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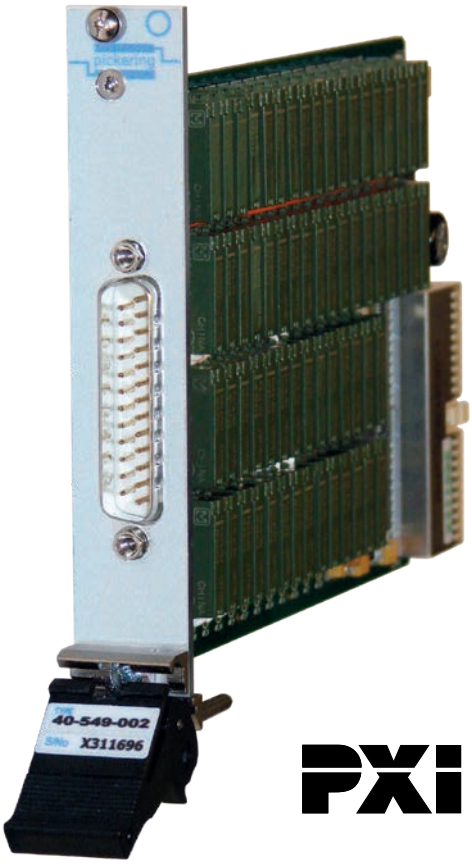
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40-549 User Manual

PXI 5 Amp Power EMR Matrix Module



Issue 2.3 November 2020

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ISO 9001
Reg No. FM38792

TECHNICAL SUPPORT

For Technical Support please contact Pickering Interfaces either by phone, the website or via e-mail.

WARRANTY

All products manufactured by Pickering Interfaces are warranted against defective materials and workmanship for a period of three years, excluding programmable power supplies, from the date of delivery to the original purchaser. Any product found to be defective within this period will, at the discretion of Pickering Interfaces be repaired or replaced.

Products serviced and repaired outside of the warranty period are warranted for ninety days.

Extended warranty and service are available. Please contact Pickering Interfaces by phone, the website or via e-mail.

ENVIRONMENTAL POLICY

Pickering Interfaces operates under an environmental management system similar to ISO 14001.

Pickering Interfaces strives to fulfil all relevant environmental laws and regulations and reduce wastes and releases to the environment. Pickering Interfaces aims to design and operate products in a way that protects the environment and the health and safety of its employees, customers and the public. Pickering Interfaces endeavours to develop and manufacture products that can be produced, distributed, used and recycled, or disposed of, in a safe and environmentally friendly manner.

Worldwide Technical Support and Product Information

pickeringtest.com

Pickering Interfaces Headquarters

Stephenson Road Clacton-on-Sea CO15 4NL United Kingdom
Tel: +44 (0)1255-687900
E-Mail: sales@pickeringtest.com

USA
Tel: (West) +1 541 471 0700
Tel: (East) +1 781 897 1710
E-mail: ussales@pickeringtest.com

France
Tel +33 9 72 58 77 00
E-mail frsales@pickeringtest.com

Germany
Tel: +49 89 125 953 160
E-mail: desales@pickeringtest.com

Sweden
Tel: +46 340-69 06 69
E-mail: ndsales@pickeringtest.com

Czech Republic
Tel: +420 558 987 613
E-mail: desales@pickeringtest.com

China
Tel: +86 4008 799 765
E-mail: chinasales@pickeringtest.com

PRODUCT SAFETY

SAFETY SYMBOLS

The following safety symbols may be used on the product and throughout the product documentation.

MEANING / DESCRIPTION	SYMBOL
PROTECTIVE EARTH (GROUND) To identify any terminal which is intended for connection to an external conductor for protection against electric shock in case of a fault, or the terminal of a protective earth (ground) electrode.	
DANGEROUS VOLTAGE To indicate hazards arising from dangerous voltages.	
WARNING / CAUTION An appropriate safety instruction should be followed or caution to a potential hazard exists. Refer to the relevant instructions detailed within the product manual.	
HEAVY If this product is heavy reference should be made to the safety instructions for provisions of lifting and moving.	
STATIC SENSITIVE To indicate that static sensitive devices are present and handling precautions should be followed.	

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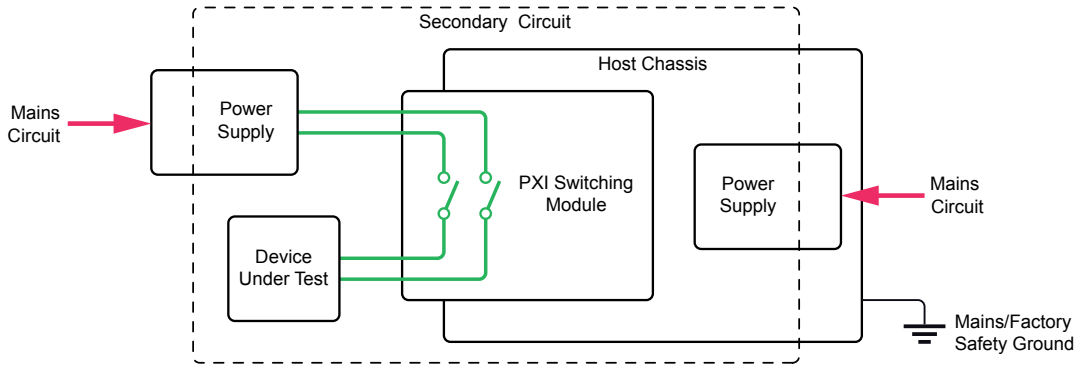
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WARNINGS AND CAUTIONS

WARNING - HAZARDOUS ENVIRONMENTS	SYMBOL
This product is not specifically designed for use in hazardous environments, for example in explosive atmospheres. If the product is to be used in hazardous environments we recommend that the user ensures suitable protective measures are taken.	

WARNING - DANGER OF ELECTRIC SHOCK	SYMBOL
This module may contain hazardous voltages. Before removing the module from the rack remove all supplies and disconnect user I/O signals. Unused slots in the host chassis are populated with blanking plates to prevent access to user I/O signals that may be present. Blanking panels are available to order from Pickering in a variety of slot widths. If the product is not used in this manner for example by using an extender card then additional care must be taken to avoid contact with exposed signals. Not to be used in safety critical circuits, refer to the Pickering Interfaces' terms & conditions of sale. This module must not be used for the switching of Mains Circuits. For the switching of voltages up to the module's full specification, Secondary Circuit power supplies and the Device Under Test must be fully isolated from the Mains Circuit and the safety earth. The host chassis must be correctly installed and be connected to mains or factory safety ground, please refer to your chassis installation manual.  **Diagram Showing Separation Between The Mains Circuit and Secondary Circuit / DUT** For the purposes of this document, a Mains Circuit is an installation classified as Overvoltage Category II up to 300V. Separation between the Secondary Circuit and Mains Circuit is achieved by a transformer in which the primary windings are separated from the secondary windings by reinforced insulation, double insulation, or a screen connected to the protective conductor terminal.	

CAUTION - HANDLING OF ELECTROSTATIC-SENSITIVE DEVICES	SYMBOL
Certain semiconductor devices used in this equipment are liable to damage due to static voltage. Observe the following precautions when handling these devices in their unterminated state, or sub-assemblies containing these devices: 1. Persons removing sub-assemblies from equipment using these devices must be earthed by a wrist strap and a resistor at the point provided on the equipment. 2. Soldering irons used during the repair operations must be low voltage types with earthed tips and isolated from the mains voltage by a double insulated transformer. 3. Outer clothing worn must be unable to generate static charges. 4. Printed Circuit Boards (PCBs) fitted with these devices must be stored and transported in anti-static bags.	

