

- Integrated PXI 2Amp Matrix Module With Built In High Performance Screened Analog Bus
- Maximum Current 2A Hot or Cold Switching
- 2-Pole Switching up to 150VDC/100VAC and up to 60W Max Power
- BRIC4 - High Density With Up To 768 Relays Per 4-Slot Module
- BRIC8 - High Density With Up To 1536 Relays Per 8-Slot Module
- Load Just The Number Of Daughter Switch Cards You Need For Your Application
- Custom Versions Available
- 3ms Operate/Release Time
- Automatic Analog Bus Isolation Switching Gives >25MHz Bandwidth
- VISA, IVI & Kernel Drivers Supplied for Windows
- Supported by PXI or LXI Chassis
- 3 Year Warranty



**PXI BRIC™ - WORLD'S FIRST
INTEGRATED PXI MATRIX**
“Pushing PXI to Amazing Densities”

BRIC™ 2nd Generation PXI 2Amp Switch Matrix

The 40-565 PXI Matrix BRIC is a range of high density matrix modules capable of switching up to 2 Amps at 150VDC/100VAC. They are available in 4 or 8-slot sizes to suit most high performance PXI matrix requirements, constructed using quality electro-mechanical relays for high switching confidence.

Typical applications include signal routing for functional ATE systems. With this high level of switching density, 40-565 matrix modules allow a complete functional ATE system to be housed in a single 3U PXI chassis. BRIC Modules allow the use of much lower cost 8 or 14 slot PXI chassis.

- **BRIC4** is a 4 slot PXI Module, this can hold up to 4 matrix daughtercards, 768 crosspoints.
- **BRIC8** is an 8 slot PXI Module, which can hold up to 8 matrix daughtercards, 1536 crosspoints.

PXI 2Amp Matrix BRIC Range Description	
40-565 (2 Pole Matrix)	
BRIC4	Up to 96 x 8
BRIC8	Up to 192 x 8
Further BRIC Modules are in development or planned for both 3U and 6U platforms, including custom versions.	

High Reliability and Easy of Use

The 40-565 PXI BRIC is designed to minimise 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. Pickering can construct custom cable assemblies for all of our PXI modules, please contact sales office for further assistance.

The 2 Amp Matrix BRIC is a higher power/voltage version of Pickering's established range of PXI Matrix BRIC modules. It features higher voltage, current and power handling than the ultra high density reed relay based BRICs. However, 2 Amp BRICs are not suited to switching low level signals - specifically signals <100µV - here ruthenium reed relays are a better choice and have a very long lifetime of up to 1000 million operations. For superior low level switching please refer to our 40-560/561/562 range.

40-565 BRIC Key Advantages

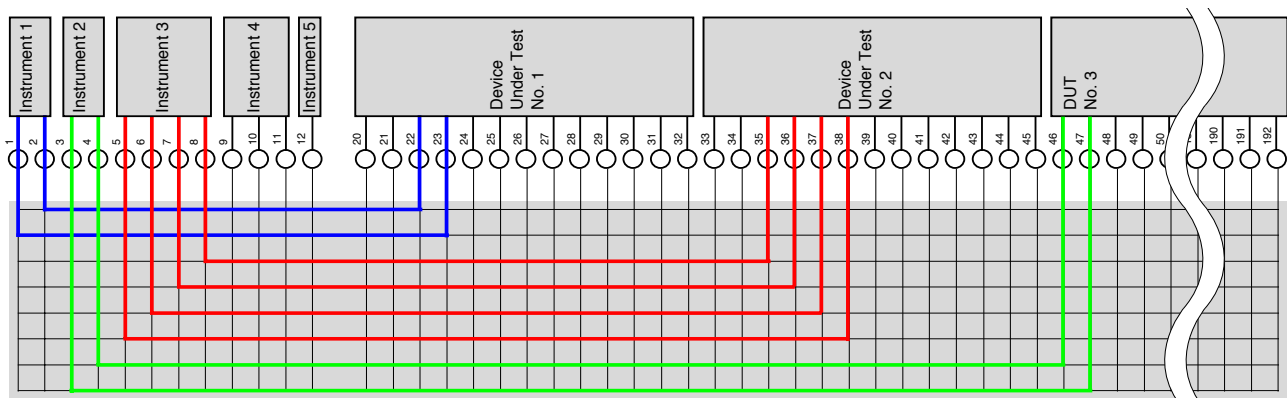
- Complete PXI Switching Solution in one PXI Module.
- Simplified cabling, easy to connect to the DUT thus minimizing costs.
- Internal Shielded Analog Bus giving maximum signal integrity with easy expansion at minimal cost with maximum bandwidth and isolation.
- Program as one whole matrix, so very easy to achieve fast operate time.
- Targeted at high performance matrix switching with minimized cost.
- Build just the matrix configuration you need. Modular architecture allows users to buy just as much matrix capacity as they require, expansion cards can be added later.
- BRICs allow use of much lower cost 8 or 14 slot PXI chassis (such as 40-908 or 40-914).
- Simpler and faster programming with Direct I/O, VISA and IVI Drivers + LabView Soft Front Panels. Fully compatible with NI Switch Executive.
- Custom versions built to order.

