0.0080	0.0800 + 0.0080
2 A	10 µA	0.1000 + 0.0035	0.1200 + 0.0060	0.1200 + 0.0060
DC CURRENT MEASUREMENT, DAQ MODE				
Range	Resolution	Accuracy 24 Hours 23°C ±5° (% of Reading)+ (% of FS)	Accuracy 90 Days 23°C ±5° (% of Reading)+ (% of FS)	Accuracy 1 Year 23°C ±5° (% of Reading)+ (% of FS)
20 mA	4µA	0.03 + 0.06	0.03 + 0.06	0.03 + 0.06
100 mA	40 µA	0.0100 + 1.0	0.0100 + 1.0	0.0100 + 1.0
1 A	40 µA	0.0400 + 0.06	0.0400 + 0.06	0.0400 + 0.06
2 A	80 µA	0.1000 + 0.04	0.1000 + 0.04	0.1000 + 0.04

Notes:

DC measurements @ 10 PLC or 1 PLC with digital filtering

Accuracy of measurement is % of reading + % of Range

AC VOLTS (RMS), AC COUPLED, DAQ MODE						
Range (RMS) (Except as noted)	Range (Vpk)	Resolution	Frequency and Accuracy [23°C ±5° (% of Reading) + (% of FS)]			
50 mV	100 mV	2 µV	Frequency	Accuracy 24 Hours	Accuracy 90 Days	Accuracy 1 Year
			3 Hz - 10Hz	0.5 + 0.28	0.5 + 0.28	0.5 + 0.28
			10 Hz - 20 KHz	0.2 + 0.28	0.2 + 0.28	0.2 + 0.28
			20 KHz - 50 KHz	0.26 + 0.3	0.26 + 0.3	0.26 + 0.3
			50 KHz - 100 KHz	0.75 + 0.33	0.75 + 0.33	0.75 + 0.33
			100 KHz - 300 KHz	4.15 + 0.75	4.15 + 0.75	4.15 + 0.75
0.5 V	1 V	20 µV	3 Hz - 10Hz	0.35 + 0.03	0.35 + 0.03	0.35 + 0.03
5 V	10 V	200 µV	10 Hz - 20 KHz	0.05 + 0.03	0.05 + 0.03	0.06 + 0.03
50 V	100 V	2 mV	20 KHz - 50 KHz	0.11 + 0.05	0.11 + 0.05	0.12 + 0.05
300 V	450 V	30 mV	50 KHz - 100 KHz	0.60 + 0.08	0.60 + 0.08	0.60 + 0.08
			100 KHz - 300 KHz	4.0 + 0.5	4.0 + 0.5	4.0 + 0.5

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AC CURRENT (RMS), AC COUPLED, DAQ MODE					
Range (RMS) (Except as noted)	Resolution	Frequency and Accuracy [23°C ±5° (% of Reading) + (% of FS)]			
0.5 A	40 μA	Frequency	Accuracy 24 Hours	Accuracy 90 Days	Accuracy 1 Year
		3 Hz - 10 Hz	0.30 + 0.04	0.30 + 0.04	0.30 + 0.04
		10 Hz - 3 KHz	0.10 + 0.04	0.10 + 0.04	0.10 + 0.04
		3 KHz - 5 KHz	0.14 + 0.04	0.14 + 0.04	0.14 + 0.04
1.0 A	80 μA	3 Hz - 10 Hz	0.35 + 0.09	0.35 + 0.09	0.35 + 0.09
		10 Hz - 3 KHz	0.15 + 0.09	0.15 + 0.09	0.15 + 0.09
		3 KHz - 5 KHz	0.18 + 0.09	0.18 + 0.09	0.18 + 0.09
RESISTANCE					
Range (ohms)	Open Circuit Voltage & Test Current	Resolution	Accuracy 24 Hours 23°C ±5° (% of Reading)+ (% of FS)	Accuracy 90 Days 23°C ±5° (% of Reading)+ (% of FS)	Accuracy 1 Year 23°C ±5° (% of Reading)+ (% of FS)
100	6.9 V, 1 mA	100μΩ	0.0020 + 0.0060	0.0080 + 0.0060	0.0100 + 0.0060
1000	6.9 V, 1 mA	1 mΩ	0.0025 + 0.0006	0.0085 + 0.0020	0.0105 + 0.0006
10 K	6.9 V, 100 μA	10 mΩ	0.0020 + 0.0006	0.0080 + 0.0020	0.0100 + 0.0006
100 K	12.8 V, 10 μA	100 mΩ	0.0030 + 0.0006	0.0090 + 0.0010	0.0110 + 0.0010
1 M	12.8 V, 1 μA	1 Ω	0.0020 + 0.0006	0.0020 + 0.0010	0.0100 + 0.0010
10 M	7 V, 0.7 μA / 10 M Ω	10 Ω	0.0150 + 0.0006	0.0200 + 0.0010	0.0400 + 0.0010
100 M	7 V, 0.7 μA / 10 MΩ	100 Ω	0.0800 + 0.0030	0.2000 + 0.0030	0.2000 + 0.0030
DC VOLTAGE MEASUREMENT, DAQ MODE					
Range	Resolution	Accuracy 24 Hours 23°C ±5° (% of Reading)+ (% of FS)	Accuracy 90 Days 23°C ±5° (% of Reading)+ (% of FS)	Accuracy 1 Year 23°C ±5° (% of Reading)+ (% of FS)	
100 mV	4μV	0.06 + 0.06	0.06 + 0.06	0.06 + 0.06	
1 V	40 μV	0.06 + 0.03	0.06 + 0.03	0.06 + 0.03	
10 V	400 μV	0.06 + 0.03	0.06 + 0.03	0.06 + 0.03	
100 V	4 mV	0.06 + 0.03	0.06 + 0.03	0.06 + 0.03	
300 V	40 mV	0.06 + 0.10	0.06 + 0.10	0.06 + 0.10	
FREQUENCY MEASUREMENT					
Frequency Range1	1 Hz to 500 KHz				
Input Voltage*	20 mV to 300 V				
Resolution (offset ppm)	0.33 (1 second gate time) 3.33 (100 mSec gate time) 33.3 (10 mSec gate time)				
Accuracy	100 ppm of reading + offset ppm				

