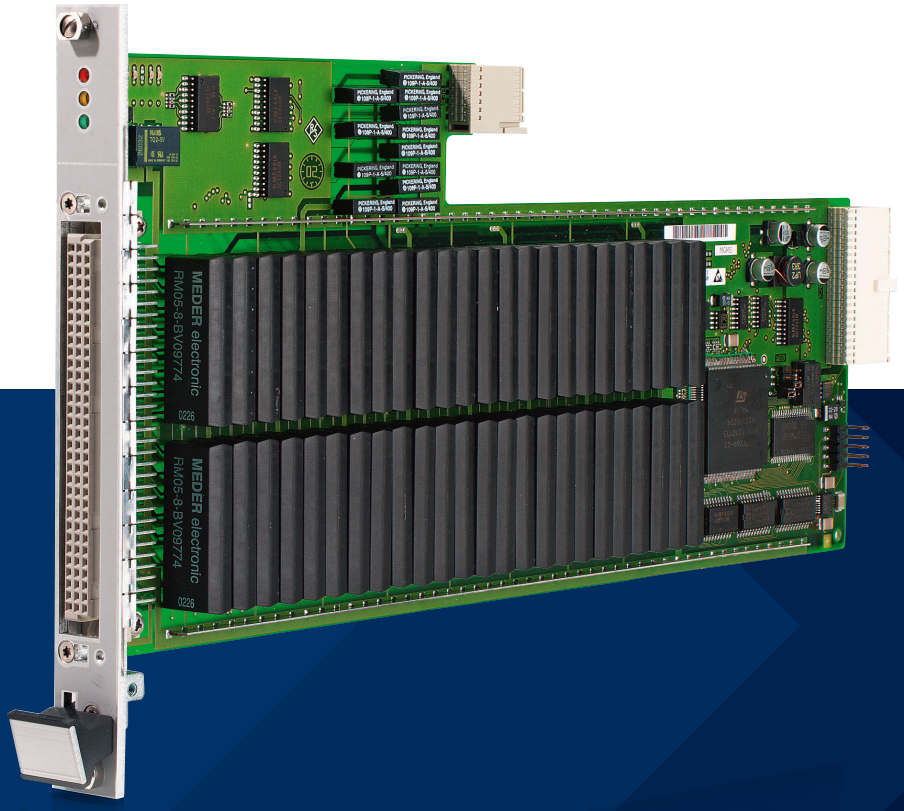
R&S®TS-PMB
SWITCH MATRIX MODULE

High-density, 90-channel,
full matrix relay multiplexer module



Product Brochure
Version 03.00

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AT A GLANCE

The matrix module allows test points or test devices to be interconnected either locally or via the analog R&S®TSVP interconnection subsystem.

Key facts

- General purpose switch matrix module
- Control interface based on CAN bus
- Input signals up to 120 V DC, up to 1 A
- Switchable signal ground via relay
- Self-test capability
- Fast switching of signal paths
- Cost efficient design based on integrated relay cluster
- Configurations include
  - Single matrix with 90 pins to four bus lines
  - Single matrix with 45 pins to eight bus lines
  - Dual matrix with 45 pins to four bus lines
- Analog measurement bus access to eight bus lines
- LabWindows/CVI device driver support
- GTSL test software library in DLL format
- EGTSL test software library for in-circuit test (ICT)

