

## 34980A matrix switch modules

The 34980A matrix modules are full crosspoint matrices that allow you to connect any row to any column. This is a convenient way to connect multiple test instruments to multiple points on a device under test.

Choose from the following features:

- Latching armature relays—300 V, 1 A
- High-speed reed relays—150 V, 0.5 A
- Configurable dual 4x8, dual 4x16 or quad 4x32 modules
- Single-wire configuration (34933A or 34934A)
- High density matrix with automatic surge protection and row disconnect for flexible measurements (34934A)
- Analog bus expandable rows to create larger matrices (34931A, 32A, 33A)
- Connections via standard 50 or 78-pin Dsub cables or detachable terminal block

Each cross-point in the matrix switch has two wires—a high and a low for the measurement. Or, if you prefer, the 34933A and 34934A can be configured as a single-wire matrix, increasing the number of channels.

The 34933A also has in-rush resistors on each column for added protection. The 34934A also has in-rush protection resistors, but also has an automatic bypass switch for flexibility in making low-level measurements. Row disconnect switches also reduce the capacitance loading when combining modules to create larger matrices.

Multiple matrix modules can be combined through the analog bus or the row expansion kit (34934A only) to create a larger matrix. The matrix can then be connected to the internal DMM for easy measurements.

Combine your matrix with a multiplexer switch to achieve the desired switching topology and get a lower-cost solution with better specifications. All the matrix switches include a relay counter to help predict when relays need to be replaced. Use the sequencing feature to easily change between different cross-point setups.

**NOTE:** The 34933A and 34934A have 100 ohm input protection resistors to limit current and protect the reed relays

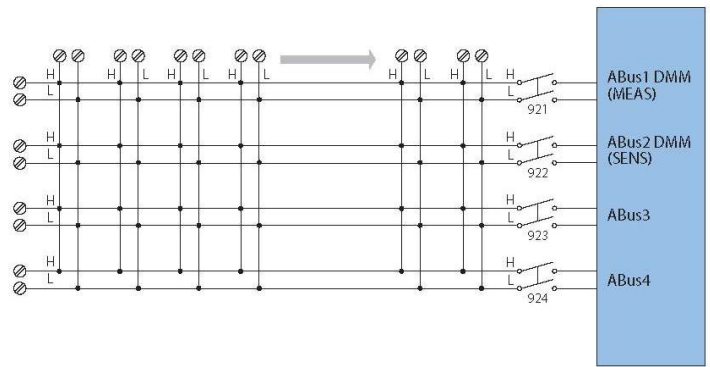


Figure 7. 34932A dual 4x16 armature matrix

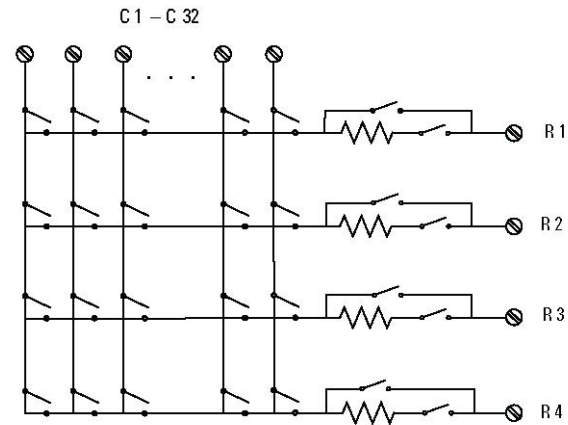


Figure 8. 34934A quad 4x32 matrix (1 of 4 matrices shown)

