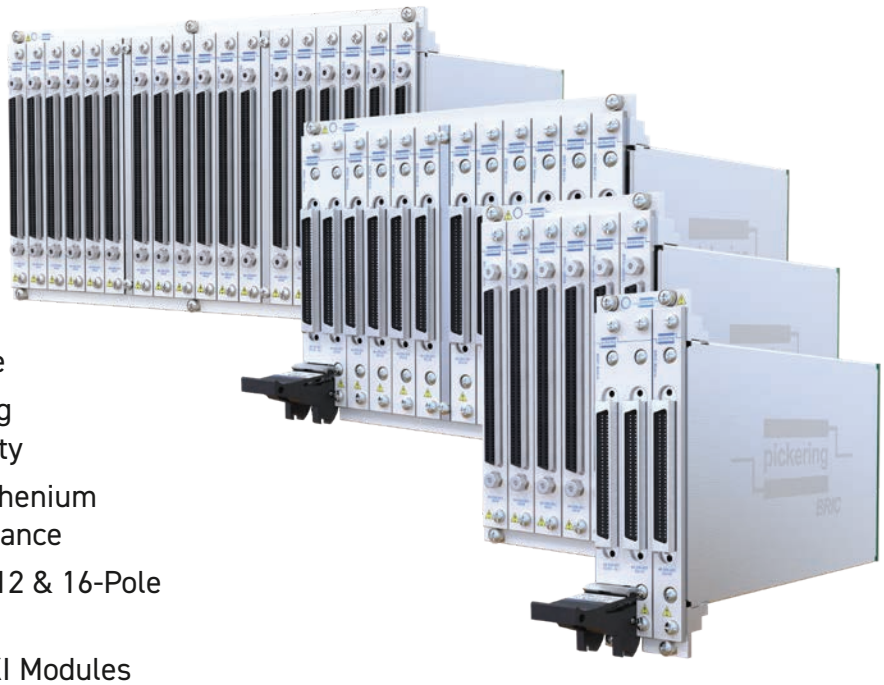
PXI BRIC™ Multi-Slot Ultra High Density Matrix 40-558

- New Generation of 0.5A PXI Matrices With 39 % Higher Density Than Competing Products
- Integrated PXI Matrix Module With Built-In High Performance Screened Analog Bus
- Robust 0.5 A/5 W Switching, With up to 9,216 Crosspoints per Module
- Automatic Isolation Relay Switching Maximizes Bandwidth and Reliability
- Uses High Reliability Pickering Ruthenium Reed Relays for Maximum Performance
- Choice of Analog Bus Widths: 6, 8, 12 & 16-Pole with Dual Analog Bus Options
- Available as 2, 4, 8 & 12-Slot 3U PXI Modules
- VISA, IVI & Kernel Drivers Supplied for Windows
- Supported by ***BIRST*** ™ & ***eBIRST*** ™ Test Tools
- 3 Year Warranty



BRIC PXI Reed Relay Matrices

The 40-558 PXI BRIC is an ultra high density matrix module available in 2, 4, 8 or 12-slot sizes suitable for high performance matrix requirements.

With its high level of switching density, the 40-558 allows a complete Functional ATE system to be housed in a single 3 U PXI chassis, and the integrated BRIC design saves on valuable chassis slots compared to standard PXI matrix modules. The 40-558 range is as follows:

- **BRIC2** is a 2-slot PXI module with 2 or 3 matrix daughter cards - a maximum of 1536 crosspoints.
- **BRIC4** is a 4-slot PXI module with up to 6 matrix daughter cards - a maximum of 3072 crosspoints.
- **BRIC8** is an 8-slot PXI module with up to 12 matrix daughter cards - a maximum of 6144 crosspoints.
- **BRIC12** is an 12-slot PXI module with up to 18 matrix daughter cards - a maximum of 9216 crosspoints.

High Reliability and Ease of Use

The module is fitted with high quality reed relays (Ruthenium sputtered type), these offer very long life with good low level switching performance and excellent contact resistance stability.

Spare relays are included with the module to allow easy maintenance with minimum downtime. All reed relays are manufactured by our Relay Division: pickeringrelay.com

The BRIC's internal high performance screened analog backplane minimizes the complexity and cost of cable assemblies. We can construct custom cables for all our PXI modules, please contact the sales office for assistance.

