



- Dual 24x8 Video Matrix
- Software Configurable As 48x8 Matrix
- Low Cost Single 24x8 Options
- 25 MHz Bandwidth
- High Density Mini SMB or MCX Connectors

- Also Available With BNC Connectors
- 75  $\Omega$  Impedance Suitable for Video Switching
- Rack Mountable Enclosure
- LXI Standard 1.4 Compliant
- IVI & Direct I/O Drivers
- 3 Year Warranty

The 60-711 is a Dual 24x8 Video Matrix suitable for switching frequencies up to 25 MHz. It has a characteristic impedance of 75  $\Omega$  with the option of mini SMB or MCX connectors or, with a larger case size, BNC connectors.

It provides a simple and scalable bidirectional matrix for video signals and is intended for the easy construction of high performance switching systems.

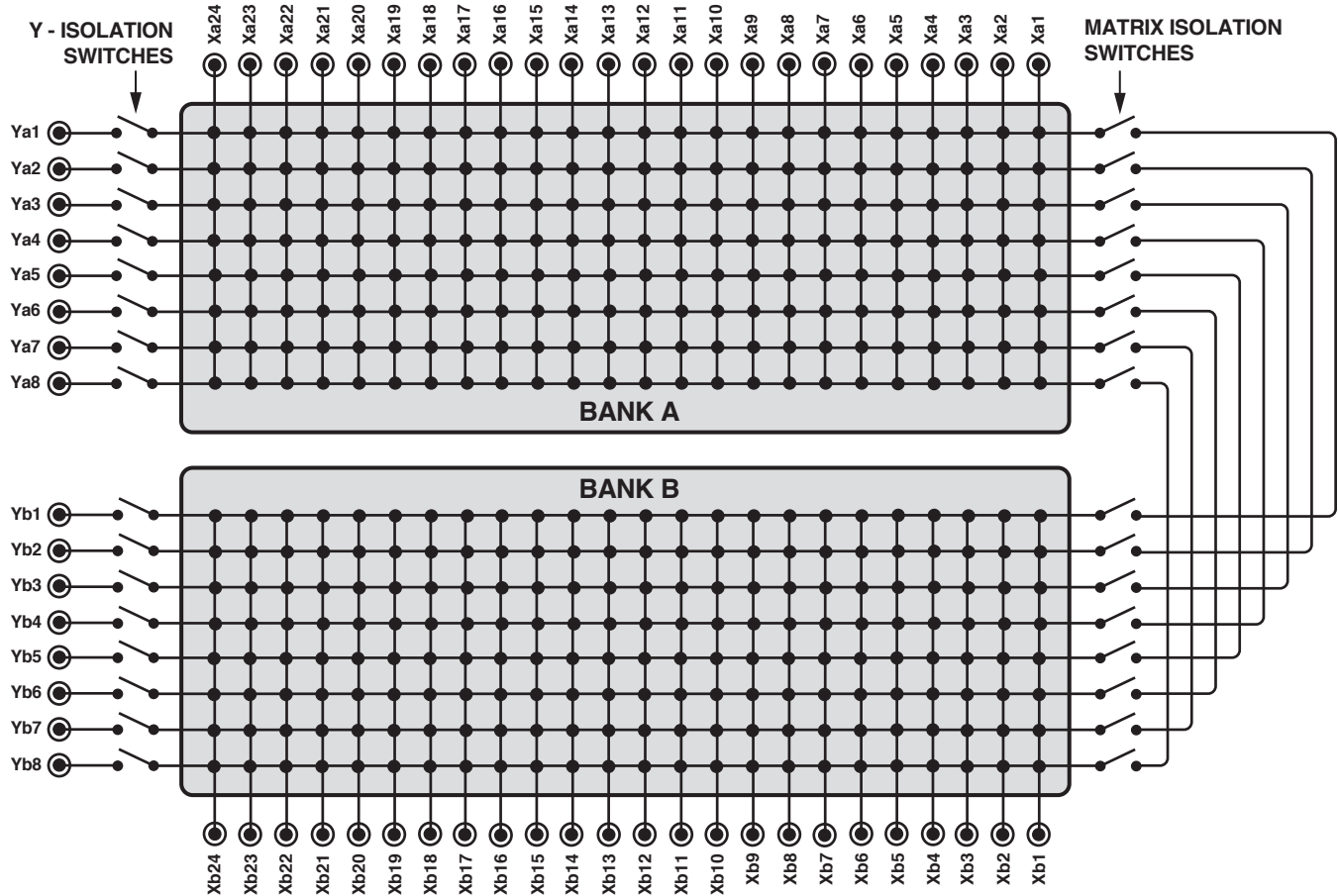
Software control allows the 60-711 to be set as a dual 24x8 matrix, a single 48x8 matrix and other configurations. Also, flexible isolation switching allows expansion with other matrices while maximizing bandwidth.