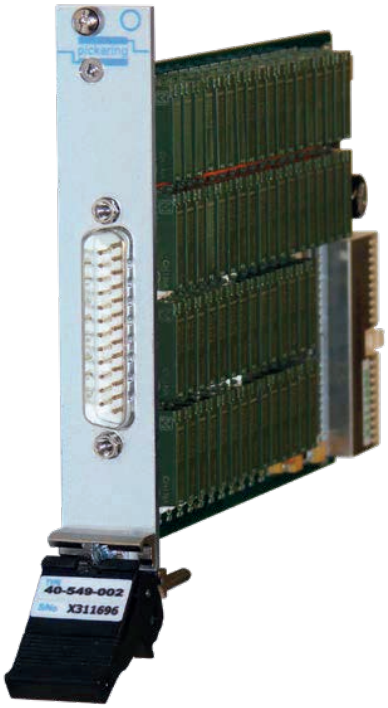
CAUTION - PRODUCT DOCUMENTATION	SYMBOL
Suitably qualified & trained users should ensure that the accompanying documentation is fully read and understood before attempting to install or operate the product.	

SAFETY INSTRUCTIONS

SAFETY INSTRUCTIONS
All cleaning and servicing requires the equipment to be isolated and disconnected from the power source and user I/O signals (refer to the Maintenance Section). • Appropriate manual handling procedures should be followed as dictated by the weight of the individual module or the combined weight of the modules & chassis. • Should a fault occur with the module or chassis, immediately isolate and disconnect the incoming power to the chassis and the user I/O signals. • Ensure the equipment is installed, operated and maintained by trained and authorised personnel. • For suitably equipped products in the event of an emergency press the red “emergency stop” button situated on the front of the unit.

SECTION 1 - TECHNICAL SPECIFICATION

- High Density, High Current Switching
- 1-Pole Power Matrix Available in Single 16x4, Single 8x8, Dual 8x4 and Single 8x4 Formats
- 5A Current Rating With 150W/1250VA Maximum Power
- Hot Switch to 110VDC/250VAC, Cold Switch to 400VDC/250VAC
- High Quality Electro-mechanical Relays
- VISA, IVI & Kernel Drivers Supplied for Windows
- Supported by PXI or LXI Chassis
- 3 Year Warranty



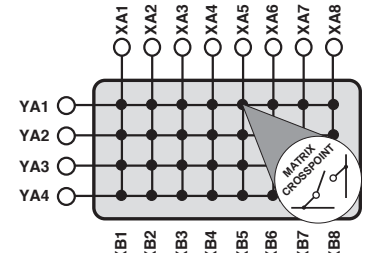
The 40-549 is a single pole power matrix module, suitable for switching inductive/capacitive loads up to 5A with 110VDC/250VAC hot switching and 400VDC/250VAC cold switching. It is available in the following configurations:

- 40-549-001 Single 16x4 1-Pole Matrix
- 40-549-002 Single 8x8 1-Pole Matrix
- 40-549-003 Dual 8x4 1-Pole Matrix
- 40-549-004 Single 8x4 1-Pole Matrix

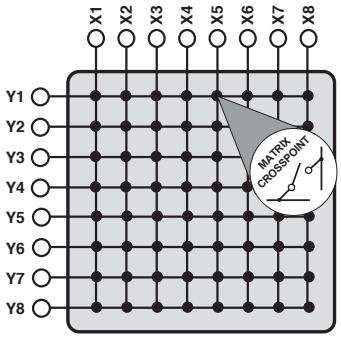
Connections are made via a front panel 25-pin D-type plug which is supported by our comprehensive range of cables and connectors.

Power Matrix Modules are intended for switching heavy AC or DC loads or for slave switching large external relays, contactors or solenoids.

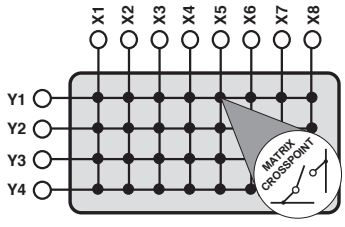
The module is suitable for applications requiring switching of either mains voltage or DC current.



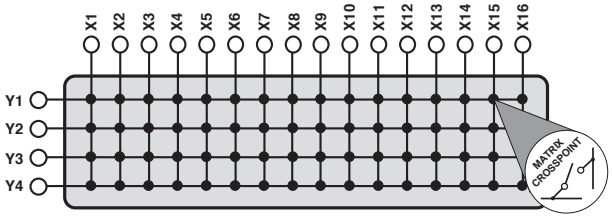
40-549-003 Dual 8x4 Power Matrix



40-549-002 8x8 Power Matrix



40-549-004 8x4 Power Matrix



40-549-001 16x4 Power Matrix

Relay Type

The 40-549 is fitted with electro-mechanical power relays, gold clad silver alloy.

Switching Specification

Contact Type:	Gold clad silver alloy
Cold Switching Capacity Maximum Current: Maximum Voltage: Typical Pulse Capability:	 5A 400VDC/250VAC* Cold Switch 10A for 100ms under low duty cycle conditions (please contact sales office for further advice)
Hot Switching Capacity Maximum Current: Maximum Voltage: Maximum Power:† Minimum Switching Capacity:	 5A 110VDC/250VAC* 150W/1250VA 10mA, 5VDC ‡
Initial On Path Resistance: Off Path Resistance:	<150mΩ (60mΩ typical) $>10^9$Ω
Bandwidth (3dB insertion loss into 50Ω typically better than): Crosstalk (channel to channel typically better than): Isolation (open channel typically better than): 	20MHz -70dB @ 100kHz -55dB @ 1MHz -24dB @ 10MHz 75dB @ 100kHz 60dB @ 1MHz 20dB @ 10MHz
Operate Time:	10ms typical
Expected Life (operations) - resistive load Mechanical Life: At Max. Switch Capacity:	 $>2x10^7$ $>5x10^4$ (5A 250VAC, 5A 30VDC) $>1x10^5$ (3A 250VAC, 3A 30VDC)

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

† For variation of maximum hot switching capacity of voltage with current refer to plot.

‡ Hot switching at/beyond the levels specified is recommended for optimal contact resistance stability. These values can change due to factors such as switching frequency, environmental conditions & desired reliability level.

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.

Power Requirements

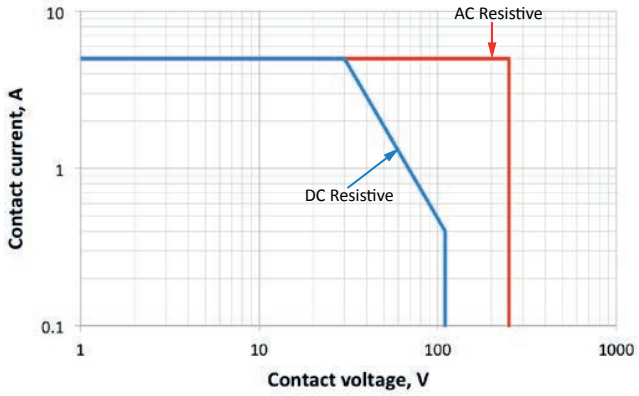
+3.3V	+5V	+12V	-12V
0	1.5A	30mA	0

Mechanical Characteristics

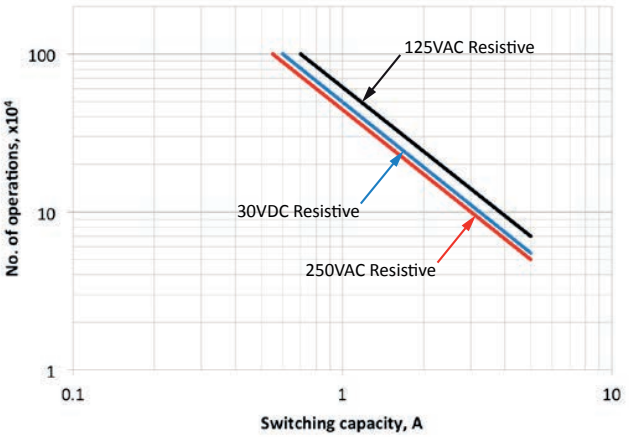
Single slot 3U PXI (CompactPCI card).
3D models for all versions in a variety of popular file formats are available on request.

