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Find the *VX Instruments PXM7810* at our website: ***Click HERE***

PXM(e)7822
High Accuracy Multi-Measurement Device

VXI instruments
the test solutions provider



TECHNICAL DATA SHEET –preliminary–

PXI
VXI
LAN
cPCI
PXIe
GPIB
USB
RS232 485
external PCIe

Features

- High voltage range with up to 500 V_{pp}
- 16 Bit Waveform Digitizer 64 MS, 20 MS/s
- High precision Digital Multimeter with 24 Bit resolution and 1 MS/s
- Fully isolated design
- >1 GΩ || <20 pF input impedance up to 8 V range
- 10 MΩ || <20 pF for all other ranges
- Changing range <1 ms
- Highly configurable trigger matrix
- Trigger engine for instrument synchronization
- Built-in timer/counter engine
- Electronic protection against overcurrent and overvoltage
- Memory segmenting

Product Information

General

The PXM(e)7822 High Speed Multi-Measurement combines a 24 Bit DMM with up to 1 MS/s, a timer/counter, a 20 MS/s Digitizer with a resolution of 16 Bit and a trigger card. One special feature of the PXM7822 is a very high input impedance of 10 MΩ || <20 pF also for all AC ranges. Therefore the influence on DC and AC signals is reduced to a minimum. A trigger input and output is provided as well as electronic protection against overvoltage and overcurrent.

High voltage, high resolution waveform digitizer

The PXM(e)7822 High Speed Multi-Measurement Device features waveform sampling with 20 MS/s, 16 Bit resolution, input voltages up to ±250 V_p and a bandwidth up to 5 MHz. This allows the measurement of high voltage signals without additional signal conditioning. Data can be acquired before and after the trigger event with a programmable sample counter that controls a number of up to 64 million data points. The memory segmenting function allows to save different digitizing events in the memory.
A great amount of trigger capabilities results in multiple instrument and channel synchronization possibilities.

High precision digital multimeter

The PXM(e)7822 High Speed Multi-Measurement Device features a high precision Digital Multimeter (DMM) for high performance measurements with 24 Bit resolution.
It provides measurement of DC voltage up to 250 V, AC voltage up to 250 V_{ACPeak}, DC current up to 1 A and AC current up to 1 A_{RMS} (2 A_{ACPeak}).

High resolution timer/counter

The PXM(e)7822 High Speed Multi-Measurement Device features a high precision timer/counter for high performance measurements of frequency, period time, interval pulse width and rise and fall time with a resolution of up to 50 ns.

High precision LCR meter

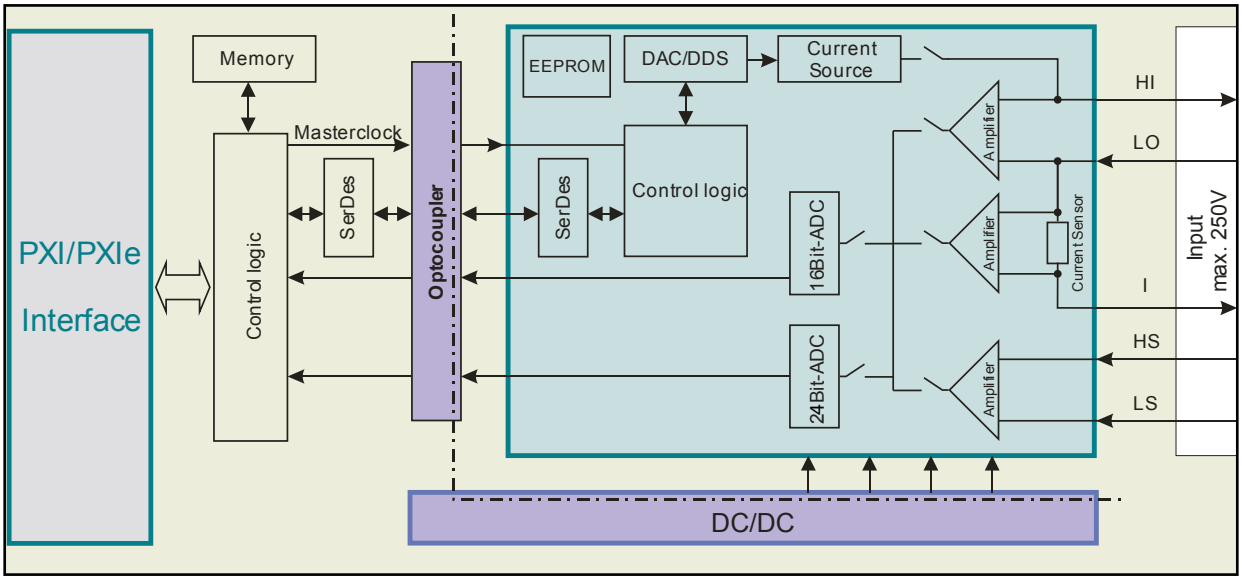
The PXM(e)7822 High Speed Multi-Measurement Device features a high precision LCR-Meter for resistance, capacitance and inductance measurement.

