

Specifications are subject to change without notice.

Introduction

The SemiTek 303-Relay Test System is PC-based and designed to test the integrity of electromechanical or coax relay devices. The system may be configured for multi-terminal testing right from the main station and the PC.

With production and final test in mind, the 303-Relay Test System can perform an array of tests and control device output binning in a fraction of the time of any other tester on the market. Under program control, the test system can test:

- Pull In/Drop Out
- Contact Voltage Drop
- Insulation Leakage
- Variable AC Coil Frequency
- Timing
- Coil Resistance
- Semiconductor
- Isolation
- Contact Resistance
- Dielectric Withstanding

Modular-in-design, the 303-Relay Test System is configured in a bench top enclosure approximately 19 inches wide, 18 inches deep, and 12 inches high. Plug-in SMU, switching, power, and control cards are added to provide a total solution to meet most test needs.

To maximize the system's resources, multiple switching cards can be configured for additional test terminals (subject to space) allowing an operator to test at one site while prepping another. This helps to maximize the use of the system. In this configuration, each terminal may test the same or a different relay part.

The SemiTek 303 XTOS operating system controls the test system and provides a window-oriented user interface for programming and operation. The most popular method to program involves selecting pre-programmed Actions and filling in the specification limits and test conditions. Quick key Help is always available for every Action.

Operation Overview

The Slot 0 card in the Main Station provides the digital communication between the controlling PC and the test system utilizing the 8-bit parallel I/O port.

At the heart of the 303-Relay Test System is the Relay Source/Measure Unit (SMU). This plug-in card consists of circuit instruments for coil, contact, and timing meter. The coil circuit is used to drive the relay under test and includes a voltmeter, a low voltage source, high voltage source, and current meter. The contact circuit is used to control the contacts of the relay under test. It too includes a current meter to measure leakage current, a voltage meter to measure contact resistance, a voltage source for leakage tests, and a current source for contact resistance. The timing meter includes a meter, switch timer, and bounce timer. A 6V/600 ohm voltage source is provided for timing and a 50mV/1ohm voltage source for stabilization. In addition the Relay SMU has a transient voltage detector.

Switching matrix cards multiplex the system SMUs and provide the interface to the relay under test. Each switch card provides parametric and timing test capability and control of Form A, B, or C relays with up to 3 poles and 2 coils. Additional cards may be added for relays with greater than 3 poles or to add more test terminals. Interface is 37-pin D-sub connector for contacts and 15-pin D-sub connector for coils. When configured to test coax relays, a multi coil matrix card is required to drive the relay under test coils.

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System Options

- 0303-0041T** Transistor Driver. To drive bipolar and FET coil switches. Current Range 20uA – 20mA.
- 0303-0041HV** High Current. Extends the contact test capability of the tester to 20A. Also provides transistor driver capability as described above. Includes high current source plug-in module.
- 0303-0042** Variable Frequency. Extends coil drive capability to 240VAC and 800Hz. Includes 0303-0042-BP VF Source.
- 0303-0056** Dielectric Withstanding Voltage (DWV). Provides DWV test capability to 500VAC.
- 0303-0017** Terminal I/O Plug-in Card. Provides control for up to 6 remote test terminals. Not required when using multiple terminal control from Main Station.
- 0303-0016** Remote Test Terminal. Includes Bench-top Enclosure with manual test actuation button, Terminal Control/Indicator Card, and Main Station to Test Terminal interconnect cable assembly twelve (12) foot in length. Requires 0303-0017 Terminal I/O Plug-in Card and DUT cable interface from Main Station.