Connectors

PXI bus via 32-bit P1/J1 backplane connector.
Signals via front panel 25-pin male-D-type connector, for pin outs please refer to the operating manual.



40-549 Current/Voltage Plot



40-549 Current/Operating Life Plot

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

Product Order Codes

5A Power EMR 1-Pole Matrix, Single 16x4	40-549-001
5A Power EMR 1-Pole Matrix, Single 8x8	40-549-002
5A Power EMR 1-Pole Matrix, Dual 8x4	40-549-003
5A Power EMR 1-Pole Matrix, Single 8x4	40-549-004

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.

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
40-549-001	91-100-020
40-549-002	91-100-020
40-549-003	91-100-020
40-549-004	91-100-020

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

Mating Connectors & Cabling

For connection accessories for the 40-549 modules please refer to the 90-008D 25-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

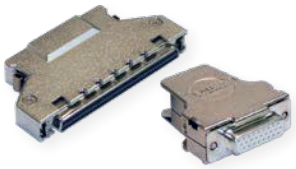
Pickering LXI or LXI/USB Modular Chassis—only accept our 1000+ PXI Switching & Simulation Modules:

- 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

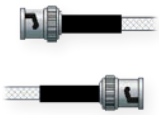
We provide a full range of supporting cable and connector solutions for all our switching products—20 connector families with 1200+ products. We offer everything from simple mating connectors to complex cables assemblies and terminal blocks. All assemblies are manufactured by Pickering and are guaranteed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



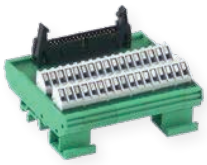
Connectors & Backshells



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.



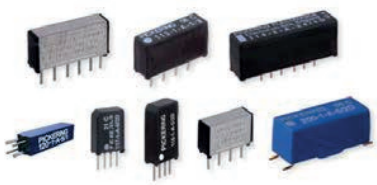
Mass Interconnect

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 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

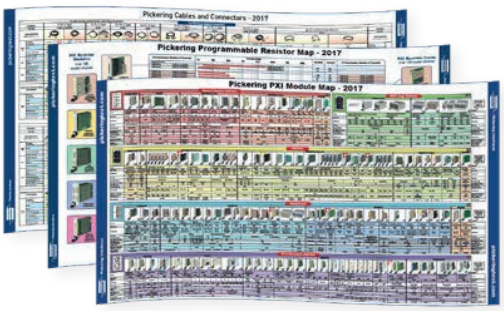
Three Year Warranty & Guaranteed Long-Term Support

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

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SECTION 2 - TECHNICAL DESCRIPTION

FUNCTIONAL DESCRIPTION

A functional block diagram is provided in Figure 2.1. The Module is powered by the +5V and +3.3V supplies from the PXI backplane via Compact PCI connector J1. The interface to the user's equipment is via the front panel mounted 25-pin male D-type connector, J2.

The module comprises a single PCB populated with 1-pole electro-mechanical relays configured as a single 16x4 (40-549-001), single 8x8 (40-549-002), dual 8x4 (40-549-003) or a single 8x4 (40-549-004) matrix. The relays are energised via control signals from relay drivers U17 to U20. Each relay driver is loaded with serial data from PCI bridge U1 to operate the required matrix crosspoint via digital isolators U21 and U22. Module configuration is determined by data stored in Serial EPROM U3. PCI Bridge U1 is configured by Flash EPROM U2.

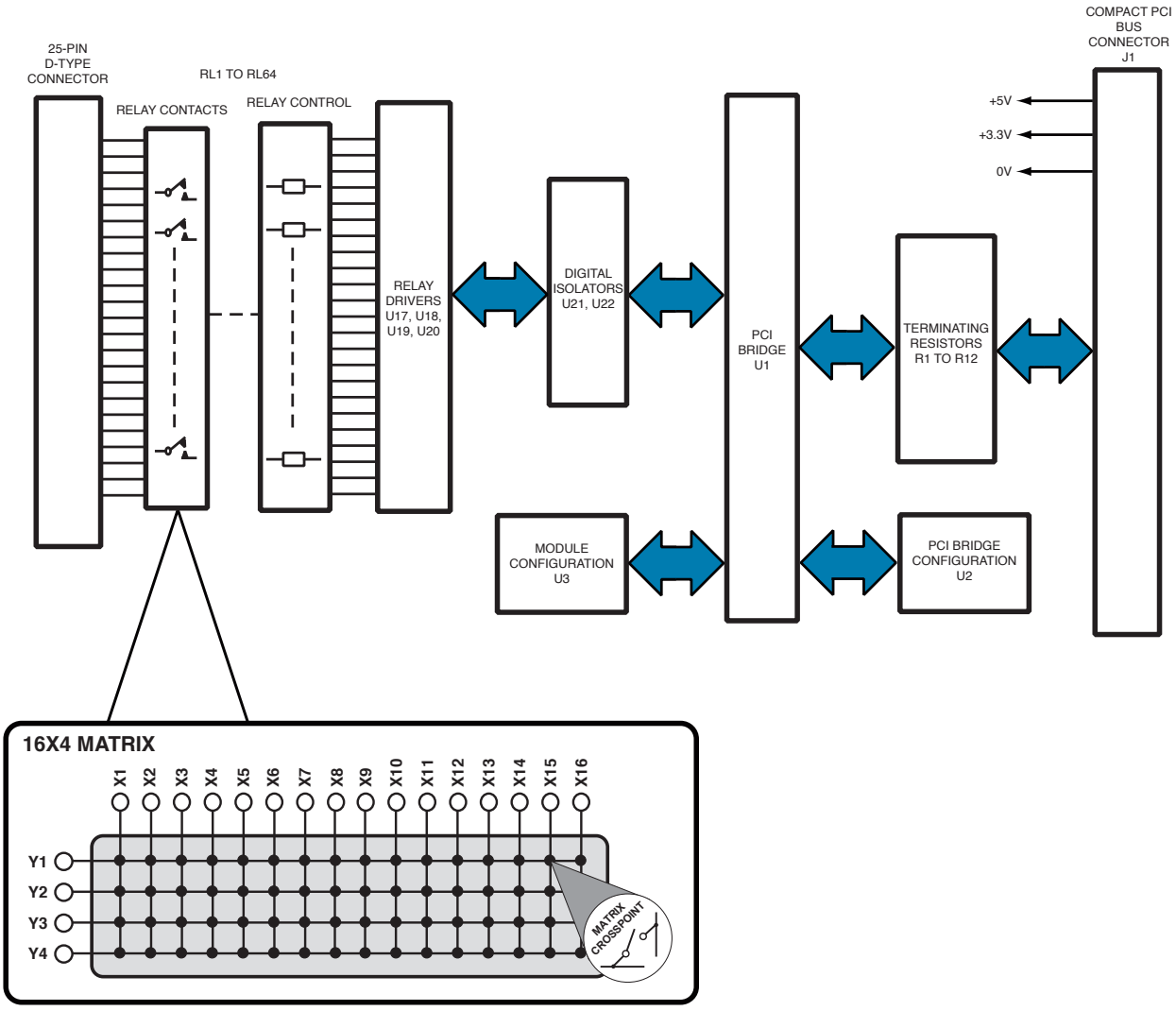


Figure 2.1 - 5 Amp Single 16x4 Power Matrix Module 40-549-001: Functional Block Diagram (the -002, -003 and -004 versions are functionally the same but are configured as single 8x8, dual 8x4 and single 8x4 matrices respectively)

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SECTION 3 - INSTALLATION

Refer to the Warnings and Cautions at the front of this manual

Modular products require installation in a suitable PXI/LXI chassis. The module is designed for indoor use only.

