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Agilent Technologies Switch Matrix Product Overview

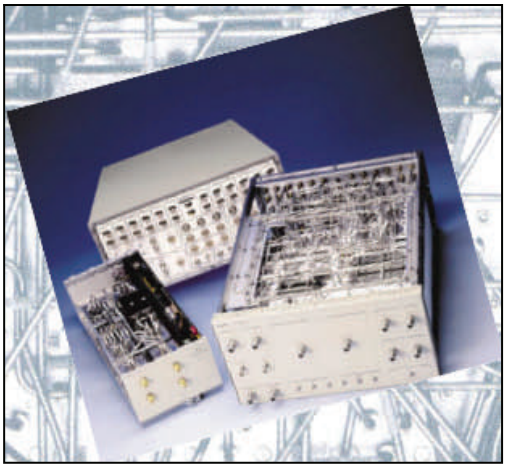
Why Buy a Switch Matrix from Agilent? Minimize Risk. Enhance Performance.

An RF switch matrix provides automatic routing and conditioning of signals between test equipment and the device under test (DUT) in an RF/ microwave ATE system.

Since multiple measurements are made automatically, the switch matrix decreases total measurement time, with a minimum number of manual connections to the DUT. Devices such as couplers, attenuators, amplifiers, and filters can be easily included in the matrix to provide signal conditioning.

Agilent switch matrix designs range from a simple 1 x 12 fanout to a 10 x 10 non-blocking full access matrix, to complete custom switching and conditioning units. Perhaps one of our previous designs is exactly what you need right now.

An optimized design ensures measurement integrity



If the switch matrix is not optimized for your application, it can negatively affect the performance of your system by degrading signal quality significantly.

Important parameters to consider when designing a switch matrix are:

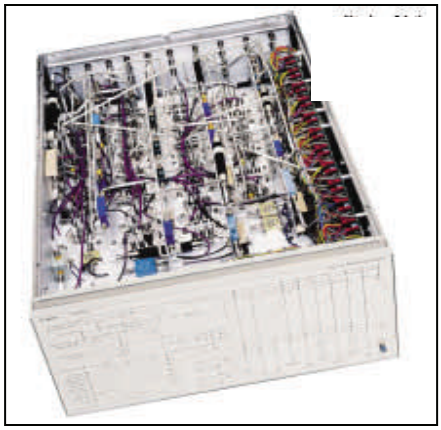
Repeatability: Test-set repeatability cannot be calibrated out with test software. It will directly impact measurement integrity and data correlation from system to system.

Standing Wave Ratio (SWR): High SWR significantly reduces system performance.

Insertion Loss: Insertion loss is important since power at high frequencies is expensive.

Isolation: Low isolation degrades measurements, especially when low- and high-level signals are routed at the same time.

Signal conditioning can be achieved within the switch matrix.



As frequency increases, these performance parameters become even more significant. Agilent engineers use analysis tools to optimize predicted s-parameter performance. To ensure measurement integrity, you need a high performance switch matrix in your system.



RF Amplifier Test System

In today's highly competitive business world, you are faced with tough management decisions. This is how Agilent can help:

Resource Management

Your resources are limited, and you need to concentrate your valuable engineering resources on core competencies that generate revenue. Agilent Technologies (Agilent) can design and manufacture a custom switch matrix for you. Agilent builds hundreds of custom switch matrices each year. Use our expertise and experience.

Cost Management

In a competitive marketplace, it is important to predict the cost of your system accurately. When designing a one-of-a-kind system, there may be unpredictable and hidden costs. With more than two decades of experience in providing custom switch matrices, Agilent can reduce your cost risk by quoting a firm price.

Support Management

The cost of documentation and support are often overlooked when total system cost is estimated. Effective system troubleshooting depends on complete, accurate documentation.

Agilent provides full documentation for your switch matrix, including an RF schematic, logic table, part locator diagram, wiring diagram, front and rear panel layouts, data sheets, replaceable parts list, and test data.

