

Selector Guide

Plug-In Modules for 2700, 2701, 2750 Integra Mainframes

Module Selector Guide

This selector guide may prove helpful in identifying the best module for a specific application. Install up to five modules at a time in the Model 2750 mainframe or two modules in the Model 2700 or 2701 mainframe.

Module	# Analog Inputs	Configuration	Type of Connector	Max. Voltage	Max. Switched Current	Bandwidth	Contact Life	Switch Speed	Other	
7700	20	Multiplexer w/CJC	1×20 or two 1×10	Screw terminals	300 V	1	50 MHz	10 ⁸	3 ms	Maximum power = 125VA. 2 current measure channels.
7701	32	Multiplexer	1×32 or two 1×16	D-sub	150 V	1 A	2 MHz	10 ⁸	3 ms	Maximum power = 125VA.
7702	40	Multiplexer	1×40 or two 1×20	Screw terminals	300 V	1 A	2 MHz	10 ⁸	3 ms	Maximum power = 125VA. 2 current measure channels.
7703	32	Multiplexer	1×32 or two 1×16	D-sub	300 V	500 mA	2 MHz	10 ⁸	1 ms	Reed relays.
7705	40	Independent SPST	N/A	D-sub	300 V	2 A	10 MHz	10 ⁸	3 ms	Maximum power = 125VA.
7706	20	Multiplexer w/CJC	1×20 or two 1×10	Screw terminals	300 V	1 A	2 MHz	10 ⁸	3 ms	2 analog outputs. 16 digital outputs. Maximum power = 125VA.
7707	10	Digital I/O/Multiplexer	1×10 or two 1×5	D-sub	300 V	1 A	2 MHz	10 ⁸	3 ms	32 digital I/O. Maximum power = 125VA.
7708	40	Multiplexer w/CJC	1×40 or two 1×20	Screw terminals	300 V	1 A	2 MHz	10 ⁸	3 ms	Maximum power = 125VA.
7709	48	Matrix	6×8	D-sub	300 V	1 A	2 MHz	10 ⁸	3 ms	Connects to internal DMM. Daisy chain multiple cards for up to a 6×40 matrix. Maximum power = 125VA.
7710	20	Multiplexer w/CJC	1×20 or two 1×10	Removable screw terminals	60 V	0.1 A	2 MHz	10 ¹⁰	0.5 ms	Solid state relays, 60V max. 500 channels/second scan rate.
7711	8	Multiplexer	Dual 1×4	SMA	60 V	0.5 A	2 GHz	10 ⁶	10 ms	Insertion loss <1.0dB @ 1GHz. VSWR <1.2 @ 1GHz.
7712	8	Multiplexer	Dual 1×4	SMA	42 V	0.5 A	3.5 GHz	10 ⁶	10 ms	Insertion loss <1.1dB @ 2.4GHz.

* Can be disconnected from internal DMM for routing external signals

Integra Plug-In Module Accessories

Module	Connector Type	Supplied Accessories	Available Accessories
7700	Oversized Screw Terminal	Strain Relief	7401 TC wire
7701	50-pin female D-sub & 25-pin female D-sub	7789 connector kit	7790 connector kit, 7705-MTC-2 & 7707-MTC-2 cables
7702	Oversized Screw Terminal	Strain Relief	—
7703	Two 50-pin female D-sub	7788 connector kit	7705-MTC-2 cable
7705	Two 50-pin female D-sub	7788 connector kit	7705-MTC-2 cable
7706	Screw Terminal	Strain Relief	7401 TC wire
7707	50-pin male D-sub & 25-pin female D-sub	7790 connector kit	7789 connector kit, 7705-MTC-2 & 7707-MTC-2 cables
7708	Oversized Screw Terminal	Strain Relief	7401 TC wire kit
7709	50-pin female D-sub & 25-pin female D-sub	7790 connector kit	7789 connector kit, 7705-MTC-2 & 7707-MTC-2 cables
7710	Quick Disconnect Screw Terminal	Strain Relief	7401 TC wire kit
7711	SMA	—	7711-BNC-SMA & 7712-SMA-N adaptors, 7712-SMA-1 & S46-SMA-0.5,-1 SMA cables, 7051-2,-5,-10 BNC cables
7712	SMA	—	7712-SMA-N adaptor, 7712-SMA-1 & S46-SMA-0.5,-1 SMA cables

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DMMS, DATA ACQUISITION/
SWITCHING SYSTEMS

7700

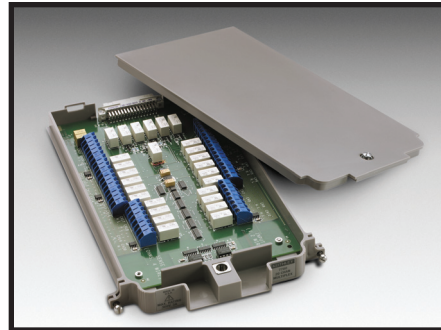
20-Channel, Differential Multiplexer Module

with Automatic CJC, Screw Terminals, and up to 50MHz Bandwidth

- 20 channels for general-purpose measurements, plus two channels to measure current
- Oversize screw terminal connection blocks are standard for easier connections
- 50MHz bandwidth
- 300V, 1A capacity for voltage channels; 60W, 125VA
- 3A capacity for current channels
- Low insertion loss of up to 50MHz
- Relay closures stored in onboard memory

Ordering Information

7700 20-Ch, Diff Mux Module w/Automatic CJC and Screw Terminals



The Model 7700 plug-in module offers 20 channels of 2-pole or 10 channels of 4-pole multiplexer switching that can be configured as two independent banks of multiplexers. There are two additional protected channels for current measurements. Automatic CJC is provided so that no other accessories are required to make thermocouple temperature measurements. In addition, the Model 7700 contains latching electromechanical relays that enable signal bandwidths of up to 50MHz. The Model 7700 is ideal for RTD, thermistor, and thermocouple applications.

CAPABILITIES

CHANNELS 1-20: Multiplex one of 20 2-pole or one of 10 4-pole signals into DMM.

CHANNELS 21-22: Multiplex one of 2 2-pole current signals into DMM.

INPUTS

MAXIMUM SIGNAL LEVEL:

Channels (1-20): 300V DC or 300V rms (425V peak) for AC waveforms, 1A switched, 60W, 125VA maximum.

Channels (21-22): 60V DC or 30V rms, 3A switched, 60W, 125VA maximum.

CONTACT LIFE (typ.): >10⁵ operations at max signal level.
>10⁸ operations cold switching.

CONTACT RESISTANCE: <1Ω at end of contact life.

CONTACT POTENTIAL: <±500nV typical per contact, 1μV max.
<±500nV typical per contact pair, 1μV max.

OFFSET CURRENT: <100pA.

CONNECTOR TYPE: Screw terminal, #20 AWG wire size.

ISOLATION BETWEEN ANY TWO TERMINALS: >10¹⁰Ω,
<100pF.

ISOLATION BETWEEN ANY TERMINAL AND EARTH: >10⁹Ω,
<200pF.

INSERTION LOSS (50Ω Source, 50Ω Load):

	w/Internal DMM	w/o Internal DMM*
<0.1 dB:	1 MHz	1 MHz
<3 dB:	2 MHz	50 MHz

CROSSTALK (50Ω Load):

	w/Internal DMM	w/o Internal DMM*
10 MHz:	<-40 dB	<-40 dB
25 MHz:	**	<-25 dB

COMMON MODE VOLTAGE: 300V or 300V rms (425V peak) for AC waveforms between any terminal and chassis.

TEMPERATURE ACCURACY USING INTERNAL CJC: 1.0°C (see mainframe specification for details).

* Channels 24 and 25 are open. Refer to ROUTe:MULTIPLE command in 27XX User Manual.

** Not valid.

GENERAL

20 CHANNELS: 20 channels of 2-pole relay input. All channels configurable to 4-pole.

2 CHANNELS: 2 channels of current only input.

RELAY TYPE: Latching electromechanical.

ACTUATION TIME: <3ms.

FIRMWARE: Specified for Model 2700 rev. A01, 2701 rev. A01, and 2750 rev. A01 or higher.