PREOPERATION CHECKS (UNPACKING)

1. Check the module for transport damage and report any damage immediately to Pickering Interfaces. Do not attempt to install the product if any damage is evident.
2. Position the chassis relative to any other equipment the module(s) will connect with. Ensure the chassis is not connected to the electrical supply.
3. Ensure that the designated area for the chassis containing the module is of flat and solid construction to withstand and support the combined weight of the module(s) and chassis.

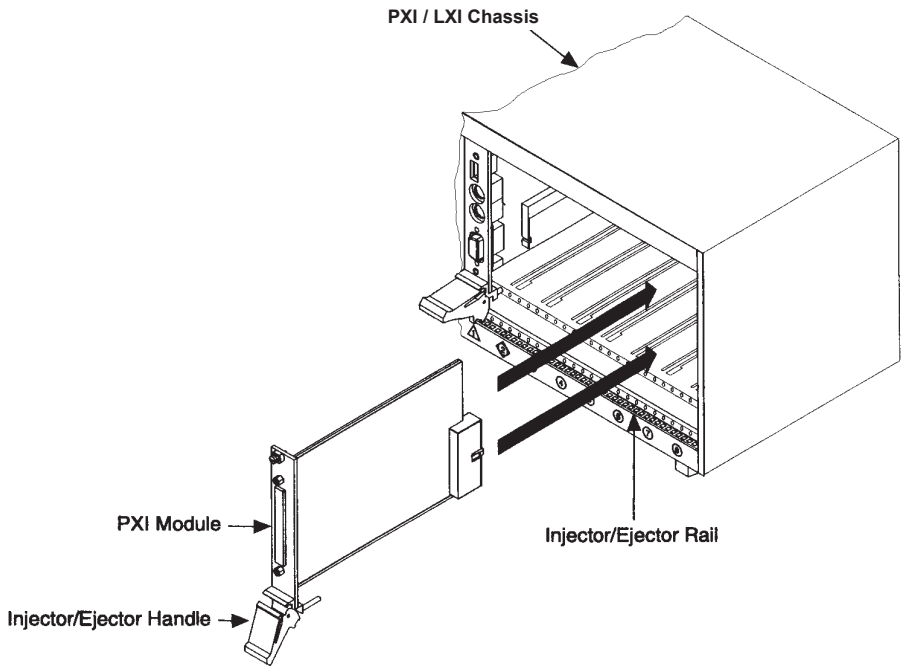


Figure 3.1 - Installing the Module into a PXI/cPCI/LXI Chassis

HARDWARE INSTALLATION
ELECTRICAL CONNECTION (CHASSIS)

1. The chassis must be electrically installed in accordance with local regional electrical codes by a qualified engineer.
2. The chassis must be grounded.

Electrostatic discharge can damage the components on the module. To avoid such damage in handling the board refer to page VII.

Ensure that there is adequate ventilation.

The module should be installed in accordance with the following procedure:

1. Ensure that the system is turned OFF but still connected to mains so that it remains grounded.
2. Choose an appropriate slot in the rack.
3. Remove the blanking plate for the chosen slot.
4. Ensure that the injector/ejector handle is in its downward position. Align the module with the card guides on the top and bottom of the slot.

   Do not raise the injector/ejector handle whilst inserting the module as the module will not insert properly.
5. Hold the handle whilst slowly sliding the module into the card guides until the handle catches on the injector/ejector rail (refer to Figure 3.1).
6. Raise the injector/ejector handle until the module firmly seats into the backplane. The front panel of the module should be flush with the front panel of the chassis.
7. Secure the front panel of the module using both screws to the chassis front panel mounting rails.
8. In a system employing a remote control interface to connect an external controller to a PXI chassis or to link multiple chassis, power-up the system as follows:
   a. For a system comprising an external controller and one chassis, power up the chassis before powering up the external controller.
   b. For a system comprising more than one chassis, turn ON the last chassis in the system followed by the penultimate, etc, and finally turn ON the external controller or chassis containing the system controller.
9. For Pickering Interfaces modular LXI installation there is no requirement to use any particular power up sequence.

SOFTWARE INSTALLATION

First install the appropriate Pickering PXI switch card drivers by running the installer program Setup.exe (provided in a compressed zip file), either from the CD-ROM supplied, or by downloading the latest version from our website **pickeringtest.com** - the recommended method. Setup is accompanied by a ReadMe file containing additional installation information. A single installation covers all cards in the System 40, System 45 and System 50 ranges.

When installation completes, the installed drivers' ReadMe file is offered for display. It can also be displayed later using a shortcut on the Programs>>Pickering menu.

If you are not a LabVIEW user you should choose the "full" version, and once that has been installed run the LabVIEW Runtime Engine installer via the shortcut on the Programs>>Pickering menu. In the absence of LabVIEW the Runtime Engine is required to support the Pickering Test Panels application.

TESTING OPERATION

After installation of the hardware and Pickering PXI Driver software package start the General Soft Front Panel (GSFP) using the desktop icon or via the Start menu (***Start Menu-> Pickering Interfaces Ltd -> General Soft Front Panel***).



Figure 3.2 - General Soft Front Panel Icon

A selector panel will appear, listing all installed Pickering PCI, PXI or LXI switch cards and resistor cards. Click on the card you wish to control, and a graphical control panel is presented allowing operation of the card. Panels can be opened simultaneously for all the installed cards.

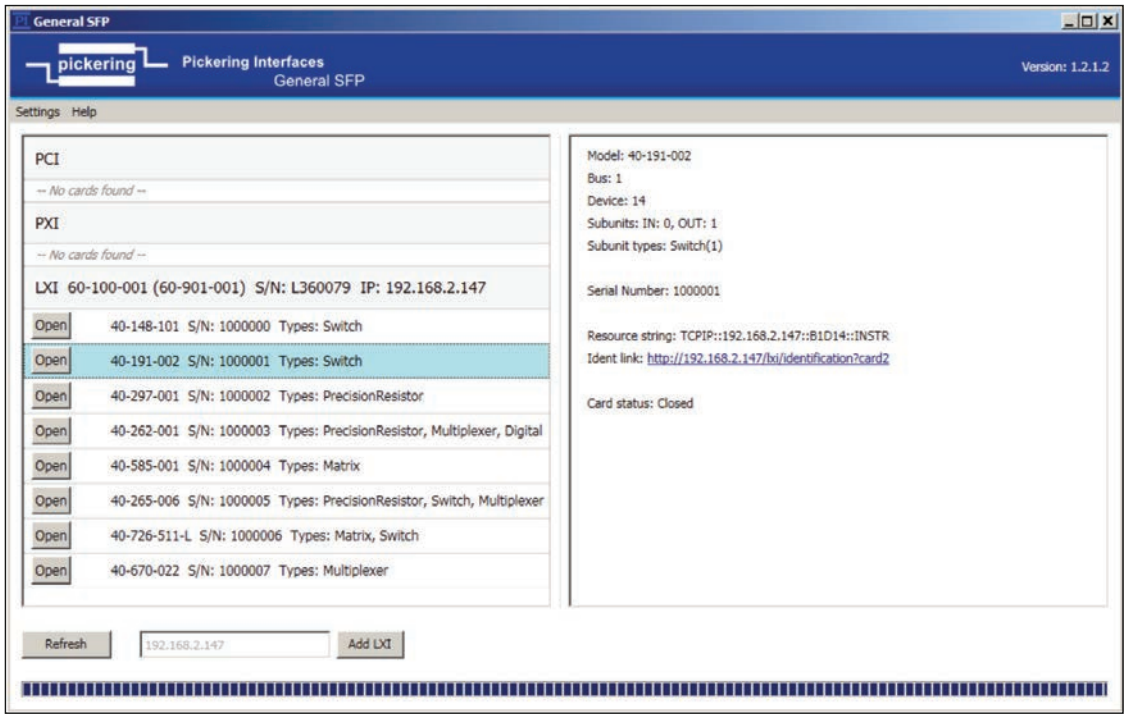


Figure 3.3 - General Soft Front Panel Selector

More details how to use the GSFP can be found in the manual, via menu ***Help\Manual***

