

DATA ACQUISITION SYSTEMS

Keithley Data Acquisition Systems combine precision measurement, switching, and control into a single, tightly integrated enclosure. They offer affordable alternatives to separate DMMs and switch systems, dataloggers/recorders, plug-in card data acquisition equipment, and VXI/PXI systems.



	DA06510	SERIES 2700	SERIES 3700A
DMM Resolution	6½ Digits	6½ Digits	7½ Digits
Switching Density	Up to 80, 2-pole channels	Up to 80, 2-pole channels (2700/2701) Up to 200, 2-pole channels (2750)	Up to 576, 2-pole channels
Special Features	5-in (12.7cm) touchscreen display, 1Msample/s digitizer, 10pA and 1μΩ sensitivity, front panel DMM jacks, 7M reading storage, solid state temperature scanning	Front panel DMM jacks, Non-volatile memory buffer, Solid State temperature scanning	USB Flash Drive support, 1 Ohm measure range, Solid State temperature scanning
Switch Features	Up to 40, 2-pole channels and 12 plug-in switch module options	Up to 40, 2-pole Channels and 12 card options	Up to 96, 2-pole Channels and 10 card options
Interface	Ethernet-LXI, USB Device-TMC, USB-Host, Optional GPIB, RS-232, or TSP-LINK	GPIB, RS-232 (Models 2700 and 2750) LAN, RS-232 (Model 2701)	GPIB, LAN (LXI), USB-TMC, TSP-Link® Channel Expansion Bus
Software	KickStart Instrument Control Software, LabView, IVI-COM/IVI-C drivers, Keithley LXI Discovery Browser, Test Script Builder	KickStart Instrument Control Software, LabVIEW and IVI drivers. Available at www.tek.com	Test Script Builder, LXI Discovery Browser, LabVIEW and IVI drivers. Available at www.tek.com

CHOOSING YOUR DATA ACQUISITION SYSTEM

Designing the switching for an automated test system demands an understanding of the signals to be switched and the tests to be performed. The following is a quick look at basic key decision points in the design of a switching system.

1 Switch Configuration

Multiplex switching can be used to connect one instrument to multiple devices or multiple instruments to a single device. Multiplex switching permits multiple simultaneous connections and sequential or non-sequential switch closures. A matrix switch configuration is the most versatile because it can connect multiple inputs to multiple outputs. The isolated, or independent, switch configuration consists of individual relays, often with multiple poles, with no connections between relays. For scanner (or multiplex) cards, the channel is used as a switched input in measuring circuits or as a switched output in sourcing circuits. For switch cards, each channel's signal paths are independent of other channels.

2 Relay Types

Three key relay types are used. Electromechanical relays offer the widest power range and a good life and speed at a relatively low cost. Reed relays cost more but offer less contact wear and bounce for a better life and speed than electromechanical. Solid-state relays cost still more, but offer the best life and speed with no contact wear or bounce.

3 Systemization

Connection types found on switch cards include both screw terminals and mass-terminated connectors. At the instrument level, TSP-Link master/slave connection offers easy system expansion between Series 3700A mainframes and Series 2600B SourceMeter instruments.

DATA ACQUISITION



2700 Series

The Series 2700 System Switch/Multimeter combines precision measurement, switching, and control in a single, tightly integrated enclosure for either rack-mount or bench-top applications used by data loggers. The 2700 Series offers two- and five-slot models, as well as an Ethernet-based model for high speed and long distance communication.

MODEL	2700	2701	2750
Mainframe Size	2U, ½ Rack	2U, ½ Rack	2U, Full Rack
Interfaces	GPIB, RS232	Ethernet, RS232	GPIB, RS232
Resolution (Digits), Accuracy	6½ Digits, 0.003%	6½ Digits, 0.003%	6½ Digits, 0.003%
Advance Measure Functions	Temperature, 4-Wire Resistance	Temperature, 4-Wire Resistance	Temperature, 4-Wire Resistance, Low Ohms

- 6½-digit measurement engine
- Front panel DMM jacks
- 300 volt isolation between channels and from any channel to ground to maintain signal integrity
- Mass terminated or screw terminal connector options
- Full per-channel card configurability
- Non-volatile memory buffer
- Choice of 12 switch/control plug-in modules
- Kickstart Instrument Control Software for the PC provides an easy way to configure channels and log data from long scans. Download at www.tek.com/keithley-kickstart.
- Install up to five switch/control modules in the 2750 mainframe or up to two in the 2700 and 2701 mainframes.
- Screw terminals use oversize connectors for easier, mistake-free wiring. Removable terminals available for some models.