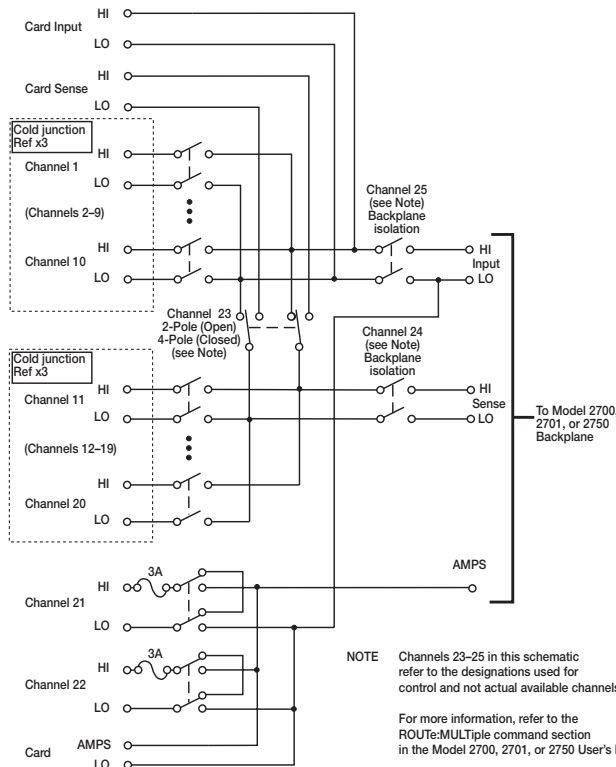
ENVIRONMENTAL:

OPERATING ENVIRONMENT: Specified for 0°C to 50°C.
Specified to 80% R.H. at 35°C.

STORAGE ENVIRONMENT: -25°C to 65°C.

WEIGHT: 0.45kg (1 lb).

ACCESSORY AVAILABLE: Model 7401 Type K Thermocouple Wire, 30.5m (100 ft).



NOTE Channels 23-25 in this schematic refer to the designations used for control and not actual available channels.

For more information, refer to the ROUTe:MULTIPLE command section in the Model 2700, 2701, or 2750 User's Manual.

Channels 24 and 25 can be individually controlled using ROUTe:MULTIPLE if the module is not to be connected to the internal DMM.

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DMMS, DATA ACQUISITION/
SWITCHING SYSTEMS

7701

32-Channel Differential Multiplexer Module

- Configurable for 32 channels of differential measurements, with up to 16 channels of 4-pole measurements
- Two female D-shell connectors are standard for secure hook-up and quick teardown
- 150V, 1A capacity for voltage channels; 60W, 125VA
- Relay closures stored in onboard memory
- Screw terminal jumpers allow user-configurable DMM connections

Ordering Information

7701 32-Channel, Differential Multiplexer Module

Accessories Supplied

Two mating IDC connectors for ribbon cable



The Model 7701 plug-in module offers 32 channels of 2-pole or 16 channels of 4-pole multiplexer switching. Its 32 channels can be configured for common-side 4-wire ohms. They can also be configured as two independent banks of multiplexers. It is ideal for RTD or thermistor temperature applications.

CAPABILITIES

CHANNELS 1–32: Multiplex one of 32 2-pole or one of 16 4-pole signals into DMM. Configuration supports dual 1×16 independent multiplexers.

INPUTS

MAXIMUM SIGNAL LEVEL: Any channel to Any Channel (1–32): 150V DC or 150Vrms (212V peak) for AC waveforms, 1A switched, 60W/125VA maximum.

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

CONTACT LIFE (typ): >10⁵ operations at max signal level. >10⁸ operations cold switching.

CONTACT RESISTANCE: <1Ω any path and additional 1Ω at end of contact life.

CONTACT POTENTIAL: <6μV per contact pair.

OFFSET CURRENT: <100pA.

CONNECTOR TYPE: 50-pin female D-shell, Channels 1–24. 25-pin female D-shell, Channels 25–32.

Supplied with male IDC ribbon cable connectors.

ISOLATION BETWEEN ANY TWO TERMINALS: >10⁹Ω, <200pF.

ISOLATION BETWEEN ANY TERMINAL AND EARTH: >10⁹Ω, <400pF.

CROSS TALK (1MHz, 50Ω Load): <–35dB.

INSERTION LOSS (50Ω Source, 50Ω Load): <0.35dB below 1MHz. <3dB below 2MHz.

COMMON MODE VOLTAGE: 300VDC or 300Vrms (425V peak) for AC waveforms between any terminal and chassis.

GENERAL

32 CHANNELS: 32 channels of 2-pole relay input. All channels configurable to 4-pole.

RELAY TYPE: Latching electromechanical.

ACTUATION TIME: <3ms.

FIRMWARE: Specified for Model 2700 rev. B03, Model 2701 rev. A01, and Model 2750 rev. A01 or higher.

DMM CONNECTIONS: Screw terminals provide internal DMM connections to channels 34 and 35 and connections to external wiring access.

ENVIRONMENTAL:

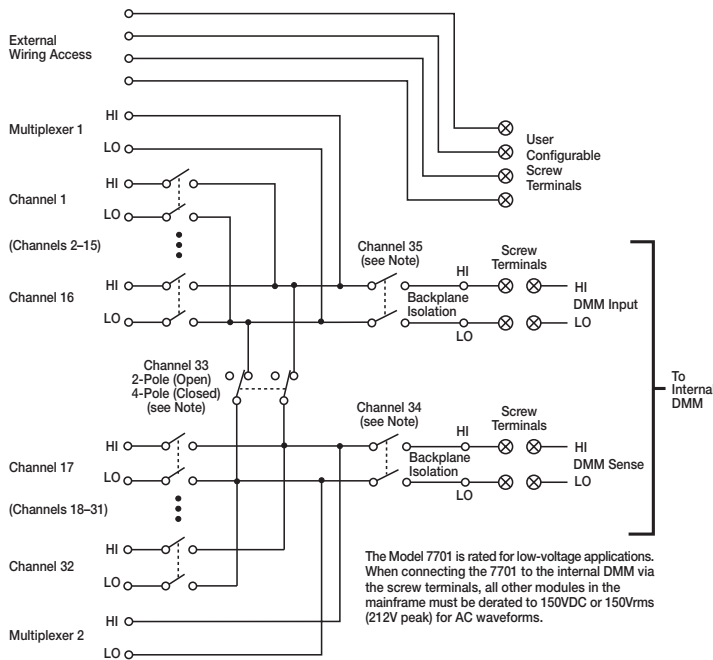
OPERATING ENVIRONMENT: Specified for 0°C to 50°C. Specified to 50% R.H. at 35°C.

STORAGE ENVIRONMENT: –25°C to 65°C.

WEIGHT: <0.52kg (1.16 lb).

ACCESSORIES AVAILABLE:

7789	50/25 Pin Male D-Shell Solder Cup Connectors
7790	50/50/25 Pin Female/Male D-Shell IDC Connectors
7705-MTC-2	50 Pin Male to Female DSUB Cable, 2m (6.6 ft).
7707-MTC-2	25 Pin Male to Female DSUB Cable, 2m (6.6 ft).



NOTE Channels 33–35 in this schematic refer to the designations used for control and not actual available channels.

For more information, refer to the ROUTE:MULT command section in the Model 2700, 2701, or 2750 User's Manual.

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DMMS, DATA ACQUISITION/
SWITCHING SYSTEMS

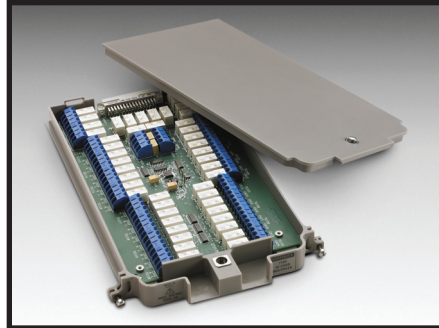
7702

40-Channel Differential Multiplexer Module with Screw Terminals

- 40 channels for general-purpose measurements, plus 2 channels to measure current
- Two- or four-wire measurement
- Oversize screw terminal connection blocks are standard for easier connection
- 300V, 1A capacity for voltage channels; 60W, 125VA
- 3A capacity for current channels
- Relay closures stored in onboard memory

Ordering Information

7702 40-Channel Differential Multiplexer Module with Screw Terminals



The Model 7702 plug-in module offers 40 channels of 2-pole or 20 channels of 4-pole multiplexer switching that can be configured as two independent banks of multiplexers. The Model 7702 provides two additional protected channels for current measurements. It is ideal for RTD, thermistor, and thermocouple temperature applications.

CAPABILITIES

CHANNELS 1-40: Multiplex one of 40 2-pole or one of 20 4-pole signals into DMM.

CHANNELS 41-42: Multiplex one of 2 2-pole current signals into DMM.

INPUTS

MAXIMUM SIGNAL LEVEL:

Channels (1-40): 300V DC or rms, 1A switched, 60W, 125VA maximum.

Channels (41-42): 60V DC or 30V rms, 3A switched, 60W, 125VA maximum.

CONTACT LIFE (typ): >10⁵ operations at max signal level. >10⁶ operations cold switching.

CONTACT RESISTANCE: <1Ω at end of contact life.