Built-In Relay Self-Test - *BIRST*

The *BIRST* facility provides a quick and simple way of finding relay failures. No test equipment is required, simply disconnect the UUT from the BRIC's connectors, launch the *BIRST* application and the tool will run a diagnostic test that will find all relays with faulty contacts.

For more information go to: pickeringtest.com/birst

Supported by *eBIRST*

In addition to *BIRST*, these modules are also supported by our *eBIRST* test tools. These tools simplify switching system fault-finding by quickly testing the system and graphically identifying the faulty relay.

For more information go to: pickeringtest.com/ebirst

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Pickering Reed Relay BRIC Advantages

- Only uses the highest quality instrument grade reed relays – be wary of inferior copies.
- Simplified cabling and interconnection for large matrix solutions.
- Extensive accessory support.
- Built in self-test to find defective and degrading relays with full path resistance characterisation.
- Simplified operation through automated isolation relay operation and single matrix presentation.
- Highest density reed relay solution in PXI.
- Designed for simple relay replacement and ease of field service.
- Extensive range of configurations and solutions.
- Fast operation through VISA driver with multiple relay operation in one command or have the convenience and simplicity of IVI drivers.

Pickering *SoftCenter*™ Instrumentation Grade Reed Relays

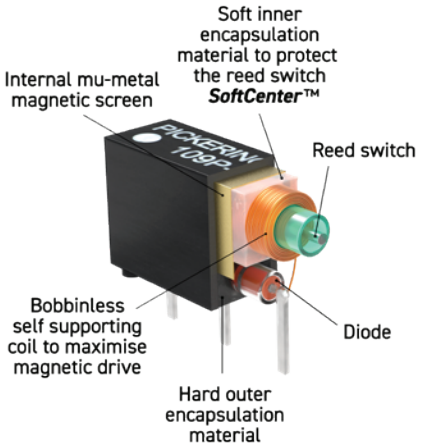
Reed relay switching solutions can only be as good as the relays they use, and Pickering Interfaces uses only the highest quality instrumentation grade reed relays manufactured by our Relay Division.

These are the reed relays of choice for ATE manufacturers, providing the most reliable and consistent switching available in the industry.

Pickering has over 50 years of experience designing relays to the highest quality levels demanded by the ATE industry. We know what makes a good relay and how to construct a reliable relay.

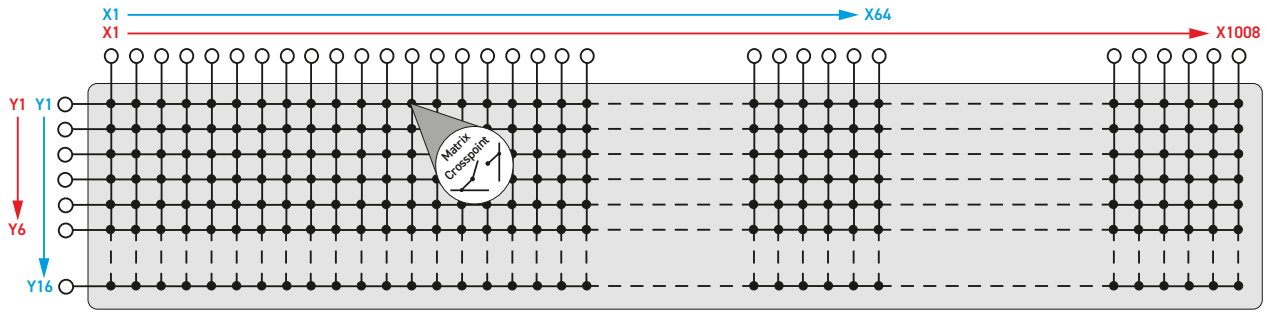
All our reed relays use the ***SoftCenter*** construction, a construction that allows for the constant expansion and contraction of the reed relay coils and the glass body without fear of damage to wires or glass seals. The high performance of reed relays is due to their hermetic structure, and only the ***SoftCenter*** structure provides the means to reliably avoid seal or wire damage that ensures a long relay contact life.

So choose the right matrix solution, and use the best quality reed relays by choosing the Pickering Interfaces' reed relay BRICs.