SHIPS WITH PRODUCT

User Documentation; 174694600: Ethernet Crossover Cable (1.5 m) (2701 Only); Calibration Certificate; Quick Reference Manual; Power Cord; 1-year Warranty

RECOMMENDED ACCESSORIES

7007-1: Shielded IEEE-488 Cable, 1 m (2700, 2750)
 7007-2: Shielded IEEE-488 Cable, 2 m (2700, 2750)
 7788: 50-Pin D-Shell Connector Kit (for 7703 & 7705)
 7789: 50-Pin/25-Pin D-Shell Kit
 7790: 50-Pin Male/Female, 25-Pin Male IDC D-Shell Con. Kit
 174694600: LAN Crossover Cable (3 m)

PLUG-IN CARDS

7700: Dual 1×10 / Multiplexer Electromechanical Relay
 7701: Dual 1×16 / Multiplexer Electromechanical Relay
 7702: Dual 1×20 / Multiplexer Electromechanical Relay
 7703: Dual 1×16 / Reed Relay Mux
 7705: 40 Independent Relay / Electromechanical Relay
 7706: 16 Digital I/O, 2 Analog Outputs, 1×20 Multiplexer
 7707: 32 Digital I/O, 1×10 Multiplexer
 7708: Dual 1×20 / Multiplexer Electromechanical Relay
 7709: 6×8 / Electromechanical Relay Matrix
 7710: Dual 1×10 / Multiplexer Solid State Relay
 7711: Dual 1×4, 2 GHz / Multiplexer RF Relay
 7712: Dual 1×4, 3.5 GHz / Multiplexer RF Relay

LEARN MORE 📄 Download the “Switching Handbook: A Guide to Signal Switching in Automated Test Systems”



3700A Series

The Series 3700A DMM/switch system offers a scalable, instrument grade switching and multi-channel measurement solution for automated testing of electronic devices. The system includes a high performance DMM with up to six switch/control cards and can support up to 576 two-wire multiplexer channels for unrivaled density and low per channel cost.

- Mainframe variations (DMM and keypad/display optional)
- High performance (1 Ω resistance, 10 μA DCI ranges) 7.5 Digit multimeter
- High density switching (Up to 720 one-wire multiplexer channels, 2,688 one-wire matrix crosspoints)
- TSP control and TSP-Link for intelligent distributed control
- 3706A-NFP eliminates keypad and display for automated test rack applications.

MODEL (MAINFRAME)	3706A	3706A-S	3706A-NFP	3706A-SNFP
DMM	Yes	No	Yes	No
Front Panel Keypad & Display	Yes	Yes	No	No
Resolution (Digits), Accuracy	7½ Digits, 0.0025%	NA	7½ Digits, 0.0025%	NA
Interface	GPIB, LAN (LXI), USB-TMC, TSP-Link® Channel Expansion Bus			

SHIPS WITH PRODUCT

User Documentation
 Test Script Builder Software (available at www.tek.com)
 174694600: TSP-Link/Ethernet Cable (1.5 m)
 Calibration Certificate
 Quick Reference Manual
 Power Cord
 1-year Warranty

RECOMMENDED ACCESSORIES

3706-BAN: DMM Adapter Cable
 3706-TLK: Test Lead Kit
 KUSB-488B: IEEE-488 USB to GPIB Interface Adapter
 4288-1: Single Fixed Rack Mount Kit
 4288-10: Fixed Rear Rack Mount Kit
 174694600: LAN Crossover Cable (3 m)

PLUG-IN CARDS

3720: Dual 1×30 Multiplexer: 300 V, 2 A, Auto-CJC with 3720-ST accessory
 3721: Dual 1×20 Multiplexer: 300 V, 3 A, Auto-CJC with 3721-ST accessory
 3722: Dual 1×48 Multiplexer: 300 V, 2 A
 3723: Dual 1×30 Multiplexer: 200 V, 1.25 A, Reed Relay
 3724: Dual 1×30 Multiplexer: 200 V, 0.12 A, Solid State Relay, Auto-CJC with 3724-ST accessory
 3730: 6×16 Matrix: 300 V, 2 A
 3731: 6×16 Matrix: 200V, 2 A, Reed Relay
 3732: Quad 4×28 Matrix: 200V, 1.2 A, Reed Relay
 3740: Independent Relay: 28 Form C: 300 V, 3 A; 4 Form A: 250 VAC, 7 A
 3750: Control: 40 Digital I/O 2 Analog Outputs, 4 Counter
 3760: 1×10 Multiplexer: 300 V, 5 A
 3761: 1×10 Multiplexer: <1 pA offset current, 30 V
 3762: 1×10 Multiplexer: 1000 V, 500 mA
 3765: Hall Effect Measurement System

LEARN MORE 📄 Download “Optimizing Switched Measurements” Application Note.