Electrical Specifications

Test		Range	Accuracy	
			Level	Full Scale
Coil				
Coil Source	DC	0 – 40VDC to 230VDC	1%	1%
	AC (optional)	0 – 30VAC to 240VAC		
Coil Meter	DC	200uA	1%	1%
		2mA		
		20mA		
		200mA		
	AC (optional)	20mA 200mA	1%	1%
Contact Resistance				
Meter		20mV	2%	2%
		200mV	1%	1%
		2V		
Contact Source		2mA	1%	1%
		20mA		
		200mA		
		2A		
		20A (optional)		
Coil Resistance – Calculated				
Insulation Leakage (Up to 1000 VDC)				
Meter		200nA	1%	1%
		2uA		
		20uA		

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	200mA		
Source (DC)	1000V	1%	1%
Dielectric Withstanding (Up to 500VAC)			
Source	200nA	2%	2%
	2mA		
Transient	8V, 100V		

Operations

XTOS Operating the System

The XTOS Operating System is Microsoft Windows 7 Professional based and used to control the programming and operation of the 303-Relay Test System. From individual windows, the operator will select a test file to run and view the results. Whether the device passes or fails is determined by it meeting the criteria specified at the time of programming. Pass or Fail indicators are in clear view of the operator at the monitor and the test terminal. A Results window lists each of the tests performed and includes a pass/fail indicator to advise the operator of each specific test's status.

Programming is made simple using the XTOS Build editor. A new test file is opened and preformatted test or Action modules are selected to add to the new file or routine. Each component of the test is specified and once all the modules are set up, the file is compiled and ready for use. Help is included in several forms. F1 key for complete help on a module or test, hovering over an input area or test label, through the Help index, or through the virtual manual.

List of Tests

Coil Resistance	The DC resistance of the relay coil.
Coil Current	The current in the relay coil at a specified voltage.
Operate Time	The time interval from coil energization to the functioning of the last contact to function.
Release Time	The time interval from coil de-energization to the functioning of the last contact to function.
Transient	The coil back electromagnetic force (EMF), also known as coil kick. Current tries to keep flowing when the contacts switch position. The voltage associated with this current is transient voltage. Closed contacts have little transient voltage. Open contacts have much transient voltage
Neutral	To verify an armature is neither in the NO or NC state.
Vz	Value of the zener diode connected to the coil of a relay in order to limit the voltage transients.
Contact Resistance	The electrical resistance of closed contacts measured at their associated contact terminals.
Contact Voltage	The contact voltage across all contacts
Break Before Make	A contact combination in which one contact opens its connection to another contact and then closes its connection to a third contact.
Insulation Resistance	The minimum insulation resistance (in ohms) between the live and non-line parts of a relay, switch, transformer, or connector.
Insulation Leakage	The minimum insulation leakage (in volts) between the live and non-line parts of a relay, switch, transformer, or connector.

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Dielectric Withstanding	The maximum allowable AC RMS voltage that may be applied between current-carrying and non-current-carrying metal members in electromechanical relays.
COT	The time the common contacts are not connected to any other contacts
Simultaneous Timing	Verify the simultaneous operation for opening and closing contacts of a relay.
Bounce	The time interval from initial actuation of a contact to the end of bounce.
Break Bounce	The period from the first to the last closing/opening of the relay contacts on change-over to a different switching position. IT is not part of the operate or release time of the relay (Ref. DIN 41 215)

Operating Specifications

- **Power**

115 VAC, single phase, 60 Hz, 20 Amp standard input with the ground pin connected to earth ground. International power also available.

- **Environmental**

Temperature: 15 to 35° C

Humidity: 70% RH Non Condensing to 1000M ohm
50% RH Non Condensing above 1000M ohm

Other

- Programming assistance.
- Programming, Operations, and Maintenance Manuals on CD.
- Installation and on-site training. (Optional)
- Spares Kit. (Optional)

SemiTek Advantages

- Manufactured in the U.S.A.
- Large worldwide installation base.
- One (1) year full system warranty, part and labor.
- Free training available at SemiTek facilities in Dallas, TX.
- Twenty-four (24) hour technical assistance
- Module replacement program.
- Software upgrades for the life of the system