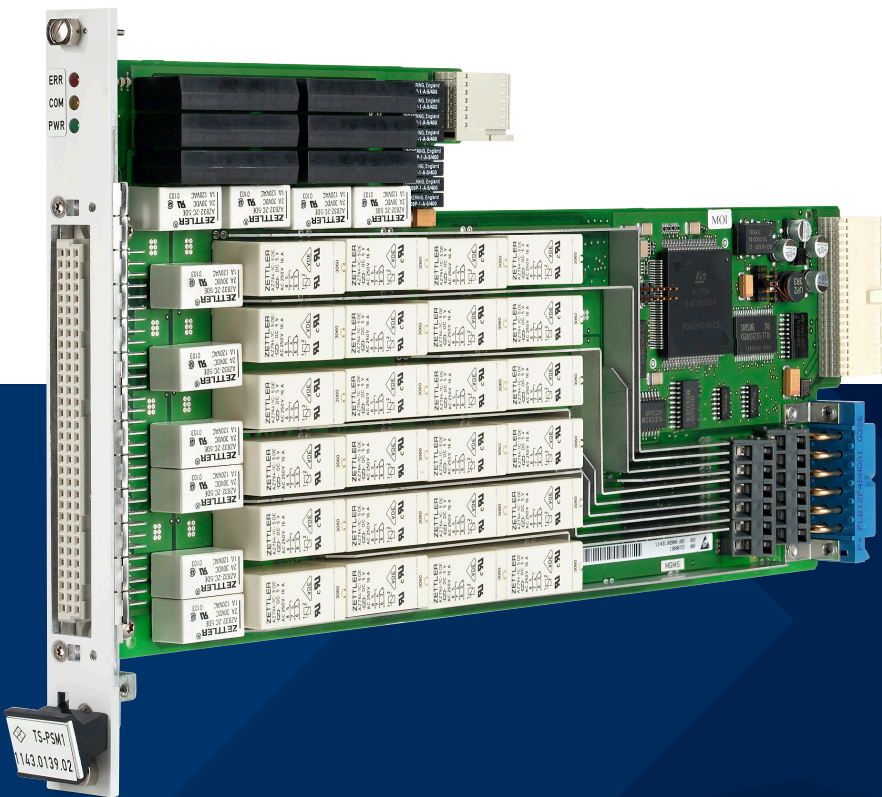


R&S® TS-PSM1 POWER SWITCHING MODULE

High-power multiplexer and multiple
DUT power switching module



Product Brochure
Version 03.00

ROHDE & SCHWARZ

Make ideas real



AT A GLANCE

The R&S®TS-PSM1 is a power switching module controlled by a CAN bus interface. Its innovative technology and versatile functionality make it ideal for automotive and high-current switching applications, e.g. power-management and test-load paradigms.