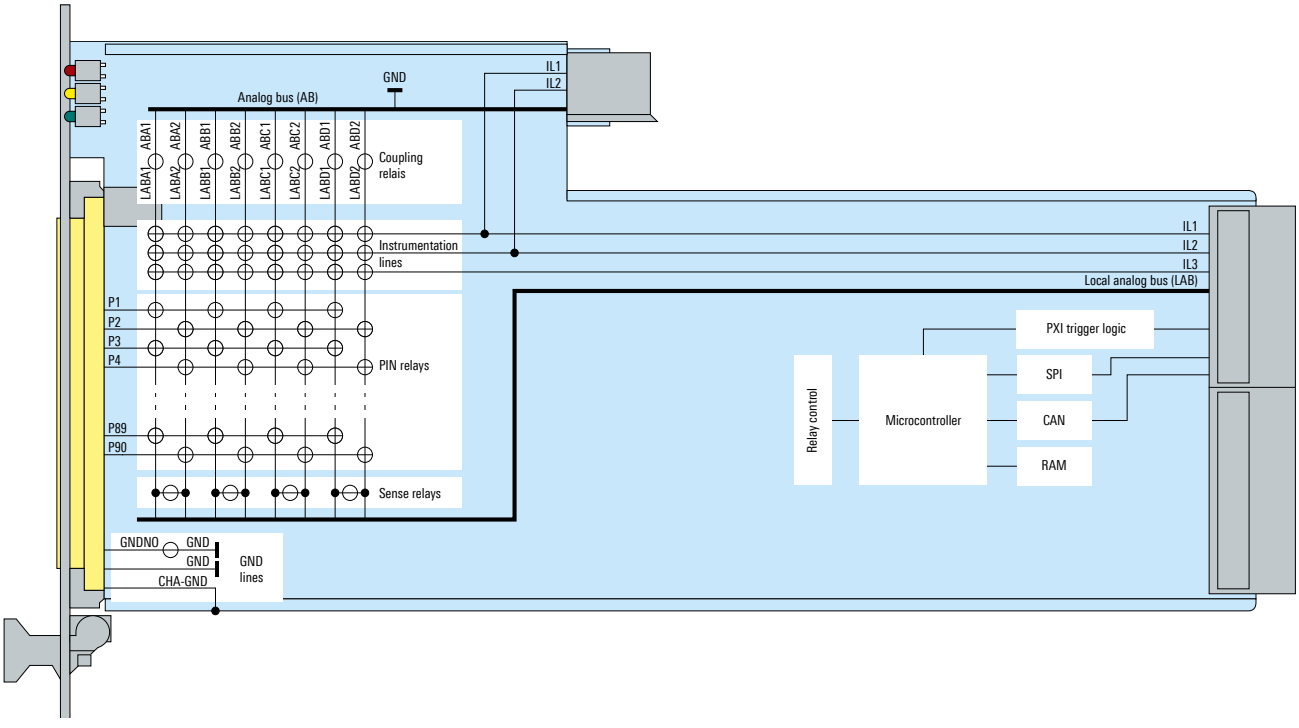
Product introduction

Typical applications are production tests in the fields of communications, automobile electronics and general industry electronics, particularly analog in-circuit tests with a large number of channels.

The R&S®TS-PMB switch matrix module is a CAN bus controlled card which takes up only one slot in the R&S®TSVP frames.

Built-in self-test capability in conjunction with the R&S®TS-PSAM makes it possible to fully check the module within the system.

Functional block diagram



SOPHISTICATED SIGNAL ROUTING

The matrix module allows test devices to be connected to any DUT pins, either locally within the module or throughout the entire instrument by using the R&S®TSVP analog bus.

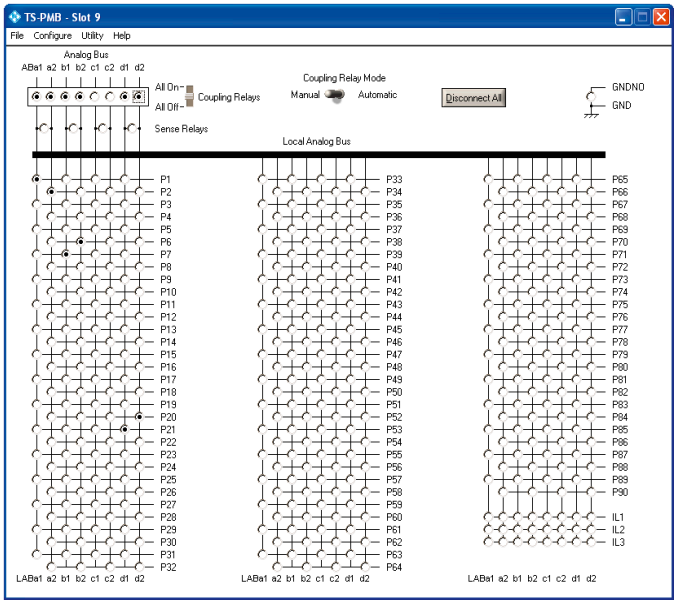
Due to the full matrix configuration of the module, no restrictions are placed on how DUT fixtures are wired or how the switching paths are established. Measurement instruments can be connected to the rear panel of the R&S®TSVP to avoid cross wiring at the fixture interface.

The compact design allows the configuration of test systems with several PXI devices and high-pin count multiplexing in a single unit (one-box solution). This is especially advantageous for functional testing in fully automated test equipment and in-line test solutions.

The interconnection solution of the R&S®TSVP analog bus is based on the best way of handling analog signals. The analog bus is located immediately above the front connector area where space is provided for onboard signal conditioning and signal routing by coupling relays for the analog bus. This distance to the high-speed PCI bus significantly improves signal quality.

Additionally, the dedicated switching modules such as the R&S®TS-PMB are controlled via the low-noise, interference-resistant CAN bus, which ensures overall high reliability and signal quality.

