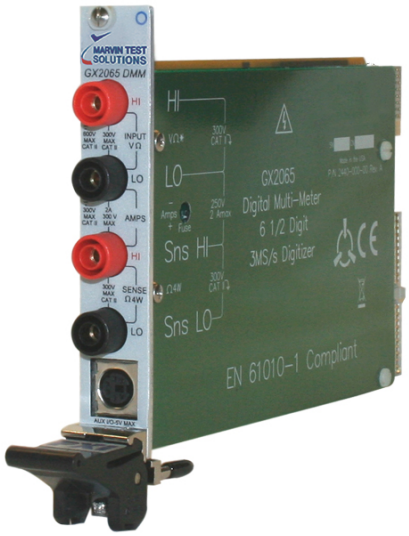
GX2065

MARVIN TEST SOLUTIONS

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 uV to 300 V
- 7 resistance ranges, 100 to 100 M
- Additional IVI-C (DMM) compatible driver
- Additional Signametrics SMX2040 & SMX2060 compatible drivers
- Extended temperature range option
- PXI hybrid slot compatible



DESCRIPTION

The GX2065 offers a unique combination of features, resolution, accuracy and speed in a compact, single slot 3U PXI format. Featuring 6-½ 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 and IV-C compatible drivers are also supplied, allowing customers to easily interchange other vendors DMMs (for example SMX2040 from Signametrics or PXI-4070 or PXI-4072 from NI) with the GX2065 without changing the application code. 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

MEASUREMENT

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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, 6-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, 0.002 to 10; PLC can be set to 50 or 60 Hz
DMM Reading Rate (V_{DC}, I_{DC} & 2WR (< 10 M ohm))	5 readings/sec @ 6.5 digits, 60 Hz, (10 PLC), Auto Zero Off 50 readings/sec @ 6.5 digits, 60 Hz, (1 PLC), Auto Zero Off 500 readings/sec @ 5.5 digits, 60 Hz, (0.1 PLC), Auto Zero Off, 1K samples into buffer 2500 readings/sec @ 4.5 digits, 60 Hz, (0.01 PLC), Auto Zero Off, 1K samples into buffer 3500 readings/sec @ 3.5 digits, 60 Hz, (0.002 PLC), Auto Zero Off, 1K samples into buffer
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
Digitizer Memory	8192 samples
DMM Memory	1 K samples
DMM MEASUREMENT CHARACTERISTICS	
Input Range	100 nV to 300 V
V_{AC} Input Range	3 µV to 425 V (peak), 300 V_{RMS} 10 Hz to 300 kHz, AC or DC coupled
Crest Factor (V_{AC})	No limitation as long as maximum input signal is below the peak range value.
V_{DC} / V_{AC} Input Impedance	> 10 G (0.1, 1, and 10 V_{DC} ranges) 400 pF shunt capacitance 10 M 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 µA to 2 A peak, 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 to 100 M
Resistance Measurement Configuration	Selectable, 2-wire or 4-wire

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Burden Voltage	20 mA range, < 0.2 V 100 mA range, < 0.1 V 1 A range, < 0.5 V 2 A range, < 1.0 V
Internal Temperature Measurement Accuracy	± 2°C
Time Base Accuracy	100 ppm

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 µs for external DIN input
Trigger Input Impedance	4.75 k
Trigger Input Edge	Selectable, positive or negative

AC MEASUREMENT PERFORMANCE

Reading Rate	**Signal Bandwidth**
1 S/s	4 Hz to 4 kHz
5 S/s	20 Hz to 20 kHz (default)
375 S/s	300 Hz to 300 kHz

DC VOLTAGE 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)**
100 mV	100nV	0.0030 + 0.0040	0.0040 + 0.0045	0.0045 + 0.0045
1 V	1 µV	0.0030 + 0.0007	0.0040 + 0.0008	0.0045 + 0.0008
10 V	10 µV	0.0010 + 0.0004	0.0025 + 0.0005	0.0030 + 0.0005
100 V	100 µV	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 ±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