The 60-711 is designed in accordance with the LXI Standard 1.4 and the SMB/MCX versions are supplied in a compact 1U high, rack width case with 340 mm depth. The BNC version is housed in a 2U high case with 500 mm depth.

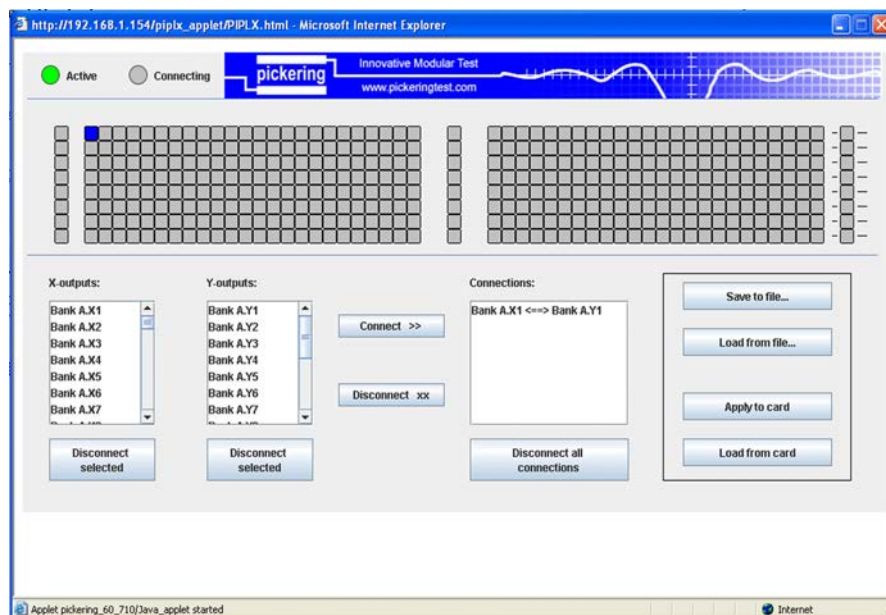
It is programmable via the LAN interface using code based Pickering PXI switch driver. Standard (W3C) web browsers can be used to access and change configuration information and provide access to the soft front panels.



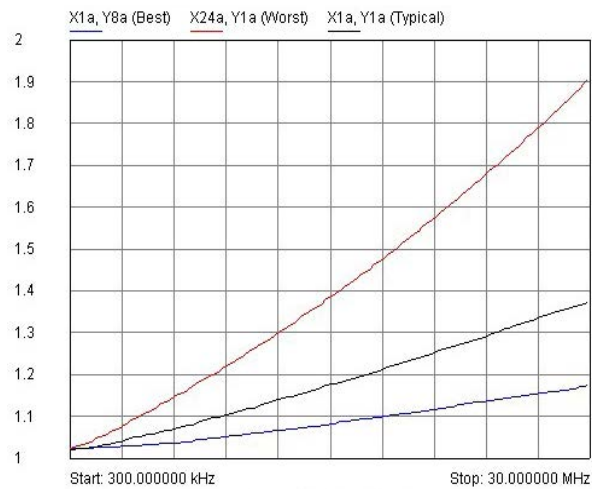
The 60-711 can be supplied  
in 2U format with BNC connectors