CONTACT POTENTIAL:

<±500nV typical per contact, 1μV max.

<±500nV typical per contact pair, 1μV max.

OFFSET CURRENT: <100pA.

CONNECTOR TYPE: Screw terminal, #20 AWG wire size.

ISOLATION BETWEEN ANY TWO TERMINALS: >10¹⁰Ω, <100pF.

ISOLATION BETWEEN ANY TERMINAL AND EARTH: >10¹⁰Ω, <200pF.

CROSS TALK (10MHz, 50Ω Load): <-40dB.

INSERTION LOSS (50Ω Source, 50Ω Load): <0.1dB below 1MHz, <3dB below 2MHz.

COMMON MODE VOLTAGE: 300V between any terminal and chassis.

GENERAL

40 CHANNELS: 40 channels of 2-pole relay input. All channels configurable to 4-pole.

2 CHANNELS: 2 channels of current only input.

RELAY TYPE: Latching electromechanical.

ACTUATION TIME: <3ms.

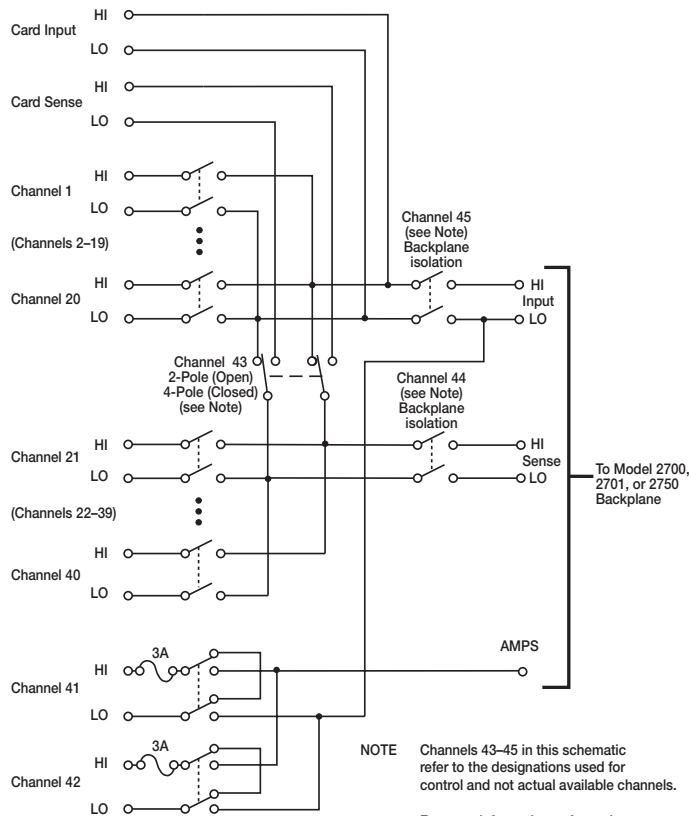
FIRMWARE: Specified for Model 2700 rev. A01, 2701 rev. A01, and 2750 rev. A01 or higher.

ENVIRONMENTAL

OPERATING ENVIRONMENT: Specified for 0°C to 50°C. Specified to 80% R.H. at 35°C.

STORAGE ENVIRONMENT: -25°C to 65°C.

WEIGHT: 0.5kg (1.1 lb).



NOTE Channels 43-45 in this schematic refer to the designations used for control and not actual available channels.

For more information, refer to the ROUTe:MULTiple command section in the Model 2700, 2701, or 2750 User's Manual.

Channels 44 and 45 can be individually controlled using ROUTe:MULTiple if the module is not to be connected to the internal DMM.

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Use with Integra Series Mainframes: 2700, 2701, 2750

DMMS, DATA ACQUISITION/
SWITCHING SYSTEMS

7703

32-Channel, High-Speed, Differential Multiplexer Module

- 32 channels for general purpose measurements
- Relay actuation time of less than 1ms for high-speed scanning
- Two- or four-wire measurement
- Two 50-pin female D-subconnectors are standard for secure hook-up and quick teardown

Ordering Information

7703 32-Channel, High-Speed, Differential Multiplexer Module

Accessories Supplied

Two mating connectors with solder cup (Model 7788)



The Model 7703 plug-in module offers 32 channels of 2-pole or 16 channels of 4-pole multiplexer switching that can be configured as two independent banks of multiplexers. The non-latching reed relays provide high speeds and are designed with 300 volt, 500mA; 10VA. The relay closures are stored in onboard memory. The Model 7703 is ideal for RTD and thermistor temperature applications.

CAPABILITIES

CHANNELS 1-32: Multiplex one of 32 2-pole or one of 16 4-pole signals into DMM.

INPUTS

MAXIMUM SIGNAL LEVEL:

Channels (1-32): 300V DC or rms, 0.5A switched, 10W maximum.

Contact Life (typ): $>5 \times 10^4$ operations at max signal level. $>10^8$ operations cold switching.

CONTACT RESISTANCE: $<1\Omega$ at end of contact life.

CONTACT POTENTIAL:

$<\pm 3\mu\text{V}$ typical per contact, $6\mu\text{V}$ max.
 $<\pm 3\mu\text{V}$ typical per contact pair, $6\mu\text{V}$ max.

OFFSET CURRENT: $<100\text{pA}$.

CONNECTOR TYPE: 50 pin D-sub $\times 2$.

RELAY DRIVE CURRENT: 20mA per channel.

ISOLATION BETWEEN ANY TWO TERMINALS: $>10^9\Omega$, $<200\text{pF}$.

ISOLATION BETWEEN ANY TERMINAL AND EARTH: $>10^9\Omega$, $<400\text{pF}$.

CROSS TALK (1 MHz, 50 Ω Load): $<-40\text{dB}$.

INSERTION LOSS (50 Ω Source, 50 Ω Load): $<0.35\text{dB}$ below 1MHz. $<3\text{dB}$ below 2MHz.

COMMON MODE VOLTAGE: 300V between any terminal and chassis.

GENERAL

32 CHANNELS: 32 channels of 2-pole relay input.
 All channels configurable to 4-pole.

RELAY TYPE: Reed.

ACTUATION TIME: $<1\text{ms}$.

FIRMWARE: Specified for Model 2700 rev. A01, 2701 rev. A01, and 2750 rev. A01 or higher.

ENVIRONMENTAL

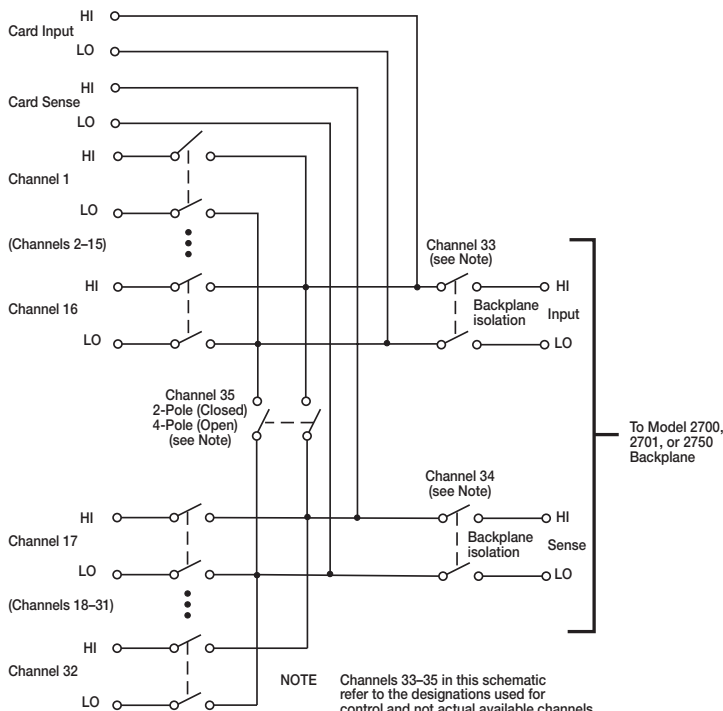
OPERATING ENVIRONMENT: Specified for 0°C to 50°C .
 Specified to 80% R.H. at 35°C .

STORAGE ENVIRONMENT: -25°C to 65°C .

WEIGHT: 0.8kg (1.75 lbs).

ACCESSORIES AVAILABLE

7705-MTC-2 50 Pin Male to Female DSUB Cable, 2m (6.6 ft).



NOTE Channels 33-35 in this schematic refer to the designations used for control and not actual available channels.

For more information, refer to the ROUTE:MULT command section in the Model 2700, 2701, or 2750 User's Manual.

