

7001

Switch/Control Mainframe

80-channel



- DC, RF, and optical switch capability
- Supports industry's broadest range of signals
- Integrates easily with DMM and SourceMeter® instruments
- Full channel status display
- 2 card slots
- Supports more than 30 switch/control cards

Ordering Information

7001 80-channel Switch/
Control Mainframe

required, reducing the amount of switching hardware needed. Higher density also provides extra capacity and flexibility.

Analog backplane. The 7001's analog backplane is used by the high density switch cards. The backplane eliminates intercard wiring and increases configuration flexibility. Two cards can be connected through the backplane to create a 1×80 multiplexer, a 4×20 matrix, or a multiplexer/matrix combination that provides matrix row expansion.

Channel status display. See the status of every channel simultaneously. The vacuum fluorescent display of the 7001 shows the open/close status of each channel in the mainframe simultaneously. The graphical display pattern makes it much easier to configure a test system, make modifications, or debug an existing program. The status of the cards in both slots is displayed side by side on the same screen.

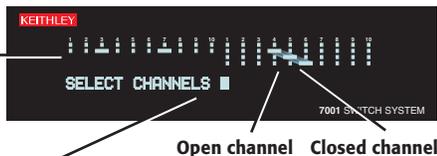
Easy to set up and use. The 7001 has a number of built-in features that make it easy to set up, run, change, or modify. It conforms to IEEE-488.2 and SCPI (Standard Commands for Programmable Instruments). All aspects of the instrument can be programmed from the front panel and over the IEEE bus.

Trigger Link. Trigger Link is a high speed trigger bus that provides simple trigger coordination between the Model 7001 and other instruments. This bus eliminates GPIB communication delays during scanning to increase overall system throughput dramatically.

More than 30 cards available. The 7001 switch cards accommodate a broad range of signals, maintain very high accuracy, and will not degrade signal quality. By minimizing signal errors, these cards will prevent degradation due to offset voltage, isolation resistance, and leakage current.

With its broad range of available cards, the 7001 provides multi-pole switching. Cards such as the 7011 can be used in either 2- or 4-pole configuration. If a card does not have the pole capacity required, the 7001 can still accommodate the application—just select the CARD PAIR function. It allows the channel closures in both slots to be synchronized for up to 8-pole switching.

Matrix cards are displayed in row-column format. Only the available rows and columns of the card are displayed. Rows are horizontal and columns are vertical.



Matrix crosspoints are entered in row-column format. The first number selects the card, the second is the row, and the third number is the column.



Multiplexer card display. The first row across represents channels 1 to 10. The second row is channels 11 to 20. Only the available channels are displayed.

Scan in any order. A scan does not have to be a contiguous set of channels. Scan forward, backward, or skip channels.

Display indicates scanning. As a scan sequence is executed, the display updates to show the scanning action.

ACCESSORIES AVAILABLE

COMMUNICATION INTERFACES AND CABLES

7007-1	Double Shielded, Premium GPIB Cable, 1m
7007-2	Double Shielded, Premium GPIB Cable, 2m
KPCI-488LPA	IEEE-488 Interface/Controller for the PCI Bus
KUSB-488B	IEEE-488 USB-to-GPIB Interface Adapter

RACK MOUNT KITS

4288-1	Single Fixed Rack Mount Kit
4288-2	Dual Fixed Rack Mount Kit

TRIGGERING

8501-1	Trigger Link Cable, DIN-to-DIN, 1m
8501-2	Trigger Link Cable, DIN-to-DIN, 2m
8502	Trigger Link to BNC Break-out Box
8503	Trigger Link Cable, DIN-to-dual BNC, 1m
8505	Male to 2-Female Y-DIN Cable for Trigger Link

SERVICES AVAILABLE

7001-3Y-EW	1-year factory warranty extended to 3 years from date of shipment
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KEITHLEY

7001

Switch/Control Mainframe

80-channel

System

CAPACITY: 2 plug-in cards per mainframe.

MEMORY: Battery backed-up storage for 100 switch patterns.

SWITCH SETTling TIME: Automatically selected by the mainframe for each card. Additional time from 0 to 99999.999 seconds can be added in 1ms increments.

TRIGGER SOURCES:

- External Trigger (TTL-compatible, programmable edge, 600ns minimum pulse, rear panel BNC).
- IEEE-488 bus (GET, *TRG)
- Trigger Link
- Manual (front panel)
- Internal Timer, programmable from 1ms to 99999.999 seconds in 1ms increments.

STATUS OUTPUT: Channel Ready (TTL-compatible signal, rear panel BNC). Low going pulse (10 μ s typical) issued after relay settling time. For two different switch cards, 7001 will be set to the slowest relay settling time.

SWITCHING SEQUENCE: Automatic break-before-make.

MAINFRAME DIGITAL I/O: 4 open-collector outputs (30V maximum pull-up voltage, 100mA maximum sink current, 10 Ω output impedance), 1 TTL compatible input, 1 common.

RELAY DRIVE: 700mA maximum for both card slots.

CARD SIZE: 32mm high \times 114mm wide \times 272mm long (1 $\frac{1}{4}$ in \times 4 $\frac{1}{2}$ in \times 10 $\frac{3}{4}$ in).

