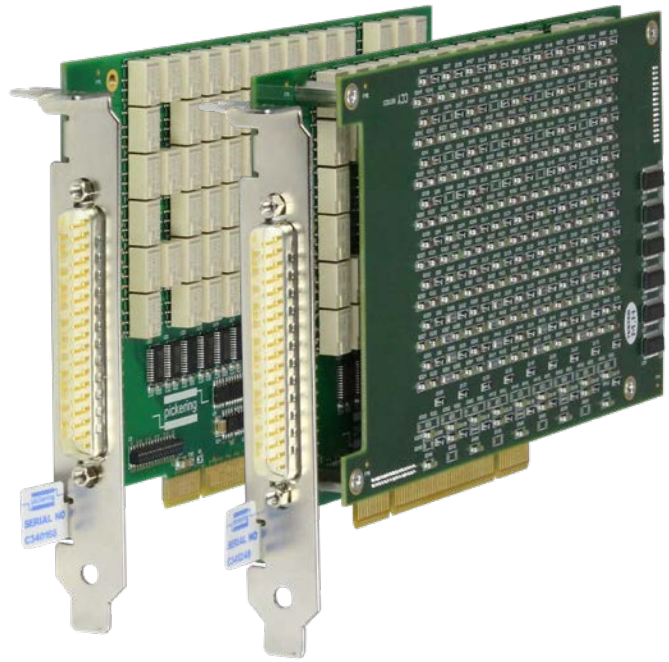


- High Density Resistor Simulation
- Up To 18 Channels in a One Slot Card
- Resistance Resolution to 0.125Ω
- Values From 1 Ω to 22 MΩ
- Accuracy of ±0.2% ± Resolution
- Short and Open Simulation
- Simple Software Control Through Resistance Calls
- VISA & Kernel Drivers Supplied for Windows
- 3 Year Warranty

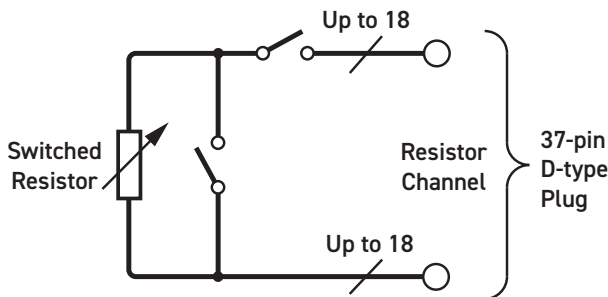


The 50-297 provides a simple solution for applications requiring accurate simulation of resistive sensors. It is available in a variety of resistance ranges and resolutions to meet the needs of most functional test systems. It is particularly suited to engine controller test applications where resistive sensors provide information such as temperature.

The channels of the 50-297 are able to simulate the common short circuit and open circuit conditions that can be experienced in a system due faults in wiring or sensors.

Software control of the 50-297 is simplified by the use of resistor value calls. The card works out the channel setting closest to what has been requested and sets that value. The user can interrogate the card to find the actual resistance setting used.

A calibration cable assembly can be attached to the card to enable an external DMM to be connected to each channel in turn for verification purposes. This considerably simplifies the effort required to check the card's calibration. Verification is performed with the UUT disconnected from the card.



**Functional Diagram for the 50-297 High Density Precision Resistor Card**

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.					