Performance & Cost Comparison With Competing Platforms for a Typical 192 x 8 Matrix (2 pole switching)

	Pickering PXI 2Amp BRIC	VXI Industry Density	SCXI Highest Density
Matrix Model Used	40-565-102-192x8	6 units (32 x 8 Matrix)	6 x units (32 x 8 Matrix)
Overall Matrix Size	192 x 8 (1536 crosspoints)	192 x 8 (1536 crosspoints)	192 x 8 (1536 crosspoints)
Analog Bus	Yes	No	Yes
No of Slots	8 Slot 3U PXI Module	6 Slots of 6U VXI	6 Slots of 4U SCXI
Use Low Cost Chassis?	Yes (8 or 14 slot)	No	No
Operate Time	3ms	2ms	4ms
Max Volts	150VDC/100VAC	200VDC	150VDC/150VAC
Max Current/Power	2A, 60W	1A, 30W	1A, 30W
Bandwidth	25MHz	<2MHz	<5MHz
Relay Lifetime	10 ⁸	10 ⁷	5x10 ⁷
Relay Type	Electro-mechanical Relay	Electro-mechanical Relay	Electro-mechanical Relay
Relative Cost †	<40%	100%	75%

† Relative Costs are for switching cards only, so additional chassis, cabling, etc have not been included.

Example Configurations of the 40-565 2 Amp BRIC Matrix



**Schematic diagram showing a 192 x 8 BRIC Matrix being used to parallel test multiple DUTs.
The BRIC Matrix allows tremendous test system flexibility.**

Relay Type

The 40-565 BRIC modules are fitted with electro-mechanical relays.

General Switching Specification

Switch Type:	Electro-mechanical
Contact Type:	Palladium-Ruthenium, Gold Covered Bifurcated
Max Switch Voltage:	150VDC/100VAC*
Max Power:	62.5VA, 60W
Max Switch Current:	2A
Max Continuous Carry Current:	2A
Max Pulsed Carry Current Example (for a single switch path):	6A for 100ms (up to 10% duty cycle)
Initial Path Resistance	
On (Single Module):	<1Ω (X-Y connection)
Off (Single Module):	>10 ⁹ Ω
Minimum Voltage:	100μV
Differential Thermal Offset:	<10μV
Operate Times	
Crosspoint Relay:	<3ms
Crosspoint & Isolation Relay:	<6ms
Expected Life (operations)	
Very low power signal load:	>1x10 ⁸
Low power load (2W):	>1.5x10 ⁷ (0.1A 20VDC)
Medium power load (30W):	>5x10 ⁶ (1A 30VDC)
Full power load (60W):	>1x10 ⁵ (2A 30VDC)

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

Typical Bandwidth and Crosstalk

Typical Bandwidth For Fully Loaded 192x8 Matrix (40-565-102-192x8)	25MHz
Crosstalk for 40-565-102-192x8 @1MHz	-55dB

Maximum Crosspoint Count

The 40-565 has a suggested maximum number of simultaneously operated crosspoints of 50 per BRIC4 or 100 per BRIC8, please contact factory if more information is required.

Power Requirements

+3.3V	+5V	+12V	-12V
0	4A (typical 1A)	0	0

Width and Dimensions

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
BRIC4	0.9Kg	2.1Kg
BRIC8	1.6Kg	4.0Kg
BRIC daughter card	0.2Kg	

Connectors

PXI bus via 32-bit P1/J1 backplane connector.

Signals via multiple front panel 78-pin male D-type connectors (Up to 4 per 4 slot module or up to 8 per 8 slot module), for pin outs please refer to the operating manual.

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

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 33MHz 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.

40-565 BRIC Matrix Product Order Codes

BRIC4 - 4-Slot 2-Pole Matrix	40-565-002-(config)
BRIC8 - 8-Slot 2-Pole Matrix	40-565-102-(config)

When ordering 40-565 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.

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

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 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		
	BRIC4 40-565-002	BRIC8 40-565-102
24x8 Matrix	-24x8	-24x8
48x8 Matrix	-48x8	-48x8
72x8 Matrix	-72x8	-72x8
96x8 Matrix	-96x8	-96x8
120x8 Matrix		-120x8
144x8 Matrix		-144x8
168x8 Matrix		-168x8
192x8 Matrix		-192x8

Special Versions

BRIC modules can be built in special versions, for example where an exact matrix size is required then partly populated daughtercards may be ordered.

Upgrading With Daughtercards

BRIC modules can be upgraded to a larger matrix size using daughtercards, please consult your local sales office for further information.

Support Products

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
40-565	91-100-209

For further assistance, please contact your local Pickering sales office.

Mating Connectors & Cabling

For connection accessories for the 40-565 module please refer to the [90-006D](#) 78-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.

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.



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 sister company, Pickering Electronics. 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 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

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, as well as complete product catalogs and product reference maps to assist when looking for the switching, simulation and cable and connector 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