Integra Series
Model 2700 Multimeter/Data Acquisition System
HIGH PERFORMANCE DATA ACQUISITION AND CONTROL SYSTEM
A complete solution for PC-based multi-point measurement and control

Get a DMM, a switch mainframe, and a data acquisition/control system for the price of a PC plug-in board

The **Model 2700 Multimeter/Data Acquisition System** combines the functionality and high channel count of a switch mainframe with the accuracy, convenience, and traceability of a true 6½-digit (22-bit) DMM. It packs all these capabilities into a compact half-rack unit at a price that’s comparable to a high performance data acquisition board. Keithley’s growing family of Integra Series plug-in modules gives the Model 2700 the industry’s lowest per-channel installed cost in a high performance data acquisition and control package. Mix or match any two modules to get up to 80 differential channels of multiplexed measurement and control. That means significantly more channels in less space than competing solutions.

An astonishing range of functions and built-in signal conditioning

Each channel of the Model 2700 can be configured separately for any of 14 measurement functions and provides built-in signal conditioning. The Model 2700’s high noise isolation up to 1000V allows it to measure virtually any electrical or physical parameter with high accuracy:

- DC volts
- Temperature measurements with thermocouples, RTDs, or thermistors
- 2-wire Ω
- 4-wire Ω
- Continuity
- DC current
- AC volts
- Frequency
- Period
- AC current
- Event counter/totalizer
- Digital I/O

Perform system level control functions

Optional plug-in modules allow the Model 2700 to manage a variety of system control tasks:

- Actuate indicator lights and/or relays to provide alarm limit status, and directly interface with mechanical systems through open-collector digital I/O.
- Control power to the DUT, switch in or change loads, and perform general signal routing through isolated switching.
- Bias the DUT or perform analog control through dual ±12V analog output ports.
- Route DC, AC, or RF signals from the DUT to other test equipment in the rack.

Wide testing flexibility

This economical, easy-to-configure solution is widely used in applications like temperature logging, precision measurement and control, and mixed signal data acquisition for product development, ATE, component testing, and process monitoring. The plug-in approach eliminates the triggering, timing, and processing issues that often complicate building systems from separate instruments and switches. The tight switching-and-measurement integration also helps reduce test time significantly. That means higher throughput and a better return on equipment investment.

Powerful software options

The Model 2700 is compatible with a variety of software options to match a variety of test programming needs. For example, the free TestPoint runtime offers basic datalogging capabilities. This start-up utility can be modified with the powerful TestPoint application development package. Optional ExcelLNX-1A software makes it easy to acquire data directly into an Excel spreadsheet. Free IVI (VISA-based) drivers simplify developing fully custom programs in Visual Basic, C/C++, LabVIEW, LabWindows/CVI, or TestPoint.

Keithley’s patented measurement engine provides true 6½-digit (22-bit) performance at higher reading rates.

Typical 6½-digit meters only deliver 5½-digit (~18-bit) performance under similar conditions.

Engineers trust Keithley to provide best-in-class measurement performance. In many cases, our products provide up to 10X better performance at equivalent reading rates or up to 10X greater speed at equivalent measurement performance. Our patented AD converter and high performance signal conditioning circuitry make this possible.
High ease of use meets high measurement accuracy

If there's a power failure, the battery-backed set-up memory and non-volatile RAM data storage means scans can automatically be resumed right where they stopped when power returns.

On-board statistical analysis is available at the push of a button, including channel average and ratio, mX+b scaling, min, max, average, and standard deviation.

Front panel input jacks simplify manual probing, troubleshooting, and calibration. Includes 1000V protection in case of accidental overload.

Non-volatile memory stores up to 55,000 time-stamped readings.

Its familiar DMM-like front panel scheme makes the Model 2700 easy to use on the bench or in the rack. Select or change functions with the press of a button.

Built-in open-collector digital I/O lines provide for control, external triggering, and HI/LO alarm/limit outputs.

Built-in relay cycle counters on each module for ease of maintenance.

A variety of measurement and control modules makes it simple to mix, match, and change input signals or control lines as needed. Install up to two modules at a time to create a "mini-ATE" system with up to 80 channels.

Non-volatile memory stores up to 55,000 time-stamped readings.

Built-in open-collector digital I/O lines provide for control, external triggering, and HI/LO alarm/limit outputs.

Screw terminals use oversize connectors for easier, mistake-free wiring.