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SECTION 4 - PROGRAMMING

PROGRAMMING OPTIONS FOR PICKERING INTERFACES PXI MODULES

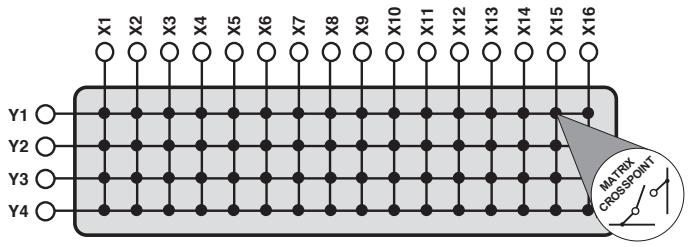
For information on the installation and use of drivers and the programming of Pickering's products in various software environments, please refer to the Software User Manual.

This is available as a download from:
https://www.pickeringtest.com/support/software-drivers-and-downloads

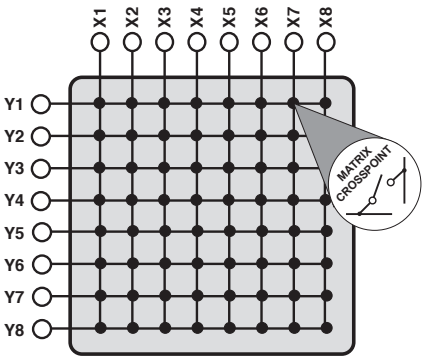
Also, it can be accessed from the DVD supplied with the product:
<DVD_DRIVE>\downloads\Documentation\Software-Manual.pdf

PROGRAMMING THE POWER MATRIX

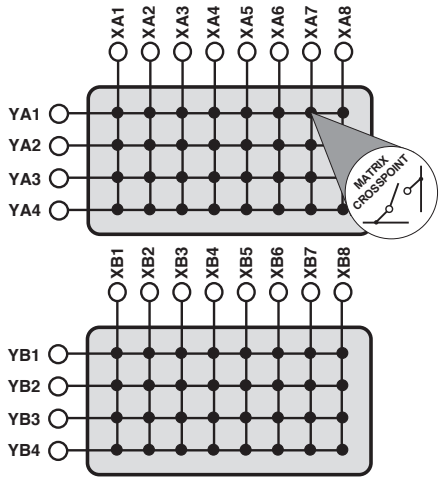
The 40-549-001 is a single pole switching matrix with 16 connections on the X-axis and 4 connections on the Y-axis. Connections are made by operating the relays at the crosspoints between X and Y lines allowing single X-Y connections, or X-X connections using a Y line as a path. The -002, -003 and -004 versions are controlled in the same way but have matrix sizes of single 8x8, dual 8x4 and single 8x4 respectively. The matrix architectures are shown in the diagrams below:



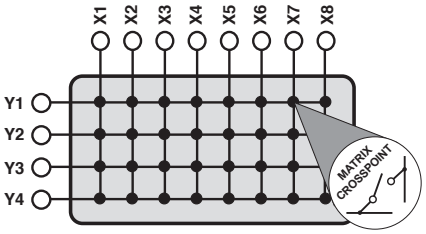
40-549-001 Single 16x4 Matrix



40-549-002 Single 8x8 Matrix



40-549-003 Dual 8x4 Matrix



40-549-004 Single 8x4 Matrix

Figure 4.1 - 40-549 Power Matrix Architecture

In the case of single matrices, the entire matrix is treated as a single programming sub-unit designated as Sub-Unit 1. The dual matrix is programmed as two sub-units; Sub-Unit 1 for matrix A and Sub-Unit 2 for matrix B. The following page gives some simple examples using the provided drivers: the IVI driver, the Direct I/O driver, and the IVI compliant driver.

USING THE IVI DRIVER, DIRECT I/O DRIVER OR VISA DRIVER

This section provides some code fragments which show how to control the Power Matrix using the IVI Driver, Direct I/O Driver or the VISA Driver.

Once the drivers are installed the manual “Sys40Prg.pdf” and driver help files which fully describes these functions can be found in the Pickering folder(s) or the Pickering entries on your Start Menu.

The card must be opened before use and closed after using the following function calls:

Direct I/O Driver - Open with `PIL_OpenCards` or `PIL_OpenSpecifiedCard` and close with `PIL_CloseCards` or `PIL_CloseSpecifiedCards` respectively.

VISA Driver - Open with `pipx40_init`, and close with, `pipx40_close`.

Setting a Matrix Crosspoint:

Using the IVI driver:

Note: the following example is for bank 1 of a dual matrix. Bank 1 is identified as A, bank 2 would be identified as B, and a single matrix would have no letter identifier.

```
pi40iv_Connect(vi, xA1, yA2); //set crosspoint x1, y2 to on
pi40iv_Disonnect(vi, xA1, yA2); //set crosspoint x1, y2 to off
```

Using the Pickering Direct I/O driver:

```
DWORD SubUnit = 1;    //select bank 1 (dual matrix) or whole matrix (single matrix)
PIL_ClearSub(CardNo, SubUnit);    //clear all crosspoints to off state
PIL_OpCrosspoint(CardNo, SubUnit, 2, 1, 1); //set crosspoint x1, y2 to on
PIL_OpCrosspoint(CardNo, SubUnit, 2, 1, 0); //set crosspoint x1, y2 to off
```

Using the VISA driver:

```
ViUInt32 SubUnit = 1; //select bank 1 (dual matrix) or whole matrix (single matrix)
pipx40_clearSub(vi, SubUnit); //clear all crosspoints off state
pipx40_setCrosspointState (vi, SubUnit, 2, 1, VI_ON); //set crosspoint x1, y2 on
pipx40_setCrosspointState (vi, SubUnit, 2, 1, VI_OFF); //set crosspoint x1, y2 off
```

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SECTION 5 - CONNECTOR INFORMATION

