

100MHz/200MHz 12-Channel Digital Pin Card for PXI Platform

12 Independent Digital Timing Channels

- 100MHz/200MHz vector rate (200Mbps/400Mbps)
- Arbitrary vector rate/frequency (not limited by 200/N)
- Support for standard ATE test vector/pattern and timing
- 4 programmable edges per cycle for flexible data format
- 32 timing sets change on-the-fly
- 8M vector & 10K/32K capture memory per channel
- 8M vector & 8M capture memory per channel scan mode

12 Independent Programmable Pin Electronics Channels

- Driver: -2V to 6V (DUT VIH/VIL and VT)
- Comparator: -2V to 6V (DUT VOH/VOL), Edge Strobe
- Load: +/- 12mA programmable active load (source/sink)

12 Independent Parametric Measurement Units (PPMU)

- FV/MV range of -2V to 6V with built-in voltage clamps
- FI/MI with 5 ranges of 25mA, 2mA, 200 μ A, 20 μ A, 2 μ A
- 16-bit resolution for programmable levels and measurement

Others

- 12 Relay Drivers (Utility Bits)
- Powered by National Instruments PXI-3U FlexRIO FPGA
- LabVIEW 2009 VI driver and DLL driver
- Integration with standard ATE test vector/pattern
- Debug tools



Description

PEony-12 offers the highest performance digital pin card on the 3U PXI platform. Its per-pin architecture is specially designed for semiconductor device digital functional test.

PEony-12's timing formatter circuitry provides 12 independent channels with a 100 MHz true vector rate for digital timing and formatting that is equivalent of ATE digital pin capability (e.g. J750). Bundled with the driver, comparator, and load (DCL) pin electronics, PEony-12 offers complete functionality for ATE digital pins.

PEony-12 works with National Instruments PXI-3U FlexRIO FPGA Card to provide 12 digital I/O channels with per-pin PMU. As an example, a typical 8-slot PXI chassis which accommodates 7 pieces of FlexRIO can drive a total 84 independent digital pins.

Features

Digital Timing Capability

PEony-12 supports deep pattern memory with dynamic per-pin per-cycle bi-directional control (drive and strobe). It has a true vector rate of up to 100 MHz, i.e. 10ns per cycle. Within each cycle, 4 programmable edges are available to support various data format such as RZ, NRZ, RO, SBH, SBC etc. Arbitrary vector rate is supported.

PEony-12 is a digital stimulus/response instrument with real-time hardware comparison of acquired response data. It also features capture memory to log specific cycles of device response vector. PEony-12's sequencer engine supports test pattern opcodes such as repeat, loop, jump etc. Up to 32 timing sets in test pattern is supported, with the ability to perform timing set change on-the-fly.

In summary, PEony-12's digital pin features ATE-like digital pin timing capability.

Pin Electronics Circuitry

PEony-12's powerful pin electronics circuitry supplies each pin independently programmable input/output high/low voltage levels without restrictions found on competitor digital instruments. VIH/VIL (driver level) and VOH/VOL (comparator level) have a range of -2V to 6V with built-in clamps to accommodate a wide variety of test devices. For active load, up to +/-12mA (source and sink) is programmable for testing of device IOH/IOL.

Indepent PPMU Resources

PEony-12's PPMU resources are independent on a per-pin basis. Each of the 12 channels can independently perform any combination of FV, FI, MV and MI. This makes PEony-12 highly suitable for parallel DC characterization of DUT. If more channels are required, simply slot in extra FlexRIO cards in the PXI chassis and link up more PEony-12.

Synchronized Mixed-Signal Test

Leveraging National Instruments FlexRIO's PXI bus synchronization and triggering capability, multiple PEony-12 cards can be synchronized to provide higher channel count. PEony-12 can combine with other PXI instruments to build a tightly synchronized mixed-signal test system. Trigger opcode in test pattern is supported to generate trigger signals from PEony-12's front-end DUT connector.

Software

PEony-12 is supplied with LabVIEW 2009 VI functional driver, which provides powerful graphical programming tools.

In addition, 32-bit DLL driver is provided for programming languages such as C/C++ and Visual Basic. The DLL driver is also designed for seamless integration with standard ATE programming environment.