Configurable trigger matrix

The PXM(e)7822 High Speed Multi-Measurement Device features a complex trigger matrix. Both trigger connectors, internal trigger events and all trigger lines on the backplane can be connected individually.

High throughput design for many applications

The PXM(e)7822 High Speed Multi-Measurement Device is designed for high throughput production testing. One key feature is the extremely low switching time of <1 ms for the changing of ranges and functions like switching from AC to DC.



General	Specification	Comment
Module size	1 slot, 3U	
Module weight	<0.7 kg	
Front connector type	FM5W5P	
Storage temperature range	-25 ... 70°C	
Operating temperature	0 ... 40°C	
Operating altitude	<2,000 m	
Relative humidity	Up to 85% at 35°C	
Electrical safety	According EN61010-1	
Isolation input to PE	250 V CAT I, Pollution Degree 2	

Waveform Digitizer

Acquisition	Specification	Comment
Maximum sample rate	20 MS/s	
Bandwidth		
Range 250 mV_p, 500 mV_p	>2 MHz	0.5 V_{pp} input signal; no filter
Range 1 V_p, 2 V_p, 4 V_p, 8 V_p	>5 MHz	2 V_{pp} input signal; no filter
All other ranges	>1 MHz	20 V_{pp} input signal; no filter
Vertical resolution	16 Bit	
Sampling interval	50 ns ... 1 s	Software selectable
Input impedance	10 MΩ // <20 pF	
Input coupling	DC or AC	Software selectable
Maximum input voltage	f < 40 kHz: 250 V_p 40 kHz < f < 1 MHz: $10^7 V_p$ / f 1 MHz < f < 5 MHz: 10 V_p	Input voltage may not exceed selected input voltage range
Input ranges	250 mV_p, 500 mV_p, 1 V_p, 2 V_p, 4 V_p, 8 V_p, 16 V_p, 32 V_p, 64 V_p, 128 V_p, 250 V_p	5% overrange 5% overrange
DC accuracy[1]		
Range 250 mV_p	0.3 + 4	±(% of input + mV)
Range 500 mV_p	0.3 + 4	±(% of input + mV)
All other ranges	0.1 + 0.1	±(% of input + % of full scale)
Filter	1 kHz, 10 kHz, 100 kHz, 1 MHz	Software selectable
Waveform memory	64 MS	

Time Base	Specification	Comment
Accuracy	1 ppm	In operating temperature range
Aging per year	1 ppm	In operating temperature range

[1] DC accuracy specified for an average value of 100 samples with a sample rate of 5 kS/s and active 10 kHz filter performed within 24 hours after an offset correction.

