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# 40-615 User Manual

## PXI Very High Density Multiplexer Module




Issue 11.2 May 2023

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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

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# 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)**<br>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**<br>To indicate hazards arising from dangerous voltages. |  |
| **WARNING / CAUTION**<br>An appropriate safety instruction should be followed or caution to a potential hazard exists.<br><br>Refer to the relevant instructions detailed within the product manual. |  |
| **HEAVY**<br>If this product is heavy reference should be made to the safety instructions for provisions of lifting and moving. |  |
| **STATIC SENSITIVE**<br>To indicate that static sensitive devices are present and handling precautions should be followed. |  |

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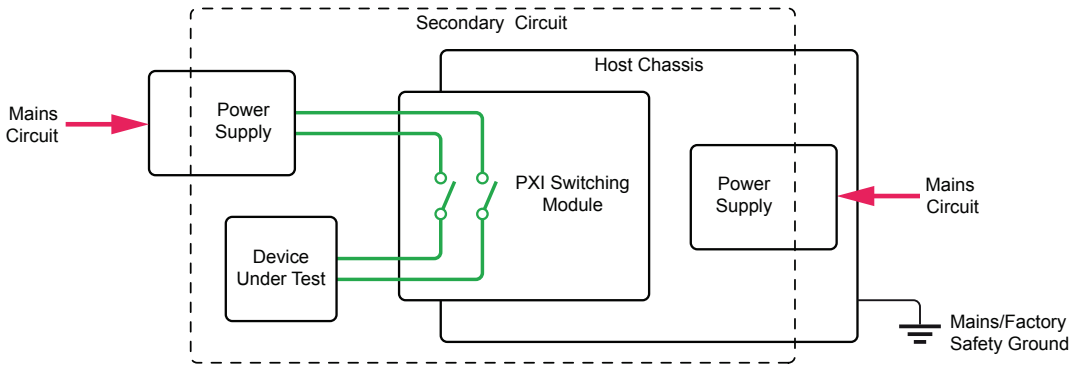
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# WARNINGS AND CAUTIONS

| 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.<br><br>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.<br><br>Not to be used in safety critical circuits, refer to the Pickering Interfaces' terms & conditions of sale.<br><br>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.<br><br>The host chassis must be correctly installed and be connected to mains or factory safety ground, please refer to your chassis installation manual.<br><br><br><br>**Diagram Showing Separation Between The Mains Circuit and Secondary Circuit / DUT**<br><br>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:<br><br>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.<br>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.<br>3. Outer clothing worn must be unable to generate static charges.<br>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).<br>• Appropriate manual handling procedures should be followed as dictated by the weight of the individual module or the combined weight of the modules & chassis.<br>• 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.<br>• Ensure the equipment is installed, operated and maintained by trained and authorised personnel.<br>• 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

- Very High Density Multi-Banked Multiplexer
- Choice of 20, 10, 5, 4, 2 or 1 Multiplexers Per Module
- Up to 168 Switch Points Available with 1 or 2-Pole Switching Formats
- Uses High Reliability Pickering Reed Relays
- Fast Operating Speed <500 µs
- Switch up to 150 VDC/100 VAC, 1.0 A with 20 W Max Power
- Versions Available With Automatic Isolation Switches To Reduce Capacitive Loading in Large Systems
- Drivers Supplied for Windows & Linux, Plus Support for Real-time Systems
- Supported by PXI or LXI Chassis
- Supported by *eBIRST* ™
- 3 Year Warranty



The 40-615 series of high density multiplexer modules feature a wide range of switching configurations (refer to schematics overleaf). It is especially useful where a large number of small multiplexers are required. Typical applications include signal routing in ATE and data acquisition systems. User connections are made via a front panel 200-pin connector.

The majority of 40-615 models (see order codes) allow multiple channels to be simultaneously selected. Alternatively, product variants can be supplied that operate as a conventional multiplexer with break-before-make action when a new channel is selected.

**Note:** The multiple channel selection option is not available for the 40-615-022 single pole versions of the multiplexer.

The 40-615-022 single pole high density versions include automatic isolation switching. This connects only the currently active multiplexer bank to the common terminal, keeping capacitive loading and leakage current to a minimum in large multiplexer systems. Larger multiplexers may be constructed by daisy chaining the common signals from multiple modules.

The 40-615 is part of a family of high density PXI multiplexer modules all sharing similar architecture and the same 200-pin connector, other members include the 40-610 and 40-670A High Density Multiplexer series.

| Available multiplexer formats |
|---|
| 20 Banks, 8 Channels, 1-Pole<br>20 Banks, 4 Channels, 2-Pole |
| 10 Banks, 16 Channels, 1-Pole<br>10 Banks, 8 Channels, 2-Pole |
| 5 Banks, 32 Channels, 1-Pole<br>5 Banks, 16 Channels, 2-Pole |
| 4 Banks, 40 Channels, 1-Pole<br>4 Banks, 20 Channels, 2-Pole |
| 2 Banks, 80 Channels, 1-Pole<br>2 Banks, 40 Channels, 2-Pole |
| 1 Bank, 160 Channels, 1-Pole<br>1 Bank, 80 Channels, 2-Pole |
| 6 Lower Density Versions<br>Custom Sizes (100s of combinations) |

### Supported by *eBIRST*

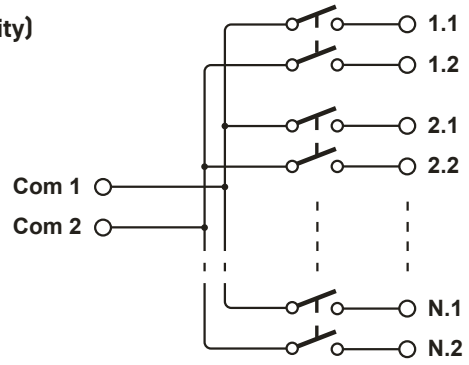
These test tools simplify fault-finding by quickly testing the system and graphically identifying the faulty relay.
For more information go to: pickeringtest.com/ebirst

### Front Panel Connector

This product is based on the obsolete Molex LFH series connector that has been superseded by a Pickering commissioned form, fit, function equivalent. The new connector series is 100% compatible with the Molex connectors allowing either gender of Pickering connector to mate with the corresponding Molex part without issue.

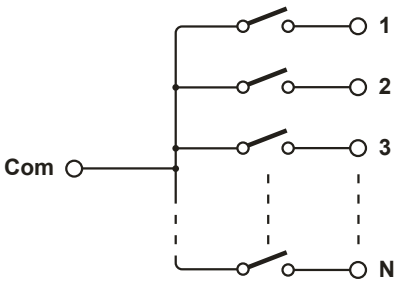
- 20 Banks of 4 Channels
- 10 Banks of 8 Channels
- 5 Banks of 16 Channels
- 4 Bank of 20 Channels
- 2 Banks of 40 Channels
- 1 Bank of 80 Channels
- Custom Configurations

**2-Pole MUX Mode (high density) – Available Configurations**




- 20 Banks of 4 Channels
- 10 Banks of 8 Channels
- 5 Banks of 16 Channels
- 4 Banks of 20 Channels
- 2 Banks of 40 Channels
- 1 Bank of 80 Channels
- Custom Configurations

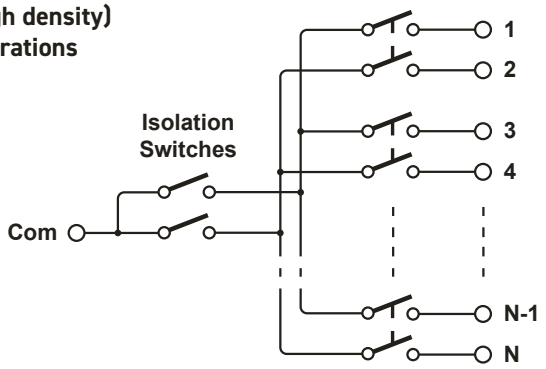
**1-Pole MUX Mode (low density) – Available Configurations**

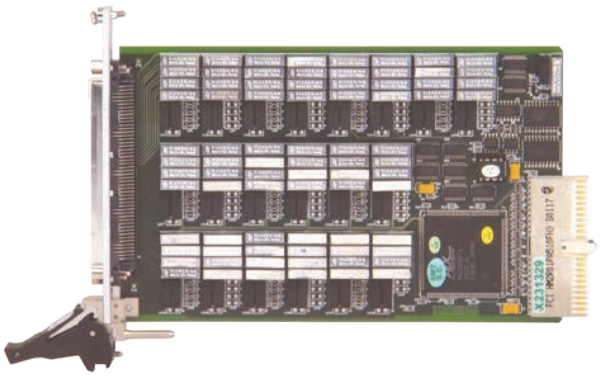



- 20 Banks of 8 Channels
- 10 Banks of 16 Channels
- 5 Banks of 32 Channels
- 4 Banks of 40 Channels
- 2 Banks of 80 Channels
- 1 Bank of 160 Channels
- Custom Configurations

Note: Multi-channel selection not available in this mode

**1-Pole MUX Mode (high density) – Available Configurations**



**PCB Layout for the 40-615 Very High Density Multiplexer Module**

### Relay Type

The 40-615 is fitted with ruthenium sputtered reed relays, these offer very long life with good low level switching performance and excellent contact resistance stability. Spare reed relays are built onto the circuit board to allow easy maintenance with minimum downtime.

All reed relays are manufactured by our Relay Division: pickeringrelay.com

### Switching Specification

| | |
|---|---|
| Switch Type: | Ruthenium Reed |
| Max Switch Voltage: | 150 VDC/100 VAC* |
| Max Power:<br>Max Switch Current:<br>Max Carry Current: | 20 W<br>1.0 A<br>1.2 A |
| Initial On Path Resistance (Single Module):<br>Off Path Resistance (Single Module): | <1 Ω<br>>$10^9$ Ω |
| Bandwidth (3 dB, 1 module) | >5 MHz † |
| Operate Time: | 1 ms typical, 500 µs for multichannel mode |
| Expected Life, low power load:<br>Expected Life, full power load: | 1x$10^9$ operations<br>>1x$10^6$ operations |

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

† Bandwidth is configuration dependent (please consult sales office for further information).

### Power Requirements

| | | | |
|---|---|---|---|
| +3.3 V | +5 V | +12 V | -12 V |
| 0 | 1350 mA (typ 280 mA) | 0 | 0 |

### Mechanical Characteristics

Single slot 3U PXI (CompactPCI card).
Module weight: 240 g (40-615-022).
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 200-pin female LFH* connector, for pin outs please refer to the operating manual.

* LFH relates to the obsolete Molex connector series and is retained for continuity, products will be fitted with a form, fit, function Pickering equivalent connector that is intermateable with the original Molex parts.

### 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.

### Product Order Codes - High Density MUX Configurations

| Channel Selection | Model Variant | Order Code |
|---|---|---|
| Multiple | **20 Bank, 4 Channel, 2-Pole** | **40-615-022-20/4/2** |
| Multiple | **10 Bank, 8 Channel, 2-Pole** | **40-615-022-10/8/2** |
| Multiple | **4 Bank, 20 Channel, 2-Pole** | **40-615-022-4/20/2** |

**Note:** Contact factory if the above modules are required in single channel selection mode.

| | | |
|---|---|---|
| Single | **20 Bank, 8 Channel, 1-Pole** | **40-615-022-20/8/1** |
| Single | **10 Bank, 16 Channel, 1-Pole** | **40-615-022-10/16/1** |
| Single | **5 Bank, 32 Channel, 1-Pole** | **40-615-022-5/32/1** |
| Single | **4 Bank, 40 Channel, 1-Pole** | **40-615-022-4/40/1** |
| Single | **2 Bank, 80 Channel, 1-Pole** | **40-615-022-2/80/1** |
| Single | **1 Bank, 160 Channel, 1-Pole** | **40-615-022-1/160/1** |

**Note:** The above modules can only select a single channel.

| | | |
|---|---|---|
| Single | **5 Bank, 16 Channel, 2-Pole** | **40-615-022-5/16/2** |
| Single | **2 Bank, 40 Channel, 2-Pole** | **40-615-022-2/40/2** |
| Single | **1 Bank, 80 Channel, 2-Pole** | **40-615-022-1/80/2** |

**Note:** The above modules are available to select a single channel.

### Product Order Codes - Low Density MUX Configurations

| Channel Selection | Model Variant | Order Code |
|---|---|---|
| Multiple | **20 Bank, 4 Channel, 1-Pole** | **40-615-021-20/4/1** |
| Multiple | **10 Bank, 8 Channel, 1-Pole** | **40-615-021-10/8/1** |
| Multiple | **5 Bank, 16 Channel, 1-Pole** | **40-615-021-5/16/1** |
| Multiple | **4 Bank, 20 Channel, 1-Pole** | **40-615-021-4/20/1** |
| Multiple | **2 Bank, 40 Channel, 1-Pole** | **40-615-021-2/40/1** |

**Note:** Contact factory if the above modules are required in single channel selection mode.

| | | |
|---|---|---|
| Single | **1 Bank, 80 Channel, 1-Pole** | **40-615-021-1/80/1** |

**Note:** The above module is available to select a single channel.

### 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.

### 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 below. For more information go to: pickeringtest.com/ebirst

| Product | Test Tool | Adaptor |
|---|---|---|
| **40-615** | **93-002-001** | **Not Required** |

#### 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 |
|---|---|
| **40-615-022** | **91-100-008 & 91-100-015** |
| **40-615-021** | **91-100-003 & 91-100-015** |

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

### Mating Connectors & Cabling

For connection accessories for the 40-615 series please refer to the 90-002D 200-pin LFH Connector Accessories data sheet where a complete list and documentation can be found for accessories, or refer to the Connection Solutions catalog.



**Pickering can supply mating 200-pin connectors and cable assemblies to enable easy integration of the 40-615 series of multiplexer modules**

## 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

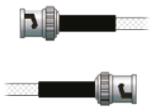
We provide a full range of supporting cable and connector solutions for all our switching products—20 connector families with 1200+ products. We offer everything from simple mating connectors to complex cables assemblies and terminal blocks. All assemblies are manufactured by Pickering and are guaranteed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



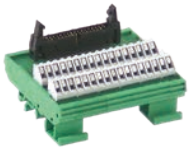
**Connectors & Backshells**



**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.

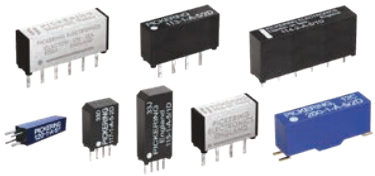


### Mass Interconnect

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 includir

- **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



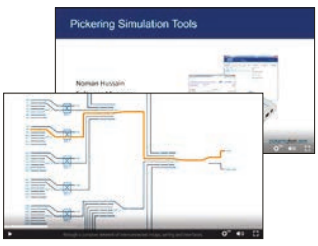

***eBIRST*** Switching System Test Tools are designed specifically for our PXI, PCI or LXI products, these tools simplify switching system fault-finding by quickly testing the system and graphically identifying the faulty relay.
To learn more, please go to: pickeringtest.com/ebirst

## 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 paper 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

# SECTION 2 - TECHNICAL DESCRIPTION

## FUNCTIONAL DESCRIPTION

A functional block diagram is provided in Figure 2.1. The Relay Module is powered by +5V inputs via Compact PCI connector J1. The interface to the user test equipment is via the front panel mounted 200-pin LFH connector, J2. The module comprises a PCB populated with relays which are two pole, single pole, or single pole screened depending on the variant. The relays are configured as a multiplexer with single pole isolation relays, which connect only the currently active multiplexer bank to the analog common, thereby keeping capacitive loading and leakage currents in large multiplexer systems to a minimum. The relays are energised via control signals from relay drivers U8 to U17. Each relay driver is addressed by PCI bridge U1, via the control logic comprising U3 to U6, to output the required signal. Module configuration is determined by data stored in EEPROM U7. PCI Bridge U1 is configured by EEPROM U2.

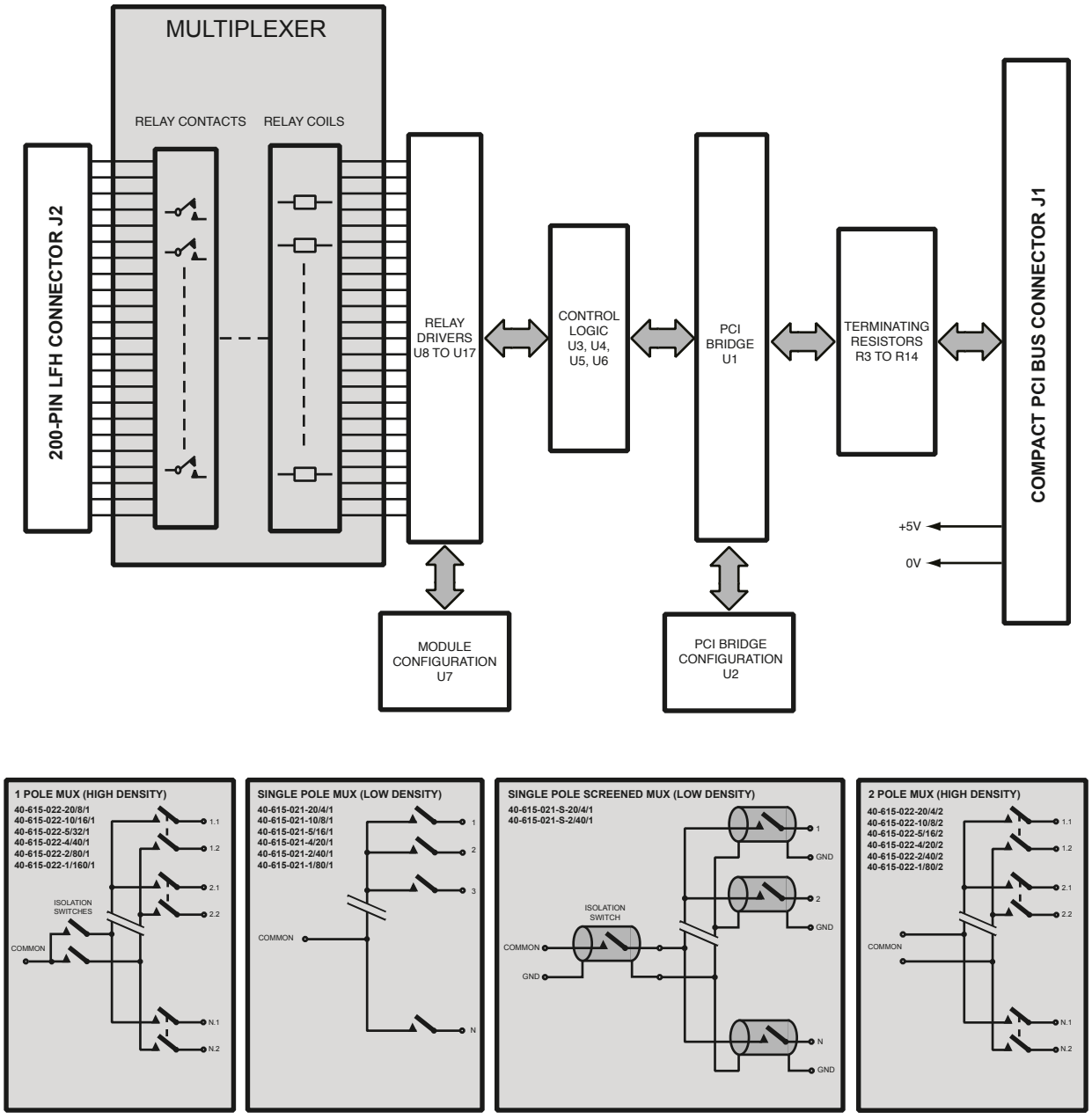



**Figure 2.1 - Very High Density Multiplexer Module 40-615: Functional Block Diagram**

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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.

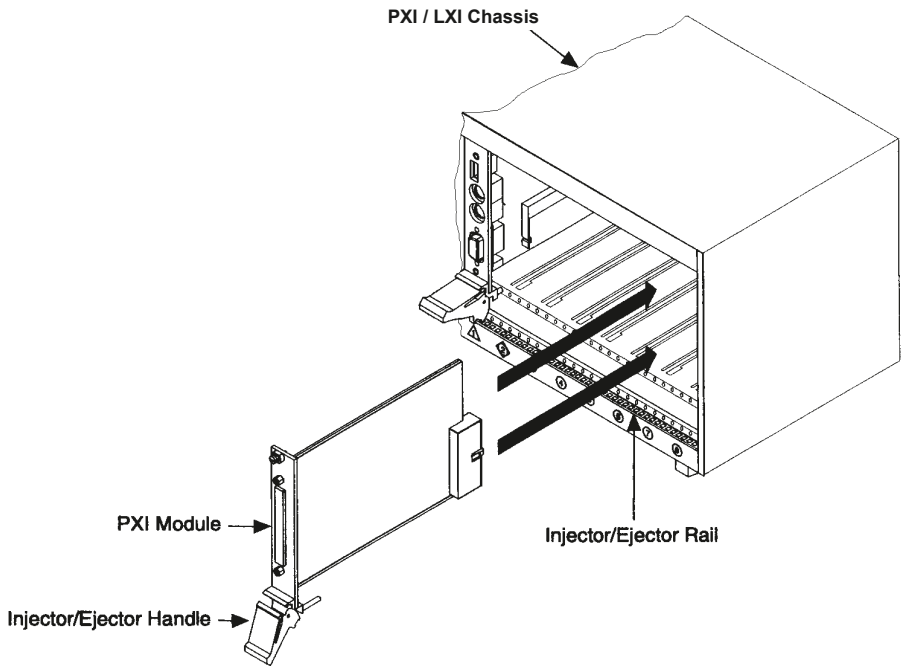



**Figure 3.1 - Installing the Module into a PXI/cPCI/LXI Chassis**

## 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.

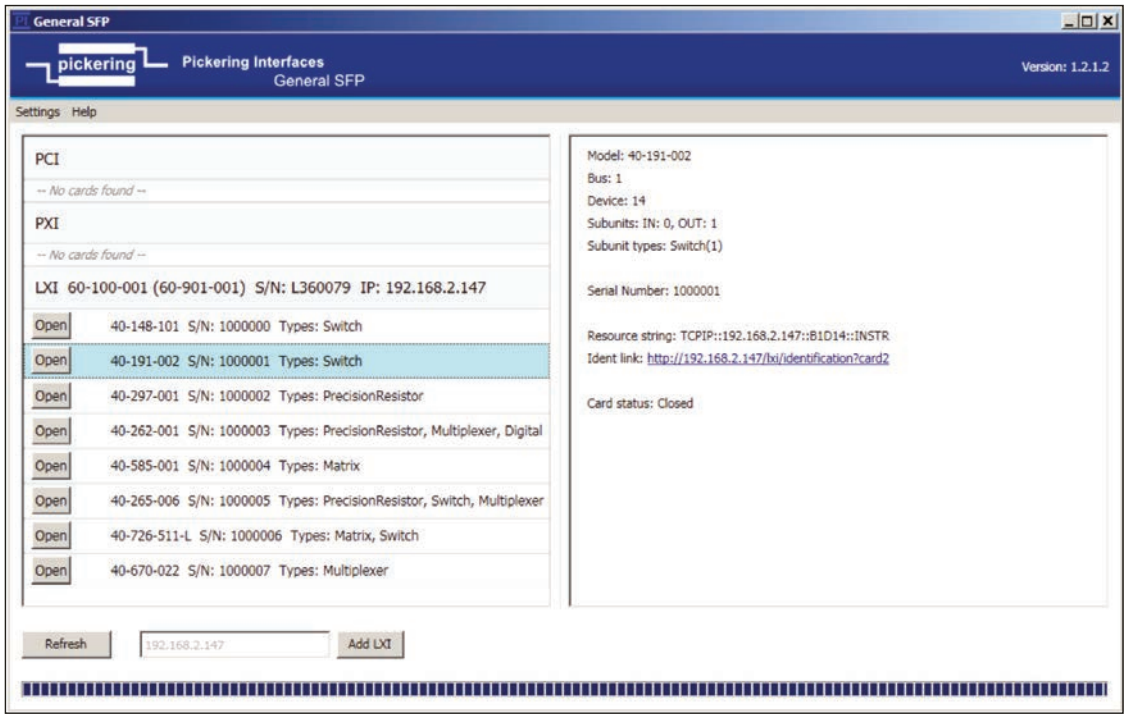



**Figure 3.3 - General Soft Front Panel Selector**

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

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# SECTION 4 - PROGRAMMING GUIDE

## PROGRAMMING OPTIONS FOR PICKERING INTERFACES PXI MODULES

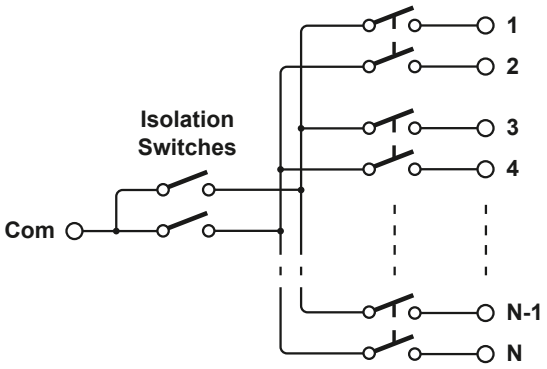
For information on the installation and use of drivers and the programming of Pickering's products in various software environments, please refer to the Software User Manual.

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*

## MODULE ARCHITECTURE 40-615-022: HIGH DENSITY 1 POLE MUX

The 40-615-022 High Density 1 Pole Multiplexer is an array of 80 DPST relays and 40 SPST Isolation switches. In the default state all relays are open circuit. Energising a particular relay creates a signal path between the common terminal and the corresponding channel terminal(s). The operation of the isolation relays is automatic, therefore they do not need to be set by the user to create a signal path. The relay module's switching architecture is shown in the default state in the diagram below:




- 20 Banks of 8 Channels
- 10 Banks of 16 Channels
- 5 Banks of 32 Channels
- 4 Banks of 40 Channels
- 2 Banks of 80 Channels
- 1 Bank of 160 Channels

Note: Multi-channel selection not available in this mode

**Figure 4.1 - 1-Pole MUX Mode (High Density) – Available Configurations**

The sub-units used to control the module's relays correspond to the module banks as shown below.

| Module | Banks | Channels | Sub-Units | Bits / Sub-Unit |
|---|---|---|---|---|
| 40-615-022-20/8/1 | 20 | 8 | 20 | 8 |
| 40-615-022-10/16/1 | 10 | 16 | 10 | 16 |
| 40-615-022-5/32/1 | 5 | 32 | 5 | 32 |
| 40-615-022-4/40/1 | 4 | 40 | 4 | 40 |
| 40-615-022-2/80/1 | 2 | 80 | 2 | 80 |
| 40-615-022-1/160/1 | 1 | 160 | 1 | 160 |

Enabling a particular bit operates the corresponding relay as detailed in the tables.

## TABLE 4.1 - Multiplexer Module 40-615-022-20/8/1: Sub-Units

| 20 Bank, 8 Channel, 1 Pole | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Active 1-Pole Relay (Isolation) | | | | | | | | | | | | | | | |
| Active 2-Pole Relay (Multiplexer) | | | | | | | | | | | | | | | |
| SU | Bit | | | SU | Bit | | | SU | Bit | | | SU | Bit | | |
| Bank | Chan | Relays | | Bank | Chan | Relays | | Bank | Chan | Relays | | Bank | Chan | Relays | |
| 1 | 1 | 1 | 5 | 6 | 1 | 31 | 35 | 11 | 1 | 61 | 65 | 16 | 1 | 91 | 95 |
| 1 | 2 | 1 | 6 | 6 | 2 | 31 | 36 | 11 | 2 | 61 | 66 | 16 | 2 | 91 | 96 |
| 1 | 3 | 2 | 5 | 6 | 3 | 32 | 35 | 11 | 3 | 62 | 65 | 16 | 3 | 92 | 95 |
| 1 | 4 | 2 | 6 | 6 | 4 | 32 | 36 | 11 | 4 | 62 | 66 | 16 | 4 | 92 | 96 |
| 1 | 5 | 3 | 5 | 6 | 5 | 33 | 35 | 11 | 5 | 63 | 65 | 16 | 5 | 93 | 95 |
| 1 | 6 | 3 | 6 | 6 | 6 | 33 | 36 | 11 | 6 | 63 | 66 | 16 | 6 | 93 | 96 |
| 1 | 7 | 4 | 5 | 6 | 7 | 34 | 35 | 11 | 7 | 64 | 65 | 16 | 7 | 94 | 95 |
| 1 | 8 | 4 | 6 | 6 | 8 | 34 | 36 | 11 | 8 | 64 | 66 | 16 | 8 | 94 | 96 |
| 2 | 1 | 7 | 11 | 7 | 1 | 37 | 41 | 12 | 1 | 67 | 71 | 17 | 1 | 97 | 101 |
| 2 | 2 | 7 | 12 | 7 | 2 | 37 | 42 | 12 | 2 | 67 | 72 | 17 | 2 | 97 | 102 |
| 2 | 3 | 8 | 11 | 7 | 3 | 38 | 41 | 12 | 3 | 68 | 71 | 17 | 3 | 98 | 101 |
| 2 | 4 | 8 | 12 | 7 | 4 | 38 | 42 | 12 | 4 | 68 | 72 | 17 | 4 | 98 | 102 |
| 2 | 5 | 9 | 11 | 7 | 5 | 39 | 41 | 12 | 5 | 69 | 71 | 17 | 5 | 99 | 101 |
| 2 | 6 | 9 | 12 | 7 | 6 | 39 | 42 | 12 | 6 | 69 | 72 | 17 | 6 | 99 | 102 |
| 2 | 7 | 10 | 11 | 7 | 7 | 40 | 41 | 12 | 7 | 70 | 71 | 17 | 7 | 100 | 101 |
| 2 | 8 | 10 | 12 | 7 | 8 | 40 | 42 | 12 | 8 | 70 | 72 | 17 | 8 | 100 | 102 |
| 3 | 1 | 13 | 17 | 8 | 1 | 43 | 47 | 13 | 1 | 73 | 77 | 18 | 1 | 103 | 107 |
| 3 | 2 | 13 | 18 | 8 | 2 | 43 | 48 | 13 | 2 | 73 | 78 | 18 | 2 | 103 | 108 |
| 3 | 3 | 14 | 17 | 8 | 3 | 44 | 47 | 13 | 3 | 74 | 77 | 18 | 3 | 104 | 107 |
| 3 | 4 | 14 | 18 | 8 | 4 | 44 | 48 | 13 | 4 | 74 | 78 | 18 | 4 | 104 | 108 |
| 3 | 5 | 15 | 17 | 8 | 5 | 45 | 47 | 13 | 5 | 75 | 77 | 18 | 5 | 105 | 107 |
| 3 | 6 | 15 | 18 | 8 | 6 | 45 | 48 | 13 | 6 | 75 | 78 | 18 | 6 | 105 | 108 |
| 3 | 7 | 16 | 17 | 8 | 7 | 46 | 47 | 13 | 7 | 76 | 77 | 18 | 7 | 106 | 107 |
| 3 | 8 | 16 | 18 | 8 | 8 | 46 | 48 | 13 | 8 | 76 | 78 | 18 | 8 | 106 | 108 |
| 4 | 1 | 19 | 23 | 9 | 1 | 49 | 53 | 14 | 1 | 79 | 83 | 19 | 1 | 109 | 113 |
| 4 | 2 | 19 | 24 | 9 | 2 | 49 | 54 | 14 | 2 | 79 | 84 | 19 | 2 | 109 | 114 |
| 4 | 3 | 20 | 23 | 9 | 3 | 50 | 53 | 14 | 3 | 80 | 83 | 19 | 3 | 110 | 113 |
| 4 | 4 | 20 | 24 | 9 | 4 | 50 | 54 | 14 | 4 | 80 | 84 | 19 | 4 | 110 | 114 |
| 4 | 5 | 21 | 23 | 9 | 5 | 51 | 53 | 14 | 5 | 81 | 83 | 19 | 5 | 111 | 113 |
| 4 | 6 | 21 | 24 | 9 | 6 | 51 | 54 | 14 | 6 | 81 | 84 | 19 | 6 | 111 | 114 |
| 4 | 7 | 22 | 23 | 9 | 7 | 52 | 53 | 14 | 7 | 82 | 83 | 19 | 7 | 112 | 113 |
| 4 | 8 | 22 | 24 | 9 | 8 | 52 | 54 | 14 | 8 | 82 | 84 | 19 | 8 | 112 | 114 |
| 5 | 1 | 25 | 29 | 10 | 1 | 55 | 59 | 15 | 1 | 85 | 89 | 20 | 1 | 115 | 119 |
| 5 | 2 | 25 | 30 | 10 | 2 | 55 | 60 | 15 | 2 | 85 | 90 | 20 | 2 | 115 | 120 |
| 5 | 3 | 26 | 29 | 10 | 3 | 56 | 59 | 15 | 3 | 86 | 89 | 20 | 3 | 116 | 119 |
| 5 | 4 | 26 | 30 | 10 | 4 | 56 | 60 | 15 | 4 | 86 | 90 | 20 | 4 | 116 | 120 |
| 5 | 5 | 27 | 29 | 10 | 5 | 57 | 59 | 15 | 5 | 87 | 89 | 20 | 5 | 117 | 119 |
| 5 | 6 | 27 | 30 | 10 | 6 | 57 | 60 | 15 | 6 | 87 | 90 | 20 | 6 | 117 | 120 |
| 5 | 7 | 28 | 29 | 10 | 7 | 58 | 59 | 15 | 7 | 88 | 89 | 20 | 7 | 118 | 119 |
| 5 | 8 | 28 | 30 | 10 | 8 | 58 | 60 | 15 | 8 | 88 | 90 | 20 | 8 | 118 | 120 |

