



Multiplex/Switch Module R&S®TS-PSM 2

Medium-power multiplexer and switching module

- ◆ Medium-power switching module for voltages up to 125 V and 2 A
- ◆ Eight independent groups of 3 SPST/1 SPDT relay channels or 4-to-1 DPST relay multiplexers
- ◆ Relay multiplexers can be cascaded via local power buses
- ◆ Indirect current measurements on each SPxT channel via shunt resistors
- ◆ Direct current measurements up to 1 A on all channels via R&S®TSVP analog measurement bus and R&S®TS-PSAM
- ◆ Connection of CompactPCI/PXI modules via side connector
- ◆ Selftest of all relays via R&S®TSVP analog measurement bus and R&S®TS-PSAM
- ◆ Access to R&S®TSVP analog measurement bus via eight bus lines
- ◆ Control via CAN bus
- ◆ Use in R&S®CompactTSVP and R&S®PowerTSVP
- ◆ Device driver for LabWindows/CVI
- ◆ Generic test software library (GTSL) in DLL format

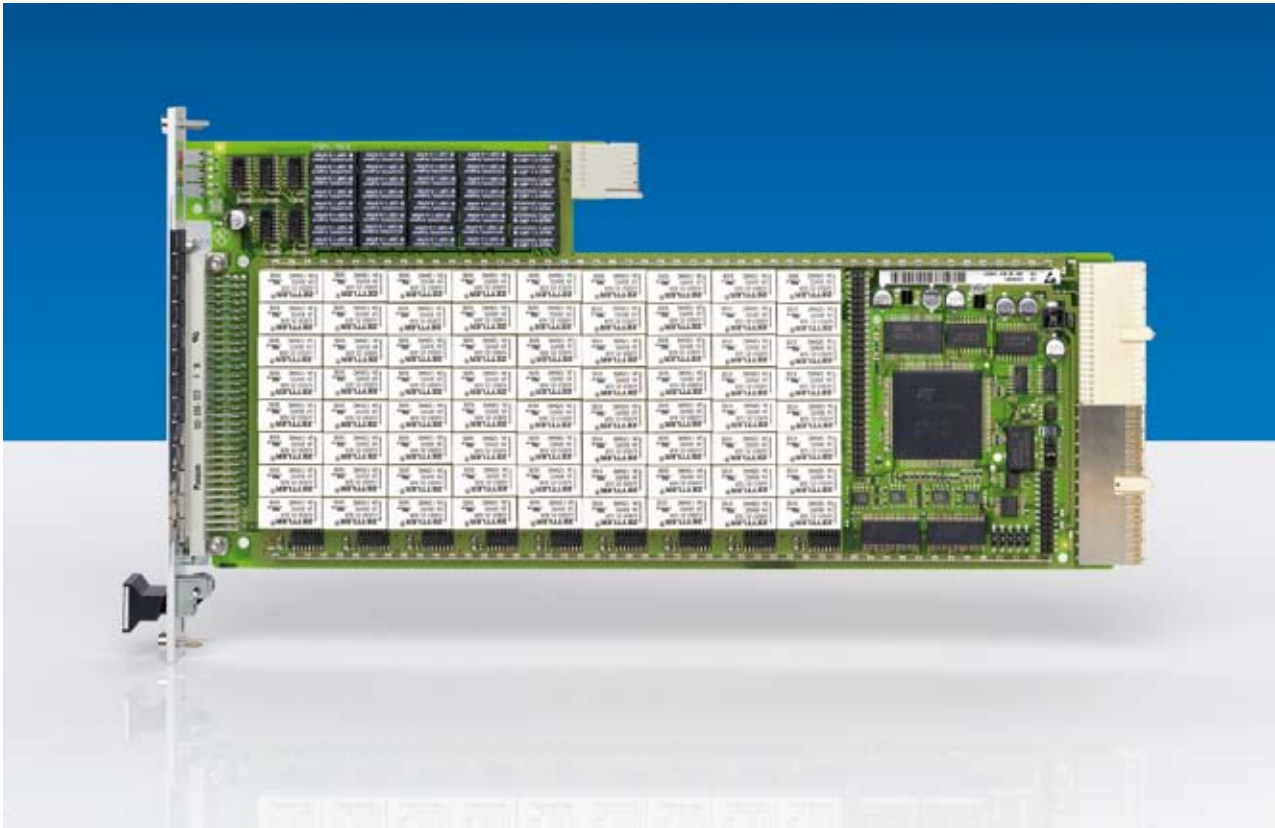


ROHDE & SCHWARZ

PXI
CompactPCI
CAN
Industrial Platform
ICT
Functional Test

Version
01.00

August
2006



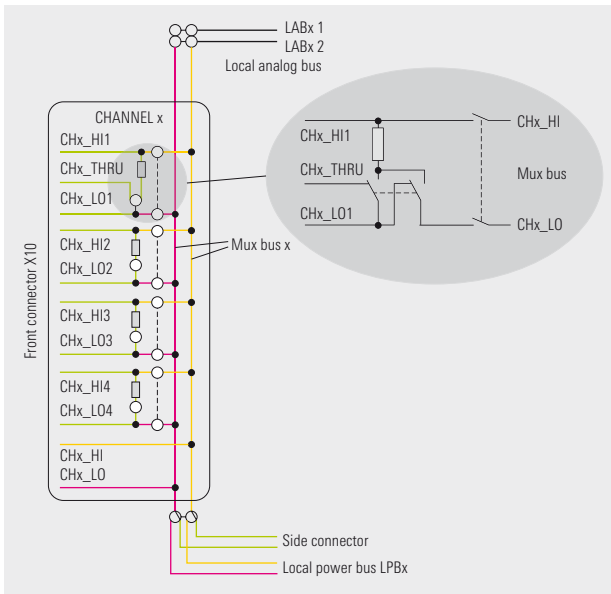
Product introduction

The R&S®TS-PSM 2 is a multiplexer and switching module for medium-power signals and is controlled via a CAN bus. Its innovative technology and versatile wiring capabilities make it ideal for automotive applications.

The special design of the module ensures that lines for differential signals in the audio frequency range are wired with very low interference.

Featuring wide voltage and current ranges and allowing the flexible use of simple switches or complex multiplexers, the module offers high versatility and expandability. Even complex load systems with real or electronically simulated loads and integrated current measurement capability can be implemented. All channels are shielded and designed with low impedance to keep crosstalk and voltage drops to a minimum.

The Multiplex/Switch Module R&S®TS-PSM 2 requires a single slot and can be installed in the R&S®CompactTSVP and R&S®PowerTSVP base units.



Structure of a relay group

Flexible signal routing

The module includes eight identical, independent relay groups that can be cascaded via the local power bus to form larger units. Each group contains a double-pole 4-to-1 multiplexer as well as three single-pole make contacts and one single-pole make-break changeover contact. The module can thus be used as a switch or a multiplexer, depending on the application.

