



PXI
CompactPCI

CAN

Industrial Platform

ICT

Functional Test

Version
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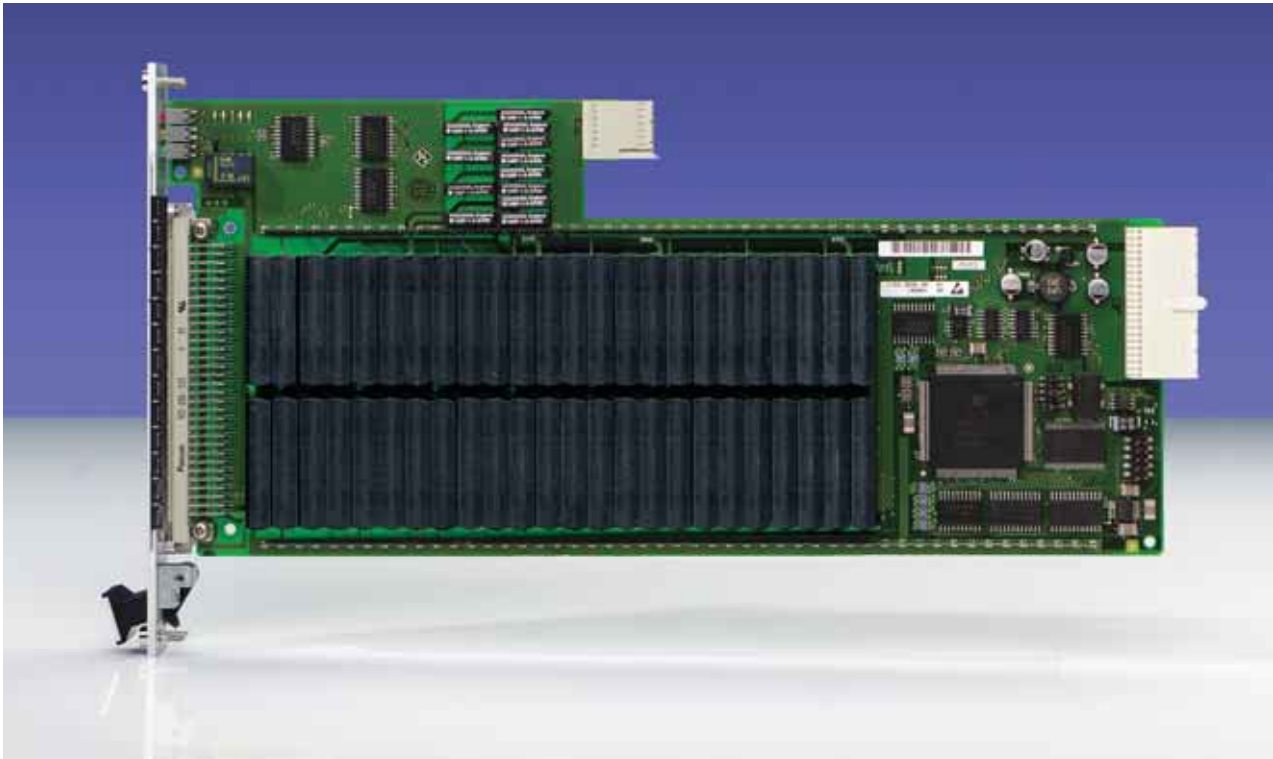
Switch Matrix Module R&S®TS-PMB

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

- ◆ General-purpose switch matrix module
- ◆ Control interface based on CAN bus
- ◆ Input signals up to 125 V, up to 1 A
- ◆ Switchable signal ground via relay
- ◆ Selftest capability
- ◆ Fast switching of signal paths
- ◆ Cost-efficient design based on integrated relay cluster
- ◆ Configurations include:
 - Single matrix 90 pins to 4 bus lines
 - Single matrix 45 pins to 8 bus lines
 - Dual matrix 45 pins to 4 bus lines
- ◆ Analog measurement bus access to 8 bus lines
- ◆ LabWindows/CVI device driver support
- ◆ GTSL test software library in DLL format
- ◆ EGTSL test software library for in-circuit test



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Product introduction

The matrix module allows test points or test devices to be interconnected either locally or via the analog R&S®TSVP (Test System Versatile Platform) interconnection subsystem. Typical applications are production tests in the fields of communication, automobile electronics or general industry electronics, particularly analog in-circuit tests with a large number of channels.