60-711 Dual 24x8 Video Matrix Schematic Diagram



Soft Front Panel for the 60-711 Dual 24x8 Video Matrix



**VSWR Plot for Dual 24x8 Video Matrix**



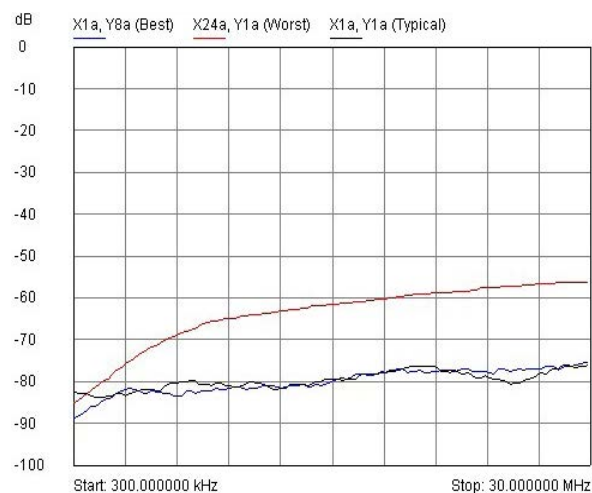
**Insertion Loss Plot for Dual 24x8 Video Matrix**



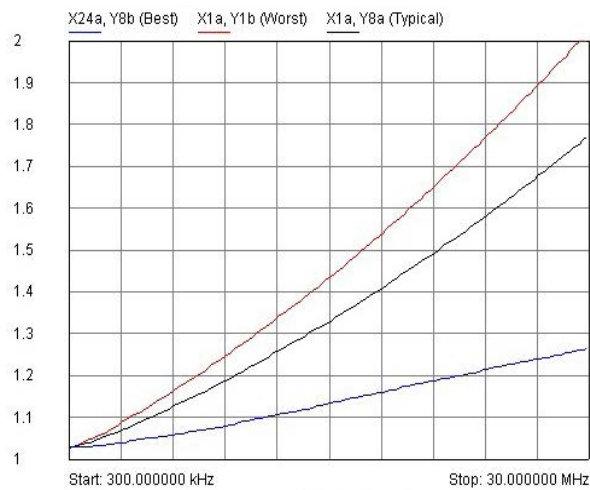
**Crosstalk Plot for Dual 24x8 Video Matrix  
(between X-Y path and X connection with 75Ω load)**



**Crosstalk Plot for Dual 24x8 Video Matrix  
(between X-Y path and Y connection with 75Ω load)**



**Isolation Plot for Dual 24x8 Video Matrix  
(all relays off)**



**VSWR Plot for Single 48x8 Video Matrix**



**Insertion Loss Plot for Single 48x8 Video Matrix**



**Crosstalk Plot for Single 48x8 Video Matrix  
(between X-Y path and X connection with 75Ω load)**



**Crosstalk Plot for Single 48x8 Video Matrix  
(between X-Y path and Y connection with 75Ω load)**



**Isolation Plot for Single 48x8 Video Matrix  
(all relays off)**

## Relay Type

The 60-711 is fitted with electro-mechanical signal relays with palladium-ruthenium, gold covered contacts. These are leaded relays (not SMT relays) so field maintenance is greatly simplified. In addition a total of 8 spare relays (dual 24x8 versions) or 4 spare relays (single 24x8 versions) are fitted to the circuit boards to allow easy maintenance with minimum downtime.

