50-295/296
PCI Programmable Resistor Card

- **High Density Resistor Card**
- **Configurable to 8, 12, 16, or 24-Bit Resolution**
- **Up to 18 Channels of 8-Bit Resolution**
- **Up to 10 Channels of 16-Bit Resolution**
- **Provides Fully Isolated Variable Resistors**
- **Configurable as Adjustable Resistor or Potentiometer**
- **Built-in Non-Volatile Parametric Memory for Calibration Data**
- **Uses High Reliability Pickering Reed Relays for Maximum Performance**
- **Up to 2000 Value Changes Per Second**
- **Special Versions With Non-Standard Resistors Built to Order**
- **VISA & Kernel Drivers Supplied for Windows XP/Vista/7/8 Plus Soft Front Panel**
- **3 Year Warranty**

The 50-295 is a Programmable Resistor card with up to 18-channels of 8-bit resolution resistor chains in a single PCI slot. The flexible architecture allows the card to also be supplied as 12-bit, 16-bit or 24-bit resolution versions for applications requiring finer resolution, greater resistance range or higher channel count. The card is ideal for simulating the sensors for control and management systems under test, allowing the user to verify system response in design verification or manufacturing test applications.

The programmable resistors can be configured as potentiometers with a wiper connection, model 50-296, simulating the response to external adjustable components.

Versions with other resistor values can be provided to meet the requirements for specific applications. Each resistor chain includes an offset resistor that can be used to set the minimum resistance value.

Requests for these versions can be entered on a simple web based form from the Pickering Interfaces web site, allowing users a quick and easy way of obtaining a quotation.
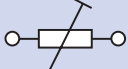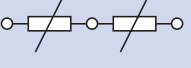
The card is available in a variety of densities that allow the user to select the most appropriate solution in terms of density and cost for every application. The high channel count in each card ensures that large systems can be simulated with minimal PCI slot occupancy.

All switches use instrument grade reed relays with low thermal offset voltage to ensure accurate operation under all conditions and a long service life.

To give maximum accuracy each resistor chain has on-board E^{2}PROM, this allows accurate calibration data to be recorded for each resistor in the chain.

The card is supplied with VISA drivers and a soft front panel.

Reso-lution	Resistance Range	Configuration	Number Per Card
8-Bit	0Ω to 255Ω	Resistor	10 or 18
12-Bit	0Ω to 4kΩ		5 or 10
16-Bit	0Ω to 65kΩ		5 or 10
24-Bit	0Ω to 16MΩ		3 or 6
8-Bit	0Ω to 255Ω Wiper	Potentiometer	5 or 9
12-Bit	0Ω to 4kΩ Wiper		2 or 4
16-Bit	0Ω to 65kΩ Wiper		2 or 4
24-Bit	0Ω to 16MΩ Wiper		1 or 3

Programmable Resistor Card Options Overview

Relay Type
The 50-295/296 card is fitted with Reed Relays (Sputtered Ruthenium type), these offer very long life with good low level switching performance and excellent contact resistance stability. All reed relays are manufactured by our sister company Pickering Electronics, www.pickeringrelay.com.

Programming
Pickering provide kernel, IVI and VISA (NI and Agilent) drivers which are compatible with 32/64-bit versions of Windows including XP, Vista, 7 and 8 operating systems. 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:

- **National Instruments** products (LabVIEW, LabWindows/CVI, Switch Executive, MAX, TestStand, etc.)
- **Microsoft Visual Studio** products (Visual Basic, Visual C+)
- **Agilent** VEE
- **Geotest** ATE Easy
- **Mathworks** Matlab
- **MTQ Testsolutions** Tecap

Drivers for popular Linux distributions are available, other environments are also supported, please contact Pickering with specific enquiries.
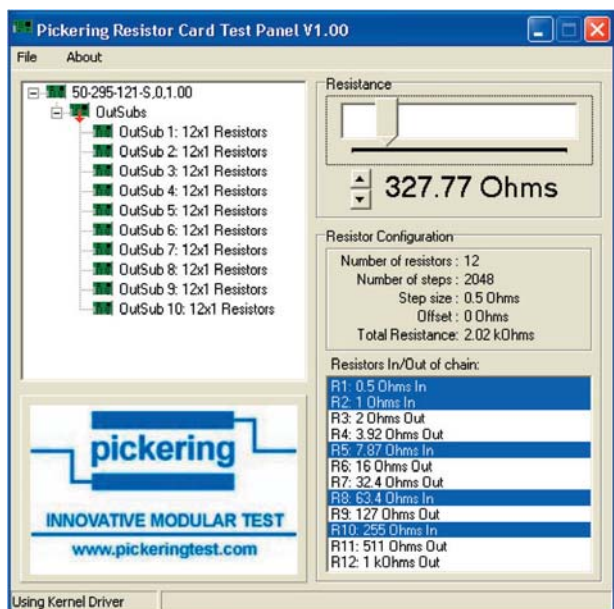
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Programmable Resistor Specification

