

Model 320-8 front  
with InspeXion® screen



## FUNCTIONAL DESCRIPTION

The 300 Series is an economical and powerful solution for industrial in-process and end-of-line testing, process monitoring, and quality verification on manufacturing and assembly lines. Based on Sciemetric's proven and reliable measurement and control technology, the 300 Series is designed for continuous operation in production environments. Based on an Intel® CPU, the 300 Series has built-in signal conditioning and A/D converter for sensor measurements, relays for digital I/O control, redundant hard disk drives and power supplies, re-writable CD-ROM for high capacity storage, and selected models include Sciemetric's InspeXion® Test and Analysis software, which supports test sequencing, data acquisition, waveform analysis, PASS/FAIL reporting, data storage, statistical process control (SPC) data analysis, and PLC (Programmable Logic Controller) communications.

## APPLICATIONS

The 300 Series has hundreds of applications ranging from in-process and end-of-line testing to assembly monitoring and verification:

- Force vs. distance press-fit monitoring
- Torque to turn testing
- Functional testing
- Process monitoring
- Gaging and dimensional verification
- Fastening torque verification systems
- Leak testing
- Weld monitoring
- Vibration testing

## FEATURES

- Uses signature analysis technology to find defects
- Built in SPC (statistical process control)
- Capture and analyze complete data waveform
- Optional PLC connectivity
- Intel® Processor and Microsoft® Windows® operating system
- Optional birth history software (QualityWorX® system)
- Ethernet port
- Rear panel, screw terminal, and quick disconnect I/O access
- SVGA monitor output
- Redundant hard drives and power supplies (on Models 320 and 330)
- Re-writable CD-ROM
- Floppy disk drive
- Flexible and expandable

## BENEFITS

### REDUCE RISKS

- Find more defects than other test systems, leading to higher levels of quality and fewer false rejects.

### IMPROVE PLANT YIELD

- Reduce lost production time by statistically establishing test PASS/FAIL limits.
- Automatically calculate process control limits.
- Rapid statistical analysis of test data.
- Provides root cause determination.

### INCREASE THROUGHPUT

- Reduces test cycle time by aborting a test when a defect is discovered without having to cycle through the entire test process
- Works seamlessly as part of your manufacturing process

### EASY TO SETUP and USE

- User friendly

### FLEXIBLE and EXPANDABLE

- Supports solutions to meet all manufacturing needs
- Upgradeable channel count



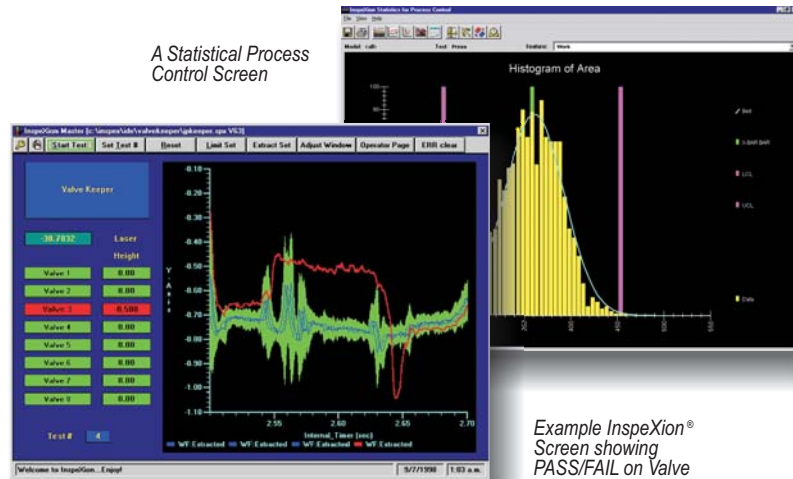
## SOFTWARE

Each 300 Series is shipped with Sciometric®'s flexible InspeXion® Test and Analysis software. This high performance 32 bit customer configurable development platform is designed specifically for rapid setup of process verification, testing and quality control applications. InspeXion® supports data acquisition, mathematical processing, signature analysis and advanced feature extraction, statistical (SPC) data analysis, PLC communication, data storage and networking in a deterministic event-driven architecture. Running under the Microsoft® Windows® environment with a user friendly GUI (Graphical User Interface), InspeXion® provides limitless configurability that is adaptable to many test applications with changing needs. To accelerate and simplify application software configuration, the 300 Series is shipped with a starter InspeXion® setup file that can be easily edited to get the system up and running quickly.

