

STI9000 Product Sheet

from Solidus Technologies, Inc.

Test Equipment

STI9000 Introduction

The STI9000 test system consists of C-sized VXI modules that provide high volume production test capability of MEMS sensors and modules. The STI9000 is a complete mixed-signal test system containing four programmable Device Power Supplies, a precision 4-quadrant / 4-range PMU and two programmable clock generators. The STI9000 resources include 256K depth stimulus pattern memory, 512K capture depth response memory, 16-bit 1MSPS multi-range analog sampling system, and 16-bit 500KSPS multi-range ARB/waveform generator. All of these functions are managed by a microcontroller on the VXI controller board which executes compiled, user-generated test programs. The STI9000 contains all of the necessary resources to control external hardware such as electro-dynamic shakers, pressure chambers, rate tables, temperature chambers, handlers and database servers.

A Clock-Trigger Expansion Bus is designed to allow two or more STI9000 modules to be used in a parallel architecture which allows tester resources to be multiplied by the number of modules which are linked together. In this configuration, one STI9000 module is designated as the master, and up to 11 more STI9000 modules in a 13-slot VXI rack may be designated as slaves. The master module generates the Response and Stimulus clocks and a master trigger signal to start and stop operation of the slave modules. Using this expansion technique, tester resources may be increased as shown in the STI9000 Resource Summary Table.

STI9000 ATE Resource Summary

STI9000 Modules	Digital Pins	PMU's	Digitizers	AWG's	DPS's
1	16	1	1	1	4
2	32	2	2	2	8
4	64	4	4	4	16
8	128	8	8	8	32
12	192	12	12	12	48



STI9000 Digital Resources

Digital Stimulus

Parameter	Specification
Stimulus Width	18-bits
Stimulus Depth	256 K
Vector Rates	1 Hz to 30 MHz

Event Counters

Parameter	Specification
Counters	6
Counter Events	65,536 per Counter
Basic Clock Rates	16, 8, 4, 2, 1, .5, .25, .125 MHz

Digital Response

Parameter	Specification
Pattern Width	32-bits
Pattern Depth	512 K
Vector Rates	1 Hz to 50 MHz

Asynchronous DUT Clock

Parameter	Specification
Frequency Range and Step Size	10 KHz to 100 KHz, step 500Hz 100 KHz to 1 MHz, step 2 KHz 1 MHz to 10 MHz, step 20 KHz 10 MHz to 20 MHz, step 200 KHz

For more information, contact your Solidus Technologies, Inc. Representative



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STI9000 Analog Resources

Digitizer

Parameter	Specification
Sample Rate	1 Hz to 1 MHz
Resolution	16-bits (15 bits + Sign)
Input Ranges	+/-2.5, 5.0, 10.0, 20V full scale
Input Impedance	1 MOhm or 50 Ohms
Input Coupling	DC or AC Coupling

Arbitrary Waveform Generator

Parameter	Specification
Data Rate	DC to 500 KHz; 2 MHz max.
Resolution	15 bits +Sign
Output Ranges	+/-5.0, 10.0, 20 V full scale
Settling Time	2 μ S to 0.0015 % for 10 V step

Digital Pin Drivers and Receivers

Parameter	Specification
VOH	2.0 V to 7.0 V, 10 mA Sourcing or Sinking
VOL	0.0 V (tester digital ground)
VIH	0.0 V to 7.0 V, Adjustable trip point
VIL(min)	-2.0 V

DUT Interface Resources

Pin Driver/Receiver Architecture

The STI9000 has 24 digital pin interface circuits.

Pins 0 to 7 are Output only:

Can be connected to the PMU force and sense bus.

Pins 0 through 3 may be connected to the AWG output.

Pins 8 to 11 are I/O:

User selectable or controlled by the Stimulus pattern.

Can be connected to the PMU force and sense bus, AWG output or the Digitizer input.

Pins 12 to 15 are Input only:

Can be connected to the PMU force and sense bus.

Pins 16 to 23 are Input only:

Streaming Digital Input pins and are used only when the Digitizer is capturing analog signals.

Parametric Measurement Unit : Force Voltage/Measure Current

Parameter	Specification
Force Voltage Range	+/- 8 V; Accuracy: +/- 2 mV
Current Meas Range 1	+/- 20 mA; Accuracy: +/- 5 μ A
Current Meas Range 2	+/- 2 mA; Accuracy: +/- 500 nA
Current Meas Range 3	+/- 200 μ A; Accuracy: +/-50 nA
Current Meas Range 4	+/- 20 μ A; Accuracy: +/- 5 nA

Force Current Resources

Parameter	Range 1	Range 2	Range 3	Range 4
I_F (range)	-8 to+8mA	-800 to+800 μ A	-80 to+80 μ A	8.0 to+8 μ A
I_F (accuracy)	+/- 2 μ A	+/- 200nA	+/- 20 nA	+/- 2 nA
I_F (resolution)	+/- 1 μ A	+/- 100nA	+/- 10 nA	+/- 1 nA

Note: Current force V_{clamp} is variable from $\pm 3.0V$ to $\pm 20.0 V$. Positive and negative clamp voltages may be set to track, or may be varied independently.

Device Power Supplies

Parameter	Specification
DPS1 and DPS2 Range	+1.0 V to +16.0 V; Step 2 mV @ 80 mA
DPS1 and DPS2 Accuracy	Set point +/-4.0 mV, current readback +/-25 μ A, voltage readback +/-4.0 mV
DPS3 Range	+1.0V to +24.0V; Step 3mV @ 8mA max
DPS3 Accuracy	Set point +/-6.0 mV, current readback +/-5 μ A, voltage readback +/-6.0 mV
DPS4 Range	$\pm 1.0 V$ to $\pm 16.0 V$; Step 2 mV @ 80 mA
DPS4 Accuracy	Set point +/-5.0 mV, current readback +/-25 μ A, voltage readback +/-4 mV

Pin Resource Architecture

- Arbitrary Waveform Generator
- Digitizer
- Device Power Supplies
- Precision Measurement Unit
- Zero Crossing Detector
- Asynchronous Clock
- Edge Counters
- Stimulus Response Clock Control
- Digital Stimulus
- Digital Response
- Pin Driver VOH & VIH
- 8 Digital Output pins
- 4 Digital I/O Pins
- 4 Digital Input Pins
- 8 Digital Input Streaming Pins
- Master/ Slave Bus



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