

# R&S® TS-PSM2

## Multiplex/Switch Module 2

### User Manual



1178277302  
Version 02

**ROHDE & SCHWARZ**  
Make ideas real



This manual describes the following R&S®TSVP models:

- R&S®TS-PSM2
- R&S®TS-PRIO

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The following abbreviations are used throughout this manual: R&S®TS-PSM2 is abbreviated as R&S TS-PSM2, R&S®TS-PRIO as R&S TS-PRIO.

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# 1 Safety information (multilingual)

This option or accessory is designed for a specific Rohde & Schwarz product. Multilingual safety information is delivered with the product. Follow the provided installation instructions.

Esta opción o este accesorio están diseñados para un producto Rohde & Schwarz concreto. El producto va acompañado de información de seguridad en varios idiomas. Siga las instrucciones de instalación puestas a disposición.

Diese Option oder dieses Zubehör ist für ein bestimmtes Rohde & Schwarz Produkt vorgesehen. Mit dem Produkt werden mehrsprachige Sicherheitsinformationen geliefert. Befolgen Sie die mitgelieferten Installationsanweisungen.

Cette option ou cet accessoire est conçu pour un produit Rohde & Schwarz spécifique. Des informations de sécurité multilingues sont fournies avec le produit. Suivez les instructions d'installation fournies.

Questa funzione opzionale o accessoria è progettata per un prodotto Rohde & Schwarz specifico. Con il prodotto sono fornite informazioni sulla sicurezza in formato multilingue. Seguire le istruzioni di installazione allegate.

Esta(e) opção ou acessório foi concebida(o) para um produto específico da Rohde & Schwarz. Serão fornecidas informações de segurança multilingues com o produto. Siga as instruções de instalação fornecidas.

Αυτή η προαιρετική επιλογή ή εξάρτημα έχει σχεδιαστεί για συγκεκριμένο προϊόν Rohde & Schwarz. Μαζί με το προϊόν παρέχονται πληροφορίες ασφαλείας σε πολλές γλώσσες. Ακολουθήστε τις παρεχόμενες οδηγίες εγκατάστασης.

Din l-għażla jew aċċessorju huma mfassla għal prodott Rohde & Schwarz speċifiku. L-informazzjoni multilingwi dwar is-sikurezza hija pprovduta mal-prodott. Segwi l-istruzzjonijiet ipprovduti għall-installazzjoni.

Deze optie of dit accessoire is ontwikkeld voor een specifiek product van Rohde & Schwarz. Het product wordt geleverd met veiligheidsinformatie in meerdere talen. Volg de meegeleverde installatie-instructies.

Denne mulighed eller tilbehørsdel er designet til et specifikt Rohde & Schwarz produkt. En flersproget sikkerhedsanvisning leveres sammen med produktet. Følg de medfølgende installationsanvisninger.

Detta tillval eller tillbehör är avsett för en särskild produkt från Rohde & Schwarz. Säkerhetsinformation på flera språk medföljer produkten. Följ de medföljande installationsanvisningarna.

Tämä vaihtoehto tai lisävaruste on suunniteltu tietyille Rohde & Schwarz -yrietyksen tuotteelle. Tuotteen mukana on toimitettu monikieliset turvallisuusohjeet. Noudata annettuja asennusohjeita.

Dette alternativet eller ekstrautstyret er utformet for et spesifikt Rohde & Schwarz produkt. Flerspråklig sikkerhetsinformasjon leveres med produktet. Overhold installasjonsveiledningen som følger med.

See valik või lisaseade on mõeldud konkreetsele Rohde & Schwarz tootele. Tootege on kaasas mitmekeelne ohutusteave. Järgige kaasasolevaid paigaldusjuhiseid.

Štī opcija vai piederums ir izstrādāts īpaši Rohde & Schwarz produktam. Produktam pievienota drošības informācija vairākās valodās. Ievērojiet sniegtos uzstādīšanas norādījumus.

Šī parinktis ar priedas skirti konkrētam Rohde & Schwarz gaminiui. Su gaminiu pateikiama saugos informācijas keliomis kalbomis. Laikykitēs pateikiamų montavimo nurodymų.

Þessi auka- eða fylgibúnaður er hannaður fyrir tiltekna Rohde & Schwarz vöru. Öryggisupplýsingar á mörgum tungumálum fylgja með vörunni. Fylgið meðfylgjandi uppsetningarleiðbeiningum.

Tá an rogha nó an oiriúint seo ceaptha le haghaidh táirge Rohde & Schwarz sonrach. Cuirtear eolas sábháilteachta ilteangach ar fáil leis an táirge. Lean na treoracha suiteála a thugtar.

Эта опция или принадлежность предназначена для конкретного продукта Rohde & Schwarz. В комплект поставки продукта входят инструкции по технике безопасности на нескольких языках. Соблюдайте прилагаемые инструкции по установке.

Ця опція або приладдя призначені для конкретного виробу Rohde & Schwarz. Інструкції з техніки безпеки кількома мовами постачаються разом із виробом. Дотримуйтеся наданих інструкцій зі встановлення.

Ta opcja lub akcesorium jest przeznaczona do określonego produktu Rohde & Schwarz. Dostarczany produkt zawiera informacje w wielu językach dotyczące bezpieczeństwa. Należy postępować zgodnie z dostarczonymi instrukcjami instalacji.

Tato varianta nebo příslušenství je určeno pro konkrétní produkt Rohde & Schwarz. S produktem jsou dodávány vícejazyčné bezpečnostní informace. Řiďte se příloženými pokyny k instalaci.

Táto verzia alebo príslušenstvo je navrhnutá pre špecifický výrobok Rohde & Schwarz. S výrobkom sa dodávajú viacjazyčné bezpečnostné pokyny. Riadťe sa dodanými pokynmi na inštaláciu.

Ta možnost ali dodatek je zasnovan za določen izdelek podjetja Rohde & Schwarz. Izdelku so priložena varnostna navodila v več jezikih. Upoštevajte priložena navodila za namestitev.

Ezt a beállítást vagy tartozékot egy adott Rohde & Schwarz termékhez tervezték. A termékhez többnyelvű biztonsági információt mellékelünk. Kövesse a mellékelt szerelési utasításokat.

Тази опция или аксесоар са проектирани за специфичен продукт на Rohde & Schwarz. Многоезикова информация за безопасност се доставя с продукта. Следвайте предоставените инструкции за монтаж.

Ova opcija ili oprema namijenjena je za određeni proizvod tvrtke Rohde & Schwarz. Uz proizvod su dostavljene sigurnosne napomene na više jezika. Pratite isporučene upute za ugradnju.



Ova opcija ili pribor je dizajniran za određeni Rohde & Schwarz proizvod. Proizvodu su priložene sigurnosne informacije na više jezika. Slijedite priložena uputstva za instalaciju.

Ova opcija ili dodatni pribor je projektovan za određeni Rohde & Schwarz proizvod. Bezbednosne informacije na više jezika se isporučuju uz proizvod. Sledite dostavljena uputstva za instalaciju.

Această opțiune sau acest accesoriu a fost conceput pentru un produs specific Rohde & Schwarz. Informațiile multilingve privind siguranța sunt livrate împreună cu produsul. Urmați instrucțiunile de instalare furnizate.

Ky opsion ose aksesori është krijuar për një produkt specifik Rohde & Schwarz. Bashkë me produktin jepen edhe informacionet e sigurisë në shumë gjuhë. Ndiqni udhëzimet e dhëna të instalimit.

Оваа опција или додаток се наменети за одреден производ на Rohde & Schwarz. Со производот се испорачани повеќејазични безбедносни упатства. Следете ги дадените упатства за инсталација.

Bu opsiyon veya aksesuar, belirli bir Rohde & Schwarz ürünü için tasarlanmıştır. Çok dilli güvenlik uyarıları ürünle birlikte teslim edilir. Size sağlanan kurulum talimatlarına uyun.

אפשרות זו או האביזר מיועדים למוצר ספציפי של Rohde & Schwarz. מידע רב-לשוני בנושא בטיחות מצורף למוצר. יש לפעול בהתאם להנחיות ההתקנה המצורפות.

تم تصميم هذا الخيار أو الملحق لمنتج معين من منتجات Rohde & Schwarz. يتم تزويد معلومات السلامة متعددة اللغات مع المنتج. اتبع تعليمات التركيب الموضحة.

این قابلیت یا وسیله جانبی منحصرأ برای محصول به خصوص Rohde & Schwarz طراحی شده است. اطلاعات ایمنی چندزبانه همراه این دستگاه ارائه شده است. دستورالعمل‌های نصب ارائه شده را دنبال کنید.

اسن اختیار یا حصے کو مخصوص Rohde & Schwarz پروڈکٹ کے لئے تیار کیا گیا ہے۔ پروڈکٹ کے ساتھ کثیر السانی زبانوں میں تحفظ کی معلومات فراہم کی جاتی ہیں۔ فراہم کردہ تنصیب کی ہدایات پر عمل کریں۔

Šu opsiya ýa-da esbap Rohde & Schwarz anyk önüm üçin niýetlenilen. Dürli dildäki howpsuzlyk barada maglumat önüm bilen bile üpjün edilýär. Üpjün edilen gurnama ugrukdymalaryny ýerine ýetiriň.

इस विकल्प या एक्सेसरी को एक विशेष Rohde & Schwarz उत्पाद के लिए डिज़ाइन किया गया है. उत्पाद के साथ बहुभाषी सुरक्षा जानकारी दी जाती है. प्रदान किए गए इंस्टालेशन अनुदेशों का पालन करें.