## SIGNATURE ANALYSIS

A powerful feature of the 300 Series is the ability to capture, process, analyze and archive complete data waveforms using signature analysis techniques without custom software programming. Sciometric® is the leader in developing this easy to use signature analysis technology and has proven its enhanced ability to find defects in assembly and manufacturing operations. What would normally take weeks or months with competitive programming languages can now be done in hours with this flexible software system.

A Statistical Process Control Screen



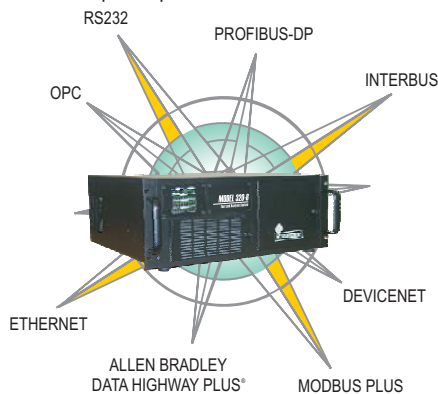
Example InspeXion® Screen showing PASS/FAIL on Valve

## NETWORK, PLC and COMMUNICATION OPTIONS

The 300 Series comes standard with a direct Ethernet network connection port to facilitate data storage, system backup and other communication needs, including communication between multiple InspeXion® stands.

Ethernet and other network interface cards are available options\*.

Direct PLC network interface options and field bus connections are also available through a variety of interface cards and InspeXion® software drivers.\*



## I/O SIGNAL CONDITIONING

The 300 Series contains a built-in high speed 16 bit A/D converter which supports 2 to 24\* analog input channels and is capable of sampling at data rates up to 30 kHz on a single channel. Each channel can measure a wide range of standard sensors such as load cells, pressure sensors, torque transducers,  $\pm 10$  VDC voltages, and much more.

A total of 8 software selectable full-scale measurement ranges from  $\pm 33$ mV to  $\pm 10$  VDC are provided. Precise DC excitation ( $\pm 5$ ,  $\pm 10$ ,  $\pm 12$ ,  $\pm 15$  VDC, switch selectable) is generated for each analog channel to power load cells or other transducers. Each channel is supplied with a relay contact for shunt calibration. This allows the sensors to be initially calibrated, and periodically shunt-calibrated to verify the integrity of the wiring and sensors.

The 300 Series provides 8 solid-state digital inputs that can be used to sense relay or PLC type voltage signals, and 8 solid-state digital outputs for power switching and control. Each of the 8 digital input channels can be read directly (Range 1: on channel 0-7) or conditioned (Range 2: on channel 8-15). The conditioning uses Zener diodes to extend the noise margin and simplify higher voltage AC operation (see specifications). An encoder channel also supports quadrature inputs for direct measurement of rotary encoders or linear scales (5V excitation is provided for the sensor). A special 9th digital output channel is provided and controlled as an on-line status indicator designed to indicate to a host PLC system that the 300 Series is on-line and fully operational.

## OPERATOR INTERFACE

The operator interface consists of a keyboard with mouse, and a standard SVGA monitor (monitor not included). An optional 10.4 or 14 inch touch screen monitor can be ordered with the 300 Series. Navigation through the configurable screens, menuing and messaging system provides operator access for data entry, programming, calibration, setup, and test process feedback. Access to the power on/off switch, reset switch, floppy disk drive, rewritable CD-ROM and removable hard drives\* is gained through a front panel door. Front panel LEDs (Light Emitting Diodes) indicate system power status, system on-line status, hard drive activity, digital I/O channel status, the active analog channel, and encoder activity.



