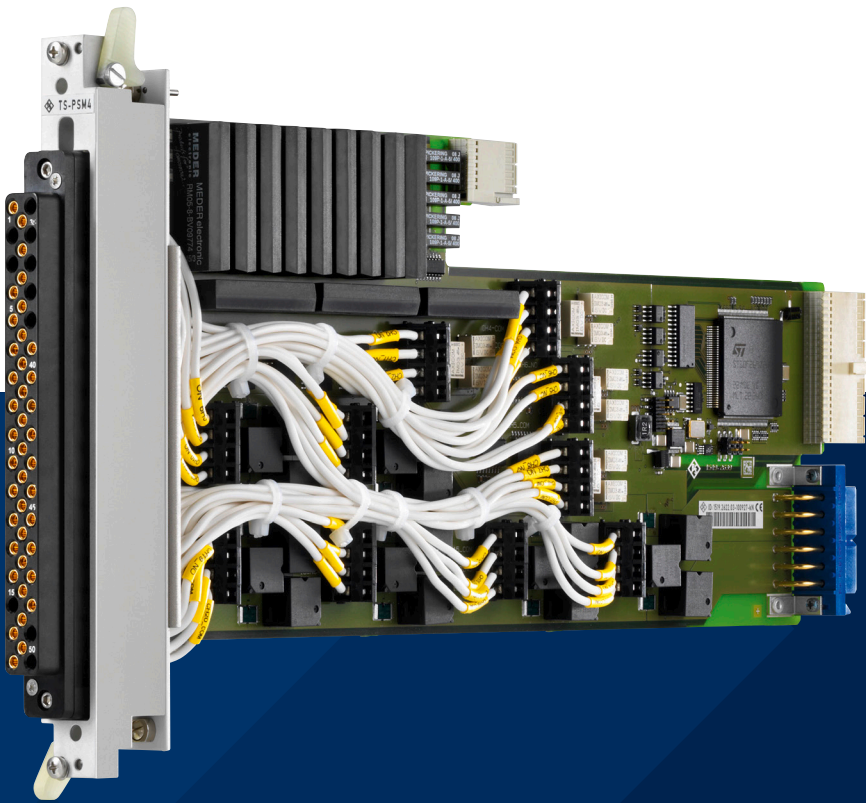


R&S® TS-PSM4 POWER SWITCHING MODULE

Power multiplexer and
DUT power switching module



Product Brochure
Version 02.00

ROHDE & SCHWARZ

Make ideas real



AT A GLANCE

The R&S®TS-PSM4 is the innovative implementation of a rugged, modular switching device for integrating supply current switching into your test system.

Key facts

- ▶ Twelve power channels for currents up to 16 A (max. 420 W)
- ▶ Eight medium-power channels for currents up to 2 A
- ▶ Integrated current measurement via shunt resistors and analog bus coupling
- ▶ Rear I/O access to the power signals for unique flexibility during system integration and seamless adaptation to power supplies and loads within a system paradigm based on R&S®PowerTSVP
- ▶ Unique comprehensive self-test and measurement of relay contact resistance
- ▶ Support by the signal routing library provides intelligent and secure switch path computing