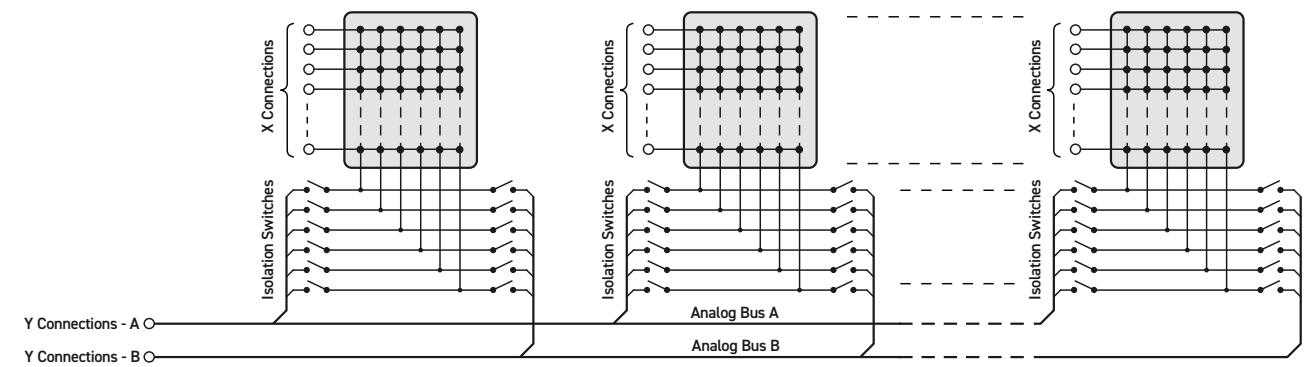


Pickering's Range of BRIC Matrix Modules

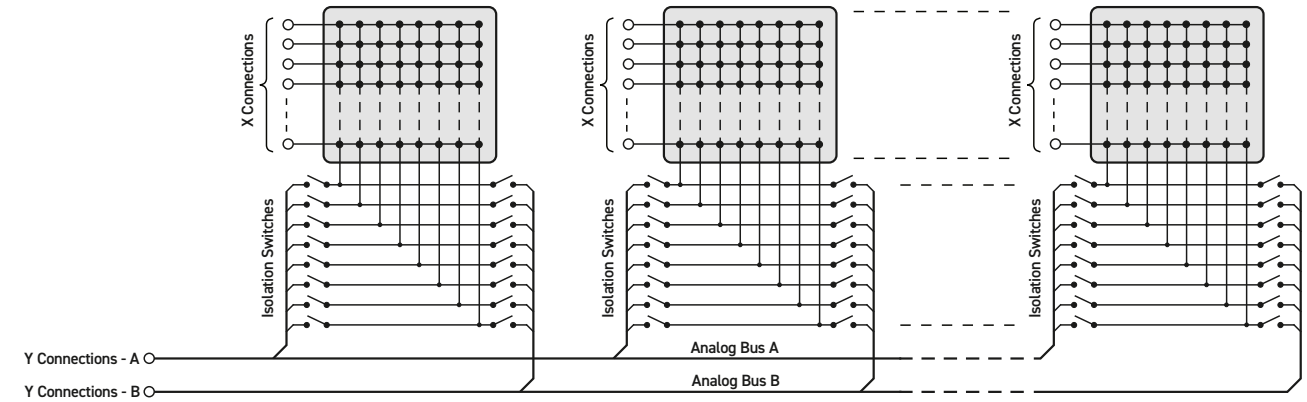
40-558 - 1-Pole Matrix - 0.5 A Reed Relay	
BRIC2	Up to 252x6, 192x8, 126x12 or 96x16
BRIC4	Up to 504x6, 384x8, 252x12 or 192x16
BRIC8	Up to 1008x6, 768x8, 504x12 or 384x16
BRIC12	Up to 1512x6, 1152x8, 756x12 or 576x16
40-559 - 1-Pole Matrix - 1 A Reed Relay	
BRIC2	256x4, 168x6, 128x8, 84x12 or 64x16
BRIC4	Up to 512x4, 336x6, 256x8, 168x12 or 128x16
BRIC8	Up to 1024x4, 672x6, 512x8, 336x12 or 256x16
40-560A - 1-Pole Matrix - 0.5 A Reed Relay	
BRIC2	Up to 276x4, 138x8 or 69x16
BRIC4	Up to 552x4, 276x8 or 138x16
BRIC8	Up to 1104x4, 552x8 or 276x16
40-561A - 1-Pole or 2-Pole Matrix - 0.5 A Reed Relay	
BRIC2	Up to 90x8 or 45x16
BRIC4	Up to 180x8 or 90x16
BRIC8	Up to 360x8 or 180x16
40-562B - 1-Pole or 2-Pole Matrix - 1 A Reed Relay	
BRIC2	Up to 132x4, 66x8, 33x16 or 15x32
BRIC4	Up to 264x4, 132x8, 66x16 or 30x32
BRIC8	Up to 528x4, 264x8, 132x16 or 60x32
BRIC12	Up to 792x4, 396x8, 198x16 or 90x32
40-563A - 1-Pole Matrix - 0.25 A Solid State	
BRIC2	Up to 96x8
BRIC4	Up to 192x8
BRIC8	Up to 384x8
40-565B - 2-Pole Matrix - 2 A Electro-mechanical Relay	
BRIC2	Up to 58x8
BRIC4	Up to 116x8
BRIC8	Up to 232x8
40-566A - 2-Pole Matrix - 2 A Electro-mechanical Relay	
BRIC4	Up to 165x4
BRIC8	Up to 385x4
40-567 - 1-Pole Matrix -2 A Electro-mechanical Relay	
BRIC2	Up to 88x8
BRIC4	Up to 176x8
BRIC8	Up to 352x8
40-568 - 1-Pole Matrix - 2 A Electro-mechanical Relay	
BRIC2	Up to 150x4
BRIC4	Up to 300x4
BRIC8	Up to 600x4
40-596 - 1-Pole Matrix - 2 A Electro-mechanical Relay	
BRIC2	Up to 161x6
BRIC4	Up to 232x6
BRIC8	Up to 464x6
40-597 - 1-Pole Matrix - 2 A Electro-mechanical Relay	
BRIC2	Up to 64x12
BRIC4	Up to 128x12
BRIC8	Up to 356x12
40-598 - 1-Pole Matrix - 2 A Electro-mechanical Relay	
BRIC2	Up to 48x16
BRIC4	Up to 96x16
BRIC8	Up to 192x16