## TABLE 4.2 - Multiplexer Module 40-615-022-10/16/1: Sub-Units

**10 Bank, 16 Channel, 1 Pole**

**Active 1-Pole Relay (Isolation)**

**Active 2-Pole Relay (Multiplexer)**

| SU Bank | Bit Chan | Relays | | SU Bank | Bit Chan | Relays | | SU Bank | Bit Chan | Relays | | SU Bank | Bit Chan | Relays | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 1 | 5 | 3 | 9 | 31 | 35 | 6 | 1 | 61 | 65 | 8 | 9 | 91 | 95 |
| 1 | 2 | 1 | 6 | 3 | 10 | 31 | 36 | 6 | 2 | 61 | 66 | 8 | 10 | 91 | 96 |
| 1 | 3 | 2 | 5 | 3 | 11 | 32 | 35 | 6 | 3 | 62 | 65 | 8 | 11 | 92 | 95 |
| 1 | 4 | 2 | 6 | 3 | 12 | 32 | 36 | 6 | 4 | 62 | 66 | 8 | 12 | 92 | 96 |
| 1 | 5 | 3 | 5 | 3 | 13 | 33 | 35 | 6 | 5 | 63 | 65 | 8 | 13 | 93 | 95 |
| 1 | 6 | 3 | 6 | 3 | 14 | 33 | 36 | 6 | 6 | 63 | 66 | 8 | 14 | 93 | 96 |
| 1 | 7 | 4 | 5 | 3 | 15 | 34 | 35 | 6 | 7 | 64 | 65 | 8 | 15 | 94 | 95 |
| 1 | 8 | 4 | 6 | 3 | 16 | 34 | 36 | 6 | 8 | 64 | 66 | 8 | 16 | 94 | 96 |
| 1 | 9 | 7 | 11 | 4 | 1 | 37 | 41 | 6 | 9 | 67 | 71 | 9 | 1 | 97 | 101 |
| 1 | 10 | 7 | 12 | 4 | 2 | 37 | 42 | 6 | 10 | 67 | 72 | 9 | 2 | 97 | 102 |
| 1 | 11 | 8 | 11 | 4 | 3 | 38 | 41 | 6 | 11 | 68 | 71 | 9 | 3 | 98 | 101 |
| 1 | 12 | 8 | 12 | 4 | 4 | 38 | 42 | 6 | 12 | 68 | 72 | 9 | 4 | 98 | 102 |
| 1 | 13 | 9 | 11 | 4 | 5 | 39 | 41 | 6 | 13 | 69 | 71 | 9 | 5 | 99 | 101 |
| 1 | 14 | 9 | 12 | 4 | 6 | 39 | 42 | 6 | 14 | 69 | 72 | 9 | 6 | 99 | 102 |
| 1 | 15 | 10 | 11 | 4 | 7 | 40 | 41 | 6 | 15 | 70 | 71 | 9 | 7 | 100 | 101 |
| 1 | 16 | 10 | 12 | 4 | 8 | 40 | 42 | 6 | 16 | 70 | 72 | 9 | 8 | 100 | 102 |
| 2 | 1 | 13 | 17 | 4 | 9 | 43 | 47 | 7 | 1 | 73 | 77 | 9 | 9 | 103 | 107 |
| 2 | 2 | 13 | 18 | 4 | 10 | 43 | 48 | 7 | 2 | 73 | 78 | 9 | 10 | 103 | 108 |
| 2 | 3 | 14 | 17 | 4 | 11 | 44 | 47 | 7 | 3 | 74 | 77 | 9 | 11 | 104 | 107 |
| 2 | 4 | 14 | 18 | 4 | 12 | 44 | 48 | 7 | 4 | 74 | 78 | 9 | 12 | 104 | 108 |
| 2 | 5 | 15 | 17 | 4 | 13 | 45 | 47 | 7 | 5 | 75 | 77 | 9 | 13 | 105 | 107 |
| 2 | 6 | 15 | 18 | 4 | 14 | 45 | 48 | 7 | 6 | 75 | 78 | 9 | 14 | 105 | 108 |
| 2 | 7 | 16 | 17 | 4 | 15 | 46 | 47 | 7 | 7 | 76 | 77 | 9 | 15 | 106 | 107 |
| 2 | 8 | 16 | 18 | 4 | 16 | 46 | 48 | 7 | 8 | 76 | 78 | 9 | 16 | 106 | 108 |
| 2 | 9 | 19 | 23 | 5 | 1 | 49 | 53 | 7 | 9 | 79 | 83 | 10 | 1 | 109 | 113 |
| 2 | 10 | 19 | 24 | 5 | 2 | 49 | 54 | 7 | 10 | 79 | 84 | 10 | 2 | 109 | 114 |
| 2 | 11 | 20 | 23 | 5 | 3 | 50 | 53 | 7 | 11 | 80 | 83 | 10 | 3 | 110 | 113 |
| 2 | 12 | 20 | 24 | 5 | 4 | 50 | 54 | 7 | 12 | 80 | 84 | 10 | 4 | 110 | 114 |
| 2 | 13 | 21 | 23 | 5 | 5 | 51 | 53 | 7 | 13 | 81 | 83 | 10 | 5 | 111 | 113 |
| 2 | 14 | 21 | 24 | 5 | 6 | 51 | 54 | 7 | 14 | 81 | 84 | 10 | 6 | 111 | 114 |
| 2 | 15 | 22 | 23 | 5 | 7 | 52 | 53 | 7 | 15 | 82 | 83 | 10 | 7 | 112 | 113 |
| 2 | 16 | 22 | 24 | 5 | 8 | 52 | 54 | 7 | 16 | 82 | 84 | 10 | 8 | 112 | 114 |
| 3 | 1 | 25 | 29 | 5 | 9 | 55 | 59 | 8 | 1 | 85 | 89 | 10 | 9 | 115 | 119 |
| 3 | 2 | 25 | 30 | 5 | 10 | 55 | 60 | 8 | 2 | 85 | 90 | 10 | 10 | 115 | 120 |
| 3 | 3 | 26 | 29 | 5 | 11 | 56 | 59 | 8 | 3 | 86 | 89 | 10 | 11 | 116 | 119 |
| 3 | 4 | 26 | 30 | 5 | 12 | 56 | 60 | 8 | 4 | 86 | 90 | 10 | 12 | 116 | 120 |
| 3 | 5 | 27 | 29 | 5 | 13 | 57 | 59 | 8 | 5 | 87 | 89 | 10 | 13 | 117 | 119 |
| 3 | 6 | 27 | 30 | 5 | 14 | 57 | 60 | 8 | 6 | 87 | 90 | 10 | 14 | 117 | 120 |
| 3 | 7 | 28 | 29 | 5 | 15 | 58 | 59 | 8 | 7 | 88 | 89 | 10 | 15 | 118 | 119 |
| 3 | 8 | 28 | 30 | 5 | 16 | 58 | 60 | 8 | 8 | 88 | 90 | 10 | 16 | 118 | 120 |

## TABLE 4.3 - Multiplexer Module 40-615-022-5/32/1: Sub-Units

| 5 Bank, 32 Channel, 1 Pole | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Active 1-Pole Relay (Isolation) | | | | | | | | | | | | | | | |
| Active 2-Pole Relay (Multiplexer) | | | | | | | | | | | | | | | |
| SU | Bit | | | SU | Bit | | | SU | Bit | | | SU | Bit | | |
| Bank | Chan | Relays | | Bank | Chan | Relays | | Bank | Chan | Relays | | Bank | Chan | Relays | |
| 1 | 1 | 1 | 5 | 2 | 9 | 31 | 35 | 3 | 17 | 61 | 65 | 4 | 25 | 91 | 95 |
| 1 | 2 | 1 | 6 | 2 | 10 | 31 | 36 | 3 | 18 | 61 | 66 | 4 | 26 | 91 | 96 |
| 1 | 3 | 2 | 5 | 2 | 11 | 32 | 35 | 3 | 19 | 62 | 65 | 4 | 27 | 92 | 95 |
| 1 | 4 | 2 | 6 | 2 | 12 | 32 | 36 | 3 | 20 | 62 | 66 | 4 | 28 | 92 | 96 |
| 1 | 5 | 3 | 5 | 2 | 13 | 33 | 35 | 3 | 21 | 63 | 65 | 4 | 29 | 93 | 95 |
| 1 | 6 | 3 | 6 | 2 | 14 | 33 | 36 | 3 | 22 | 63 | 66 | 4 | 30 | 93 | 96 |
| 1 | 7 | 4 | 5 | 2 | 15 | 34 | 35 | 3 | 23 | 64 | 65 | 4 | 31 | 94 | 95 |
| 1 | 8 | 4 | 6 | 2 | 16 | 34 | 36 | 3 | 24 | 64 | 66 | 4 | 32 | 94 | 96 |
| 1 | 9 | 7 | 11 | 2 | 17 | 37 | 41 | 3 | 25 | 67 | 71 | 5 | 1 | 97 | 101 |
| 1 | 10 | 7 | 12 | 2 | 18 | 37 | 42 | 3 | 26 | 67 | 72 | 5 | 2 | 97 | 102 |
| 1 | 11 | 8 | 11 | 2 | 19 | 38 | 41 | 3 | 27 | 68 | 71 | 5 | 3 | 98 | 101 |
| 1 | 12 | 8 | 12 | 2 | 20 | 38 | 42 | 3 | 28 | 68 | 72 | 5 | 4 | 98 | 102 |
| 1 | 13 | 9 | 11 | 2 | 21 | 39 | 41 | 3 | 29 | 69 | 71 | 5 | 5 | 99 | 101 |
| 1 | 14 | 9 | 12 | 2 | 22 | 39 | 42 | 3 | 30 | 69 | 72 | 5 | 6 | 99 | 102 |
| 1 | 15 | 10 | 11 | 2 | 23 | 40 | 41 | 3 | 31 | 70 | 71 | 5 | 7 | 100 | 101 |
| 1 | 16 | 10 | 12 | 2 | 24 | 40 | 42 | 3 | 32 | 70 | 72 | 5 | 8 | 100 | 102 |
| 1 | 17 | 13 | 17 | 2 | 25 | 43 | 47 | 4 | 1 | 73 | 77 | 5 | 9 | 103 | 107 |
| 1 | 18 | 13 | 18 | 2 | 26 | 43 | 48 | 4 | 2 | 73 | 78 | 5 | 10 | 103 | 108 |
| 1 | 19 | 14 | 17 | 2 | 27 | 44 | 47 | 4 | 3 | 74 | 77 | 5 | 11 | 104 | 107 |
| 1 | 20 | 14 | 18 | 2 | 28 | 44 | 48 | 4 | 4 | 74 | 78 | 5 | 12 | 104 | 108 |
| 1 | 21 | 15 | 17 | 2 | 29 | 45 | 47 | 4 | 5 | 75 | 77 | 5 | 13 | 105 | 107 |
| 1 | 22 | 15 | 18 | 2 | 30 | 45 | 48 | 4 | 6 | 75 | 78 | 5 | 14 | 105 | 108 |
| 1 | 23 | 16 | 17 | 2 | 31 | 46 | 47 | 4 | 7 | 76 | 77 | 5 | 15 | 106 | 107 |
| 1 | 24 | 16 | 18 | 2 | 32 | 46 | 48 | 4 | 8 | 76 | 78 | 5 | 16 | 106 | 108 |
| 1 | 25 | 19 | 23 | 3 | 1 | 49 | 53 | 4 | 9 | 79 | 83 | 5 | 17 | 109 | 113 |
| 1 | 26 | 19 | 24 | 3 | 2 | 49 | 54 | 4 | 10 | 79 | 84 | 5 | 18 | 109 | 114 |
| 1 | 27 | 20 | 23 | 3 | 3 | 50 | 53 | 4 | 11 | 80 | 83 | 5 | 19 | 110 | 113 |
| 1 | 28 | 20 | 24 | 3 | 4 | 50 | 54 | 4 | 12 | 80 | 84 | 5 | 20 | 110 | 114 |
| 1 | 29 | 21 | 23 | 3 | 5 | 51 | 53 | 4 | 13 | 81 | 83 | 5 | 21 | 111 | 113 |
| 1 | 30 | 21 | 24 | 3 | 6 | 51 | 54 | 4 | 14 | 81 | 84 | 5 | 22 | 111 | 114 |
| 1 | 31 | 22 | 23 | 3 | 7 | 52 | 53 | 4 | 15 | 82 | 83 | 5 | 23 | 112 | 113 |
| 1 | 32 | 22 | 24 | 3 | 8 | 52 | 54 | 4 | 16 | 82 | 84 | 5 | 24 | 112 | 114 |
| 2 | 1 | 25 | 29 | 3 | 9 | 55 | 59 | 4 | 17 | 85 | 89 | 5 | 25 | 115 | 119 |
| 2 | 2 | 25 | 30 | 3 | 10 | 55 | 60 | 4 | 18 | 85 | 90 | 5 | 26 | 115 | 120 |
| 2 | 3 | 26 | 29 | 3 | 11 | 56 | 59 | 4 | 19 | 86 | 89 | 5 | 27 | 116 | 119 |
| 2 | 4 | 26 | 30 | 3 | 12 | 56 | 60 | 4 | 20 | 86 | 90 | 5 | 28 | 116 | 120 |
| 2 | 5 | 27 | 29 | 3 | 13 | 57 | 59 | 4 | 21 | 87 | 89 | 5 | 29 | 117 | 119 |
| 2 | 6 | 27 | 30 | 3 | 14 | 57 | 60 | 4 | 22 | 87 | 90 | 5 | 30 | 117 | 120 |
| 2 | 7 | 28 | 29 | 3 | 15 | 58 | 59 | 4 | 23 | 88 | 89 | 5 | 31 | 118 | 119 |
| 2 | 8 | 28 | 30 | 3 | 16 | 58 | 60 | 4 | 24 | 88 | 90 | 5 | 32 | 118 | 120 |

## TABLE 4.4 - Multiplexer Module 40-615-022-4/40/1: Sub-Units

| 4 Bank, 40 Channel, 1 Pole | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Active 1-Pole Relay (Isolation) | | | | | | | | | | | | | | | |
| Active 2-Pole Relay (Multiplexer) | | | | | | | | | | | | | | | |
| SU | Bit | | | SU | Bit | | | SU | Bit | | | SU | Bit | | |
| Bank | Chan | Relays | | Bank | Chan | Relays | | Bank | Chan | Relays | | Bank | Chan | Relays | |
| 1 | 1 | 1 | 5 | 2 | 1 | 31 | 35 | 3 | 1 | 61 | 65 | 4 | 1 | 91 | 95 |
| 1 | 2 | 1 | 6 | 2 | 2 | 31 | 36 | 3 | 2 | 61 | 66 | 4 | 2 | 91 | 96 |
| 1 | 3 | 2 | 5 | 2 | 3 | 32 | 35 | 3 | 3 | 62 | 65 | 4 | 3 | 92 | 95 |
| 1 | 4 | 2 | 6 | 2 | 4 | 32 | 36 | 3 | 4 | 62 | 66 | 4 | 4 | 92 | 96 |
| 1 | 5 | 3 | 5 | 2 | 5 | 33 | 35 | 3 | 5 | 63 | 65 | 4 | 5 | 93 | 95 |
| 1 | 6 | 3 | 6 | 2 | 6 | 33 | 36 | 3 | 6 | 63 | 66 | 4 | 6 | 93 | 96 |
| 1 | 7 | 4 | 5 | 2 | 7 | 34 | 35 | 3 | 7 | 64 | 65 | 4 | 7 | 94 | 95 |
| 1 | 8 | 4 | 6 | 2 | 8 | 34 | 36 | 3 | 8 | 64 | 66 | 4 | 8 | 94 | 96 |
| 1 | 9 | 7 | 11 | 2 | 9 | 37 | 41 | 3 | 9 | 67 | 71 | 4 | 9 | 97 | 101 |
| 1 | 10 | 7 | 12 | 2 | 10 | 37 | 42 | 3 | 10 | 67 | 72 | 4 | 10 | 97 | 102 |
| 1 | 11 | 8 | 11 | 2 | 11 | 38 | 41 | 3 | 11 | 68 | 71 | 4 | 11 | 98 | 101 |
| 1 | 12 | 8 | 12 | 2 | 12 | 38 | 42 | 3 | 12 | 68 | 72 | 4 | 12 | 98 | 102 |
| 1 | 13 | 9 | 11 | 2 | 13 | 39 | 41 | 3 | 13 | 69 | 71 | 4 | 13 | 99 | 101 |
| 1 | 14 | 9 | 12 | 2 | 14 | 39 | 42 | 3 | 14 | 69 | 72 | 4 | 14 | 99 | 102 |
| 1 | 15 | 10 | 11 | 2 | 15 | 40 | 41 | 3 | 15 | 70 | 71 | 4 | 15 | 100 | 101 |
| 1 | 16 | 10 | 12 | 2 | 16 | 40 | 42 | 3 | 16 | 70 | 72 | 4 | 16 | 100 | 102 |
| 1 | 17 | 13 | 17 | 2 | 17 | 43 | 47 | 3 | 17 | 73 | 77 | 4 | 17 | 103 | 107 |
| 1 | 18 | 13 | 18 | 2 | 18 | 43 | 48 | 3 | 18 | 73 | 78 | 4 | 18 | 103 | 108 |
| 1 | 19 | 14 | 17 | 2 | 19 | 44 | 47 | 3 | 19 | 74 | 77 | 4 | 19 | 104 | 107 |
| 1 | 20 | 14 | 18 | 2 | 20 | 44 | 48 | 3 | 20 | 74 | 78 | 4 | 20 | 104 | 108 |
| 1 | 21 | 15 | 17 | 2 | 21 | 45 | 47 | 3 | 21 | 75 | 77 | 4 | 21 | 105 | 107 |
| 1 | 22 | 15 | 18 | 2 | 22 | 45 | 48 | 3 | 22 | 75 | 78 | 4 | 22 | 105 | 108 |
| 1 | 23 | 16 | 17 | 2 | 23 | 46 | 47 | 3 | 23 | 76 | 77 | 4 | 23 | 106 | 107 |
| 1 | 24 | 16 | 18 | 2 | 24 | 46 | 48 | 3 | 24 | 76 | 78 | 4 | 24 | 106 | 108 |
| 1 | 25 | 19 | 23 | 2 | 25 | 49 | 53 | 3 | 25 | 79 | 83 | 4 | 25 | 109 | 113 |
| 1 | 26 | 19 | 24 | 2 | 26 | 49 | 54 | 3 | 26 | 79 | 84 | 4 | 26 | 109 | 114 |
| 1 | 27 | 20 | 23 | 2 | 27 | 50 | 53 | 3 | 27 | 80 | 83 | 4 | 27 | 110 | 113 |
| 1 | 28 | 20 | 24 | 2 | 28 | 50 | 54 | 3 | 28 | 80 | 84 | 4 | 28 | 110 | 114 |
| 1 | 29 | 21 | 23 | 2 | 29 | 51 | 53 | 3 | 29 | 81 | 83 | 4 | 29 | 111 | 113 |
| 1 | 30 | 21 | 24 | 2 | 30 | 51 | 54 | 3 | 30 | 81 | 84 | 4 | 30 | 111 | 114 |
| 1 | 31 | 22 | 23 | 2 | 31 | 52 | 53 | 3 | 31 | 82 | 83 | 4 | 31 | 112 | 113 |
| 1 | 32 | 22 | 24 | 2 | 32 | 52 | 54 | 3 | 32 | 82 | 84 | 4 | 32 | 112 | 114 |
| 1 | 33 | 25 | 29 | 2 | 33 | 55 | 59 | 3 | 33 | 85 | 89 | 4 | 33 | 115 | 119 |
| 1 | 34 | 25 | 30 | 2 | 34 | 55 | 60 | 3 | 34 | 85 | 90 | 4 | 34 | 115 | 120 |
| 1 | 35 | 26 | 29 | 2 | 35 | 56 | 59 | 3 | 35 | 86 | 89 | 4 | 35 | 116 | 119 |
| 1 | 36 | 26 | 30 | 2 | 36 | 56 | 60 | 3 | 36 | 86 | 90 | 4 | 36 | 116 | 120 |
| 1 | 37 | 27 | 29 | 2 | 37 | 57 | 59 | 3 | 37 | 87 | 89 | 4 | 37 | 117 | 119 |
| 1 | 38 | 27 | 30 | 2 | 38 | 57 | 60 | 3 | 38 | 87 | 90 | 4 | 38 | 117 | 120 |
| 1 | 39 | 28 | 29 | 2 | 39 | 58 | 59 | 3 | 39 | 88 | 89 | 4 | 39 | 118 | 119 |
| 1 | 40 | 28 | 30 | 2 | 40 | 58 | 60 | 3 | 40 | 88 | 90 | 4 | 40 | 118 | 120 |

## TABLE 4.5 - Multiplexer Module 40-615-022-2/80/1: Sub-Units

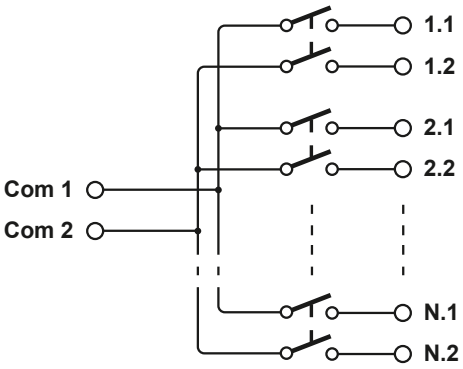
| 2 Bank, 80 Channel, 1 Pole | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Active 1-Pole Relay (Isolation) | | | | | | | | | | | | | | | |
| Active 2-Pole Relay (Multiplexer) | | | | | | | | | | | | | | | |
| SU | Bit | | | SU | Bit | | | SU | Bit | | | SU | Bit | | |
| Bank | Chan | Relays | | Bank | Chan | Relays | | Bank | Chan | Relays | | Bank | Chan | Relays | |
| 1 | 1 | 1 | 5 | 1 | 41 | 31 | 35 | 2 | 1 | 61 | 65 | 2 | 41 | 91 | 95 |
| 1 | 2 | 1 | 6 | 1 | 42 | 31 | 36 | 2 | 2 | 61 | 66 | 2 | 42 | 91 | 96 |
| 1 | 3 | 2 | 5 | 1 | 43 | 32 | 35 | 2 | 3 | 62 | 65 | 2 | 43 | 92 | 95 |
| 1 | 4 | 2 | 6 | 1 | 44 | 32 | 36 | 2 | 4 | 62 | 66 | 2 | 44 | 92 | 96 |
| 1 | 5 | 3 | 5 | 1 | 45 | 33 | 35 | 2 | 5 | 63 | 65 | 2 | 45 | 93 | 95 |
| 1 | 6 | 3 | 6 | 1 | 46 | 33 | 36 | 2 | 6 | 63 | 66 | 2 | 46 | 93 | 96 |
| 1 | 7 | 4 | 5 | 1 | 47 | 34 | 35 | 2 | 7 | 64 | 65 | 2 | 47 | 94 | 95 |
| 1 | 8 | 4 | 6 | 1 | 48 | 34 | 36 | 2 | 8 | 64 | 66 | 2 | 48 | 94 | 96 |
| 1 | 9 | 7 | 11 | 1 | 49 | 37 | 41 | 2 | 9 | 67 | 71 | 2 | 49 | 97 | 101 |
| 1 | 10 | 7 | 12 | 1 | 50 | 37 | 42 | 2 | 10 | 67 | 72 | 2 | 50 | 97 | 102 |
| 1 | 11 | 8 | 11 | 1 | 51 | 38 | 41 | 2 | 11 | 68 | 71 | 2 | 51 | 98 | 101 |
| 1 | 12 | 8 | 12 | 1 | 52 | 38 | 42 | 2 | 12 | 68 | 72 | 2 | 52 | 98 | 102 |
| 1 | 13 | 9 | 11 | 1 | 53 | 39 | 41 | 2 | 13 | 69 | 71 | 2 | 53 | 99 | 101 |
| 1 | 14 | 9 | 12 | 1 | 54 | 39 | 42 | 2 | 14 | 69 | 72 | 2 | 54 | 99 | 102 |
| 1 | 15 | 10 | 11 | 1 | 55 | 40 | 41 | 2 | 15 | 70 | 71 | 2 | 55 | 100 | 101 |
| 1 | 16 | 10 | 12 | 1 | 56 | 40 | 42 | 2 | 16 | 70 | 72 | 2 | 56 | 100 | 102 |
| 1 | 17 | 13 | 17 | 1 | 57 | 43 | 47 | 2 | 17 | 73 | 77 | 2 | 57 | 103 | 107 |
| 1 | 18 | 13 | 18 | 1 | 58 | 43 | 48 | 2 | 18 | 73 | 78 | 2 | 58 | 103 | 108 |
| 1 | 19 | 14 | 17 | 1 | 59 | 44 | 47 | 2 | 19 | 74 | 77 | 2 | 59 | 104 | 107 |
| 1 | 20 | 14 | 18 | 1 | 60 | 44 | 48 | 2 | 20 | 74 | 78 | 2 | 60 | 104 | 108 |
| 1 | 21 | 15 | 17 | 1 | 61 | 45 | 47 | 2 | 21 | 75 | 77 | 2 | 61 | 105 | 107 |
| 1 | 22 | 15 | 18 | 1 | 62 | 45 | 48 | 2 | 22 | 75 | 78 | 2 | 62 | 105 | 108 |
| 1 | 23 | 16 | 17 | 1 | 63 | 46 | 47 | 2 | 23 | 76 | 77 | 2 | 63 | 106 | 107 |
| 1 | 24 | 16 | 18 | 1 | 64 | 46 | 48 | 2 | 24 | 76 | 78 | 2 | 64 | 106 | 108 |
| 1 | 25 | 19 | 23 | 1 | 65 | 49 | 53 | 2 | 25 | 79 | 83 | 2 | 65 | 109 | 113 |
| 1 | 26 | 19 | 24 | 1 | 66 | 49 | 54 | 2 | 26 | 79 | 84 | 2 | 66 | 109 | 114 |
| 1 | 27 | 20 | 23 | 1 | 67 | 50 | 53 | 2 | 27 | 80 | 83 | 2 | 67 | 110 | 113 |
| 1 | 28 | 20 | 24 | 1 | 68 | 50 | 54 | 2 | 28 | 80 | 84 | 2 | 68 | 110 | 114 |
| 1 | 29 | 21 | 23 | 1 | 69 | 51 | 53 | 2 | 29 | 81 | 83 | 2 | 69 | 111 | 113 |
| 1 | 30 | 21 | 24 | 1 | 70 | 51 | 54 | 2 | 30 | 81 | 84 | 2 | 70 | 111 | 114 |
| 1 | 31 | 22 | 23 | 1 | 71 | 52 | 53 | 2 | 31 | 82 | 83 | 2 | 71 | 112 | 113 |
| 1 | 32 | 22 | 24 | 1 | 72 | 52 | 54 | 2 | 32 | 82 | 84 | 2 | 72 | 112 | 114 |
| 1 | 33 | 25 | 29 | 1 | 73 | 55 | 59 | 2 | 33 | 85 | 89 | 2 | 73 | 115 | 119 |
| 1 | 34 | 25 | 30 | 1 | 74 | 55 | 60 | 2 | 34 | 85 | 90 | 2 | 74 | 115 | 120 |
| 1 | 35 | 26 | 29 | 1 | 75 | 56 | 59 | 2 | 35 | 86 | 89 | 2 | 75 | 116 | 119 |
| 1 | 36 | 26 | 30 | 1 | 76 | 56 | 60 | 2 | 36 | 86 | 90 | 2 | 76 | 116 | 120 |
| 1 | 37 | 27 | 29 | 1 | 77 | 57 | 59 | 2 | 37 | 87 | 89 | 2 | 77 | 117 | 119 |
| 1 | 38 | 27 | 30 | 1 | 78 | 57 | 60 | 2 | 38 | 87 | 90 | 2 | 78 | 117 | 120 |
| 1 | 39 | 28 | 29 | 1 | 79 | 58 | 59 | 2 | 39 | 88 | 89 | 2 | 79 | 118 | 119 |
| 1 | 40 | 28 | 30 | 1 | 80 | 58 | 60 | 2 | 40 | 88 | 90 | 2 | 80 | 118 | 120 |

## TABLE 4.6 - Multiplexer Module 40-615-022-1/160/1: Sub-Units

| 1 Bank, 160 Channel, 1 Pole | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Active 1-Pole Relay (Isolation) | | | | | | | | | | | | | | | |
| Active 2-Pole Relay (Multiplexer) | | | | | | | | | | | | | | | |
| SU | Bit | | | SU | Bit | | | SU | Bit | | | SU | Bit | | |
| Bank | Chan | Relays | | Bank | Chan | Relays | | Bank | Chan | Relays | | Bank | Chan | Relays | |
| 1 | 1 | 1 | 5 | 1 | 41 | 31 | 35 | 1 | 81 | 61 | 65 | 1 | 121 | 91 | 95 |
| 1 | 2 | 1 | 6 | 1 | 42 | 31 | 36 | 1 | 82 | 61 | 66 | 1 | 122 | 91 | 96 |
| 1 | 3 | 2 | 5 | 1 | 43 | 32 | 35 | 1 | 83 | 62 | 65 | 1 | 123 | 92 | 95 |
| 1 | 4 | 2 | 6 | 1 | 44 | 32 | 36 | 1 | 84 | 62 | 66 | 1 | 124 | 92 | 96 |
| 1 | 5 | 3 | 5 | 1 | 45 | 33 | 35 | 1 | 85 | 63 | 65 | 1 | 125 | 93 | 95 |
| 1 | 6 | 3 | 6 | 1 | 46 | 33 | 36 | 1 | 86 | 63 | 66 | 1 | 126 | 93 | 96 |
| 1 | 7 | 4 | 5 | 1 | 47 | 34 | 35 | 1 | 87 | 64 | 65 | 1 | 127 | 94 | 95 |
| 1 | 8 | 4 | 6 | 1 | 48 | 34 | 36 | 1 | 88 | 64 | 66 | 1 | 128 | 94 | 96 |
| 1 | 9 | 7 | 11 | 1 | 49 | 37 | 41 | 1 | 89 | 67 | 71 | 1 | 129 | 97 | 101 |
| 1 | 10 | 7 | 12 | 1 | 50 | 37 | 42 | 1 | 90 | 67 | 72 | 1 | 130 | 97 | 102 |
| 1 | 11 | 8 | 11 | 1 | 51 | 38 | 41 | 1 | 91 | 68 | 71 | 1 | 131 | 98 | 101 |
| 1 | 12 | 8 | 12 | 1 | 52 | 38 | 42 | 1 | 92 | 68 | 72 | 1 | 132 | 98 | 102 |
| 1 | 13 | 9 | 11 | 1 | 53 | 39 | 41 | 1 | 93 | 69 | 71 | 1 | 133 | 99 | 101 |
| 1 | 14 | 9 | 12 | 1 | 54 | 39 | 42 | 1 | 94 | 69 | 72 | 1 | 134 | 99 | 102 |
| 1 | 15 | 10 | 11 | 1 | 55 | 40 | 41 | 1 | 95 | 70 | 71 | 1 | 135 | 100 | 101 |
| 1 | 16 | 10 | 12 | 1 | 56 | 40 | 42 | 1 | 96 | 70 | 72 | 1 | 136 | 100 | 102 |
| 1 | 17 | 13 | 17 | 1 | 57 | 43 | 47 | 1 | 97 | 73 | 77 | 1 | 137 | 103 | 107 |
| 1 | 18 | 13 | 18 | 1 | 58 | 43 | 48 | 1 | 98 | 73 | 78 | 1 | 138 | 103 | 108 |
| 1 | 19 | 14 | 17 | 1 | 59 | 44 | 47 | 1 | 99 | 74 | 77 | 1 | 139 | 104 | 107 |
| 1 | 20 | 14 | 18 | 1 | 60 | 44 | 48 | 1 | 100 | 74 | 78 | 1 | 140 | 104 | 108 |
| 1 | 21 | 15 | 17 | 1 | 61 | 45 | 47 | 1 | 101 | 75 | 77 | 1 | 141 | 105 | 107 |
| 1 | 22 | 15 | 18 | 1 | 62 | 45 | 48 | 1 | 102 | 75 | 78 | 1 | 142 | 105 | 108 |
| 1 | 23 | 16 | 17 | 1 | 63 | 46 | 47 | 1 | 103 | 76 | 77 | 1 | 143 | 106 | 107 |
| 1 | 24 | 16 | 18 | 1 | 64 | 46 | 48 | 1 | 104 | 76 | 78 | 1 | 144 | 106 | 108 |
| 1 | 25 | 19 | 23 | 1 | 65 | 49 | 53 | 1 | 105 | 79 | 83 | 1 | 145 | 109 | 113 |
| 1 | 26 | 19 | 24 | 1 | 66 | 49 | 54 | 1 | 106 | 79 | 84 | 1 | 146 | 109 | 114 |
| 1 | 27 | 20 | 23 | 1 | 67 | 50 | 53 | 1 | 107 | 80 | 83 | 1 | 147 | 110 | 113 |
| 1 | 28 | 20 | 24 | 1 | 68 | 50 | 54 | 1 | 108 | 80 | 84 | 1 | 148 | 110 | 114 |
| 1 | 29 | 21 | 23 | 1 | 69 | 51 | 53 | 1 | 109 | 81 | 83 | 1 | 149 | 111 | 113 |
| 1 | 30 | 21 | 24 | 1 | 70 | 51 | 54 | 1 | 110 | 81 | 84 | 1 | 150 | 111 | 114 |
| 1 | 31 | 22 | 23 | 1 | 71 | 52 | 53 | 1 | 111 | 82 | 83 | 1 | 151 | 112 | 113 |
| 1 | 32 | 22 | 24 | 1 | 72 | 52 | 54 | 1 | 112 | 82 | 84 | 1 | 152 | 112 | 114 |
| 1 | 33 | 25 | 29 | 1 | 73 | 55 | 59 | 1 | 113 | 85 | 89 | 1 | 153 | 115 | 119 |
| 1 | 34 | 25 | 30 | 1 | 74 | 55 | 60 | 1 | 114 | 85 | 90 | 1 | 154 | 115 | 120 |
| 1 | 35 | 26 | 29 | 1 | 75 | 56 | 59 | 1 | 115 | 86 | 89 | 1 | 155 | 116 | 119 |
| 1 | 36 | 26 | 30 | 1 | 76 | 56 | 60 | 1 | 116 | 86 | 90 | 1 | 156 | 116 | 120 |
| 1 | 37 | 27 | 29 | 1 | 77 | 57 | 59 | 1 | 117 | 87 | 89 | 1 | 157 | 117 | 119 |
| 1 | 38 | 27 | 30 | 1 | 78 | 57 | 60 | 1 | 118 | 87 | 90 | 1 | 158 | 117 | 120 |
| 1 | 39 | 28 | 29 | 1 | 79 | 58 | 59 | 1 | 119 | 88 | 89 | 1 | 159 | 118 | 119 |
| 1 | 40 | 28 | 30 | 1 | 80 | 58 | 60 | 1 | 120 | 88 | 90 | 1 | 160 | 118 | 120 |

## MODULE ARCHITECTURE 40-615-022: HIGH DENSITY 2 POLE MUX

The 40-615-022 High Density 2 Pole Multiplexer is an array of 80 DPST relays. In the default state all relays are open circuit. Energising a particular relay creates a signal path between the relays common terminals and the corresponding channel terminals. The relay module's switching architecture is shown in the default state in the diagram below:




- 20 Banks of 4 Channels
- 10 Banks of 8 Channels
- 5 Banks of 16 Channels
- 4 Bank of 20 Channels
- 2 Banks of 40 Channels
- 1 Bank of 80 Channels

**Figure 4.2 - 2-Pole MUX Mode (high density) – Available Configurations**

The sub-units used to control the module's relays correspond to the module banks as shown below.

| Module | Banks | Channels | Sub-Units | Bits / Sub-Unit |
|---|---|---|---|---|
| 40-615-022-20/4/2 | 20 | 4 | 20 | 4 |
| 40-615-022-10/8/2 | 10 | 8 | 10 | 8 |
| 40-615-022-5/16/2 | 5 | 16 | 5 | 16 |
| 40-615-022-4/20/2 | 4 | 20 | 4 | 20 |
| 40-615-022-2/40/2 | 2 | 40 | 2 | 40 |
| 40-615-022-1/80/2 | 1 | 80 | 1 | 80 |

Enabling a particular bit operates the corresponding relay as detailed in the tables.