InspeXion® Interface and Front Panel LEDs

\*Optional component not available on all models. Consult factory for specific PLC options and exact availability.

# 300 SERIES

FRONT



- ① LED Panel
- ② Vertical Mount Option
- ③ Redundant Hard Drives\*
- ④ Rewritable CD-ROM

BACK



- ⑤ 1U Expansion chassis for 200 cards for Model 330-8 and Model 330-24 (not shown).
- ⑥ Up to 8 Channels of Analog Inputs on removable panel for quick replacement
- ⑦ Redundant Power Supplies\*
- ⑧  $\pm 5, \pm 10, \pm 12, \pm 15$  VDC built-in
- ⑨ PCI and ISA slots available

## MANUFACTURING BIRTH HISTORY AND TRACEABILITY

For the ultimate in manufacturing traceability, permanent storage of test data is available through the optional QualityWorX® Product Quality Management System. Sciometric's QualityWorX® can be used to archive test results by serial number and store the actual waveforms measured during testing.

Some of the benefits of storing the test waveforms include:

- Specific products can be identified for recall without having to issue a costly and damaging general recall.
- The system features an advanced "What-If Analyst" feature that uses stored waveforms to assist engineers in designing test approaches or refining tests. Basing test designs on real historical data helps increase confidence in a specific approach before it is implemented in production

**Traceability and Analysis** - QualityWorX® also provides exceptional traceability throughout the entire manufacturing process. The system creates a comprehensive overview of all test functions, delivering production monitoring with the highest degree of precision. Defects and deficiencies can be traced to the level of individual stations, operators, shifts, and components. This facilitates rapid identification and resolution of process and product problems before significant costs for repair and rework are incurred. QualityWorX® is the global leader in manufacturing intelligence and quality control management.

## DESIGNED FOR PRODUCTION ENVIRONMENTS

Some of the 300 Series are outfitted with redundant power supplies and hard disk drives. This increases the fault tolerance of the system and results in minimal down time by replicating the data from one drive to another and by including a second power supply in parallel.



Redundant Hard Drives and Power Supplies

\*Optional component not available on all models. Consult factory for specific PLC options and exact availability.

# 300 SERIES

## 300 SERIES - SPECIFICATIONS and ORDERING INFORMATION

<b>SYSTEM</b>	
* Intel® processor	
* InspecXion Test and Analysis Software & SPC module	
* Microsoft® Windows® operating system	
* Dual IDE compatible redundant hard disk drives (specified models only)	
* Dual hot swap power supplies (specified models only)	
* Rewritable CD-ROM and floppy disk drive (3.5", 1.44MB)	
* Keyboard	
* 19" rack mounting adapter	
* Online User's Manual	
<b>PROCESSOR</b>	
<b>Processor</b>	Intel®*
<b>Hard Disk</b>	40 GB*
<b>DRAM</b>	512 MB RAM* (Model 310, 315, 320, 330)
<b>Ethernet</b>	10/100 Base-TX
<b>Expansion Slots</b>	1 ISA or 1 PCI min.
<b>Printer Ports</b>	1
<b>RS232 Serial Ports</b>	2
<b>PS2 Ports</b>	2 (Keyboard / mouse)
<b>GENERAL</b>	
<b>Chassis Dimensions</b>	
<b>315 and 320 Series</b>	7.0 x 17.3 x 16.5 in (178 x 439 x 419 mm), HxWxD
<b>325 and 330 Series</b>	8.75 x 17.3 x 16.5 in (222 x 439 x 419 mm), HxWxD
<b>Vertical Rack Space</b>	4U (330 Series are 5U)
<b>Chassis Weight</b>	50 lbs (21 kg)
<b>Shipping Weight</b>	60 lbs (27 kg)
<b>Operating Humidity</b>	8 to 90% relative, non-condensing
<b>Operating Temperature</b>	10 to 45 °C
<b>Warm Up Time</b>	60 minutes for stated accuracy
<b>Paint Finish</b>	Black exterior baked enamel
<b>AC POWER REQUIREMENTS</b>	
<b>Supply Voltage</b>	90-135/180-265 VAC rms, auto-detecting
<b>Frequency</b>	50 - 60 Hz
<b>Power Consumption</b>	180 W maximum, 130 W typical

\* The exact processor type and speed, memory supplied, hard disk capacity and other technical specifications will change as computer technology improves.  
\*\* Depends on system configuration.

