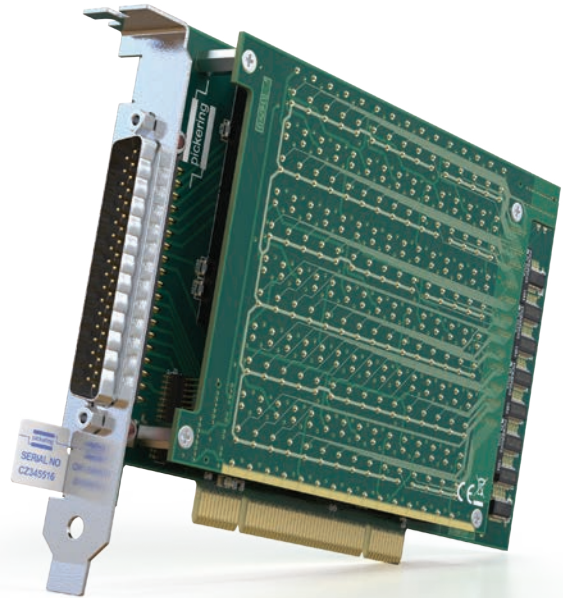


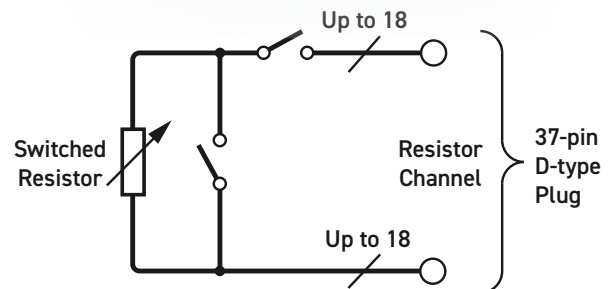
- High Density Resistor Simulation
- Fitted With Pickering Reed Relays, Providing Superior Speed of Operation & Card Life
- Up to 18 Channels on a Single Card
- Resistance Resolution to 0.125 Ω
- Values From 2 Ω to 22 M Ω
- Accuracy of $\pm 0.2\% \pm$ Resolution
- Short and Open Simulation
- Simple Software Control Through Resistance Calls
- VISA & Kernel Drivers Supplied for Windows
- 3 Year Warranty



The 50-298 provides a simple solution for applications requiring accurate simulation of resistive sensors. It is available in a variety of resistance ranges and resolutions to meet the needs of functional test systems. It is suitable for engine controller testing where resistive sensors provide information such as temperature.

The 50-298's channels are able to be set as short or open circuit to simulate a wiring or sensor fault.

Software control is simplified by the use of resistor value calls. The card works out the channel setting closest to the requested value and sets that value. The user can interrogate the card to find the actual resistance setting used.

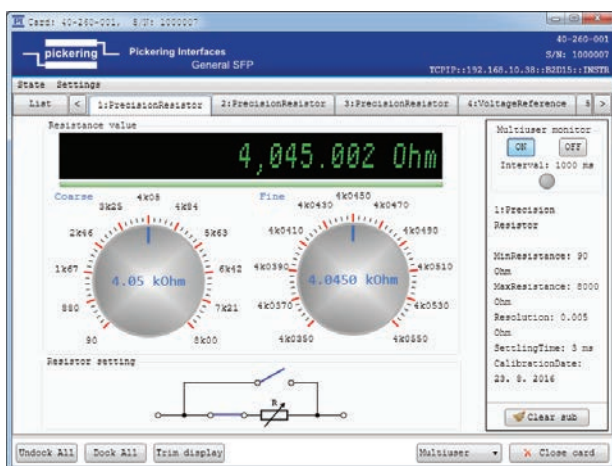


Functional Diagram for the 50-298 High Density Precision Resistor Card

A calibration cable can be attached to the card allowing a DMM to be used to verify each channel. This considerably simplifies the checking of the card's calibration. Verification is performed with the UUT disconnected from the card.

The 50-298 is available in 50 standard builds that suit the most common configurations required:

- A narrow resistance range version with 9 or 18 channels.
- A medium resistance range version with 4 or 9 channels.
- A wide resistance range version with 3 or 6 channels.