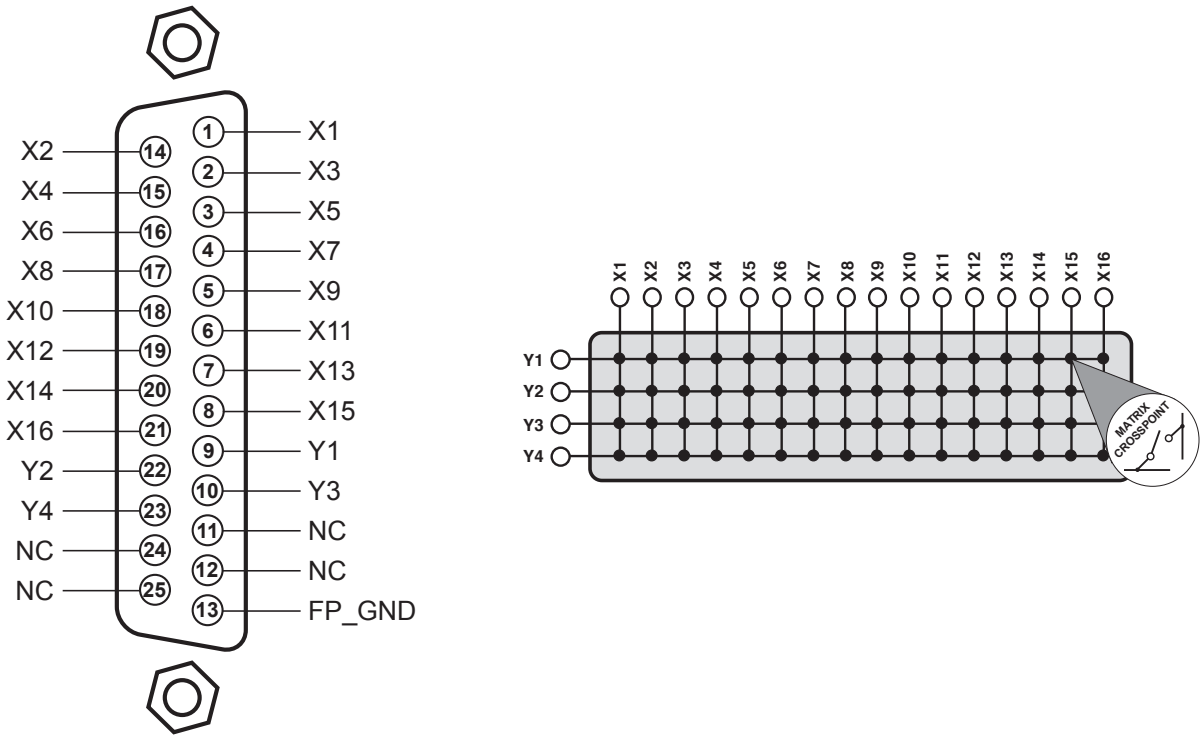


Figure 5.1 - Pinout: 5 Amp Single 16x4 Power Matrix 40-549-001: (25-pin Male D-type Connector Viewed From Front of Module)

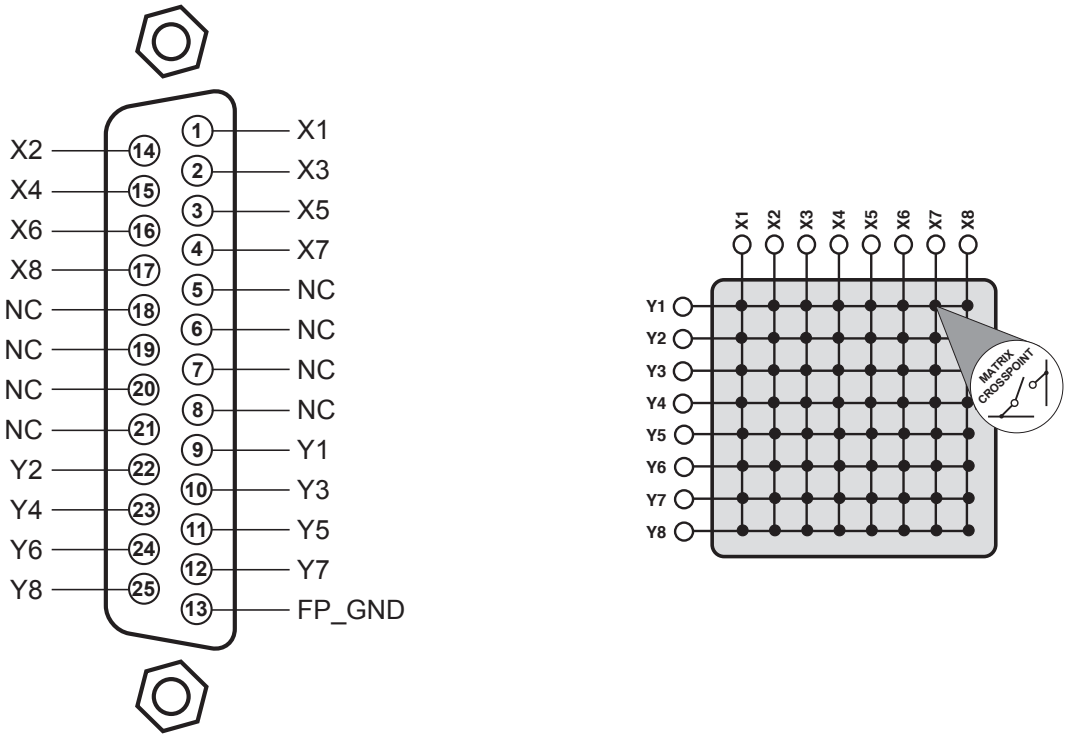


Figure 5.2 - Pinout: 5 Amp Single 8x8 Power Matrix 40-549-002: (25-pin Male D-type Connector Viewed From Front of Module)

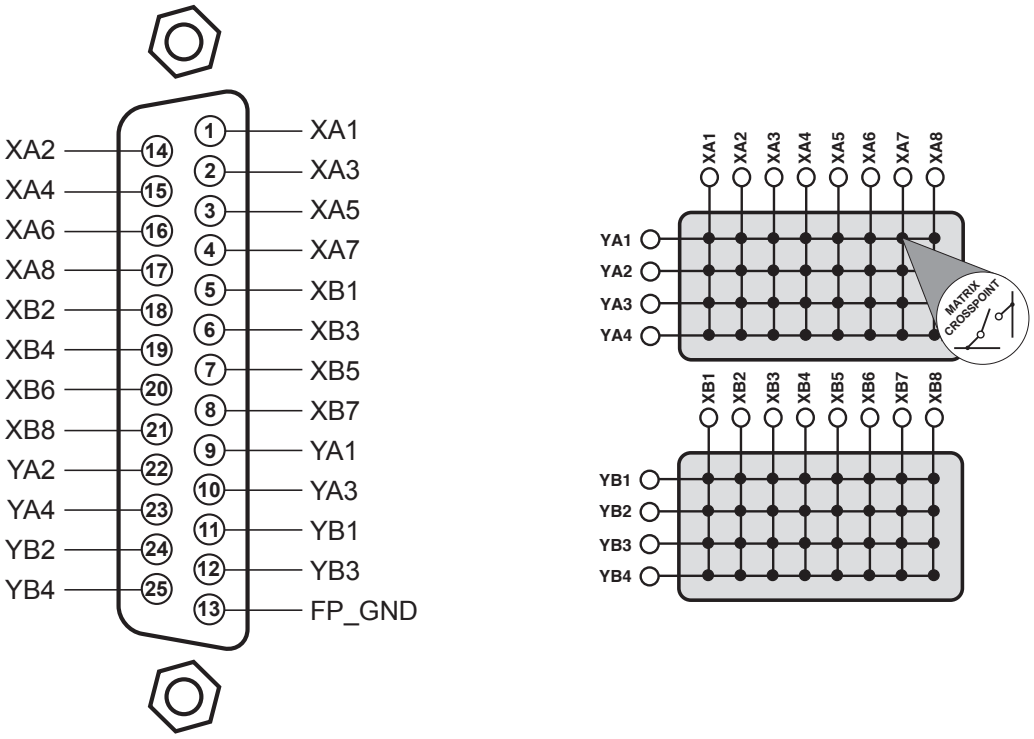


Figure 5.3 - Pinout: 5 Amp Dual 8x4 Power Matrix 40-549-003: (25-pin Male D-type Connector Viewed From Front of Module)