### 315, 320, 325, 330 and 332 SERIES

#### ANALOG INPUTS

<b>Number of Channels</b>	315-4 and 320-4 320-8, 325-8 and 330-8 332-16 325-24 and 330-24 332-32	4 channels 8 channels 16 channels 24 channels 32 channels
<b>Input Ranges</b>	±10 V, ±5 V, ±1 V, ±500 mV, ±200 mV, ±100 mV, ±66 mV, ±33 mV	
<b>Input Accuracy</b>	0.01 % ±3 counts (5 V range), 0.02 % ±5 counts (all other ranges except 33mV range), 0.03 % ±5 counts (33 mV range)	
<b>Maximum A/D Sample Rate</b>	Single Channel any unit: 30 kHz** Multi Channel: Sample Rate** = $\frac{60 \text{ kHz}}{\text{Number of Channels} + 1}$	
<b>Input Impedance</b>	10 MΩ	
<b>Overload Protection</b>	24 V without damage	
<b>EXCITATION TYPE 1:</b>		
<b>Voltages</b>	±5, ±10, ±12 and ±15 VDC	
<b>Maximum Current</b>	500 mA	
<b>Regulation</b>	0.1 %	
<b>Selection</b>	Voltages are selectable with a switch on the back of the unit in two separate channel groups. <b>Group 1:</b> CH. 0, 2, 4, 6 <b>Group 2:</b> CH. 1, 3, 5, 7. 320 Series and lower 8 channels of 330-24.	
<b>Excitation Availability</b>	300 Series: Dry relay contact* 325-24 and 330-24: Dry relay contact Ch. 0-7, Solid state relay Ch. 8 - 23* *control paired for the lower 8 channels 0-4, 1-5, 2-6, 3-7	
<b>EXCITATION TYPE 2:</b>		
<b>Voltages</b>	2.5, 5, 10 VDC	
<b>Maximum Current</b>	300, 500, 800 mA (respectively)	
<b>Regulation</b>	0.1 %	
<b>Selection</b>	Voltages are selectable with jumpers in two separate channel groups per 251B card. <b>Group 1:</b> lower 8 channels of card <b>Group 2:</b> upper 8 channels of card Upper 16 channels of card 330-24.	
<b>Excitation Availability</b>	Upper 16 channels of card 330-24.	
<b>Shunt Calibration</b>	300 Series: Dry relay contact* 325-24 and 330-24: Dry relay contact Ch. 0-7, Solid state relay Ch. 8 - 23* *control paired for the lower 8 channels 0-4, 1-5, 2-6, 3-7	

#### ENCODER INPUT

<b>Sensors</b>	Rotary encoders and linear scales
<b>Signal Type</b>	Quadrature input or single phase pulses both with index (zero pulse)
<b>Frequency</b>	5 MHz maximum pulse rate TTL encoder 50 kHz maximum pulse rate open collector encoder (internal pull-up)
<b>Counter</b>	32-bit (±2 x 10 <sup>9</sup> counts)
<b>Input Protection</b>	±28 V without damage
<b>Sensor Power</b>	+5V DC @ 300 mA, current limited
<b>Isolation Voltage</b>	350 VAC or DC (Optically isolated)

#### DIGITAL INPUTS

<b>Channels</b>	8 SPST	
<b>Isolation Voltage</b>	350 VAC or DC (Optically isolated)	
<b>Input Current</b>	2.5 mA maximum	
<b>Voltage Ranges</b>	<b>Logic Low (0)</b>	<b>Logic High (1)</b>
<b>Range 1:</b>	0 - 1 VDC	3 - 200 VDC
	0 - 0.7 VAC RMS	24 - 140 VAC RMS
<b>Range 2:</b>	0 - 50 VDC	75 - 200 VDC
	0 - 38 VAC RMS	92 - 140 VAC RMS

