PXI BRIC™ Multi-Slot Solid State Matrix 40-563B

- Integrated PXI Matrix Module With Built In High Performance Screened Analog Bus
- Available as 2, 4 and 8 Slot 3 U PXI Modules
- Solid State 1-Pole Matrix With Sizes Between 64x8 and 384x8
- Low Thermal EMF
- Fast Switch Operation and Long Service Life
- Switch up to 40 V, 0.25 A Continuous Current
- Automatic Analog Bus Isolation Switching Gives Maximum Bandwidth
- Supported by PXI or LXI Chassis
- Drivers Supplied for Windows & Linux, Plus Support for Real-time Systems
- Reduced Service and Maintenance Costs Through the Use of Built-In Diagnostics - ***BIRST*™**
- Supported by ***eBIRST*™**
- 3 Year Warranty

BRIC™ PXI Solid State Matrices

The 40-563B PXI BRIC is an ultra high density matrix module. It is available in 2, 4 or 8-slot sizes to suit high performance PXI Matrix requirements and are constructed using solid state switches.

With its high level of switching density, the 40-563B matrix modules allow a complete functional ATE system to be housed in a single 3 U PXI chassis, BRIC Modules allow the use of much lower cost 8 or 14-slot PXI chassis.

- **BRIC2** is a 2-slot PXI Module, this can hold up to 3 matrix daughtercards with a maximum size of 96x8.
- **BRIC4** is a 4-slot PXI Module, this can hold up to 6 matrix daughtercards with a maximum size of 192x8.
- **BRIC8** is an 8-slot PXI Module, which can hold up to 12 matrix daughtercards with a maximum size of 384x8.

High Reliability and Easy of Use

All models in the 40-563B range are constructed using solid state relays making them ideal for applications requiring fast operation and a long service life with frequent switch operations. Since the design is based on solid state switching, the matrix has no wear out mechanism.

The 40-563B PXI BRICs are designed to minimize the cost and complexity of cable assemblies to the device under test and instrumentation. Analog busing is housed within the module using a high performance screened analog backplane. We can construct custom cable assemblies for all of our PXI modules, please contact sales office for further 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*

These modules are also supported by *eBIRST*. These test tools simplify switching fault-finding by quickly testing the system and graphically identifying the faulty relay.

For more information go to: pickeringtest.com/ebirst

Updated Product Information

These products have been introduced as a “form & fit” update to the 40-563A range, the changes are to provide an updated bus interface which will require the use of an updated software driver. Otherwise, the electrical performance is very similar and the pinout is identical.

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Pickering Solid State BRIC Advantages

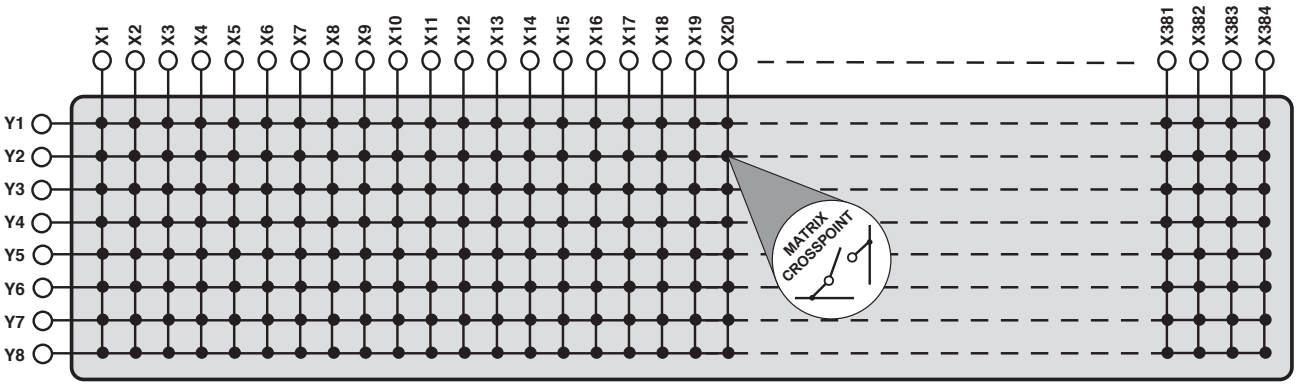
- Uses high speed, high reliability solid state relays.
- Long service life – solid state relays have no wear out mechanism.
- Low thermal EMF errors for accurate low voltage switching.
- Simplified cabling and interconnection for large matrix solutions.
- Extensive accessory support.
- Built in self-test to find defective and degrading relays with full path resistance characterisation.
- Simplified operation through automated isolation relay operation and single matrix presentation.
- Highest density solid state switching solution in PXI.
- 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's Range of BRIC Matrix Modules Up to 1 A