The 40-558 BRIC Module is available with matrix sizes between 64x16 and 1512x6

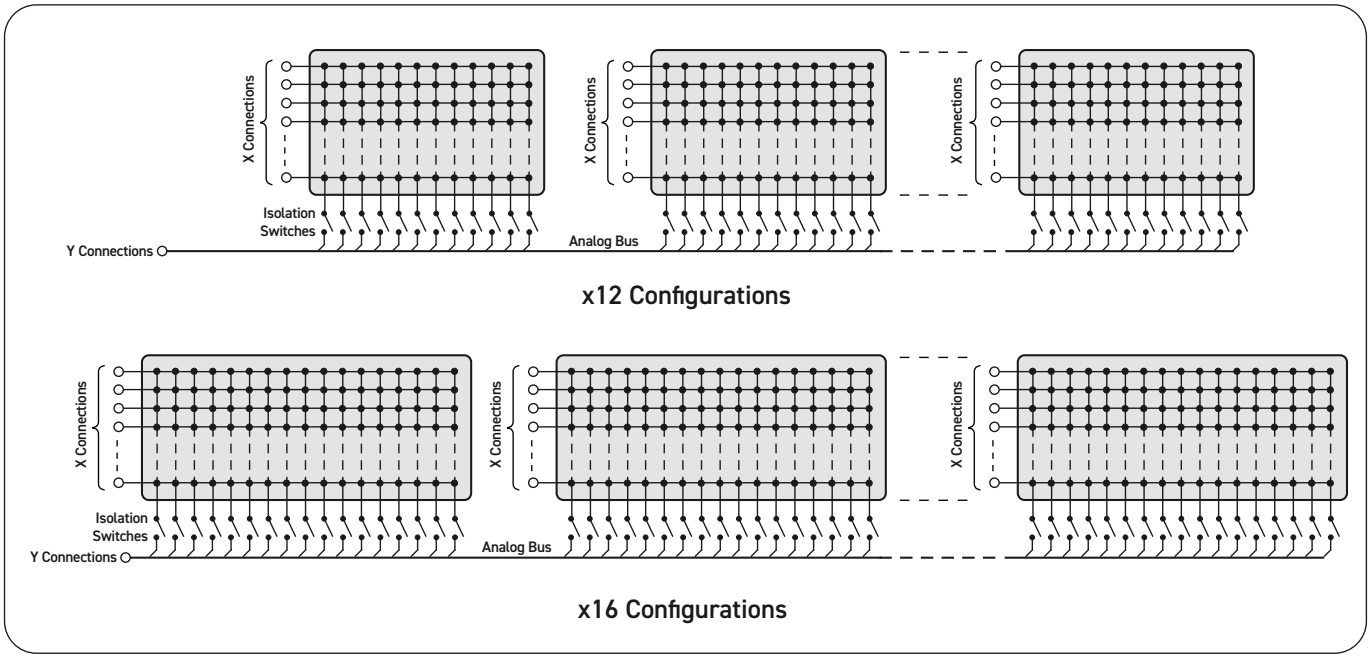


x6 Configurations



x8 Configurations

Architecture diagrams for x6 and x8 configurations of the 40-558 range showing how the matrix daughter cards are interconnected with dual analog buses.