Use with Integra Series Mainframes: 2700, 2701, 2750

DMMS, DATA ACQUISITION/
SWITCHING SYSTEMS

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- 300V, 2A capacity
- Two 50-pin female D-subconnectors are standard for secure hook-up and quick teardown
- Relay closures stored in onboard memory

Ordering Information

7705 40-Ch, Single-Pole, Control Module

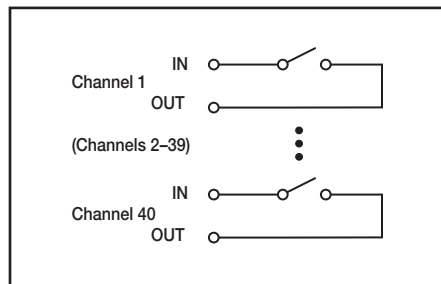
Accessories Supplied

Two mating connectors with solder cup (Model 7788)

40-Channel Single-Pole Control Module



The Model 7705 plug-in module offers 40 channels of independent switching. These channels are designed to control power to the DUT and switching loads. They can also directly control light indicators, relays, etc.



INPUTS

MAXIMUM SIGNAL LEVEL: 300VDC or rms, 2A switched, 60W (DC, resistive), 125VA (AC, resistive).

CONTACT LIFE: Cold Switching: 10^8 closures.
At Maximum Signal Levels: 10^5 closures.

CHANNEL RESISTANCE (per conductor): $<1\Omega$.

CONTACT POTENTIAL: $\leq 4\mu\text{V}$ per contact.

OFFSET CURRENT: $<100\text{pA}$.

ACTUATION TIME: 3ms.

ISOLATION: Channel to Channel: $>10^9\Omega$, $<50\text{pF}$.
Common Mode: $>10^9\Omega$, $<100\text{pF}$.

CROSSTALK (1MHz, 50 Ω load): $<-35\text{dB}$.

INSERTION LOSS (50 Ω source, 50 Ω load): $<0.3\text{dB}$ below 1MHz, $<3\text{dB}$ below 10MHz.

COMMON MODE VOLTAGE: 300V between any terminal and chassis.

GENERAL

RELAY SWITCH CONFIGURATION: 40 independent channels of 1-pole switching. Isolated from internal DMM.

CONTACT CONFIGURATION: 1 pole Form A.

RELAY TYPE: Latching electromechanical.

CONNECTOR TYPE: Two 50-pin female D-sub connectors.

FIRMWARE: Specified for Model 2700 rev. A01, 2701 rev. A01, and 2750 rev. A01 or higher.

ENVIRONMENTAL

OPERATING ENVIRONMENT: Specified for 0°C to 50°C .
Specified to 80% R.H. at 35°C .

STORAGE ENVIRONMENT: -25°C to 65°C .

WEIGHT: 0.45kg (1 lb).

ACCESSORIES AVAILABLE

7705-MTC-2 50 Pin Male to Female DSUB Cable, 2m (6.6 ft).

Use with Integra Series Mainframes: 2700, 2701, 2750

DMMS, DATA ACQUISITION/
SWITCHING SYSTEMS

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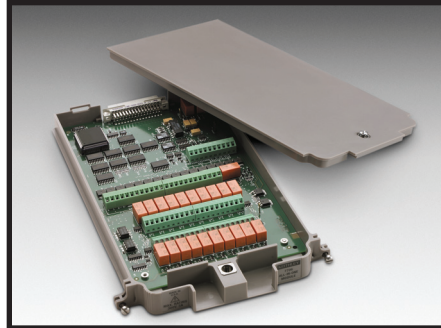
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7706

All-in-One I/O Module

20-Channel Differential Multiplexer w/Automatic CJC, 16 Digital Outputs, 2 Analog Outputs, a Counter/Totalizer, and Screw Terminals

- 20 channels of analog input (w/automatic CJC) for general-purpose measurements
- 16 channels of digital output
- 2 analog outputs ($\pm 12V$, 5mA)
- 300V, 1A capacity; 60W, 125VA maximum
- Configurable as two independent banks of multiplexers
- Relay closures stored in onboard memory



The Model 7706 plug-in module offers 20 channels of 2-pole or 10 channels of 4-pole multiplexer switching with automatic CJC, as well as two analog output channels, 16 digital outputs, and one event counter/totalizer. The event counter/totalizer can be used to monitor and control system components, such as fixtures, limit switches, pass/fail indicators, external voltage sources, loads, door closures, revolutions, etc., while performing mixed signal measurements. The Model 7706 is ideal for RTD, thermistor, and thermocouple temperature applications.

CAPABILITIES

- CHANNELS 1–20:** Multiplex one of 20 2-pole or one of 10 4-pole signals into DMM.
- Channels 21–25 are referenced to chassis ground.
- CHANNELS 21–22:** 16 Digital Outputs.
- CHANNELS 23–24:** Analog Voltage Output (2).
- CHANNELS 25:** Totalize Input.

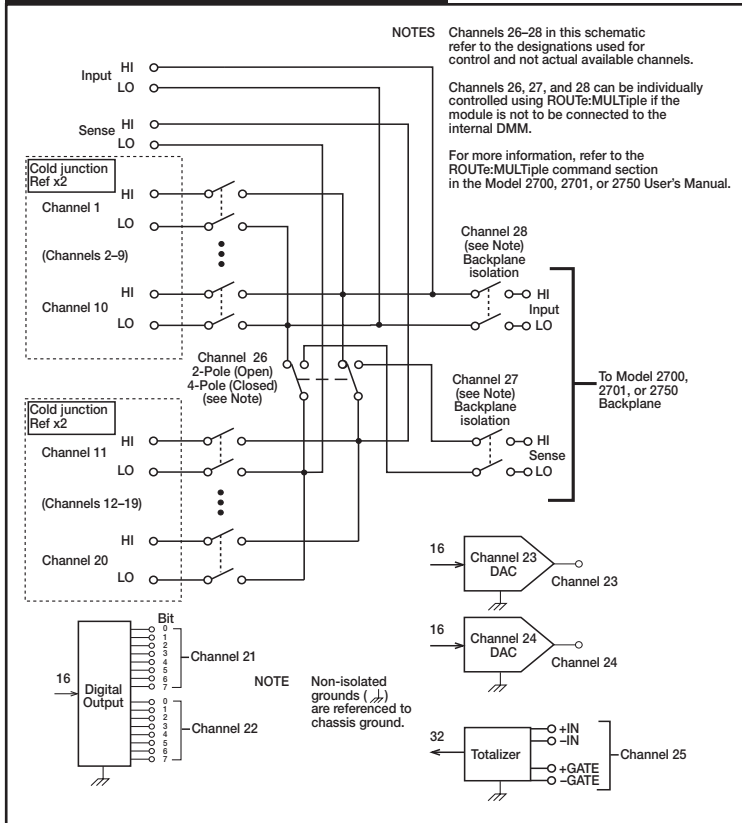
INPUTS

- MAXIMUM SIGNAL LEVEL (Channels 1–20):** 300V DC or rms, 1A switched, 60W, 125VA maximum.
- CONTACT LIFE (typ.):** $>10^8$ operations at max. signal level; $>10^8$ operations cold switching.
- CONTACT RESISTANCE:** $<1\Omega$ at end of contact life.
- CONTACT POTENTIAL:** $\leq \pm 2\mu V$ typical per contact, $3\mu V$ max.
- OFFSET CURRENT:** $<100pA$.
- CONNECTOR TYPE:** Screw terminal, #20 AWG wire size.
- ISOLATION BETWEEN ANY TWO TERMINALS:** $>10^9\Omega$, $<100pF$.
- ISOLATION BETWEEN ANY TERMINAL AND EARTH:** $>10^9\Omega$, $<200pF$.
- CROSS TALK (10MHz, 50 Ω Load):** $<-35dB$.
- INSERTION LOSS (50 Ω Source, 50 Ω Load):** $<0.1dB$ below 1MHz, $<3dB$ below 2MHz.
- COMMON MODE VOLTAGE:** 300V between any terminal and chassis.
- TEMPERATURE ACCURACY USING INTERNAL CJC:** 1.0°C (see mainframe specification for details).

Ordering Information

7706 All-in-One I/O Module

Use with Integra Series Mainframes: 2700, 2701, 2750



TOTALIZE INPUT

- MAXIMUM COUNT:** $2^{32}-1$.
- TOTALIZE INPUT:** 100kHz (max), rising or falling edge, programmable.
- SIGNAL LEVEL:** 1Vp-p (min), 42Vpk (max).
- THRESHOLD:** 0V or TTL, jumper selectable.
- GATE INPUT:** TTL-Hi, TTL-Lo, or none.
- COUNT RESET:** manual or Read+Reset.
- READ SPEED:** 50/s.