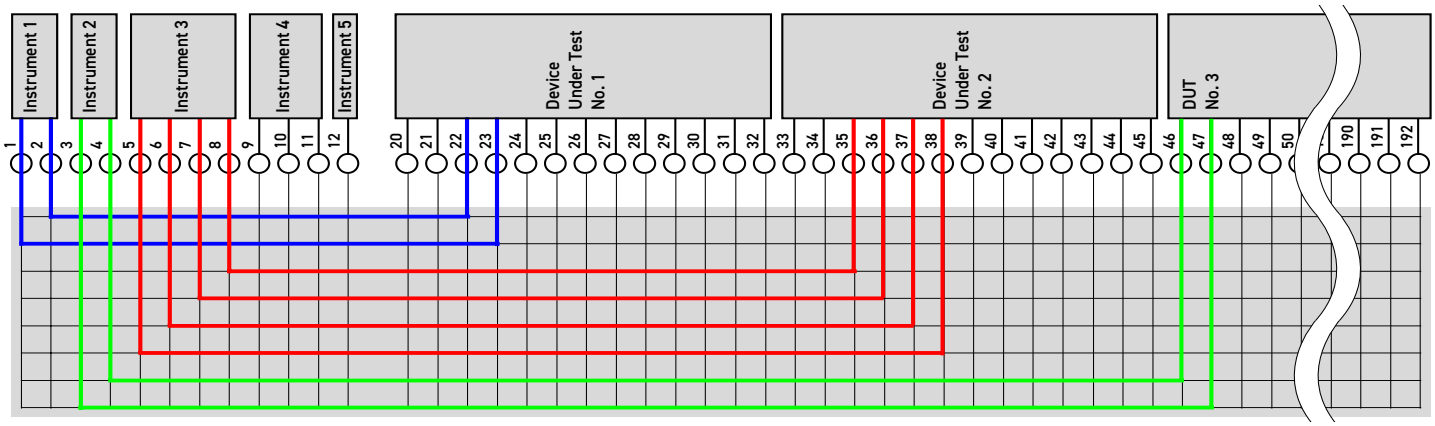
40-558 - 1-Pole Matrix - 0.5 A Reed Relay	
BRIC2	Up to 252x6, 192x8, 126x12 or 96x16
BRIC4	Up to 504x6, 384x8, 252x12 or 192x16
BRIC8	Up to 1008x6, 768x8, 504x12 or 384x16
BRIC12	Up to 1512x6, 1152x8, 756x12 or 576x16
40-559 - 1-Pole Matrix - 1 A Reed Relay	
BRIC2	256x4, 168x6, 128x8, 84x12 or 64x16
BRIC4	Up to 512x4, 336x6, 256x8, 168x12 or 128x16
BRIC8	Up to 1024x4, 672x6, 512x8, 336x12 or 256x16
40-560B - 1-Pole Matrix - 0.5 A Reed Relay	
BRIC2	Up to 276x4, 138x8, 69x16 or 33x32
BRIC4	Up to 552x4, 276x8, 138x16 or 66x32
BRIC8	Up to 1104x4, 552x8, 276x16 or 132x32
BRIC12	Up to 1656x4, 828x8, 414x16 or 198x32
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
40-563B - 1-Pole Matrix - 0.25 A Solid State	
BRIC2	Up to 96x8
BRIC4	Up to 192x8
BRIC8	Up to 384x8

Pickering's Range of 2 A BRIC Matrix Modules

40-565A - 2-Pole Matrix - 2 A Electro-mechanical Relay	
BRIC2	Up to 58x8
BRIC4	Up to 116x8
BRIC8	Up to 232x8
40-566B - 2-Pole Matrix - 2 A Electro-mechanical Relay	
BRIC4	Up to 165x4
BRIC8	Up to 385x4
40-567A - 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
40-573 - 2-Pole Matrix -2 A Electro-mechanical Relay	
BRIC2	Up to 58x8
BRIC4	Up to 116x8
BRIC8	Up to 232x8
40-574 - 2-Pole Matrix - 2 A Electro-mechanical Relay (Dual Analog Bus)	
BRIC2	Up to 114x4
BRIC4	Up to 228x4
BRIC8	Up to 456x4
40-596A - 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



Switching Diagram for the 40-563B Solid State Matrix
Available With a Minimum Size of 64x8 and a Maximum Size of 384x8



How to use the BRIC matrix to connect instrumentation to the UUT

Relay Type

The 40-563B BRIC modules are fitted with solid state relays based on fully isolated MOSFET switches that exhibit a long service life under all conditions within its capacity ratings. The switches can withstand short term surges without damage.

General Switching Specification

Switch Type:	Solid State Relay
Max Switch Voltage:	±40 V* †
Max Continuous Switch Current:	0.25 A
Surge Current:	0.75 A for 100 ms
Relay Resistance:	800 mΩ (typical)
Path Resistance X to X - on:	2.4 Ω typical (within same daughter card) 4.8 Ω typical (across different daughter cards)
Leakage Current (off state):	<1 nA at 40 V, X to X (typical)
Thermal Offset:	3 µV (X to Y) (typical) 5 µV (X to X) (typical)
Programming Time:	<0.5 ms
Switching Time:	<20 µs, no bounce
Expected Life:	Unlimited at full load

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

† Differential voltage between channels must not exceed rated voltage, additional caution should be used when applying AC voltages as multiple asynchronous supplies can create high differential voltages between channels.