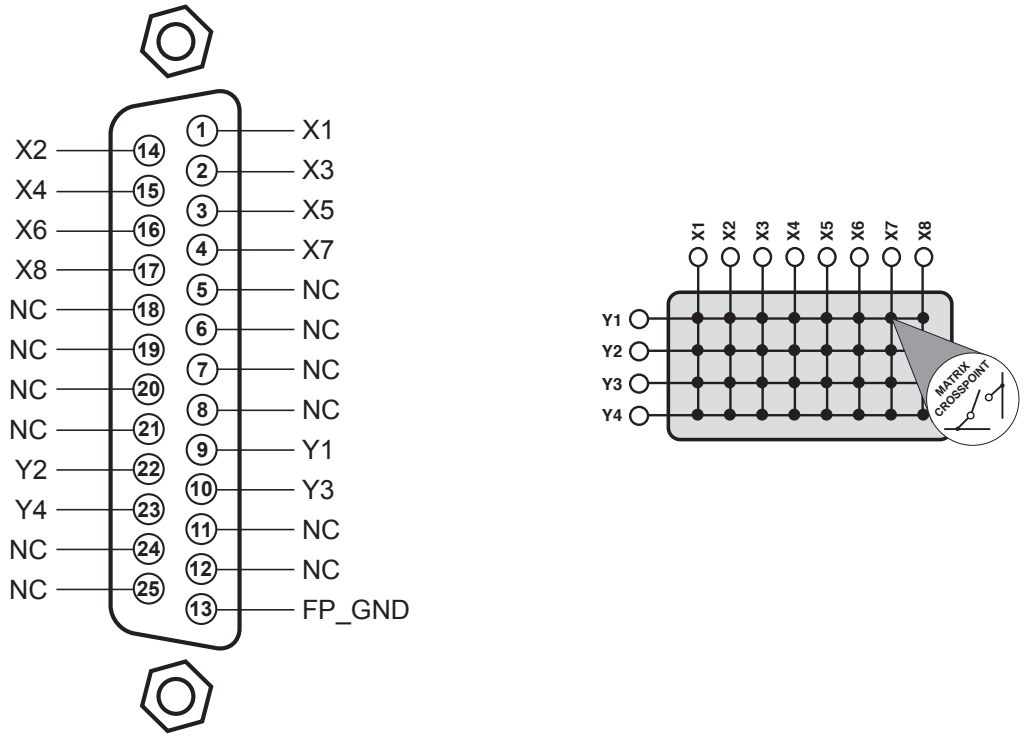


Figure 5.4 - Pinout: 5 Amp Single 8x4 Power Matrix 40-549-004: (25-pin Male D-type Connector Viewed From Front of Module)

SECTION 6 - TROUBLE SHOOTING

Refer to the Warnings and Cautions at the front of this manual 

INSTALLATION PROBLEMS

The Plug & Play functionality of Pickering switch cards generally ensures trouble-free installation.

If you do experience any installation problems you should first ensure that all cards are properly seated in their slots. Improperly mated cards may go undetected by the operating system, or may be detected as a card of an unknown type. They can also cause the computer to freeze at various stages in the boot sequence.

If your system employs a remote control interface you should check the integrity of all remote control interface links. When the system is powered up, and during Windows start-up, you should expect to see periodic activity on the remote control interface RX/TX (yellow) indicators, clearing to leave only the PWR/LNK (green) LEDs illuminated. The RX/TX indicators should show activity when you attempt to access a card.

DIAGNOSTIC UTILITY

The Pickering Diagnostic Utility (accessible through the Programs>>Pickering>>PXI Utilities menu) generates a diagnostic report of the system's PCI configuration, highlighting any potential configuration problems. Specific details of all installed Pickering switch cards are included. All the installed Pickering switch cards should be listed in the "Pilpxi information" section - if one or more cards is missing it may be possible to determine the reason by referring to the PCI configuration dump contained in the report, but interpretation of this information is far from straightforward, and the best course is to contact Pickering support: support@pickeringtest.com, if possible including a copy of the diagnostic report.

In the "VISA information" section, if VISA is not installed its absence will be reported. This does not affect operation using the Direct I/O driver, and is not a problem unless you wish to use VISA. VISA is a component of National Instruments LabWindows/CVI and LabVIEW, or is available as a standalone environment.

If VISA is present and is of a sufficiently recent version, the section "Pipx40 information" should present a listing similar to "Pilpxi information".

Please note that the Diagnostic Utility cannot access cards if they are currently opened by some other application, such as the Test Panels or Terminal Monitor.

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SECTION 7 - MAINTENANCE INFORMATION

Refer to the Warnings and Cautions at the front of this manual 

PERIODIC MAINTENANCE

This product and its corresponding chassis do not require any periodic maintenance.

GENERAL CLEANING

- Isolate the electrical power from the chassis and ensure that no user I/O signals are being applied.
- Wipe the product & chassis surfaces with a clean dry anti-static cloth only.

SOFTWARE UPDATE

For PXI modules operating in a PXI chassis, no module software updates are required. For the latest version of the driver please refer to our web site **pickeringtest.com** where links to our Software Download page will provide the latest version of the driver software for the various programming environments encountered.

For PXI modules which are supported in one of Pickering Interfaces' Modular LXI Chassis (such as the 60-102B and 60-103B) no module software update is required. If the module was introduced after the LXI chassis was manufactured the module may not be recognized, in this case the chassis firmware may need upgrading. This is a simple process which is described in the manual for the Modular LXI Chassis.

RELAY LOOK-UP TABLES

The following pages provide a cross reference between the signal paths of the Relay Module and the physical relays on the PCB. The tables can be used in the fault finding process and should be used in conjunction with the corresponding PCB layout diagrams to identify the position of faulty relays.

40-549-001 RELAY CROSS REFERENCE

Crosspoint X	Crosspoint Y	Relay No.	Crosspoint X	Crosspoint Y	Relay No.
1	1	RL1	9	1	RL33
2	1	RL2	10	1	RL34
3	1	RL3	11	1	RL35
4	1	RL4	12	1	RL36
5	1	RL5	13	1	RL37
6	1	RL6	14	1	RL38
7	1	RL7	15	1	RL39
8	1	RL8	16	1	RL40
1	2	RL9	9	2	RL41
2	2	RL10	10	2	RL42
3	2	RL11	11	2	RL43
4	2	RL12	12	2	RL44
5	2	RL13	13	2	RL45
6	2	RL14	14	2	RL46
7	2	RL15	15	2	RL47
8	2	RL16	16	2	RL48
1	3	RL17	9	3	RL49
2	3	RL18	10	3	RL50
3	3	RL19	11	3	RL51
4	3	RL20	12	3	RL52
5	3	RL21	13	3	RL53
6	3	RL22	14	3	RL54
7	3	RL23	15	3	RL55
8	3	RL24	16	3	RL56
1	4	RL25	9	4	RL57
2	4	RL26	10	4	RL58
3	4	RL27	11	4	RL59
4	4	RL28	12	4	RL60
5	4	RL29	13	4	RL61
6	4	RL30	14	4	RL62
7	4	RL31	15	4	RL63
8	4	RL32	16	4	RL64

40-549-002 RELAY CROSS REFERENCE

Crosspoint X	Crosspoint Y	Relay No.	Crosspoint X	Crosspoint Y	Relay No.
1	1	RL1	1	5	RL33
2	1	RL2	2	5	RL34
3	1	RL3	3	5	RL35
4	1	RL4	4	5	RL36
5	1	RL5	5	5	RL37
6	1	RL6	6	5	RL38
7	1	RL7	7	5	RL39
8	1	RL8	8	5	RL40
1	2	RL9	1	6	RL41
2	2	RL10	2	6	RL42
3	2	RL11	3	6	RL43
4	2	RL12	4	6	RL44
5	2	RL13	5	6	RL45
6	2	RL14	6	6	RL46
7	2	RL15	7	6	RL47
8	2	RL16	8	6	RL48
1	3	RL17	1	7	RL49
2	3	RL18	2	7	RL50
3	3	RL19	3	7	RL51
4	3	RL20	4	7	RL52
5	3	RL21	5	7	RL53
6	3	RL22	6	7	RL54
7	3	RL23	7	7	RL55
8	3	RL24	8	7	RL56
1	4	RL25	1	8	RL57
2	4	RL26	2	8	RL58
3	4	RL27	3	8	RL59
4	4	RL28	4	8	RL60
5	4	RL29	5	8	RL61
6	4	RL30	6	8	RL62
7	4	RL31	7	8	RL63
8	4	RL32	8	8	RL64