## General Matrix Switching Specification

Maximum Voltage:	100 VDC*
Maximum Power:	30 W
Maximum Switch Current:	1.0 A
Characteristic Impedance:	75 $\Omega$
On Path Resistance:	<500 m $\Omega$
Off Path Resistance:	>108 $\Omega$
Thermal Offset:	<50 $\mu$ V
Expected Life (Low Power):	10 <sup>8</sup> operations
Expected Life (Max Power):	>10 <sup>7</sup> operations
Operate Time:	<3 ms

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

## RF Specification - Single or Dual 24x8 Configuration

Insertion Loss:	<0.3 dB @ 10 MHz, 0.2 dB typical <0.75 dB @ 25 MHz, 0.29 dB typical typical worst case 0.53 dB @ 25 MHz
VSWR:	<1.4 @ 10 MHz, 1.25 typical <2.0 @ 25 MHz, 1.37 typical typical worst case 1.76 @ 25 MHz
Crosstalk (X-Y path, X terminated):	Better than 45 dB @ 10 MHz Better than 40 dB @ 25 MHz
(X-Y path, Y terminated):	Better than 60 dB @ 10 MHz Better than 50 dB @ 25 MHz
Isolation:	Better than 55 dB to 25 MHz

## RF Specification - Single 48x8 Configuration

Insertion Loss:	<0.3 dB @ 10 MHz, 0.2 dB typical <1 dB @ 25 MHz, 0.55 dB typical typical worst case 0.74 dB @ 25 MHz
VSWR:	<1.4 @ 10 MHz, 1.2 typical <2.0 @ 25 MHz, 1.6 typical typical worst case 1.9 @ 25 MHz
Crosstalk (X-Y path, X terminated):	Better than 45 dB @ 10 MHz Better than 40 dB @ 25 MHz
(X-Y path, Y terminated):	Better than 60 dB @ 10 MHz Better than 50 dB @ 25 MHz
Isolation:	Better than 70 dB to 25 MHz

**Note:** Matrix RF Performance is entirely dependant upon the combination of crosspoints currently selected, these figures are for one selected crosspoint on any X or Y channel only, refer to graphs. For further assistance on getting maximum performance using the 60-711 please refer to the Operating Manual.

## Power Source

Universal AC mains supply, 90-120/200-240 V 50-60 Hz	
Power Inlet:	Male IEC connector
Power Rating:	100 VA maximum
Fuse Rating:	2.5 A, 250 V

## LAN Interface

Compliant to LXI Standard 1.4, the 60-711 has a 1000Base-T Ethernet Interface via a standard RJ-45 connector mounted on the rear panel with an LCD display showing the unit's IP address.\*

**\*Note:** Legacy units may not have 1000Base-T support or be fitted with an LCD display.

## Mechanical Characteristics

Supplied with front panel ears to enable rack mounting on a shelf or other rear support mechanism.

Dimensions: 1U high, full rack width, 340 mm depth (SMB/MCX)  
2U high, full rack width, 500 mm depth (BNC)

Weight: 4.6 kg

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

## Connectors

The 60-711 is available with the following front panel connector options:

- 75  $\Omega$  mini SMB
- 75  $\Omega$  MCX
- 75  $\Omega$  BNC
- 50  $\Omega$  SMB

## Operating/Storage Conditions

Operating Temperature: 0 °C to +55 °C  
Humidity: Up to 90% non-condensing  
Altitude: 5000 m

Storage/Transport Temperature: -20 °C to +75 °C  
Humidity: Up to 90% non-condensing  
Altitude: 15000 m

## Product Order Codes

Single 24x8 Video Matrix, Mini Smb (75 $\Omega$ )	60-711-001
Dual 24x8 Video Matrix, Mini Smb (75 $\Omega$ )	60-711-002
Single 24x8 Video Matrix, Mcx (75 $\Omega$ )	60-711-003
Dual 24x8 Video Matrix, Mcx (75 $\Omega$ )	60-711-004
Single 24x8 Video Matrix, Bnc (75 $\Omega$ )	60-711-005
Dual 24x8 Video Matrix, Bnc (75 $\Omega$ )	60-711-006
Single 24x8 Video Matrix, Smb (50 $\Omega$ )	60-711-711
Dual 24x8 Video Matrix, Smb (50 $\Omega$ )	60-711-721

## Product Customization

Pickering LXI units are designed and manufactured on our own flexible manufacturing lines, giving complete product control and enabling simple customization to meet very specific requirements.

