Data sheet

Version 01.00

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Power Switching Module R&S®TS-PSM1

High-power multiplexer and multiple DUT power switching module

- Power switching module for supplies and loads
- Switching module for voltages of up to 70 V
- 8 high-power channels with 16 A max.
- 10 power channels with 2 A max.
- 4 high-power 4-to-1 multiplexer channels with 16 A max.
- 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
- Selftest of all relays via R&S®TSVP analog measurement bus and R&S®TS-PSAM
- Analog measurement bus access to 8 bus lines
- Control interface based on CAN bus
- Deployment in R&S®CompactTSVP and R&S®PowerTSVP
- LabWindows/CVI device driver support
- GTSL test software library in DLL format

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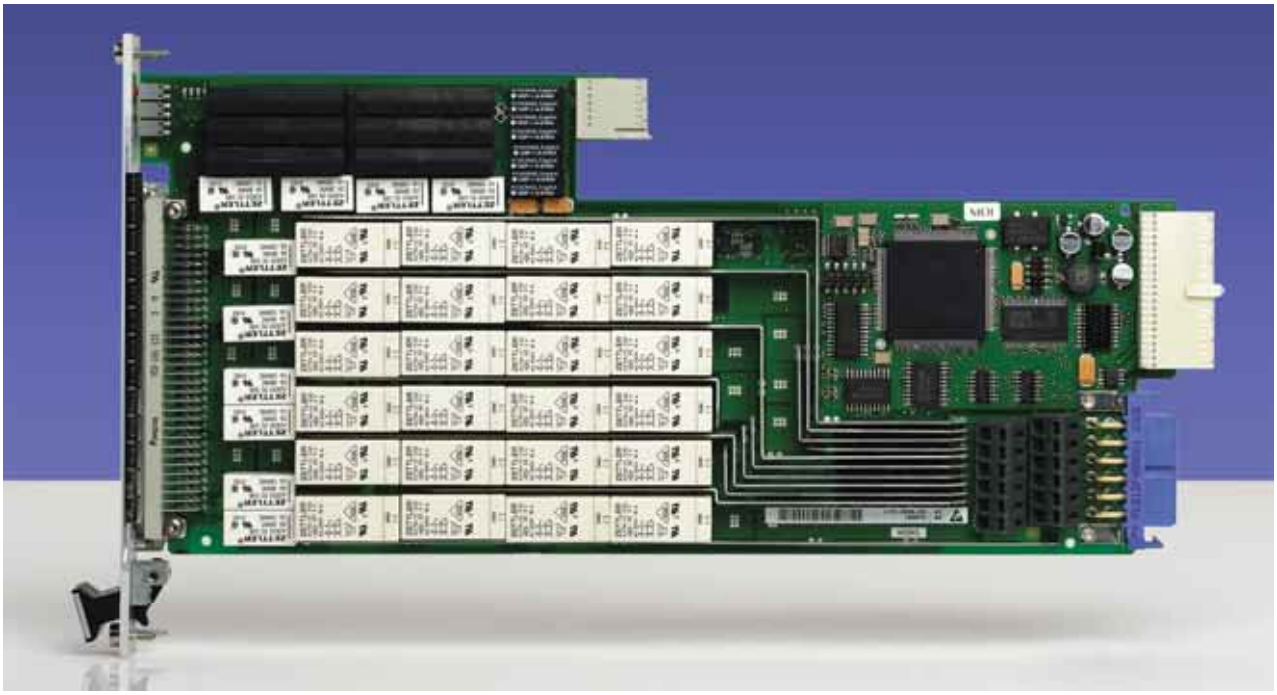


Product introduction

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

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 provide selectability of different load simulations that may be integrated 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 Power Switching Module R&S®TS PSM1 can be used in the R&S®CompactTSVP and in the R&S®PowerTSVP. It is a CAN-bus-controlled module which takes up only one slot.

Flexible signal routing

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

Even complex yet flexible load systems with original or electronic loads can be configured to obtain a high-current R&S®PowerTSVP switching instrument by means of device-internal connection of the multiplexed power channels.