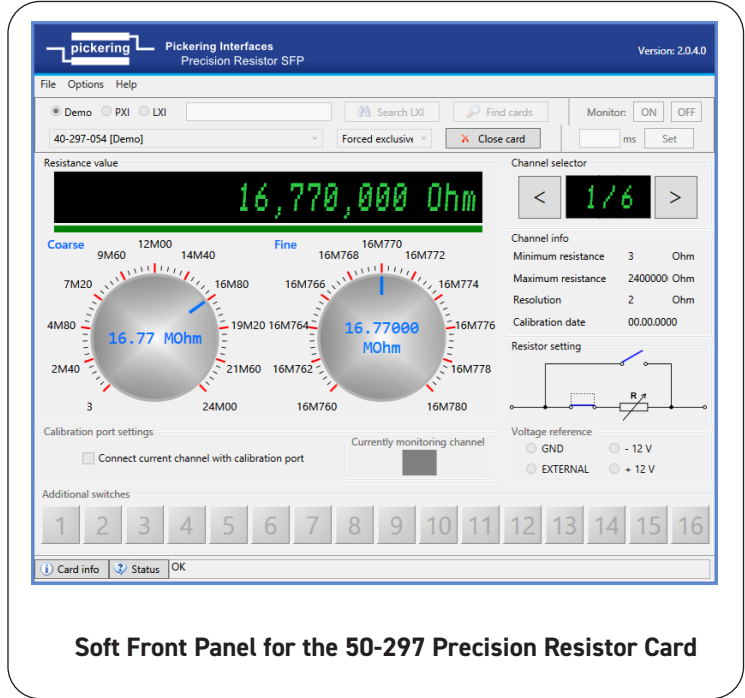
The 50-297 is available in 50 standard builds that suit the most common configurations required:

- A narrow resistance range version, available in 9 or 18 channel variants.
- A medium resistance range version, available in 4 or 9 channel variants.
- A wide resistance range version, available in 3 or 6 channel variants.