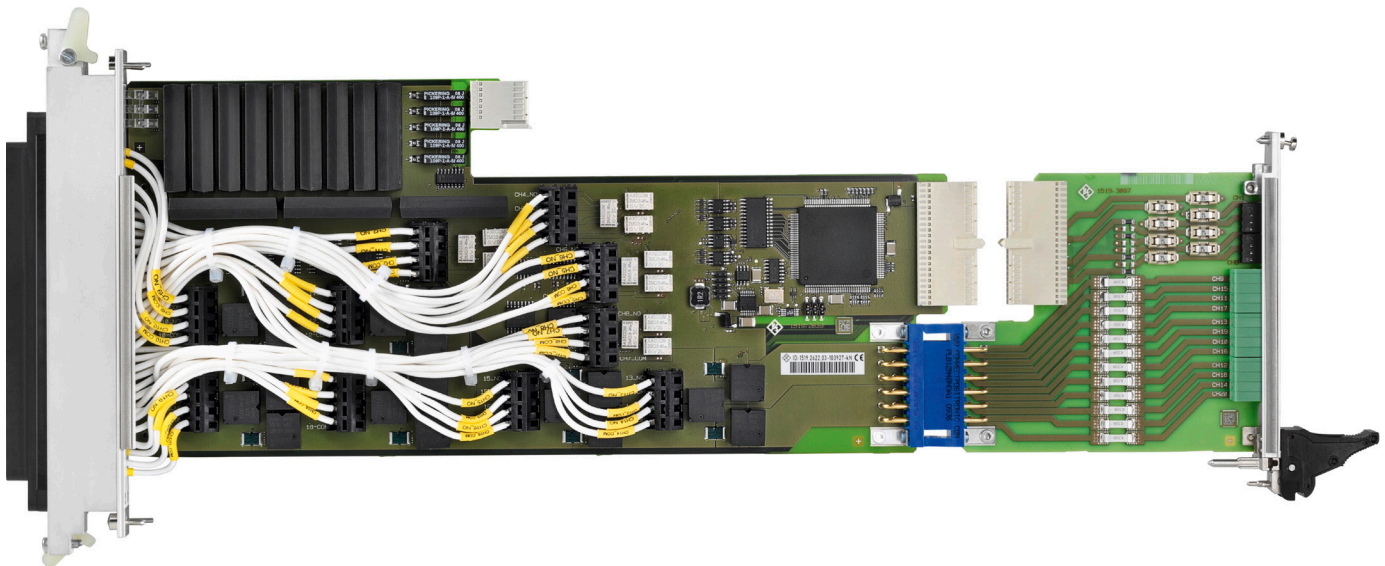
Product introduction

The R&S®TS-PSM4 power switching module was developed to add high-current switching up to 16 A to the standard functionality of the R&S®TSVP test system versatile platform.

Powerful and flexible switching capabilities are combined with ruggedized signal connection and high availability secured by switching cycle monitoring. The R&S®TS-PSM4 module is a CAN bus controlled card which takes up only one slot in the R&S®TSVP frames.

A switch cycle counter for reliable operation and monitoring strain of the relays is implemented by an FRAM accessible by the onboard microprocessor. Readings can be retrieved from the module via the I/O switch driver.

R&S®TS-PSM4 power switching module with VPC connector bracket connected to R&S®TS-PRIO2 rear I/O module



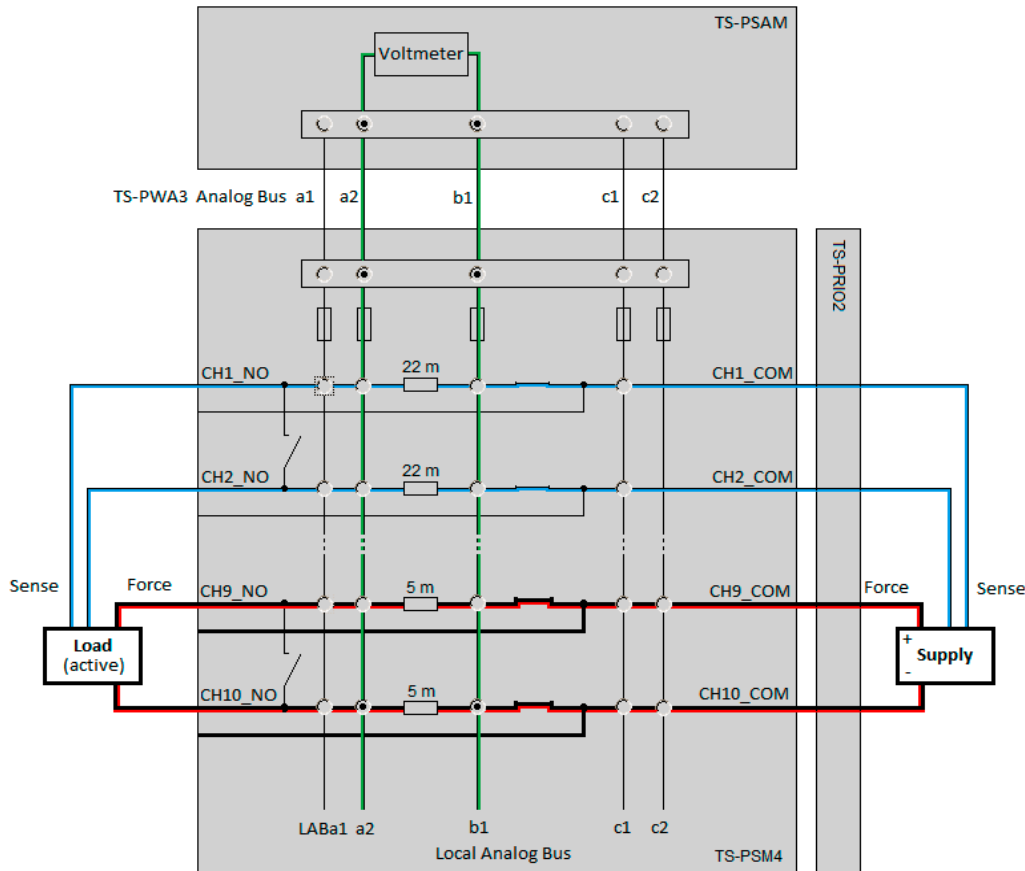
KEY FEATURES

- ▶ Ruggedized mechanical construction
- ▶ Industrially approved Virginia Panel Corp. power connector available for sophisticated test receiver deployment
- ▶ Suitable Virginia Panel Corp. GEMINI test receivers available for the R&S®TSVP chassis
- ▶ High-quality cage clamp terminal blocks for reliable power cabling and convenient dismantling
- ▶ Switch cycle counter