本选项或附件专门设计用于特定的 Rohde & Schwarz 产品。产品随附多种语言版本的安全资讯。谨遵文件中的安装说明。

本オプションアクセサリは、特定の Rohde & Schwarz 製品向けに設計されています。多言語で記載された安全情報が製品に付属します。付属のインストール手順に従ってください。

이 옵션 또는 액세서리는 특정 Rohde & Schwarz 제품용으로 설계되었습니다. 제품과 함께 다국어로 작성된 안전 정보가 제공됩니다. 함께 제공된 설치 지침을 따르십시오.

本選配或配件專門設計用於特定的 Rohde & Schwarz 產品。產品隨附多種語言版本的安全資訊。遵守文件中的安裝說明。

Tùy chọn hoặc phụ kiện này dành riêng cho một sản phẩm Rohde & Schwarz cụ thể. Thông tin an toàn đa ngôn ngữ được cung cấp kèm theo sản phẩm. Thực hiện theo hướng dẫn lắp đặt kèm theo.

ตัวเลือกหรืออุปกรณ์เสริมนี้ออกแบบมาสำหรับผลิตภัณฑ์ Rohde & Schwarz โดยเฉพาะ โดยจะมีการจัดส่งข้อมูลด้านความปลอดภัยหลายภาษามาให้พร้อมกับผลิตภัณฑ์ ปฏิบัติตามคำแนะนำในการติดตั้งที่ให้ไว้

Pilihan atau aksesoris ini direka bentuk untuk produk Rohde & Schwarz yang tertentu. Maklumat keselamatan berbilang bahasa disertakan bersama produk. Ikut arahan pemasangan yang diberikan.

Opsi atau aksesoris ini dirancang untuk produk Rohde & Schwarz tertentu. Informasi keamanan dalam beberapa bahasa juga disertakan bersama produk. Ikuti petunjuk pemasangan yang disediakan.

Esta opción o este accesorio están diseñados para un producto Rohde & Schwarz en concreto. El producto va acompañado de información de seguridad en varios idiomas. Siga las instrucciones de instalación proporcionadas con el producto.

Esta opção ou acessório foi desenvolvido para um produto Rohde & Schwarz específico. Informações de segurança em vários idiomas acompanham o produto. Siga as instruções de instalação disponibilizadas.

## 2 Documentation overview

This section provides an overview of the R&S TSVP (test system versatile platform) user documentation.

All documents are delivered with the Generic Test Software Library ("R&S GTSL") installation package. After installing the software, you can open all the documentation from the Windows "Start" menu. Additionally, you can find detailed information about the software interfaces in the "R&S GTSL Help" folder in the Windows "Start" menu.

The user documentation and "R&S GTSL" installation package are also available for download in GLORIS at:

<https://gloris.rohde-schwarz.com/>

For details, see the R&S TSVP Getting Started manual.

### 2.1 Getting started manual

Introduces the R&S TSVP (test system versatile platform) and describes how to set up and start working with the product. It includes safety information.

A printed version is delivered with the instrument.

### 2.2 User manuals

Separate manuals are provided for the base units, the individual plug-in module types, as well as for the control software and the calibration tool:

- Base unit manual  
The base unit user manuals introduce the base units and describes how to set up and operate the product. It includes safety information and information on maintenance and instrument interfaces. It includes the contents of the getting started manual.
- Plug-in module manuals  
Contain the description of the specific modules. Basic information on setting up the R&S TSVP (test system versatile platform) is not included.
- In-System calibration user manuals  
Provide all the information required for installation and operation of the in-system calibration R&S TS-ISC solution.
- Control software
  - R&S GTSL  
Generic Test Software Library
  - R&S EGTSL  
Enhanced Generic Test Software Library
  - R&S IC-Check

## Generic Test Software Library

## 2.3 System manual

Describes the complete R&S TSVP (test system versatile platform) as a whole, including the combined use of R&S CompactTSVP and R&S PowerTSVP, plug-in modules and generic test software. It also includes typical use cases.

Additionally, it describes known installation problems (hardware and software) along with possible solutions.

## 2.4 Service manual

Describes the self-test to check correct operation, troubleshooting and fault elimination, and contains mechanical drawings and spare part lists.

## 2.5 Printed safety instructions

Provides safety information in many languages. The printed document is delivered with the product.

## 2.6 Brochures and specifications

Separate brochures are provided for the base unit, the individual plug-in module types, as well as for the control software. The brochures provide an overview of the base units and each additional module, and also contain the technical specifications. They also list the hardware options and their order numbers, and optional accessories.

## 2.7 Release notes and open source acknowledgment

The release notes list new features, improvements and known issues of the current software version. In addition, the available firmware versions and the firmware update procedure for plug-in modules are described.

The open-source acknowledgment document provides verbatim license texts of the used open source software.

## 3 Welcome to the R&S TS-PSM2

The Rohde & Schwarz multiplex / switch module R&S TS-PSM2 is intended for the use in the R&S TSVP base units. The module is designed for switching or distribution of signals of medium power. The R&S TS-PSM2 is controlled by the CAN bus.

The Rohde & Schwarz analog bus can be used to measure voltages and currents on all circuit nodes. These functions are especially important if current must be measured for the test object in normal operation and in addition a measurement must be performed in standby mode. In addition to the functionality of a simple power switching module, small signals can be switched in the lower MHz range with high quality.

### Features of the R&S TS-PSM2

- Switching module for power supplies and loads with medium power.
- Switching of voltages up to 120 V
- Switching of currents up to 2 A
- 8 relay groups, each with:
  - 1 Multiplexer 4:1, two-pin, DPST  
or
  - 1 change-over contact, one-pin, SPDT with shunt resistor
  - 3 make contacts, one-pin, SPST with shunt resistor
  - 1 make contact, two-pin, DPDT to local Powerbus/side plug connector
- Indirect current measurement via shunt resistors
- Direct current measurement via R&S analog bus and plug-in module R&S TS-PSAM (<1 A)
- Self-test of all relays via analog bus and plug-in module R&S TS-PSAM
- Control bus: CAN

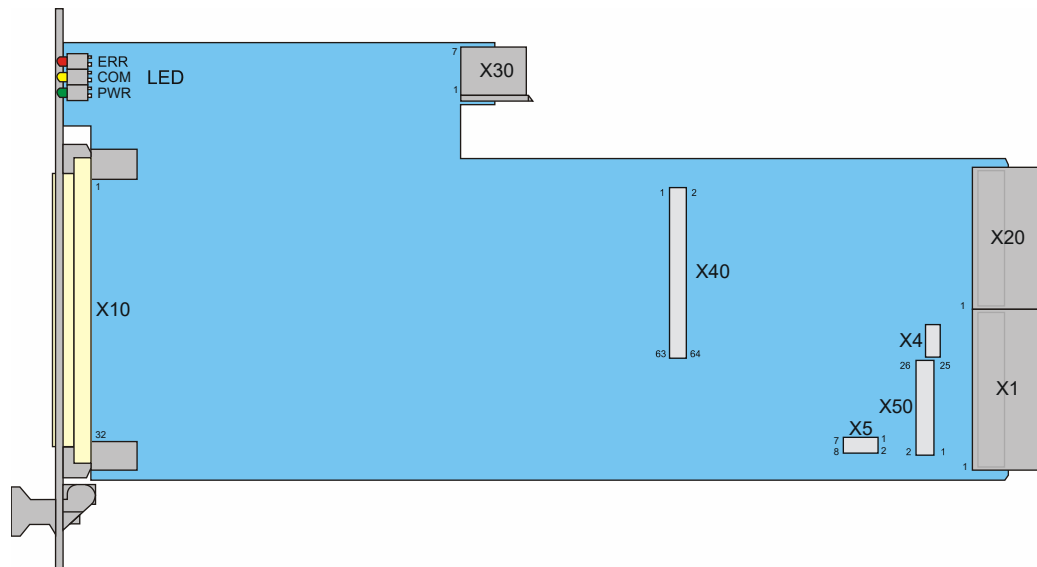
### Features of the R&S TS-PRIO

- Direct routing out of the local analog bus LABxy of the R&S TS-PSM2 to the connector on the rear panel
- Wiring of the local analog bus LABxy of the R&S TS-PSM2 via relays to the connector on the rear panel
- Automatic detection via SPI

## 4 Module tour

### 4.1 R&S TS-PSM2

The R&S TS-PSM2 is designed as a long plug-in module for mounting in the front of R&S TSVP base units.



**Figure 4-1: Overview of connectors and LEDs**

- LEDs = [Chapter 4.1.1, "Status LEDs"](#), on page 14
- X1 = [Chapter 4.1.2, "Connectors X1 and X20"](#), on page 15
- X4 / X5 = [Chapter 4.1.3, "Connector X4 and X5"](#), on page 15
- X10 = [Chapter 4.1.4, "Connector X10"](#), on page 15
- X20 = [Chapter 4.1.2, "Connectors X1 and X20"](#), on page 15
- X30 = [Chapter 4.1.5, "Connector X30"](#), on page 15
- X40 / X50 = [Chapter 4.1.6, "Connector X40 and X50"](#), on page 15

#### 4.1.1 Status LEDs

The LEDs on the front indicate the current status of the module.

- "PWR" (green LED)  
Indicates that all necessary supply voltages are present.
- "COM" (yellow LED)  
Indicates data exchange via the interface.
- "ERR" (red LED)  
Indicates an error condition if illuminated.

### 4.1.2 Connectors X1 and X20

**Type:** Control bus

Interface to connect the module to the backplane of the base units.

See [Chapter C.1.1, "Connector X1"](#), on page 40 and [Chapter C.1.5, "Connector X20"](#), on page 43 for a detailed description of the connectors.

### 4.1.3 Connector X4 and X5

**Type:** Clock configuration and RS232

Interfaces for internal purposes.

### 4.1.4 Connector X10

Interface to connect test objects and peripheral devices to the module.

The 96-pin connector connects flush with the R&S TSVP. It is used to establish contact with test objects. If necessary, an additional adapter frame can be used.

See [Chapter C.1.4, "Connector X10"](#), on page 42 for a detailed description of the connector.