GPIB and RS-232 communications are standard.

Built-in relay cycle counters on each module for ease of maintenance.

Rugged 50-pin D-sub connectors ensure dependability and quick setup/teardown in production test racks.

High ease of use meets high measurement accuracy
Versatile plug-in options for any application

We’re continuing to expand our line of Integra plug-in switch/control modules:

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7700</td>
<td>20-channel differential multiplexer with automatic CJC and screw terminals for general purpose or thermocouple measurements.</td>
</tr>
<tr>
<td>7701</td>
<td>NEW! 32-channel differential multiplexer with D-sub connectors, IDC ribbon cable compatible</td>
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<tr>
<td>7702</td>
<td>40-channel differential multiplexer with screw terminals</td>
</tr>
<tr>
<td>7703</td>
<td>32-channel high speed differential multiplexer with reed relays and D-sub connectors</td>
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<tr>
<td>7705</td>
<td>40-channel switch/control module, SPST independent switch with D-sub connectors (Form C configurable)</td>
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<tr>
<td>7706</td>
<td>All-in-one I/O module, 20-channel differential multiplexer, 2 analog outputs, 16 digital outputs and event counter/totalizer with screw terminals</td>
</tr>
<tr>
<td>7707</td>
<td>NEW! 32 open-collector digital I/O and 10-channel differential multiplexer with D-sub connectors, IDC ribbon cable compatible</td>
</tr>
<tr>
<td>7708</td>
<td>NEW! 40-channel differential multiplexer with automatic CJC and screw terminals for general purpose or thermocouple measurements</td>
</tr>
<tr>
<td>7709</td>
<td>NEW! 6x8 matrix switch module, with D-sub connectors, IDC ribbon cable compatible</td>
</tr>
<tr>
<td>7711</td>
<td>NEW! 2GHz RF switch module with dual 1x4 configuration</td>
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<tr>
<td>7712</td>
<td>NEW! 3.5GHz RF switch module with dual 1x4 configuration</td>
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</tbody>
</table>

Additional hardware accessories:

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>KPCI-488</td>
<td>IEEE-488/GPIB interface for PCI bus</td>
</tr>
<tr>
<td>7007-2</td>
<td>2-meter double shielded premium GPIB/IEEE-488 cable</td>
</tr>
<tr>
<td>7705-MTC-2</td>
<td>2-meter male to female 50-pin D-sub cable for 7703, 7707, and 7709</td>
</tr>
<tr>
<td>7707-MTC-2</td>
<td>2-meter male to female 25-pin D-sub cable for 7707 and 7709</td>
</tr>
<tr>
<td>7788</td>
<td>50-pin D-shell connector kit (2 each)</td>
</tr>
<tr>
<td>7789</td>
<td>50-pin/25-pin D-shell connector kit (1 each)</td>
</tr>
<tr>
<td>7790</td>
<td>50-pin male, 50-pin female and 25-pin male IDC D-shell kit (1 each)</td>
</tr>
</tbody>
</table>

Visit www.keithley.com for more information on modules and accessories.

Ideal for production testing

Use the Model 2700 for high throughput production testing of multiple points on a DUT and/or testing multiple DUTs in batch mode. D-sub and SMA rear panel connectors make it fast and easy to disconnect the Model 2700 from the test fixture. Free instrument drivers designed for use in a variety of popular Application Development Environments simplify creating custom systems for production test.

Versatile enough for environmental stress, burn-in, and QA testing

The Model 2700 is ideal for both short- and long-term monitoring and characterization tasks. It’s immune to power failures, resuming scanning where it left off when power is restored—all set-up information is battery backed and data is stored in non-volatile RAM. Input channels can handle virtually any input while its digital output lines can trigger external alarms or perform other controls independent of a PC.

Perfect for research and product development

A DMM-like front panel, half-rack footprint, 80-channel capacity, outstanding measurement performance, and low cost make the Model 2700 ideal for R&D applications. The free TestPoint™ runtime start-up software included with the Model 2700 and the economical ExcelINX-1A add-in utility provide basic datalogging capabilities, so it’s easy to get new applications “Up & Running” quickly and inexpensively.
Powerful, easy-to-use software options

Free Customizable Start-up Software. This free TestPoint runtime offers basic datalogging capabilities that can get a system up and running almost immediately. With just a few clicks of the mouse, this software can confirm that the system's hardware, wiring, communications, and software drivers are installed and operating correctly. It can also be used to configure instrument functions and perform simple data acquisition tasks. Data from multiple channels can be saved to disk and up to eight channels of data can be graphed automatically. If the application demands greater functionality, this runtime can be modified with the TestPoint package.