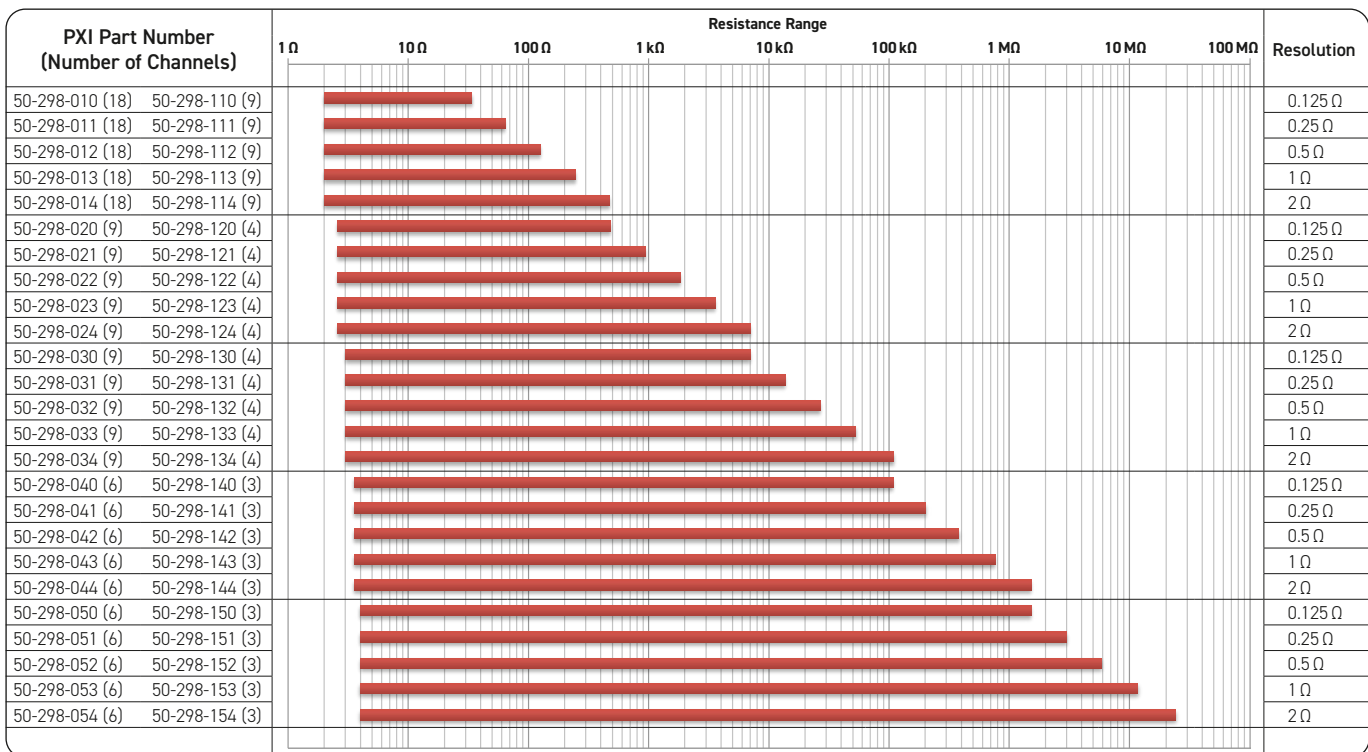
Soft Front Panel for Programmable Resistor Cards

Pickering's Range of PCI Resistor Cards

Model	Description	Chan.	Range	Resolution	Accuracy
50-262	RTD Simulator	6	350 Ω, 1 kΩ, 1.5 kΩ, 2 kΩ or 3 kΩ	<8 mΩ or <90 mΩ	0.1 %
50-265	Strain Gauge Simulator	6	350 Ω, 1 kΩ, 1.5 kΩ, 2 kΩ or 3 kΩ	<2 mΩ, <10 mΩ, <12.5 mΩ, <20 mΩ or <25 mΩ	0.03 % or 0.06 %
50-293	Programmable Resistor + SPDT	2 or 4	Up to 131 kΩ	0.25 Ω, 0.5 Ω, 1 Ω or 2 Ω	1 % ±Resolution
50-294	Programmable Resistor + SPST	2 or 4			
50-295A	Programmable Resistor	3, 6, 5, 10 or 18	Up to 16 MΩ	8, 12, 16 or 24-Bit	±0.5 % (1% >1 MΩ)
50-296A	Programmable Potentiometer	1, 2, 3, 4, 5 or 9			
50-297	High Density Precision Resistor	3, 4, 6, 9 or 18	Up to 22.3 MΩ	0.125 Ω, 0.25 Ω, 0.5 Ω, 1 Ω or 2 Ω	0.2 %
50-298	High Density Precision Resistor	3, 4, 6, 9 or 18	Up to 22.3 MΩ	0.125 Ω, 0.25 Ω, 0.5 Ω, 1 Ω or 2 Ω	0.2 %

Custom Resistor Cards

If our range of Resistor Cards does not meet your specific requirements, please contact you local sales office to discuss your application. Customizations include: different start and stop values, current, power, voltage, precision, accuracy, number of channels, connector etc.