### 4.1.5 Connector X30

**Type:** Analog bus

Interface to connect the module to the analog bus backplane in the housing of the R&S TSVP.

See [Chapter C.1.6, "Connector X30"](#), on page 44 for a detailed description of the connector.

### 4.1.6 Connector X40 and X50

The side and system connectors are interfaces for project-specific purposes.

See [Chapter C.1.7, "Connector X40"](#), on page 45 and [Chapter C.1.8, "Connector X50"](#), on page 48 for a detailed description of the connectors.

## 4.2 R&S TS-PRIO

In the rear I/O area, an R&S TS-PRIO Rear Transmission Module can be used for the R&S TS-PSM2. This makes it possible to route the local analog bus out to the rear of the R&S TSVP base units.

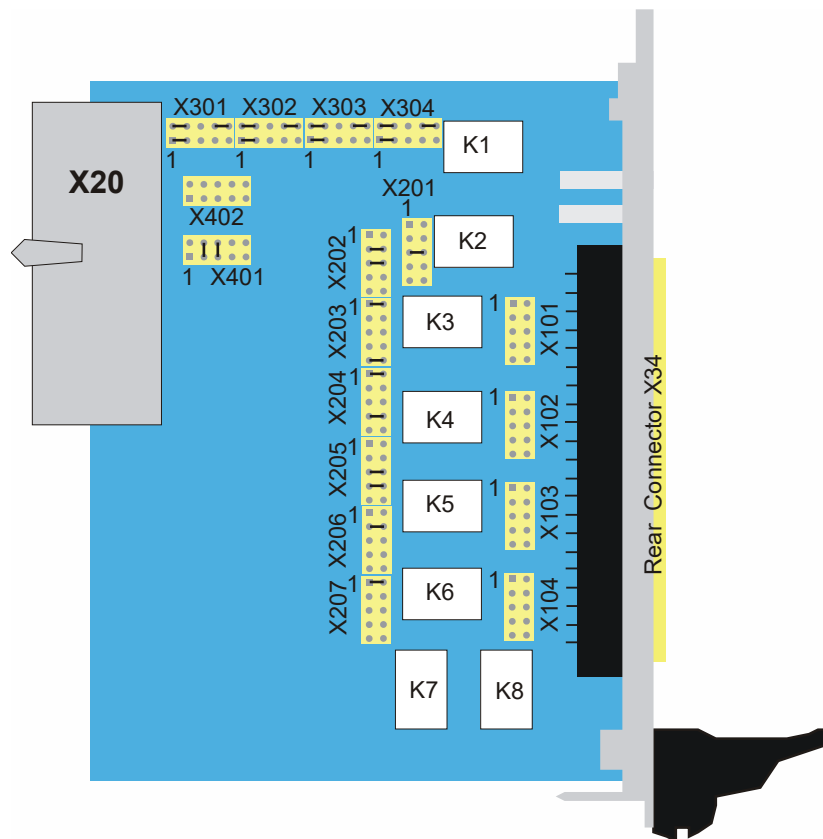


Figure 4-2: Overview of connectors on the R&S TS-PRIO

LEDs =

X20 = [Chapter 4.2.2, "Connector X20"](#), on page 17

## 4.2.1 Display elements

There are four LEDs on the rear panel of the R&S TS-PRIO module. The LEDs are connected to connectors X301 to X304 and can be connected to signals via jumpers.

In the delivery configuration of the jumpers, the associated LED is lit when voltage is applied to R\_AUXn. The brightness depends on the voltage.

Table 4-1: Display elements on the R&S TS-PRIO

LED	Is lit when
H1	a voltage of > 3V is applied to R_AUX1
H2	a voltage of > 3V is applied to R_AUX2
H3	a voltage of > 3V is applied to R_AUX3
H4	a voltage of > 3V is applied to R_AUX4



## 4.2.2 Connector X20

**Type:** CPCI design AB22

Interface to connect the R&S TS-PRIO to the R&S TS-PSM2.

See [Chapter C.2.1, "Connector X20"](#), on page 48 for a detailed description of the connector.

## 5 Installing the module

### 5.1 Installation R&S TS-PSM2

The R&S TS-PSM2 is a module installed on the front panel of the R&S TSVP base unit.

1. Install the module as described in the user manuals of the base units.

For additional information about installing the R&S TS-PSM2 and its optional accessories, see:

- [Chapter 5.2, "Installing the R&S TS-PRIO"](#), on page 18

2. **WARNING!** Risk of electric shock. The test environment, e.g the UUT or additional power supplies, can supply high voltages to the instruments. In this case, the voltage can also apply to the signal output connectors of the R&S TSVP, in particular the analog bus connector X2.

Therefore, do not connect or disconnect devices from the X2 connectors while connected to an external power supply or UUT.

Always connect both ends of the cable connecting the R&S CompactTSVP and R&S PowerTSVP. Thus, you avoid the risk of touching the X2 connector with a possibly hazardous voltage applied.

Take the system into operation as described in the user manuals of the base units.

### 5.2 Installing the R&S TS-PRIO

The R&S TS-PRIO is a module installed on the rear panel of the base unit.

For a detailed description on how to install modules, refer to the user manual of the base units.

# 6 Functions

## 6.1 R&S TS-PSM2

(see [Chapter B, "Block diagrams"](#), on page 38)

### 6.1.1 Signal concept

The design and construction of the Multiplex/Switch Module R&S TS-PSM2 guarantee excellent guiding of load and measurement paths. Both „Force“ channels with high currents as well as „Sense“ channels of voltage and current sources or loads are guided to the test object via the R&S TS-PSM2. In the opposite direction, test objects can be switched with single- or multi-pin loads. Eight two-pin 4-to-1 multiplexers make it possible to select from four measurement signals. These signals can be configured via local power buses (LPBA and LPBB) to larger multiplexers or can be applied to GND.

Access to the R&S analog bus makes it possible to connect all input channels with measurement and stimulus modules of the R&S CompactTSVP without the need for any additional external wiring.

In order to facilitate measurements of high currents without voltage drops interfering, low-Ohm shunt resistors (22 mΩ) are inserted into each channel. The instantaneous current can be measured indirectly through these shunt resistors as a voltage value.

All channels are shielded in a low-Ohm design. This reduces voltage drops and cross-talk.

### 6.1.2 System functions

The system functions are implemented by a local processor with internal flash.

Communication with the system controller in the R&S CompactTSVP is via the CAN bus.

The functions of the R&S TS-PSM2 can be summarized as follows:

- Analog function test
- Connection of voltage/current sources
- Connection of test component loads (original loads, simulated/electronic load)
- Switch simulation
- Power Multiplexer

### 6.1.3 Flexibility

The structure of the R&S TS-PSM2 in addition to the wide voltage and current range, combined with effective use extending into the lower MHz range, guarantee a high level of flexibility and a wide range of uses. Even complex yet flexible load systems with original loads and/or electronic loads can be implemented using multiple module-internal connections.

Figure 6-1 shows the basic principle with a switching group consisting of four switching elements. Detail implementation with two changeover contacts offers advantages for sensed current measurements because the contact resistance of the relay is not introduced as an error. There is no need to take this into consideration in the function.

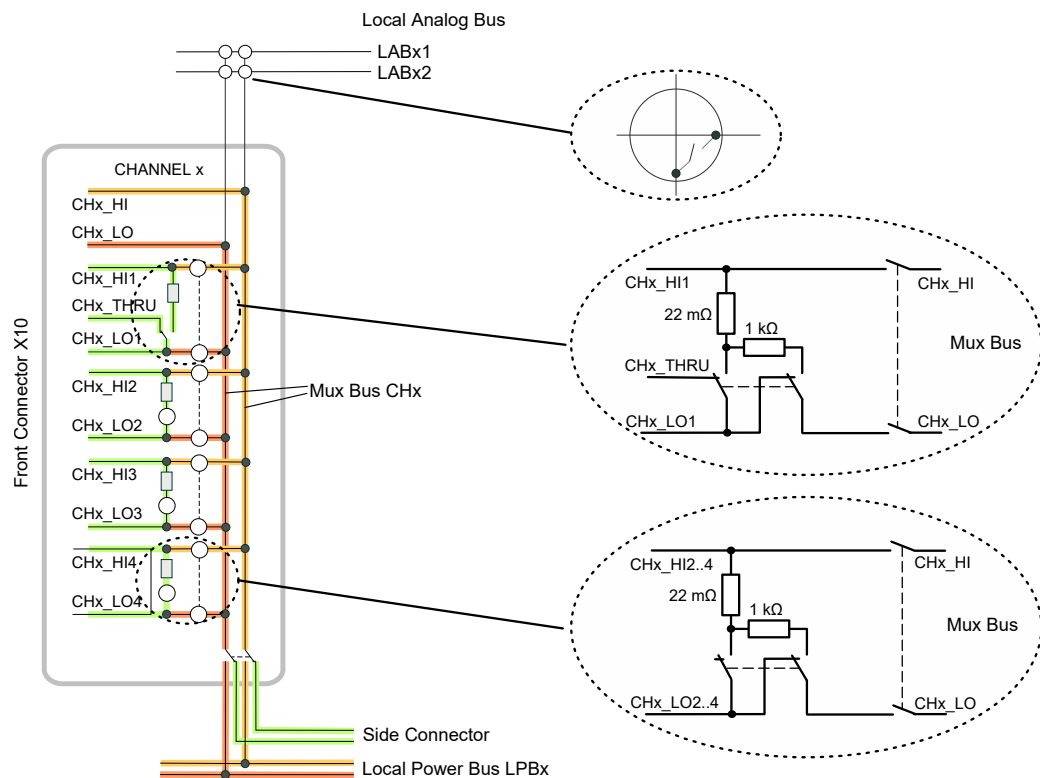


Figure 6-1: Switching group

This switching group is present eight times on the R&S TS-PSM2 module. Four input channels each can be switched with two pins to a separate Mux bus. In addition, each bus can be switched to the local analog bus LABxx (max. 1 A), the local Powerbus LPBx or the side connector.