40-549-003 RELAY CROSS REFERENCE

Crosspoint X	Crosspoint Y	Relay No.	Crosspoint X	Crosspoint Y	Relay No.
A1	A1	RL1	B1	B1	RL33
A2	A1	RL2	B2	B1	RL34
A3	A1	RL3	B3	B1	RL35
A4	A1	RL4	B4	B1	RL36
A5	A1	RL5	B5	B1	RL37
A6	A1	RL6	B6	B1	RL38
A7	A1	RL7	B7	B1	RL39
A8	A1	RL8	B8	B1	RL40
A1	A2	RL9	B1	B2	RL41
A2	A2	RL10	B2	B2	RL42
A3	A2	RL11	B3	B2	RL43
A4	A2	RL12	B4	B2	RL44
A5	A2	RL13	B5	B2	RL45
A6	A2	RL14	B6	B2	RL46
A7	A2	RL15	B7	B2	RL47
A8	A2	RL16	B8	B2	RL48
A1	A3	RL17	B1	B3	RL49
A2	A3	RL18	B2	B3	RL50
A3	A3	RL19	B3	B3	RL51
A4	A3	RL20	B4	B3	RL52
A5	A3	RL21	B5	B3	RL53
A6	A3	RL22	B6	B3	RL54
A7	A3	RL23	B7	B3	RL55
A8	A3	RL24	B8	B3	RL56
A1	A4	RL25	B1	B4	RL57
A2	A4	RL26	B2	B4	RL58
A3	A4	RL27	B3	B4	RL59
A4	A4	RL28	B4	B4	RL60
A5	A4	RL29	B5	B4	RL61
A6	A4	RL30	B6	B4	RL62
A7	A4	RL31	B7	B4	RL63
A8	A4	RL32	B8	B4	RL64

40-549-004 RELAY CROSS REFERENCE

Crosspoint X	Crosspoint Y	Relay No.	Crosspoint X	Crosspoint Y	Relay No.
1	1	RL1	Not Fitted		RL33
2	1	RL2	Not Fitted		RL34
3	1	RL3	Not Fitted		RL35
4	1	RL4	Not Fitted		RL36
5	1	RL5	Not Fitted		RL37
6	1	RL6	Not Fitted		RL38
7	1	RL7	Not Fitted		RL39
8	1	RL8	Not Fitted		RL40
1	2	RL9	Not Fitted		RL41
2	2	RL10	Not Fitted		RL42
3	2	RL11	Not Fitted		RL43
4	2	RL12	Not Fitted		RL44
5	2	RL13	Not Fitted		RL45
6	2	RL14	Not Fitted		RL46
7	2	RL15	Not Fitted		RL47
8	2	RL16	Not Fitted		RL48
1	3	RL17	Not Fitted		RL49
2	3	RL18	Not Fitted		RL50
3	3	RL19	Not Fitted		RL51
4	3	RL20	Not Fitted		RL52
5	3	RL21	Not Fitted		RL53
6	3	RL22	Not Fitted		RL54
7	3	RL23	Not Fitted		RL55
8	3	RL24	Not Fitted		RL56
1	4	RL25	Not Fitted		RL57
2	4	RL26	Not Fitted		RL58
3	4	RL27	Not Fitted		RL59
4	4	RL28	Not Fitted		RL60
5	4	RL29	Not Fitted		RL61
6	4	RL30	Not Fitted		RL62
7	4	RL31	Not Fitted		RL63
8	4	RL32	Not Fitted		RL64

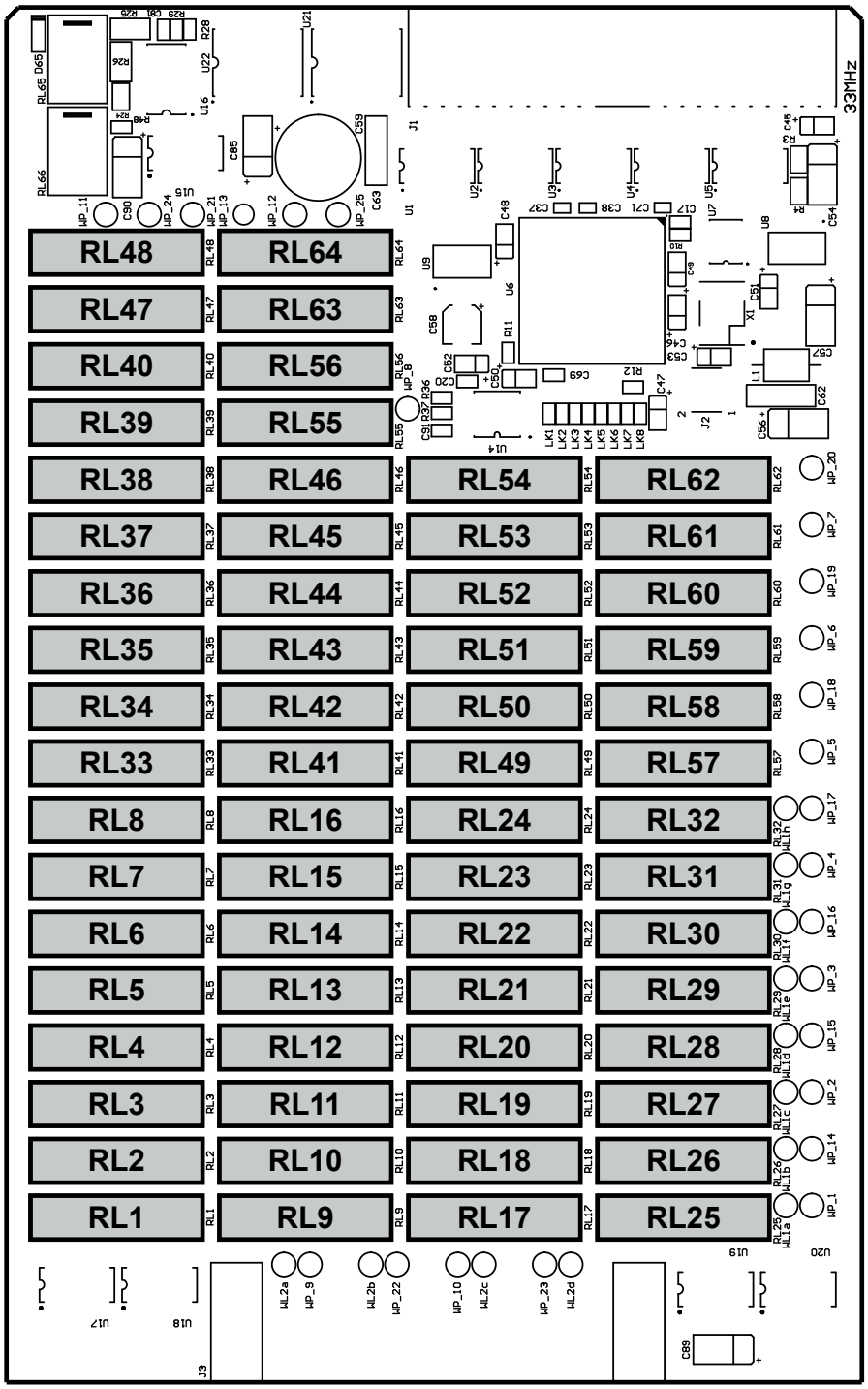


Figure 7.1 - 40-549 Component Layout

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