* Input amplitude must be at least 20% of FS and input amplitude must not exceed specified volt - hertz product.

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ENVIRONMENTAL AND PHYSICAL SPECIFICATIONS	
Safety	Complies with IEC 61010-1, CAT II 300 V, pollution degree 2
EMC	Complies with EN61326-1
Calibration	Calibration is performed at the factory using NIST traceable instrumentation. All calibration constants are stored on-board in non-volatile EEROM. Calibration can be performed by any calibration laboratory with the appropriate equipment.
Temperature Range	Operating: 0 °C to +50 °C Extended operating range: -20 °C to +70 °C Storage: -20 °C to +70 °C storage
Relative Humidity	Operating: 80% at 40 °C Storage: 95% at 40 °C
Power (max)	+5 VDC, 2.3 A +3.3 VDC, 255 mA +12 VDC, 16 mA -12 VDC, 25 mA
Connectors	(4) Banana jacks: Hi: Voltage, 2 W Ω Lo: Voltage, Current, 2 W Ω Sense Hi: Current, 4 W Ω Sense Lo: 4 W Ω 7-pin DIN: Trigger in, Trigger out, Trigger Gnd

Note: Specifications are subject to change without notice

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ORDERING INFORMATION

GX2065	Performance 6.5 Digit DMM / Digitizer
GX2065-M	Performance 6.5 Digit DMM / Digitizer (Ruggedized and Conformally Coated)
ACCESSORY	
GX93005	DIN Mating Connector for GTX22xx
GX93006	3' Harness for GTX22xx DIN connector (DIN to Header)
GX2065-CAL	GX2065 Calibration/Verification Service. Includes pre-verification data (post calibration data provided if applicable)
GX2065-CAL-3	GX2065 Calibration/Verification Service - 3 Years. Includes pre-verification data (post calibration data provided if applicable)
GX2065-CAL-5	GX2065 Calibration/Verification Service - 5 Years. Includes pre-verification data (post calibration data provided if applicable)
CALIBRATION	
CalEasy	CalEasy License for all Supported Marvin Test Solutions Products (Single User License) with One Year Support and Subscription
CalEasy-2Y	CalEasy License for all Supported Marvin Test Solutions Products (Single User License) with Two Year Support and Subscription
CalEasy-3Y	CalEasy License for all Supported Marvin Test Solutions Products (Single User License) with Three Year Support and Subscription
CalEasy-GX1120	CalEasy for the GX1120 (Single User License) with One Year Support and Subscription
CalEasy-GX1649	CalEasy for the GX1649 (Single User License) with One Year Support and Subscription
CalEasy-GX2065	CalEasy for the GX2065 (Single User License) with One Year Support and Subscription
CalEasy-GX5055	CalEasy for the GX5055 (Single User License) with One Year Support and Subscription
CalEasy-GX5295	CalEasy for the GX5295 (Single User License) with One Year Support and Subscription
CalEasy-GX5960	CalEasy for the GX5960 (Single User License) with One Year Support and Subscription
CalEasy-UG	Upgrades a Single Instrument CalEasy License to Include All Supported Marvin Test Solutions Instruments
CalEasy-S1Y	Renew CalEasy Subscription and Support 1 Year
CalEasy-S2Y	Renew CalEasy Subscription and Support 2 Years
CalEasy-S3Y	Renew CalEasy Subscription and Support 3 Years
CalEasy-GX5296	CalEasy for the GX5296 (Single User License) with One Year Support and Subscription