Input channels with R&S CompactTSVP measuring system and PXI measuring system can be connected via the R&S analog bus. The local analog bus is also directed to connector X20. Signals can also be connected here from the back of the R&S CompactTSVP through corresponding rear I/O modules.

The local Powerbus lines are accessible on side connector X40. In this case standard PXI modules, which typically do not have a relay multiplexer, can have access to the multiplexers or the R&S analog bus via flat-band cable on the side. Another application

consists of integrating project-specific additions via the side and system connector X50 (for example passive loads, terminating resistors, voltage distributors, etc.).

### 6.1.4 Compactness

The layout of the R&S TS-PSM2 (one slot) with 112 relays offers maximum space savings. Extremely high-powered and compact measurement and load systems can be set up with as many as 12 modules in the R&S CompactTSVP and 16 modules in R&S PowerTSVP. These measurement and load systems can be integrated directly into manufacturing cells, which makes them very cost-efficient.

### 6.1.5 Noise immunity

Optimum response to electrical interference or rises in temperature is achieved by the controller on the serial differential CAN bus (Controller Area Network).

### 6.1.6 Sample applications

#### 6.1.6.1 Simple switching function - normally open, 1-pin.

The relay switches the channel on and off; the shunt resistor is not used.

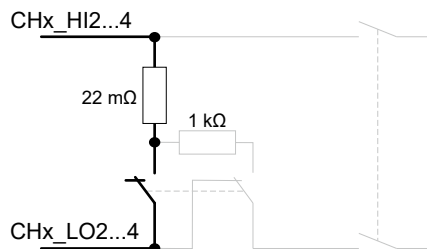


Figure 6-2: The relay switches the channel on and off; the shunt resistor is not used.

#### 6.1.6.2 Simple switching function - changeover contact, 1-pin.

The relay switches the channel; the shunt resistor is not used.

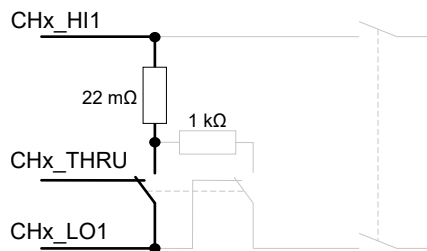


Figure 6-3: Simple switching function - changeover contact, 1-pin.

### 6.1.6.3 Current measurement - indirect, via shunt resistor

The circuit is closed or opened through the relay. The voltage drop on the shunt resistor is measured with a voltmeter via the R&S analog bus. The current can be calculated from the voltage and the value of the shunt. The second relay contact is used to eliminate the measurement error caused by the resistance of the switching contact.

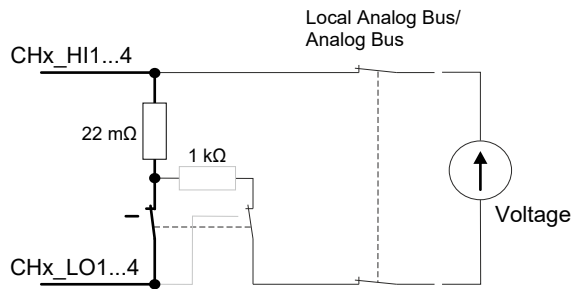


Figure 6-4: Current measurement - indirect, via shunt resistor

### 6.1.6.4 Current measurement - direct, up to 1 A

The current is measured directly with a current measurement device via the analog bus.

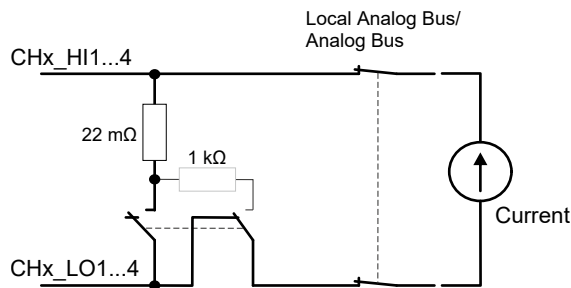


Figure 6-5: Current measurement - direct, up to 1 A

### 6.1.6.5 Multiplexer - test object signals

Up to four test object signals can be multiplexed to a single local bus. If necessary, the local bus can be connected with up to three additional local buses or with the global R&S analog bus.

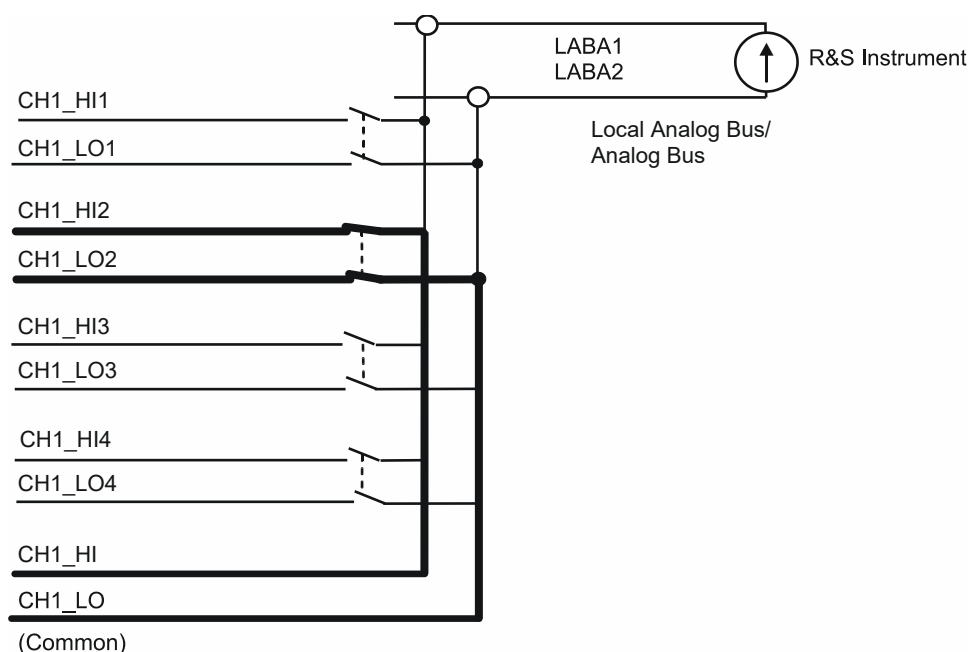


Figure 6-6: Multiplexer - test object signals

### 6.1.6.6 Multiplexer - CompactPCI/PXI instruments

Signals of adjacent CompactPCI/PXI modules can be directed to the local multiplex bus via the side connector and a two-pin changeover contact. Routing to the global R&S analog bus is also possible.

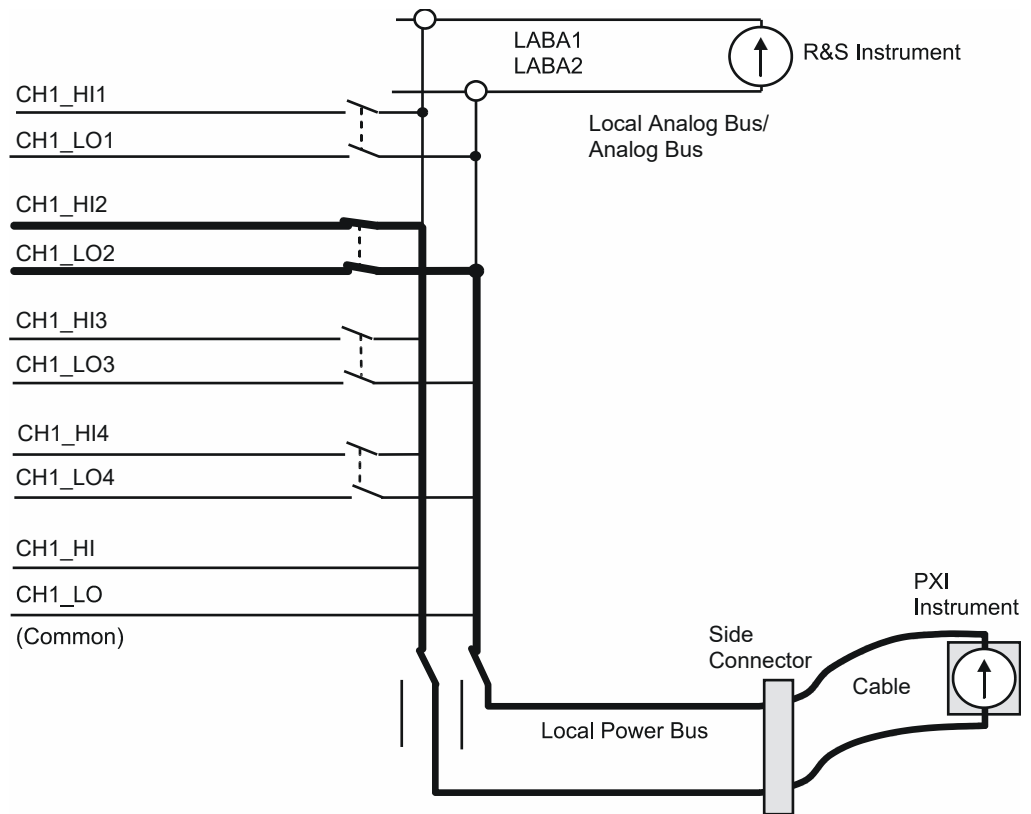


Figure 6-7: Multiplexer - CompactPCI/PXI instruments

### 6.1.6.7 Multiplexer - external components, up to 1 A

Signals of external components can be directed to the local multiplexer bus via the local R&S analog bus and an optional customer-specific rear I/O module. Routing to the global R&S analog bus is also possible.