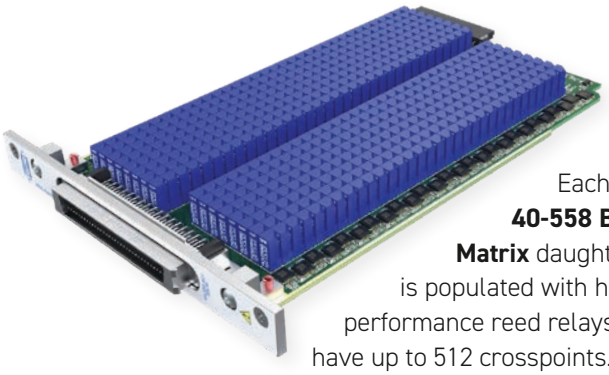
Architecture diagrams for x12 and x16 configurations of the 40-558 range showing how the matrix daughter cards are interconnected with a single analog bus.

Analog Bus

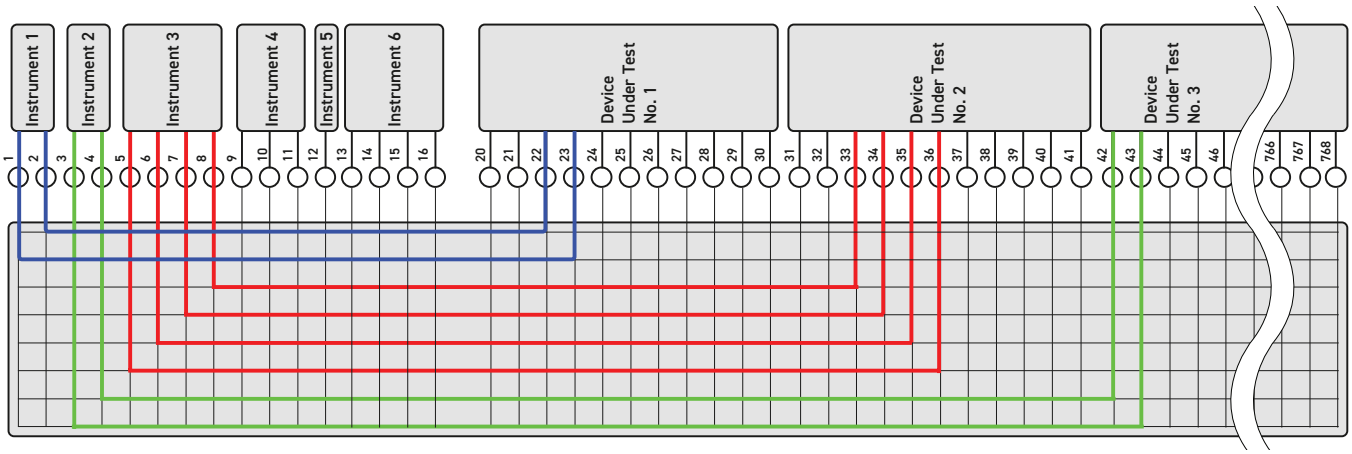
The Y-buses of the 40-558 daughter cards are linked via the analog bus on the BRIC backplane. x16 and x12 versions have a single analog bus, x8 and x6 versions have the added versatility of a dual analog bus. This allows the matrix to be configured as two totally separate matrices within the same BRIC module.

Isolation Switching

Each of the 40-558 daughter cards is fitted with isolation switches between the matrix Y-bus and the analog bus on the BRIC backplane.



Each **40-558 BRIC Matrix** daughter card is populated with high performance reed relays and can have up to 512 crosspoints.

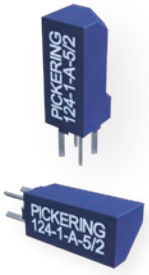


Schematic diagram showing the efficient use of a 768x8 BRIC Matrix for parallel testing multiple DUTs. The BRIC Matrix allows tremendous test system flexibility.