Customization can include:

- Alternative relay types
- Mixture of relay types
- Alternative number of relays
- Different performance specifications

All customized products are given a unique part number, fully documented and may be ordered at any time in the future. Please contact your local sales office to discuss.

## Safety & CE Compliance

All products 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.

## Mating Connectors & Cabling

For connection accessories for the 60-711 please refer to the [90-011D](#) RF Cable Assemblies data sheet where a complete list and documentation can be found for accessories, or refer to our website.



## Connectivity Solutions

We provide a full range of supporting cable and connector solutions for all our switching products—20 connector families with **1200+** products. We offer everything from simple mating connectors to complex cables assemblies and terminal blocks. All assemblies are manufactured by Pickering and are guaranteed to mechanically and electrically mate to our modules. These accessories are detailed in Connector Accessories data sheets, where a complete list and documentation can be found for each accessory.



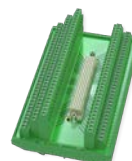
Connectors  
& Backshells



Multi-way  
Cable Assemblies



RF Cable  
Assemblies



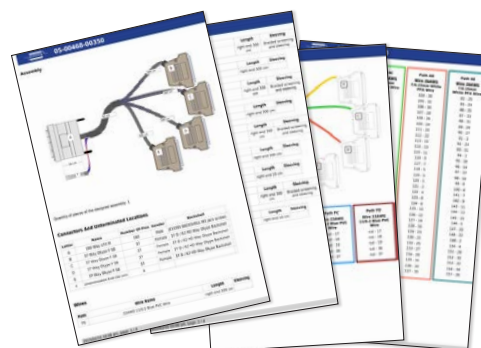
Breakouts



Connector  
Blocks

We also offer customized cabling and have a free online **Cable Design Tool** that can be used to create custom cable solutions for many applications.

- Fully supported on modern browsers and tablet operating systems.
- Built-in tutorials and videos allow you to get quickly up to speed.
- Store cable assemblies in the Cloud and develop over time.
- Each cable design has a downloadable PDF documentation file detailing all specifications



Start designing your custom cabling, go to [pickeringtest.com/cdt](http://pickeringtest.com/cdt)

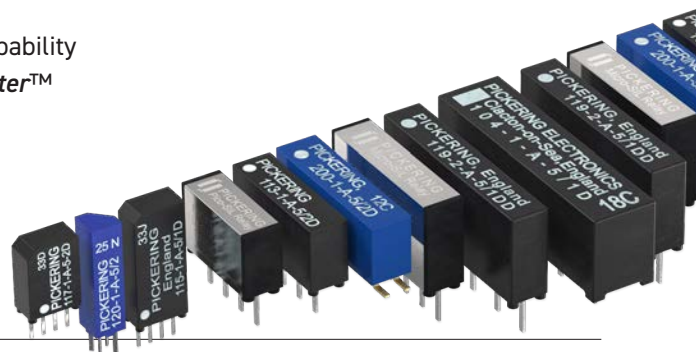
## Mass Interconnect

We recommend the use of a mass interconnect solution when an Interchangeable Test Adapter (ITA) is required for PXI/LXI based test systems. Our modules are fully supported by Virginia Panel and MacPanel.

## Pickering Reed Relays

We are the only switch provider with in-house reed relay manufacturing capability via our Relay Division. These instrument grade reed relays feature **SoftCenter™** technology, ensuring long service life and repeatable contact performance.

To learn more go to [pickeringrelay.com](http://pickeringrelay.com)



## Programming

Pickering provide kernel, IIVI and VISA (NI & Keysight) drivers which are compatible with all Microsoft supported versions of Windows and popular older versions.