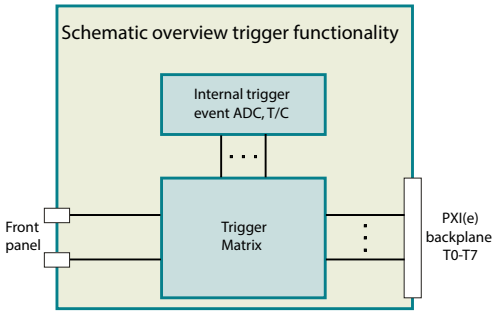
Notes: All product data are specified for 1 year at an ambient temperature of 23°C ±5°C (after 1 hour warm-up time). Product specification and description in this document are subject to change without notice.

Trigger

Trigger System	Specification	Comment
Input from		
Internal function module	Module can trigger itself	
Software	Via software command	
Front connector	Front trigger input (TTL level)	
PXI trigger	Trigger 0 ... 7 and star trigger	From the PXI backplane
Output to		
Internal function module	Module can trigger itself	
Front connector	Front trigger output (TTL level)	
PXI trigger	Trigger 0 ... 7	To the PXI backplane
Level resolution	16 Bit or 24 Bit	
Level accuracy		
250 mV_p	0.2 + 0.2	±(% of programmed value + % of full range)
500 mV_p	0.15 + 0.15	±(% of programmed value + % of full range)
All other ranges	0.1 + 0.1	±(% of programmed value + % of full range)
Trigger delay	0 ... 200 s	Programmable delay, 50 ns resolution
Trigger slope	Positive or negative	
Trigger hysteresis	0 ... 100% of signal range	Programmable via software
Pre-Trigger	0 ... 100% of full record length	Trigger is armed after all pre-samples are captured; post-samples are captured after trigger
Post-Trigger	0 ... 100% of full record length	Number of samples captured after trigger event
Trigger Mode	Asynchronous, synchronous level, synchronous slope	

Timer/Counter

T/C Measurement Modes	Specification
Frequency	
Counter width	32 Bit
Range	0.1 Hz ... 10 MHz
Minimum pulse width	10 µs
Gate time	1 µs ... 10 s
Period	
Resolution	50 ns
Accuracy[1,2]	±50 ns
Range	1 µs ... 10 s
Time interval and pulse width	
Resolution	50 ns
Accuracy[2]	±50 ns
Range	1 µs ... 10 s
Rise and fall time	
Resolution	50 ns
Accuracy[2]	±50 ns
Range	1 µs ... 10 s
Totalize	
Minimum pulse width	1 µs
Range	0 ... 2^{32}-1



1 Square wave signal with T_{Rise}<1 ns and T_{Fall}<1 ns.
2 Trigger comparator error not included.

Digital Multimeter (DMM)

DC Voltage Measurement	Specification	Comment
Resolution	24 Bit	
Maximum input voltage	±250 V	
Overrange	5% of range	
Filter frequencies	100 Hz, 1 kHz, 10 kHz, 100 kHz	Software selectable
DC accuracy[1,2,5,7]		
Range 250 mV	0.019 + 0.0045	Input resistance >1 GΩ
Range 500 mV	0.014 + 0.003	Input resistance >1 GΩ
Range 1 V	0.0095 + 0.002	Input resistance >1 GΩ
Range 2 V	0.0095 + 0.002	Input resistance >1 GΩ
Range 4 V	0.0095 + 0.002	Input resistance >1 GΩ
Range 8 V	0.0095 + 0.002	Input resistance >1 GΩ
Range 16 V	0.0095 + 0.002	Input resistance 10 MΩ
Range 32 V	0.0095 + 0.002	Input resistance 10 MΩ
Range 64 V	0.0095 + 0.0025	Input resistance 10 MΩ
Range 128 V	0.0095 + 0.003	Input resistance 10 MΩ
Range 250 V	0.0095 + 0.003	Input resistance 10 MΩ