## TABLE 4.7 - Multiplexer Module 40-615-022-20/4/2: Sub-Units

| 20 Bank, 4 Channel, 2 Pole | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Active 2-Pole Relay | | | | | | | | | | | | | | | | |
| SU | | Bit | | SU | | Bit | | SU | | Bit | | SU | | Bit | | |
| Bank | Chan | | RL | Bank | Chan | | RL | Bank | Chan | | RL | Bank | Chan | | RL | |
| 1 | 1.1 | 1 | 1 | 6 | 1.1 | 1 | 31 | 11 | 1.1 | 1 | 61 | 16 | 1.1 | 1 | 91 | |
| 1 | 1.2 | | 1 | 6 | 1.2 | | 31 | 11 | 1.2 | | 61 | 16 | 1.2 | | 91 | |
| 1 | 2.1 | 2 | 2 | 6 | 2.1 | 2 | 32 | 11 | 2.1 | 2 | 62 | 16 | 2.1 | 2 | 92 | |
| 1 | 2.2 | | 2 | 6 | 2.2 | | 32 | 11 | 2.2 | | 62 | 16 | 2.2 | | 92 | |
| 1 | 3.1 | 3 | 3 | 6 | 3.1 | 3 | 33 | 11 | 3.1 | 3 | 63 | 16 | 3.1 | 3 | 93 | |
| 1 | 3.2 | | 3 | 6 | 3.2 | | 33 | 11 | 3.2 | | 63 | 16 | 3.2 | | 93 | |
| 1 | 4.1 | 4 | 4 | 6 | 4.1 | 4 | 34 | 11 | 4.1 | 4 | 64 | 16 | 4.1 | 4 | 94 | |
| 1 | 4.2 | | 4 | 6 | 4.2 | | 34 | 11 | 4.2 | | 64 | 16 | 4.2 | | 94 | |
| 2 | 1.1 | 1 | 7 | 7 | 1.1 | 1 | 37 | 12 | 1.1 | 1 | 67 | 17 | 1.1 | 1 | 97 | |
| 2 | 1.2 | | 7 | 7 | 1.2 | | 37 | 12 | 1.2 | | 67 | 17 | 1.2 | | 97 | |
| 2 | 2.1 | 2 | 8 | 7 | 2.1 | 2 | 38 | 12 | 2.1 | 2 | 68 | 17 | 2.1 | 2 | 98 | |
| 2 | 2.2 | | 8 | 7 | 2.2 | | 38 | 12 | 2.2 | | 68 | 17 | 2.2 | | 98 | |
| 2 | 3.1 | 3 | 9 | 7 | 3.1 | 3 | 39 | 12 | 3.1 | 3 | 69 | 17 | 3.1 | 3 | 99 | |
| 2 | 3.2 | | 9 | 7 | 3.2 | | 39 | 12 | 3.2 | | 69 | 17 | 3.2 | | 99 | |
| 2 | 4.1 | 4 | 10 | 7 | 4.1 | 4 | 40 | 12 | 4.1 | 4 | 70 | 17 | 4.1 | 4 | 100 | |
| 2 | 4.2 | | 10 | 7 | 4.2 | | 40 | 12 | 4.2 | | 70 | 17 | 4.2 | | 100 | |
| 3 | 1.1 | 1 | 13 | 8 | 1.1 | 1 | 43 | 13 | 1.1 | 1 | 73 | 18 | 1.1 | 1 | 103 | |
| 3 | 1.2 | | 13 | 8 | 1.2 | | 43 | 13 | 1.2 | | 73 | 18 | 1.2 | | 103 | |
| 3 | 2.1 | 2 | 14 | 8 | 2.1 | 2 | 44 | 13 | 2.1 | 2 | 74 | 18 | 2.1 | 2 | 104 | |
| 3 | 2.2 | | 14 | 8 | 2.2 | | 44 | 13 | 2.2 | | 74 | 18 | 2.2 | | 104 | |
| 3 | 3.1 | 3 | 15 | 8 | 3.1 | 3 | 45 | 13 | 3.1 | 3 | 75 | 18 | 3.1 | 3 | 105 | |
| 3 | 3.2 | | 15 | 8 | 3.2 | | 45 | 13 | 3.2 | | 75 | 18 | 3.2 | | 105 | |
| 3 | 4.1 | 4 | 16 | 8 | 4.1 | 4 | 46 | 13 | 4.1 | 4 | 76 | 18 | 4.1 | 4 | 106 | |
| 3 | 4.2 | | 16 | 8 | 4.2 | | 46 | 13 | 4.2 | | 76 | 18 | 4.2 | | 106 | |
| 4 | 1.1 | 1 | 19 | 9 | 1.1 | 1 | 49 | 14 | 1.1 | 1 | 79 | 19 | 1.1 | 1 | 109 | |
| 4 | 1.2 | | 19 | 9 | 1.2 | | 49 | 14 | 1.2 | | 79 | 19 | 1.2 | | 109 | |
| 4 | 2.1 | 2 | 20 | 9 | 2.1 | 2 | 50 | 14 | 2.1 | 2 | 80 | 19 | 2.1 | 2 | 110 | |
| 4 | 2.2 | | 20 | 9 | 2.2 | | 50 | 14 | 2.2 | | 80 | 19 | 2.2 | | 110 | |
| 4 | 3.1 | 3 | 21 | 9 | 3.1 | 3 | 51 | 14 | 3.1 | 3 | 81 | 19 | 3.1 | 3 | 111 | |
| 4 | 3.2 | | 21 | 9 | 3.2 | | 51 | 14 | 3.2 | | 81 | 19 | 3.2 | | 111 | |
| 4 | 4.1 | 4 | 22 | 9 | 4.1 | 4 | 52 | 14 | 4.1 | 4 | 82 | 19 | 4.1 | 4 | 112 | |
| 4 | 4.2 | | 22 | 9 | 4.2 | | 52 | 14 | 4.2 | | 82 | 19 | 4.2 | | 112 | |
| 5 | 1.1 | 1 | 25 | 10 | 1.1 | 1 | 55 | 15 | 1.1 | 1 | 85 | 20 | 1.1 | 1 | 115 | |
| 5 | 1.2 | | 25 | 10 | 1.2 | | 55 | 15 | 1.2 | | 85 | 20 | 1.2 | | 115 | |
| 5 | 2.1 | 2 | 26 | 10 | 2.1 | 2 | 56 | 15 | 2.1 | 2 | 86 | 20 | 2.1 | 2 | 116 | |
| 5 | 2.2 | | 26 | 10 | 2.2 | | 56 | 15 | 2.2 | | 86 | 20 | 2.2 | | 116 | |
| 5 | 3.1 | 3 | 27 | 10 | 3.1 | 3 | 57 | 15 | 3.1 | 3 | 87 | 20 | 3.1 | 3 | 117 | |
| 5 | 3.2 | | 27 | 10 | 3.2 | | 57 | 15 | 3.2 | | 87 | 20 | 3.2 | | 117 | |
| 5 | 4.1 | 4 | 28 | 10 | 4.1 | 4 | 58 | 15 | 4.1 | 4 | 88 | 20 | 4.1 | 4 | 118 | |
| 5 | 4.2 | | 28 | 10 | 4.2 | | 58 | 15 | 4.2 | | 88 | 20 | 4.2 | | 118 | |

## TABLE 4.8 - Multiplexer Module 40-615-022-10/8/2: Sub-Units

| 10 Bank, 8 Channel, 2 Pole | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Active 2-Pole Relay | | | | | | | | | | | | | | | |
| SU | | Bit | | SU | | Bit | | SU | | Bit | | SU | | Bit | |
| Bank | Chan | | RL | Bank | Chan | | RL | Bank | Chan | | RL | Bank | Chan | | RL |
| 1 | 1.1 | 1 | 1 | 3 | 5.1 | 5 | 31 | 6 | 1.1 | 1 | 61 | 8 | 5.1 | 5 | 91 |
| 1 | 1.2 | | 1 | 3 | 5.2 | | 31 | 6 | 1.2 | | 61 | 8 | 5.2 | | 91 |
| 1 | 2.1 | 2 | 2 | 3 | 6.1 | 6 | 32 | 6 | 2.1 | 2 | 62 | 8 | 6.1 | 6 | 92 |
| 1 | 2.2 | | 2 | 3 | 6.2 | | 32 | 6 | 2.2 | | 62 | 8 | 6.2 | | 92 |
| 1 | 3.1 | 3 | 3 | 3 | 7.1 | 7 | 33 | 6 | 3.1 | 3 | 63 | 8 | 7.1 | 7 | 93 |
| 1 | 3.2 | | 3 | 3 | 7.2 | | 33 | 6 | 3.2 | | 63 | 8 | 7.2 | | 93 |
| 1 | 4.1 | 4 | 4 | 3 | 8.1 | 8 | 34 | 6 | 4.1 | 4 | 64 | 8 | 8.1 | 8 | 94 |
| 1 | 4.2 | | 4 | 3 | 8.2 | | 34 | 6 | 4.2 | | 64 | 8 | 8.2 | | 94 |
| 1 | 5.1 | 5 | 7 | 4 | 1.1 | 1 | 37 | 6 | 5.1 | 5 | 67 | 9 | 1.1 | 1 | 97 |
| 1 | 5.2 | | 7 | 4 | 1.2 | | 37 | 6 | 5.2 | | 67 | 9 | 1.2 | | 97 |
| 1 | 6.1 | 6 | 8 | 4 | 2.1 | 2 | 38 | 6 | 6.1 | 6 | 68 | 9 | 2.1 | 2 | 98 |
| 1 | 6.2 | | 8 | 4 | 2.2 | | 38 | 6 | 6.2 | | 68 | 9 | 2.2 | | 98 |
| 1 | 7.1 | 7 | 9 | 4 | 3.1 | 3 | 39 | 6 | 7.1 | 7 | 69 | 9 | 3.1 | 3 | 99 |
| 1 | 7.2 | | 9 | 4 | 3.2 | | 39 | 6 | 7.2 | | 69 | 9 | 3.2 | | 99 |
| 1 | 8.1 | 8 | 10 | 4 | 4.1 | 4 | 40 | 6 | 8.1 | 8 | 70 | 9 | 4.1 | 4 | 100 |
| 1 | 8.2 | | 10 | 4 | 4.2 | | 40 | 6 | 8.2 | | 70 | 9 | 4.2 | | 100 |
| 2 | 1.1 | 1 | 13 | 4 | 5.1 | 5 | 43 | 7 | 1.1 | 1 | 73 | 9 | 5.1 | 5 | 103 |
| 2 | 1.2 | | 13 | 4 | 5.2 | | 43 | 7 | 1.2 | | 73 | 9 | 5.2 | | 103 |
| 2 | 2.1 | 2 | 14 | 4 | 6.1 | 6 | 44 | 7 | 2.1 | 2 | 74 | 9 | 6.1 | 6 | 104 |
| 2 | 2.2 | | 14 | 4 | 6.2 | | 44 | 7 | 2.2 | | 74 | 9 | 6.2 | | 104 |
| 2 | 3.1 | 3 | 15 | 4 | 7.1 | 7 | 45 | 7 | 3.1 | 3 | 75 | 9 | 7.1 | 7 | 105 |
| 2 | 3.2 | | 15 | 4 | 7.2 | | 45 | 7 | 3.2 | | 75 | 9 | 7.2 | | 105 |
| 2 | 4.1 | 4 | 16 | 4 | 8.1 | 8 | 46 | 7 | 4.1 | 4 | 76 | 9 | 8.1 | 8 | 106 |
| 2 | 4.2 | | 16 | 4 | 8.2 | | 46 | 7 | 4.2 | | 76 | 9 | 8.2 | | 106 |
| 2 | 5.1 | 5 | 19 | 5 | 1.1 | 1 | 49 | 7 | 5.1 | 5 | 79 | 10 | 1.1 | 1 | 109 |
| 2 | 5.2 | | 19 | 5 | 1.2 | | 49 | 7 | 5.2 | | 79 | 10 | 1.2 | | 109 |
| 2 | 6.1 | 6 | 20 | 5 | 2.1 | 2 | 50 | 7 | 6.1 | 6 | 80 | 10 | 2.1 | 2 | 110 |
| 2 | 6.2 | | 20 | 5 | 2.2 | | 50 | 7 | 6.2 | | 80 | 10 | 2.2 | | 110 |
| 2 | 7.1 | 7 | 21 | 5 | 3.1 | 3 | 51 | 7 | 7.1 | 7 | 81 | 10 | 3.1 | 3 | 111 |
| 2 | 7.2 | | 21 | 5 | 3.2 | | 51 | 7 | 7.2 | | 81 | 10 | 3.2 | | 111 |
| 2 | 8.1 | 8 | 22 | 5 | 4.1 | 4 | 52 | 7 | 8.1 | 8 | 82 | 10 | 4.1 | 4 | 112 |
| 2 | 8.2 | | 22 | 5 | 4.2 | | 52 | 7 | 8.2 | | 82 | 10 | 4.2 | | 112 |
| 3 | 1.1 | 1 | 25 | 5 | 5.1 | 5 | 55 | 8 | 1.1 | 1 | 85 | 10 | 5.1 | 5 | 115 |
| 3 | 1.2 | | 25 | 5 | 5.2 | | 55 | 8 | 1.2 | | 85 | 10 | 5.2 | | 115 |
| 3 | 2.1 | 2 | 26 | 5 | 6.1 | 6 | 56 | 8 | 2.1 | 2 | 86 | 10 | 6.1 | 6 | 116 |
| 3 | 2.2 | | 26 | 5 | 6.2 | | 56 | 8 | 2.2 | | 86 | 10 | 6.2 | | 116 |
| 3 | 3.1 | 3 | 27 | 5 | 7.1 | 7 | 57 | 8 | 3.1 | 3 | 87 | 10 | 7.1 | 7 | 117 |
| 3 | 3.2 | | 27 | 5 | 7.2 | | 57 | 8 | 3.2 | | 87 | 10 | 7.2 | | 117 |
| 3 | 4.1 | 4 | 28 | 5 | 8.1 | 8 | 58 | 8 | 4.1 | 4 | 88 | 10 | 8.1 | 8 | 118 |
| 3 | 4.2 | | 28 | 5 | 8.2 | | 58 | 8 | 4.2 | | 88 | 10 | 8.2 | | 118 |

## TABLE 4.9 - Multiplexer Module 40-615-022-5/16/2: Sub-Units

| 5 Bank, 16 Channel, 2 Pole | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Active 2-Pole Relay | | | | | | | | | | | | | | | |
| SU | | Bit | | SU | | Bit | | SU | | Bit | | SU | | Bit | |
| Bank | Chan | | RL | Bank | Chan | | RL | Bank | Chan | | RL | Bank | Chan | | RL |
| 1 | 1.1 | 1 | 1 | 2 | 5.1 | 5 | 31 | 3 | 9.1 | 9 | 61 | 4 | 13.1 | 13 | 91 |
| 1 | 1.2 | | 1 | 2 | 5.2 | | 31 | 3 | 9.2 | | 61 | 4 | 13.2 | | 91 |
| 1 | 2.1 | 2 | 2 | 2 | 6.1 | 6 | 32 | 3 | 10.1 | 10 | 62 | 4 | 14.1 | 14 | 92 |
| 1 | 2.2 | | 2 | 2 | 6.2 | | 32 | 3 | 10.2 | | 62 | 4 | 14.2 | | 92 |
| 1 | 3.1 | 3 | 3 | 2 | 7.1 | 7 | 33 | 3 | 11.1 | 11 | 63 | 4 | 15.1 | 15 | 93 |
| 1 | 3.2 | | 3 | 2 | 7.2 | | 33 | 3 | 11.2 | | 63 | 4 | 15.2 | | 93 |
| 1 | 4.1 | 4 | 4 | 2 | 8.1 | 8 | 34 | 3 | 12.1 | 12 | 64 | 4 | 16.1 | 16 | 94 |
| 1 | 4.2 | | 4 | 2 | 8.2 | | 34 | 3 | 12.2 | | 64 | 4 | 16.2 | | 94 |
| 1 | 5.1 | 5 | 7 | 2 | 9.1 | 9 | 37 | 3 | 13.1 | 13 | 67 | 5 | 1.1 | 1 | 97 |
| 1 | 5.2 | | 7 | 2 | 9.2 | | 37 | 3 | 13.2 | | 67 | 5 | 1.2 | | 97 |
| 1 | 6.1 | 6 | 8 | 2 | 10.1 | 10 | 38 | 3 | 14.1 | 14 | 68 | 5 | 2.1 | 2 | 98 |
| 1 | 6.2 | | 8 | 2 | 10.2 | | 38 | 3 | 14.2 | | 68 | 5 | 2.2 | | 98 |
| 1 | 7.1 | 7 | 9 | 2 | 11.1 | 11 | 39 | 3 | 15.1 | 15 | 69 | 5 | 3.1 | 3 | 99 |
| 1 | 7.2 | | 9 | 2 | 11.2 | | 39 | 3 | 15.2 | | 69 | 5 | 3.2 | | 99 |
| 1 | 8.1 | 8 | 10 | 2 | 12.1 | 12 | 40 | 3 | 16.1 | 16 | 70 | 5 | 4.1 | 4 | 100 |
| 1 | 8.2 | | 10 | 2 | 12.2 | | 40 | 3 | 16.2 | | 70 | 5 | 4.2 | | 100 |
| 1 | 9.1 | 9 | 13 | 2 | 13.1 | 13 | 43 | 4 | 1.1 | 1 | 73 | 5 | 5.1 | 5 | 103 |
| 1 | 9.2 | | 13 | 2 | 13.2 | | 43 | 4 | 1.2 | | 73 | 5 | 5.2 | | 103 |
| 1 | 10.1 | 10 | 14 | 2 | 14.1 | 14 | 44 | 4 | 2.1 | 2 | 74 | 5 | 6.1 | 6 | 104 |
| 1 | 10.2 | | 14 | 2 | 14.2 | | 44 | 4 | 2.2 | | 74 | 5 | 6.2 | | 104 |
| 1 | 11.1 | 11 | 15 | 2 | 15.1 | 15 | 45 | 4 | 3.1 | 3 | 75 | 5 | 7.1 | 7 | 105 |
| 1 | 11.2 | | 15 | 2 | 15.2 | | 45 | 4 | 3.2 | | 75 | 5 | 7.2 | | 105 |
| 1 | 12.1 | 12 | 16 | 2 | 16.1 | 16 | 46 | 4 | 4.1 | 4 | 76 | 5 | 8.1 | 8 | 106 |
| 1 | 12.2 | | 16 | 2 | 16.2 | | 46 | 4 | 4.2 | | 76 | 5 | 8.2 | | 106 |
| 1 | 13.1 | 13 | 19 | 3 | 1.1 | 1 | 49 | 4 | 5.1 | 5 | 79 | 5 | 9.1 | 9 | 109 |
| 1 | 13.2 | | 19 | 3 | 1.2 | | 49 | 4 | 5.2 | | 79 | 5 | 9.2 | | 109 |
| 1 | 14.1 | 14 | 20 | 3 | 2.1 | 2 | 50 | 4 | 6.1 | 6 | 80 | 5 | 10.1 | 10 | 110 |
| 1 | 14.2 | | 20 | 3 | 2.2 | | 50 | 4 | 6.2 | | 80 | 5 | 10.2 | | 110 |
| 1 | 15.1 | 15 | 21 | 3 | 3.1 | 3 | 51 | 4 | 7.1 | 7 | 81 | 5 | 11.1 | 11 | 111 |
| 1 | 15.2 | | 21 | 3 | 3.2 | | 51 | 4 | 7.2 | | 81 | 5 | 11.2 | | 111 |
| 1 | 16.1 | 16 | 22 | 3 | 4.1 | 4 | 52 | 4 | 8.1 | 8 | 82 | 5 | 12.1 | 12 | 112 |
| 1 | 16.2 | | 22 | 3 | 4.2 | | 52 | 4 | 8.2 | | 82 | 5 | 12.2 | | 112 |
| 2 | 1.1 | 1 | 25 | 3 | 5.1 | 5 | 55 | 4 | 9.1 | 9 | 85 | 5 | 13.1 | 13 | 115 |
| 2 | 1.2 | | 25 | 3 | 5.2 | | 55 | 4 | 9.2 | | 85 | 5 | 13.2 | | 115 |
| 2 | 2.1 | 2 | 26 | 3 | 6.1 | 6 | 56 | 4 | 10.1 | 10 | 86 | 5 | 14.1 | 14 | 116 |
| 2 | 2.2 | | 26 | 3 | 6.2 | | 56 | 4 | 10.2 | | 86 | 5 | 14.2 | | 116 |
| 2 | 3.1 | 3 | 27 | 3 | 7.1 | 7 | 57 | 4 | 11.1 | 11 | 87 | 5 | 15.1 | 15 | 117 |
| 2 | 3.2 | | 27 | 3 | 7.2 | | 57 | 4 | 11.2 | | 87 | 5 | 15.2 | | 117 |
| 2 | 4.1 | 4 | 28 | 3 | 8.1 | 8 | 58 | 4 | 12.1 | 12 | 88 | 5 | 16.1 | 16 | 118 |
| 2 | 4.2 | | 28 | 3 | 8.2 | | 58 | 4 | 12.2 | | 88 | 5 | 16.2 | | 118 |

## TABLE 4.10 - Multiplexer Module 40-615-022-4/20/2: Sub-Units

| 4 Bank, 20 Channel, 2 Pole | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Active 2-Pole Relay | | | | | | | | | | | | | | | |
| SU | | Bit | | SU | | Bit | | SU | | Bit | | SU | | Bit | |
| Bank | Chan | | RL | Bank | Chan | | RL | Bank | Chan | | RL | Bank | Chan | | RL |
| 1 | 1.1 | 1 | 1 | 2 | 1.1 | 1 | 31 | 3 | 1.1 | 1 | 61 | 4 | 1.1 | 1 | 91 |
| 1 | 1.2 | | 1 | 2 | 1.2 | | 31 | 3 | 1.2 | | 61 | 4 | 1.2 | | 91 |
| 1 | 2.1 | 2 | 2 | 2 | 2.1 | 2 | 32 | 3 | 2.1 | 2 | 62 | 4 | 2.1 | 2 | 92 |
| 1 | 2.2 | | 2 | 2 | 2.2 | | 32 | 3 | 2.2 | | 62 | 4 | 2.2 | | 92 |
| 1 | 3.1 | 3 | 3 | 2 | 3.1 | 3 | 33 | 3 | 3.1 | 3 | 63 | 4 | 3.1 | 3 | 93 |
| 1 | 3.2 | | 3 | 2 | 3.2 | | 33 | 3 | 3.2 | | 63 | 4 | 3.2 | | 93 |
| 1 | 4.1 | 4 | 4 | 2 | 4.1 | 4 | 34 | 3 | 4.1 | 4 | 64 | 4 | 4.1 | 4 | 94 |
| 1 | 4.2 | | 4 | 2 | 4.2 | | 34 | 3 | 4.2 | | 64 | 4 | 4.2 | | 94 |
| 1 | 5.1 | 5 | 7 | 2 | 5.1 | 5 | 37 | 3 | 5.1 | 5 | 67 | 4 | 5.1 | 5 | 97 |
| 1 | 5.2 | | 7 | 2 | 5.2 | | 37 | 3 | 5.2 | | 67 | 4 | 5.2 | | 97 |
| 1 | 6.1 | 6 | 8 | 2 | 6.1 | 6 | 38 | 3 | 6.1 | 6 | 68 | 4 | 6.1 | 6 | 98 |
| 1 | 6.2 | | 8 | 2 | 6.2 | | 38 | 3 | 6.2 | | 68 | 4 | 6.2 | | 98 |
| 1 | 7.1 | 7 | 9 | 2 | 7.1 | 7 | 39 | 3 | 7.1 | 7 | 69 | 4 | 7.1 | 7 | 99 |
| 1 | 7.2 | | 9 | 2 | 7.2 | | 39 | 3 | 7.2 | | 69 | 4 | 7.2 | | 99 |
| 1 | 8.1 | 8 | 10 | 2 | 8.1 | 8 | 40 | 3 | 8.1 | 8 | 70 | 4 | 8.1 | 8 | 100 |
| 1 | 8.2 | | 10 | 2 | 8.2 | | 40 | 3 | 8.2 | | 70 | 4 | 8.2 | | 100 |
| 1 | 9.1 | 9 | 13 | 2 | 9.1 | 9 | 43 | 3 | 9.1 | 9 | 73 | 4 | 9.1 | 9 | 103 |
| 1 | 9.2 | | 13 | 2 | 9.2 | | 43 | 3 | 9.2 | | 73 | 4 | 9.2 | | 103 |
| 1 | 10.1 | 10 | 14 | 2 | 10.1 | 10 | 44 | 3 | 10.1 | 10 | 74 | 4 | 10.1 | 10 | 104 |
| 1 | 10.2 | | 14 | 2 | 10.2 | | 44 | 3 | 10.2 | | 74 | 4 | 10.2 | | 104 |
| 1 | 11.1 | 11 | 15 | 2 | 11.1 | 11 | 45 | 3 | 11.1 | 11 | 75 | 4 | 11.1 | 11 | 105 |
| 1 | 11.2 | | 15 | 2 | 11.2 | | 45 | 3 | 11.2 | | 75 | 4 | 11.2 | | 105 |
| 1 | 12.1 | 12 | 16 | 2 | 12.1 | 12 | 46 | 3 | 12.1 | 12 | 76 | 4 | 12.1 | 12 | 106 |
| 1 | 12.2 | | 16 | 2 | 12.2 | | 46 | 3 | 12.2 | | 76 | 4 | 12.2 | | 106 |
| 1 | 13.1 | 13 | 19 | 2 | 13.1 | 13 | 49 | 3 | 13.1 | 13 | 79 | 4 | 13.1 | 13 | 109 |
| 1 | 13.2 | | 19 | 2 | 13.2 | | 49 | 3 | 13.2 | | 79 | 4 | 13.2 | | 109 |
| 1 | 14.1 | 14 | 20 | 2 | 14.1 | 14 | 50 | 3 | 14.1 | 14 | 80 | 4 | 14.1 | 14 | 110 |
| 1 | 14.2 | | 20 | 2 | 14.2 | | 50 | 3 | 14.2 | | 80 | 4 | 14.2 | | 110 |
| 1 | 15.1 | 15 | 21 | 2 | 15.1 | 15 | 51 | 3 | 15.1 | 15 | 81 | 4 | 15.1 | 15 | 111 |
| 1 | 15.2 | | 21 | 2 | 15.2 | | 51 | 3 | 15.2 | | 81 | 4 | 15.2 | | 111 |
| 1 | 16.1 | 16 | 22 | 2 | 16.1 | 16 | 52 | 3 | 16.1 | 16 | 82 | 4 | 16.1 | 16 | 112 |
| 1 | 16.2 | | 22 | 2 | 16.2 | | 52 | 3 | 16.2 | | 82 | 4 | 16.2 | | 112 |
| 1 | 17.1 | 17 | 25 | 2 | 17.1 | 17 | 55 | 3 | 17.1 | 17 | 85 | 4 | 17.1 | 17 | 115 |
| 1 | 17.2 | | 25 | 2 | 17.2 | | 55 | 3 | 17.2 | | 85 | 4 | 17.2 | | 115 |
| 1 | 18.1 | 18 | 26 | 2 | 18.1 | 18 | 56 | 3 | 18.1 | 18 | 86 | 4 | 18.1 | 18 | 116 |
| 1 | 18.2 | | 26 | 2 | 18.2 | | 56 | 3 | 18.2 | | 86 | 4 | 18.2 | | 116 |
| 1 | 19.1 | 19 | 27 | 2 | 19.1 | 19 | 57 | 3 | 19.1 | 19 | 87 | 4 | 19.1 | 19 | 117 |
| 1 | 19.2 | | 27 | 2 | 19.2 | | 57 | 3 | 19.2 | | 87 | 4 | 19.2 | | 117 |
| 1 | 20.1 | 20 | 28 | 2 | 20.1 | 20 | 58 | 3 | 20.1 | 20 | 88 | 4 | 20.1 | 20 | 118 |
| 1 | 20.2 | | 28 | 2 | 20.2 | | 58 | 3 | 20.2 | | 88 | 4 | 20.2 | | 118 |