Graphical Representation of the 50-298 Precision Resistor Card Range

Relay Type

The 50-298 is fitted with Pickering reed relays with sputtered ruthenium contacts. A spare relay is built onto the circuit board to allow easy maintenance with minimum downtime.

Specification

Accuracy:	0.2% ±Resolution @ ±10°C from calibration temperature (factory calibration @ 21°C)
Fault Simulation:	Open and short circuit (typically <0.5 Ω)
Max Power:	0.5 W
Max Voltage:	100 V* or as limited by power
Thermal Offset:	<100 µV
Settling Time:	0.5 ms †
Software Control:	By resistance calls to card for selected channel.
Calibration:	4-wire resistance measurement of selected channel for verification purposes with UUT removed and a special cable assembly attached. Factory calibration data is stored in the card.
Expected Life (operations):	1000 million (10 mA)

* For full voltage rating, signal sources must be fully isolated from mains supply and safety earth.

† The total operate time when setting a resistance may be longer depending upon the change requested due to relay sequencing.

Power Requirements

+3.3 V	+5 V	+12 V	-12 V
0.2 A	0.9 A max	0	0

Mechanical Characteristics

Single slot short PCI format.

3D models for all versions in a variety of popular file formats are available on request.

Connectors

Resistor connections via a 37-pin male D-Type connector. For pin outs please refer to the operating manual.

PCI Compliance

The 50-298 complies with the PCI Specification 2.0 (issued Feb 2004).

Signalling Environment: 33 MHz, 32-bit Universal (+3.3 V & +5 V).

For advance information about a PCI Express version of this card please contact your local Pickering sales office

Supplied soft front panels and driver software are fully compatible with Windows operating systems.

Safety & CE Compliance

All cards are fully CE compliant and meet applicable EU directives:

Low-voltage safety EN61010-1:2010,
EMC Immunity EN61326-1:2013,
Emissions EN55011:2009+A1:2010.

Operating/Storage Conditions

Operating Temperature:	0 °C to +55 °C
Humidity:	Up to 90 % non-condensing
Altitude:	5000 m
Storage Temperature:	-20 °C to +75 °C
Humidity:	Up to 90 % non-condensing
Altitude:	15000 m

Product Order Codes

0.125 Ω Resolution

Range	No. of Channels	Order Code	No. of Channels	Order Code
2 Ω to 31.5 Ω	9	50-298-110	18	50-298-010
2.5 Ω to 472 Ω	4	50-298-120	9	50-298-020
3 Ω to 6.97 kΩ	4	50-298-130	9	50-298-030
3.5 Ω to 102 kΩ	3	50-298-140	6	50-298-040
4 Ω to 1.51 MΩ	3	50-298-150	6	50-298-050

0.25 Ω Resolution

Range	No. of Channels	Order Code	No. of Channels	Order Code
2 Ω to 62.1 Ω	9	50-298-111	18	50-298-011
2.5 Ω to 925 Ω	4	50-298-121	9	50-298-021
3 Ω to 13.6 kΩ	4	50-298-131	9	50-298-031
3.5 Ω to 201 kΩ	3	50-298-141	6	50-298-041
4 Ω to 2.97 MΩ	3	50-298-151	6	50-298-051

0.5 Ω Resolution

Range	No. of Channels	Order Code	No. of Channels	Order Code
2 Ω to 122 Ω	9	50-298-112	18	50-298-012
2.5 Ω to 1.81 kΩ	4	50-298-122	9	50-298-022
3 Ω to 26.7 kΩ	4	50-298-132	9	50-298-032
3.5 Ω to 395 kΩ	3	50-298-142	6	50-298-042
4 Ω to 5.82 MΩ	3	50-298-152	6	50-298-052

1 Ω Resolution

Range	No. of Channels	Order Code	No. of Channels	Order Code
2 Ω to 239 Ω	9	50-298-113	18	50-298-013
2.5 Ω to 3.55 kΩ	4	50-298-123	9	50-298-023
3 Ω to 52.4 kΩ	4	50-298-133	9	50-298-033
3.5 Ω to 773 kΩ	3	50-298-143	6	50-298-043
4 Ω to 11.4 MΩ	3	50-298-153	6	50-298-053