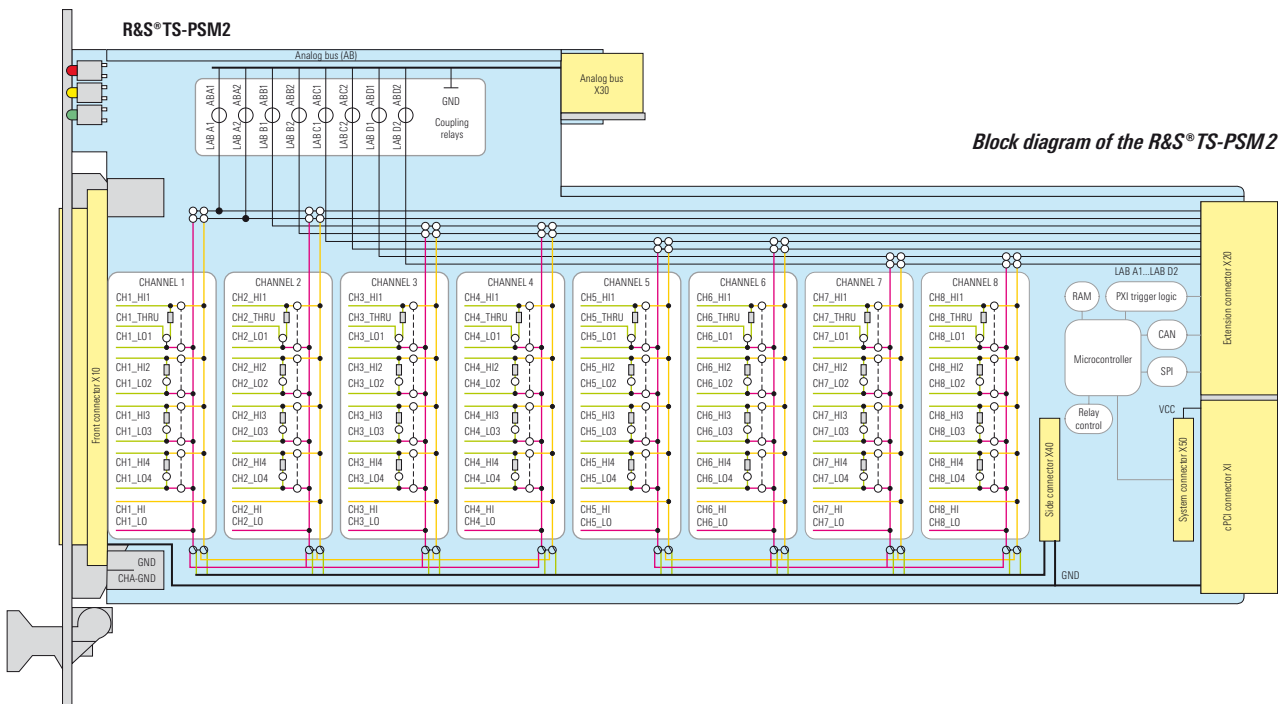
Low-impedance shunt resistors in each switching channel enable even high currents to be measured without voltage drops. With the relay closed, the resistors enable the actual current to be measured indirectly by tapping the voltage via the multiplexer. The relay is designed with two changeover contacts, thus preventing any measurement error due to the resistance of the relay contact.

Each multiplexer bus can also be connected to the local analog bus (LABxx), the local power bus (LPBx) or the side connector. The Rohde & Schwarz analog bus allows all channels to be connected to R&S® CompactTSVP measurement and stimulus modules; no extra external wiring is required.

The side connector and appropriate wiring enable the R&S® TS-PSM 2 to multiplex signals from CompactPCI/PXI modules or to switch them to the Rohde & Schwarz analog bus.

Typical applications

- ◆ Multiplexing of audio frequency signals
- ◆ Multiplexing of medium-power voltage and current sources
- ◆ Switching of DUT loads with optional current measurement
- ◆ Multiplexing of measurement and stimulus signals of CompactPCI/PXI modules included in the system
- ◆ Switch simulation



Block diagram of the R&S® TS-PSM 2

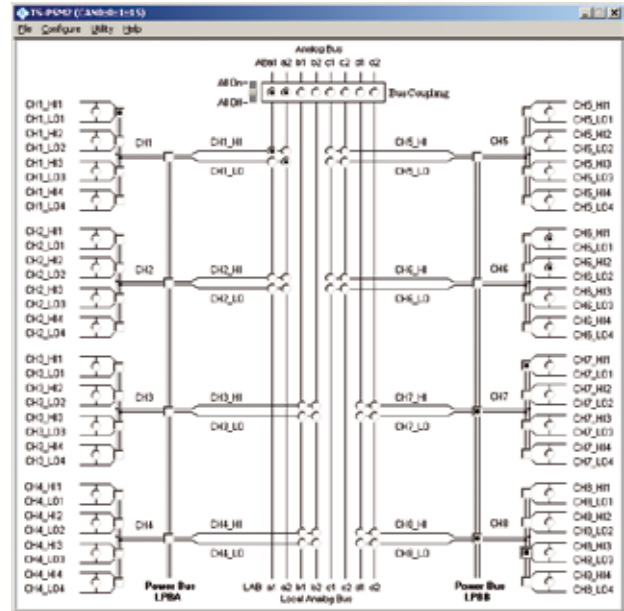
Software support

The Multiplex/Switch Module R&S®TS-PSM 2 is supplied with an IVI-compliant LabWindows/CVI driver, which offers control panels and online help as common features. Alternatively, all switching functions can be called via the GTSL switch manager.