## TABLE 4.11 - Multiplexer Module 40-615-022-2/40/2: Sub-Units

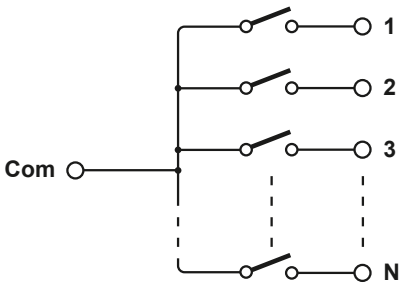
| 2 Bank, 40 Channel, 2 Pole | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Active 2-Pole Relay | | | | | | | | | | | | | | | |
| SU | | Bit | | SU | | Bit | | SU | | Bit | | SU | | Bit | |
| Bank | Chan | | RL | Bank | Chan | | RL | Bank | Chan | | RL | Bank | Chan | | RL |
| 1 | 1.1 | 1 | 1 | 1 | 21.1 | 21 | 31 | 2 | 1.1 | 1 | 61 | 2 | 21.1 | 21 | 91 |
| 1 | 1.2 | | 1 | 1 | 21.2 | | 31 | 2 | 1.2 | | 61 | 2 | 21.2 | | 91 |
| 1 | 2.1 | 2 | 2 | 1 | 22.1 | 22 | 32 | 2 | 2.1 | 2 | 62 | 2 | 22.1 | 22 | 92 |
| 1 | 2.2 | | 2 | 1 | 22.2 | | 32 | 2 | 2.2 | | 62 | 2 | 22.2 | | 92 |
| 1 | 3.1 | 3 | 3 | 1 | 23.1 | 23 | 33 | 2 | 3.1 | 3 | 63 | 2 | 23.1 | 23 | 93 |
| 1 | 3.2 | | 3 | 1 | 23.2 | | 33 | 2 | 3.2 | | 63 | 2 | 23.2 | | 93 |
| 1 | 4.1 | 4 | 4 | 1 | 24.1 | 24 | 34 | 2 | 4.1 | 4 | 64 | 2 | 24.1 | 24 | 94 |
| 1 | 4.2 | | 4 | 1 | 24.2 | | 34 | 2 | 4.2 | | 64 | 2 | 24.2 | | 94 |
| 1 | 5.1 | 5 | 7 | 1 | 25.1 | 25 | 37 | 2 | 5.1 | 5 | 67 | 2 | 25.1 | 25 | 97 |
| 1 | 5.2 | | 7 | 1 | 25.2 | | 37 | 2 | 5.2 | | 67 | 2 | 25.2 | | 97 |
| 1 | 6.1 | 6 | 8 | 1 | 26.1 | 26 | 38 | 2 | 6.1 | 6 | 68 | 2 | 26.1 | 26 | 98 |
| 1 | 6.2 | | 8 | 1 | 26.2 | | 38 | 2 | 6.2 | | 68 | 2 | 26.2 | | 98 |
| 1 | 7.1 | 7 | 9 | 1 | 27.1 | 27 | 39 | 2 | 7.1 | 7 | 69 | 2 | 27.1 | 27 | 99 |
| 1 | 7.2 | | 9 | 1 | 27.2 | | 39 | 2 | 7.2 | | 69 | 2 | 27.2 | | 99 |
| 1 | 8.1 | 8 | 10 | 1 | 28.1 | 28 | 40 | 2 | 8.1 | 8 | 70 | 2 | 28.1 | 28 | 100 |
| 1 | 8.2 | | 10 | 1 | 28.2 | | 40 | 2 | 8.2 | | 70 | 2 | 28.2 | | 100 |
| 1 | 9.1 | 9 | 13 | 1 | 29.1 | 29 | 43 | 2 | 9.1 | 9 | 73 | 2 | 29.1 | 29 | 103 |
| 1 | 9.2 | | 13 | 1 | 29.2 | | 43 | 2 | 9.2 | | 73 | 2 | 29.2 | | 103 |
| 1 | 10.1 | 10 | 14 | 1 | 30.1 | 30 | 44 | 2 | 10.1 | 10 | 74 | 2 | 30.1 | 30 | 104 |
| 1 | 10.2 | | 14 | 1 | 30.2 | | 44 | 2 | 10.2 | | 74 | 2 | 30.2 | | 104 |
| 1 | 11.1 | 11 | 15 | 1 | 31.1 | 31 | 45 | 2 | 11.1 | 11 | 75 | 2 | 31.1 | 31 | 105 |
| 1 | 11.2 | | 15 | 1 | 31.2 | | 45 | 2 | 11.2 | | 75 | 2 | 31.2 | | 105 |
| 1 | 12.1 | 12 | 16 | 1 | 32.1 | 32 | 46 | 2 | 12.1 | 12 | 76 | 2 | 32.1 | 32 | 106 |
| 1 | 12.2 | | 16 | 1 | 32.2 | | 46 | 2 | 12.2 | | 76 | 2 | 32.2 | | 106 |
| 1 | 13.1 | 13 | 19 | 1 | 33.1 | 33 | 49 | 2 | 13.1 | 13 | 79 | 2 | 33.1 | 33 | 109 |
| 1 | 13.2 | | 19 | 1 | 33.2 | | 49 | 2 | 13.2 | | 79 | 2 | 33.2 | | 109 |
| 1 | 14.1 | 14 | 20 | 1 | 34.1 | 34 | 50 | 2 | 14.1 | 14 | 80 | 2 | 34.1 | 34 | 110 |
| 1 | 14.2 | | 20 | 1 | 34.2 | | 50 | 2 | 14.2 | | 80 | 2 | 34.2 | | 110 |
| 1 | 15.1 | 15 | 21 | 1 | 35.1 | 35 | 51 | 2 | 15.1 | 15 | 81 | 2 | 35.1 | 35 | 111 |
| 1 | 15.2 | | 21 | 1 | 35.2 | | 51 | 2 | 15.2 | | 81 | 2 | 35.2 | | 111 |
| 1 | 16.1 | 16 | 22 | 1 | 36.1 | 36 | 52 | 2 | 16.1 | 16 | 82 | 2 | 36.1 | 36 | 112 |
| 1 | 16.2 | | 22 | 1 | 36.2 | | 52 | 2 | 16.2 | | 82 | 2 | 36.2 | | 112 |
| 1 | 17.1 | 17 | 25 | 1 | 37.1 | 37 | 55 | 2 | 17.1 | 17 | 85 | 2 | 37.1 | 37 | 115 |
| 1 | 17.2 | | 25 | 1 | 37.2 | | 55 | 2 | 17.2 | | 85 | 2 | 37.2 | | 115 |
| 1 | 18.1 | 18 | 26 | 1 | 38.1 | 38 | 56 | 2 | 18.1 | 18 | 86 | 2 | 38.1 | 38 | 116 |
| 1 | 18.2 | | 26 | 1 | 38.2 | | 56 | 2 | 18.2 | | 86 | 2 | 38.2 | | 116 |
| 1 | 19.1 | 19 | 27 | 1 | 39.1 | 39 | 57 | 2 | 19.1 | 19 | 87 | 2 | 39.1 | 39 | 117 |
| 1 | 19.2 | | 27 | 1 | 39.2 | | 57 | 2 | 19.2 | | 87 | 2 | 39.2 | | 117 |
| 1 | 20.1 | 20 | 28 | 1 | 40.1 | 40 | 58 | 2 | 20.1 | 20 | 88 | 2 | 40.1 | 40 | 118 |
| 1 | 20.2 | | 28 | 1 | 40.2 | | 58 | 2 | 20.2 | | 88 | 2 | 40.2 | | 118 |

## TABLE 4.12 - Multiplexer Module 40-615-022-1/80/2: Sub-Units

| 1 Bank, 80 Channel, 2 Pole | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Active 2-Pole Relay | | | | | | | | | | | | | | | |
| SU | | Bit | | SU | | Bit | | SU | | Bit | | SU | | Bit | |
| Bank | Chan | | RL | Bank | Chan | | RL | Bank | Chan | | RL | Bank | Chan | | RL |
| 1 | 1.1 | 1 | 1 | 1 | 21.1 | 21 | 31 | 1 | 41.1 | 41 | 61 | 1 | 61.1 | 61 | 91 |
| 1 | 1.2 | | 1 | 1 | 21.2 | | 31 | 1 | 41.2 | | 61 | 1 | 61.2 | | 91 |
| 1 | 2.1 | 2 | 2 | 1 | 22.1 | 22 | 32 | 1 | 42.1 | 42 | 62 | 1 | 62.1 | 62 | 92 |
| 1 | 2.2 | | 2 | 1 | 22.2 | | 32 | 1 | 42.2 | | 62 | 1 | 62.2 | | 92 |
| 1 | 3.1 | 3 | 3 | 1 | 23.1 | 23 | 33 | 1 | 43.1 | 43 | 63 | 1 | 63.1 | 63 | 93 |
| 1 | 3.2 | | 3 | 1 | 23.2 | | 33 | 1 | 43.2 | | 63 | 1 | 63.2 | | 93 |
| 1 | 4.1 | 4 | 4 | 1 | 24.1 | 24 | 34 | 1 | 44.1 | 44 | 64 | 1 | 64.1 | 64 | 94 |
| 1 | 4.2 | | 4 | 1 | 24.2 | | 34 | 1 | 44.2 | | 64 | 1 | 64.2 | | 94 |
| 1 | 5.1 | 5 | 7 | 1 | 25.1 | 25 | 37 | 1 | 45.1 | 45 | 67 | 1 | 65.1 | 65 | 97 |
| 1 | 5.2 | | 7 | 1 | 25.2 | | 37 | 1 | 45.2 | | 67 | 1 | 65.2 | | 97 |
| 1 | 6.1 | 6 | 8 | 1 | 26.1 | 26 | 38 | 1 | 46.1 | 46 | 68 | 1 | 66.1 | 66 | 98 |
| 1 | 6.2 | | 8 | 1 | 26.2 | | 38 | 1 | 46.2 | | 68 | 1 | 66.2 | | 98 |
| 1 | 7.1 | 7 | 9 | 1 | 27.1 | 27 | 39 | 1 | 47.1 | 47 | 69 | 1 | 67.1 | 67 | 99 |
| 1 | 7.2 | | 9 | 1 | 27.2 | | 39 | 1 | 47.2 | | 69 | 1 | 67.2 | | 99 |
| 1 | 8.1 | 8 | 10 | 1 | 28.1 | 28 | 40 | 1 | 48.1 | 48 | 70 | 1 | 68.1 | 68 | 100 |
| 1 | 8.2 | | 10 | 1 | 28.2 | | 40 | 1 | 48.2 | | 70 | 1 | 68.2 | | 100 |
| 1 | 9.1 | 9 | 13 | 1 | 29.1 | 29 | 43 | 1 | 49.1 | 49 | 73 | 1 | 69.1 | 69 | 103 |
| 1 | 9.2 | | 13 | 1 | 29.2 | | 43 | 1 | 49.2 | | 73 | 1 | 69.2 | | 103 |
| 1 | 10.1 | 10 | 14 | 1 | 30.1 | 30 | 44 | 1 | 50.1 | 50 | 74 | 1 | 70.1 | 70 | 104 |
| 1 | 10.2 | | 14 | 1 | 30.2 | | 44 | 1 | 50.2 | | 74 | 1 | 70.2 | | 104 |
| 1 | 11.1 | 11 | 15 | 1 | 31.1 | 31 | 45 | 1 | 51.1 | 51 | 75 | 1 | 71.1 | 71 | 105 |
| 1 | 11.2 | | 15 | 1 | 31.2 | | 45 | 1 | 51.2 | | 75 | 1 | 71.2 | | 105 |
| 1 | 12.1 | 12 | 16 | 1 | 32.1 | 32 | 46 | 1 | 52.1 | 52 | 76 | 1 | 72.1 | 72 | 106 |
| 1 | 12.2 | | 16 | 1 | 32.2 | | 46 | 1 | 52.2 | | 76 | 1 | 72.2 | | 106 |
| 1 | 13.1 | 13 | 19 | 1 | 33.1 | 33 | 49 | 1 | 53.1 | 53 | 79 | 1 | 73.1 | 73 | 109 |
| 1 | 13.2 | | 19 | 1 | 33.2 | | 49 | 1 | 53.2 | | 79 | 1 | 73.2 | | 109 |
| 1 | 14.1 | 14 | 20 | 1 | 34.1 | 34 | 50 | 1 | 54.1 | 54 | 80 | 1 | 74.1 | 74 | 110 |
| 1 | 14.2 | | 20 | 1 | 34.2 | | 50 | 1 | 54.2 | | 80 | 1 | 74.2 | | 110 |
| 1 | 15.1 | 15 | 21 | 1 | 35.1 | 35 | 51 | 1 | 55.1 | 55 | 81 | 1 | 75.1 | 75 | 111 |
| 1 | 15.2 | | 21 | 1 | 35.2 | | 51 | 1 | 55.2 | | 81 | 1 | 75.2 | | 111 |
| 1 | 16.1 | 16 | 22 | 1 | 36.1 | 36 | 52 | 1 | 56.1 | 56 | 82 | 1 | 76.1 | 76 | 112 |
| 1 | 16.2 | | 22 | 1 | 36.2 | | 52 | 1 | 56.2 | | 82 | 1 | 76.2 | | 112 |
| 1 | 17.1 | 17 | 25 | 1 | 37.1 | 37 | 55 | 1 | 57.1 | 57 | 85 | 1 | 77.1 | 77 | 115 |
| 1 | 17.2 | | 25 | 1 | 37.2 | | 55 | 1 | 57.2 | | 85 | 1 | 77.2 | | 115 |
| 1 | 18.1 | 18 | 26 | 1 | 38.1 | 38 | 56 | 1 | 58.1 | 58 | 86 | 1 | 78.1 | 78 | 116 |
| 1 | 18.2 | | 26 | 1 | 38.2 | | 56 | 1 | 58.2 | | 86 | 1 | 78.2 | | 116 |
| 1 | 19.1 | 19 | 27 | 1 | 39.1 | 39 | 57 | 1 | 59.1 | 59 | 87 | 1 | 79.1 | 79 | 117 |
| 1 | 19.2 | | 27 | 1 | 39.2 | | 57 | 1 | 59.2 | | 87 | 1 | 79.2 | | 117 |
| 1 | 20.1 | 20 | 28 | 1 | 40.1 | 40 | 58 | 1 | 60.1 | 60 | 88 | 1 | 80.1 | 80 | 118 |
| 1 | 20.2 | | 28 | 1 | 40.2 | | 58 | 1 | 60.2 | | 88 | 1 | 80.2 | | 118 |

## MODULE ARCHITECTURE 40-615-021: LOW DENSITY 1 POLE MUX

The 40-615-021 Low Density Single Pole Multiplexer is an array of 80 DPST relays. In the default state all relays are open circuit. Energising a particular relay creates a signal path between the relays common terminal and the corresponding channel terminal. The relay module's switching architecture is shown in the default state in the diagram below:




- 20 Banks of 4 Channels
- 10 Banks of 8 Channels
- 5 Banks of 16 Channels
- 4 Banks of 20 Channels
- 2 Banks of 40 Channels
- 1 Bank of 80 Channels

**Figure 4.3 - 1-Pole MUX Mode (low density) – Available Configurations**

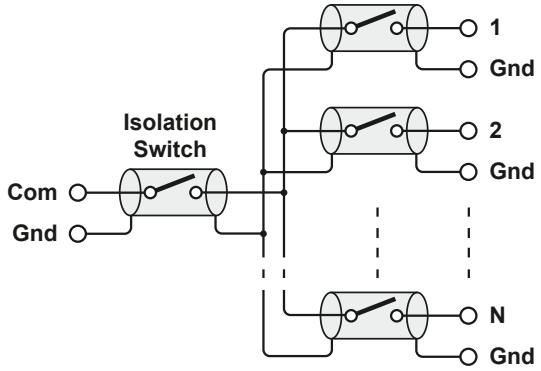
The sub-units used to control the module's relays correspond to the module banks as shown below.

| Module | Banks | Channels | Sub-Units | Bits / Sub-Unit |
|---|---|---|---|---|
| 40-615-021-20/4/1 | 20 | 4 | 20 | 4 |
| 40-615-021-10/8/1 | 10 | 8 | 10 | 8 |
| 40-615-021-5/16/1 | 5 | 16 | 5 | 16 |
| 40-615-021-4/20/1 | 4 | 20 | 4 | 20 |
| 40-615-021-2/40/1 | 2 | 40 | 2 | 40 |
| 40-615-021-1/80/1 | 1 | 80 | 1 | 80 |

Enabling a particular bit operates the corresponding relay as detailed in the tables.

## MODULE ARCHITECTURE 40-615-021: SCREENED LOW DENSITY 1 POLE MUX

The 40-615-021 Low Density 1 Pole Screened Multiplexer is an array of 80 shielded SPST relays and 40 screened SPST Isolation switches. In the default state all relays are open circuit. Energising a particular relay creates a signal path between the common terminal and the corresponding channel terminal. The operation of the isolation relays is automatic, therefore they do not need to be set by the user to create a signal path. The relay module's switching architecture is shown in the default state in the diagram below:




- 20 Banks of 4 Channels
- 4 Banks of 20 Channels

**Figure 4.4 - 1-Pole Screened MUX Mode (low density) – Available Configurations**

The sub-units used to control the module's relays correspond to the module banks as shown below.

| Module | Banks | Channels | Sub-Units | Bits / Sub-Unit |
|---|---|---|---|---|
| 40-615-021-S-20/4/1 | 20 | 4 | 20 | 4 |
| 40-615-021-S-4/20/1 | 4 | 20 | 4 | 20 |

Enabling a particular bit operates the corresponding relay as detailed in the tables.

Note: The tables used for the screened versions are the same as those for the equivalent unscreened versions however the Isolation switches are not detailed.

## TABLE 4.13 - Multiplexer Module 40-615-021: Sub-Units (40-615-021-20/4/1, 40-615-021-10/8/1)

**20 Bank, 4 Channel, 1 Pole**

**Active 1-Pole Relay**

| SU Bit | | | SU Bit | | |
|---|---|---|---|---|---|
| Bank | Chan | Relay | Bank | Chan | Relay |
| 1 | 1 | 1 | 11 | 1 | 61 |
| 1 | 2 | 2 | 11 | 2 | 62 |
| 1 | 3 | 3 | 11 | 3 | 63 |
| 1 | 4 | 4 | 11 | 4 | 64 |
| 2 | 1 | 7 | 12 | 1 | 67 |
| 2 | 2 | 8 | 12 | 2 | 68 |
| 2 | 3 | 9 | 12 | 3 | 69 |
| 2 | 4 | 10 | 12 | 4 | 70 |
| 3 | 1 | 13 | 13 | 1 | 73 |
| 3 | 2 | 14 | 13 | 2 | 74 |
| 3 | 3 | 15 | 13 | 3 | 75 |
| 3 | 4 | 16 | 13 | 4 | 76 |
| 4 | 1 | 19 | 14 | 1 | 79 |
| 4 | 2 | 20 | 14 | 2 | 80 |
| 4 | 3 | 21 | 14 | 3 | 81 |
| 4 | 4 | 22 | 14 | 4 | 82 |
| 5 | 1 | 25 | 15 | 1 | 85 |
| 5 | 2 | 26 | 15 | 2 | 86 |
| 5 | 3 | 27 | 15 | 3 | 87 |
| 5 | 4 | 28 | 15 | 4 | 88 |
| 6 | 1 | 31 | 16 | 1 | 91 |
| 6 | 2 | 32 | 16 | 2 | 92 |
| 6 | 3 | 33 | 16 | 3 | 93 |
| 6 | 4 | 34 | 16 | 4 | 94 |
| 7 | 1 | 37 | 17 | 1 | 97 |
| 7 | 2 | 38 | 17 | 2 | 98 |
| 7 | 3 | 39 | 17 | 3 | 99 |
| 7 | 4 | 40 | 17 | 4 | 100 |
| 8 | 1 | 43 | 18 | 1 | 103 |
| 8 | 2 | 44 | 18 | 2 | 104 |
| 8 | 3 | 45 | 18 | 3 | 105 |
| 8 | 4 | 46 | 18 | 4 | 106 |
| 9 | 1 | 49 | 19 | 1 | 109 |
| 9 | 2 | 50 | 19 | 2 | 110 |
| 9 | 3 | 51 | 19 | 3 | 111 |
| 9 | 4 | 52 | 19 | 4 | 112 |
| 10 | 1 | 55 | 20 | 1 | 115 |
| 10 | 2 | 56 | 20 | 2 | 116 |
| 10 | 3 | 57 | 20 | 3 | 117 |
| 10 | 4 | 58 | 20 | 4 | 118 |

**10 Bank, 8 Channel, 1 Pole**

**Active 1-Pole Relay**

| SU Bit | | | SU Bit | | |
|---|---|---|---|---|---|
| Bank | Chan | Relay | Bank | Chan | Relay |
| 1 | 1 | 1 | 6 | 1 | 61 |
| 1 | 2 | 2 | 6 | 2 | 62 |
| 1 | 3 | 3 | 6 | 3 | 63 |
| 1 | 4 | 4 | 6 | 4 | 64 |
| 1 | 5 | 7 | 6 | 5 | 67 |
| 1 | 6 | 8 | 6 | 6 | 68 |
| 1 | 7 | 9 | 6 | 7 | 69 |
| 1 | 8 | 10 | 6 | 8 | 70 |
| 2 | 1 | 13 | 7 | 1 | 73 |
| 2 | 2 | 14 | 7 | 2 | 74 |
| 2 | 3 | 15 | 7 | 3 | 75 |
| 2 | 4 | 16 | 7 | 4 | 76 |
| 2 | 5 | 19 | 7 | 5 | 79 |
| 2 | 6 | 20 | 7 | 6 | 80 |
| 2 | 7 | 21 | 7 | 7 | 81 |
| 2 | 8 | 22 | 7 | 8 | 82 |
| 3 | 1 | 25 | 8 | 1 | 85 |
| 3 | 2 | 26 | 8 | 2 | 86 |
| 3 | 3 | 27 | 8 | 3 | 87 |
| 3 | 4 | 28 | 8 | 4 | 88 |
| 3 | 5 | 31 | 8 | 5 | 91 |
| 3 | 6 | 32 | 8 | 6 | 92 |
| 3 | 7 | 33 | 8 | 7 | 93 |
| 3 | 8 | 34 | 8 | 8 | 94 |
| 4 | 1 | 37 | 9 | 1 | 97 |
| 4 | 2 | 38 | 9 | 2 | 98 |
| 4 | 3 | 39 | 9 | 3 | 99 |
| 4 | 4 | 40 | 9 | 4 | 100 |
| 4 | 5 | 43 | 9 | 5 | 103 |
| 4 | 6 | 44 | 9 | 6 | 104 |
| 4 | 7 | 45 | 9 | 7 | 105 |
| 4 | 8 | 46 | 9 | 8 | 106 |
| 5 | 1 | 49 | 10 | 1 | 109 |
| 5 | 2 | 50 | 10 | 2 | 110 |
| 5 | 3 | 51 | 10 | 3 | 111 |
| 5 | 4 | 52 | 10 | 4 | 112 |
| 5 | 5 | 55 | 10 | 5 | 115 |
| 5 | 6 | 56 | 10 | 6 | 116 |
| 5 | 7 | 57 | 10 | 7 | 117 |
| 5 | 8 | 58 | 10 | 8 | 118 |

# TABLE 4.14 - Multiplexer Module 40-615-021: Sub-Units (40-615-021-5/16/1, 40-615-021-4/20/1)

## 5 Bank, 16 Channel, 1 Pole

Active 1-Pole Relay

| SU Bit | | | SU Bit | | |
|---|---|---|---|---|---|
| Bank | Chan | Relay | Bank | Chan | Relay |
| 1 | 1 | 1 | 3 | 9 | 61 |
| 1 | 2 | 2 | 3 | 10 | 62 |
| 1 | 3 | 3 | 3 | 11 | 63 |
| 1 | 4 | 4 | 3 | 12 | 64 |
| 1 | 5 | 7 | 3 | 13 | 67 |
| 1 | 6 | 8 | 3 | 14 | 68 |
| 1 | 7 | 9 | 3 | 15 | 69 |
| 1 | 8 | 10 | 3 | 16 | 70 |
| 1 | 9 | 13 | 4 | 1 | 73 |
| 1 | 10 | 14 | 4 | 2 | 74 |
| 1 | 11 | 15 | 4 | 3 | 75 |
| 1 | 12 | 16 | 4 | 4 | 76 |
| 1 | 13 | 19 | 4 | 5 | 79 |
| 1 | 14 | 20 | 4 | 6 | 80 |
| 1 | 15 | 21 | 4 | 7 | 81 |
| 1 | 16 | 22 | 4 | 8 | 82 |
| 2 | 1 | 25 | 4 | 9 | 85 |
| 2 | 2 | 26 | 4 | 10 | 86 |
| 2 | 3 | 27 | 4 | 11 | 87 |
| 2 | 4 | 28 | 4 | 12 | 88 |
| 2 | 5 | 31 | 4 | 13 | 91 |
| 2 | 6 | 32 | 4 | 14 | 92 |
| 2 | 7 | 33 | 4 | 15 | 93 |
| 2 | 8 | 34 | 4 | 16 | 94 |
| 2 | 9 | 37 | 5 | 1 | 97 |
| 2 | 10 | 38 | 5 | 2 | 98 |
| 2 | 11 | 39 | 5 | 3 | 99 |
| 2 | 12 | 40 | 5 | 4 | 100 |
| 2 | 13 | 43 | 5 | 5 | 103 |
| 2 | 14 | 44 | 5 | 6 | 104 |
| 2 | 15 | 45 | 5 | 7 | 105 |
| 2 | 16 | 46 | 5 | 8 | 106 |
| 3 | 1 | 49 | 5 | 9 | 109 |
| 3 | 2 | 50 | 5 | 10 | 110 |
| 3 | 3 | 51 | 5 | 11 | 111 |
| 3 | 4 | 52 | 5 | 12 | 112 |
| 3 | 5 | 55 | 5 | 13 | 115 |
| 3 | 6 | 56 | 5 | 14 | 116 |
| 3 | 7 | 57 | 5 | 15 | 117 |
| 3 | 8 | 58 | 5 | 16 | 118 |

## 4 Bank, 20 Channel, 1 Pole

Active 1-Pole Relay

| SU Bit | | | SU Bit | | |
|---|---|---|---|---|---|
| Bank | Chan | Relay | Bank | Chan | Relay |
| 1 | 1 | 1 | 3 | 1 | 61 |
| 1 | 2 | 2 | 3 | 2 | 62 |
| 1 | 3 | 3 | 3 | 3 | 63 |
| 1 | 4 | 4 | 3 | 4 | 64 |
| 1 | 5 | 7 | 3 | 5 | 67 |
| 1 | 6 | 8 | 3 | 6 | 68 |
| 1 | 7 | 9 | 3 | 7 | 69 |
| 1 | 8 | 10 | 3 | 8 | 70 |
| 1 | 9 | 13 | 3 | 9 | 73 |
| 1 | 10 | 14 | 3 | 10 | 74 |
| 1 | 11 | 15 | 3 | 11 | 75 |
| 1 | 12 | 16 | 3 | 12 | 76 |
| 1 | 13 | 19 | 3 | 13 | 79 |
| 1 | 14 | 20 | 3 | 14 | 80 |
| 1 | 15 | 21 | 3 | 15 | 81 |
| 1 | 16 | 22 | 3 | 16 | 82 |
| 1 | 17 | 25 | 3 | 17 | 85 |
| 1 | 18 | 26 | 3 | 18 | 86 |
| 1 | 19 | 27 | 3 | 19 | 87 |
| 1 | 20 | 28 | 3 | 20 | 88 |
| 2 | 1 | 31 | 4 | 1 | 91 |
| 2 | 2 | 32 | 4 | 2 | 92 |
| 2 | 3 | 33 | 4 | 3 | 93 |
| 2 | 4 | 34 | 4 | 4 | 94 |
| 2 | 5 | 37 | 4 | 5 | 97 |
| 2 | 6 | 38 | 4 | 6 | 98 |
| 2 | 7 | 39 | 4 | 7 | 99 |
| 2 | 8 | 40 | 4 | 8 | 100 |
| 2 | 9 | 43 | 4 | 9 | 103 |
| 2 | 10 | 44 | 4 | 10 | 104 |
| 2 | 11 | 45 | 4 | 11 | 105 |
| 2 | 12 | 46 | 4 | 12 | 106 |
| 2 | 13 | 49 | 4 | 13 | 109 |
| 2 | 14 | 50 | 4 | 14 | 110 |
| 2 | 15 | 51 | 4 | 15 | 111 |
| 2 | 16 | 52 | 4 | 16 | 112 |
| 2 | 17 | 55 | 4 | 17 | 115 |
| 2 | 18 | 56 | 4 | 18 | 116 |
| 2 | 19 | 57 | 4 | 19 | 117 |
| 2 | 20 | 58 | 4 | 20 | 118 |

## TABLE 4.15 - Multiplexer Module 40-615-021: Sub-Units (40-615-021-2/40/1, 40-615-021-1/80/1)

| 2 Bank, 40 Channel, 1 Pole | | | | | |
|---|---|---|---|---|---|
| Active 1-Pole Relay | | | | | |
| SU Bit | | | SU Bit | | |
| Bank | Chan | Relay | Bank | Chan | Relay |
| 1 | 1 | 1 | 2 | 1 | 61 |
| 1 | 2 | 2 | 2 | 2 | 62 |
| 1 | 3 | 3 | 2 | 3 | 63 |
| 1 | 4 | 4 | 2 | 4 | 64 |
| 1 | 5 | 7 | 2 | 5 | 67 |
| 1 | 6 | 8 | 2 | 6 | 68 |
| 1 | 7 | 9 | 2 | 7 | 69 |
| 1 | 8 | 10 | 2 | 8 | 70 |
| 1 | 9 | 13 | 2 | 9 | 73 |
| 1 | 10 | 14 | 2 | 10 | 74 |
| 1 | 11 | 15 | 2 | 11 | 75 |
| 1 | 12 | 16 | 2 | 12 | 76 |
| 1 | 13 | 19 | 2 | 13 | 79 |
| 1 | 14 | 20 | 2 | 14 | 80 |
| 1 | 15 | 21 | 2 | 15 | 81 |
| 1 | 16 | 22 | 2 | 16 | 82 |
| 1 | 17 | 25 | 2 | 17 | 85 |
| 1 | 18 | 26 | 2 | 18 | 86 |
| 1 | 19 | 27 | 2 | 19 | 87 |
| 1 | 20 | 28 | 2 | 20 | 88 |
| 1 | 21 | 31 | 2 | 21 | 91 |
| 1 | 22 | 32 | 2 | 22 | 92 |
| 1 | 23 | 33 | 2 | 23 | 93 |
| 1 | 24 | 34 | 2 | 24 | 94 |
| 1 | 25 | 37 | 2 | 25 | 97 |
| 1 | 26 | 38 | 2 | 26 | 98 |
| 1 | 27 | 39 | 2 | 27 | 99 |
| 1 | 28 | 40 | 2 | 28 | 100 |
| 1 | 29 | 43 | 2 | 29 | 103 |
| 1 | 30 | 44 | 2 | 30 | 104 |
| 1 | 31 | 45 | 2 | 31 | 105 |
| 1 | 32 | 46 | 2 | 32 | 106 |
| 1 | 33 | 49 | 2 | 33 | 109 |
| 1 | 34 | 50 | 2 | 34 | 110 |
| 1 | 35 | 51 | 2 | 35 | 111 |
| 1 | 36 | 52 | 2 | 36 | 112 |
| 1 | 37 | 55 | 2 | 37 | 115 |
| 1 | 38 | 56 | 2 | 38 | 116 |
| 1 | 39 | 57 | 2 | 39 | 117 |
| 1 | 40 | 58 | 2 | 40 | 118 |

| 1 Bank, 80 Channel, 1 Pole | | | | | |
|---|---|---|---|---|---|
| Active 1-Pole Relay | | | | | |
| SU Bit | | | SU Bit | | |
| Bank | Chan | Relay | Bank | Chan | Relay |
| 1 | 1 | 1 | 1 | 41 | 61 |
| 1 | 2 | 2 | 1 | 42 | 62 |
| 1 | 3 | 3 | 1 | 43 | 63 |
| 1 | 4 | 4 | 1 | 44 | 64 |
| 1 | 5 | 7 | 1 | 45 | 67 |
| 1 | 6 | 8 | 1 | 46 | 68 |
| 1 | 7 | 9 | 1 | 47 | 69 |
| 1 | 8 | 10 | 1 | 48 | 70 |
| 1 | 9 | 13 | 1 | 49 | 73 |
| 1 | 10 | 14 | 1 | 50 | 74 |
| 1 | 11 | 15 | 1 | 51 | 75 |
| 1 | 12 | 16 | 1 | 52 | 76 |
| 1 | 13 | 19 | 1 | 53 | 79 |
| 1 | 14 | 20 | 1 | 54 | 80 |
| 1 | 15 | 21 | 1 | 55 | 81 |
| 1 | 16 | 22 | 1 | 56 | 82 |
| 1 | 17 | 25 | 1 | 57 | 85 |
| 1 | 18 | 26 | 1 | 58 | 86 |
| 1 | 19 | 27 | 1 | 59 | 87 |
| 1 | 20 | 28 | 1 | 60 | 88 |
| 1 | 21 | 31 | 1 | 61 | 91 |
| 1 | 22 | 32 | 1 | 62 | 92 |
| 1 | 23 | 33 | 1 | 63 | 93 |
| 1 | 24 | 34 | 1 | 64 | 94 |
| 1 | 25 | 37 | 1 | 65 | 97 |
| 1 | 26 | 38 | 1 | 66 | 98 |
| 1 | 27 | 39 | 1 | 67 | 99 |
| 1 | 28 | 40 | 1 | 68 | 100 |
| 1 | 29 | 43 | 1 | 69 | 103 |
| 1 | 30 | 44 | 1 | 70 | 104 |
| 1 | 31 | 45 | 1 | 71 | 105 |
| 1 | 32 | 46 | 1 | 72 | 106 |
| 1 | 33 | 49 | 1 | 73 | 109 |
| 1 | 34 | 50 | 1 | 74 | 110 |
| 1 | 35 | 51 | 1 | 75 | 111 |
| 1 | 36 | 52 | 1 | 76 | 112 |
| 1 | 37 | 55 | 1 | 77 | 115 |
| 1 | 38 | 56 | 1 | 78 | 116 |
| 1 | 39 | 57 | 1 | 79 | 117 |
| 1 | 40 | 58 | 1 | 80 | 118 |

## PROGRAMMING THE MODULE

Here are some simple examples of using the drivers with the 40-615-022-20/8/1 Multiplexer module. Other modules in the range operate in the same way but have different numbers of sub-units and different bit allocations within each sub-unit as outlined in the previous tables.