Table 4. Matrix selection table—specifications and characteristics

	<b>34931A</b>	<b>34932A</b>	<b>34933A</b>	<b>34934A</b>
Channels/configurations	dual 4x8 8x8 4x16	dual 4x16 8x16 4x32	dual 4x8 8x8 4x16 quad 4x8, 1-wire	quad 4x32 4x128 8x64 16x32
Switch type	Armature latching	Armature latching	Reed non-latching	Reed non-latching
<b>Input characteristics (per channel)</b>				
Max volts	± 300 V <sup>[1]</sup>	± 300 V <sup>[1]</sup>	± 150 V peak <sup>[2]</sup>	± 100 V peak
Max current (DC, AC RMS)				
Switch current	1 A	1 A	0.5 A <sup>[5]</sup> /0.05 A <sup>[8]</sup>	0.5 A
Carry current	2 A	2 A	1.5 A <sup>[5]</sup> /0.05 A <sup>[8]</sup>	0.5 A
Power (W, VA) <sup>[2, 6]</sup>	60 W	60 W	10 W <sup>[7]</sup>	10 W
Volt-Hertz limit	10 <sup>8</sup>	10 <sup>8</sup>	10 <sup>8</sup>	10 <sup>8</sup>
Initial closed channel res <sup>[3][9]</sup>	< 1.5 Ω	< 1.5 Ω	< 1.5 Ω <sup>[5]</sup> /200 Ω <sup>[8]</sup> nominal	< 1Ω/100 Ω
<b>General Specifications</b>				
Offset voltage <sup>[3]</sup>	< 3 μV	< 3 μV	< 50 μV < 100 μV 1-wire	< 20 μV < 50 μV 1-wire
DC Isolation (ch-ch, ch-earth)	> 10G Ω	> 10G Ω	> 10G Ω	10G Ω
<b>AC characteristics</b>				
Bandwidth at terminal block <sup>[4]</sup>	30 MHz	30 MHz	30 MHz <sup>[5]</sup> /4 MHz <sup>[8]</sup> 2 MHz 1-wire	35 MHz 2-wire 15 MHz 1-wire
<b>Crosstalk at terminal block (ch-ch) <sup>[4]</sup></b>				
300 kHz	-65 dB	-65 dB	-65 dB	-65 dB
1 MHz	-55 dB	-55 dB	-55 dB	-55 dB
20 MHz	-30 dB	-30 dB	-40 dB	-33 dB
<b>Capacitance at terminal block</b>				
HI-LO	50 pF	50 pF	80 pF	45 pF
LO – earth	80 pF	80 pF	75 pF	250 pF
<b>General characteristics</b>				
<b>Relay life, typical</b>				
No load	100 M	100 M	1000 M	
10 V, 100 mA	10 M	10 M	10 M	1000 M operations
Rated load	100 k	100 k	10 k	
Open/close time	4 ms/4 ms	4 ms/4 ms	0.5 ms/0.5 ms	0.35 ms/0.10 ms
Analog bus backplane connection	Bank 2	Bank 2	Bank 2	No

[1] DC or AC RMS voltage, channel-to-channel or channel-to-earth

[2] Peak voltage, channel-to-channel or channel-to-earth

[3] Into analog bus. System errors are included in the internal DMM measurement accuracy specifications

[4] 50 Ω source, 50 Ω load, differential measurements verified (Sdd21)

[5] With input resistors bypassed. Bypassing resistors will reduce lifetime of relays. See the rated load relay life characteristics.

[6] Limited to 6 W channel resistance power loss per module

[7] Power restrictions allow only 20 channels to be closed at one time

[8] Protection Resistors:

34933A - 100Ω ±5%; 0.5W; TC = ±200ppm/°C.

34934A - 100Ω ±1%; 0.25W; TC = ±100ppm/°C.

If this resistance is not bypassed in the low side source line of a 4-wire resistance measurement, the 100 Ω range is limited.

[9] Channel resistance is typically &lt; 1.5 Ω but can go as high as 50 Ω when a channel is used in measurement applications with &lt; 10 mA load current. Increased relay channel resistance for measurements with load currents below 10 mA can occur on cards that have been out of service or following relay inactivity for periods of greater than 1 week. Switching relays for 2K cycles prior to use may reduce the variation in channel resistance. Applies to the 34931A and 34932A. Keysight recommends the use of 4-wire Ohms for resistance measurements. For high accuracy voltage measurements, select the DMM input resistance setting of &gt; 10 G ohms to minimize the impact of relay contact resistance.