AC Voltage Measurement	Specification	Comment
Resolution	16 Bit	
Input impedance	10 MΩ // <20 pF	
Maximum input voltage	f < 40 kHz: 250 V_p 40 kHz < f < 1 MHz: $10^7 V_p$ / f 1 MHz < f < 5 MHz: 10 V_p	Input voltage may not exceed selected input voltage range
Overrange	5% of range	
Ranges	250 mV_{RMS}, 500 mV_{RMS} 1 V_{RMS}, 2 V_{RMS}, 4 V_{RMS} 8 V_{RMS}, 16 V_{RMS}, 32 V_{RMS}, 64 V_{RMS}, 128 V_{RMS}	

AC Voltage Accuracy[1,2,3,4,5,8]	1 ... 40 Hz[6]	40 Hz ... 20 kHz	20 ... 50 kHz	50 ... 100 kHz	100 ... 300 kHz
Range 250 mV_{RMS}	0.3 + 0.05	0.3 + 0.05	0.3 + 0.05	0.8 + 0.08	3.6 + 0.8
Range 500 mV_{RMS}	0.2 + 0.04	0.3 + 0.05	0.2 + 0.04	0.8 + 0.08	3.6 + 0.8
Range 1 V_{RMS}	0.2 + 0.04	0.3 + 0.05	0.2 + 0.04	0.8 + 0.08	3.6 + 0.8
Range 2 V_{RMS}	0.2 + 0.04	0.3 + 0.05	0.2 + 0.04	0.8 + 0.08	3.6 + 0.8
Range 4 V_{RMS}	0.2 + 0.04	0.3 + 0.05	0.2 + 0.04	0.8 + 0.08	3.6 + 0.8
Range 8 V_{RMS}	0.2 + 0.04	0.3 + 0.05	0.2 + 0.04	0.8 + 0.08	3.6 + 0.8
Range 16 V_{RMS}	0.2 + 0.04	0.3 + 0.05	0.2 + 0.04	0.8 + 0.08	3.6 + 0.8
Range 32 V_{RMS}	0.2 + 0.04	0.3 + 0.05	0.2 + 0.04	0.8 + 0.08	3.6 + 0.8[9]
Range 64 V_{RMS}	0.2 + 0.04	0.3 + 0.05	0.2 + 0.04	0.8 + 0.08	3.6 + 0.8[9]
Range 128 V_{RMS}	0.2 + 0.04	0.3 + 0.05	0.2 + 0.04	0.8 + 0.08[9]	3.6 + 0.8[9]

1 For measurements >5% of range.
2 ±(% of reading + % of full scale).
3 For sine wave signals >5% of range.
4 Maximum peak input voltage = 2x full scale (e.g. maximum input voltage for 128 V_{RMS} range = ±256 V_p).
5 With auto offset correction.
6 With DC coupling.
7 50 PLC.
8 Measurement aperture greater than 5/f_{Low}, where f_{Low} is the lowest frequency component of the signal being measured.
9 Maximum Input Voltage must be satisfied.

DC Current Measurement	Specification	Comment
Resolution	24 Bit	
Maximum input current	±1 A	
Overrange	5% of range	
Filter frequencies	100 Hz, 1 kHz, 10 kHz, 100 kHz	Software selectable
DC accuracy[1,3,4]		
Range 10 mA	0.1 + 0.1	
Range 100 mA	0.1 + 0.1	
Range 1 A	0.1 + 0.1	

AC Current Measurement[6]	Specification	Comment
Resolution	16 Bit	
Maximum input current	±2 A_p	
Overrange	5% of range	

AC Current Accuracy[1,2,3,4,5,6]	40Hz ... 5 kHz	5 kHz ... 20 kHz	Comment
Range 10 mA_{RMS}	0.3 + 0.2	0.5 + 0.3	
Range 100 mA_{RMS}	0.1 + 0.01	0.2 + 0.02	
Range 1 A_{RMS}	0.1 + 0.01	0.3 + 0.02	