### Using PILPXI

To operate a relay the user could use the simple OpBit command or the WriteSub commands

**OpBit**

```
DWORD sub_unit = 1;
PIL_OpBit( card_num, sub_unit, 1, 1);   // Connects channel 1 to common
PIL_OpBit( card_num, sub_unit, 1, 0);   // Disconnects channel 1 from common
PIL_OpBit( card_num, sub_unit, 4, 1);   // Connects channel 4 to common
```

**WriteSub**

```
// Sub-unit is 8 bits wide, so 1 DWORD is needed to hold the pattern
DWORD data[1];
data[0] = 1;            // Sets lowest bit to 1, channel 1 to common
PIL_WriteSub( card_num, sub_unit, data);
data[0] = 0x8;          // Sets 4th bit, channel 4 to common
                        // All other relays are set to off
PIL_WriteSub( card_num, sub_unit, data);
```

### Using PIPX40

**setChannelState**

```
ViUInt32 sub_unit = 1;
pipx40_setChannelState(vi, sub_unit, 1, VI_ON);     // Connects channel 1 to common
pipx40_setChannelState(vi, sub_unit, 1, VI_OFF);    // Disconnects channel 1 from common
pipx40_setChannelState(vi, sub_unit, 4, VI_ON);     // Connects channel 4 to common
```

**setChannelPattern**

```
// Sub-unit is 8 bits wide, so 1 ViUInt32 value is needed to hold the entire pattern
ViUInt32 data[1];
data[0] = 1;            // Sets lowest bit to 1, channel 1 to common
pipx40_setChannelPattern( vi, sub_unit, data);
data[0] = 0x8;          // Sets 4th bit, channel 4 to common
                        // All other relays are set to off
pipx40_setChannelPattern( vi, sub_unit, data);
```

### Using pi40iv

The IVI driver treats the multiplexers as an array of switches labelling the channels using the normal comA/chA labelling tags.

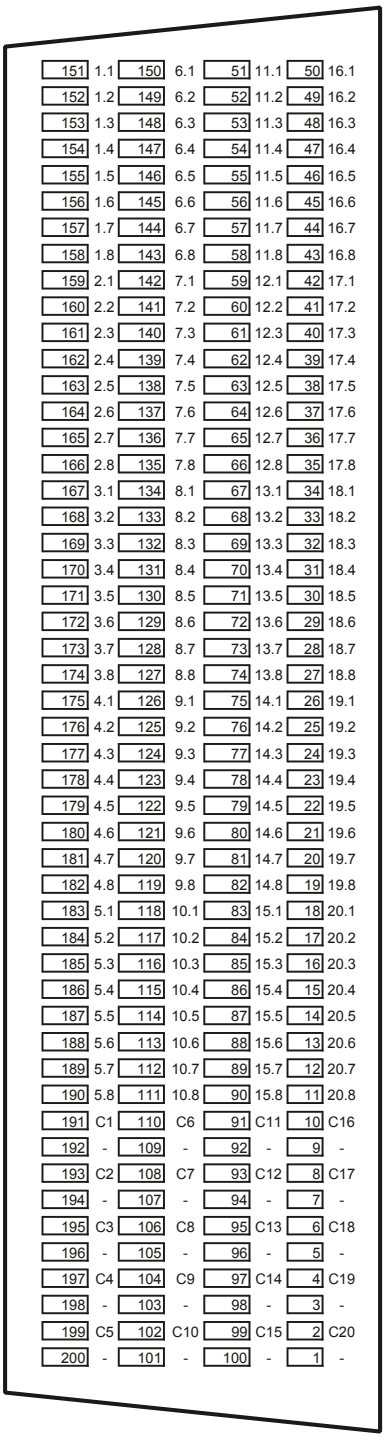
```
pi40iv_Connect(vi, comA, chA1);      // Connects channel 1 to common
pi40iv_Disconnect(vi, comA, chA1);   // Disconnects channel 1 from common
pi40iv_Connect(vi, comA, chA4);      // Connects channel 4 to common
```

For single bank multiplexers the channel labelling is in the form com,ch

The IVI Swtch driver specification contains no bulk setting capabilities.

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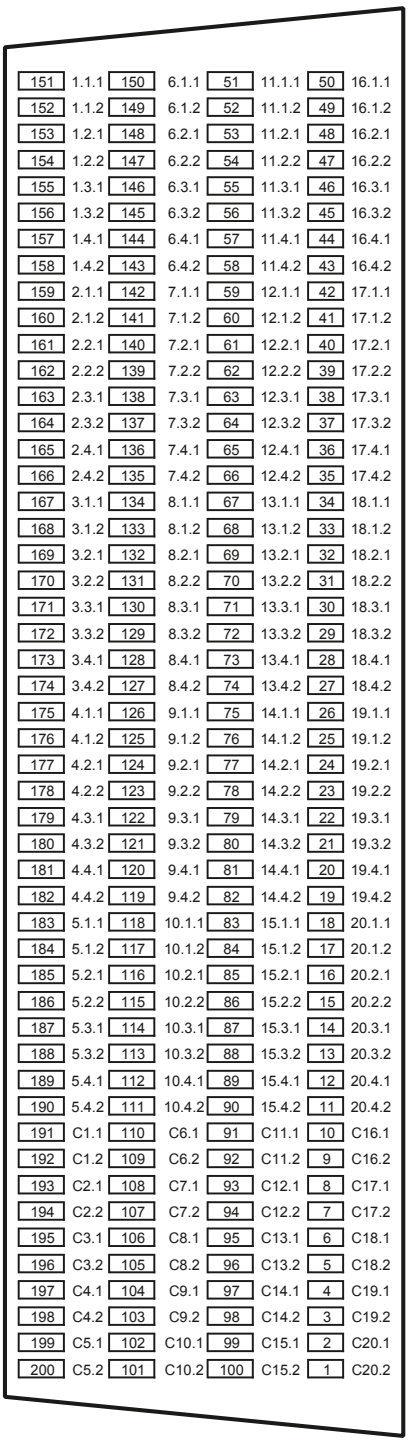
# SECTION 5 - CONNECTOR INFORMATION



| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 151 | 1.1 | 150 | 6.1 | 51 | 11.1 | 50 | 16.1 |
| 152 | 1.2 | 149 | 6.2 | 52 | 11.2 | 49 | 16.2 |
| 153 | 1.3 | 148 | 6.3 | 53 | 11.3 | 48 | 16.3 |
| 154 | 1.4 | 147 | 6.4 | 54 | 11.4 | 47 | 16.4 |
| 155 | 1.5 | 146 | 6.5 | 55 | 11.5 | 46 | 16.5 |
| 156 | 1.6 | 145 | 6.6 | 56 | 11.6 | 45 | 16.6 |
| 157 | 1.7 | 144 | 6.7 | 57 | 11.7 | 44 | 16.7 |
| 158 | 1.8 | 143 | 6.8 | 58 | 11.8 | 43 | 16.8 |
| 159 | 2.1 | 142 | 7.1 | 59 | 12.1 | 42 | 17.1 |
| 160 | 2.2 | 141 | 7.2 | 60 | 12.2 | 41 | 17.2 |
| 161 | 2.3 | 140 | 7.3 | 61 | 12.3 | 40 | 17.3 |
| 162 | 2.4 | 139 | 7.4 | 62 | 12.4 | 39 | 17.4 |
| 163 | 2.5 | 138 | 7.5 | 63 | 12.5 | 38 | 17.5 |
| 164 | 2.6 | 137 | 7.6 | 64 | 12.6 | 37 | 17.6 |
| 165 | 2.7 | 136 | 7.7 | 65 | 12.7 | 36 | 17.7 |
| 166 | 2.8 | 135 | 7.8 | 66 | 12.8 | 35 | 17.8 |
| 167 | 3.1 | 134 | 8.1 | 67 | 13.1 | 34 | 18.1 |
| 168 | 3.2 | 133 | 8.2 | 68 | 13.2 | 33 | 18.2 |
| 169 | 3.3 | 132 | 8.3 | 69 | 13.3 | 32 | 18.3 |
| 170 | 3.4 | 131 | 8.4 | 70 | 13.4 | 31 | 18.4 |
| 171 | 3.5 | 130 | 8.5 | 71 | 13.5 | 30 | 18.5 |
| 172 | 3.6 | 129 | 8.6 | 72 | 13.6 | 29 | 18.6 |
| 173 | 3.7 | 128 | 8.7 | 73 | 13.7 | 28 | 18.7 |
| 174 | 3.8 | 127 | 8.8 | 74 | 13.8 | 27 | 18.8 |
| 175 | 4.1 | 126 | 9.1 | 75 | 14.1 | 26 | 19.1 |
| 176 | 4.2 | 125 | 9.2 | 76 | 14.2 | 25 | 19.2 |
| 177 | 4.3 | 124 | 9.3 | 77 | 14.3 | 24 | 19.3 |
| 178 | 4.4 | 123 | 9.4 | 78 | 14.4 | 23 | 19.4 |
| 179 | 4.5 | 122 | 9.5 | 79 | 14.5 | 22 | 19.5 |
| 180 | 4.6 | 121 | 9.6 | 80 | 14.6 | 21 | 19.6 |
| 181 | 4.7 | 120 | 9.7 | 81 | 14.7 | 20 | 19.7 |
| 182 | 4.8 | 119 | 9.8 | 82 | 14.8 | 19 | 19.8 |
| 183 | 5.1 | 118 | 10.1 | 83 | 15.1 | 18 | 20.1 |
| 184 | 5.2 | 117 | 10.2 | 84 | 15.2 | 17 | 20.2 |
| 185 | 5.3 | 116 | 10.3 | 85 | 15.3 | 16 | 20.3 |
| 186 | 5.4 | 115 | 10.4 | 86 | 15.4 | 15 | 20.4 |
| 187 | 5.5 | 114 | 10.5 | 87 | 15.5 | 14 | 20.5 |
| 188 | 5.6 | 113 | 10.6 | 88 | 15.6 | 13 | 20.6 |
| 189 | 5.7 | 112 | 10.7 | 89 | 15.7 | 12 | 20.7 |
| 190 | 5.8 | 111 | 10.8 | 90 | 15.8 | 11 | 20.8 |
| 191 | C1 | 110 | C6 | 91 | C11 | 10 | C16 |
| 192 | - | 109 | - | 92 | - | 9 | - |
| 193 | C2 | 108 | C7 | 93 | C12 | 8 | C17 |
| 194 | - | 107 | - | 94 | - | 7 | - |
| 195 | C3 | 106 | C8 | 95 | C13 | 6 | C18 |
| 196 | - | 105 | - | 96 | - | 5 | - |
| 197 | C4 | 104 | C9 | 97 | C14 | 4 | C19 |
| 198 | - | 103 | - | 98 | - | 3 | - |
| 199 | C5 | 102 | C10 | 99 | C15 | 2 | C20 |
| 200 | - | 101 | - | 100 | - | 1 | - |

TWENTY BANK EIGHT CHANNEL SINGLE POLE

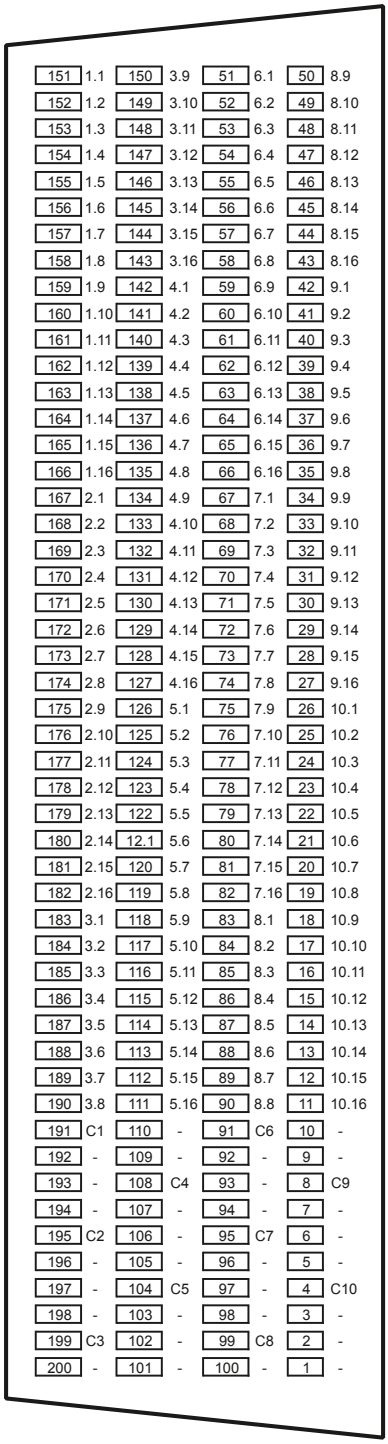
**Figure 5.1 - Module Pin Outs: 40-615-022-20/8/1 (200-pin Female LFH Connector Viewed From Front of Module)**



| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 151 | 1.1.1 | 150 | 6.1.1 | 51 | 11.1.1 | 50 | 16.1.1 |
| 152 | 1.1.2 | 149 | 6.1.2 | 52 | 11.1.2 | 49 | 16.1.2 |
| 153 | 1.2.1 | 148 | 6.2.1 | 53 | 11.2.1 | 48 | 16.2.1 |
| 154 | 1.2.2 | 147 | 6.2.2 | 54 | 11.2.2 | 47 | 16.2.2 |
| 155 | 1.3.1 | 146 | 6.3.1 | 55 | 11.3.1 | 46 | 16.3.1 |
| 156 | 1.3.2 | 145 | 6.3.2 | 56 | 11.3.2 | 45 | 16.3.2 |
| 157 | 1.4.1 | 144 | 6.4.1 | 57 | 11.4.1 | 44 | 16.4.1 |
| 158 | 1.4.2 | 143 | 6.4.2 | 58 | 11.4.2 | 43 | 16.4.2 |
| 159 | 2.1.1 | 142 | 7.1.1 | 59 | 12.1.1 | 42 | 17.1.1 |
| 160 | 2.1.2 | 141 | 7.1.2 | 60 | 12.1.2 | 41 | 17.1.2 |
| 161 | 2.2.1 | 140 | 7.2.1 | 61 | 12.2.1 | 40 | 17.2.1 |
| 162 | 2.2.2 | 139 | 7.2.2 | 62 | 12.2.2 | 39 | 17.2.2 |
| 163 | 2.3.1 | 138 | 7.3.1 | 63 | 12.3.1 | 38 | 17.3.1 |
| 164 | 2.3.2 | 137 | 7.3.2 | 64 | 12.3.2 | 37 | 17.3.2 |
| 165 | 2.4.1 | 136 | 7.4.1 | 65 | 12.4.1 | 36 | 17.4.1 |
| 166 | 2.4.2 | 135 | 7.4.2 | 66 | 12.4.2 | 35 | 17.4.2 |
| 167 | 3.1.1 | 134 | 8.1.1 | 67 | 13.1.1 | 34 | 18.1.1 |
| 168 | 3.1.2 | 133 | 8.1.2 | 68 | 13.1.2 | 33 | 18.1.2 |
| 169 | 3.2.1 | 132 | 8.2.1 | 69 | 13.2.1 | 32 | 18.2.1 |
| 170 | 3.2.2 | 131 | 8.2.2 | 70 | 13.2.2 | 31 | 18.2.2 |
| 171 | 3.3.1 | 130 | 8.3.1 | 71 | 13.3.1 | 30 | 18.3.1 |
| 172 | 3.3.2 | 129 | 8.3.2 | 72 | 13.3.2 | 29 | 18.3.2 |
| 173 | 3.4.1 | 128 | 8.4.1 | 73 | 13.4.1 | 28 | 18.4.1 |
| 174 | 3.4.2 | 127 | 8.4.2 | 74 | 13.4.2 | 27 | 18.4.2 |
| 175 | 4.1.1 | 126 | 9.1.1 | 75 | 14.1.1 | 26 | 19.1.1 |
| 176 | 4.1.2 | 125 | 9.1.2 | 76 | 14.1.2 | 25 | 19.1.2 |
| 177 | 4.2.1 | 124 | 9.2.1 | 77 | 14.2.1 | 24 | 19.2.1 |
| 178 | 4.2.2 | 123 | 9.2.2 | 78 | 14.2.2 | 23 | 19.2.2 |
| 179 | 4.3.1 | 122 | 9.3.1 | 79 | 14.3.1 | 22 | 19.3.1 |
| 180 | 4.3.2 | 121 | 9.3.2 | 80 | 14.3.2 | 21 | 19.3.2 |
| 181 | 4.4.1 | 120 | 9.4.1 | 81 | 14.4.1 | 20 | 19.4.1 |
| 182 | 4.4.2 | 119 | 9.4.2 | 82 | 14.4.2 | 19 | 19.4.2 |
| 183 | 5.1.1 | 118 | 10.1.1 | 83 | 15.1.1 | 18 | 20.1.1 |
| 184 | 5.1.2 | 117 | 10.1.2 | 84 | 15.1.2 | 17 | 20.1.2 |
| 185 | 5.2.1 | 116 | 10.2.1 | 85 | 15.2.1 | 16 | 20.2.1 |
| 186 | 5.2.2 | 115 | 10.2.2 | 86 | 15.2.2 | 15 | 20.2.2 |
| 187 | 5.3.1 | 114 | 10.3.1 | 87 | 15.3.1 | 14 | 20.3.1 |
| 188 | 5.3.2 | 113 | 10.3.2 | 88 | 15.3.2 | 13 | 20.3.2 |
| 189 | 5.4.1 | 112 | 10.4.1 | 89 | 15.4.1 | 12 | 20.4.1 |
| 190 | 5.4.2 | 111 | 10.4.2 | 90 | 15.4.2 | 11 | 20.4.2 |
| 191 | C1.1 | 110 | C6.1 | 91 | C11.1 | 10 | C16.1 |
| 192 | C1.2 | 109 | C6.2 | 92 | C11.2 | 9 | C16.2 |
| 193 | C2.1 | 108 | C7.1 | 93 | C12.1 | 8 | C17.1 |
| 194 | C2.2 | 107 | C7.2 | 94 | C12.2 | 7 | C17.2 |
| 195 | C3.1 | 106 | C8.1 | 95 | C13.1 | 6 | C18.1 |
| 196 | C3.2 | 105 | C8.2 | 96 | C13.2 | 5 | C18.2 |
| 197 | C4.1 | 104 | C9.1 | 97 | C14.1 | 4 | C19.1 |
| 198 | C4.2 | 103 | C9.2 | 98 | C14.2 | 3 | C19.2 |
| 199 | C5.1 | 102 | C10.1 | 99 | C15.1 | 2 | C20.1 |
| 200 | C5.2 | 101 | C10.2 | 100 | C15.2 | 1 | C20.2 |

TWENTY BANK FOUR CHANNEL TWO POLE

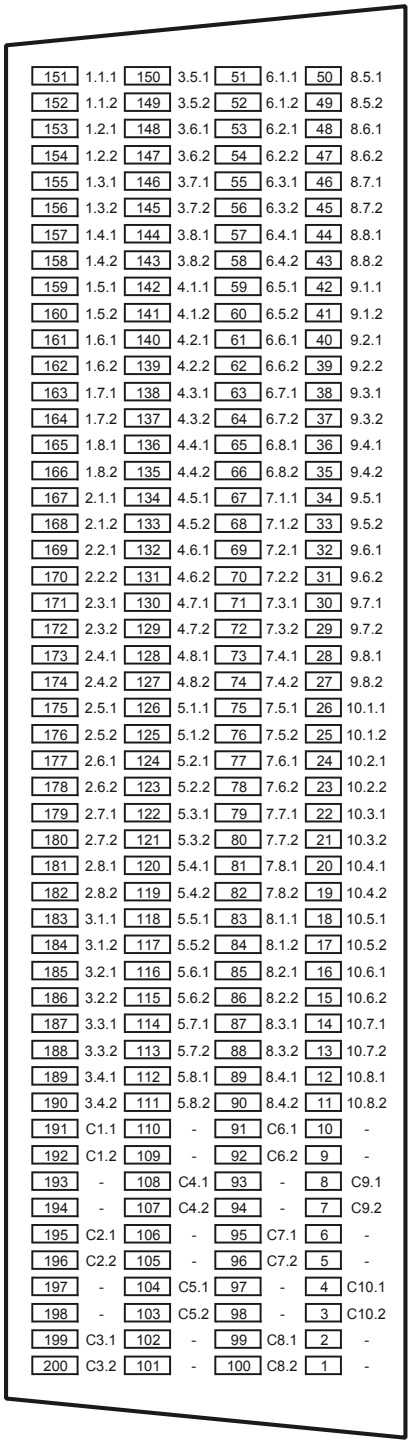
**Figure 5.2 - Module Pin Outs: 40-615-022-20/4/2 (200-pin Female LFH Connector Viewed From Front of Module)**



| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 151 | 1.1 | 150 | 3.9 | 51 | 6.1 | 50 | 8.9 |
| 152 | 1.2 | 149 | 3.10 | 52 | 6.2 | 49 | 8.10 |
| 153 | 1.3 | 148 | 3.11 | 53 | 6.3 | 48 | 8.11 |
| 154 | 1.4 | 147 | 3.12 | 54 | 6.4 | 47 | 8.12 |
| 155 | 1.5 | 146 | 3.13 | 55 | 6.5 | 46 | 8.13 |
| 156 | 1.6 | 145 | 3.14 | 56 | 6.6 | 45 | 8.14 |
| 157 | 1.7 | 144 | 3.15 | 57 | 6.7 | 44 | 8.15 |
| 158 | 1.8 | 143 | 3.16 | 58 | 6.8 | 43 | 8.16 |
| 159 | 1.9 | 142 | 4.1 | 59 | 6.9 | 42 | 9.1 |
| 160 | 1.10 | 141 | 4.2 | 60 | 6.10 | 41 | 9.2 |
| 161 | 1.11 | 140 | 4.3 | 61 | 6.11 | 40 | 9.3 |
| 162 | 1.12 | 139 | 4.4 | 62 | 6.12 | 39 | 9.4 |
| 163 | 1.13 | 138 | 4.5 | 63 | 6.13 | 38 | 9.5 |
| 164 | 1.14 | 137 | 4.6 | 64 | 6.14 | 37 | 9.6 |
| 165 | 1.15 | 136 | 4.7 | 65 | 6.15 | 36 | 9.7 |
| 166 | 1.16 | 135 | 4.8 | 66 | 6.16 | 35 | 9.8 |
| 167 | 2.1 | 134 | 4.9 | 67 | 7.1 | 34 | 9.9 |
| 168 | 2.2 | 133 | 4.10 | 68 | 7.2 | 33 | 9.10 |
| 169 | 2.3 | 132 | 4.11 | 69 | 7.3 | 32 | 9.11 |
| 170 | 2.4 | 131 | 4.12 | 70 | 7.4 | 31 | 9.12 |
| 171 | 2.5 | 130 | 4.13 | 71 | 7.5 | 30 | 9.13 |
| 172 | 2.6 | 129 | 4.14 | 72 | 7.6 | 29 | 9.14 |
| 173 | 2.7 | 128 | 4.15 | 73 | 7.7 | 28 | 9.15 |
| 174 | 2.8 | 127 | 4.16 | 74 | 7.8 | 27 | 9.16 |
| 175 | 2.9 | 126 | 5.1 | 75 | 7.9 | 26 | 10.1 |
| 176 | 2.10 | 125 | 5.2 | 76 | 7.10 | 25 | 10.2 |
| 177 | 2.11 | 124 | 5.3 | 77 | 7.11 | 24 | 10.3 |
| 178 | 2.12 | 123 | 5.4 | 78 | 7.12 | 23 | 10.4 |
| 179 | 2.13 | 122 | 5.5 | 79 | 7.13 | 22 | 10.5 |
| 180 | 2.14 | 12.1 | 5.6 | 80 | 7.14 | 21 | 10.6 |
| 181 | 2.15 | 120 | 5.7 | 81 | 7.15 | 20 | 10.7 |
| 182 | 2.16 | 119 | 5.8 | 82 | 7.16 | 19 | 10.8 |
| 183 | 3.1 | 118 | 5.9 | 83 | 8.1 | 18 | 10.9 |
| 184 | 3.2 | 117 | 5.10 | 84 | 8.2 | 17 | 10.10 |
| 185 | 3.3 | 116 | 5.11 | 85 | 8.3 | 16 | 10.11 |
| 186 | 3.4 | 115 | 5.12 | 86 | 8.4 | 15 | 10.12 |
| 187 | 3.5 | 114 | 5.13 | 87 | 8.5 | 14 | 10.13 |
| 188 | 3.6 | 113 | 5.14 | 88 | 8.6 | 13 | 10.14 |
| 189 | 3.7 | 112 | 5.15 | 89 | 8.7 | 12 | 10.15 |
| 190 | 3.8 | 111 | 5.16 | 90 | 8.8 | 11 | 10.16 |
| 191 | C1 | 110 | - | 91 | C6 | 10 | - |
| 192 | - | 109 | - | 92 | - | 9 | - |
| 193 | - | 108 | C4 | 93 | - | 8 | C9 |
| 194 | - | 107 | - | 94 | - | 7 | - |
| 195 | C2 | 106 | - | 95 | C7 | 6 | - |
| 196 | - | 105 | - | 96 | - | 5 | - |
| 197 | - | 104 | C5 | 97 | - | 4 | C10 |
| 198 | - | 103 | - | 98 | - | 3 | - |
| 199 | C3 | 102 | - | 99 | C8 | 2 | - |
| 200 | - | 101 | - | 100 | - | 1 | - |

TEN BANK SIXTEEN CHANNEL SINGLE POLE

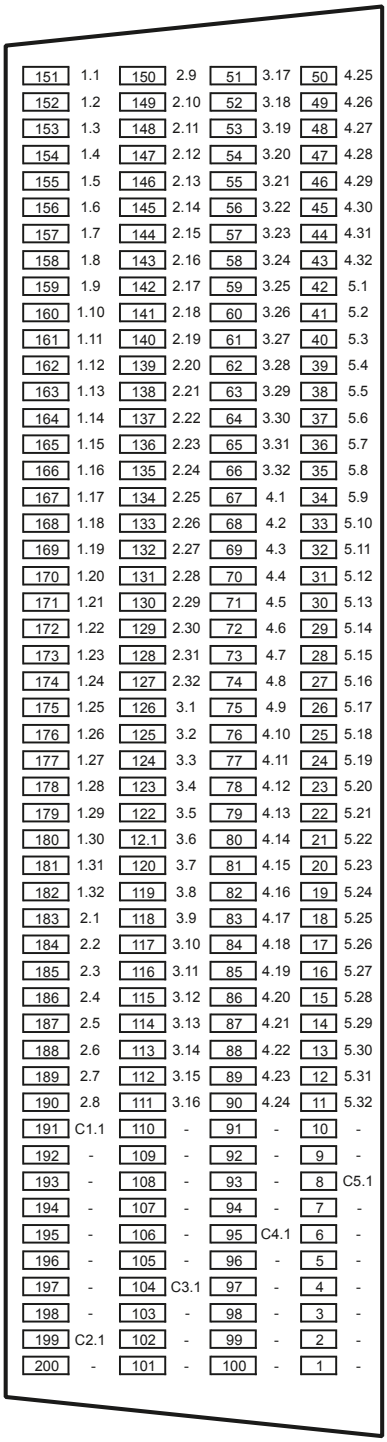
**Figure 5.3 - Module Pin Outs: 40-615-022-10/16/1 (200-pin Female LFH Connector Viewed From Front of Module)**



| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 151 | 1.1.1 | 150 | 3.5.1 | 51 | 6.1.1 | 50 | 8.5.1 |
| 152 | 1.1.2 | 149 | 3.5.2 | 52 | 6.1.2 | 49 | 8.5.2 |
| 153 | 1.2.1 | 148 | 3.6.1 | 53 | 6.2.1 | 48 | 8.6.1 |
| 154 | 1.2.2 | 147 | 3.6.2 | 54 | 6.2.2 | 47 | 8.6.2 |
| 155 | 1.3.1 | 146 | 3.7.1 | 55 | 6.3.1 | 46 | 8.7.1 |
| 156 | 1.3.2 | 145 | 3.7.2 | 56 | 6.3.2 | 45 | 8.7.2 |
| 157 | 1.4.1 | 144 | 3.8.1 | 57 | 6.4.1 | 44 | 8.8.1 |
| 158 | 1.4.2 | 143 | 3.8.2 | 58 | 6.4.2 | 43 | 8.8.2 |
| 159 | 1.5.1 | 142 | 4.1.1 | 59 | 6.5.1 | 42 | 9.1.1 |
| 160 | 1.5.2 | 141 | 4.1.2 | 60 | 6.5.2 | 41 | 9.1.2 |
| 161 | 1.6.1 | 140 | 4.2.1 | 61 | 6.6.1 | 40 | 9.2.1 |
| 162 | 1.6.2 | 139 | 4.2.2 | 62 | 6.6.2 | 39 | 9.2.2 |
| 163 | 1.7.1 | 138 | 4.3.1 | 63 | 6.7.1 | 38 | 9.3.1 |
| 164 | 1.7.2 | 137 | 4.3.2 | 64 | 6.7.2 | 37 | 9.3.2 |
| 165 | 1.8.1 | 136 | 4.4.1 | 65 | 6.8.1 | 36 | 9.4.1 |
| 166 | 1.8.2 | 135 | 4.4.2 | 66 | 6.8.2 | 35 | 9.4.2 |
| 167 | 2.1.1 | 134 | 4.5.1 | 67 | 7.1.1 | 34 | 9.5.1 |
| 168 | 2.1.2 | 133 | 4.5.2 | 68 | 7.1.2 | 33 | 9.5.2 |
| 169 | 2.2.1 | 132 | 4.6.1 | 69 | 7.2.1 | 32 | 9.6.1 |
| 170 | 2.2.2 | 131 | 4.6.2 | 70 | 7.2.2 | 31 | 9.6.2 |
| 171 | 2.3.1 | 130 | 4.7.1 | 71 | 7.3.1 | 30 | 9.7.1 |
| 172 | 2.3.2 | 129 | 4.7.2 | 72 | 7.3.2 | 29 | 9.7.2 |
| 173 | 2.4.1 | 128 | 4.8.1 | 73 | 7.4.1 | 28 | 9.8.1 |
| 174 | 2.4.2 | 127 | 4.8.2 | 74 | 7.4.2 | 27 | 9.8.2 |
| 175 | 2.5.1 | 126 | 5.1.1 | 75 | 7.5.1 | 26 | 10.1.1 |
| 176 | 2.5.2 | 125 | 5.1.2 | 76 | 7.5.2 | 25 | 10.1.2 |
| 177 | 2.6.1 | 124 | 5.2.1 | 77 | 7.6.1 | 24 | 10.2.1 |
| 178 | 2.6.2 | 123 | 5.2.2 | 78 | 7.6.2 | 23 | 10.2.2 |
| 179 | 2.7.1 | 122 | 5.3.1 | 79 | 7.7.1 | 22 | 10.3.1 |
| 180 | 2.7.2 | 121 | 5.3.2 | 80 | 7.7.2 | 21 | 10.3.2 |
| 181 | 2.8.1 | 120 | 5.4.1 | 81 | 7.8.1 | 20 | 10.4.1 |
| 182 | 2.8.2 | 119 | 5.4.2 | 82 | 7.8.2 | 19 | 10.4.2 |
| 183 | 3.1.1 | 118 | 5.5.1 | 83 | 8.1.1 | 18 | 10.5.1 |
| 184 | 3.1.2 | 117 | 5.5.2 | 84 | 8.1.2 | 17 | 10.5.2 |
| 185 | 3.2.1 | 116 | 5.6.1 | 85 | 8.2.1 | 16 | 10.6.1 |
| 186 | 3.2.2 | 115 | 5.6.2 | 86 | 8.2.2 | 15 | 10.6.2 |
| 187 | 3.3.1 | 114 | 5.7.1 | 87 | 8.3.1 | 14 | 10.7.1 |
| 188 | 3.3.2 | 113 | 5.7.2 | 88 | 8.3.2 | 13 | 10.7.2 |
| 189 | 3.4.1 | 112 | 5.8.1 | 89 | 8.4.1 | 12 | 10.8.1 |
| 190 | 3.4.2 | 111 | 5.8.2 | 90 | 8.4.2 | 11 | 10.8.2 |
| 191 | C1.1 | 110 | - | 91 | C6.1 | 10 | - |
| 192 | C1.2 | 109 | - | 92 | C6.2 | 9 | - |
| 193 | - | 108 | C4.1 | 93 | - | 8 | C9.1 |
| 194 | - | 107 | C4.2 | 94 | - | 7 | C9.2 |
| 195 | C2.1 | 106 | - | 95 | C7.1 | 6 | - |
| 196 | C2.2 | 105 | - | 96 | C7.2 | 5 | - |
| 197 | - | 104 | C5.1 | 97 | - | 4 | C10.1 |
| 198 | - | 103 | C5.2 | 98 | - | 3 | C10.2 |
| 199 | C3.1 | 102 | - | 99 | C8.1 | 2 | - |
| 200 | C3.2 | 101 | - | 100 | C8.2 | 1 | - |