Pickering State-Of-The-Art Reed Relays

This matrix module is constructed using Series 124 Reed Relays manufactured by our Relay Division.

For further information please visit: pickeringrelay.com



Switching Specifications

Switch Type:	Ruthenium Reed
Max Switch Voltage:	150 VDC/100 VAC*
Max Power:	5 W
Max Switch Current:	0.5 A
Max Carry Current:	0.5 A
Relay Resistance:	120 mΩ typical
Path Resistance X to X - on:	x8 & x16 configs: 1 Ω typical (within same daughter card), 2 Ω typical (across different daughter cards) x6 & x12 configs: 1.8 Ω typical (within same daughter card), 2.2 Ω typical (across different daughter cards)
Path Resistance - off:	10^9 Ω
Thermal Offset:	<460 µV
Typical Operate Time:	1 ms
Expected Life (Operations)	
Low Power Load:	$>10^9$
Full Power Load:	$>5x10^6$

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

Power Requirements

+3.3 V	+5 V	+12 V	-12 V
0.3 A	2.7 A (100 relays)	45 mA	0

Notes: +5 V power consumption will vary by daughtercard loading.
Both PXI connectors must be engaged for BRIC12 configurations.

RF Specification - x6 Configurations

Bandwidth (-3 dB):	10 MHz (typical)	
Bandwidth (1.5:1 VSWR):	3 MHz (typical)	
Crosstalk (typical):	10 kHz:	-65 dB
	100 kHz:	-60 dB
	1 MHz:	-40 dB
	10 MHz	-20 dB
Isolation (typical):	10 kHz:	65 dB
	100 kHz:	60 dB
	1 MHz:	55 dB
	10 MHz	30 dB

RF Specification - x8 Configurations

Bandwidth (-3 dB):	12 MHz (typical)	
Bandwidth (1.5:1 VSWR):	5 MHz (typical)	
Crosstalk (typical):	10 kHz:	-60 dB
	100 kHz:	-55 dB
	1 MHz:	-30 dB
	10 MHz	-15 dB
Isolation (typical):	10 kHz:	65 dB
	100 kHz:	60 dB
	1 MHz:	55 dB
	10 MHz	30 dB

RF Specification - x12 Configurations

Bandwidth (-3 dB):	18 MHz (typical)	
Bandwidth (1.5:1 VSWR):	3 MHz (typical)	
Crosstalk (typical):	10 kHz:	-65 dB
	100 kHz:	-60 dB
	1 MHz:	-40 dB
	10 MHz	-20 dB
Isolation (typical):	10 kHz:	65 dB
	100 kHz:	60 dB
	1 MHz:	55 dB
	10 MHz	30 dB

RF Specification - x16 Configurations

Bandwidth (-3 dB):	12 MHz (typical)	
Bandwidth (1.5:1 VSWR):	4 MHz (typical)	
Crosstalk (typical):	10 kHz:	-45 dB
	100 kHz:	-40 dB
	1 MHz:	-30 dB
	10 MHz	-15 dB
Isolation (typical):	10 kHz:	65 dB
	100 kHz:	60 dB
	1 MHz:	55 dB
	10 MHz	30 dB

Width and Dimensions

Two, four, eight or twelve-slot 3 U PXI module (CompactPCI).

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

Module Weight

	Empty BRIC	Fully Loaded BRIC
BRIC2	0.6 Kg	2 Kg
BRIC4	0.9 Kg	3.6 Kg
BRIC8	1.6 Kg	7 Kg
BRIC12	2.5 Kg	10.6 Kg
BRIC daughter card	0.45 Kg	

Connectors

BRIC2/4/8 - PXI bus via 32-bit P1/J1 backplane connector.
BRIC12 - PXI bus via two 32-bit P1/J1 backplane connectors
(second PXI connector on BRIC12 is for power only).

Signals are carried via multiple front panel connectors (up to three per 2-slot module, up to six per 4-slot module, up to twelve per 8-slot module or up to eighteen per 12-slot module), the types are as follows:

- x6 Configurations: 100-pin female SCSI style micro D
- x8 Configurations: 100-pin female SCSI style micro D
- x12 Configurations: 68-pin male SCSI style micro D
- x16 Configurations: 68-pin male SCSI style micro D

Maximum Crosspoint Count

The 40-558 has a suggested maximum number of simultaneously operated crosspoints:

- 200 per BRIC2
- 200 per BRIC4
- 200 per BRIC8
- 400 per BRIC12

Please contact you local sales office for applications requiring higher closure counts.