ANALOG VOLTAGE OUTPUT

- DAC 1, 2:** $\pm 12V$ in 1mV increments, non-isolated.
- RESOLUTION:** 1mV
- I_{OUT} :** 5mA max.
- SETTLING TIME:** 1ms to 0.01% of output.
- ACCURACY \pm (% of output + mV):**
 - 1 year $\pm 5^\circ C$: 0.15% + 19mV;
 - 90 day $\pm 5^\circ C$: 0.1% + 19mV;
 - 24 hour $\pm 1^\circ C$: 0.04% + 19mV
- TEMPERATURE COEFFICIENT:** $\pm(0.015\% + 1mV)^\circ C$.

DIGITAL OUTPUT

- $V_{OUT(L)}$:** $<0.8V$ @ $I_{out} = 400mA$.
- $V_{OUT(H)}$:** $>2.4V$ @ $I_{out} = 1mA$.
- $V_{OUT(H)MAX}$:** $<42V$ with external open drain pull-up.
- WRITE SPEED:** 50/s.

GENERAL

- 20 CHANNELS:** 20 channels of 2-pole relay input. All channels configurable to 4-pole.
- RELAY TYPE:** Latching electromechanical.
- ACTUATION TIME:** $<3ms$.
- FIRMWARE:** Specified for Model 2700 rev. A02 or B01, 2701 rev. A01, and 2750 rev. A01 or higher.

ENVIRONMENTAL

- OPERATING ENVIRONMENT:** Specified for $0^\circ C$ to $50^\circ C$. Specified to 80% R.H. at $35^\circ C$.
- STORAGE ENVIRONMENT:** $-25^\circ C$ to $65^\circ C$.
- WEIGHT:** 0.5kg (1.1 lbs).

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DMMS, DATA ACQUISITION/ SWITCHING SYSTEMS

7707

32-Channel Digital I/O Module with 10-Channel Differential Multiplexer

- 300V, 1A capacity; 60W, 125VA maximum (analog)
- 33V, 100mA capacity (digital)
- Digital outputs are short circuit protected
- Relay closures stored in onboard memory

Ordering Information

7707 32-Channel Digital I/O Module with 10-Channel Differential Multiplexer

Accessories Supplied

Two mating IDC connectors



The Model 7707 plug-in module offers 10 channels of 2-pole or 5 channels of 4-pole multiplexer switching that can be configured as two independent banks of multiplexers. The Model 7707 also provides 32 digital input/output channels (four 8-bit ports) for I/O control. Connect the Model 7707 to industry standard solid-state relays to switch up to 980VA.

CAPABILITIES

CHANNELS 1–10: Multiplex one of 10 2-pole or one of 5 4-pole signals into DMM.

CHANNELS 11–14: 32 Digital Inputs/Outputs referenced to chassis ground.

THERMAL PROTECTION: Channels 11–14 are thermally protected to 1A.

INPUTS (Channels 1–10)

MAXIMUM SIGNAL LEVEL: Any Channel to Any Channel (1–10): 300VDC or 300Vrms (425V peak) for AC waveforms, 1A switched, 60W, 125VA maximum.

SAFETY CATEGORY: Conforms to European Union Directive 73/23/EEC EN 61010-1, CAT I.

CONTACT LIFE (typ.): >10⁵ operations at max. signal level: >10⁸ operations cold switching.

CONTACT RESISTANCE: <1Ω any path and additional 1Ω at end of contact life.

CONTACT POTENTIAL: <6μV typical per contact pair and additional 5μV with Channels 11–14 at rate V_{OUT}(L).

OFFSET CURRENT: <100pA.

CONNECTOR TYPE: 50-pin male D-shell, Channels 11–14. 25-pin female D-shell, Channels 1–10. Supplied with female and male IDC ribbon cable connectors.

ISOLATION BETWEEN ANY TWO TERMINALS: >10⁹Ω, <100pF with isolation channels 16 and 17 open.

ISOLATION BETWEEN ANY TERMINAL AND EARTH: >10⁹Ω, <200pF.

CROSS TALK (10MHz, 50Ω Load): <–35dB.

INSERTION LOSS (50Ω Source, 50Ω Load): <0.1dB below 1MHz. <3dB below 2MHz.

COMMON MODE VOLTAGE: 300VDC or 300Vrms (425V peak) for AC waveforms between any terminal and chassis.

DIGITAL INPUT/OUTPUT (Channels 11–14)

V_{IN}(L): <0.8V (TTL).

V_{IN}(H): >2V (TTL).

V_{OUT}(L): <1.0V @ I_{OUT} = 100mA.

V_{OUT}(H): >2.4V @ I_{OUT} = 1mA.

V_{OUT}(H)MAX.: <40V with external open drain pull-up.

READ/WRITE SPEED: 50/s.

GENERAL

10 CHANNELS: 10 channels of 2-pole relay input. All channels configurable to 4-pole.

RELAY TYPE: Latching electromechanical.

ACTUATION TIME: <3ms.

FIRMWARE: Specified for Model 2700 rev. B03, 2701 rev. A01, and 2750 rev. A01 or higher.

CAPACITY: Model 2700: (1) 7707 and (1) 77XX, except 7706. Model 2701: Any combination of 77XX modules. Model 2750: (4) 7707 and (1) 77XX, except 7706. A 7706 module may be substituted for a 7707 module.

ENVIRONMENTAL

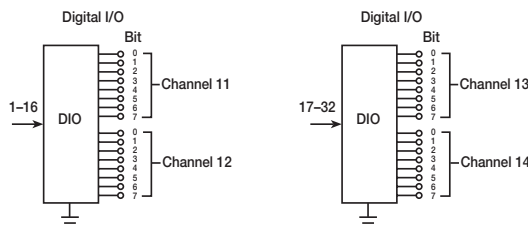
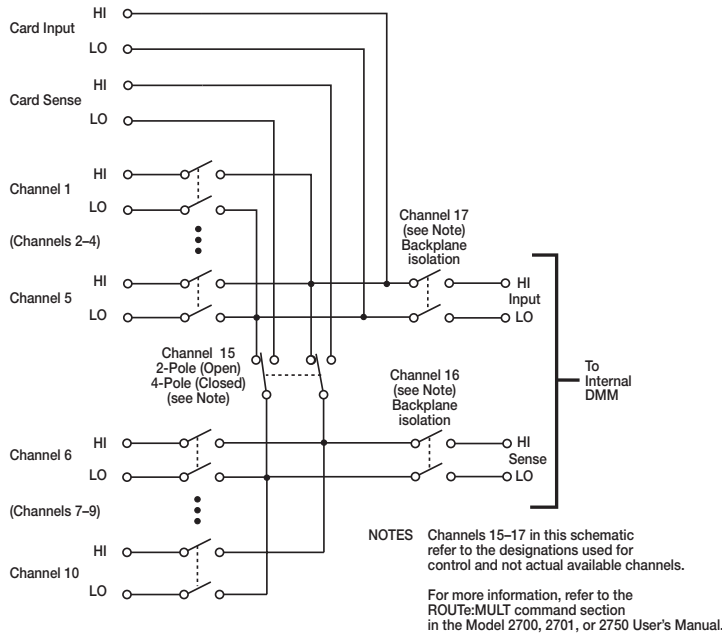
OPERATING ENVIRONMENT: Specified for 0°C to 50°C. Specified to 50% R.H. at 35°C.

STORAGE ENVIRONMENT: –25°C to 65°C.

WEIGHT: <0.5kg (1.1 lbs).

ACCESSORIES AVAILABLE

7790	50/50/25 Pin Female/Male D-Shell IDC Connectors
7705-MTC-2	50 Pin Male to Female DSUB Cable, 2m (6.6 ft).
7707-MTC-2	25 Pin Male to Female DSUB Cable, 2m (6.6 ft).



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Use with Integra Series Mainframes: 2700, 2701, 2750

DMMS, DATA ACQUISITION/
SWITCHING SYSTEMS

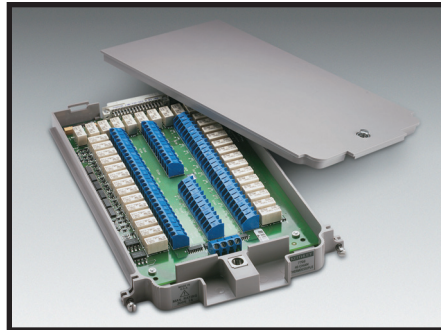
7708

40-Channel Differential Multiplexer Module with Automatic CJC and Screw Terminals

- 40 differential channels for general-purpose measurements
- Two- or four-wire measurements
- 300V, 1A capacity for voltage channels; 60W, 125VA
- Oversize screw terminal connection blocks are standard for easier connection
- Relay closures stored in onboard memory

Ordering Information

7708 40-Channel Differential Multiplexer Module with Automatic CJC and Screw Terminals



The Model 7708 plug-in module offers 40 channels of 2-pole or 20 channels of 4-pole multiplexer switching that can be configured as two independent banks of multiplexers. The built-in CJC sensors automatically linearize thermocouples, making the Model 7708 ideal for RTD, thermistor, and thermocouple temperature applications. It is also well suited for mixed-signal measurement applications that require multi-point monitoring, such as environmental stress screening.