TEN BANK EIGHT CHANNEL TWO POLE

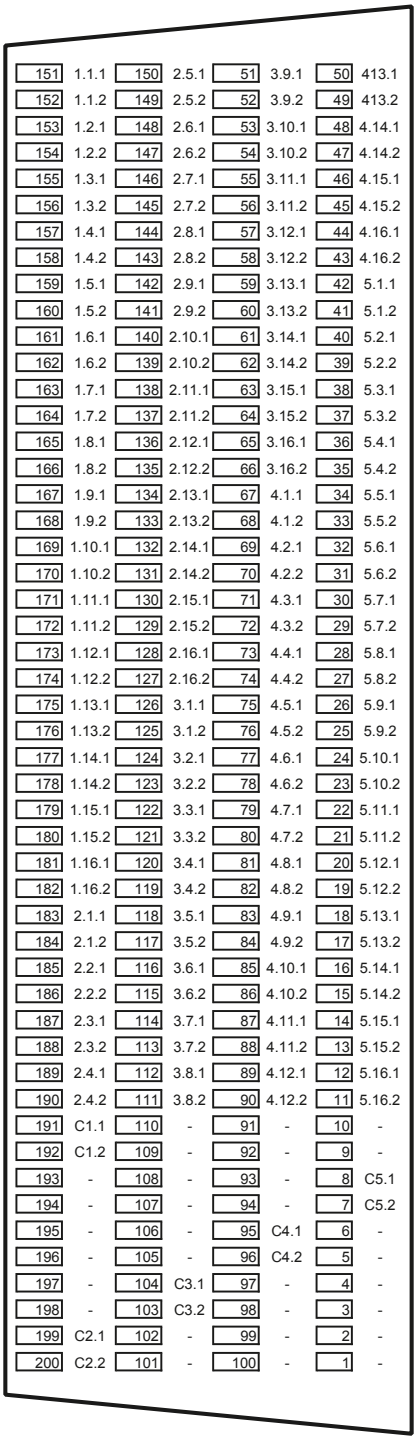
**Figure 5.4 - Module Pin Outs: 40-615-022-10/8/2 (200-pin Female LFH Connector Viewed From Front of Module)**



| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 151 | 1.1 | 150 | 2.9 | 51 | 3.17 | 50 | 4.25 |
| 152 | 1.2 | 149 | 2.10 | 52 | 3.18 | 49 | 4.26 |
| 153 | 1.3 | 148 | 2.11 | 53 | 3.19 | 48 | 4.27 |
| 154 | 1.4 | 147 | 2.12 | 54 | 3.20 | 47 | 4.28 |
| 155 | 1.5 | 146 | 2.13 | 55 | 3.21 | 46 | 4.29 |
| 156 | 1.6 | 145 | 2.14 | 56 | 3.22 | 45 | 4.30 |
| 157 | 1.7 | 144 | 2.15 | 57 | 3.23 | 44 | 4.31 |
| 158 | 1.8 | 143 | 2.16 | 58 | 3.24 | 43 | 4.32 |
| 159 | 1.9 | 142 | 2.17 | 59 | 3.25 | 42 | 5.1 |
| 160 | 1.10 | 141 | 2.18 | 60 | 3.26 | 41 | 5.2 |
| 161 | 1.11 | 140 | 2.19 | 61 | 3.27 | 40 | 5.3 |
| 162 | 1.12 | 139 | 2.20 | 62 | 3.28 | 39 | 5.4 |
| 163 | 1.13 | 138 | 2.21 | 63 | 3.29 | 38 | 5.5 |
| 164 | 1.14 | 137 | 2.22 | 64 | 3.30 | 37 | 5.6 |
| 165 | 1.15 | 136 | 2.23 | 65 | 3.31 | 36 | 5.7 |
| 166 | 1.16 | 135 | 2.24 | 66 | 3.32 | 35 | 5.8 |
| 167 | 1.17 | 134 | 2.25 | 67 | 4.1 | 34 | 5.9 |
| 168 | 1.18 | 133 | 2.26 | 68 | 4.2 | 33 | 5.10 |
| 169 | 1.19 | 132 | 2.27 | 69 | 4.3 | 32 | 5.11 |
| 170 | 1.20 | 131 | 2.28 | 70 | 4.4 | 31 | 5.12 |
| 171 | 1.21 | 130 | 2.29 | 71 | 4.5 | 30 | 5.13 |
| 172 | 1.22 | 129 | 2.30 | 72 | 4.6 | 29 | 5.14 |
| 173 | 1.23 | 128 | 2.31 | 73 | 4.7 | 28 | 5.15 |
| 174 | 1.24 | 127 | 2.32 | 74 | 4.8 | 27 | 5.16 |
| 175 | 1.25 | 126 | 3.1 | 75 | 4.9 | 26 | 5.17 |
| 176 | 1.26 | 125 | 3.2 | 76 | 4.10 | 25 | 5.18 |
| 177 | 1.27 | 124 | 3.3 | 77 | 4.11 | 24 | 5.19 |
| 178 | 1.28 | 123 | 3.4 | 78 | 4.12 | 23 | 5.20 |
| 179 | 1.29 | 122 | 3.5 | 79 | 4.13 | 22 | 5.21 |
| 180 | 1.30 | 12.1 | 3.6 | 80 | 4.14 | 21 | 5.22 |
| 181 | 1.31 | 120 | 3.7 | 81 | 4.15 | 20 | 5.23 |
| 182 | 1.32 | 119 | 3.8 | 82 | 4.16 | 19 | 5.24 |
| 183 | 2.1 | 118 | 3.9 | 83 | 4.17 | 18 | 5.25 |
| 184 | 2.2 | 117 | 3.10 | 84 | 4.18 | 17 | 5.26 |
| 185 | 2.3 | 116 | 3.11 | 85 | 4.19 | 16 | 5.27 |
| 186 | 2.4 | 115 | 3.12 | 86 | 4.20 | 15 | 5.28 |
| 187 | 2.5 | 114 | 3.13 | 87 | 4.21 | 14 | 5.29 |
| 188 | 2.6 | 113 | 3.14 | 88 | 4.22 | 13 | 5.30 |
| 189 | 2.7 | 112 | 3.15 | 89 | 4.23 | 12 | 5.31 |
| 190 | 2.8 | 111 | 3.16 | 90 | 4.24 | 11 | 5.32 |
| 191 | C1.1 | 110 | - | 91 | - | 10 | - |
| 192 | - | 109 | - | 92 | - | 9 | - |
| 193 | - | 108 | - | 93 | - | 8 | C5.1 |
| 194 | - | 107 | - | 94 | - | 7 | - |
| 195 | - | 106 | - | 95 | C4.1 | 6 | - |
| 196 | - | 105 | - | 96 | - | 5 | - |
| 197 | - | 104 | C3.1 | 97 | - | 4 | - |
| 198 | - | 103 | - | 98 | - | 3 | - |
| 199 | C2.1 | 102 | - | 99 | - | 2 | - |
| 200 | - | 101 | - | 100 | - | 1 | - |

FIVE BANK THIRTY TWO CHANNEL SINGLE POLE

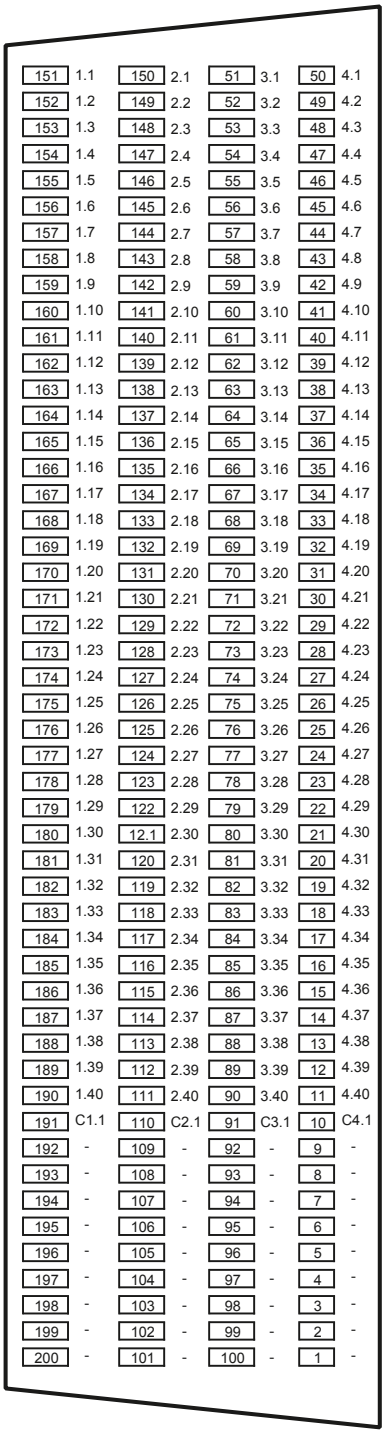
**Figure 5.5 - Module Pin Outs: 40-615-022-5/32/1 (200-pin Female LFH Connector Viewed From Front of Module)**



| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 151 | 1.1.1 | 150 | 2.5.1 | 51 | 3.9.1 | 50 | 413.1 |
| 152 | 1.1.2 | 149 | 2.5.2 | 52 | 3.9.2 | 49 | 413.2 |
| 153 | 1.2.1 | 148 | 2.6.1 | 53 | 3.10.1 | 48 | 4.14.1 |
| 154 | 1.2.2 | 147 | 2.6.2 | 54 | 3.10.2 | 47 | 4.14.2 |
| 155 | 1.3.1 | 146 | 2.7.1 | 55 | 3.11.1 | 46 | 4.15.1 |
| 156 | 1.3.2 | 145 | 2.7.2 | 56 | 3.11.2 | 45 | 4.15.2 |
| 157 | 1.4.1 | 144 | 2.8.1 | 57 | 3.12.1 | 44 | 4.16.1 |
| 158 | 1.4.2 | 143 | 2.8.2 | 58 | 3.12.2 | 43 | 4.16.2 |
| 159 | 1.5.1 | 142 | 2.9.1 | 59 | 3.13.1 | 42 | 5.1.1 |
| 160 | 1.5.2 | 141 | 2.9.2 | 60 | 3.13.2 | 41 | 5.1.2 |
| 161 | 1.6.1 | 140 | 2.10.1 | 61 | 3.14.1 | 40 | 5.2.1 |
| 162 | 1.6.2 | 139 | 2.10.2 | 62 | 3.14.2 | 39 | 5.2.2 |
| 163 | 1.7.1 | 138 | 2.11.1 | 63 | 3.15.1 | 38 | 5.3.1 |
| 164 | 1.7.2 | 137 | 2.11.2 | 64 | 3.15.2 | 37 | 5.3.2 |
| 165 | 1.8.1 | 136 | 2.12.1 | 65 | 3.16.1 | 36 | 5.4.1 |
| 166 | 1.8.2 | 135 | 2.12.2 | 66 | 3.16.2 | 35 | 5.4.2 |
| 167 | 1.9.1 | 134 | 2.13.1 | 67 | 4.1.1 | 34 | 5.5.1 |
| 168 | 1.9.2 | 133 | 2.13.2 | 68 | 4.1.2 | 33 | 5.5.2 |
| 169 | 1.10.1 | 132 | 2.14.1 | 69 | 4.2.1 | 32 | 5.6.1 |
| 170 | 1.10.2 | 131 | 2.14.2 | 70 | 4.2.2 | 31 | 5.6.2 |
| 171 | 1.11.1 | 130 | 2.15.1 | 71 | 4.3.1 | 30 | 5.7.1 |
| 172 | 1.11.2 | 129 | 2.15.2 | 72 | 4.3.2 | 29 | 5.7.2 |
| 173 | 1.12.1 | 128 | 2.16.1 | 73 | 4.4.1 | 28 | 5.8.1 |
| 174 | 1.12.2 | 127 | 2.16.2 | 74 | 4.4.2 | 27 | 5.8.2 |
| 175 | 1.13.1 | 126 | 3.1.1 | 75 | 4.5.1 | 26 | 5.9.1 |
| 176 | 1.13.2 | 125 | 3.1.2 | 76 | 4.5.2 | 25 | 5.9.2 |
| 177 | 1.14.1 | 124 | 3.2.1 | 77 | 4.6.1 | 24 | 5.10.1 |
| 178 | 1.14.2 | 123 | 3.2.2 | 78 | 4.6.2 | 23 | 5.10.2 |
| 179 | 1.15.1 | 122 | 3.3.1 | 79 | 4.7.1 | 22 | 5.11.1 |
| 180 | 1.15.2 | 121 | 3.3.2 | 80 | 4.7.2 | 21 | 5.11.2 |
| 181 | 1.16.1 | 120 | 3.4.1 | 81 | 4.8.1 | 20 | 5.12.1 |
| 182 | 1.16.2 | 119 | 3.4.2 | 82 | 4.8.2 | 19 | 5.12.2 |
| 183 | 2.1.1 | 118 | 3.5.1 | 83 | 4.9.1 | 18 | 5.13.1 |
| 184 | 2.1.2 | 117 | 3.5.2 | 84 | 4.9.2 | 17 | 5.13.2 |
| 185 | 2.2.1 | 116 | 3.6.1 | 85 | 4.10.1 | 16 | 5.14.1 |
| 186 | 2.2.2 | 115 | 3.6.2 | 86 | 4.10.2 | 15 | 5.14.2 |
| 187 | 2.3.1 | 114 | 3.7.1 | 87 | 4.11.1 | 14 | 5.15.1 |
| 188 | 2.3.2 | 113 | 3.7.2 | 88 | 4.11.2 | 13 | 5.15.2 |
| 189 | 2.4.1 | 112 | 3.8.1 | 89 | 4.12.1 | 12 | 5.16.1 |
| 190 | 2.4.2 | 111 | 3.8.2 | 90 | 4.12.2 | 11 | 5.16.2 |
| 191 | C1.1 | 110 | - | 91 | - | 10 | - |
| 192 | C1.2 | 109 | - | 92 | - | 9 | - |
| 193 | - | 108 | - | 93 | - | 8 | C5.1 |
| 194 | - | 107 | - | 94 | - | 7 | C5.2 |
| 195 | - | 106 | - | 95 | C4.1 | 6 | - |
| 196 | - | 105 | - | 96 | C4.2 | 5 | - |
| 197 | - | 104 | C3.1 | 97 | - | 4 | - |
| 198 | - | 103 | C3.2 | 98 | - | 3 | - |
| 199 | C2.1 | 102 | - | 99 | - | 2 | - |
| 200 | C2.2 | 101 | - | 100 | - | 1 | - |

FIVE BANK SIXTEEN CHANNEL TWO POLE

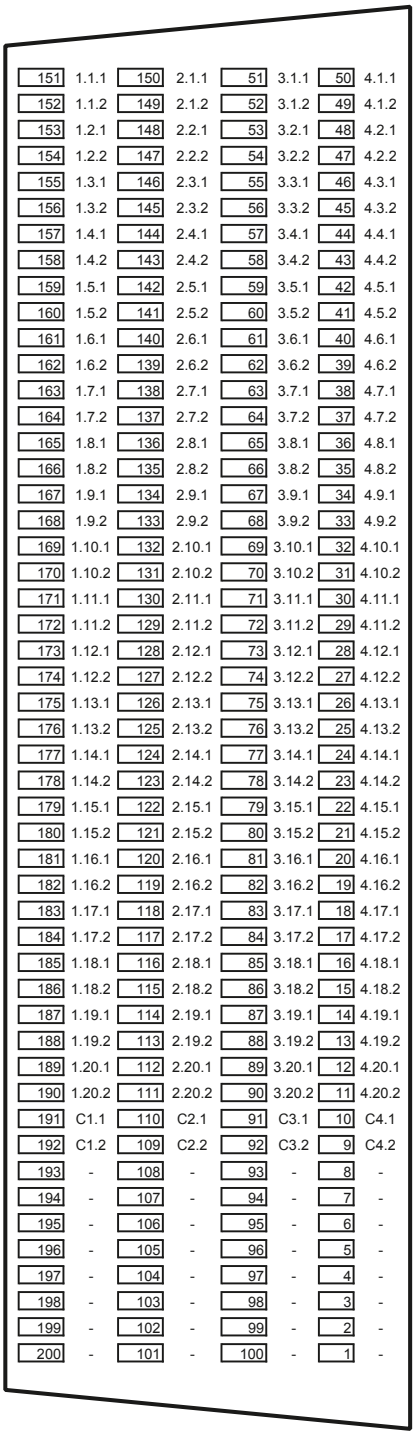
**Figure 5.6 - Module Pin Outs: 40-615-022-5/16/2 (200-pin Female LFH Connector Viewed From Front of Module)**



| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 151 | 1.1 | 150 | 2.1 | 51 | 3.1 | 50 | 4.1 |
| 152 | 1.2 | 149 | 2.2 | 52 | 3.2 | 49 | 4.2 |
| 153 | 1.3 | 148 | 2.3 | 53 | 3.3 | 48 | 4.3 |
| 154 | 1.4 | 147 | 2.4 | 54 | 3.4 | 47 | 4.4 |
| 155 | 1.5 | 146 | 2.5 | 55 | 3.5 | 46 | 4.5 |
| 156 | 1.6 | 145 | 2.6 | 56 | 3.6 | 45 | 4.6 |
| 157 | 1.7 | 144 | 2.7 | 57 | 3.7 | 44 | 4.7 |
| 158 | 1.8 | 143 | 2.8 | 58 | 3.8 | 43 | 4.8 |
| 159 | 1.9 | 142 | 2.9 | 59 | 3.9 | 42 | 4.9 |
| 160 | 1.10 | 141 | 2.10 | 60 | 3.10 | 41 | 4.10 |
| 161 | 1.11 | 140 | 2.11 | 61 | 3.11 | 40 | 4.11 |
| 162 | 1.12 | 139 | 2.12 | 62 | 3.12 | 39 | 4.12 |
| 163 | 1.13 | 138 | 2.13 | 63 | 3.13 | 38 | 4.13 |
| 164 | 1.14 | 137 | 2.14 | 64 | 3.14 | 37 | 4.14 |
| 165 | 1.15 | 136 | 2.15 | 65 | 3.15 | 36 | 4.15 |
| 166 | 1.16 | 135 | 2.16 | 66 | 3.16 | 35 | 4.16 |
| 167 | 1.17 | 134 | 2.17 | 67 | 3.17 | 34 | 4.17 |
| 168 | 1.18 | 133 | 2.18 | 68 | 3.18 | 33 | 4.18 |
| 169 | 1.19 | 132 | 2.19 | 69 | 3.19 | 32 | 4.19 |
| 170 | 1.20 | 131 | 2.20 | 70 | 3.20 | 31 | 4.20 |
| 171 | 1.21 | 130 | 2.21 | 71 | 3.21 | 30 | 4.21 |
| 172 | 1.22 | 129 | 2.22 | 72 | 3.22 | 29 | 4.22 |
| 173 | 1.23 | 128 | 2.23 | 73 | 3.23 | 28 | 4.23 |
| 174 | 1.24 | 127 | 2.24 | 74 | 3.24 | 27 | 4.24 |
| 175 | 1.25 | 126 | 2.25 | 75 | 3.25 | 26 | 4.25 |
| 176 | 1.26 | 125 | 2.26 | 76 | 3.26 | 25 | 4.26 |
| 177 | 1.27 | 124 | 2.27 | 77 | 3.27 | 24 | 4.27 |
| 178 | 1.28 | 123 | 2.28 | 78 | 3.28 | 23 | 4.28 |
| 179 | 1.29 | 122 | 2.29 | 79 | 3.29 | 22 | 4.29 |
| 180 | 1.30 | 12.1 | 2.30 | 80 | 3.30 | 21 | 4.30 |
| 181 | 1.31 | 120 | 2.31 | 81 | 3.31 | 20 | 4.31 |
| 182 | 1.32 | 119 | 2.32 | 82 | 3.32 | 19 | 4.32 |
| 183 | 1.33 | 118 | 2.33 | 83 | 3.33 | 18 | 4.33 |
| 184 | 1.34 | 117 | 2.34 | 84 | 3.34 | 17 | 4.34 |
| 185 | 1.35 | 116 | 2.35 | 85 | 3.35 | 16 | 4.35 |
| 186 | 1.36 | 115 | 2.36 | 86 | 3.36 | 15 | 4.36 |
| 187 | 1.37 | 114 | 2.37 | 87 | 3.37 | 14 | 4.37 |
| 188 | 1.38 | 113 | 2.38 | 88 | 3.38 | 13 | 4.38 |
| 189 | 1.39 | 112 | 2.39 | 89 | 3.39 | 12 | 4.39 |
| 190 | 1.40 | 111 | 2.40 | 90 | 3.40 | 11 | 4.40 |
| 191 | C1.1 | 110 | C2.1 | 91 | C3.1 | 10 | C4.1 |
| 192 | - | 109 | - | 92 | - | 9 | - |
| 193 | - | 108 | - | 93 | - | 8 | - |
| 194 | - | 107 | - | 94 | - | 7 | - |
| 195 | - | 106 | - | 95 | - | 6 | - |
| 196 | - | 105 | - | 96 | - | 5 | - |
| 197 | - | 104 | - | 97 | - | 4 | - |
| 198 | - | 103 | - | 98 | - | 3 | - |
| 199 | - | 102 | - | 99 | - | 2 | - |
| 200 | - | 101 | - | 100 | - | 1 | - |

FOUR BANK FOURTY CHANNEL SINGLE POLE

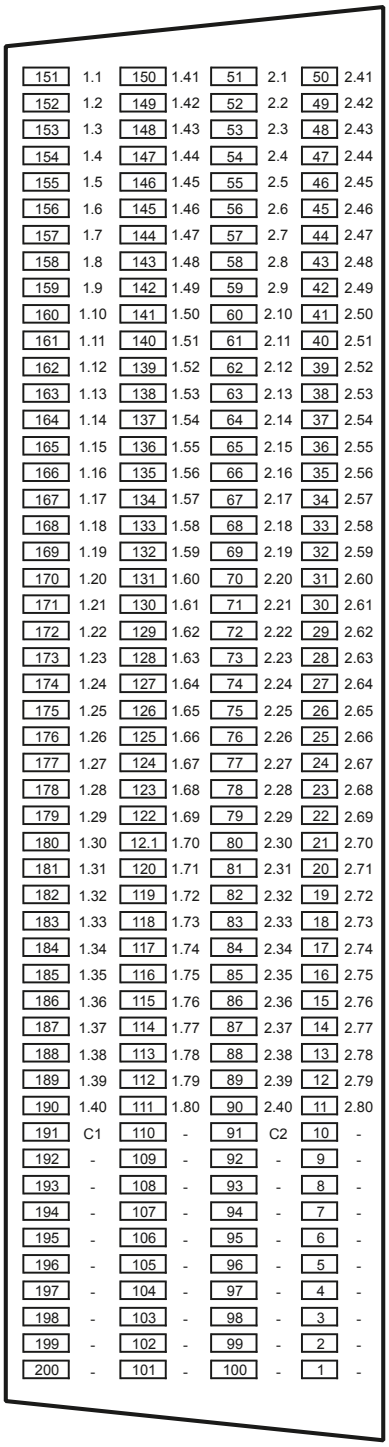
**Figure 5.7 - Module Pin Outs: 40-615-022-4/40/1 (200-pin Female LFH Connector Viewed From Front of Module)**



| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 151 | 1.1.1 | 150 | 2.1.1 | 51 | 3.1.1 | 50 | 4.1.1 |
| 152 | 1.1.2 | 149 | 2.1.2 | 52 | 3.1.2 | 49 | 4.1.2 |
| 153 | 1.2.1 | 148 | 2.2.1 | 53 | 3.2.1 | 48 | 4.2.1 |
| 154 | 1.2.2 | 147 | 2.2.2 | 54 | 3.2.2 | 47 | 4.2.2 |
| 155 | 1.3.1 | 146 | 2.3.1 | 55 | 3.3.1 | 46 | 4.3.1 |
| 156 | 1.3.2 | 145 | 2.3.2 | 56 | 3.3.2 | 45 | 4.3.2 |
| 157 | 1.4.1 | 144 | 2.4.1 | 57 | 3.4.1 | 44 | 4.4.1 |
| 158 | 1.4.2 | 143 | 2.4.2 | 58 | 3.4.2 | 43 | 4.4.2 |
| 159 | 1.5.1 | 142 | 2.5.1 | 59 | 3.5.1 | 42 | 4.5.1 |
| 160 | 1.5.2 | 141 | 2.5.2 | 60 | 3.5.2 | 41 | 4.5.2 |
| 161 | 1.6.1 | 140 | 2.6.1 | 61 | 3.6.1 | 40 | 4.6.1 |
| 162 | 1.6.2 | 139 | 2.6.2 | 62 | 3.6.2 | 39 | 4.6.2 |
| 163 | 1.7.1 | 138 | 2.7.1 | 63 | 3.7.1 | 38 | 4.7.1 |
| 164 | 1.7.2 | 137 | 2.7.2 | 64 | 3.7.2 | 37 | 4.7.2 |
| 165 | 1.8.1 | 136 | 2.8.1 | 65 | 3.8.1 | 36 | 4.8.1 |
| 166 | 1.8.2 | 135 | 2.8.2 | 66 | 3.8.2 | 35 | 4.8.2 |
| 167 | 1.9.1 | 134 | 2.9.1 | 67 | 3.9.1 | 34 | 4.9.1 |
| 168 | 1.9.2 | 133 | 2.9.2 | 68 | 3.9.2 | 33 | 4.9.2 |
| 169 | 1.10.1 | 132 | 2.10.1 | 69 | 3.10.1 | 32 | 4.10.1 |
| 170 | 1.10.2 | 131 | 2.10.2 | 70 | 3.10.2 | 31 | 4.10.2 |
| 171 | 1.11.1 | 130 | 2.11.1 | 71 | 3.11.1 | 30 | 4.11.1 |
| 172 | 1.11.2 | 129 | 2.11.2 | 72 | 3.11.2 | 29 | 4.11.2 |
| 173 | 1.12.1 | 128 | 2.12.1 | 73 | 3.12.1 | 28 | 4.12.1 |
| 174 | 1.12.2 | 127 | 2.12.2 | 74 | 3.12.2 | 27 | 4.12.2 |
| 175 | 1.13.1 | 126 | 2.13.1 | 75 | 3.13.1 | 26 | 4.13.1 |
| 176 | 1.13.2 | 125 | 2.13.2 | 76 | 3.13.2 | 25 | 4.13.2 |
| 177 | 1.14.1 | 124 | 2.14.1 | 77 | 3.14.1 | 24 | 4.14.1 |
| 178 | 1.14.2 | 123 | 2.14.2 | 78 | 3.14.2 | 23 | 4.14.2 |
| 179 | 1.15.1 | 122 | 2.15.1 | 79 | 3.15.1 | 22 | 4.15.1 |
| 180 | 1.15.2 | 121 | 2.15.2 | 80 | 3.15.2 | 21 | 4.15.2 |
| 181 | 1.16.1 | 120 | 2.16.1 | 81 | 3.16.1 | 20 | 4.16.1 |
| 182 | 1.16.2 | 119 | 2.16.2 | 82 | 3.16.2 | 19 | 4.16.2 |
| 183 | 1.17.1 | 118 | 2.17.1 | 83 | 3.17.1 | 18 | 4.17.1 |
| 184 | 1.17.2 | 117 | 2.17.2 | 84 | 3.17.2 | 17 | 4.17.2 |
| 185 | 1.18.1 | 116 | 2.18.1 | 85 | 3.18.1 | 16 | 4.18.1 |
| 186 | 1.18.2 | 115 | 2.18.2 | 86 | 3.18.2 | 15 | 4.18.2 |
| 187 | 1.19.1 | 114 | 2.19.1 | 87 | 3.19.1 | 14 | 4.19.1 |
| 188 | 1.19.2 | 113 | 2.19.2 | 88 | 3.19.2 | 13 | 4.19.2 |
| 189 | 1.20.1 | 112 | 2.20.1 | 89 | 3.20.1 | 12 | 4.20.1 |
| 190 | 1.20.2 | 111 | 2.20.2 | 90 | 3.20.2 | 11 | 4.20.2 |
| 191 | C1.1 | 110 | C2.1 | 91 | C3.1 | 10 | C4.1 |
| 192 | C1.2 | 109 | C2.2 | 92 | C3.2 | 9 | C4.2 |
| 193 | - | 108 | - | 93 | - | 8 | - |
| 194 | - | 107 | - | 94 | - | 7 | - |
| 195 | - | 106 | - | 95 | - | 6 | - |
| 196 | - | 105 | - | 96 | - | 5 | - |
| 197 | - | 104 | - | 97 | - | 4 | - |
| 198 | - | 103 | - | 98 | - | 3 | - |
| 199 | - | 102 | - | 99 | - | 2 | - |
| 200 | - | 101 | - | 100 | - | 1 | - |

FOUR BANK TWENTY CHANNEL TWO POLE

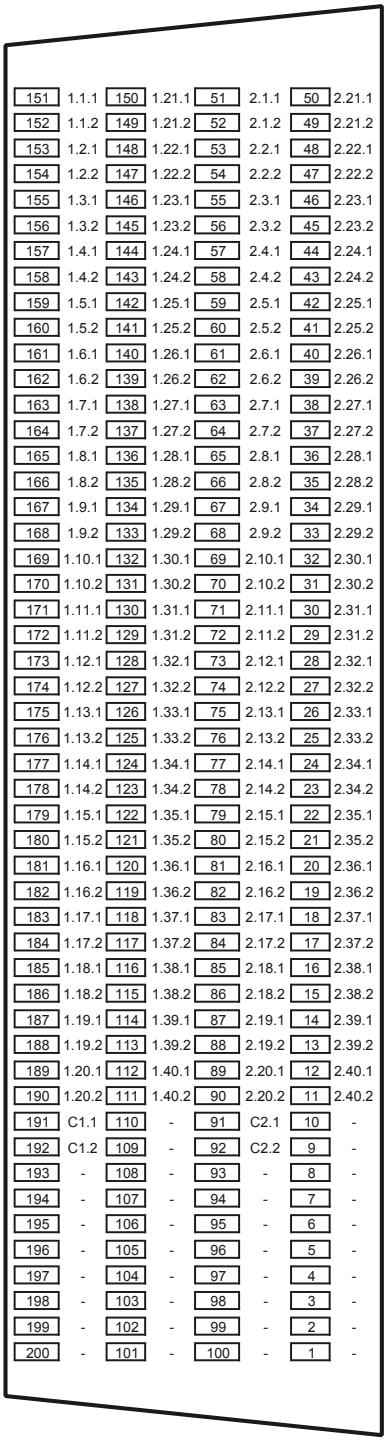
**Figure 5.8 - Module Pin Outs: 40-615-022-4/20/2 (200-pin Female LFH Connector Viewed From Front of Module)**



| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 151 | 1.1 | 150 | 1.41 | 51 | 2.1 | 50 | 2.41 |
| 152 | 1.2 | 149 | 1.42 | 52 | 2.2 | 49 | 2.42 |
| 153 | 1.3 | 148 | 1.43 | 53 | 2.3 | 48 | 2.43 |
| 154 | 1.4 | 147 | 1.44 | 54 | 2.4 | 47 | 2.44 |
| 155 | 1.5 | 146 | 1.45 | 55 | 2.5 | 46 | 2.45 |
| 156 | 1.6 | 145 | 1.46 | 56 | 2.6 | 45 | 2.46 |
| 157 | 1.7 | 144 | 1.47 | 57 | 2.7 | 44 | 2.47 |
| 158 | 1.8 | 143 | 1.48 | 58 | 2.8 | 43 | 2.48 |
| 159 | 1.9 | 142 | 1.49 | 59 | 2.9 | 42 | 2.49 |
| 160 | 1.10 | 141 | 1.50 | 60 | 2.10 | 41 | 2.50 |
| 161 | 1.11 | 140 | 1.51 | 61 | 2.11 | 40 | 2.51 |
| 162 | 1.12 | 139 | 1.52 | 62 | 2.12 | 39 | 2.52 |
| 163 | 1.13 | 138 | 1.53 | 63 | 2.13 | 38 | 2.53 |
| 164 | 1.14 | 137 | 1.54 | 64 | 2.14 | 37 | 2.54 |
| 165 | 1.15 | 136 | 1.55 | 65 | 2.15 | 36 | 2.55 |
| 166 | 1.16 | 135 | 1.56 | 66 | 2.16 | 35 | 2.56 |
| 167 | 1.17 | 134 | 1.57 | 67 | 2.17 | 34 | 2.57 |
| 168 | 1.18 | 133 | 1.58 | 68 | 2.18 | 33 | 2.58 |
| 169 | 1.19 | 132 | 1.59 | 69 | 2.19 | 32 | 2.59 |
| 170 | 1.20 | 131 | 1.60 | 70 | 2.20 | 31 | 2.60 |
| 171 | 1.21 | 130 | 1.61 | 71 | 2.21 | 30 | 2.61 |
| 172 | 1.22 | 129 | 1.62 | 72 | 2.22 | 29 | 2.62 |
| 173 | 1.23 | 128 | 1.63 | 73 | 2.23 | 28 | 2.63 |
| 174 | 1.24 | 127 | 1.64 | 74 | 2.24 | 27 | 2.64 |
| 175 | 1.25 | 126 | 1.65 | 75 | 2.25 | 26 | 2.65 |
| 176 | 1.26 | 125 | 1.66 | 76 | 2.26 | 25 | 2.66 |
| 177 | 1.27 | 124 | 1.67 | 77 | 2.27 | 24 | 2.67 |
| 178 | 1.28 | 123 | 1.68 | 78 | 2.28 | 23 | 2.68 |
| 179 | 1.29 | 122 | 1.69 | 79 | 2.29 | 22 | 2.69 |
| 180 | 1.30 | 12.1 | 1.70 | 80 | 2.30 | 21 | 2.70 |
| 181 | 1.31 | 120 | 1.71 | 81 | 2.31 | 20 | 2.71 |
| 182 | 1.32 | 119 | 1.72 | 82 | 2.32 | 19 | 2.72 |
| 183 | 1.33 | 118 | 1.73 | 83 | 2.33 | 18 | 2.73 |
| 184 | 1.34 | 117 | 1.74 | 84 | 2.34 | 17 | 2.74 |
| 185 | 1.35 | 116 | 1.75 | 85 | 2.35 | 16 | 2.75 |
| 186 | 1.36 | 115 | 1.76 | 86 | 2.36 | 15 | 2.76 |
| 187 | 1.37 | 114 | 1.77 | 87 | 2.37 | 14 | 2.77 |
| 188 | 1.38 | 113 | 1.78 | 88 | 2.38 | 13 | 2.78 |
| 189 | 1.39 | 112 | 1.79 | 89 | 2.39 | 12 | 2.79 |
| 190 | 1.40 | 111 | 1.80 | 90 | 2.40 | 11 | 2.80 |
| 191 | C1 | 110 | - | 91 | C2 | 10 | - |
| 192 | - | 109 | - | 92 | - | 9 | - |
| 193 | - | 108 | - | 93 | - | 8 | - |
| 194 | - | 107 | - | 94 | - | 7 | - |
| 195 | - | 106 | - | 95 | - | 6 | - |
| 196 | - | 105 | - | 96 | - | 5 | - |
| 197 | - | 104 | - | 97 | - | 4 | - |
| 198 | - | 103 | - | 98 | - | 3 | - |
| 199 | - | 102 | - | 99 | - | 2 | - |
| 200 | - | 101 | - | 100 | - | 1 | - |