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

PXI & CompactPCI Compliance

The module is compliant with the PXI Specification 2.2. Local Bus, Trigger Bus and Star Trigger are not implemented.

Uses a 33 MHz 32-bit backplane interface.

Safety & CE Compliance

All modules 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.

Ordering Information

Product Order Codes

BRIC2 - 2-Slot 1-Pole Matrix	40-558-201-(config)
BRIC4 - 4-Slot 1-Pole Matrix	40-558-401-(config)
BRIC8 - 8-Slot 1-Pole Matrix	40-558-801-(config)
BRIC12 - 12-Slot 1-Pole Matrix	40-558-121-(config)

When ordering 40-558 modules the matrix configuration **must** be specified, this includes the prefix code together with the configuration code, see the tables for specific details.

For the expansion of an existing BRIC matrix or replacement of faulty BRIC daughter cards please contact your local sales office.

Product Customization

Pickering 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 reed relay types
- Mixture of reed relay types
- Alternative number of relays
- 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.

x6 Configuration Options (Dual Analog Bus)

	BRIC2 40-558-201	BRIC4 40-558-401	BRIC8 40-558-801	BRIC12 40-558-121
168x6 Matrix	-168x6	-168x6	-168x6	-168x6
252x6 Matrix	-252x6	-252x6	-252x6	-252x6
336x6 Matrix		-336x6	-336x6	-336x6
420x6 Matrix		-420x6	-420x6	-420x6
504x6 Matrix		-504x6	-504x6	-504x6
588x6 Matrix			-588x6	-588x6
672x6 Matrix			-672x6	-672x6
756x6 Matrix			-756x6	-756x6
840x6 Matrix			-840x6	-840x6
924x6 Matrix			-924x6	-924x6
1008x6 Matrix			-1008x6	-1008x6
1092x6 Matrix				-1092x6
1176x6 Matrix				-1176x6
1260x6 Matrix				-1260x6
1344x6 Matrix				-1344x6
1428x6 Matrix				-1428x6
1512x6 Matrix				-1512x6

x8 Configuration Options (Dual Analog Bus)

	BRIC2 40-558-201	BRIC4 40-558-401	BRIC8 40-558-801	BRIC12 40-558-121
128x8 Matrix	-128x8	-128x8	-128x8	-128x8
192x8 Matrix	-192x8	-192x8	-192x8	-192x8
256x8 Matrix		-256x8	-256x8	-256x8
320x8 Matrix		-320x8	-320x8	-320x8
384x8 Matrix		-384x8	-384x8	-384x8
448x8 Matrix			-448x8	-448x8
512x8 Matrix			-512x8	-512x8
576x8 Matrix			-576x8	-576x8
640x8 Matrix			-640x8	-640x8
704x8 Matrix			-704x8	-704x8
768x8 Matrix			-768x8	-768x8
832x8 Matrix				-832x8
896x8 Matrix				-896x8
960x8 Matrix				-960x8
1024x8 Matrix				-1024x8
1088x8 Matrix				-1088x8
1152x8 Matrix				-1152x8

x12 Configuration Options (Single Analog Bus)

	BRIC2 40-558-201	BRIC4 40-558-401	BRIC8 40-558-801	BRIC12 40-558-121
84x12 Matrix	-84x12	-84x12	-84x12	-84x12
126x12 Matrix	-126x12	-126x12	-126x12	-126x12
168x12 Matrix		-168x12	-168x12	-168x12
210x12 Matrix		-210x12	-210x12	-210x12
252x12 Matrix		-252x12	-252x12	-252x12
294x12 Matrix			-294x12	-294x12
336x12 Matrix			-336x12	-336x12
378x12 Matrix			-378x12	-378x12
420x12 Matrix			-420x12	-420x12
462x12 Matrix			-462x12	-462x12
504x12 Matrix			-504x12	-504x12
546x12 Matrix				-546x12
588x12 Matrix				-588x12
630x12 Matrix				-630x12
672x12 Matrix				-672x12
714x12 Matrix				-714x12
756x12 Matrix				-756x12