CAPABILITIES

CHANNELS 1–40: Multiplex one of 40 2-pole or one of 20 4-pole signals into DMM.

INPUTS

MAXIMUM SIGNAL LEVEL:

Channels (1–40): 300V DC or rms, 1A switched, 60W, 125VA maximum.

CONTACT LIFE (typ): >10⁵ operations at max. signal level.
>10⁸ operations cold switching.

CONTACT RESISTANCE: <1Ω at end of contact life.

CONTACT POTENTIAL:

<±500nV typical per contact, 1μV max.
<±500nV typical per contact pair, 1μV max.

OFFSET CURRENT: <100pA.

CONNECTOR TYPE: Screw terminal, #20 AWG wire size.

ISOLATION BETWEEN ANY TWO TERMINALS: >10¹⁰Ω, <100pF.

ISOLATION BETWEEN ANY TERMINAL AND EARTH: >10⁹Ω, <200pF.

CROSS TALK (10MHz, 50Ω Load): <-40dB.

INSERTION LOSS (50Ω Source, 50Ω Load): <0.1dB below 1MHz. <3dB below 2MHz.

COMMON MODE VOLTAGE: 300V between any terminal and chassis.

TEMPERATURE ACCURACY USING INTERNAL CJC: 1.0°C (see mainframe specification for details).

GENERAL

40 CHANNELS: 40 channels of 2-pole relay input. All channels configurable to 4-pole.

RELAY TYPE: Latching electromechanical.

ACTUATION TIME: <3ms.

FIRMWARE: Specified for Model 2700 rev. B02, 2701 rev. A01, and 2750 rev. A01 or higher.

ENVIRONMENTAL:

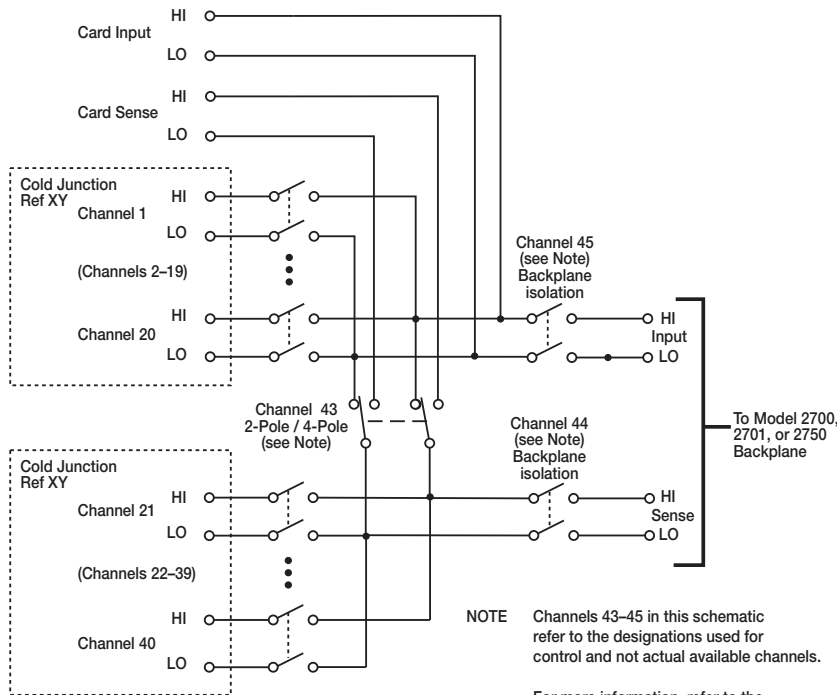
OPERATING ENVIRONMENT: Specified for 0°C to 50°C.
Specified to 80% R.H. at 35°C.

STORAGE ENVIRONMENT: -25°C to 65°C.

WEIGHT: 0.52kg (1.16 lb).

ACCESSORIES AVAILABLE

7401 Type K Thermocouple Wire, 30.5m (100 ft).



NOTE Channels 43–45 in this schematic refer to the designations used for control and not actual available channels.

For more information, refer to the ROUTE:MULTiple command section in the Model 2700, 2710, or 2750 User's Manual.

Use with Integra Series Mainframes: 2700, 2701, 2750

DMMS, DATA ACQUISITION/
SWITCHING SYSTEMS

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7709

6x8 Matrix Module

- Automatic two- or four-wire connection to DMM
- 6 row x 8 column matrix
- Expandable to larger switch configurations by daisy-chaining or cascading multiple modules
- Two female D-subconnectors are standard for secure hook-up and quick teardown
- 300V, 1A capacity
- Relay closures stores in onboard memory

Ordering Information

7709 6x8 Matrix Module

Accessories Supplied

Two mating IDC connectors



The Model 7709 plug-in module is a two-pole, 6x8 matrix module. It can connect any combination of six differential channels of instrumentation to any combination of eight differential device-under-test channels. The instrumentation can be AC and DC sources, internal or external meters, oscilloscopes, etc. This matrix configuration allows wide flexibility for complex test systems.

CAPABILITIES

DMM CONNECTION:

2-Wire Functions

Row 1, channels 1–8, through channel 50.

4-Wire Functions

Row 1, channels 1–4 (Source) through channel 50 and Row 2, channels 13–16 (Sense), through channel 49.

CLOSE CHANNEL: CLOSE command connects channels 1–8 to DMM. For 4-wire, channels 1–4 are automatically paired with channels 13–16. ROUTE:MULTIPLE allows any combination of rows and columns to be connected at the same time.

INPUTS

MAXIMUM SIGNAL LEVEL: Any Channel to Any Channel (1–48): 300VDC or 300Vrms (425V peak) for AC waveforms, 1A switched, 60W, 125VA maximum.

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

CONTACT LIFE (typ): >10⁹ operations at max signal level. >10⁸ operations cold switching.

CONTACT RESISTANCE: <1Ω any path and additional 1Ω at end of contact life.

CONTACT POTENTIAL: <3μV per contact pair.

OFFSET CURRENT: <100pA.

CONNECTOR TYPE: 50-pin female D-shell for rows and columns. 25-pin female D-shell for “daisy-chain” rows. Supplied with male IDC ribbon cable connectors.

ISOLATION BETWEEN ANY TWO TERMINALS: >10⁹Ω, <200pF.

ISOLATION BETWEEN ANY TERMINAL AND EARTH: >10⁹Ω, <400pF.

CROSS TALK (1MHz, 50Ω Load): <–35dB.

INSERTION LOSS (50Ω Source, 50Ω Load): <0.35dB below 1MHz. <3dB below 2MHz.

COMMON MODE VOLTAGE: 300VDC or 300Vrms (425V peak) for AC waveforms between any terminal and chassis.

GENERAL

MATRIX CONFIGURATION: 6 rows x 8 columns.

CONTACT CONFIGURATION: 2 pole Form A.

FIRMWARE: Specified for Model 2700 rev. B03, Model 2701 rev. A01, and Model 2750 rev. A01 or higher.

RELAY TYPE: Latching electromechanical.

ACTUATION TIME: <3ms.

ENVIRONMENTAL:

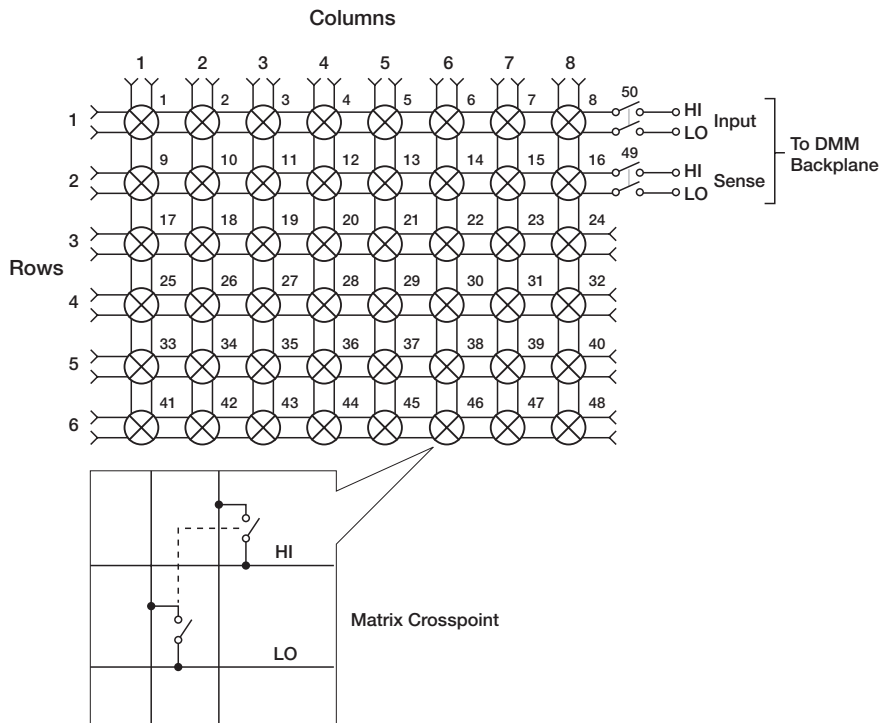
OPERATING ENVIRONMENT: Specified for 0°C to 50°C. Specified to 50% R.H. at 35°C.