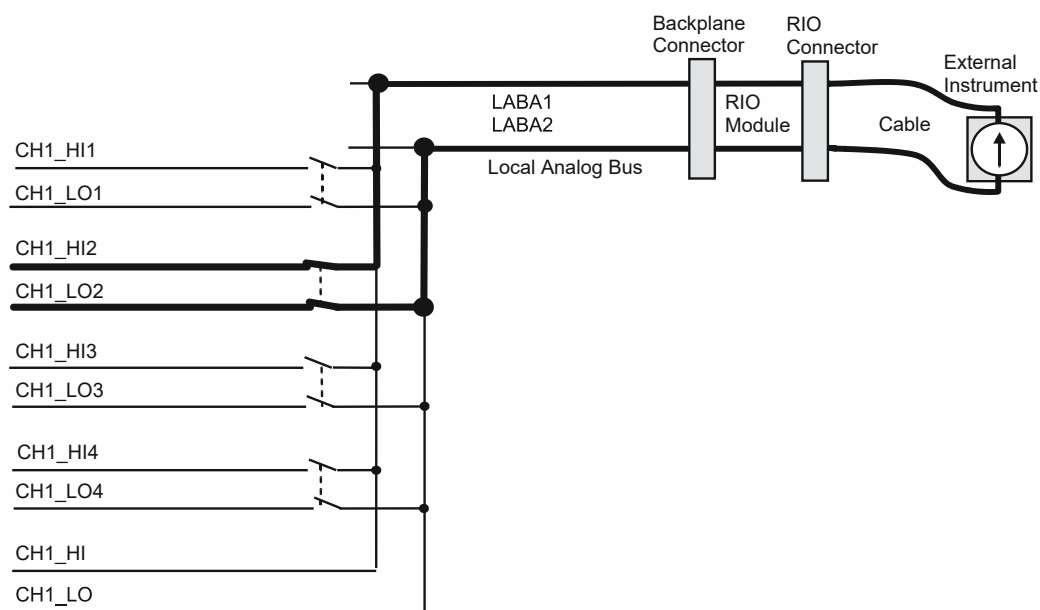


Figure 6-8: Multiplexer - external components, up to 1 A

## 6.2 R&S TS-PRIO

### 6.2.1 Analog bus wiring

The R&S TS-PRIO module is equipped with 8 channels wired identically as follows (shown with the example of channel 1).

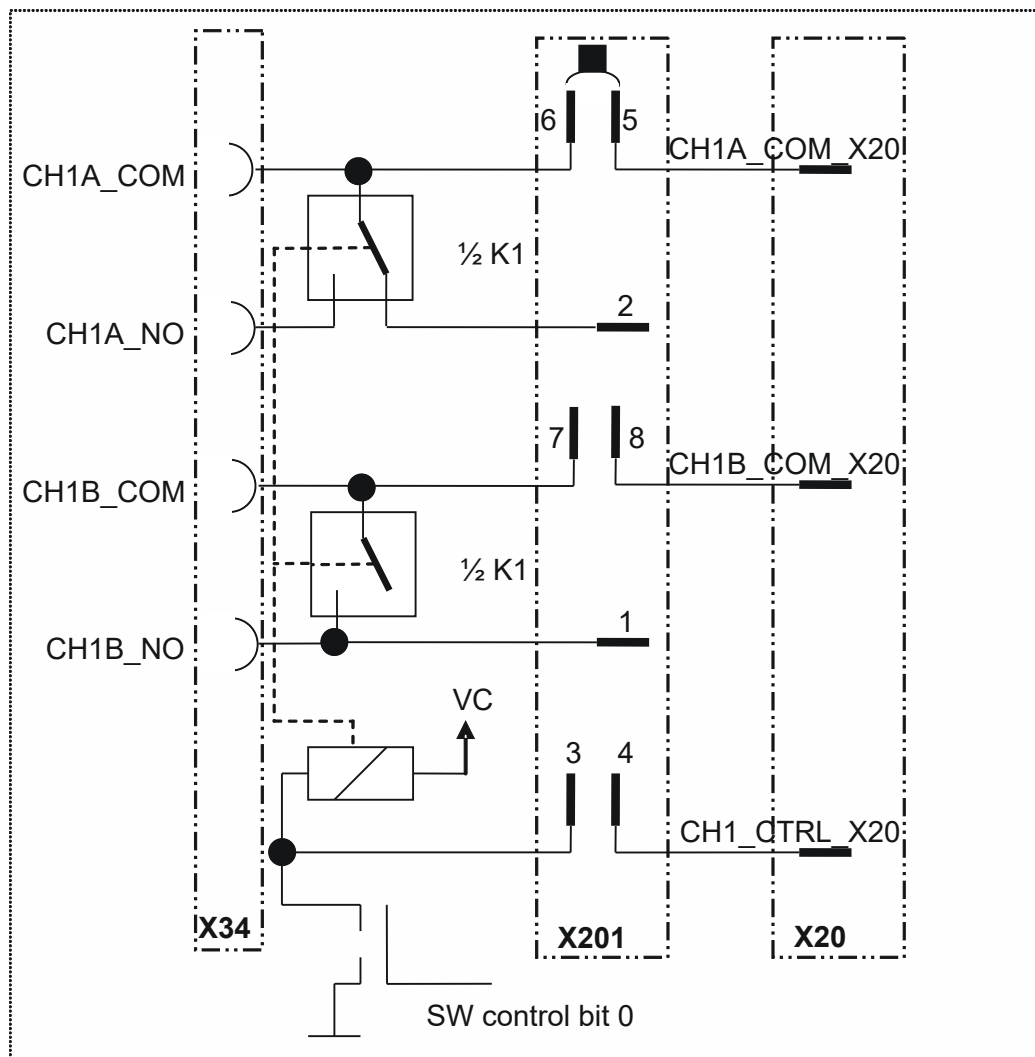


Figure 6-9: Circuit diagram of channel 1 R&S TS-PRIO



X201 to X207 are 10-pin connectors, of which only 8 contacts are used for one channel. For this reason, X201.9 (CH2B\_NO) is the first contact for channel 2, X202.7 for channel 3 etc. Thus the contact assignment shown above ONLY applies to channel 1. All the other channels are offset by 2 contacts as compared to the previous channel. The jumpers are also plugged differently on the channels!

The local analog bus lines of the R&S TS-PSM2 are input at the CHxA\_COM\_X20 lines. The following contact table applies:

Table 6-1: Wiring of the local analog bus on R&S TS-PRIO

Local analog bus	R&S TS-PRIO signal
LABA1	CH1A_COM_X20
LABB1	CH2A_COM_X20
LABA2	CH3A_COM_X20

Local analog bus	R&S TS-PRIO signal
LABB2	CH4A_COM_X20
LABC1	CH5A_COM_X20
LABD1	CH6A_COM_X20
LABC2	CH7A_COM_X20
LABD2	CH8A_COM_X20

The R&S TS-PSM2 software can switch the relay in the above circuit diagram via the following function. Then, the signal present at the analog bus or CHxA\_COM\_X20 is additionally routed to pin CHxA\_NO.

```
ViStatus rpsm2_Connect (ViSession instrumentHandle,
                       ViChar _VI_FAR channel1[],
                       ViChar _VI_FAR channel2[]);
```

The following mapping table of the names in the software to the pin names applies:

**Table 6-2: Mapping of the SW names to R&S TS-PRIO signals**

Name in SW	R&S TS-PRIO signal
ILa1	CH1A_NO
ILb1	CH2A_NO
ILa2	CH3A_NO
ILb2	CH4A_NO
ILc1	CH5A_NO
ILd1	CH6A_NO
ILc2	CH7A_NO
ILd2	CH8A_NO

## 6.2.2 Wiring of the AUX lines

The AUX lines AUX1\_X20 and AUX2\_X20 can be wired to the rear panel of connector X34 by setting a jumper.

**Table 6-3: Wiring of the AUX lines**

Signal at X20	Jumper	Signal at X34
AUX1_X20	X301. 5-6	R_AUX1
AUX2_X20	X302. 5-6	R_AUX2

The signals R\_AUX3 and R\_AUX4 are reserved for future expansions.

# 7 Software

## 7.1 Software R&S TS-PSM2

### 7.1.1 Driver software

A LabWindows IVI driver is available to control the Multiplex/Switch Module R&S TS-PSM2 that supports class IVI SWITCH. All additional functions of the hardware are supported by specific extensions of the driver. The driver is a component of the ROHDE & SCHWARZ GTSL software. All functions of the driver are documented extensively in online Help and in the LabWindows/CVI Function Panels.

During driver installation, the following software modules are installed:

**Table 7-1: Driver installation R&S TS-PSM2**

Module	Path	Comment
rspsm2.dll	<GTSL directory>\Bin	Driver
rspsm2.chm	<GTSL directory>\Bin	Help files
rspsm2.fp	<GTSL directory>\Bin	LabWindows CVI Function Panel file, function panels for CVI development interface
rspsm2.sub	<GTSL directory>\Bin	LabWindows CVI attribute file. This file is required by some „function panels“.
rspsm2.lib	<GTSL directory>\Bin	Import Library
rspsm2.h	<GTSL directory>\Include	Header file for the driver



To use the driver, the IVI and VISA libraries from National Instruments are necessary.

### 7.1.2 Softpanel

The software package of the R&S TS-PSM2 includes a so-called softpanel. The softpanel enables interactive operation of the module.