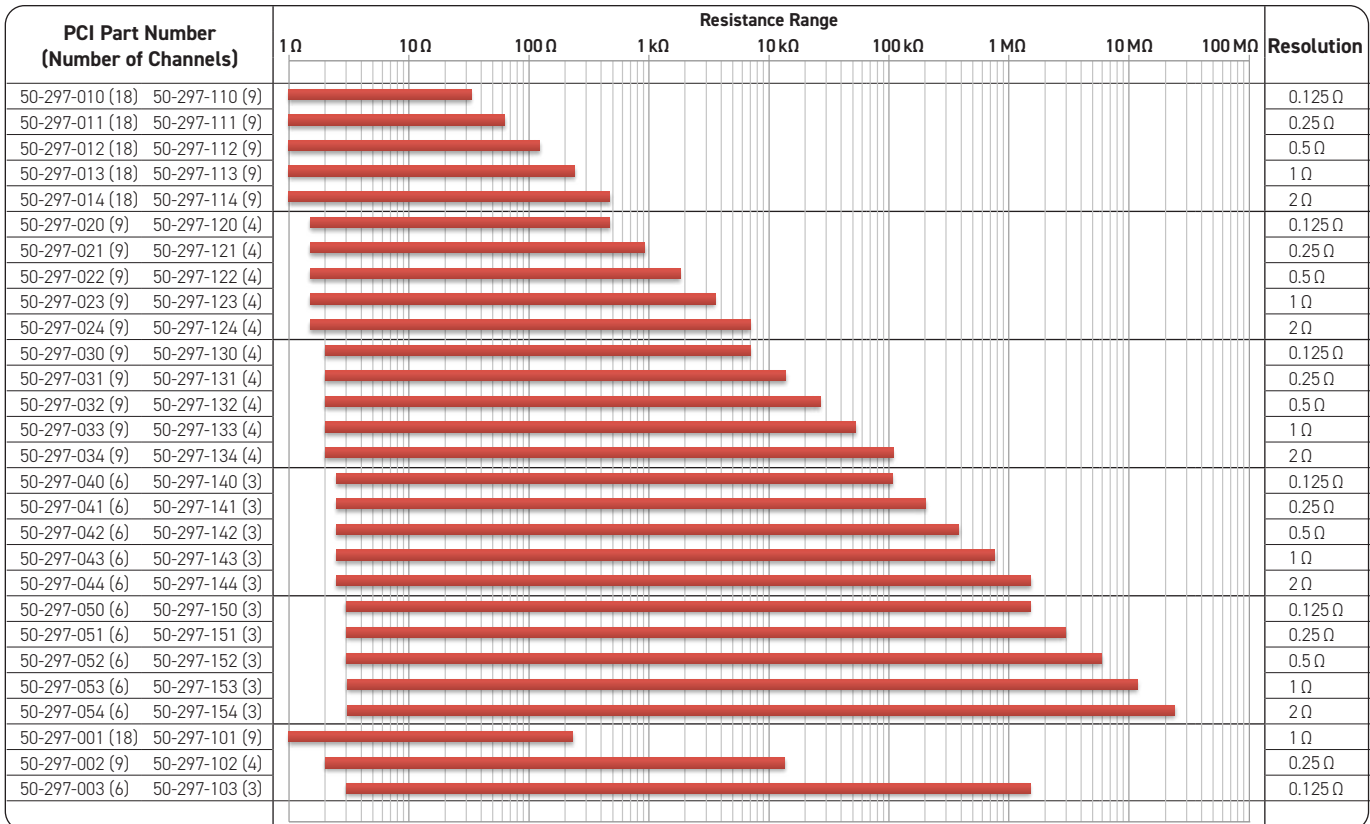
## Legacy Support

Due to the new expanded range of builds available within the 50-297 family, the part numbering has been revised. Users are encouraged to order under the new part numbering system where possible. However, to support our existing users the following legacy part numbers are still available:

Resistor Card Description	Legacy Part Number	New Part Number
9 Channel Precision Resistor, 1Ω Resolution	50-297-101	50-297-113
18 Channel Precision Resistor, 1Ω Resolution	50-297-001	50-297-013
4 Channel Precision Resistor, 0.25Ω Resolution	50-297-102	50-297-131
9 Channel Precision Resistor, 0.25Ω Resolution	50-297-002	50-297-031
3 Channel Precision Resistor, 0.125Ω Resolution	50-297-103	50-297-150
6 Channel Precision Resistor, 0.125Ω Resolution	50-297-003	50-297-050



Soft Front Panel for the 50-297 Precision Resistor Card



Graphical Representation of the 50-297 Precision Resistor Card Range

## Relay Type

The 50-297 is fitted with electro-mechanical relays.

## Specification

Accuracy:	±0.2% ±Resolution @ ±10°C from calibration temperature (factory calibration @ 21 °C)
Fault Simulation:	Open and short circuit (typically <0.3Ω)
Power:	0.5 W maximum
Number of Operations:	100 million (10 mA)
Maximum Voltage:	100 V* or as limited by power
Settling time:	<3 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 on the card.

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

## Power Requirements

+3.3V	+5V	+12V	-12V
200 mA	4.3 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 50-297 complies with the PCI Specification 2.0 (issued Feb 2004).

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

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 Conditions

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

### Storage and Transport Conditions

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

## Product Order Codes

### 0.125 $\Omega$ Resolution

Range	No. of Channels	Order Code	No. of Channels	Order Code
1 $\Omega$ to 31.5 $\Omega$	9	50-297-110	18	50-297-010
1.5 $\Omega$ to 472 $\Omega$	4	50-297-120	9	50-297-020
2 $\Omega$ to 6.97 k $\Omega$	4	50-297-130	9	50-297-030
2.5 $\Omega$ to 102 k $\Omega$	3	50-297-140	6	50-297-040
3 $\Omega$ to 1.51 M $\Omega$	3	50-297-150	6	50-297-050

### 0.25 $\Omega$ Resolution

Range	No. of Channels	Order Code	No. of Channels	Order Code
1 $\Omega$ to 62.1 $\Omega$	9	50-297-111	18	50-297-011
1.5 $\Omega$ to 925 $\Omega$	4	50-297-121	9	50-297-021
2 $\Omega$ to 13.6 k $\Omega$	4	50-297-131	9	50-297-031
2.5 $\Omega$ to 201 k $\Omega$	3	50-297-141	6	50-297-041
3 $\Omega$ to 2.97 M $\Omega$	3	50-297-151	6	50-297-051

### 0.5 $\Omega$ Resolution

Range	No. of Channels	Order Code	No. of Channels	Order Code
1 $\Omega$ to 122 $\Omega$	9	50-297-112	18	50-297-012
1.5 $\Omega$ to 1.81 k $\Omega$	4	50-297-122	9	50-297-022
2 $\Omega$ to 26.7 k $\Omega$	4	50-297-132	9	50-297-032
2.5 $\Omega$ to 395 k $\Omega$	3	50-297-142	6	50-297-042
3 $\Omega$ to 5.82 M $\Omega$	3	50-297-152	6	50-297-052