The Switch Matrix Module R&S®TS-PMB can be used in the R&S®CompactTSVP and R&S®PowerTSVP. It is a CAN-bus-controlled module which takes up only one slot.

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

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 and the switching paths established. Measurement instruments can be connected to the rear panel of the R&S®TSVP to avoid crosswiring at the fixture interface.

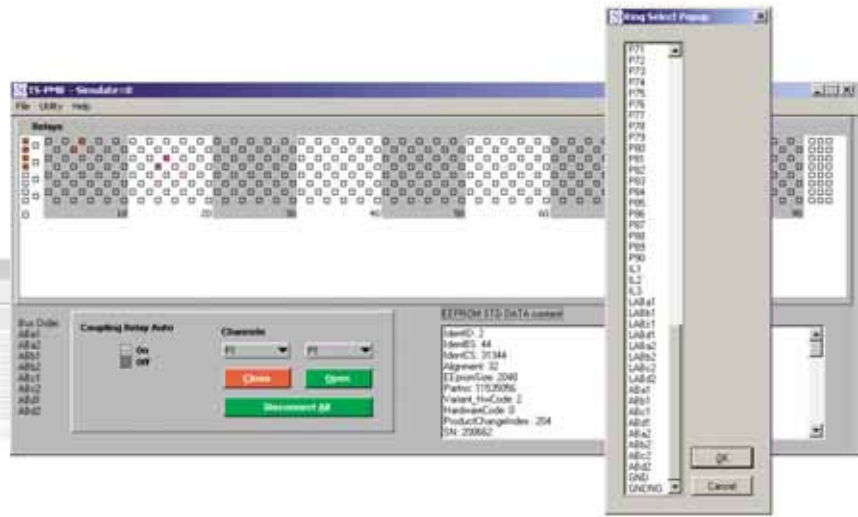
The compact design allows the configuration of test systems with several PXI devices and high pin-count multiplexing in a single unit (one-box solution). This is of particular advantage for functional testing in fully automated test equipment and in-line test solutions.

The best way of handling analog signals led to the interconnection solution of the R&S®TSVP analog bus. The analog bus is located immediately above the front connector area where space is provided for on-board 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 and interference-resistant CAN bus, which ensures overall high reliability and signal quality.

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 switching matrix in fixtures without R&S®TSVP