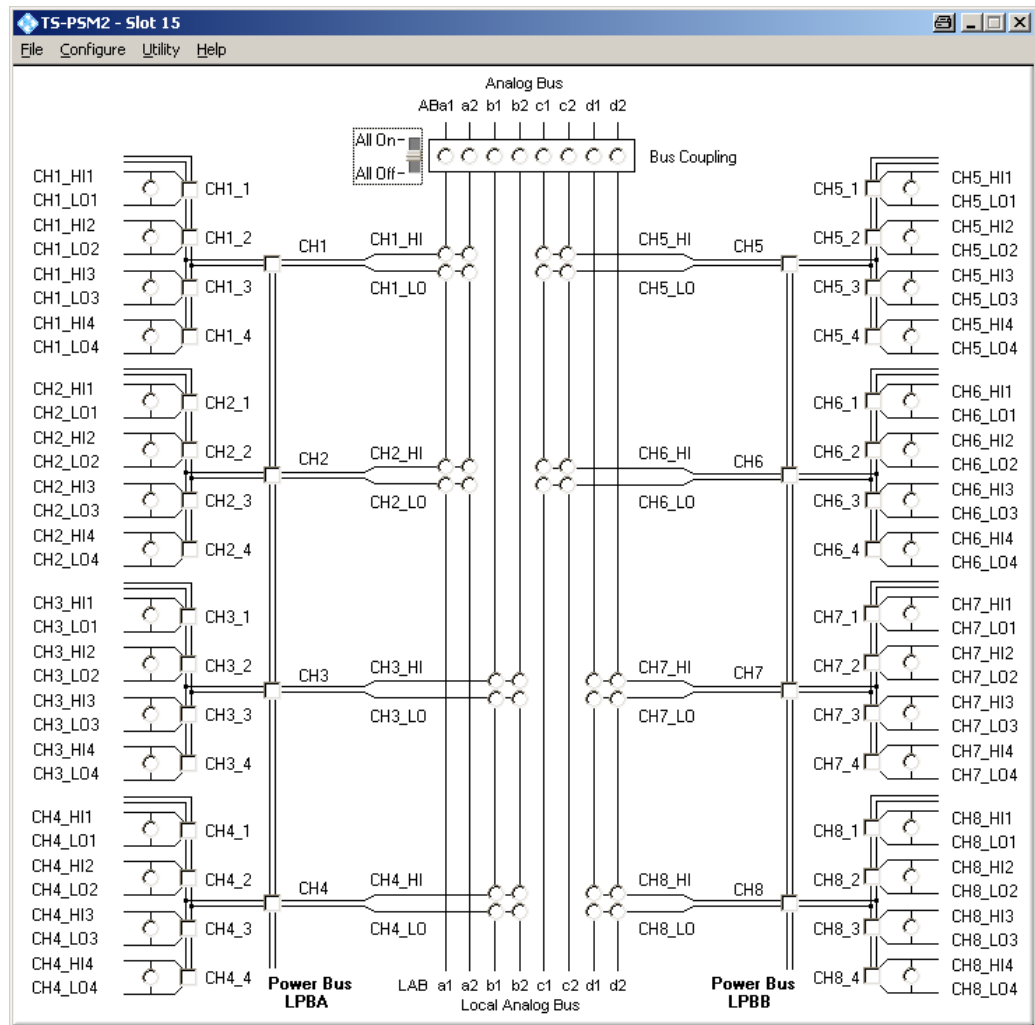


Figure 7-1: Softpanel R&S TS-PSM2

## 7.1.3 Sample programs

### 7.1.3.1 Programming with GTSL libraries

/\*

This example connects TS-PSM2 channel 1 to different internal and external switch channels.

Error handling is not considered in this sample in order to keep it easy to read. The return status should be checked for "errorOccured" after each library call.

The following configuration files are used in this example:

```

physical.ini
-----

[device->psm2_7]
Description = "TS-PSM2, Slot 7"
Type       = PSM2
ResourceDesc = CAN0::0::2::7
DriverDll   = rpsm2.dll
DriverPrefix = rpsm2
DriverOption = "Simulate=0,RangeCheck=1"

; the analog bus pseudo device is used by the switch manager
[device->abus]
Type       = AB

Psm2Application.ini
-----

[bench->switch]

; configure the TS-PSM2 as switch device
SwitchDevice1 = device->psm2_7
AnalogBus     = device->abus
AppChannelTable = io_channel->switch

; configure the switch channels
[io_channel->switch]

; TS-PSM2 channels
CH1     = psm2_7!CH1
CH1_1   = psm2_7!CH1_1
CH1_HI  = psm2_7!CH1_HI
CH1_LO  = psm2_7!CH1_LO

; TS-PSM2 local power bus
LPBA    = psm2_7!LPBA
; TS-PSM2 local analog bus
LABa1   = psm2_7!LABa1
LABa2   = psm2_7!LABa2

; TSVP system wide analog bus
ABa1    = abus!ABa1
ABa2    = abus!ABa2

*/

#include "resmgr.h"
#include "swmgr.h"

```

```
int main (int argc, char *argv[])
{
    long residSwmgr; /* resource ID for switch manager library */

    short errorOccurred = 0;
    long errorCode = 0;
    char errorMessage [GTSL_ERROR_BUFFER_SIZE] = "";

    /* load the physical and application configuration files */
    RESMGR_Setup ( 0, "physical.ini", "Psm2Application.ini",
                  &errorOccurred, &errorCode, errorMessage);

    /* initialize the switch manager library */
    SWMGR_Setup ( 0, "bench->switch", &residSwmgr,
                  &errorOccurred, &errorCode, errorMessage);

    /* connect channel 1 to local power bus A */
    SWMGR_Connect ( 0, residSwmgr, "CH1", "LPBA",
                   &errorOccurred, &errorCode, errorMessage);

    /* connect channel 1 to local front connector */
    SWMGR_Connect ( 0, residSwmgr, "CH1", "CH1_1",
                   &errorOccurred, &errorCode, errorMessage);

    /* connect channel 1 to local analog bus lines */
    SWMGR_Connect ( 0, residSwmgr, "CH1_HI", "LABa1",
                   &errorOccurred, &errorCode, errorMessage);
    SWMGR_Connect ( 0, residSwmgr, "CH1_LO", "LABa2",
                   &errorOccurred, &errorCode, errorMessage);

    /* connect local analog bus lines to analog bus line on backplane */
    SWMGR_Connect ( 0, residSwmgr, "LABa1", "ABa1",
                   &errorOccurred, &errorCode, errorMessage);
    SWMGR_Connect ( 0, residSwmgr, "LABa2", "ABa2",
                   &errorOccurred, &errorCode, errorMessage);

    /* wait until relays have settled; timeout 500 ms */
    SWMGR_WaitForDebounce ( 0, residSwmgr, 500,
                            &errorOccurred, &errorCode, errorMessage);

    /* disconnect channel 1 from local front connector */
    SWMGR_Disconnect ( 0, residSwmgr, "CH1", "CH1_1",
                      &errorOccurred, &errorCode, errorMessage);

    /* wait until relays have settled; timeout 500 ms */
    SWMGR_WaitForDebounce ( 0, residSwmgr, 500,
                            &errorOccurred, &errorCode, errorMessage);

    /* disconnect the rest */
```

```

SWMGR_DisconnectAll ( 0, residSwmgr,
                    &errorOccurred, &errorCode, errorMessage);

/* close the library */
SWMGR_Cleanup ( 0, residSwmgr,
               &errorOccurred, &errorCode, errorMessage);

RESMGR_Cleanup ( 0, &errorOccurred, &errorCode, errorMessage);

return 0;
}

```

### 7.1.3.2 Programming with device drivers

```

/*
   Error handling is not considered in this sample in order to
   keep it easy to read. The return status should be checked for
   VI_SUCCESS after each driver call.
*/

#include "rspsm2.h"

int main (int argc, char *argv[])
{
    ViSession vi;
    ViStatus status;

    /*
       open a session to the device driver. The resource descriptor
       depends on the slot number of the module and must be adapted
       to the target system.
    */
    status = rspsm2_InitWithOptions ("CAN0::0::2::7::INSTR",
                                     VI_TRUE,
                                     VI_TRUE,
                                     "Simulate=0,RangeCheck=1",
                                     &vi);

    /* connect channel 1 to Local Power Bus A */
    status = rspsm2_Connect (vi, "CH1", "LPBA");
    /* connect channel 1 to front connector */
    status = rspsm2_Connect (vi, "CH1", "CH1_1");

    /* connect channel 1 HI to local analog bus line */
    status = rspsm2_Connect (vi, "CH1_HI", "LABa1");

    /* connect channel 1 LO to local analog bus line */
    status = rspsm2_Connect (vi, "CH1_LO", "LABa2");
}

```



```
/* connect local analog bus line to analog bus line on back plane */
status = rspsm2_Connect (vi, "ABa1", "LABa1");

/* connect local analog bus line to analog bus line on back plane */
status = rspsm2_Connect (vi, "ABa2", "LABa2");

/* wait until relays have settled; timeout 500 ms */
status = rspsm2_WaitForDebounce (vi, 500.0);

/* disconnect channel 1 from front connector */
status = rspsm2_Disconnect (vi, "CH1", "CH1_1");

/* wait until relay has settled; timeout 500 ms */
status = rspsm2_WaitForDebounce (vi, 500.0);

/* disconnect the rest */
status = rspsm2_DisconnectAll(vi);

/* close the driver session */
status = rspsm2_close (vi);

return 0;
}
```

## 7.2 Software R&S TS-PRIO

Simple routing out of the LABxy pins of an R&S TS-PSM2 does not require any software. However, if the relays on the R&S TS-PRIO are to be used, the software for the R&S TS-PSM2 must be installed correctly.

Support for R&S TS-PRIO is available as of the following versions of the R&S TS-PSM2 software:

Firmware: psm2.h86 as of version 1.05 (GTSL version 2.81)

Drivers: rspsm2.dll as of version 1.11 (GTSL version 2.81)

The firmware can be updated using the "Firmware Update" tool. Start the tool via Start => Programs => GTSL => Tools => Firmware Update.

## 8 Maintenance, storage and disposal

### 8.1 Storage

Protect the product against dust. Ensure that the environmental conditions, e.g. temperature range and climatic load, meet the values specified in the data sheet.