Applications

- Automated test equipment (ATE)
- High speed digital instrumentation
 - Digital Stimulus/Response functional test using ATP test pattern
 - Characterization and Functional Validation
 - Pulse generation
- DC parametric test
 - Per-pin parametric measurement unit (PPMU)
 - Open/Short test & continuity measurement
 - Leakage Current Measurement
 - I-V Curve Measurement

Specifications

Digital Timing

Vector Rate	100MHz, i.e. 10ns per cycle 200MHz in channel multiplex mode Run at arbitrary vector rate (not limited by 200MHz/N as commonly found in other digital instruments)
Vector Memory	Normal Mode: 8M vector depth & 10K/32K capture memory per channel Scan Mode (i.e. Large Capture Memory Mode): 8M vector depth & 8M capture memory per channel
Number of Timing Sets	32, change on-the-fly
Number of Driving Edges	4, per-channel programmable
Number of Strobe Edges	2, per-channel programmable
Edge placement resolution	39.06ps
Edge placement accuracy	300ps
Data Format	RZ, RO, NRZ, SBH, SBL, SBC etc. Or any other formats as programmed according to timing set and edge placement Per-channel programmable
Test Pattern Sequencer	Support for opcodes such as: repeat, loopA/loopB/loopC, if (pass) jump, if(cpuA/cpuB) jump, STV, halt etc.
Channel Timing Configuration	Support ATE-format pin names, pin levels and timing set

Pin Electronics

Driver Output Voltage Level (Also known as Generation Voltage, or DUT VIH/VIL)	Programmable on a per-channel basis Output High: -1.9V to +6.0V Output Low: -2.0V to +5.9V Output Term Range (VT): -2.0V to +6.0V
Driver Voltage Resolution	14-bit DAC
Driver Voltage Accuracy	10mV
Driver Current Limit	±100mA (Source and Sink)
Comparator Input Voltage Range (Also known as Sense Voltage, Acquisition Voltage, or DUT VOH/VOL)	Programmable on a per-channel basis Input High (DUT VOH): -2.0V to 6.0V Input Low (DUT VOL): -2.0V to 6.0V

Comparator Threshold Resolution	14-bit DAC
Comparator Threshold Accuracy	40mV
Programmable Active Load (Also known as DUT IOH/IOL)	Programmable on a per-channel basis Maximum source/sink current: $\pm 12\text{mA}$
Programmable Active Load Resolution	14-bit DAC
Programmable Active Load Accuracy	25 μA

Parametric Measurement Unit (PMU)

Number of PMUs	12, 1 PMU per channel
Force/Measure Voltage Range	-2.0V to +6.0V
Force/Measure Current Range	$\pm 25\text{mA}$, $\pm 2\text{mA}$, $\pm 200\mu\text{A}$, $\pm 20\mu\text{A}$, and $\pm 2\mu\text{A}$
Output Resolution	16-bit DAC
Measurement Resolution	16-bit ADC
Force Voltage Accuracy	10mV
Measure Voltage Accuracy	5mV
Force Current Accuracy	
Range 2 μA	10nA
Range 20 μA	50nA
Range 200 μA	500nA
Range 2mA	5 μA
Range 25mA	50 μA
Measure Current Accuracy	
Range 2 μA	10nA
Range 20 μA	50nA
Range 200 μA	500nA
Range 2mA	5 μA
Range 25mA	50 μA
Voltage Clamps	Low Clamp: -2.0 to +4.0 V, High Clamp: 0.0 to 6.0 V

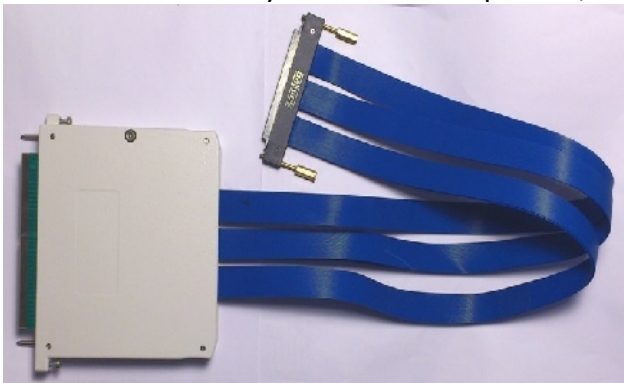
Others

Relay Driver (Utility Bits)	12, individually programmable 12V coil voltage supply with up to 50mA per relay driver
Trigger Lines	2 trigger input/output lines, programmable through test vector pattern, for synchronization with other instruments
Front-end DUT Connector	Samtec High Speed Ground Plane Socket QSS-025-01-L-D-RA
Recommended DUT Cable	Samtec SQCD Series (High Speed Co-ax Cable Assembly)

Ordering Information

Part Number	Description
SP-269801-01	PEony-12 Digital Pin Card
SP-269801-02	PEony-12 FlexRIO Adapter Kit (including FlexRIO Adapter + 0.5M Samtec Interconnect Cable)
SP-782230-02	PEony-12 Type-4 Power Supply. Supply 12V power for up to 6 cards.
SP-965583-01	PEony-12 Card Cage for 19" Rack Width. Houses up to 12 cards to provide a total of 144 digital pins.

SP-269801-02: PEony-12 FlexRIO Adapter Kit, for connecting FlexRIO to PEony.



SP-782230-02: PEony-12 Type-4 Power Supply. Supply 12V power for up to 6 cards.