STORAGE ENVIRONMENT: –25°C to 65°C.

WEIGHT: <0.52kg (1.16 lb).

ACCESSORIES AVAILABLE

7789	50/25 Pin Male D-Shell Solder Cup Connectors
7790	50/50/25 Pin Female/Male D-Shell IDC Connectors
7705-MTC-2	50 Pin Male to Female DSUB Cable, 2m (6.6 ft).
7707-MTC-2	25 Pin Male to Female DSUB Cable, 2m (6.6 ft).



Use with Integra Series Mainframes: 2700, 2701, 2750

DMMS, DATA ACQUISITION/
SWITCHING SYSTEMS

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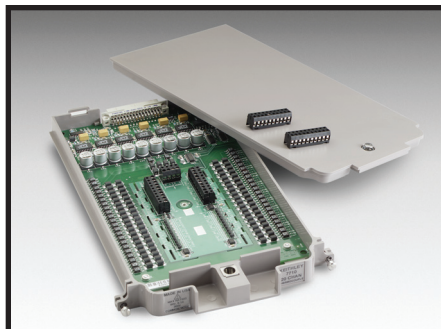
7710

20-Channel Solid-State Differential Multiplexer with Automatic CJC

- 20 channels for general purpose measurements
- Scanning speeds of up to 500 channels/second
- High speed production or ATE testing up to 500 channels/s
- Long lifetime solid state relay
- Removable screw terminals for simple, quick connections

Ordering Information

7710 20-Channel Solid-State Differential Multiplexer Module



The Model 7710 plug-in module offers 20 channels of 2-pole or 10 channels of 4-pole relay input that can be configured as two independent banks of multiplexers. The relays are solid state, providing long life and low maintenance. Solid-state relays usually have 100 times longer life than mechanical relays. It is ideal for long-term data logging applications as well as for demanding high-speed applications.

CAPABILITIES

CHANNELS 1–20: Multiplex one of 20 2-pole or one of 10 4-pole signals into DMM.

INPUTS

MAXIMUM SIGNAL LEVEL: Any channel to any channel (1–20): 60VDC or 42V rms, 100mA switched, 6W 4.2VA maximum.

COMMON MODE VOLTAGE: 300VDC or 300Vrms (425V peak) maximum between any terminal and chassis.

RELAY LIFE (TYP): >10⁵ operational hours max. signal level or 10¹⁰ operations (guaranteed by design).

RELAY DRIVE CURRENT: 6mA per channel continuous, 25mA during initial pulse.

CHANNEL RESISTANCE (per conductor): <5Ω.

CONTACT POTENTIAL: <1μV per pair.

OFFSET CURRENT: <3nA @ 23°C (per channel); additional 0.13nA/°C >23°C.

CONNECTOR TYPE: 3.5mm removable screw terminals, #20 AWG wire size.

ISOLATION BETWEEN ANY TWO TERMINALS: >10⁹Ω, <100pF.

ISOLATION BETWEEN ANY TERMINAL AND EARTH: >10⁹Ω, <100pF.

CROSSTALK (CH-CH, 300kHz, 50Ω Load): <-40dB.

INSERTION LOSS (50Ω Source, 50Ω Load): <0.5dB below 100kHz, <3dB below 2MHz.

TEMPERATURE ACCURACY USING INTERNAL CJC: 1°C for K type (see mainframe specifications for details).

GENERAL

CHANNELS: 20 channels of 2-pole relay input. All channels configurable to 4-pole.

RELAY TYPE: Solid State Opto-Coupled FET.

ACTUATION TIME: <0.5ms (100mA load).

FIRMWARE: Specified for Model 2700 Rev. B05, Model 2750 Rev. A04, and Model 2701 Rev. A01.

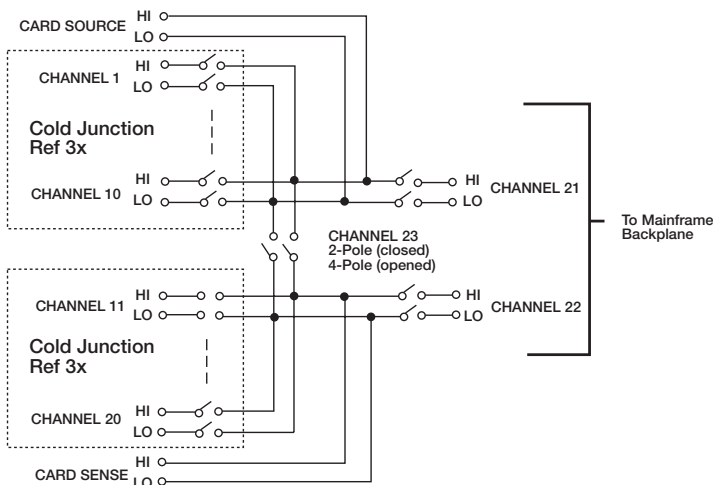
ENVIRONMENTAL

OPERATING ENVIRONMENT: Specified for 0°C to 50°C. Specified for 80% R.H. at 35°C.

STORAGE ENVIRONMENT: -25° to 65°C.

WEIGHT: 0.45kg (1 lb).

ACCESSORIES AVAILABLE: Model 7401 Type K Thermocouple Wire, 30.5m (100 ft).



SCANNING SPEEDS (see mainframe specifications for details)

Multiple Channels, Into Memory

	Channels/s		
	2700	2701	2750
7710 Scanning DCV	180/s	500/s	230/s
7710 Scanning DCV with Limits or Time Stamp On	170/s	500/s	230/s
7710 Scanning DCV alternating 2WΩ	45/s	130/s	60/s

Multiple Channels, Into and Out of Memory to GPIB or Ethernet

	Channels/s		
	2700	2701	2750
7710 Scanning DCV	145/s	440/s	210/s
7710 Scanning DCV with Limits or Time Stamp On	145/s	440/s	210/s
7710 Scanning DCV alternating 2WΩ	40/s	130/s	55/s

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Use with Integra Series Mainframes: 2700, 2701, 2750

DMMS, DATA ACQUISITION/
SWITCHING SYSTEMS

7711

2GHz 50Ω RF Module

- Signal routing performance to 2GHz
- Switches up to 60VDC
- Rear panel SMA connections
- Onboard switch closure counter
- Onboard S parameter storage

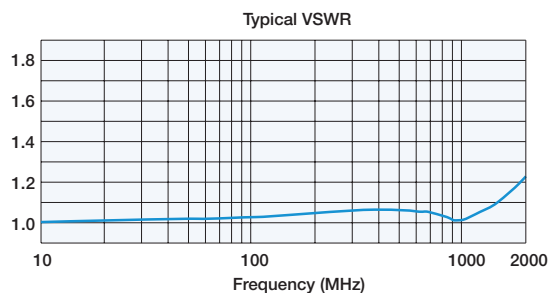
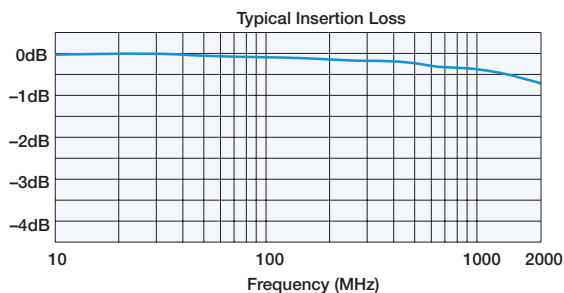
Ordering Information

7711 2GHz 50Ω RF Module



The Model 7711 plug-in module provides an economical, wideband signal routing solution that complements the DC/low frequency switching and measurement capability of the Integra Series systems.

