

# 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.



	SERIES 2700	SERIES 3700A
<b>DMM Resolution</b>	6½ Digits	7½ Digits
<b>Switching Density</b>	Up to 80, 2-pole channels (2700/2701) Up to 200, 2-pole channels (2750)	Up to 576, 2-pole channels
<b>Special Features</b>	Front panel DMM jacks, Non-volatile memory buffer, Solid State temperature scanning	USB Flash Drive support, 1 Ohm measure range, Solid State temperature scanning
<b>Switch Features</b>	Up to 40, 2-pole Channels and 12 card options	Up to 96, 2-pole Channels and 10 card options
<b>Interface</b>	GPIB, RS-232 (Models 2700 and 2750) LAN, RS-232 (Model 2701)	GPIB, LAN (LXI), USB-TMC, TSP-Link® Channel Expansion Bus
<b>Software</b>	KickStart Instrument Control Software, LabVIEW and IVI drivers. Available at <a href="http://www.tek.com">www.tek.com</a>	Test Script Builder, LXI Discovery Browser, LabVIEW and IVI drivers. Available at <a href="http://www.tek.com">www.tek.com</a>

## 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.



PRODUCT HIGHLIGHTS

- 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, the PC-based instrument-control software, provides an easy way to configure channels and log data from long scans

## 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.



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.

MODEL	MAINFRAME SIZE	INTERFACES	RESOLUTION (DIGITS), ACCURACY	ADVANCE MEASURE FUNCTIONS
2700	2U, ½ Rack	GPIB, RS232	6½ Digits, 0.003%	Temperature, 4-Wire Resistance
2701	2U, ½ Rack	Ethernet, RS232	6½ Digits, 0.003%	Temperature, 4-Wire Resistance
2750	2U, Full Rack	GPIB, RS232	6½ Digits, 0.003%	Temperature, 4-Wire Resistance, Low Ohms

### PLUG-IN CARDS

7700	Dual 1x10 / Electromechanical Relay
7701	Dual 1x16 / Electromechanical Relay
7702	Dual 1x20 / Electromechanical Relay
7703	Dual 1x16 / Reed Relay
7705	40 Independent Relay / Electromechanical Relay

### RECOMMENDED ACCESSORIES

7007-1	Shielded IEEE-488 Cable, 1m (2700, 2750)
7007-2	Shielded IEEE-488 Cable, 2m (2700, 2750)
7788	50-Pin D-Shell Connector Kit (for 7703 & 7705 Mods.)
7789	50-Pin/25-Pin D-Shell Kit
7790	50-Pin Male/Female, 25-Pin Male IDC D-Shell Con. Kit
CA-180-3A	LAN Crossover Cable (3 m)

### PLUG-IN CARDS

7706	16 Digital I/O, 2 Analog Outputs, 1x20 Multiplexer
7707	32 Digital I/O, 1x10 Multiplexer
7708	Dual 1x20 / Electromechanical Relay
7709	6x8 / Electromechanical Relay
7710	Dual 1x10 / Solid State Relay
7711	Dual 1x4, 2GHz / RF Relay
7712	Dual 1x4, 3.5GHz / RF Relay

### SHIPS WITH PRODUCT

- User Documentation
- 174694600 Ethernet Crossover Cable (1.5 m) (Model 2701 Only)
- Calibration Certificate
- Quick Reference Manual
- Kickstart Instrument Control Software (available at [www.tek.com](http://www.tek.com))
- Power Cord
- 1-year Warranty

**LEARN MORE**  
with the "Switching Handbook: A Guide to Signal Switching in Automated Test Systems"





DATA SHEET

**PRODUCT HIGHLIGHTS**

- Mainframe variations (DMM and keypad/display optional)
- High performance (1 Ohm resistance, 10µA DCI range) 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
- Embedded startup/control software



Use the built-in web server interface to configure the system, build and run an automated scan list, and analyze data.



Model 3706A-NFP eliminates keypad and display for automated test rack applications.

## 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.

MODEL (MAINFRAME)	DMM	FRONT PANEL KEYPAD & DISPLAY	RESOLUTION (DIGITS), ACCURACY	INTERFACE
3706A	Yes	Yes	7½ Digits, 0.0025%	GPIB, LAN (LXI), USB-TMC, TSP-Link® Channel Expansion Bus
3706A-S	No	Yes	NA	GPIB, LAN (LXI), USB-TMC, TSP-Link® Channel Expansion Bus
3706A-NFP	Yes	No	7½ Digits, 0.0025%	GPIB, LAN (LXI), USB-TMC, TSP-Link® Channel Expansion Bus
3706A-SNFP	No	No	NA	GPIB, LAN (LXI), USB-TMC, TSP-Link® Channel Expansion Bus

### PLUG-IN CARDS

3720	Dual 1x30 Multiplexer: 300V, 2A, Auto-CJC with 3720-ST accessory
3721	Dual 1x20 Multiplexer: 300V, 3A, Auto-CJC with 3721-ST accessory
3722	Dual 1x48 Multiplexer: 300V, 2A
3723	Dual 1x30 Multiplexer: 200V, 1.25A, Reed Relay
3724	Dual 1x30 Multiplexer: 200V, 0.12A, Solid State Relay, Auto-CJC with 3724-ST accessory

### PLUG-IN CARDS

3730	6x16 Matrix: 300V, 2A
3731	6x16 Matrix: 200V, 2A, Reed Relay
3732	Quad 4x28 Matrix: 200V, 1.2A, Reed Relay
3740	Independent Relay: 28 Form C: 300V, 3A; 4 Form A: 250VAC, 7A
3750	Control: 40 Digital I/O 2 Analog Outputs, 4 Counter

### 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
CA-180-3A	LAN Crossover Cable (3 m)

### SHIPS WITH PRODUCT

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

## LEARN MORE

with the “Optimizing Switched Measurements with the Series 3700 System Switch/Multimeter and Series 2600 System SourceMeter® Instruments Through the Use of TSP” Application Note.



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