RF Specification

Bandwidth -3 dB (typical):	8 MHz (40-563B-021-192x8) 6 MHz (40-563B-121-384x8)	
Crosstalk (typical):	10 kHz	-65 dB
	100 kHz	-55 dB
	1 MHz	-25 dB
	10 MHz	-20 dB
Isolation (typical):	10 kHz	65 dB
	100 kHz	65 dB
	1 MHz	50 dB
	10 MHz	20 dB

Power Requirements

+3.3 V	+5 V	+12V	-12V
0.25 A (typical)	1.15 A (typical)	0.03 A	0

Width and Dimensions

Two, four or eight slot 3U 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	0.9 Kg
BRIC4	0.9 Kg	1.5 Kg
BRIC8	1.6 Kg	2.8 Kg
BRIC daughter card	0.1 Kg	

Connectors

PXI bus via 32-bit P1/J1 backplane connector.
Signals via front panel 68-pin male micro-D connectors (3 per 2-slot module, 6 per 4-slot module or 12 per 8-slot module), for pin outs please refer to the operating manual.

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

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.

Product Order Codes

BRIC2 - 2-Slot Solid State 1-Pole Matrix 0.25 A/40 V	40-563B-221-(config)
BRIC4 - 4-Slot Solid State 1-Pole Matrix 0.25 A/40 V	40-563B-021-(config)
BRIC8 - 8-Slot Solid State 1-Pole Matrix 0.25 A/40 V	40-563B-121-(config)

When ordering 40-563B modules the matrix configuration **must** be specified, this includes the prefix code together with the configuration code, see the configuration table below for specific details. All versions are 1 pole with 8-way Y-bus.

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 relay types
- Mixture of 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.

x8 Configuration Options			
	BRIC2 40-563B-221	BRIC4 40-563B-021	BRIC8 40-563B-121
64x8 Matrix	-64x8	-64x8	-64x8
96x8 Matrix	-96x8	-96x8	-96x8
128x8 Matrix		-128x8	-128x8
160x8 Matrix		-160x8	-160x8
192x8 Matrix		-192x8	-192x8
224x8 Matrix			-224x8
256x8 Matrix			-256x8
288x8 Matrix			-288x8
320x8 Matrix			-320x8
352x8 Matrix			-352x8
384x8 Matrix			-384x8

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	Termination
All Versions	93-006-001	93-006-222	93-015-103

Mating Connectors & Cabling

For connection accessories for the 40-563B series BRIC modules please refer to the 90-015D 68-pin micro-D Connector Accessories data sheet 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 PXI Switching & Simulation Modules:

- Choose from 1000+ Pickering PXI 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. 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

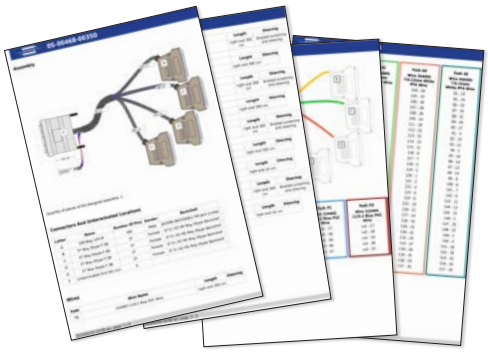
RF Cable Assemblies

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

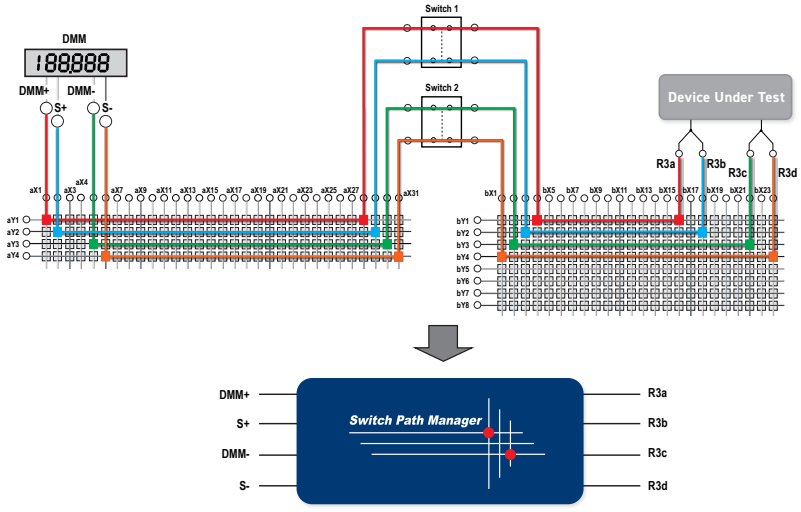
Drivers for popular Linux distributions are available, other environments are also supported, please contact Pickering with specific enquiries. We provide Soft Front Panels (SFPs) for our products for familiarity and manual control, as well as comprehensive documentation and example programs to help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