Diode Measurement	Specification	Comment
Resolution	24 Bit	
Overrange	5% of range	
Accuracy[1,3,4,7]		
Range 500 mV	0.1 + 0.01	Test current 1 µA, 10 µA, 100 µA, 1 mA
Range 1 V	0.1 + 0.01	Test current 1 µA, 10 µA, 100 µA, 1 mA
Range 2 V	0.1 + 0.01	Test current 1 µA, 10 µA, 100 µA, 1 mA
Range 4 V	0.1 + 0.01	Test current 1 µA, 10 µA, 100 µA, 1 mA
Range 8 V	0.1 + 0.01	Test current 1 µA, 10 µA, 100 µA, 1 mA

1 For measurements >5% of range.
2 For sine wave signals >5% of range.
3 With auto offset correction.
4 ±(% of reading + % of full scale).
5 Maximum peak input current = 2x full scale (e.g. maximum input current for 1 A_{RMS} range = ±2 A_p).
6 With DC coupling.
7 Only 4 wire measurement.

LCR meter

Resistance Measurement	Specification	Comment
Resolution	24 Bit	
Overrange	5% of range	
Accuracy[1,2,3,4]		
Range 100 Ω	0.1 + 0.01	Test current 8 mA
Range 1 kΩ	0.1 + 0.01	Test current 8 mA
Range 10 kΩ	0.1 + 0.01	Test current 800 µA
Range 100 kΩ	0.1 + 0.01	Test current 80 µA
Range 1 MΩ	0.1 + 0.01	Test current 8 µA
Range 10 MΩ	0.1 + 0.01	Test current 800 nA

Capacitance Measurement	Specification	Comment
Resolution	24 Bit	
Overrange	5% of range	
Accuracy[1,2,3,4]		
Range 1 nF	0.15 + 0.1	
Range 10 nF	0.15 + 0.1	
Range 100 nF	0.15 + 0.1	
Range 1 µF	0.18 + 0.1	
Range 10 µF	0.18 + 0.1	
Range 100 µF	0.18 + 0.1	
Range 1 mF	0.18 + 0.1	
Range 10 mF	0.18 + 0.1	

Inductance Measurement	Specification	Comment
Resolution	24 Bit	
Overrange	5% of range	
Accuracy[1,2,3,4]		
Range 10 µH	0.5 + 1	
Range 100 µH	0.2 + 0.1	
Range 1 mH	0.2 + 0.1	
Range 10 mH	0.15 + 0.1	
Range 100 mH	0.15 + 0.1	
Range 1 H	0.18 + 0.1	

1 For measurements >5% of range.
2 Only 4 wire measurement.
3 With auto offset correction.
4 ±(% of reading + % of full scale).

PXI(e) Trigger

PXI Capabilities	Specification	Comment
PXI(e) trigger usage	Possible	PXI(e) trigger 0...7; input and output
PXI(e) star trigger usage	Possible	Input only

Switching Times

Scope of Application	Specification	Comment
Ranges	<1 ms	
Functions[1]	<1 ms	For all U–, I–, R–, L–, C–Ranges[1]

Ordering Information

Ordering Information	Comment	
PXM782x	Device with PXI interface	
PXMe782x	Device with PXIe interface	
Accessory Parts	**MPN**	**VPN**
Mixed Signal Connector		
Pin connector shell	FCT FM5W5P	ZJ1353-0
High voltage contact, plug	FCT FMV001P107K	ZJ1385-0
Metal hood	FCT FMK3G	ZJ1850-0
SMB Trigger Connector		
SMB connector soldering	11_SMB-50-1-40	ZJ1522-0
Isolation sleeve	78_Z-5-1-1	ZJ1523-0
Cable Adapters		
Banana-Jack adapter	---	KA1111-0
BNC adapter	---	KA1112-0

[1] For AC modes with DC coupling.

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