### 8.2 Disposal

Rohde & Schwarz is committed to making careful, ecologically sound use of natural resources and minimizing the environmental footprint of our products. Help us by disposing of waste in a way that causes minimum environmental impact.

#### Disposing electrical and electronic equipment

A product that is labeled as follows cannot be disposed of in normal household waste after it has come to the end of its service life. Even disposal via the municipal collection points for waste electrical and electronic equipment is not permitted.



*Figure 8-1: Labeling in line with EU directive WEEE*

Rohde & Schwarz has developed a disposal concept for the eco-friendly disposal or recycling of waste material. As a manufacturer, Rohde & Schwarz completely fulfills its obligation to take back and dispose of electrical and electronic waste. Contact your local service representative to dispose of the product.

## 9 Troubleshooting

If the system is not running properly, try to find the problem with the following tests. If the tests do not help to locate the problem, contact your Rohde & Schwarz service representative.

- [LED test](#)..... 35
- [Power-on test](#)..... 35
- [R&S TSVP self-test](#)..... 36
- [Contacting customer support](#)..... 36

### 9.1 LED test

The module has three LEDs on its front panel that indicate its status.

After turning on the system, all LEDs light up for a short time to indicate that the power supply is present and that all LEDs are working.

- A single LED does not light up in that time frame:  
Indicates a faulty LED or faulty LED control.
- All LEDs do not light up during that time frame:  
Indicates that the power supply for the module is faulty.  
Check the status LEDs of the main power supply module in slot A3 and A4.

For rear modules, you have to check the LEDs separately, see "[Power-on test for modules with a rear I/O supply module](#)" on page 36.

### 9.2 Power-on test

The power-on test runs at the same time as the LED test. The following statements can be made regarding the different display states of the LEDs.

- "PWR LED" (green LED) = on  
Indicates that all power supply voltages are present.
- "PWR LED" (green LED) = off  
Indicates that at least one power supply voltage is missing.
- "ERR LED" (red LED) = off  
If the green LED is illuminated at the same time, indicates that the system is working without any errors.
- "ERR LED" (red LED) = on (or blinking)  
Indicates a hardware problem.

### Power-on test for modules with a rear I/O supply module

If the green LED indicates a problem with the supply voltage, check the LEDs of the corresponding rear I/O supply module separately. If the LEDs on the rear I/O module also indicate a supply voltage failure, replace the rear I/O module.

## 9.3 R&S TSVP self-test

The R&S TSVP self-test is an extensive test procedure for the whole system or individual components. After the test is done, you receive a test report for all components that have been tested.

The self-test uses the R&S TS-PSAM module as a measurement unit. The functionality of the modules in the system is ensured by measurements via the analog measurement bus.

For more information about running the system self-test and the test procedures, refer to the R&S TSVP service manual.

## 9.4 Contacting customer support

### Technical support – where and when you need it

For quick, expert help with any Rohde & Schwarz product, contact our customer support center. A team of highly qualified engineers provides support and works with you to find a solution to your query on any aspect of the operation, programming or applications of Rohde & Schwarz products.

### Contact information

Contact our customer support center at [www.rohde-schwarz.com/support](http://www.rohde-schwarz.com/support), or follow this QR code:



Figure 9-1: QR code to the Rohde & Schwarz support page

# Annex

## A Specifications

For an overview of technical specifications of the R&S TS-PSM2 module, refer to the corresponding product brochure / data sheet.

If discrepancies exist between information in this manual and the values in the data sheet, the values in the data sheet take precedence.

## B Block diagrams

Figure B-1 and Figure B-2 shows the functional block diagram and the block diagram of the Multiplex/Switch Module R&S TS-PSM2.

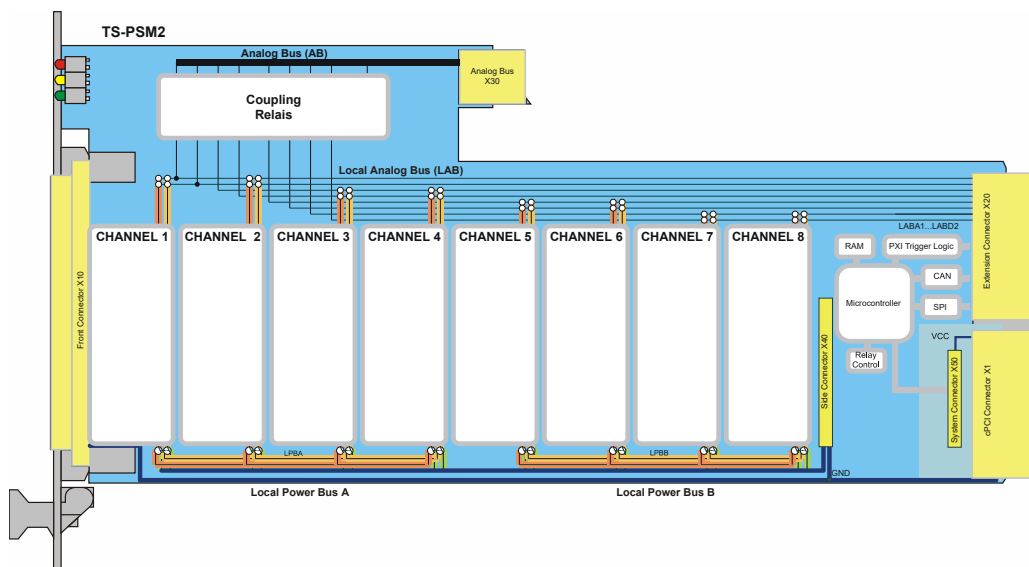


Figure B-1: Functional block diagram R&S TS-PSM2

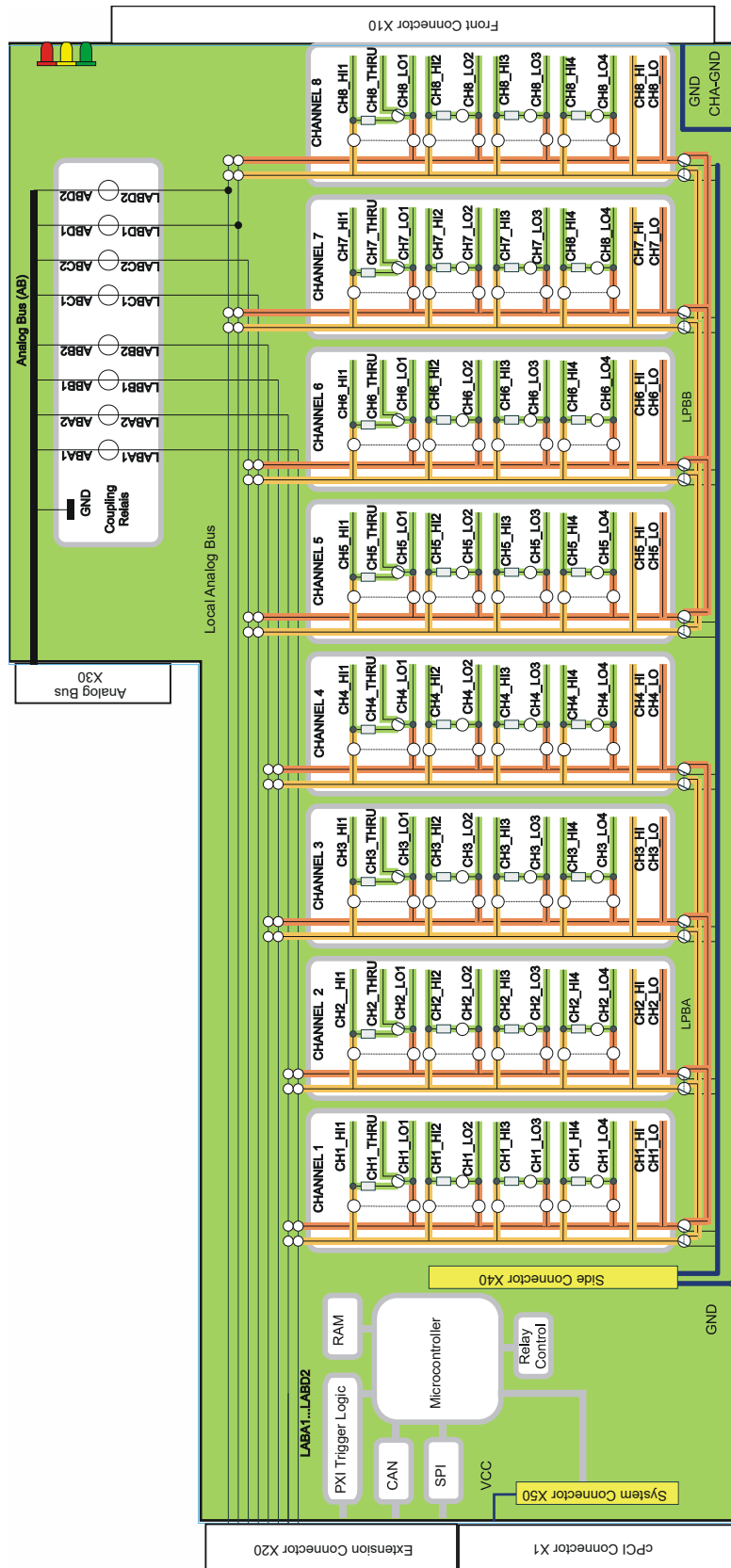


Figure B-2: Detailed block diagram R&S TS-PSM2

# C Interface description

## C.1 R&S TS-PSM2

### C.1.1 Connector X1

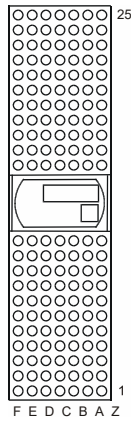


Figure C-1: R&S TS-PSM2 Connector X1 (view: mating side)