DAQ6510 Data Acquisition and Logging Multimeter System

The DAQ6510 is a precision data acquisition and logging system that creates a new level of simplicity. A large 5-in (12.7 cm) multi-touch display will guide users through set-up, data visualization, and analysis removing the necessity of a PC and custom software for many applications. Using Keithley's 6½-digit multimeter technology, the DAQ6510 provides greater accuracy, more functionality, and higher speed. With 12 plug-in switch modules and with two slots for modules, test systems as large as 80 channels can be built. If you prefer or require a PC, a complement of IVI and LabView drivers and KickStart start-up software are available.

MODEL	DAQ6510
Mainframe Size	2U, ½ Rack
Interfaces	Ethernet-LXI, USB Device-TMC, USB-Host, Optional GPIB, RS-232, or TSP-LINK
Resolution (Digits), Accuracy	6½ Digits, 0.0025%
Advance Measure Functions	Temperature, 4-Wire Resistance, 1Msample/s digitizing, Capacitance

- Large 5-in (12.7 cm) multi-touch capacitive touchscreen with graphical display
- 2-year specified, full-featured, traceable 6½-digit multimeter with 0.0025% DCV (10 V range) basic accuracy
- 12 different switch, RF, and control plug-in modules to connect to as many as 80 DUTs in one test setup
- Up to 80 2-pole channels of thermocouple, RTD, or thermistor temperature measurements
- Front panel jacks for stand-alone DMM operation
- LAN/LXI and USB communication interfaces are standard
- Optional interfaces include GPIB, RS-232, and TSP-Link
- Kickstart Instrument Control Software for the PC enables instrument control without programming. Download at www.tek.com/keithley-kickstart.
- Use the touchscreen user interface to quickly set up a test, run and monitor results, and analyze data.
- Build an 80 channel system with two 7700-series plug-in switch modules.

SHIPS WITH PRODUCT

1757: Standard Test Lead Kit; USB-B-1: USB Cable Type A to Type B, 1 m (3.3 ft); Calibration Certificate; User documentation (available at www.tek.com): DAQ6510-903-01 Quick Start Guide, DAQ6510 900-01 User Manual, DAQ6510 901-01 Reference Manual; Test Script Builder Software (available at www.tek.com); LabView® and IVI Drivers (available at www.tek.com); Power Cord; 3-Year Warranty

RECOMMENDED ACCESSORIES

7007-1: Shielded IEEE-488 Cable, 1 m (2700, 2750); 7007-2: Shielded IEEE-488 Cable, 2 m (2700, 2750); 7788: 50-Pin D-Shell Connector Kit (for 7703 & 7705); 7789: 50-Pin/25-Pin D-Shell Kit; 7790: 50-Pin Male/Female, 25-Pin Male IDC D-Shell Con. Kit; 174694600: CAT5 Crossover Cable for TSP-Link or Ethernet, 1.5 m (5 ft)

PLUG-IN CARDS

7700: Dual 1×10 / Multiplexer Electromechanical Relay; 7701: Dual 1×16 / Multiplexer Electromechanical Relay; 7702: Dual 1×20 / Multiplexer Electromechanical Relay; 7703: Dual 1×16 / Reed Relay Mux; 7705: 40 Independent Relay / Electromechanical Relay; 7706: 16 Digital I/O, 2 Analog Outputs, 1×20 Multiplexer; 7707: 32 Digital I/O, 1×10 Multiplexer; 7708: Dual 1×20 / Multiplexer Electromechanical Relay; 7709: 6×8 / Electromechanical Relay Matrix; 7710: Dual 1×10 / Multiplexer Solid State Relay; 7711: Dual 1×4, 2GHz / Multiplexer RF Relay; 7712: Dual 1×4, 3.5GHz / Multiplexer RF Relay

OPTIONAL INTERFACE MODULES

KTTI-GPIB: GPIB interface with 6 digital I/O ports; KTTI-RS232: RS-232 interface with 6 digital I/O ports; KTTI-TSP: TSP-Link® Expansion interface with 6 digital I/O ports

LEARN MORE 📄 Download the "Data Acquisition Primer: An Introduction to Multi-Channel Measurement Systems".

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