Selftest and diagnostics for reliable operation

The built-in selftest capability of the module ranges from rapid diagnostics to a fully automatic test of all relays and switching paths (requires R&S®TS-PSAM).

Diagnostic LEDs on the module front panel make system integration faster and easier, as the user can see at a glance whether the module is in proper working order.



Software control panel for the R&S®TS-PSM 2

Specifications

Use with the R&S®TSVP system platform

R&S®CompactTSVP	1 slot required
R&S®PowerTSVP	1 slot required

Interfaces

Control bus	CAN 2.0b (1 Mbit/s)
DUT connector (front)	in line with DIN 41612, 96 pins
I/O connector (rear)	CompactPCI connector J1/J2, 110 pins

Control logic

Local microprocessor	ST10, 16 bit, 40 MHz
----------------------	----------------------

Channel switching characteristics

Eight relay groups	
Single SPST/SPDT switch with current measurement shunt	3 × SPST/1 × SPDT
Nominal value	22 mΩ
Accuracy at 23 °C	±1 %
Temperature coefficient	±75 ppm/K
Additional error (with max. current on all channels)	±0.5 %
Shunt current max.	2 A with current on every second channel/1.5 A with current on all channels
Or	
DPST multiplexer	4-to-1
With changeover of CHx_COM	DPDT: connection to either local power bus or side connector

Relay characteristics	type Zettler AZ 832
Max. switching voltage	125 V DC/125 V Vp
Max. switching current	2 A at 30 V DC resistive/2 A at 125 VA resistive
Max. switching power	60 W/250 VA
Switching time (including bouncing)	typ. 5 ms

Analog measurement bus and coupling relays

Number of bus lines	8
Relay characteristics	type Pickering 109
Switching voltage DC/AC rms	125 V/max. 125 V
Switching current DC/AC rms	1 A/ max. 1 A
Switching power	10 W/ max. 10 VA
Switching time (including bouncing)	<0.5 ms

Path resistance, DC (typical, initially)

Input – input (within relay group)	<250 mΩ
Input – input (relay group to relay group)	<500 mΩ

Frequency characteristics (50 Ω termination)

	20 kHz	100 kHz	1 MHz	5 MHz	
Insertion loss					
Within relay group	≤0.1 dB	≤0.2 dB	≤0.5 dB	≤2 dB	3 dB at ≥15 MHz
Relay group to relay group	≤0.1 dB	≤0.2 dB	≤0.5 dB	≤2 dB	3 dB at ≥10 MHz
Crosstalk					
Within relay group	≤-80 dB	≤-65 dB	≤-50 dB	≤-40 dB	
Relay group to relay group	≤-70 dB	≤-55 dB	≤-45 dB	≤-35 dB	

General data

Power consumption	+5 V/1 A (with 25 % of relays activated)
Electromagnetic compatibility	in line with EMC Directive 89/336/EEC and EMC Standard EN 61326
Safety	CE, in line with EN 61010 Part 1
Mechanical loading	
Vibration test, sinusoidal	5 Hz to 55 Hz: 2 g, in line with MIL-T-28800D, Class 5; 55 Hz to 150 Hz: 0.5 g, in line with MIL-T-28800D, Class 5
Vibration test, random	10 Hz to 300 Hz, 1.2 g
Shock test	40 g, in line with MIL-STD-810, Classes 3 and 5
Temperature loading	
Operating temperature range	0 °C to +50 °C
Storage temperature range	-40 °C to +70 °C
Relative humidity	95 % at +40 °C
Dimensions (W × H × D)	316 mm × 174 mm × 20 mm
Weight	0.6 kg
Calibration	not required

Ordering information

Designation	Type	Order No.
Multiplex/Switch Module	R&S®TS-PSM 2	1504.4901.02
Open Test Platform R&S®CompactTSVP	R&S®TS-PCA 3	1152.2518.02
R&S®PowerTSVP Switching Application Chassis	R&S®TS-PWA 3	1157.8043.02



More information at
www.rohde-schwarz.com
(search term: TS-PSM2)



www.rohde-schwarz.com

Europe: +49 1805 12 4242, customersupport@rohde-schwarz.com
USA and Canada: +1-888-837-8772, customer.support@rsa.rohde-schwarz.com
Asia: +65 65 130 488, customersupport.asia@rohde-schwarz.com