CARD COMPATIBILITY: Fully compatible with all 7XXX cards.

Throughput

EXECUTION SPEED OF SCAN LIST¹:

	7011 Card	7015 Card
Individual Channels:	130/second	500/second
Memory Setups:	125/second	450/second

TRIGGER EXECUTION TIME (maximum time from activation of Trigger Source to start of switch open or close²):

Source	Latency	Jitter
GET ³	200 μ s	<50 μ s
*TRG ³	5.0 ms	
Trigger Link	200 μ s	<13 μ s
External	200 μ s	<13 μ s

NOTES

- Rates include switch settling time of cards: 3ms for 7011 and 500 μ s for 7015 cards.
- Excluding switch settling time.
- Assuming no IEEE-488 commands are pending execution.

IEEE-488 Command Execution Time

Command	Execution Time ¹	
	Display Off	Display On
OPEN (@!1)	7.5 ms	8.5 ms
CLOS (@!1)	7.5 ms	8.5 ms
MEM:REC M1	5.0 ms	6.0 ms

NOTES

- Measured from the time at which the command terminator is taken from the bus to the time at which the relay begins to open or close.

Analog Backplane

SIGNALS: Four 3-pole rows (Hi, Lo, Guard). These signals provide matrix and multiplexer expansion between cards within one mainframe.

MAXIMUM VOLTAGE: 250V DC, 250V rms, 350V AC peak, signal path to signal path or signal path to chassis.

MAXIMUM CURRENT: 1A peak.

PATH ISOLATION:

- >10 $^6\Omega$, <50pF path to path (any Hi, Lo, Guard to another Hi, Lo, Guard).
- >10 $^6\Omega$, <50pF differential (Hi to Lo or Hi, Lo to Guard).
- >10 $^6\Omega$, <75pF path to chassis.

CHANNEL CROSSTALK: <-65dB @ 1MHz (50 Ω load).

BANDWIDTH: <3dB loss at 100MHz (50 Ω load).

IEEE-488 BUS IMPLEMENTATION

STANDARDS CONFORMANCE: Conforms to SCPI-1990, IEEE-488.2, and IEEE-488.1.

MULTILINE COMMANDS: DCL, LLO, SDC, GET, GTL, UNT, UNL, SPE, SPD.

UNLINE COMMANDS: IFC, REN, EOI, SRQ, ATN.

INTERFACE FUNCTIONS: SH1, AH1,T5, TE0, L4, LE0, SR1, RLI, PPO, DC1, DT1, C0, E1.

GENERAL

DISPLAY: Dual-line vacuum fluorescent.

- 1st line:20-character alphanumeric.
- 2nd line:32-character alphanumeric.

REAR PANEL CONNECTORS:

- IEEE-488
- 8-pin micro-DIN connector for digital I/O
- 8-pin micro-DIN for Trigger Link
- 8-pin micro-DIN for Trigger Link expansion
- BNC for External Trigger
- BNC for Channel Ready

POWER: 100V to 240Vrms, 50/60Hz, 50VA maximum.

EMC: Conforms to European Union Directive 89/336/EEC, EN61326-1.

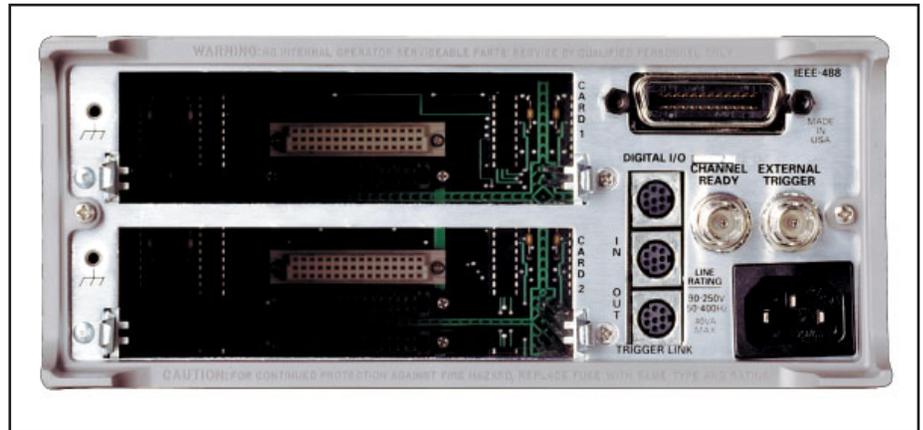
SAFETY: Conforms to European Union Directive 73/23/EEC, EN61010-1.

EMI/RFI: Meets VDE 0871B and FCC Class B.

ENVIRONMENT:

- Operating: 0 $^{\circ}$ -50 $^{\circ}$ C, <80% relative humidity (0 $^{\circ}$ -35 $^{\circ}$ C).
- Storage: -25 $^{\circ}$ to +65 $^{\circ}$ C.

DIMENSIONS, WEIGHT: 89mm high \times 216mm wide \times 375mm deep (3 $\frac{1}{2}$ in \times 8 $\frac{1}{2}$ in \times 14 $\frac{3}{4}$ in). Net weight 3.4kg (7 $\frac{1}{2}$ lbs).



Model 7001 rear panel