Serviceability is an important element of our designs. Plug-in options are now available for most Agilent switch types, thereby reducing MTTR. The Agilent coaxial switches and other components used in our matrices are off-the-shelf units found in the Agilent RF & Microwave Test Accessories (MTA) Catalog. When ordered through MTA QuickShip, they have a guaranteed delivery of five days or less. Every customized switch matrix has a standard one year, return-to-Agilent warranty. We can also provide a tailored support scheme to meet your specific needs.

Schedule management

We know that delays in your development or manufacturing processes can critically affect your success. You can't afford late delivery of the system. So, let Agilent reduce the risk by providing the switch matrix. Through our mature manufacturing process and our experience, we can meet your schedule.

What makes us unique?

The keys to Agilent's exceptional switch matrix performance are our unmatched design experience, our no-compromise manufacturing processes for switches and semi-rigid cables, and our well-established methods for matrix assembly and testing.

Our coaxial switches provide performance and reliability.

The performance of a switch matrix is determined chiefly by the performance of its components, particularly the coaxial switches. Agilent's switches have the best performance in the industry, with typical isolation of more than 90 db and SWR less than 1.2:1. Insertion loss repeatability is 0.03 db, resulting in higher measurement confidence.



Agilent RF Switches

Agilent's multiport switch performance is guaranteed over a life of 5 million cycles, ensuring higher uptime for test system platforms.

The outstanding performance of our switches is the result of excellent design and rigid manufacturing tolerances. Every switch is tested for all specifications using Agilent 8510 series network analyzers.

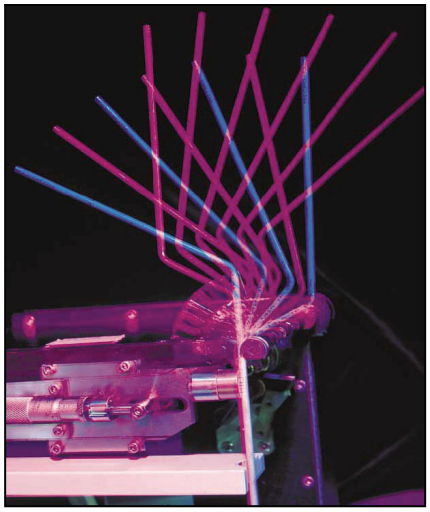
Semi-rigid cable without equal.

The same Agilent manufacturing operation that produces high-quality, semi-rigid coaxial cables for our RF and microwave instruments also makes the cables used in our custom switch matrices.

Semi-rigid cable design using OneSpace™ design tools

Agilent's high-quality cables transfer the optimum performance of Agilent switches to your DUT. For less demanding VSWR and insertion loss applications
Agilent can offer lower price "conformable" RF cables.

Agilent's high quality switches provide the best building blocks for your matrix– and our semi-rigid cables transfer the optimum performance of these switches to your DUT.



Semi-rigid Cable Automatic Bending Process

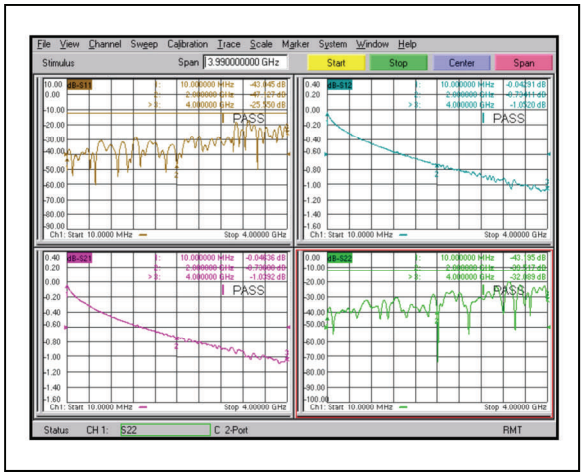
A standard process for a custom solution

We use Agilent's standard commercial manufacturing process for your custom switch matrix, except for one important difference: you are involved in the design phase. The process starts when you contact Agilent. Our sales representative works with you to fully understand your specific electrical and mechanical requirements. Once the requirements are understood and documented, we will provide you with a detailed proposal including an RF block diagram, specification, price, and delivery.