x16 Configuration Options (Single Analog Bus)				
	BRIC2 40-558-201	**BRIC4 40-558-401**	**BRIC8 40-558-801**	**BRIC12 40-558-121**
64x16 Matrix	**-64x16**	**-64x16**	**-64x16**	**-64x16**
96x16 Matrix	**-96x16**	**-96x16**	**-96x16**	**-96x16**
128x16 Matrix		**-128x16**	**-128x16**	**-128x16**
160x16 Matrix		**-160x16**	**-160x16**	**-160x16**
192x16 Matrix		**-192x16**	**-192x16**	**-192x16**
224x16 Matrix			**-224x16**	**-224x16**
256x16 Matrix			**-256x16**	**-256x16**
288x16 Matrix			**-288x16**	**-288x16**
320x16 Matrix			**-320x16**	**-320x16**
352x16 Matrix			**-352x16**	**-352x16**
384x16 Matrix			**-384x16**	**-384x16**
416x16 Matrix				**-416x16**
448x16 Matrix				**-448x16**
480x16 Matrix				**-480x16**
512x16 Matrix				**-512x16**
544x16 Matrix				**-544x16**
576x16 Matrix				**-576x16**

Support Products

eBIRST Switching System Test Tool

This product is supported by the *eBIRST* test tools which simplify the identification of failed relays, the required *eBIRST* tools are listed below. This product requires master slave testing and two sets of tools are required together with the master slave cable: **93-970-301**.
For more information go to: pickeringtest.com/ebirst

Product	Test Tool	Adaptor
x6 Configurations	**93-022-001**	**93-022-245**
x8 Configurations	**93-022-001**	**93-022-245**
x12 Configurations	**93-006-001**	**93-006-222**
x16 Configurations	**93-006-001**	**93-006-222**

Spare Relay Kits

Kits of replacement relays are available for the majority of Pickering's PXI switching products, simplifying servicing and reducing down-time.

Product	Relay Kit
All Configurations	**91-100-100**

For further assistance, please contact the Pickering sales office.

Mating Connectors & Cabling

For connection accessories for the 40-558 module please refer to the 90-015D 68-pin male micro-D and 90-019D 100-pin female micro-D Accessories data sheets where a complete list and documentation can be found for accessories, or refer to the Connection Solutions catalog.

Chassis Compatibility

This PXI module must be used in a suitable chassis. It is compatible with the following chassis types:

- All chassis conforming to the 3U PXI and 3U Compact PCI (cPCI) specification
- Legacy and Hybrid Peripheral slots in a 3U PXI Express (PXIe) chassis
- Pickering Interfaces LXI or LXI/USB Modular Chassis

Chassis Selection Guide

Standard PXI or hybrid PXIe Chassis from any Vendor:

- Mix our 1000+ PXI switching & simulation modules with any vendor's PXI instrumentation
- Embedded or remote Windows PC control
- Real-time Operating System Support
- High data bandwidths, especially with PXI Express
- Integrated module timing and synchronization

Pickering LXI or LXI/USB Modular Chassis—only accept our 1000+ PXI Switching & Simulation Modules:

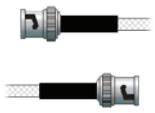
- Ethernet or USB control enables remote operation
- Low-cost control from practically any controller
- LXI provides manual control via Web browsers
- Driverless software support
- Power sequencing immunity
- Ethernet provides chassis/controller voltage isolation
- Independence from Windows operating system

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

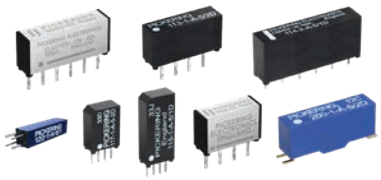
We also offer customized cabling and have a free online **Cable Design Tool** that can be used to create custom cable solutions for many applications. Visit: pickeringtest.com/cdt to start your design.

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



Programming

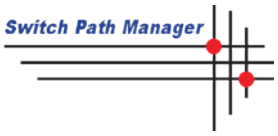
Pickering provide kernel, IVI and VISA (NI & Keysight) drivers which are compatible with all Microsoft supported versions of Windows and popular older versions. For a list of all supporting operating systems, please see: pickeringtest.com/os

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
- **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

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

Diagnostic Relay Test Tools

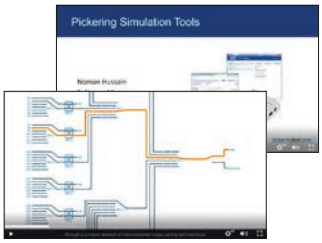
eBIRST Switching System Test Tools are designed specifically for our PXI, PCI or LXI products, these tools simplify switching system fault-finding by quickly testing the system and graphically identifying the faulty relay.
To learn more, please go to: pickeringtest.com/ebirst

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

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 also have 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