TYPICAL APPLICATIONS

- ▶ Distribution of a power supply to multiple DUTs
- ▶ Flexible distribution of power supplies to DUTs including sense lines via medium-power relays
- ▶ Switching of DUT supplies and loads with optional current measurement via shunt resistors
- ▶ Routing of measurement signals to adjacent modules via analog measurement bus
- ▶ Automotive and general purpose switch simulation

Application example: measuring high-current through an active load involves sensing the supply voltage



ELABORATED SOFTWARE FRAMEWORK FOR EASE OF USE

Use the module's soft front panel (SFP) to interactively control and evaluate test scenarios and verify DUT adaptation.

The SFP provides sophisticated access to the full scope of functions.

The R&S®TS-PSM4 power switching module is supplied with a IVI-style driver that supports the IVI switch class to control the module.

All additional hardware functions are supported by specific driver extensions. All driver functions are documented extensively in the help files and on the LabWindows/CVI function panels.

Alternatively, switch path management can be done via the intelligent signal routing library as part of the generic test software library (GTSL).

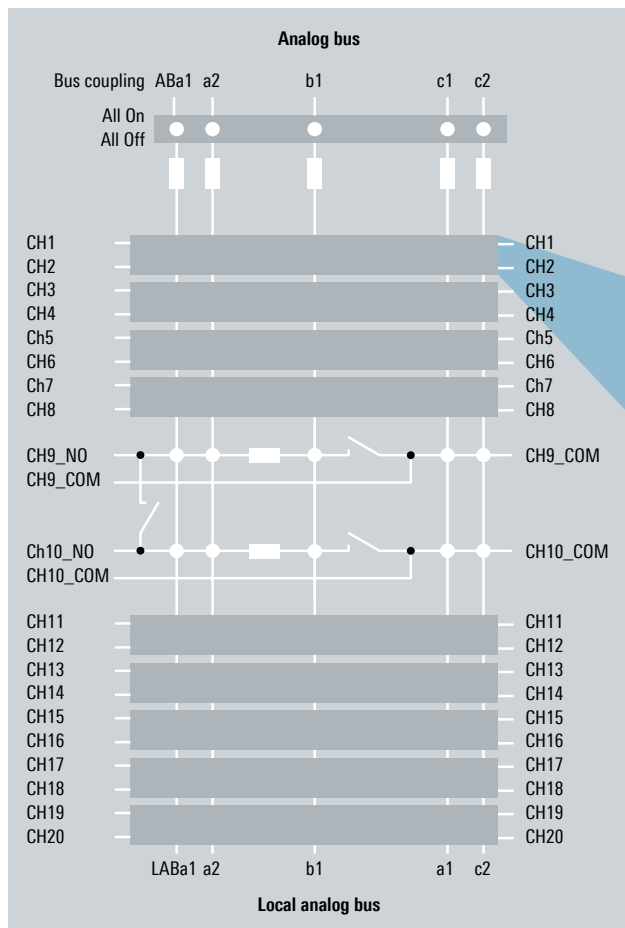
The voltage drop on shunt resistors corresponding to the current flow through each power channel of the R&S®TS-PSM4 can be routed to the R&S®TS-PSAM internal source and measurement module via the analog bus. The precise values of the shunt resistors are determined during calibration.

SELF-TEST AND DIAGNOSTICS FOR RELIABLE OPERATION

The module's built-in self-test provides fast diagnostics to verify basic functionality. Diagnostic LEDs on the front panel speed up system integration and allow proper operation to be determined at a glance.