TWO BANK EIGHTY CHANNEL SINGLE POLE

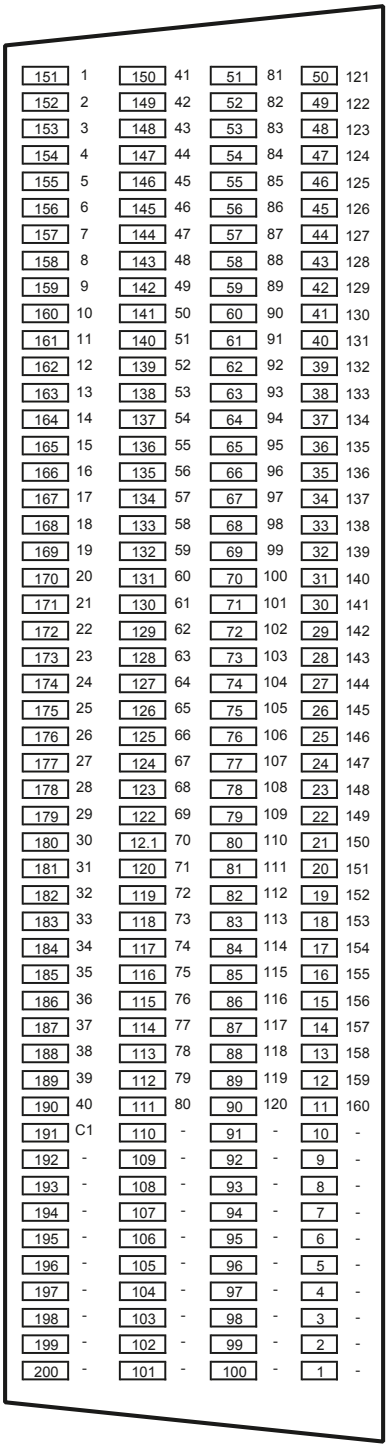
**Figure 5.9 - Module Pin Outs: 40-615-022-2/80/1 (200-pin Female LFH Connector Viewed From Front of Module)**



| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 151 | 1.1.1 | 150 | 1.21.1 | 51 | 2.1.1 | 50 | 2.21.1 |
| 152 | 1.1.2 | 149 | 1.21.2 | 52 | 2.1.2 | 49 | 2.21.2 |
| 153 | 1.2.1 | 148 | 1.22.1 | 53 | 2.2.1 | 48 | 2.22.1 |
| 154 | 1.2.2 | 147 | 1.22.2 | 54 | 2.2.2 | 47 | 2.22.2 |
| 155 | 1.3.1 | 146 | 1.23.1 | 55 | 2.3.1 | 46 | 2.23.1 |
| 156 | 1.3.2 | 145 | 1.23.2 | 56 | 2.3.2 | 45 | 2.23.2 |
| 157 | 1.4.1 | 144 | 1.24.1 | 57 | 2.4.1 | 44 | 2.24.1 |
| 158 | 1.4.2 | 143 | 1.24.2 | 58 | 2.4.2 | 43 | 2.24.2 |
| 159 | 1.5.1 | 142 | 1.25.1 | 59 | 2.5.1 | 42 | 2.25.1 |
| 160 | 1.5.2 | 141 | 1.25.2 | 60 | 2.5.2 | 41 | 2.25.2 |
| 161 | 1.6.1 | 140 | 1.26.1 | 61 | 2.6.1 | 40 | 2.26.1 |
| 162 | 1.6.2 | 139 | 1.26.2 | 62 | 2.6.2 | 39 | 2.26.2 |
| 163 | 1.7.1 | 138 | 1.27.1 | 63 | 2.7.1 | 38 | 2.27.1 |
| 164 | 1.7.2 | 137 | 1.27.2 | 64 | 2.7.2 | 37 | 2.27.2 |
| 165 | 1.8.1 | 136 | 1.28.1 | 65 | 2.8.1 | 36 | 2.28.1 |
| 166 | 1.8.2 | 135 | 1.28.2 | 66 | 2.8.2 | 35 | 2.28.2 |
| 167 | 1.9.1 | 134 | 1.29.1 | 67 | 2.9.1 | 34 | 2.29.1 |
| 168 | 1.9.2 | 133 | 1.29.2 | 68 | 2.9.2 | 33 | 2.29.2 |
| 169 | 1.10.1 | 132 | 1.30.1 | 69 | 2.10.1 | 32 | 2.30.1 |
| 170 | 1.10.2 | 131 | 1.30.2 | 70 | 2.10.2 | 31 | 2.30.2 |
| 171 | 1.11.1 | 130 | 1.31.1 | 71 | 2.11.1 | 30 | 2.31.1 |
| 172 | 1.11.2 | 129 | 1.31.2 | 72 | 2.11.2 | 29 | 2.31.2 |
| 173 | 1.12.1 | 128 | 1.32.1 | 73 | 2.12.1 | 28 | 2.32.1 |
| 174 | 1.12.2 | 127 | 1.32.2 | 74 | 2.12.2 | 27 | 2.32.2 |
| 175 | 1.13.1 | 126 | 1.33.1 | 75 | 2.13.1 | 26 | 2.33.1 |
| 176 | 1.13.2 | 125 | 1.33.2 | 76 | 2.13.2 | 25 | 2.33.2 |
| 177 | 1.14.1 | 124 | 1.34.1 | 77 | 2.14.1 | 24 | 2.34.1 |
| 178 | 1.14.2 | 123 | 1.34.2 | 78 | 2.14.2 | 23 | 2.34.2 |
| 179 | 1.15.1 | 122 | 1.35.1 | 79 | 2.15.1 | 22 | 2.35.1 |
| 180 | 1.15.2 | 121 | 1.35.2 | 80 | 2.15.2 | 21 | 2.35.2 |
| 181 | 1.16.1 | 120 | 1.36.1 | 81 | 2.16.1 | 20 | 2.36.1 |
| 182 | 1.16.2 | 119 | 1.36.2 | 82 | 2.16.2 | 19 | 2.36.2 |
| 183 | 1.17.1 | 118 | 1.37.1 | 83 | 2.17.1 | 18 | 2.37.1 |
| 184 | 1.17.2 | 117 | 1.37.2 | 84 | 2.17.2 | 17 | 2.37.2 |
| 185 | 1.18.1 | 116 | 1.38.1 | 85 | 2.18.1 | 16 | 2.38.1 |
| 186 | 1.18.2 | 115 | 1.38.2 | 86 | 2.18.2 | 15 | 2.38.2 |
| 187 | 1.19.1 | 114 | 1.39.1 | 87 | 2.19.1 | 14 | 2.39.1 |
| 188 | 1.19.2 | 113 | 1.39.2 | 88 | 2.19.2 | 13 | 2.39.2 |
| 189 | 1.20.1 | 112 | 1.40.1 | 89 | 2.20.1 | 12 | 2.40.1 |
| 190 | 1.20.2 | 111 | 1.40.2 | 90 | 2.20.2 | 11 | 2.40.2 |
| 191 | C1.1 | 110 | - | 91 | C2.1 | 10 | - |
| 192 | C1.2 | 109 | - | 92 | C2.2 | 9 | - |
| 193 | - | 108 | - | 93 | - | 8 | - |
| 194 | - | 107 | - | 94 | - | 7 | - |
| 195 | - | 106 | - | 95 | - | 6 | - |
| 196 | - | 105 | - | 96 | - | 5 | - |
| 197 | - | 104 | - | 97 | - | 4 | - |
| 198 | - | 103 | - | 98 | - | 3 | - |
| 199 | - | 102 | - | 99 | - | 2 | - |
| 200 | - | 101 | - | 100 | - | 1 | - |

TWO BANK FORTY CHANNEL TWO POLE

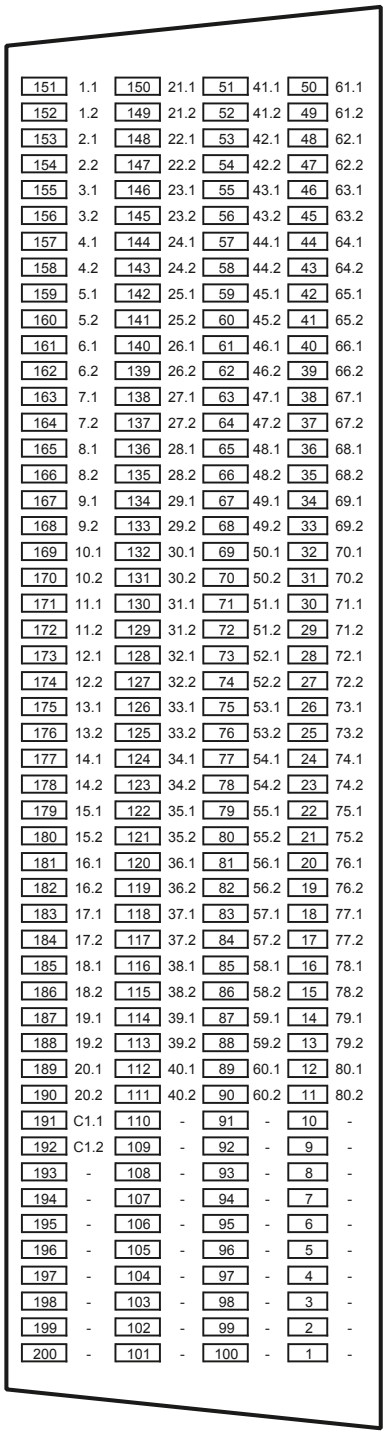
**Figure 5.10 - Module Pin Outs: 40-615-022-2/40/2 (200-pin Female LFH Connector Viewed From Front of Module)**



| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 151 | 1 | 150 | 41 | 51 | 81 | 50 | 121 |
| 152 | 2 | 149 | 42 | 52 | 82 | 49 | 122 |
| 153 | 3 | 148 | 43 | 53 | 83 | 48 | 123 |
| 154 | 4 | 147 | 44 | 54 | 84 | 47 | 124 |
| 155 | 5 | 146 | 45 | 55 | 85 | 46 | 125 |
| 156 | 6 | 145 | 46 | 56 | 86 | 45 | 126 |
| 157 | 7 | 144 | 47 | 57 | 87 | 44 | 127 |
| 158 | 8 | 143 | 48 | 58 | 88 | 43 | 128 |
| 159 | 9 | 142 | 49 | 59 | 89 | 42 | 129 |
| 160 | 10 | 141 | 50 | 60 | 90 | 41 | 130 |
| 161 | 11 | 140 | 51 | 61 | 91 | 40 | 131 |
| 162 | 12 | 139 | 52 | 62 | 92 | 39 | 132 |
| 163 | 13 | 138 | 53 | 63 | 93 | 38 | 133 |
| 164 | 14 | 137 | 54 | 64 | 94 | 37 | 134 |
| 165 | 15 | 136 | 55 | 65 | 95 | 36 | 135 |
| 166 | 16 | 135 | 56 | 66 | 96 | 35 | 136 |
| 167 | 17 | 134 | 57 | 67 | 97 | 34 | 137 |
| 168 | 18 | 133 | 58 | 68 | 98 | 33 | 138 |
| 169 | 19 | 132 | 59 | 69 | 99 | 32 | 139 |
| 170 | 20 | 131 | 60 | 70 | 100 | 31 | 140 |
| 171 | 21 | 130 | 61 | 71 | 101 | 30 | 141 |
| 172 | 22 | 129 | 62 | 72 | 102 | 29 | 142 |
| 173 | 23 | 128 | 63 | 73 | 103 | 28 | 143 |
| 174 | 24 | 127 | 64 | 74 | 104 | 27 | 144 |
| 175 | 25 | 126 | 65 | 75 | 105 | 26 | 145 |
| 176 | 26 | 125 | 66 | 76 | 106 | 25 | 146 |
| 177 | 27 | 124 | 67 | 77 | 107 | 24 | 147 |
| 178 | 28 | 123 | 68 | 78 | 108 | 23 | 148 |
| 179 | 29 | 122 | 69 | 79 | 109 | 22 | 149 |
| 180 | 30 | 12.1 | 70 | 80 | 110 | 21 | 150 |
| 181 | 31 | 120 | 71 | 81 | 111 | 20 | 151 |
| 182 | 32 | 119 | 72 | 82 | 112 | 19 | 152 |
| 183 | 33 | 118 | 73 | 83 | 113 | 18 | 153 |
| 184 | 34 | 117 | 74 | 84 | 114 | 17 | 154 |
| 185 | 35 | 116 | 75 | 85 | 115 | 16 | 155 |
| 186 | 36 | 115 | 76 | 86 | 116 | 15 | 156 |
| 187 | 37 | 114 | 77 | 87 | 117 | 14 | 157 |
| 188 | 38 | 113 | 78 | 88 | 118 | 13 | 158 |
| 189 | 39 | 112 | 79 | 89 | 119 | 12 | 159 |
| 190 | 40 | 111 | 80 | 90 | 120 | 11 | 160 |
| 191 | C1 | 110 | - | 91 | - | 10 | - |
| 192 | - | 109 | - | 92 | - | 9 | - |
| 193 | - | 108 | - | 93 | - | 8 | - |
| 194 | - | 107 | - | 94 | - | 7 | - |
| 195 | - | 106 | - | 95 | - | 6 | - |
| 196 | - | 105 | - | 96 | - | 5 | - |
| 197 | - | 104 | - | 97 | - | 4 | - |
| 198 | - | 103 | - | 98 | - | 3 | - |
| 199 | - | 102 | - | 99 | - | 2 | - |
| 200 | - | 101 | - | 100 | - | 1 | - |

SINGLE BANK ONE HUNDRED AND SIXTY CHANNEL SINGLE POLE

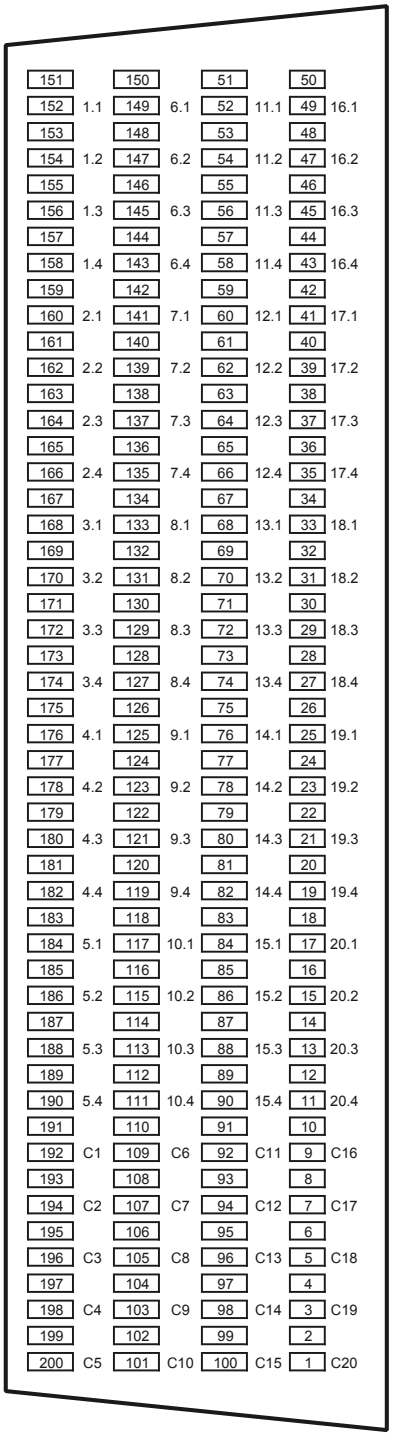
**Figure 5.11 - Module Pin Outs: 40-615-022-1/160/1 (200-pin Female LFH Connector Viewed From Front of Module)**



| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 151 | 1.1 | 150 | 21.1 | 51 | 41.1 | 50 | 61.1 |
| 152 | 1.2 | 149 | 21.2 | 52 | 41.2 | 49 | 61.2 |
| 153 | 2.1 | 148 | 22.1 | 53 | 42.1 | 48 | 62.1 |
| 154 | 2.2 | 147 | 22.2 | 54 | 42.2 | 47 | 62.2 |
| 155 | 3.1 | 146 | 23.1 | 55 | 43.1 | 46 | 63.1 |
| 156 | 3.2 | 145 | 23.2 | 56 | 43.2 | 45 | 63.2 |
| 157 | 4.1 | 144 | 24.1 | 57 | 44.1 | 44 | 64.1 |
| 158 | 4.2 | 143 | 24.2 | 58 | 44.2 | 43 | 64.2 |
| 159 | 5.1 | 142 | 25.1 | 59 | 45.1 | 42 | 65.1 |
| 160 | 5.2 | 141 | 25.2 | 60 | 45.2 | 41 | 65.2 |
| 161 | 6.1 | 140 | 26.1 | 61 | 46.1 | 40 | 66.1 |
| 162 | 6.2 | 139 | 26.2 | 62 | 46.2 | 39 | 66.2 |
| 163 | 7.1 | 138 | 27.1 | 63 | 47.1 | 38 | 67.1 |
| 164 | 7.2 | 137 | 27.2 | 64 | 47.2 | 37 | 67.2 |
| 165 | 8.1 | 136 | 28.1 | 65 | 48.1 | 36 | 68.1 |
| 166 | 8.2 | 135 | 28.2 | 66 | 48.2 | 35 | 68.2 |
| 167 | 9.1 | 134 | 29.1 | 67 | 49.1 | 34 | 69.1 |
| 168 | 9.2 | 133 | 29.2 | 68 | 49.2 | 33 | 69.2 |
| 169 | 10.1 | 132 | 30.1 | 69 | 50.1 | 32 | 70.1 |
| 170 | 10.2 | 131 | 30.2 | 70 | 50.2 | 31 | 70.2 |
| 171 | 11.1 | 130 | 31.1 | 71 | 51.1 | 30 | 71.1 |
| 172 | 11.2 | 129 | 31.2 | 72 | 51.2 | 29 | 71.2 |
| 173 | 12.1 | 128 | 32.1 | 73 | 52.1 | 28 | 72.1 |
| 174 | 12.2 | 127 | 32.2 | 74 | 52.2 | 27 | 72.2 |
| 175 | 13.1 | 126 | 33.1 | 75 | 53.1 | 26 | 73.1 |
| 176 | 13.2 | 125 | 33.2 | 76 | 53.2 | 25 | 73.2 |
| 177 | 14.1 | 124 | 34.1 | 77 | 54.1 | 24 | 74.1 |
| 178 | 14.2 | 123 | 34.2 | 78 | 54.2 | 23 | 74.2 |
| 179 | 15.1 | 122 | 35.1 | 79 | 55.1 | 22 | 75.1 |
| 180 | 15.2 | 121 | 35.2 | 80 | 55.2 | 21 | 75.2 |
| 181 | 16.1 | 120 | 36.1 | 81 | 56.1 | 20 | 76.1 |
| 182 | 16.2 | 119 | 36.2 | 82 | 56.2 | 19 | 76.2 |
| 183 | 17.1 | 118 | 37.1 | 83 | 57.1 | 18 | 77.1 |
| 184 | 17.2 | 117 | 37.2 | 84 | 57.2 | 17 | 77.2 |
| 185 | 18.1 | 116 | 38.1 | 85 | 58.1 | 16 | 78.1 |
| 186 | 18.2 | 115 | 38.2 | 86 | 58.2 | 15 | 78.2 |
| 187 | 19.1 | 114 | 39.1 | 87 | 59.1 | 14 | 79.1 |
| 188 | 19.2 | 113 | 39.2 | 88 | 59.2 | 13 | 79.2 |
| 189 | 20.1 | 112 | 40.1 | 89 | 60.1 | 12 | 80.1 |
| 190 | 20.2 | 111 | 40.2 | 90 | 60.2 | 11 | 80.2 |
| 191 | C1.1 | 110 | - | 91 | - | 10 | - |
| 192 | C1.2 | 109 | - | 92 | - | 9 | - |
| 193 | - | 108 | - | 93 | - | 8 | - |
| 194 | - | 107 | - | 94 | - | 7 | - |
| 195 | - | 106 | - | 95 | - | 6 | - |
| 196 | - | 105 | - | 96 | - | 5 | - |
| 197 | - | 104 | - | 97 | - | 4 | - |
| 198 | - | 103 | - | 98 | - | 3 | - |
| 199 | - | 102 | - | 99 | - | 2 | - |
| 200 | - | 101 | - | 100 | - | 1 | - |

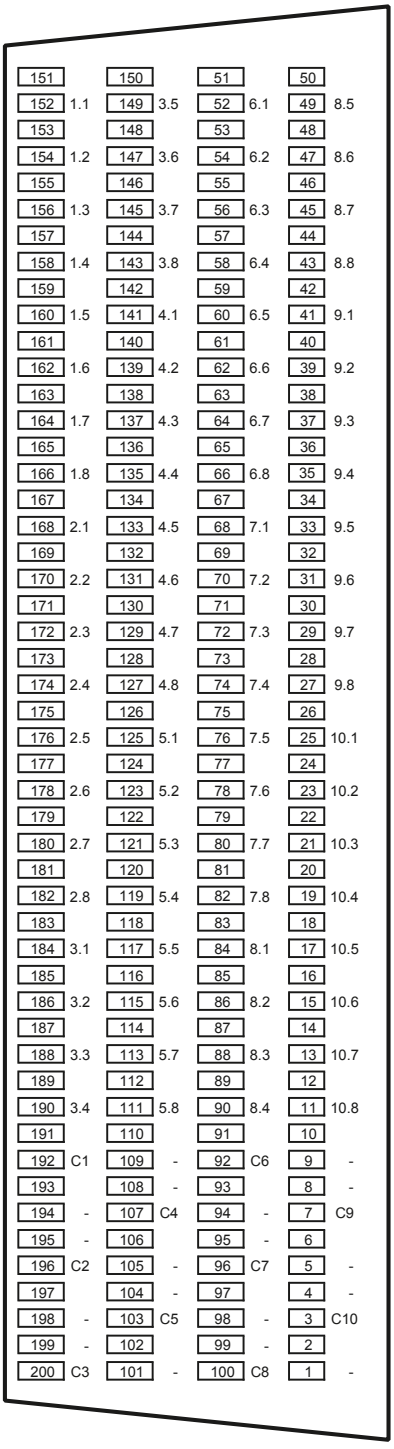
SINGLE BANK EIGHTY CHANNEL TWO POLE

**Figure 5.12 - Module Pin Outs: 40-615-022-1/80/2 (200-pin Female LFH Connector Viewed From Front of Module)**



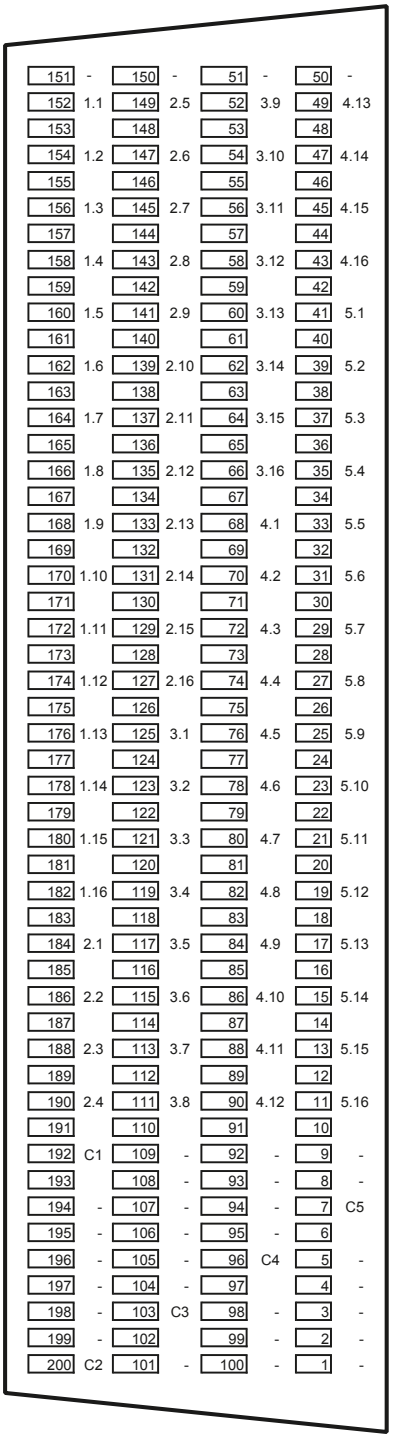

TWENTY BANK FOUR CHANNEL SINGLE POLE

**Figure 5.13 - Module Pin Outs: 40-615-021-20/4/1 (200-pin Female LFH Connector Viewed From Front of Module)**




TEN BANK EIGHT CHANNEL SINGLE POLE

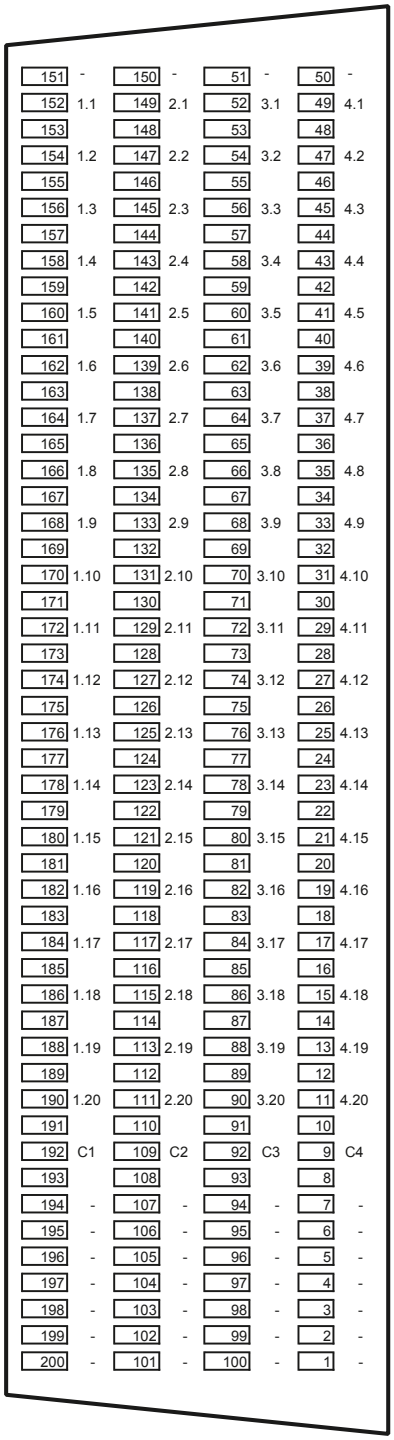
**Figure 5.14 - Module Pin Outs: 40-615-021-10/8/1 (200-pin Female LFH Connector Viewed From Front of Module)**



| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 151 | - | 150 | - | 51 | - | 50 | - |
| 152 | 1.1 | 149 | 2.5 | 52 | 3.9 | 49 | 4.13 |
| 153 | | 148 | | 53 | | 48 | |
| 154 | 1.2 | 147 | 2.6 | 54 | 3.10 | 47 | 4.14 |
| 155 | | 146 | | 55 | | 46 | |
| 156 | 1.3 | 145 | 2.7 | 56 | 3.11 | 45 | 4.15 |
| 157 | | 144 | | 57 | | 44 | |
| 158 | 1.4 | 143 | 2.8 | 58 | 3.12 | 43 | 4.16 |
| 159 | | 142 | | 59 | | 42 | |
| 160 | 1.5 | 141 | 2.9 | 60 | 3.13 | 41 | 5.1 |
| 161 | | 140 | | 61 | | 40 | |
| 162 | 1.6 | 139 | 2.10 | 62 | 3.14 | 39 | 5.2 |
| 163 | | 138 | | 63 | | 38 | |
| 164 | 1.7 | 137 | 2.11 | 64 | 3.15 | 37 | 5.3 |
| 165 | | 136 | | 65 | | 36 | |
| 166 | 1.8 | 135 | 2.12 | 66 | 3.16 | 35 | 5.4 |
| 167 | | 134 | | 67 | | 34 | |
| 168 | 1.9 | 133 | 2.13 | 68 | 4.1 | 33 | 5.5 |
| 169 | | 132 | | 69 | | 32 | |
| 170 | 1.10 | 131 | 2.14 | 70 | 4.2 | 31 | 5.6 |
| 171 | | 130 | | 71 | | 30 | |
| 172 | 1.11 | 129 | 2.15 | 72 | 4.3 | 29 | 5.7 |
| 173 | | 128 | | 73 | | 28 | |
| 174 | 1.12 | 127 | 2.16 | 74 | 4.4 | 27 | 5.8 |
| 175 | | 126 | | 75 | | 26 | |
| 176 | 1.13 | 125 | 3.1 | 76 | 4.5 | 25 | 5.9 |
| 177 | | 124 | | 77 | | 24 | |
| 178 | 1.14 | 123 | 3.2 | 78 | 4.6 | 23 | 5.10 |
| 179 | | 122 | | 79 | | 22 | |
| 180 | 1.15 | 121 | 3.3 | 80 | 4.7 | 21 | 5.11 |
| 181 | | 120 | | 81 | | 20 | |
| 182 | 1.16 | 119 | 3.4 | 82 | 4.8 | 19 | 5.12 |
| 183 | | 118 | | 83 | | 18 | |
| 184 | 2.1 | 117 | 3.5 | 84 | 4.9 | 17 | 5.13 |
| 185 | | 116 | | 85 | | 16 | |
| 186 | 2.2 | 115 | 3.6 | 86 | 4.10 | 15 | 5.14 |
| 187 | | 114 | | 87 | | 14 | |
| 188 | 2.3 | 113 | 3.7 | 88 | 4.11 | 13 | 5.15 |
| 189 | | 112 | | 89 | | 12 | |
| 190 | 2.4 | 111 | 3.8 | 90 | 4.12 | 11 | 5.16 |
| 191 | | 110 | | 91 | | 10 | |
| 192 | C1 | 109 | - | 92 | - | 9 | - |
| 193 | | 108 | - | 93 | - | 8 | - |
| 194 | - | 107 | - | 94 | - | 7 | C5 |
| 195 | - | 106 | - | 95 | - | 6 | |
| 196 | - | 105 | - | 96 | C4 | 5 | - |
| 197 | - | 104 | - | 97 | | 4 | - |
| 198 | - | 103 | C3 | 98 | - | 3 | - |
| 199 | - | 102 | | 99 | - | 2 | - |
| 200 | C2 | 101 | - | 100 | - | 1 | - |