TestPoint Application Development Package. If the free start-up software doesn’t provide a feature the job demands, there’s no problem—just use the economical TestPoint application development package to modify it. TestPoint’s object oriented, drag-and-drop technology offers the flexibility needed to build basic systems quickly, without in-depth programming. Expanding TestPoint applications is easy, too, with optional Internet, database, and statistical process control toolkits.

ExcelLINX-1A. This powerful and economical add-in utility for Microsoft Excel makes it simple to acquire data from the Model 2700 directly into Excel, then employ Excel’s graphics, charting, and analysis capabilities to turn that data into useful information. No programming is required to use ExcelLINX—a few mouse clicks are all it takes to configure channels, set parameters, triggers, and scan lists.

Free IVI (VISA-based) Instrument drivers. Experienced programmers who prefer to build fully custom systems from scratch can take advantage of our instrument driver, which is designed for use with Application Development Environments such as Visual Basic, C/C++, LabVIEW™, LabWindows™/CVI, and TestPoint. This IVI-style driver (VISA based) supports all of the instrument’s functionality, and comes with numerous programming examples to help programmers get started quickly.

Three new system bundles make it easy to get applications off to a quick, economical start:

• The 2700/7700 value pack provides a basic 20-channel system.
• The 2700-DAQ-40 includes the Models 2700 and 7708 plus ExcelLINX-1A for a 40-channel system.
• The 2700-DAQ-80 provides one Model 2700, two Model 7708 modules, and ExcelLINX-1A for an 80-channel system.
### Condensed Specifications

#### DC Voltage
- Protection: All ranges, A/D Linearity of ±1 ppm
- Resolution: 100mV, 100nV, 0.0025% + 0.0035% and 0.0030% + 0.0007%
- Accuracy: 100mV or >10GΩ
- Input: 1000.000V
- Range: ±0.05% + 0.007%
- Response: 100µsec

#### AC Current
- Resolution: 1A, 1mA, 10mA, 100mA
- Frequency Range: 10Hz – 5kHz
- Accuracy: 0.55% + 0.06%

#### DC Reading Rates
- Function: DCV, DCL, 2W Ohms
- NPLC: 6.5, 5, 10
- Digits: 0.1, 0.5, 2.5, 10
- Accuracy: 0.01% + 0.003%

#### Scanning Rate, Into and Out of Memory to GPIB
- Channels: 7703 scanning DCV
- Up to 80 differential

#### Specifications
- Specifications subject to change without notice.

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### Resistance
- 2- or 4-wire Offset Compensation selectable; 1000V / 350V protection on source / sense inputs

#### THERMOCOUPLE
- Conversion to ITS-90, Automatic, External, or Simulated CJC; Open T/C check

#### THERMISTOR
- D100, F100, PT385, PT3916, or user type; plus probe error

#### RTD
- 2- or 4-wire; Offset Compensation selectable; 1000V / 350V protection on source / sense inputs

#### DC Current
- Resolution: 1A, 10mA
- Accuracy: 0.55% + 0.06%

#### AC Voltage
- True RMS: 5.1 Crest Factor
- Range: 100mV to 750V
- Frequency: 5Hz – 10kHz
- Accuracy: 0.55% + 0.06%

#### Frequency and Period
- Selectable Gate Times of 10µsec, 100µsec, 1sec
- Frequency: 3Hz to 50kHz
- Period: 1msec to 2.5µsec
- Accuracy: 0.01% + 0.033ppm

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* Visit www.keithley.com for detailed specifications.
High channel count measurement and control solutions

While the Model 2700 offers the capacity needed to handle applications with up to 80 channels, many applications require hundreds of switch/control channels. For these cases, the five-slot, 200-channel Model 2750 Multimeter/Switch System is often the perfect size. Built on the same measurement platform, the Model 2700 and Model 2750 share many of the same capabilities and programming commands. The Model 2750 also offers low-ohms measurement capabilities with 1µΩ sensitivity. All the switch/control modules and software work in both mainframes. This high compatibility also makes it easy to migrate applications from the Model 2700 to the Model 2750 as new test needs emerge or the number of test points grows.

Specifications are subject to change without notice.

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