Soft front panel



TYPICAL APPLICATIONS

- Connection/multiplexing of DUT signals to test devices
- Interconnection of test points locally or via the analog bus
- Configuration of scalable matrices, from a simple multiplexer to a matrix for numerous measurement devices
- ICT (in-circuit test) with up to 6-wire measurements
- Parallel testing through the use of two 4-wire systems
- Remote switch matrix in fixtures without R&S®TSVP

SOFTWARE SUPPORT

A LabWindows/CVI driver in line with the IVI standard is available for the module switching functions. Function panels and online help are available as common features for the LabWindows/CVI driver. The ICT is performed with a dedicated software package, the enhanced generic test software library (EGTSL).

SELF-TEST AND DIAGNOSTICS FOR RELIABLE OPERATION

The built-in self-test capability of the module ranges from fast diagnostics to the complete, automated evaluation of all relays and switching paths (R&S®TS-PSAM required). Diagnostic LEDs on the front panel speed up system integration and allow proper operation to be determined at a glance.

SPECIFICATIONS

Specifications		
Application in R&S®TSVP platform	CAN bus controlled module	1 slot required
Interface		
Control bus		CAN 2.0b (1 Mbit/s)
DUT connector (front)		DIN 41612, 96 pins
Rear I/O connector		CompactPCI connector J2, 110 pins
Switching characteristics [1]		
Switching voltage DC/AC		max. 120 V/50 V (RMS)
Switching current DC/AC		max. 1 A/1 A (RMS)
Switching power		max. 10 W/10 VA
Switching time (includes bouncing)		typ. 0.5 ms
Path resistance		typ. < 2 Ω/0.5 Ω
Ground relay [2]		
Maximum voltage DC/AC		max. 120 V/50 V (RMS)
Maximum current (switched) DC/AC		max. 2 A/2 A (RMS)
Maximum switching power		max. 60 W/60 VA
Switching configurations		
Analog measurement bus access		8 lines
Input pins		90
Instrument lines		3 to 8 analog bus lines
Configurable as	dual matrix	45 pins to 4 bus lines
	single matrix	90 pins to 4 bus lines
	single matrix	45 pins to 8 bus lines
Mode of coupling relays		local or global
Transfer characteristics [3]		
Crosstalk (channel-to-channel, typ., 50 Ω)	Frequency	Crosstalk
	10 kHz	≤ –80 dB
	100 kHz	≤ –65 dB
	1 MHz	≤ –40 dB
	10 MHz	≤ –10 dB

[1] All data, carried and switched, resistive load.
[2] Data for resistive load.
[3] Single module data, typical values.

General data		
Power consumption		max. 5 V/4.2 A
Power consumption for 0 to all relays active		max. 0.5 W to 22 W
Environmental conditions		
Temperature	operating temperature range	+5 °C to +40 °C
	storage temperature range	–10 °C to +60 °C
Damp heat		+40 °C, 80 % rel. humidity, steady state, in line with EN 60068-2-78
Altitude	operating	up to 2000 m
Mechanical resistance		
Vibration	sinusoidal	in line with EN 60068-2-6, frequency range: 5 Hz to 55 Hz, displacement: 0.3 mm (peak-to-peak) (1.8 g at 55 Hz), frequency range: 55 Hz to 150 Hz, acceleration: 0.5 g constant6
	random	in line with EN 60068-2-64, 8 Hz to 500 Hz, acceleration 1.2 g (RMS); 5 min/axis
Shock		shock test in line with MIL-STD-810G, method 516.6, procedure I: shock response spectrum ramp 6 dB/octave up to 45 Hz, 45 Hz to 2000 Hz: max. 40 g
Product conformity		
Electromagnetic compatibility	EU: in line with EMC Directive 2014/30/EC	applied harmonized standards: ► EN 61326-1 (industrial environment) ► EN 61326-2-1 ► EN 55011 Group 1, Class A
Electrical safety	EU: in line with Low Voltage Directive 2014/35/EC	applied harmonized standard: EN 61010-1
RoHS	EU: in line with the restriction of the use of hazardous substances in electrical and electronic equipment 2011/65/EU	compliant; applied harmonized standard: EN IEC 63000
Dimensions	W × H × D	316 mm × 174 mm × 20 mm (12.44 in × 6.85 in × 0.79 in)
Weight		0.84 (1.85 lb)

ORDERING INFORMATION

Designation	Type	Order No.
Switch matrix module	R&S®TS-PMB	1143.0039.02

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- Customized and flexible
- Uncompromising quality
- Long-term dependability

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- Environmental compatibility and eco-footprint
- Energy efficiency and low emissions
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