2 Ω Resolution

Range	No. of Channels	Order Code	No. of Channels	Order Code
2 Ω to 470 Ω	9	50-298-114	18	50-298-014
2.5 Ω to 6.97 kΩ	4	50-298-124	9	50-298-024
3 Ω to 102 kΩ	4	50-298-134	9	50-298-034
3.5 Ω to 1.51 MΩ	3	50-298-144	6	50-298-044
4 Ω to 22.3 MΩ	3	50-298-154	6	50-298-054

Accessories:

Calibration lead for 4-wire resistance measurement using DMM - 37-pin D-type socket to shrouded 4mm bayonet plugs.

1 m length: 40-975-037-1m

Adapter to convert from male 37-pin D-type to male 78-pin D-type, converting from 2-wire to 4-wire channel connections.

Please contact your local sales office for details.

Mating Connectors & Cabling

For connection accessories for the 50-298 series please refer to the [90-007D](#) 37-pin D-Type Connector Accessories data sheet where a complete list and documentation can be found for accessories.



Pickering can supply mating connectors and cable assemblies to enable easy integration of the 50-298 series of PCI cards

Other Resistor Cards

Pickering Interfaces manufacture a range of variable resistor cards in the PCI format. If you have a requirement for a variable resistor card please contact your local sales office with the information below and we will advise you on the best solution for your application.

Lowest Resistance †	<input type="text"/>
Highest Resistance	<input type="text"/>
Resistance Resolution	<input type="text"/>
Overall Accuracy	<input type="text"/>
Maximum Power/Current	<input type="text"/>
Number of Channels (variable resistors)	<input type="text"/>

† Resistance is as measured across the user connector terminals, minimum resistance must have a non-zero value.

Product Customization

Pickering PCI cards are designed and manufactured on our own flexible manufacturing lines, giving complete product control and enabling simple customization to meet very specific requirements.

Customization can include:

- Alternative resistance range
- Alternative resolution
- Different number of channels
- Different performance specifications

All customized products are given a unique part number, fully documented and may be ordered at any time in the future.

Please contact your local sales office to discuss.

Connectivity Solutions

We provide a full range of supporting cable and connector solutions for all our switching products—20 connector families with 1200+ products. We offer everything from simple mating connectors to complex cables assemblies and terminal blocks. All assemblies are manufactured by Pickering and are guaranteed to mechanically and electrically mate to our modules. These accessories are detailed in Connector Accessories data sheets, where a complete list and documentation can be found for each accessory.



Connectors & Backshells



Multi-way Cable Assemblies



RF Cable Assemblies



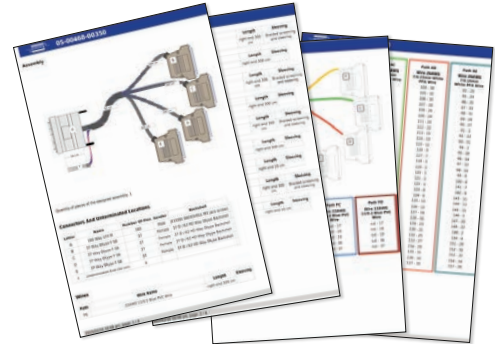
Breakouts



Connector Blocks

We also offer customized cabling and have a free online **Cable Design Tool** that can be used to create custom cable solutions for many applications.

- Fully supported on modern browsers and tablet operating systems.
- Built-in tutorials and videos allow you to get quickly up to speed.
- Store cable assemblies in the Cloud and develop over time.
- Each cable design has a downloadable PDF documentation file detailing all specifications



Start designing your custom cabling, go to pickeringtest.com/cdt

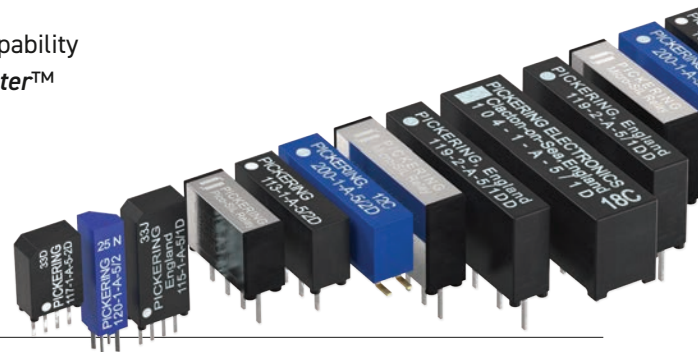
Mass Interconnect

We recommend the use of a mass interconnect solution when an Interchangeable Test Adapter (ITA) is required for PXI/LXI based test systems. Our modules are fully supported by Virginia Panel and MacPanel.