Key facts

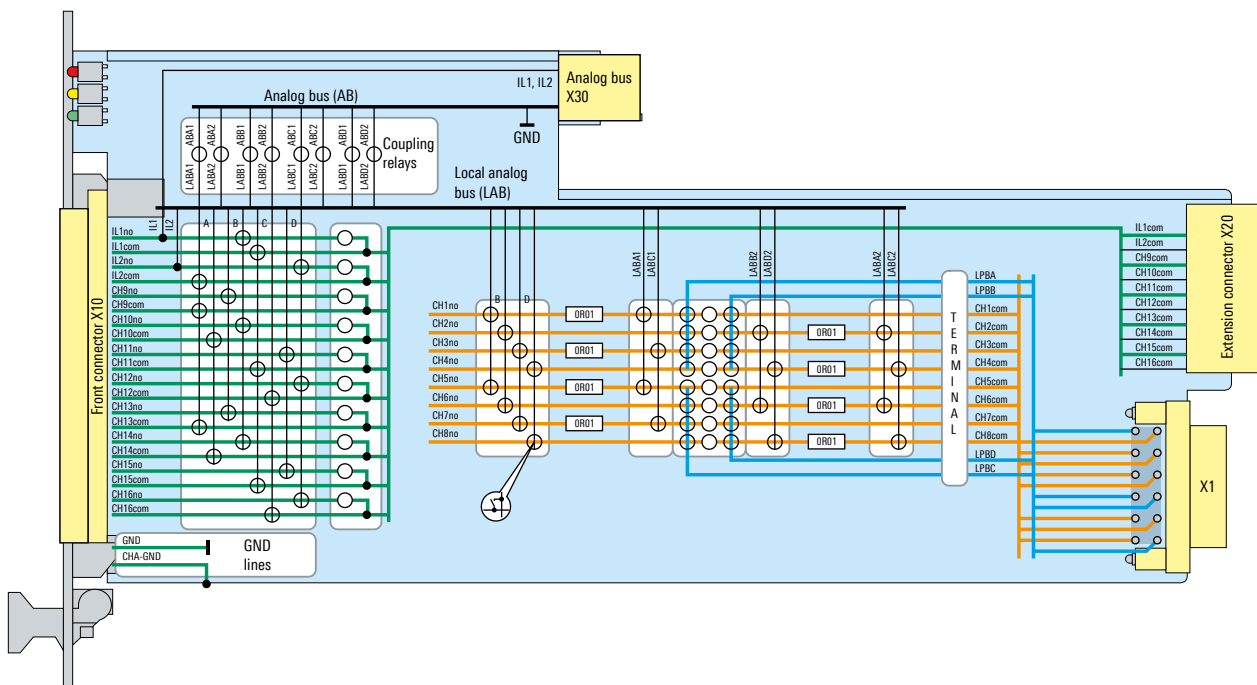
- ▶ Power switching module for supplies and loads
- ▶ Switching module for voltages of up to 70 V
- ▶ Eight high-power channels with maximum 16 A
- ▶ Ten power channels with maximum 2 A
- ▶ Four high-power 4-to-1 multiplexer channels with maximum 16 A
- ▶ Indirect high-current measurements on high-power channels via shunt resistors
- ▶ Direct current measurements up to 1 A in all channels via R&S®TSVP analog measurement bus and R&S®TS-PSAM
- ▶ Self-test of all relays via R&S®TSVP analog measurement bus and R&S®TS-PSAM
- ▶ Analog measurement bus access to eight bus lines
- ▶ Control interface based on CAN bus
- ▶ LabWindows/CVI device driver support
- ▶ Generic test software library (GTSL) in DLL format

Product introduction

The special design of the module ensures ideal routing of supply and load paths through the test system. High-current force channels and sense channels from voltage or current sources can be switched and routed to the DUTs via the module. In the opposite direction, single-pole or multipole loads can be applied to the DUTs. High-power multiplexers on the module make it possible to select different load simulations for integration in the R&S®TSVP test system versatile platform base units.

The currents and voltages can be measured or monitored at all switching nodes by means of additional relays on the module and the Rohde&Schwarz analog bus. Shunt resistors are integrated for measuring high currents. This characteristic is particularly important if the power consumption of the DUT must be measured during normal operation and in standby modes. Additionally, the tests of various operating modes and their current consumption can be executed without interrupting the DUT's powerpath. The R&S®TS-PSM1 power switching module is a CAN bus controlled card which takes up only one slot in the R&S®TSVP frames.

Functional block diagram



FLEXIBLE SIGNAL ROUTING

The design of the switching module and the large voltage and current ranges ensure high flexibility and a wide application range.

Device-internal connection of the multiplexed power channels even makes it possible to configure complex yet flexible load systems with original or electronic loads to obtain a high-current R&S®PowerTSVP switching instrument.

When lower power signals are measured, the signal concept relies on the system-wide analog bus.

Proper handling of analog signals led to the R&S®TSVP analog bus interconnection solution. The analog bus is located immediately above the front connector area, where space is provided for onboard signal conditioning and signal routing. The distance to the digital signals on the backplane significantly improves signal quality.

In addition, dedicated switching modules such as the R&S®TS-PSM1 are controlled via the low-noise and interference-resistant CAN bus, which ensures overall high reliability and signal quality, especially in the vicinity of high-current signals.

Direct current measurement via the analog measurement bus is limited to 1 A, but measurements up to 16 A can be performed by forwarding the shunt resistor voltages of the R&S®TS-PSM1 via the analog bus to a precise multimeter such as the R&S®TS-PSAM.