### 1 $\Omega$ Resolution

Range	No. of Channels	Order Code	No. of Channels	Order Code
1 $\Omega$ to 239 $\Omega$	9	50-297-113	18	50-297-013
1.5 $\Omega$ to 3.55 k $\Omega$	4	50-297-123	9	50-297-023
2 $\Omega$ to 52.4 k $\Omega$	4	50-297-133	9	50-297-033
2.5 $\Omega$ to 773 k $\Omega$	3	50-297-143	6	50-297-043
3 $\Omega$ to 11.4 M $\Omega$	3	50-297-153	6	50-297-053

### 2 $\Omega$ Resolution

Range	No. of Channels	Order Code	No. of Channels	Order Code
1 $\Omega$ to 470 $\Omega$	9	50-297-114	18	50-297-014
1.5 $\Omega$ to 6.97 k $\Omega$	4	50-297-124	9	50-297-024
2 $\Omega$ to 102 k $\Omega$	4	50-297-134	9	50-297-034
2.5 $\Omega$ to 1.51 M $\Omega$	3	50-297-144	6	50-297-044
3 $\Omega$ to 22.3 M $\Omega$	3	50-297-154	6	50-297-054

## 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**

## Mating Connectors & Cabling

For connection accessories for the 50-297 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, or refer to the Connection Solutions catalog.

## Other Resistor Modules

Pickering Interfaces manufacture a range of variable resistor modules in the PXI and PCI formats. If you have a requirement for a variable resistor module 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 PXI modules 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

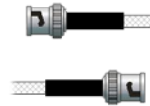
We provide a full range of supporting cable and connector solutions for all our switching products—20 connector families with 1200+ products. We offer everything from simple mating connectors to complex cables assemblies and terminal blocks. All assemblies are manufactured by Pickering and are guaranteed to mechanically and electrically mate to our modules.



Connectors & Backshells



Multiway Cable Assemblies



RF Cable Assemblies



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. Visit: [pickeringtest.com/cdt](http://pickeringtest.com/cdt) to start your design.

## Mass Interconnect

We recommend the use of a mass interconnect solution when an Interchangeable Test Adapter (ITA) is required for a PXI or LXI based test system. Our modules are fully supported by both 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, please go to: [pickeringrelay.com](http://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 a list of all supporting operating systems, please see: [pickeringtest.com/os](http://pickeringtest.com/os)

The VISA driver is also compatible with Real-Time Operating Systems such as LabVIEW RT. For other RTOS support contact Pickering. These drivers may be used with a variety of programming environments and applications including:

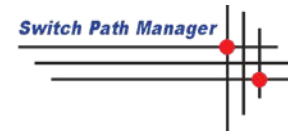
- **Pickering Interfaces Switch Path Manager**
- **National Instruments** products (LabVIEW, LabWindows/CVI, Switch Executive, MAX, TestStand, VeriStand, etc.)
- **Microsoft Visual Studio** products (Visual Basic, Visual C+)
- **Keysight** VEE and OpenTAP
- **Mathworks** Matlab
- **Marvin** ATEasy
- **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, please go to: [pickeringtest.com/software](http://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, please go to: [pickeringtest.com/spm](http://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, please go to: [pickeringtest.com/ebirst](http://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 a period of three years from the date of delivery to the original purchaser. Extended warranty and service agreements are available for all our modules and systems with various levels to suit 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, please go to: [pickeringtest.com/support](http://pickeringtest.com/support)

## Available Product Resources

We have a large library of product resources including success stories, product and support videos, articles and white papers as well as application specific product brochures to assist when looking for the switching, simulation and connection solutions you need. We have also published handy reference books on Switching Technology and for the PXI and LXI standards.



To view, download or request any of our product resources, please visit: [pickeringtest.com/resources](http://pickeringtest.com/resources)

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