The Model 7711 offers dual 1×4 configurations and can interface with a wide range of external AC instruments, including oscilloscopes, pulse generators, and signal analysis tools. One channel in each multiplex bank is always closed to the corresponding OUT connector. All connections are easily accessible from the rear panel.



AC PERFORMANCE (END OF LIFE)

For $Z_{load} = Z_{source} = 50\Omega$

	<100 MHz	500 MHz	1 GHz	1.5 GHz	2 GHz
Insertion Loss Max.	<0.4 dB	<0.6 dB	<1.0 dB	<1.2 dB	<2.0 dB
VSWR Max.	<1.1	<1.2	<1.2	<1.3	<1.7 ²
Ch-Ch Crosstalk ¹ Max.	-85 dB	-65 dB	-55 dB	-45 dB	-35 dB

¹ Specification assumes 50Ω termination.

² Add 0.1VSWR after 5×10⁵ closures (no load).

INPUTS (Channels 1-8)

MAXIMUM SIGNAL LEVEL: Any channel to any channel or chassis (1–8): 30Vrms (42V peak for AC waveforms) or 60VDC, 0.5A.

MAXIMUM POWER: 20W per module, 10W per channel (refer to 7711/7712 Manual PA-818 for measurement considerations).

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

EMC: Conforms with European Union Directive 89/336/EEC; EN61326-1.

ISOLATION: Multiplexer to Multiplexer: >1GΩ.
Center to Shield: >1GΩ, <25pF.
Channel to Channel: >100MΩ.

CONTACT LIFE: 1×10⁶ no load, 1×10⁵ rated load (resistive load).

CONTACT POTENTIAL: <6μV

CONTACT RESISTANCE: <0.5Ω (initial), <1Ω (end of life).

RISE TIME: <300ps (guaranteed by design).

SIGNAL DELAY: <3ns.

GENERAL

RELAY TYPE: High frequency electromechanical.

CONTACT CONFIGURATION: Dual 1×4 multiplexer, single pole four throw, Channels 1 and 5 are normally closed.

NOTE: One channel in each multiplex bank is always closed to the corresponding OUT connector.

CLOSE CHANNEL: ROUTe:CLOSE allows a single channel in a multiplex bank to be closed. ROUTe:MULTiple:CLOSE allows two channels (one in each bank) to be closed at one time.

OPEN CHANNEL: ROUTe:OPEN:ALL closes CH1 and CH5 to OUT A and OUT B respectively.

ACTION TIME: <10ms.

FIRMWARE: Specified for Model 2700 rev. B04, 2701 rev. A01, and 2750 rev. A03 or higher.

CONNECTOR TYPE: Ten external rear panel SMA connectors.

MATING TORQUE: 0.9 N·m (8 in-lb).

ENVIRONMENTAL

OPERATING ENVIRONMENT: Specified for 0°C to 50°C. Specified for 80% RH at 35°C.

STORAGE ENVIRONMENT: -25°C to 65°C.

WEIGHT: <0.5kg (1.1 lb).

ACCESSORIES AVAILABLE

7051-2	BNC Cable, male to male, 0.6m (2 ft.)
7051-5	BNC Cable, male to male, 1.5m (5 ft.)
7051-10	BNC Cable, male to male, 3.0m (10 ft.)
7711-BNC-SMA	Male SMA to female BNC Cables (5), 0.15m (0.5 ft)
7712-SMA-1	SMA Cable, male to male, 1m (3.3 ft)
7712-SMA-N	Female SMA to Male N-Type Adapter
S46-SMA-0.5	SMA Cable, male to male, 0.15m (0.5 ft.)
S46-SMA-1	SMA Cable, male to male, 0.3m (1 ft.)

Use with Integra Series Mainframes: 2700, 2701, 2750

DMMS, DATA ACQUISITION/
SWITCHING SYSTEMS

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7712

3.5GHz 50Ω RF Module

- 3.5GHz bandwidth
- Dual 1x4 configuration
- Onboard switch closure counter
- Onboard S parameter storage

Ordering Information

7712 3.5GHz 50Ω RF Module



The Model 7712 plug-in module offers a 50Ω, dual 1x4 multiplexer configuration with rear panel SMA 1x4 connectors. Multiple multiplexers can be cascaded to build scalable matrix and multiplexer systems for a large number of devices under test

and RF source/measurement instruments. One channel in each multiplex bank is always closed to the corresponding OUT connector. The 3.5GHz RF switching capability of the Model 7712 makes it ideal for applications such as 3G telecom, wireless LAN, and Bluetooth module testing.

INPUTS (CHANNELS 1-8)

MAXIMUM SIGNAL LEVEL: Any channel to any channel or chassis (1-8): 30Vrms (42V peak for AC waveforms) or 42VDC, 0.5A.

MAXIMUM POWER: 20W per module, 10W per channel (refer to 7711/7712 Manual PA-818 for measurement considerations).

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

EMC: Conforms with European Union Directive 89/336/EEC; EN61326-1.

ISOLATION: **Multiplexer to Multiplexer:** >1GΩ.
Center to Shield: >1GΩ, <20pF.
Channel to Channel: >100MΩ.

CONTACT LIFE: 5x10⁶ no load, 1x10⁵ rated load (resistive load).

CONTACT POTENTIAL: <12μV

CONTACT RESISTANCE: <0.5Ω (initial), <1Ω (end of life).

RISE TIME: <200ps (guaranteed by design).

SIGNAL DELAY: <1.5ns.

GENERAL

RELAY TYPE: High frequency electromechanical.

CONTACT CONFIGURATION: Dual 1x4 multiplexer, single pole four throw, Channels 1 and 5 are normally closed.

NOTE: One channel in each multiplex bank is always closed to the corresponding OUT connector.

CLOSE CHANNEL: ROUTe:CLOSe allows a single channel in a multiplex bank to be closed. ROUTe:MULTiple:CLOSe allows two channels (one in each bank) to be closed at one time.

OPEN CHANNEL: ROUTe:OPeN:ALL closes CH1 and CH5 to OUT A and OUT B respectively.

ACTUATION TIME: <10ms.

FIRMWARE: Specified for Model 2700 rev. B04, 2701 rev. A01, and 2750 rev. A03 or higher.

CONNECTOR TYPE: Ten external rear panel SMA connectors.

MATING TORQUE: 0.9 N·m (8 in-lb).

ENVIRONMENTAL

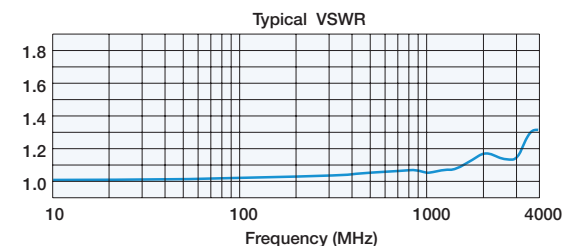
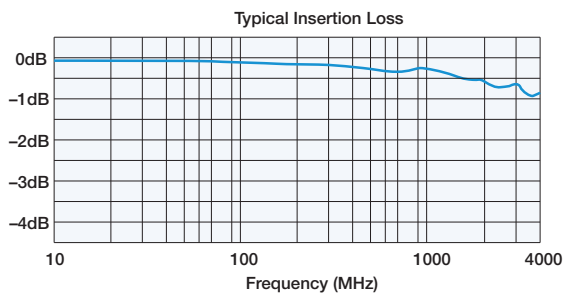
OPERATING ENVIRONMENT: Specified for 0°C to 50°C. Specified for 80% RH at 35°C.

STORAGE ENVIRONMENT: -25°C to 65°C.

WEIGHT: <0.5kg (1.1 lb).

ACCESSORIES AVAILABLE

7712-SMA-1	SMA Cable, male to male, 1m (3.3 ft)
7712-SMA-N	Female SMA to Male N-Type Adapter
S46-SMA-0.5	SMA Cable, male to male, 0.15m (0.5 ft.)
S46-SMA-1	SMA Cable, male to male, 0.3m (1 ft.)



AC PERFORMANCE (End of Life)

For $Z_{load} = Z_{source} = 50\Omega$

	<500 MHz	1 GHz	2.4 GHz	3.5 GHz
Insertion Loss MAX	<0.5 dB	<0.65 dB	<1.1 dB	<1.3 dB
VSWR MAX	<1.15	<1.2	<1.45 ²	<1.45
Ch-Ch Crosstalk ¹ MAX	-75 dB	-70 dB	-50 dB	-45 dB

¹ Specification assumes 50Ω termination.

² Add 0.1VSWR after 5x10⁵ closures (no load).

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Use with Integra Series Mainframes: 2700, 2701, 2750

DMMS, DATA ACQUISITION/
SWITCHING SYSTEMS