TYPICAL APPLICATIONS

- ▶ Switching of voltage or current sources to DUTs
- ▶ Switching of DUT loads as original loads or simulated/ electronic loads
- ▶ Power multiplexer for DUT signals to test devices
- ▶ Analog functional test for general purpose signals
- ▶ Switch simulation for DUTs

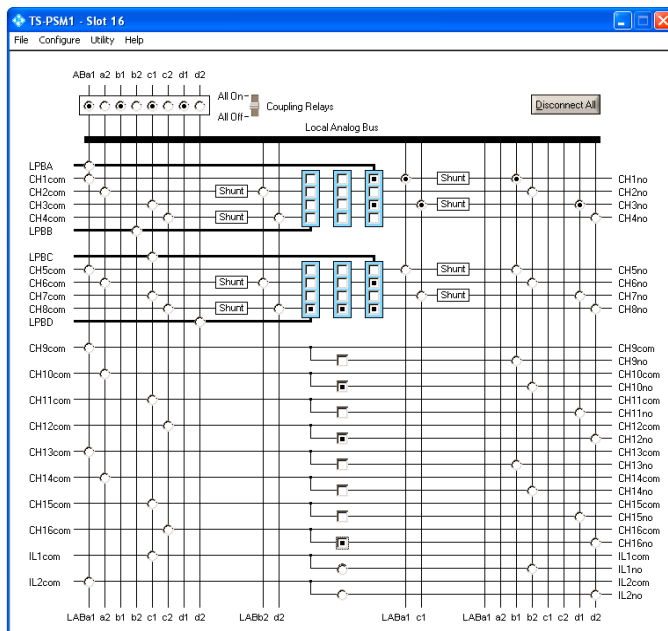
SOFTWARE SUPPORT

A LabWindows/CVI driver in line with the IVI standard is available for the module's switching functions. Function panels and online help are available as common features for the LabWindows/CVI driver.

SECURITY BY SELF-TEST AND DIAGNOSTIC FEATURES

The module's built-in self-test capability 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.

Soft front panel



SPECIFICATIONS

Specifications

Application in the R&S®TSVP platform	CAN bus controlled module	1 slot required
Interface		
Control bus		CAN 2.0b (1 Mbit/s)
DUT connector (front)		DIN41612, 96 pins
I/O connector (rear)		CompactPCI connector J2, 110 pins
Control logic		
Local microprocessor		ST10, 16 bit, 40 MHz
Switching characteristics		
High-power switching channels		
	number/type of relays	8/Zettler AZ764
	contact configuration	8 × SPST
	max. switching voltage DC/AC	70 V DC, 46 V (peak), 33 V (RMS)
	max. switching current	16 A/16 A (RMS) (continuously)
	max. switching power	480 W/4000 VA (resistive load)
	current measurement	
	indirect via shunt	5 mΩ shunt resistor ±0.6% ±60 ppm/K (for temperature range from +20°C to +60°C)
	direct via analog bus	with R&S®TS-PSAM, max. 1 A/10 W
High-power multiplexer		
	number/type of relays	16/Zettler AZ764
	contact configuration	4 multiplexers, 4-to-1
	max. switching voltage DC/AC	70 V DC, 46 V (peak), 33 V (RMS)
	max. switching current	16 A/16 A (RMS) (continuous)
	max. switching power	480 W/4000 VA (resistive load)
Medium-power switching channels		
	number/type of relays	10/Zettler AZ832
	contact configuration	10 × SPST
	max. switching voltage DC/AC	70 V DC, 46 V (peak), 33 V (RMS)
	max. switching current	2 A/2 A (RMS) (continuously)
	max. switching power	150 W/250 VA (resistive load)
	current measurement	
	direct via analog bus	with R&S®TS-PSAM, max. 1 A/10 W
Monitor switching channels		
	number/type of relays	6/Meder RM-05
	contact configuration	12 multiplexers, 4-to-1
	max. switching voltage DC/AC	70 V DC, 46 V (peak), 33 V (RMS)
	max. switching current	1 A/1 A (RMS) (1.5 A carry)
	max. switching power	10 W
	current measurement	
	direct via analog bus	with R&S®TS-PSAM, max. 1 A/10 W
Analog measurement bus access		8 lines

General data		
Power consumption		max. +5 V/4.0 A (all relays switched)
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
	Canada	applied standard: CSA-C22.2 No. 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	20 mm × 174 mm × 316 mm (0.79 in × 6.85 in × 12.44 in)
Weight		0.75 kg (1.65 lb)
Calibration		not required

ORDERING INFORMATION

Designation	Type	Order No.
Power switching module	R&S®TS-PSM1	1143.0139.02

Service that adds value

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

Rohde & Schwarz

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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

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