For more information go to [pickeringtest.com/os](http://pickeringtest.com/os)

The VISA driver support is provided for LabVIEW Real Time Operating Systems (Pharlap and Linux-RT). For other RTOS support contact Pickering. These drivers may be used with a variety of programming environments and applications including:

- **Pickering Interfaces Switch Path Manager**
- **National Instruments** products (LabVIEW, LabWindows/CVI, Switch Executive, MAX, TestStand, VeriStand, etc.)
- **Microsoft Visual Studio** products (Visual Basic, Visual C++)
- **Programming Languages** C, C++, C#, Python
- **Keysight** VEE and OpenTAP
- **Mathworks MATLAB, Simulink**
- **Marvin ATEasy**
- **MTQ Testsolutions** Tecap Test & Measurement Suite

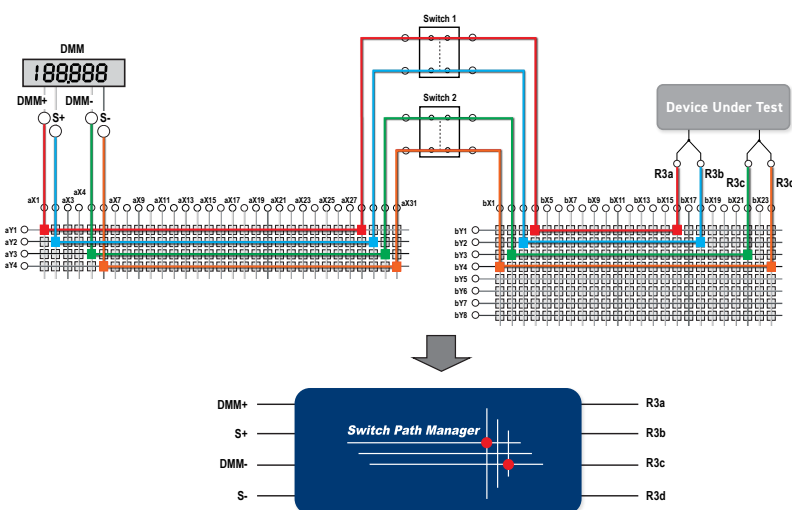
Drivers for popular Linux distributions are available, other environments are also supported, please contact Pickering with specific enquiries. We provide Soft Front Panels (SFPs) for our products for familiarity and manual control, as well as comprehensive documentation and example programs to help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

To learn more about software drivers and development environments go to [pickeringtest.com/software](http://pickeringtest.com/software)

## Signal Routing Software

Our signal routing software, Switch Path Manager, automatically selects and energizes switch paths through Pickering switching systems. Signal routing is performed by simply defining test system endpoints to be connected together, greatly accelerating Test System software development.

To learn more go to [pickeringtest.com/spm](http://pickeringtest.com/spm)





## Diagnostic Relay Test Tools

**eBIRST** Switching System Test Tools are designed specifically for our PXI, PCI or LXI products, these tools simplify switching system fault-finding by quickly testing the system and graphically identifying the faulty relay.

To learn more go to [pickeringtest.com/ebirst](http://pickeringtest.com/ebirst)



## Three Year Warranty & Guaranteed Long-Term Support

All standard products manufactured by Pickering Interfaces are warranted against defective materials and workmanship for three years from the date of delivery to the original purchaser. Extended warranty and service agreements are available with various levels for your requirements. Although we offer a 3-year warranty as standard, we also include guaranteed long-term support—with a history of supporting our products for typically 15-20 years.

To learn more go to [pickeringtest.com/support](http://pickeringtest.com/support)

## Available Product Resources

We have a library of resources including success stories, product and support videos, articles and white papers as well as application-specific brochures to assist you. We have also published reference books on switching technology and the PXI and LXI standards.

To view, download or request any of our product resources go to [pickeringtest.com/resources](http://pickeringtest.com/resources)