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

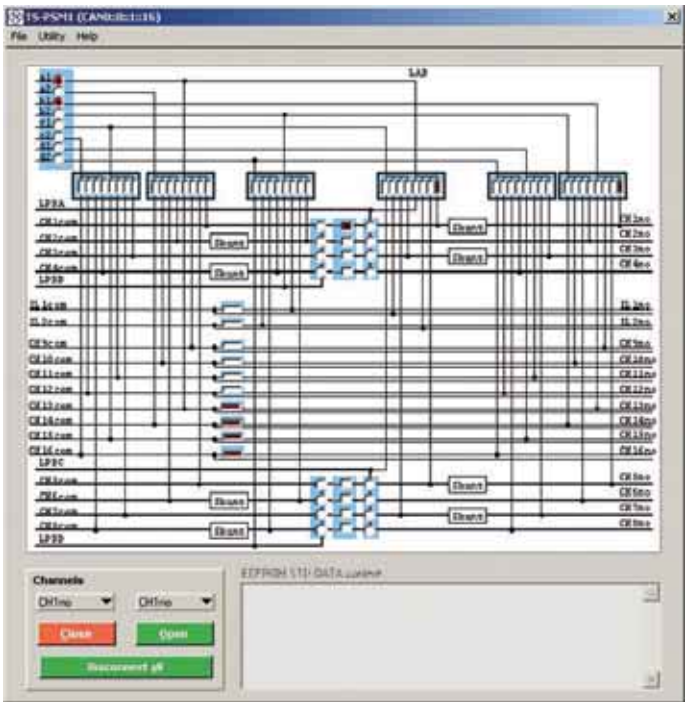
The appropriate way of handling analog signals led to the interconnection solution of the R&S®TSVP analog bus. The analog bus is located immediately above the front connector area where space is provided for on-board signal conditioning and signal routing by coupling relays for the analog bus. This distance to the digital signals on the backplane significantly improves signal quality.

Additionally, the 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 in the R&S®CompactTSVP.

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



Soft front panel for the R&S®TS-PSM1

Software support

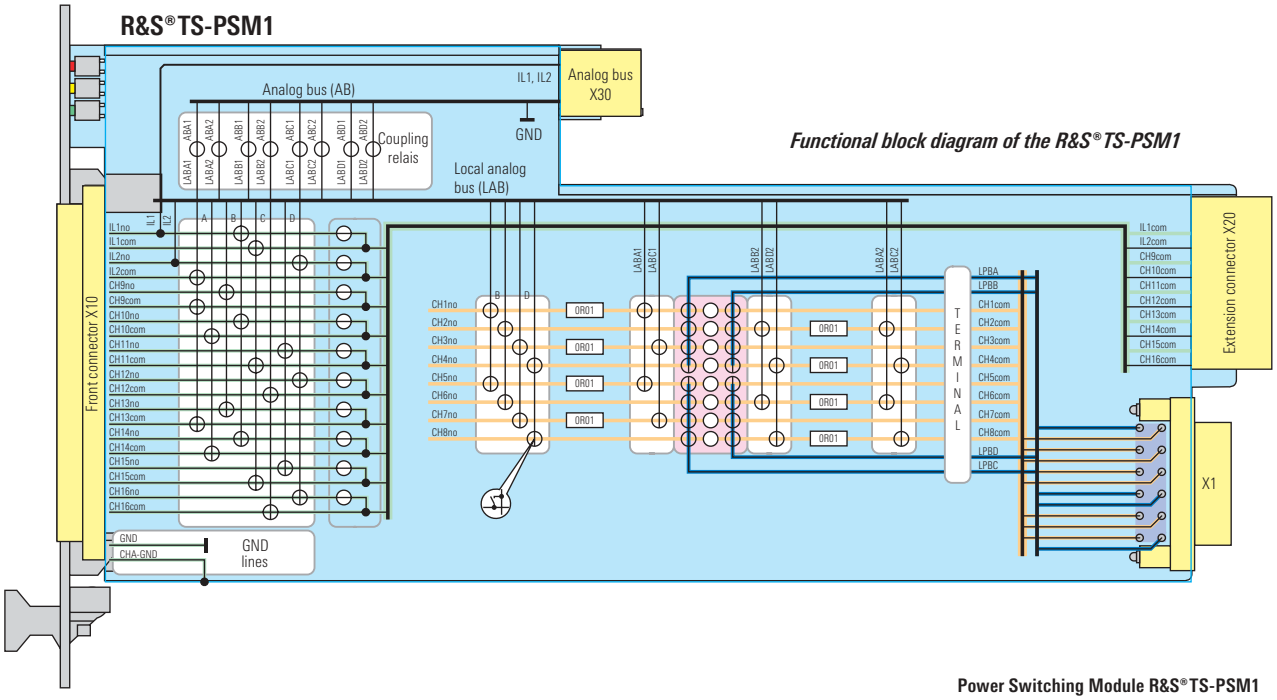
A LabWindows/CVI driver according to the IVI standard is available for the switching functions of the module. Function panels and online help are available as common features for the LabWindows/CVI driver.