Max Switching Voltage:	100V
Resolution	1Ω
Accuracy:	±0.5% (0 to 1MΩ)
	±5% (>1MΩ)
Residual Resistance, typical: (when chain resistance is set to 0Ω)	1Ω (8-bit)
	1.5Ω (12-bit)
	2Ω (16-bit)
	3Ω (24-bit)
Max Power:	0.5W
Max Switch Current:	0.5A
Max Carry Current:	1.0A
Differential Thermal Offset:	<35uV (8-bit)
	<45uV (12-bit)
	<50uV (16-bit)
	<60uV (24-bit)
Operate Time:	<0.5ms
Release Time:	<0.5ms
Expected Life	
Low power load:	>1x10^8 operations
Full power load:	>1x10^6 operations

Custom Resistor Values

If you require a customized Resistor Card please contact the sales office and specify the information required below

Start Resistance/Ohm	
Stop Resistance/Ohm	
Step Resistance/Ohm	
Overall Resistor Precision/%	
Resistor Max Power/W	

Soft Front Panel for the 50-295 Programmable Resistor Card

Latest Details

Please refer to our Web Site for Latest Product Details.

www.pickeringtest.com

Power Requirements

+3.3V	+5V	+12V	-12V
0	850mA (typ 450mA)	0	0

Physical Parameters

Physical characteristics: Single slot short PCI format

Signalling Environment: +5V only

Resistor Connector: Male 37-way D-type

PCI Compliance

The 50-295/296 comply with the PCI Specification 2.0 (issued Aug 2000). Local Bus, Interrupts, Trigger Bus and Star Trigger are not implemented. Supplied soft front panels and driver software are fully compatible with Windows XP/Vista/7/8.

Safety & CE Compliance

All cards are fully CE compliant and meet applicable EU directives: Low-voltage safety EN61010-1:2001, EMC Immunity EN61000-6-1:2001, Emissions EN55011:1998.

High Density Resistor Card Order Codes

10 x 8-Bit (0Ω to 255Ω)	**50-295-021-10/8**
18 x 8-Bit (0Ω to 255Ω)	**50-295-121-18/8**
5 x 12-Bit (0Ω to 4kΩ)	**50-295-021-5/12**
10 x 12-Bit (0Ω to 4kΩ)	**50-295-121-10/12**
5 x 16-Bit (0Ω to 65kΩ)	**50-295-021-5/16**
10 x 16-Bit (0Ω to 65kΩ)	**50-295-121-10/16**
3 x 24-Bit (0Ω to 16MΩ)	**50-295-021-3/24**
6 x 24-Bit (0Ω to 16MΩ)	**50-295-121-6/24**

High Density Potentiometer Card Order Codes

5 x 8-Bit Pot (0Ω to 255Ω Wiper)	**50-296-021-5/8**
9 x 8-Bit Pot (0Ω to 255Ω Wiper)	**50-296-121-9/8**
2 x 12-Bit Pot (0Ω to 4kΩ Wiper)	**50-296-021-2/12**
4 x 12-Bit Pot (0Ω to 4kΩ Wiper)	**50-296-121-4/12**
2 x 16-Bit Pot (0Ω to 65kΩ Wiper)	**50-296-021-2/16**
4 x 16-Bit Pot (0Ω to 65kΩ Wiper)	**50-296-121-4/16**
1 x 24-Bit Pot (0Ω to 16MΩ Wiper)	**50-296-021-1/24**
3 x 24-Bit Pot (0Ω to 16MΩ Wiper)	**50-296-121-3/24**

Mating Connectors & Cabling

For connection accessories for the 50-295/296 please refer to the **90-007D** 37 way D-type Connector Accessories data sheet where a complete list and documentation can be found for accessories, or refer to the Connection Solutions catalog.

Operating/Storage Conditions

Operating Conditions

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

Storage and Transport Conditions

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

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