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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 + 1.0	0.03 + 1.0	0.03 + 1.0
100 mA	40 µA	0.01 + 1.0	0.01 + 1.0	0.01 + 1.0
1 A	40 µA	0.04 + 0.15	0.04 + 0.15	0.04 + 0.15
2 A	80 µA	0.04 + 0.15	0.04 + 0.15	0.04 + 0.15

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)	**Range (Vpk)**	**Resolution**	**Frequency and Accuracy [23°C ±5° (% of Reading) + (% of FS)]**			
			Frequency	**Accuracy 24 Hours**	**Accuracy 90 Days**	**Accuracy 1 Year**
50 mV	100 mV	2 µV	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 5 V 50 V 300 V	1 V 10 V 100 V 450 V	20 uV 200 uV 2 mV 30 mV	3 Hz - 10Hz	0.35 + 0.03	0.35 + 0.03	0.35 + 0.03
			>10 Hz - 20 KHz	0.05 + 0.03	0.05 + 0.03	0.06 + 0.03
			>20 KHz - 50 KHz	0.11 + 0.05	0.11 + 0.05	0.12 + 0.05
			>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)	Resolution	Frequency and Accuracy [23°C ±5° (% of Reading) + (% of FS)]			
		Frequency	**Accuracy 24 Hours**	**Accuracy 90 Days**	**Accuracy 1 Year**
0.5 A	40 µA	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	100µ	0.0020 + 0.0060	0.0080 + 0.0060	0.0100 + 0.0060
1000	6.9 V, 1 mA	1 m	0.0025 + 0.0006	0.0085 + 0.0020	0.0105 + 0.0006
10 K	6.9 V, 100 µA	10 m	0.0020 + 0.0006	0.0080 + 0.0020	0.0100 + 0.0006
100 K	12.8 V, 10 µA	100 m	0.0030 + 0.0006	0.0090 + 0.0010	0.0110 + 0.0010
1 M	12.8 V, 1 µA	1	0.0020 + 0.0006	0.0020 + 0.0010	0.0100 + 0.0010
10 M	7 V, 0.7 µA // 10 M	10	0.0150 + 0.0006	0.0200 + 0.0010	0.0400 + 0.0010
100 M	7 V, 0.7 µA // 10 M	100	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

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DIODE MEASUREMENT					
Test Current	**Voltage Range**	**Current Source Accuracy**	**Accuracy (Nominal) 24 Hours 23°C ±5° (% of Reading)+ (% of FS)**	**Accuracy (Nominal) 90 Days 23°C ±5° (% of Reading)+ (% of FS)**	**Accuracy (Nominal) 1 Year 23°C ±5° (% of Reading)+ (% of FS)**
10 uA	0 - 12 V	5%	0.001 + 0.004	0.0025 + 0.005	0.003 + 0.005
100 uA	0 - 6.5 V	5%	0.001 + 0.004	0.0025 + 0.005	0.003 + 0.005
1 mA	0 - 6.5 V	5%	0.001 + 0.004	0.0025 + 0.005	0.003 + 0.005

FREQUENCY MEASUREMENT	
Frequency Range	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.

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. Calibration Interval: 1 year
Operating Temperature Range	GX2065: 0°C to +50°C GX2065-M: 0°C to +62°C; contact factory for extended temperature range specifications
Storage Temperature Range	GX2065: -20 °C to +85°C GX2065-M: -51 °C to +85 °C
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 Lo: Voltage, Current, 2 W Sense Hi: Current, 4 W Sense Lo: 4 W 6-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 / GX2065
GX93006	3 ft Harness for GTX22xx/GX2065 DIN connector (DIN to Header)
GX93007	DIN Adapter cable, SMX2040 / SMX2060 to GX2065 trigger cable
CALIBRATION	
GX2065/GX2065-M-CAL	GX2065/GX2065-M Calibration/Verification Service. Includes pre-verification data (post calibration data provided if applicable)
GX2065/GX2065-M-CAL-3	GX2065/GX2065-M Calibration/Verification Service - 3 Years. Includes pre-verification data (post calibration data provided if applicable)
GX2065/GX2065-M-CAL-5	GX2065/GX2065-M Calibration/Verification Service - 5 Years. Includes pre-verification data (post calibration data provided if applicable)
CalEasy-GX2065	CalEasy for the GX2065 (Single User License) with One Year Support and Subscription
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

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