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.

Certified Quality System
ISO 9001
DQS REG. NO 1954 QM

Certified Environmental System
ISO 14001
DQS REG. NO 1954 UM



Functional block diagram of the R&S®TS-PSM1

Specifications

Application in the R&S®TSVP	
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
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
Switching voltage DC / AC max.	70 V DC, 46 V peak, 33 V rms
Switching current max.	16 A / 16 A rms (continuously)
Switching power max.	480 W / 4000 VA (resistive load)
Current measurement	
Indirect via shunt	5 mΩ shunt resistor ±0.6 % ±60 ppm/K (for 20 °C to 60 °C)
Direct via analog bus	with R&S®TS-PSAM, 1 A (10 W) max.
High-power multiplexer	
Number / type of relays	16 / Zettler AZ764
Contact configuration	4 multiplexers 4-to-1
Switching voltage DC / AC max.	70 V DC, 46 V peak, 33 V rms
Switching current max.	16 A / 16 A rms (continuously)
Switching power max.	480 W / 4000 VA (resistive load)
Medium-power switching channels	
Number / type of relays	10 / Zettler AZ832
Contact configuration	10 × SPST
Switching voltage DC / AC max.	70 V DC, 46 V peak, 33 V rms
Switching current max.	2 A / 2 A rms (continuously)
Switching power max.	150 W / 250 VA (resistive load)
Current measurement	
Direct via analog bus	with R&S®TS-PSAM, 1 A (10 W) max.
Monitor switching channels	
Number / type of relays	6 / Meder RM-05
Contact configuration	12 multiplexers 4-to-1
Switching voltage DC / AC max.	70 V DC, 46 V peak, 33 V rms
Switching current max.	1 A / 1 A rms (1.5 A carry)
Switching power max.	10 W
Current measurement	
Direct via analog bus	with R&S®TS-PSAM, 1 A (10 W) max.
Analog measurement bus access	8 lines

General data

Power consumption	+5 V / 4.0 A max. (all relays switched)
EMC compliance	compliant with EMC directive 89 / 336 / EEC and EMC standard EN 61326
Safety	CE, EN 61010 Part 1
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-288800D, class 5
Vibration test, random	10 Hz to 300 Hz, 1.2 g
Shock test	40 g, MIL-STD-810, classes 3 and 5
Temperature loading	
Operating	+5 °C to +40 °C
Permissible	0 °C to +50 °C
Storage	–40 °C to +70 °C
Humidity	+40 °C, 95 % rel. humidity
Dimensions	316 mm × 174 mm × 20 mm
Weight	0.75 kg
Calibration	not required

Ordering information

Designation	Type	Order No.
Power Switching Module	R&S®TS-PSM1	1143.0139.02
R&S®CompactTSVP Test and Measurement Chassis	R&S®TS-PCA3	1152.2518.02
R&S®PowerTSVP Industrial Switching Application Chassis	R&S®TS-PWA3	1157.8043.02

More information at
www.rohde-schwarz.com
(search term: TS-PSM1)

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