Soft front panel of the module for interactive operation

Power flap open for CH9 and CH10



Medium-power flap open for CH1 and CH2



SPECIFICATIONS

Specifications

Application in the R&S®TSVP platform	CAN bus controlled module	one slot on front
Interface		
Control bus		CAN 2.0b (1 Mbit/s)
DUT connector (front)	model.02	none
	model.03	Virginia Panel connector: ▶ micro power ▶ module receiver ▶ 50 positions
		contacts: ▶ micro power, receiver, 12 AWG
Rear I/O connector	CompactPCI	110 pins
	power	12 pins
Maximum operating voltages		
Channel to channel		max. 117 V DC
Channel to GND		max. 105 V DC
Channel switching characteristics		
Power channels¹⁾		
Switch paths		12 channels
Switching voltage	DC	max. 26 V (at 16 A)
Switching current		max. 16 A
Switching power	DC	max. 420 W
Operate/release time		typ. < 4 ms
Medium-power channels		
Switch paths		8 channels
Relay type		AxiCom IM03
Switching voltage	DC	max. 30 V (at 2 A)
	AC	max. 46 V (peak)
Switching current		max. 2 A
Switching power	DC	max. 60 W
	AC	max. 62.5 VA
Operate/release time		typ. < 6 ms
Analog measurement bus access and coupling relays		
Switching current		max. 1 A
Switching power	DC	max. 10 W
	AC	max. 10 VA
Operate/release time		typ. < 0.5 ms

¹⁾ If the contact-applied voltage and contact-applied current are small, contact resistance may become a larger value due to a small amount of film on a contact surface.

Specifications

Conditions

Temperature range		+23°C ±5°C
Additional error specified by the temperature coefficient in the range		+5°C to +18°C and +28°C to +40°C
Warm-up		30 min
Shunt resistor (power channels)		
Nominal value		5 mΩ
Accuracy	correction values included, measured by R&S®TS-PSAM	±(1% + 32 mA)
Temperature coefficient	shunt resistor	±50 ppm/K
Shunt resistor (medium power channels)		
Nominal value		22 mΩ
Accuracy	correction values included, measured by R&S®TS-PSAM	±(1% + 4 mA)
Temperature coefficient	shunt resistor	±75 ppm/K

General data

Power consumption	reset state	5 V/0.22 A
	all CHx relays activated, one channel connected to analog bus	5 V/1.4 A
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 constant
	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
	USA	applied standard: UL 61010
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
	Canada	applied standard: CSA-C22.2 No. 61010-1
Dimensions (W × H × D)	R&S®TS-PSM4B model .02	20 mm × 174 mm × 316 mm (0.79 in × 6.85 in × 12.44 in)
	R&S®TS-PRIO2	20 mm × 130 mm × 180 mm (0.79 in × 5.12 in × 7.09 in)
Weight	R&S®TS-PSM4B model .02	570 g (1.26 lb)
	R&S®TS-PSM4 model .03	860 g (1.90 lb)
	R&S®TS-PRIO2	125 g (0.28 lb)
Calibration interval	recommended for highest accuracy	24 months

ORDERING INFORMATION

Designation	Type	Order No.
Power switching module	R&S®TS-PSM4B	1519.2622.02
Power switching module, with VPC connector	R&S®TS-PSM4	1519.2622.03
Rear I/O module, for R&S®TS-PSM4	R&S®TS-PRIO2	1519.3070.02
Rear extension module: ▶ Mandatory for configuration of the R&S®TS-PSM4 in a PXI bus based R&S®TSVP, slots 5 to 14 ▶ Rear I/O is supported only for the 2 A medium-power channels	R&S®TS-PRIO4	1510.8005.04

Service options		
Extended warranty, one year	R&S®WE1	Please contact your local Rohde & Schwarz sales office.
Extended warranty, two years	R&S®WE2	
Extended warranty, three years	R&S®WE3	
Extended warranty, four years	R&S®WE4	
Extended warranty with calibration coverage, one year	R&S®CW1	
Extended warranty with calibration coverage, two years	R&S®CW2	
Extended warranty with calibration coverage, three years	R&S®CW3	
Extended warranty with calibration coverage, four years	R&S®CW4	

Service that adds value

- ▶ Worldwide
- ▶ Local and personalized
- ▶ Customized and flexible
- ▶ Uncompromising quality
- ▶ Long-term dependability

Rohde & Schwarz

The Rohde&Schwarz technology group is among the trailblazers when it comes to paving the way for a safer and connected world with its leading solutions in test & measurement, technology systems and networks & cybersecurity. Founded more than 85 years ago, the group is a reliable partner for industry and government customers around the globe. The independent company is headquartered in Munich, Germany and has an extensive sales and service network with locations in more than 70 countries.

www.rohde-schwarz.com

Sustainable product design

- ▶ Environmental compatibility and eco-footprint
- ▶ Energy efficiency and low emissions
- ▶ Longevity and optimized total cost of ownership

Certified Quality Management

ISO 9001

Certified Environmental Management

ISO 14001

Rohde & Schwarz training

www.training.rohde-schwarz.com

Rohde & Schwarz customer support

www.rohde-schwarz.com/support