FIVE BANK SIXTEEN CHANNEL SINGLE POLE

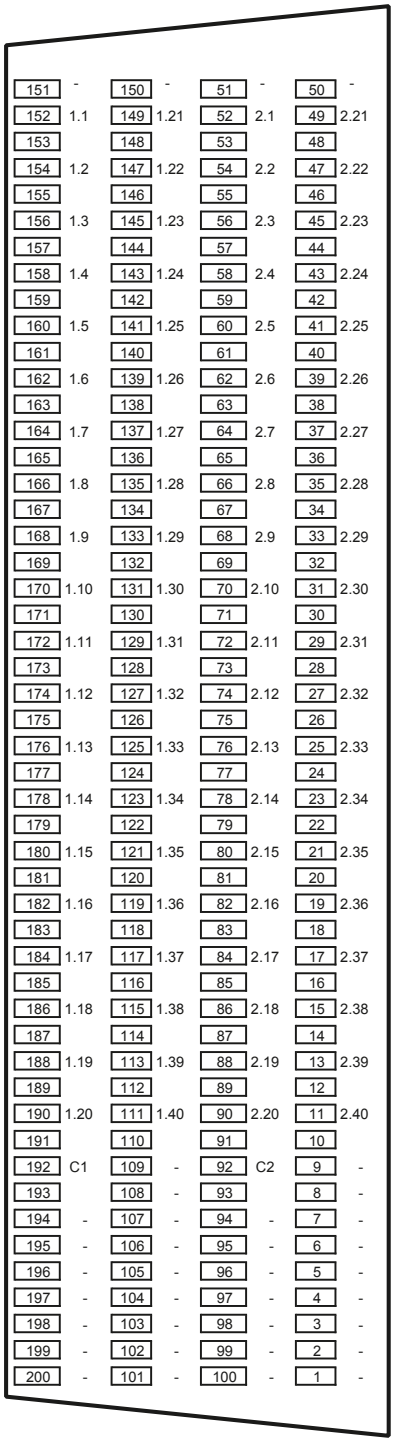
**Figure 5.15 - Module Pin Outs: 40-615-021-5/16/1 (200-pin Female LFH Connector Viewed From Front of Module)**



| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 151 | - | 150 | - | 51 | - | 50 | - |
| 152 | 1.1 | 149 | 2.1 | 52 | 3.1 | 49 | 4.1 |
| 153 | | 148 | | 53 | | 48 | |
| 154 | 1.2 | 147 | 2.2 | 54 | 3.2 | 47 | 4.2 |
| 155 | | 146 | | 55 | | 46 | |
| 156 | 1.3 | 145 | 2.3 | 56 | 3.3 | 45 | 4.3 |
| 157 | | 144 | | 57 | | 44 | |
| 158 | 1.4 | 143 | 2.4 | 58 | 3.4 | 43 | 4.4 |
| 159 | | 142 | | 59 | | 42 | |
| 160 | 1.5 | 141 | 2.5 | 60 | 3.5 | 41 | 4.5 |
| 161 | | 140 | | 61 | | 40 | |
| 162 | 1.6 | 139 | 2.6 | 62 | 3.6 | 39 | 4.6 |
| 163 | | 138 | | 63 | | 38 | |
| 164 | 1.7 | 137 | 2.7 | 64 | 3.7 | 37 | 4.7 |
| 165 | | 136 | | 65 | | 36 | |
| 166 | 1.8 | 135 | 2.8 | 66 | 3.8 | 35 | 4.8 |
| 167 | | 134 | | 67 | | 34 | |
| 168 | 1.9 | 133 | 2.9 | 68 | 3.9 | 33 | 4.9 |
| 169 | | 132 | | 69 | | 32 | |
| 170 | 1.10 | 131 | 2.10 | 70 | 3.10 | 31 | 4.10 |
| 171 | | 130 | | 71 | | 30 | |
| 172 | 1.11 | 129 | 2.11 | 72 | 3.11 | 29 | 4.11 |
| 173 | | 128 | | 73 | | 28 | |
| 174 | 1.12 | 127 | 2.12 | 74 | 3.12 | 27 | 4.12 |
| 175 | | 126 | | 75 | | 26 | |
| 176 | 1.13 | 125 | 2.13 | 76 | 3.13 | 25 | 4.13 |
| 177 | | 124 | | 77 | | 24 | |
| 178 | 1.14 | 123 | 2.14 | 78 | 3.14 | 23 | 4.14 |
| 179 | | 122 | | 79 | | 22 | |
| 180 | 1.15 | 121 | 2.15 | 80 | 3.15 | 21 | 4.15 |
| 181 | | 120 | | 81 | | 20 | |
| 182 | 1.16 | 119 | 2.16 | 82 | 3.16 | 19 | 4.16 |
| 183 | | 118 | | 83 | | 18 | |
| 184 | 1.17 | 117 | 2.17 | 84 | 3.17 | 17 | 4.17 |
| 185 | | 116 | | 85 | | 16 | |
| 186 | 1.18 | 115 | 2.18 | 86 | 3.18 | 15 | 4.18 |
| 187 | | 114 | | 87 | | 14 | |
| 188 | 1.19 | 113 | 2.19 | 88 | 3.19 | 13 | 4.19 |
| 189 | | 112 | | 89 | | 12 | |
| 190 | 1.20 | 111 | 2.20 | 90 | 3.20 | 11 | 4.20 |
| 191 | | 110 | | 91 | | 10 | |
| 192 | C1 | 109 | C2 | 92 | C3 | 9 | C4 |
| 193 | | 108 | | 93 | | 8 | |
| 194 | - | 107 | - | 94 | - | 7 | - |
| 195 | - | 106 | - | 95 | - | 6 | - |
| 196 | - | 105 | - | 96 | - | 5 | - |
| 197 | - | 104 | - | 97 | - | 4 | - |
| 198 | - | 103 | - | 98 | - | 3 | - |
| 199 | - | 102 | - | 99 | - | 2 | - |
| 200 | - | 101 | - | 100 | - | 1 | - |

FOUR BANK TWENTY CHANNEL SINGLE POLE

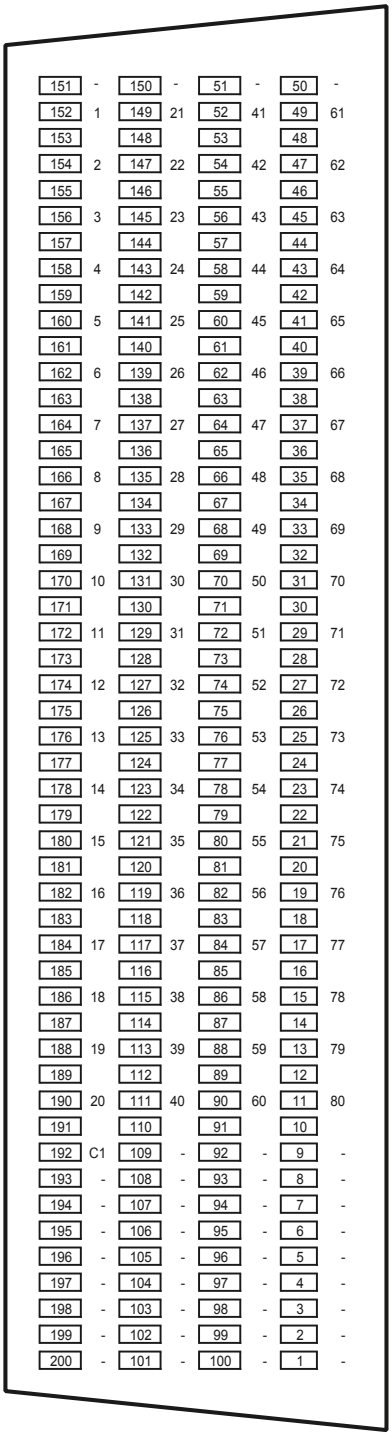
**Figure 5.16 - Module Pin Outs: 40-615-021-4/20/1 (200-pin Female LFH Connector Viewed From Front of Module)**



| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 151 | - | 150 | - | 51 | - | 50 | - |
| 152 | 1.1 | 149 | 1.21 | 52 | 2.1 | 49 | 2.21 |
| 153 | | 148 | | 53 | | 48 | |
| 154 | 1.2 | 147 | 1.22 | 54 | 2.2 | 47 | 2.22 |
| 155 | | 146 | | 55 | | 46 | |
| 156 | 1.3 | 145 | 1.23 | 56 | 2.3 | 45 | 2.23 |
| 157 | | 144 | | 57 | | 44 | |
| 158 | 1.4 | 143 | 1.24 | 58 | 2.4 | 43 | 2.24 |
| 159 | | 142 | | 59 | | 42 | |
| 160 | 1.5 | 141 | 1.25 | 60 | 2.5 | 41 | 2.25 |
| 161 | | 140 | | 61 | | 40 | |
| 162 | 1.6 | 139 | 1.26 | 62 | 2.6 | 39 | 2.26 |
| 163 | | 138 | | 63 | | 38 | |
| 164 | 1.7 | 137 | 1.27 | 64 | 2.7 | 37 | 2.27 |
| 165 | | 136 | | 65 | | 36 | |
| 166 | 1.8 | 135 | 1.28 | 66 | 2.8 | 35 | 2.28 |
| 167 | | 134 | | 67 | | 34 | |
| 168 | 1.9 | 133 | 1.29 | 68 | 2.9 | 33 | 2.29 |
| 169 | | 132 | | 69 | | 32 | |
| 170 | 1.10 | 131 | 1.30 | 70 | 2.10 | 31 | 2.30 |
| 171 | | 130 | | 71 | | 30 | |
| 172 | 1.11 | 129 | 1.31 | 72 | 2.11 | 29 | 2.31 |
| 173 | | 128 | | 73 | | 28 | |
| 174 | 1.12 | 127 | 1.32 | 74 | 2.12 | 27 | 2.32 |
| 175 | | 126 | | 75 | | 26 | |
| 176 | 1.13 | 125 | 1.33 | 76 | 2.13 | 25 | 2.33 |
| 177 | | 124 | | 77 | | 24 | |
| 178 | 1.14 | 123 | 1.34 | 78 | 2.14 | 23 | 2.34 |
| 179 | | 122 | | 79 | | 22 | |
| 180 | 1.15 | 121 | 1.35 | 80 | 2.15 | 21 | 2.35 |
| 181 | | 120 | | 81 | | 20 | |
| 182 | 1.16 | 119 | 1.36 | 82 | 2.16 | 19 | 2.36 |
| 183 | | 118 | | 83 | | 18 | |
| 184 | 1.17 | 117 | 1.37 | 84 | 2.17 | 17 | 2.37 |
| 185 | | 116 | | 85 | | 16 | |
| 186 | 1.18 | 115 | 1.38 | 86 | 2.18 | 15 | 2.38 |
| 187 | | 114 | | 87 | | 14 | |
| 188 | 1.19 | 113 | 1.39 | 88 | 2.19 | 13 | 2.39 |
| 189 | | 112 | | 89 | | 12 | |
| 190 | 1.20 | 111 | 1.40 | 90 | 2.20 | 11 | 2.40 |
| 191 | | 110 | | 91 | | 10 | |
| 192 | C1 | 109 | - | 92 | C2 | 9 | - |
| 193 | | 108 | - | 93 | | 8 | - |
| 194 | - | 107 | - | 94 | - | 7 | - |
| 195 | - | 106 | - | 95 | - | 6 | - |
| 196 | - | 105 | - | 96 | - | 5 | - |
| 197 | - | 104 | - | 97 | - | 4 | - |
| 198 | - | 103 | - | 98 | - | 3 | - |
| 199 | - | 102 | - | 99 | - | 2 | - |
| 200 | - | 101 | - | 100 | - | 1 | - |

TWO BANK FOURTY CHANNEL SINGLE POLE

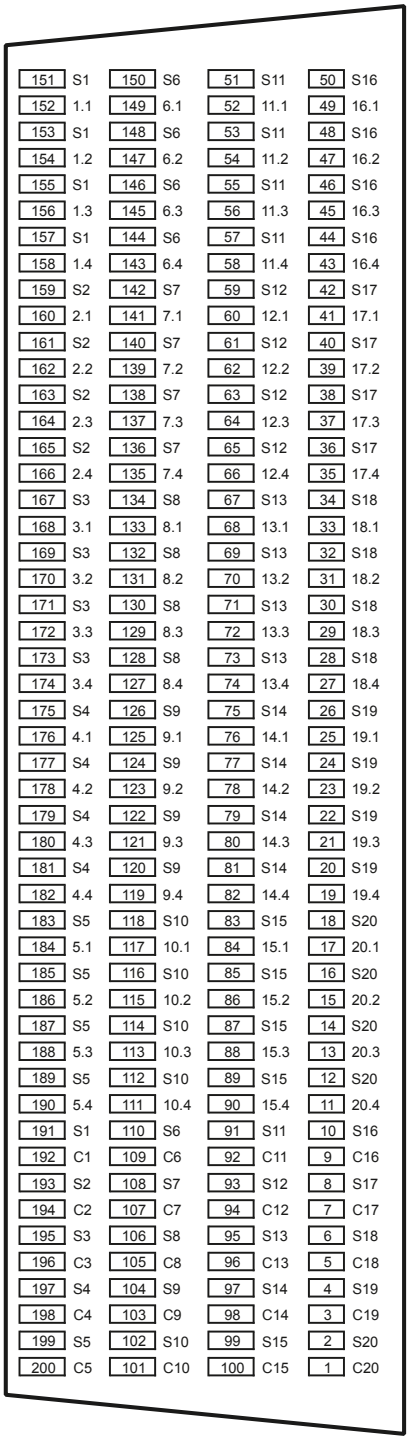
**Figure 5.17 - Module Pin Outs: 40-615-021-2/40/1 (200-pin Female LFH Connector Viewed From Front of Module)**



| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 151 | - | 150 | - | 51 | - | 50 | - |
| 152 | 1 | 149 | 21 | 52 | 41 | 49 | 61 |
| 153 | | 148 | | 53 | | 48 | |
| 154 | 2 | 147 | 22 | 54 | 42 | 47 | 62 |
| 155 | | 146 | | 55 | | 46 | |
| 156 | 3 | 145 | 23 | 56 | 43 | 45 | 63 |
| 157 | | 144 | | 57 | | 44 | |
| 158 | 4 | 143 | 24 | 58 | 44 | 43 | 64 |
| 159 | | 142 | | 59 | | 42 | |
| 160 | 5 | 141 | 25 | 60 | 45 | 41 | 65 |
| 161 | | 140 | | 61 | | 40 | |
| 162 | 6 | 139 | 26 | 62 | 46 | 39 | 66 |
| 163 | | 138 | | 63 | | 38 | |
| 164 | 7 | 137 | 27 | 64 | 47 | 37 | 67 |
| 165 | | 136 | | 65 | | 36 | |
| 166 | 8 | 135 | 28 | 66 | 48 | 35 | 68 |
| 167 | | 134 | | 67 | | 34 | |
| 168 | 9 | 133 | 29 | 68 | 49 | 33 | 69 |
| 169 | | 132 | | 69 | | 32 | |
| 170 | 10 | 131 | 30 | 70 | 50 | 31 | 70 |
| 171 | | 130 | | 71 | | 30 | |
| 172 | 11 | 129 | 31 | 72 | 51 | 29 | 71 |
| 173 | | 128 | | 73 | | 28 | |
| 174 | 12 | 127 | 32 | 74 | 52 | 27 | 72 |
| 175 | | 126 | | 75 | | 26 | |
| 176 | 13 | 125 | 33 | 76 | 53 | 25 | 73 |
| 177 | | 124 | | 77 | | 24 | |
| 178 | 14 | 123 | 34 | 78 | 54 | 23 | 74 |
| 179 | | 122 | | 79 | | 22 | |
| 180 | 15 | 121 | 35 | 80 | 55 | 21 | 75 |
| 181 | | 120 | | 81 | | 20 | |
| 182 | 16 | 119 | 36 | 82 | 56 | 19 | 76 |
| 183 | | 118 | | 83 | | 18 | |
| 184 | 17 | 117 | 37 | 84 | 57 | 17 | 77 |
| 185 | | 116 | | 85 | | 16 | |
| 186 | 18 | 115 | 38 | 86 | 58 | 15 | 78 |
| 187 | | 114 | | 87 | | 14 | |
| 188 | 19 | 113 | 39 | 88 | 59 | 13 | 79 |
| 189 | | 112 | | 89 | | 12 | |
| 190 | 20 | 111 | 40 | 90 | 60 | 11 | 80 |
| 191 | | 110 | | 91 | | 10 | |
| 192 | C1 | 109 | - | 92 | - | 9 | - |
| 193 | - | 108 | - | 93 | - | 8 | - |
| 194 | - | 107 | - | 94 | - | 7 | - |
| 195 | - | 106 | - | 95 | - | 6 | - |
| 196 | - | 105 | - | 96 | - | 5 | - |
| 197 | - | 104 | - | 97 | - | 4 | - |
| 198 | - | 103 | - | 98 | - | 3 | - |
| 199 | - | 102 | - | 99 | - | 2 | - |
| 200 | - | 101 | - | 100 | - | 1 | - |

SINGLE BANK EIGHTY CHANNEL SINGLE POLE

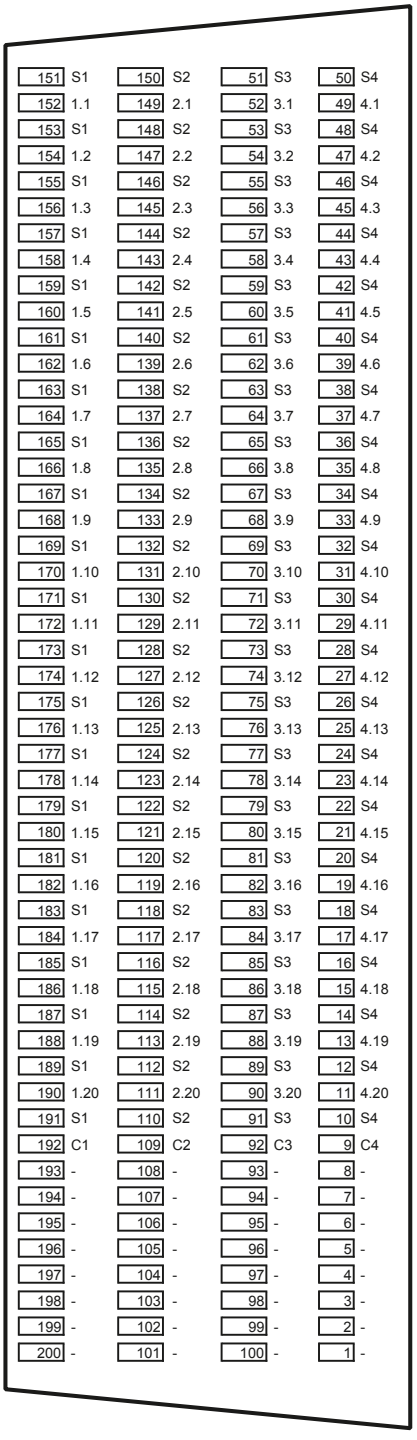
**Figure 5.18 - Module Pin Outs: 40-615-021-1/80/1 (200-pin Female LFH Connector Viewed From Front of Module)**



| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 151 | S1 | 150 | S6 | 51 | S11 | 50 | S16 |
| 152 | 1.1 | 149 | 6.1 | 52 | 11.1 | 49 | 16.1 |
| 153 | S1 | 148 | S6 | 53 | S11 | 48 | S16 |
| 154 | 1.2 | 147 | 6.2 | 54 | 11.2 | 47 | 16.2 |
| 155 | S1 | 146 | S6 | 55 | S11 | 46 | S16 |
| 156 | 1.3 | 145 | 6.3 | 56 | 11.3 | 45 | 16.3 |
| 157 | S1 | 144 | S6 | 57 | S11 | 44 | S16 |
| 158 | 1.4 | 143 | 6.4 | 58 | 11.4 | 43 | 16.4 |
| 159 | S2 | 142 | S7 | 59 | S12 | 42 | S17 |
| 160 | 2.1 | 141 | 7.1 | 60 | 12.1 | 41 | 17.1 |
| 161 | S2 | 140 | S7 | 61 | S12 | 40 | S17 |
| 162 | 2.2 | 139 | 7.2 | 62 | 12.2 | 39 | 17.2 |
| 163 | S2 | 138 | S7 | 63 | S12 | 38 | S17 |
| 164 | 2.3 | 137 | 7.3 | 64 | 12.3 | 37 | 17.3 |
| 165 | S2 | 136 | S7 | 65 | S12 | 36 | S17 |
| 166 | 2.4 | 135 | 7.4 | 66 | 12.4 | 35 | 17.4 |
| 167 | S3 | 134 | S8 | 67 | S13 | 34 | S18 |
| 168 | 3.1 | 133 | 8.1 | 68 | 13.1 | 33 | 18.1 |
| 169 | S3 | 132 | S8 | 69 | S13 | 32 | S18 |
| 170 | 3.2 | 131 | 8.2 | 70 | 13.2 | 31 | 18.2 |
| 171 | S3 | 130 | S8 | 71 | S13 | 30 | S18 |
| 172 | 3.3 | 129 | 8.3 | 72 | 13.3 | 29 | 18.3 |
| 173 | S3 | 128 | S8 | 73 | S13 | 28 | S18 |
| 174 | 3.4 | 127 | 8.4 | 74 | 13.4 | 27 | 18.4 |
| 175 | S4 | 126 | S9 | 75 | S14 | 26 | S19 |
| 176 | 4.1 | 125 | 9.1 | 76 | 14.1 | 25 | 19.1 |
| 177 | S4 | 124 | S9 | 77 | S14 | 24 | S19 |
| 178 | 4.2 | 123 | 9.2 | 78 | 14.2 | 23 | 19.2 |
| 179 | S4 | 122 | S9 | 79 | S14 | 22 | S19 |
| 180 | 4.3 | 121 | 9.3 | 80 | 14.3 | 21 | 19.3 |
| 181 | S4 | 120 | S9 | 81 | S14 | 20 | S19 |
| 182 | 4.4 | 119 | 9.4 | 82 | 14.4 | 19 | 19.4 |
| 183 | S5 | 118 | S10 | 83 | S15 | 18 | S20 |
| 184 | 5.1 | 117 | 10.1 | 84 | 15.1 | 17 | 20.1 |
| 185 | S5 | 116 | S10 | 85 | S15 | 16 | S20 |
| 186 | 5.2 | 115 | 10.2 | 86 | 15.2 | 15 | 20.2 |
| 187 | S5 | 114 | S10 | 87 | S15 | 14 | S20 |
| 188 | 5.3 | 113 | 10.3 | 88 | 15.3 | 13 | 20.3 |
| 189 | S5 | 112 | S10 | 89 | S15 | 12 | S20 |
| 190 | 5.4 | 111 | 10.4 | 90 | 15.4 | 11 | 20.4 |
| 191 | S1 | 110 | S6 | 91 | S11 | 10 | S16 |
| 192 | C1 | 109 | C6 | 92 | C11 | 9 | C16 |
| 193 | S2 | 108 | S7 | 93 | S12 | 8 | S17 |
| 194 | C2 | 107 | C7 | 94 | C12 | 7 | C17 |
| 195 | S3 | 106 | S8 | 95 | S13 | 6 | S18 |
| 196 | C3 | 105 | C8 | 96 | C13 | 5 | C18 |
| 197 | S4 | 104 | S9 | 97 | S14 | 4 | S19 |
| 198 | C4 | 103 | C9 | 98 | C14 | 3 | C19 |
| 199 | S5 | 102 | S10 | 99 | S15 | 2 | S20 |
| 200 | C5 | 101 | C10 | 100 | C15 | 1 | C20 |

TWENTY BANK FOUR CHANNEL SCREENED

**Figure 5.19 - Module Pin Outs: 40-615-021-S-20/4/1 (200-pin Female LFH Connector Viewed From Front of Module)**



| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 151 | S1 | 150 | S2 | 51 | S3 | 50 | S4 |
| 152 | 1.1 | 149 | 2.1 | 52 | 3.1 | 49 | 4.1 |
| 153 | S1 | 148 | S2 | 53 | S3 | 48 | S4 |
| 154 | 1.2 | 147 | 2.2 | 54 | 3.2 | 47 | 4.2 |
| 155 | S1 | 146 | S2 | 55 | S3 | 46 | S4 |
| 156 | 1.3 | 145 | 2.3 | 56 | 3.3 | 45 | 4.3 |
| 157 | S1 | 144 | S2 | 57 | S3 | 44 | S4 |
| 158 | 1.4 | 143 | 2.4 | 58 | 3.4 | 43 | 4.4 |
| 159 | S1 | 142 | S2 | 59 | S3 | 42 | S4 |
| 160 | 1.5 | 141 | 2.5 | 60 | 3.5 | 41 | 4.5 |
| 161 | S1 | 140 | S2 | 61 | S3 | 40 | S4 |
| 162 | 1.6 | 139 | 2.6 | 62 | 3.6 | 39 | 4.6 |
| 163 | S1 | 138 | S2 | 63 | S3 | 38 | S4 |
| 164 | 1.7 | 137 | 2.7 | 64 | 3.7 | 37 | 4.7 |
| 165 | S1 | 136 | S2 | 65 | S3 | 36 | S4 |
| 166 | 1.8 | 135 | 2.8 | 66 | 3.8 | 35 | 4.8 |
| 167 | S1 | 134 | S2 | 67 | S3 | 34 | S4 |
| 168 | 1.9 | 133 | 2.9 | 68 | 3.9 | 33 | 4.9 |
| 169 | S1 | 132 | S2 | 69 | S3 | 32 | S4 |
| 170 | 1.10 | 131 | 2.10 | 70 | 3.10 | 31 | 4.10 |
| 171 | S1 | 130 | S2 | 71 | S3 | 30 | S4 |
| 172 | 1.11 | 129 | 2.11 | 72 | 3.11 | 29 | 4.11 |
| 173 | S1 | 128 | S2 | 73 | S3 | 28 | S4 |
| 174 | 1.12 | 127 | 2.12 | 74 | 3.12 | 27 | 4.12 |
| 175 | S1 | 126 | S2 | 75 | S3 | 26 | S4 |
| 176 | 1.13 | 125 | 2.13 | 76 | 3.13 | 25 | 4.13 |
| 177 | S1 | 124 | S2 | 77 | S3 | 24 | S4 |
| 178 | 1.14 | 123 | 2.14 | 78 | 3.14 | 23 | 4.14 |
| 179 | S1 | 122 | S2 | 79 | S3 | 22 | S4 |
| 180 | 1.15 | 121 | 2.15 | 80 | 3.15 | 21 | 4.15 |
| 181 | S1 | 120 | S2 | 81 | S3 | 20 | S4 |
| 182 | 1.16 | 119 | 2.16 | 82 | 3.16 | 19 | 4.16 |
| 183 | S1 | 118 | S2 | 83 | S3 | 18 | S4 |
| 184 | 1.17 | 117 | 2.17 | 84 | 3.17 | 17 | 4.17 |
| 185 | S1 | 116 | S2 | 85 | S3 | 16 | S4 |
| 186 | 1.18 | 115 | 2.18 | 86 | 3.18 | 15 | 4.18 |
| 187 | S1 | 114 | S2 | 87 | S3 | 14 | S4 |
| 188 | 1.19 | 113 | 2.19 | 88 | 3.19 | 13 | 4.19 |
| 189 | S1 | 112 | S2 | 89 | S3 | 12 | S4 |
| 190 | 1.20 | 111 | 2.20 | 90 | 3.20 | 11 | 4.20 |
| 191 | S1 | 110 | S2 | 91 | S3 | 10 | S4 |
| 192 | C1 | 109 | C2 | 92 | C3 | 9 | C4 |
| 193 | - | 108 | - | 93 | - | 8 | - |
| 194 | - | 107 | - | 94 | - | 7 | - |
| 195 | - | 106 | - | 95 | - | 6 | - |
| 196 | - | 105 | - | 96 | - | 5 | - |
| 197 | - | 104 | - | 97 | - | 4 | - |
| 198 | - | 103 | - | 98 | - | 3 | - |
| 199 | - | 102 | - | 99 | - | 2 | - |
| 200 | - | 101 | - | 100 | - | 1 | - |

FOUR BANK TWENTY CHANNEL SCREENED

**Figure 5.20 - Module Pin Outs: 40-615-021-S-4/20/1 (200-pin Female LFH 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.

## SWITCHING SYSTEM TEST TOOLS

Please refer to Section 7 - Maintenance Information.

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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.

## SWITCHING SYSTEM TEST TOOLS

We recommend the use of ***eBIRST*** to provide a check of the correct operation of relays and to identify the location of any faulty relay. For more information on ***eBIRST*** click here.

## RELAY LOOK-UP TABLES

Section 4 provides cross reference tables for the signal paths of the product 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. Users of ***eBIRST*** switching system test tools do not need to use this information to locate faulty relays.

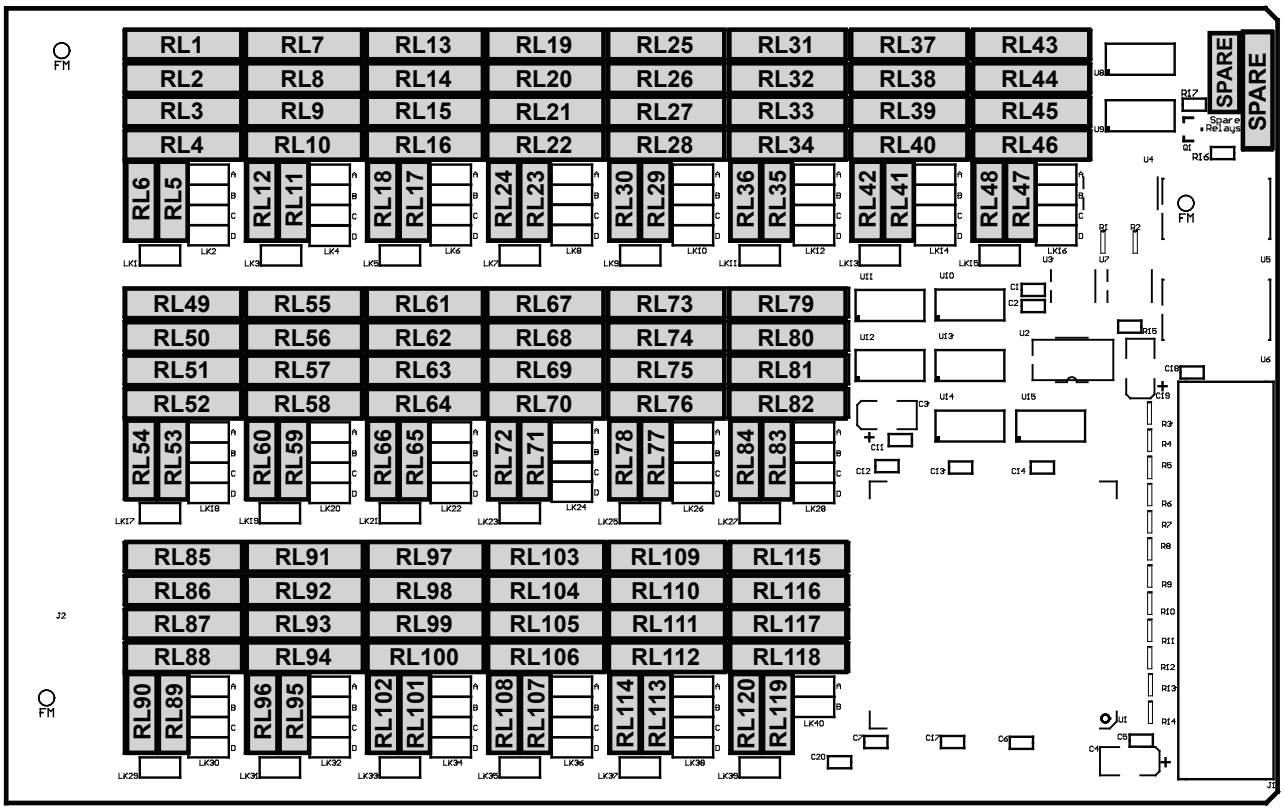



**Figure 7.1 - Multiplexer Module: Component Layout**
**40-615-022 HD 1 Pole Multiplexer and 40-615-021 LD 1 Pole (Screened) Multiplexer.**

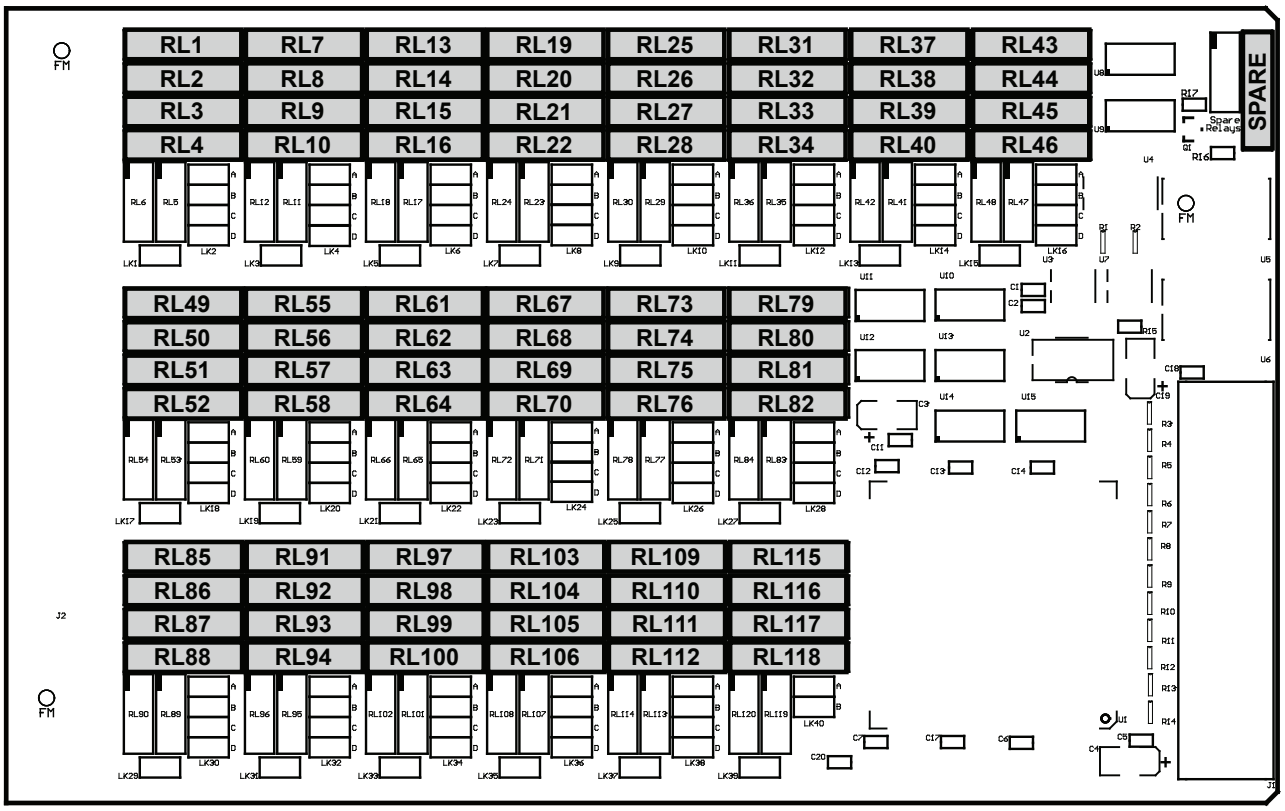



**Figure 7.2 - Multiplexer Module: Component Layout**
**40-615-022 HD 2 Pole Multiplexer and 40-615-021 LD 1 Pole Multiplexer.**

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