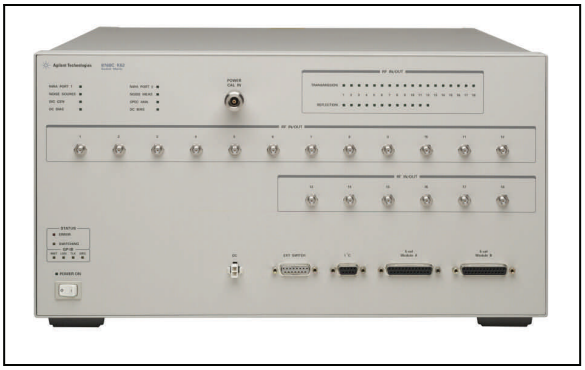
When needed, we may list cost or performance improvement suggestions. After you approve the basic design and price, our engineering team will design the optimum switch matrix for your application. When the design is completed, you will have an opportunity to approve it before manufacturing begins.

Fully tested

After your matrix is built, we will measure the S-parameters of every signal path with an Agilent Performance Series Network Analyzer to make sure that your specifications are met. The test data is included in the documentation you receive with the matrix.



Sample of S-Parameters Final Test Data



Fully Assembled Custom Switch Matrix

Rackmount Solutions

The Agilent N8990 series matrices are rackmount boxes with size, weight, connector type, and location designed to your specifications. Options include LED readouts, external switch drivers, system interface, and alarm circuits.

Custom Form Factors

Agilent can provide custom packaging as required. We have experience in many standard and custom form factors and can provide quotes for switch matrices to meet your needs.

Standard Configurations

Agilent offers several standard configuration switch matrix products which may meet your needs. Please check with your local sales representative for information.

MUX switch matrix

- *Range from 1x4 to 1x48.*
- *Frequency range from DC to 26.5GHz with / without internal termination.*

Blocking switch matrix

- *Range from 2x2 to 6x6.*
- *Frequency range from DC to 26.5GHz with / without internal termination.*

Non-blocking switch matrix

- *Range from 2x2 to 6x6.*
- *Frequency range from DC to 18GHz with / without internal termination.*

Matrix switching matrix

- *Range from 2x2 to 12x12.*
- *Frequency range from DC to 26.5GHz with / without internal termination.*

Programmable Attenuation Box

- *Range from 0db to 121dB attenuation (1 attenuation block) with 1dB resolution.*
- *Available up to 4 attenuation blocks in one mechanical box.*
- *Frequency range from DC to 18 GHz*

Application Assistance

Agilent's application experts are available to help optimize the system, taking full advantage of the system capability for your unique application. Operator training is also available to help you get the system into service quickly.

If your application goes beyond the standard system-offering described above, Agilent program managers and engineering professionals can help define and implement unique functionality. They ensure that your custom system requirements are implemented successfully.

Warranty & Support

Agilent provides a 1-year return-to-Agilent warranty on custom systems. Warranty extensions and custom repair strategies are available to meet your specific requirements.

Agilent Technologies aims to maximize the value you receive, while minimizing your risk and problems. We strive to ensure that you get the test and measurement capabilities you paid for and obtain the support you need. Our extensive support resources and services can help you choose the right Agilent products for your applications and apply them successfully. Every instrument and system we sell has a global warranty. Support is available for at least five years beyond the production life of the product. Two concepts underlie Agilent's overall support policy: "Our Promise" and "Your Advantage."

Our Promise

Our Promise means your Agilent test and measurement equipment will meet its advertised performance and functionality. When you are choosing new equipment, we will help you with product information, including realistic performance specifications and practical recommendations from experienced test engineers. When you use Agilent equipment, we can verify that it works properly, help with product operation, and provide basic measurement assistance for the use of specified capabilities, at no extra cost upon request. Many self-help tools are available.

Your Advantage

Your Advantage means that Agilent offers a wide range of additional expert test and measurement services, which you can purchase according to your unique technical and business needs. Solve problems efficiently and gain a competitive edge by contracting with us for calibration, extra-cost upgrades, out-of-warranty repairs, and onsite education and training, as well as design, system integration, project management, and other professional engineering services.

Get the latest information on the products and applications you select.



For more assistance with your test and measurement needs or to find your local Agilent office go to:

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Note: Contact your Agilent sales representative for configuration and pricing information.

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Agilent Technologies

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