

Broadband Switching Matrices

Our Approach

The growth in the broadband communication market over the past few years has increased the demand for automated signal switching solutions that cover the microwave band from 2 GHz to 40 GHz, and optical switch solutions for both singlemode and multimode applications. VXI provides standard switch solutions from dc to light, as well as custom matrices pre-configured with other components such as attenuators, mixers, dividers, amplifiers, and couplers.

When providing custom switch matrices, we start with our line of high-performance modular components, develop 3D models for all custom cabling and other components, assemble the solution in our industry-standard mainframes or enclosures, completely test the final switch matrix, and deliver the system with swept test data, industry standard software drivers and worldwide service and support.

All assemblies are completely characterized utilizing state-of-the-art vector network analyzers. Swept test data is provided to the customer identifying critical frequency dependent parameters such as VSWR, insertion loss, and isolation.

Innovative Modular Components

All of VXI Technology's solutions are based on modular design, and this holds true for our broadband automated switching matrices. We were the first company worldwide to introduce miniature microwave relays with different configurations in a standard building block.

This allows us to provide cost-effective matrices to virtually every major communications equipment manufacturer worldwide.

These optical and microwave switch matrices are based on our high-density microwave and optical building blocks, and include multi-throw relays, transfer switches and attenuators.

Precision Engineering

In order to manufacture repeatable matrices designed for optimum performance, all solutions are 3D-modeled using SolidWorks® on state-of-the-art workstations. This approach allows critical cable assemblies and component placements to be built the same every time, as well as allowing us to minimize cable paths, thus improving signal integrity and reducing the size of the solution.



Features

Standard Microwave Systems up to 40 GHz

Singlemode and Multimode Optical Systems

Platform Independent Control
– Ethernet, Firewire, VXIbus GPIB, PCI

Standard Modular Building Blocks
Provide Cost Effective Customization

High-Density Solutions – Smaller Footprint and Lower Costs

Optimized Routing Design Using 3D Modeling

State-of-the-Art Characterization and Test Capabilities



Switching

Broadband Switching Matrices



Over the years a large library of component models has been created, reducing engineering time, and hence time-to-market, for all new configurations. Every effort is taken to design the building block to be platform independent. For example, a 26.5 GHz 4x4 matrix building block can easily be housed in VXI, Ethernet, GPIB, or even a custom enclosure, with minimal engineering.

Superior Signal Integrity

It is impossible to design a switch matrix that does not degrade the original signal, but it can be designed to optimize the key performance requirements of the application. All of our microwave components are designed to provide high isolation and crosstalk, as well as low VSWR and insertion loss. However, to fully optimize a custom switch matrix and maintain the desired specifications, correct cabling and shielding also need to be considered. VXI Technology has the experience to provide solutions that focus on signal integrity from the switch matrix, through the interface cabling, and directly to the unit under test.

Industry Standard Software and Control

The switch driver used to program all of our switch matrices remains the same regardless of the interface being used to control it. By using industry standard VISA based software drivers, the switch matrix can be controlled over VXI, Ethernet, GPIB, PCI, Firewire, RS-232 or more. A standalone executable soft front panel accompanies every solution, along with a driver that allows programming via Visual Basic, C/C++, LabWindows/CVI, LabVIEW, HP VEE, or other popular industry application programs. This control approach, coupled with our modular hardware building blocks, ensures that the switch matrix from VXI Technology can easily be used in any environment and that it is positioned for future growth. Additionally, the control circuitry provides coil current feedback, as well as control for a limitless number of microwave components within the complete system.

Mixed Signal Applications

In many applications both optical and microwave switch solutions need to reside in the same test system, and often with other general purpose instruments such as Digital Multimeters or Digital I/O. An example of this is the testing of optical components where there exists the need for optical switches and attenuators, as well as digital I/O for control and a DMM and low-frequency multiplexer for standard resistance, current or voltage measurements.

Our family of high-density switches (SMIP//™) and instruments (VMIP™) allows us to be the only supplier worldwide that can provide a complete modular solution (with instruments, switches and attenuators) from dc to light, to be housed in the same computer independent, industry standard, enclosure.

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