#### DIGITAL OUTPUTS

<b>Regular Channels</b>	8 SPST
<b>On-line Status</b>	1 SPST
<b>Isolation Voltage</b>	350 VAC or DC (Optically isolated)
<b>Switching Capability</b>	±1 A @ ±60 VAC peak or DC
<b>Contact Resistance</b>	>100 MΩ off; <0.5 Ω, on

Note: Specifications subject to change without notice.

### PART NUMBERS

Model Series 300 Test and Analysis Systems Standard configuration includes InspecXion Test and Analysis runtime software, high speed 16-bit A/D converter, 8 digital inputs, 8 digital outputs, 1 encoder input, 19" rack mount hardware, user guide, 120V North American style power cable.

**10300-0315-CH04** *Model 315-4 Test and Analysis System* - Standard 300 Series configuration plus 4 analog input channels

**10300-0315-CH08** *Model 315-8 Test and Analysis System* - Standard 300 Series configuration plus 8 analog input channels

**10300-0320-CH04** *Model 320-4 Test and Analysis System* - Standard 300 Series configuration plus 4 analog input channels, redundant IDE hard disk drives & redundant power supplies

**10300-0320-CH08** *Model 320-8 Test and Analysis System* - Standard 300 Series configuration plus 8 analog input channels, redundant IDE hard disk drives & redundant power supplies.

**10300-0325-CH08** *Model 325-8 Test and Analysis System* - Standard 300 Series configuration plus 8 analog input channels, 3 additional expansion slots for System 200 Modules.

**10300-0325-CH24** *Model 325-24 Test and Analysis System* - Standard 300 Series configuration plus 24 analog input channels, 3 additional expansion slots for System 200 Modules.

**10300-0330-CH08** *Model 330-8 Test and Analysis System* - Standard 300 Series configuration plus 8 analog input channels, redundant IDE hard disk drives, redundant power supplies, 3 additional expansion slots for System 200 Modules.

**10300-0330-CH24** *Model 330-24 Test and Analysis System* - Standard 300 Series configuration plus 24 analog input channels, redundant IDE hard disk drives, redundant power supplies, 1 additional expansion slots for System 200 Modules.

**10300-0332-0016** *Model 332-16 Leak Test Controller* - Controller for up to 16 pneumatic chamber leak tests - includes 16 analog channels, 32 channels of digital I/O for valve control, 16 channels of digital I/O for PLC interface, signature analysis leak test software. System 300, non redundant, 237, Dual 251B, 226 & 224. Specify Devicenet, Interbus, Profi fieldbus or no fieldbus interface.

**10300-0332-0032** *Model 332-32 Leak Test Controller* - Controller for up to 32 pneumatic chamber leak tests - includes 32 analog channels, 64 channels of digital I/O for valve control, 0 channels of digital I/O for PLC interface, signature analysis leak test software. System 300, non redundant, 237, Dual 251B, dual 224. Specify Devicenet, Interbus, Profi fieldbus or no fieldbus interface.

#### OTHER CARD OPTIONS FOR 325 and 330 SERIES

<b>Digital I/O</b>	241, 242
<b>Signal Conditioning</b>	207
<b>Relay Cards</b>	224, 225, 226

(selection of cards only, not extensive list)

#### DOCUMENTATION

One product Online User's Manual is supplied with each 300 Series that covers basic usage, getting started, electrical connections and I/O channels, and software operation (InspecXion® Test and Analysis software). Extra User's Manuals as well as an application specific operators guide of approximately 5-10 pages written by the commissioning engineer (part number 0300-0010-UG00), provided 1 month after project acceptance are available at additional costs.

**ISO 9001**  
**REGISTERED**

For more information contact your local Sciometric Representative

**TECHNICAL SUPPORT**  
**1-877-581-0112**



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