Pickering Reed Relays

We are the only switch provider with in-house reed relay manufacturing capability via our Relay Division. These instrument grade reed relays feature **SoftCenter™** technology, ensuring long service life and repeatable contact performance.

To learn more go to pickeringrelay.com



Programming

Pickering provide kernel, IVI and VISA (NI & Keysight) drivers which are compatible with all Microsoft supported versions of Windows and popular older versions.

For more information go to pickeringtest.com/os

The VISA driver support is provided for LabVIEW Real Time Operating Systems (Pharlap and Linux-RT). For other RTOS support contact Pickering. These drivers may be used with a variety of programming environments and applications including:

- Pickering Interfaces Switch Path Manager
- National Instruments products (LabVIEW, LabWindows/CVI, Switch Executive, MAX, TestStand, VeriStand, etc.)
- Microsoft Visual Studio products (Visual Basic, Visual C++)
- Programming Languages C, C++, C#, Python
- Keysight VEE and OpenTAP
- Mathworks MATLAB, Simulink
- Marvin ATEasy
- MTQ Testsolutions Tecap Test & Measurement Suite

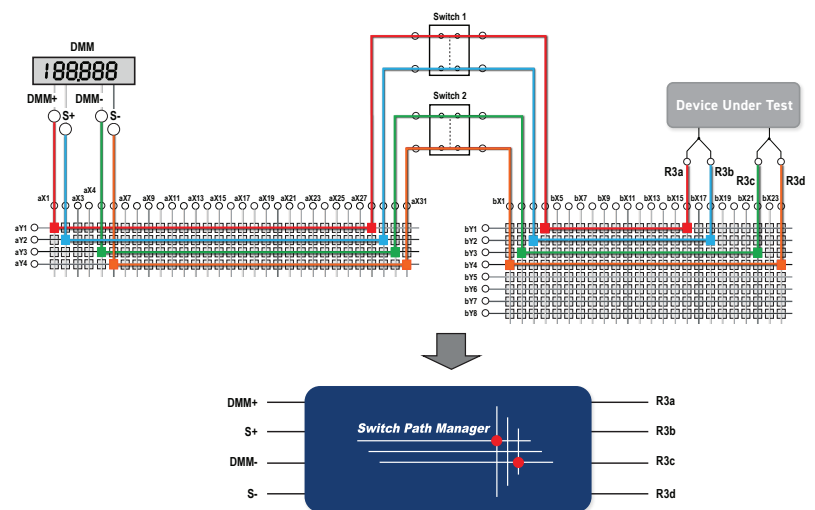
Drivers for popular Linux distributions are available, other environments are also supported, please contact Pickering with specific enquiries. We provide Soft Front Panels (SFPs) for our products for familiarity and manual control, as well as comprehensive documentation and example programs to help you develop test routines with ease.

To learn more about software drivers and development environments go to pickeringtest.com/software

Signal Routing Software

Our signal routing software, Switch Path Manager, automatically selects and energizes switch paths through Pickering switching systems. Signal routing is performed by simply defining test system endpoints to be connected together, greatly accelerating Test System software development.

To learn more go to pickeringtest.com/spm



Diagnostic Relay Test Tools

eBIRST Switching System Test Tools are designed specifically for our PXI, PCI or LXI products, these tools simplify switching system fault-finding by quickly testing the system and graphically identifying the faulty relay.

To learn more go to pickeringtest.com/ebirst



Three Year Warranty & Guaranteed Long-Term Support

All standard products manufactured by Pickering Interfaces are warranted against defective materials and workmanship for three years from the date of delivery to the original purchaser. Extended warranty and service agreements are available with various levels for your requirements. Although we offer a 3-year warranty as standard, we also include guaranteed long-term support—with a history of supporting our products for typically 15-20 years.

To learn more go to pickeringtest.com/support

Available Product Resources

We have a library of resources including success stories, product and support videos, articles and white papers as well as application-specific brochures to assist you. We have also published reference books on switching technology and the PXI and LXI standards.

To view, download or request any of our product resources go to pickeringtest.com/resources