Software support

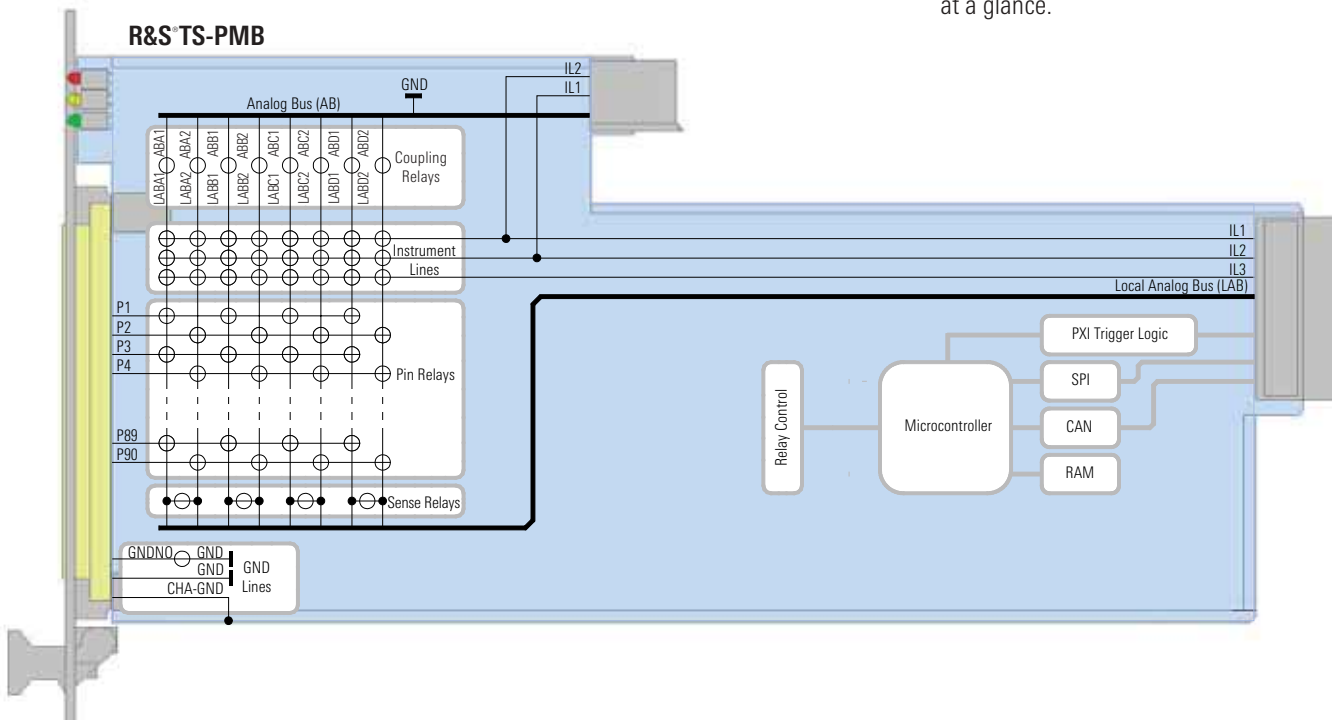
A LabWindows/CVI DMM driver according to the IVI standard is available for the switching functions of the module. Function panels and online help are available as common features for the LabWindows/CVI driver.

The ICT is performed with a dedicated software package named EGTSL (Enhanced Generic Test Software Library).

Security by selftest and diagnostic features

The built-in selftest 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 module front panel speed up system integration and allow proper operation to be determined at a glance.



Functional block diagram of the R&S®TS-PMB

Specifications

Application in R&S®TSVP platform

R&S®CompactTSVP	1 slot required
R&S®PowerTSVP	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 rms	125 V/125 V max.
Switching current DC/AC rms	1 A/1 A max.
Switching power	10 W/10 VA max.
Switching time (includes bouncing)	0.5 ms typ.
Path resistance	<2 Ω, (typ. 0.5 Ω)

[1] All data carry and switched, resistive load.

Ground relay [2]

Max. voltage DC/AC rms	125 V/125 V max.
Max. current (switched) DC/AC rms	2 A/2 A
Max. switching power	60 W/60 VA

[2] Data for resistive load.

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]

Maximum frequency (3 dB bandwidth, 50 Ω)	10 MHz
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Crosstalk (channel-to-channel, typ., 50 Ω) [3]

Frequency	Crosstalk
10 kHz	≤-80 dB
100 kHz	≤-65 dB
1 MHz	≤-40 dB
10 MHz	≤-10 dB

[3] Single module data, typical values.

General data

Power consumption	5 V/4.2 A max.
Power consumption for 0 to all relays active EMC compliance	0.5 to 22 W max. compliant with EMC directive 89/336/ EEC and EMC standard EN 61326 CE, EN 61010 Part 1
Safety	

Mechanical loading

Vibration test, sinusoidal	5 Hz to 55 Hz: 2 g, MIL-T-28800D, class 5 55 Hz to 150 Hz: 0.5 g, MIL-T-28800D, class 5 10 Hz to 300 Hz, 1.2 g 40 g, MIL-STD-810, classes 3 and 5
Vibration test, random	
Shock test	
Temperature loading	
Operating	+5°C to +40°C
Permissible	0 to +50°C
Storage	-40°C to +70°C
Humidity	+40°C, 95% rel. humidity
Dimensions in mm	316 x 174 x 20
Weight	typ. 0.75 kg
Calibration	not required

Ordering information

Switch Matrix Module	R&S®TS-PMB	1143.0039.02
Platform	R&S®TS-PCA3	1152.2518.02
	R&S®TS-PWA3	1157.8043.02



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