Pin	F	E	D	C	B	A	Z
25	GND	+5V				+5V	GND
24	GND				+5V		GND
23	GND		+5V				GND
22	GND				GND		GND
21	GND						GND
20	GND				GND		GND
19	GND		GND				GND
18	GND				GND		GND
17	GND		GND				GND
16	GND				GND		GND
15	GND		GND				GND
12..14							
11	GND		GND				GND
10	GND				GND		GND
9	GND		GND				GND
8	GND				GND		GND
7	GND		GND				GND
6	GND				GND		GND
5	GND		GND				GND
4	GND				GND		GND
3	GND		+5V				GND
2	GND				+5V		GND
1	GND	+5V				+5V	GND
Pin	F	E	D	C	B	A	Z

Figure C-2: R&S TS-PSM2 Assignment of X1



### C.1.2 Connector X4

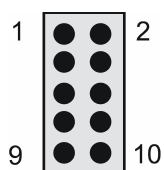


Figure C-3: R&S TS-PSM2 Connector X4 (view: mating side)

Table C-1: R&S TS-PSM2 assignment of x4

Pin	Signal	Pin	Signal
1	PRO_DAT_4	2	GND
3	MAN_RST/	4	GND
5	OSC_CLK10	6	PRO_CLK10
7	PXI_CLK10	8	PRO_CLK_R
9	OSC_OE	10	GND

### C.1.3 Connector X5

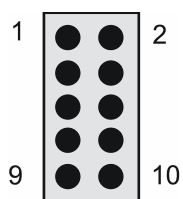


Figure C-4: R&S TS-PSM2 Connector X5 (view: mating side)

Table C-2: R&S TS-PSM2 assignment of x5

Pin	Signal	Pin	Signal
1	nc	2	nc
3	RS232_RXD/	4	Nc
5	RS232_TXD/	6	nc
7	RS232_CTS/	8	T2_low
9	GND	10	GND

### C.1.4 Connector X10

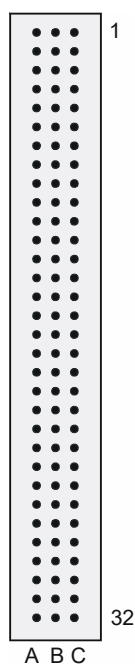


Figure C-5: R&S TS-PSM2 Connector X10 (view: mating side)

Table C-3: R&S TS-PSM2 assignment of x10 (signals printed in bold are high power)

Pin	A	B	C
1	CH1_HI1	CH1_LO1	<b>CH1_THRU</b>
2	CH1_HI2	CH1_LO2	CH1_HI3
3	CH1_LO3	CH1_HI4	CH1_LO4
4	CH1_HI	CH1_LO	CH2_HI1
5	CH2_LO1	<b>CH2_THRU</b>	CH2_HI2
6	CH2_LO2	CH2_HI3	CH2_LO3
7	CH2_HI4	CH2_LO4	CH2_HI
8	CH2_LO	CH3_HI1	CH3_LO1
9	<b>CH3_THRU</b>	CH3_HI2	CH3_LO2
10	CH3_HI3	CH3_LO3	CH3_HI4
11	CH3_LO4	CH3_HI	CH3_LO
12	CH4_HI1	CH4_LO1	<b>CH4_THRU</b>
13	CH4_HI2	CH4_LO2	CH4_HI3
14	CH4_LO3	CH4_HI4	CH4_LO4
15	CH4_HI	CH4_LO	CH5_HI1
16	CH5_LO1	<b>CH5_THRU</b>	CH5_HI2

Pin	A	B	C
17	CH5_LO2	CH5_HI3	CH5_LO3
18	CH5_HI4	CH5_LO4	CH5_HI
19	CH5_LO	CH6_HI1	CH6_LO1
20	<b>CH6_THRU</b>	CH6_HI2	CH6_LO2
21	CH6_HI3	CH6_LO3	CH6_HI4
22	CH6_LO4	CH6_HI	CH6_LO
23	CH7_HI1	CH7_LO1	<b>CH7_THRU</b>
24	CH7_HI2	CH7_LO2	CH7_HI3
25	CH7_LO3	CH7_HI4	CH7_LO4
26	CH7_HI	CH7_LO	CH8_HI1
27	CH8_LO1	<b>CH8_THRU</b>	CH8_HI2
28	CH8_LO2	CH8_HI3	CH8_LO3
29	CH8_HI4	CH8_LO4	CH8_HI
30	CH8_LO	<b>GND</b>	<b>GND</b>
31	<b>GND</b>	<b>GND</b>	<b>GND</b>
32	<b>GND</b>	<b>GND</b>	<b>CHA-GND</b>

The CHA\_GND signal is connected with the front plate of the module and via two 10 nF capacitors with GND. The front plate itself has no direct connection to GND. When a test object is connected, the test object GND should be connected to GND. To avoid ripple loops, do not connect GND and CHA\_GND.

### C.1.5 Connector X20

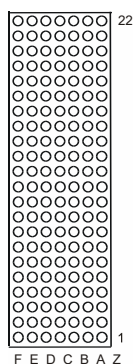


Figure C-6: R&S TS-PSM2 Connector X20 (view: mating side)

Pin	F	E	D	C	B	A	Z
22		GA0	GA1	GA2	GA3	GA4	
21					GA5		
20		+5V (PWA)	GND	+5V (PWA)	AUX1R	AUX2R	
19		AUX1L	AUX2L	+5V (PWA)	GND		
18		PXI TRIG6	CAN EN	PXI TRIG5	PXI TRIG4	PXI TRIG3	
17		PXI CLK10			GND	PXI TRIG2	
16		PXI TRIG7	GND		PXI TRIG0	PXI TRIG1	
15		+5V	+5V (PWA)		GND		
14							
13							
12	NP	LABA1				LABC1	NP
11	NP						NP
10		LABB1				LABD1	
9							
8		LABA2				LABC2	
7							
6		LABB2				LABD2	
5							
4							
3		RSA0	RRST#		GND	RSD0	
2			RSDI	RSA1		RSCLK	
1		+5V (PWA)	CAN L	CAN H	GND	RCS#	
Pin	F	E	D	C	B	A	Z

Figure C-7: R&S TS-PSM2 Assignment of X20 (NP = not populated)

### C.1.6 Connector X30

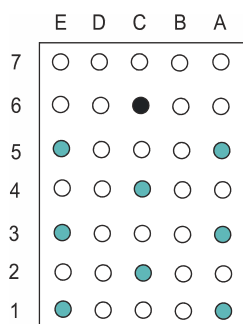


Figure C-8: Connector X30 (mating side)

Table C-4: X30 pinning schedule

Pin	E	D	C	B	A
7					
6			GND		
5	ABC1				ABA1
4			ABB1		
3	ABC2				ABB2
2			ABA2		
1	ABD2				ABD1

### C.1.7 Connector X40

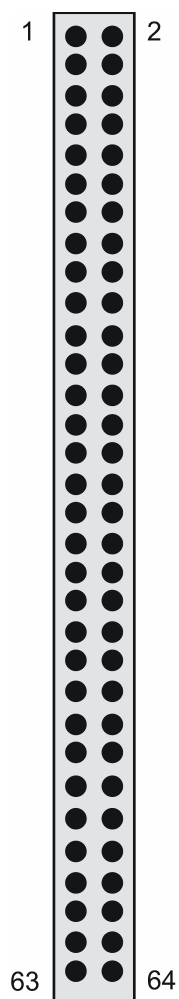


Figure C-9: R&S TS-PSM2 Connector X40 (view: mating side)

Table C-5: R&S TS-PSM2 assignment of x40, version 1.x and version 2.x

Pin	Signal	Pin	Signal
1	LABA1	2	GND
3	LABC1	4	GND
5	LABD1	6	GND
7	LABB1	8	GND
9	LABC2	10	GND
11	LABA2	12	GND
13	LABD2	14	GND
15	LABB2	16	GND
17	AUX2R	18	GND

Pin	Signal	Pin	Signal
19	AUX1R	20	GND
21	AUX2L	22	GND
23	AUX1L	24	GND
25	CH1_SIDECON_HI	26	GND
27	CH1_SIDECON_LO	28	GND
29	CH2_SIDECON_HI	30	GND
31	CH2_SIDECON_LO	32	GND
33	CH3_SIDECON_HI	34	GND
35	CH3_SIDECON_LO	36	GND
37	CH4_SIDECON_HI	38	GND
39	CH4_SIDECON_LO	40	GND
41		42	GND
43		44	GND
45		46	GND
47		48	GND
49	CH5_SIDECON_HI	50	GND
51	CH5_SIDECON_LO	52	GND
53	CH6_SIDECON_HI	54	GND
55	CH6_SIDECON_LO	56	GND
57	CH7_SIDECON_HI	58	GND
59	CH7_SIDECON_LO	60	GND
61	CH8_SIDECON_HI	62	GND
63	CH8_SIDECON_LO	64	GND

**Table C-6: R&S TS-PSM2 assignment of x40, from version 3.x**

Pin	Signal	Pin	Signal
1	LABA1	2	GND
3	LABA2	4	GND
5	LABB1	6	GND
7	LABB2	8	GND
9	LABC1	10	GND
11	LABC2	12	GND
13	LABD1	14	GND
15	LABD2	16	GND

Pin	Signal	Pin	Signal
17	AUX2R	18	GND
19	AUX1R	20	GND
21	AUX2L	22	GND
23	AUX1L	24	GND
25	CH1_SIDECON_HI	26	GND
27	CH1_SIDECON_LO	28	GND
29	CH2_SIDECON_HI	30	GND
31	CH2_SIDECON_LO	32	GND
33	CH3_SIDECON_HI	34	GND
35	CH3_SIDECON_LO	36	GND
37	CH4_SIDECON_HI	38	GND
39	CH4_SIDECON_LO	40	GND
41		42	GND
43		44	GND
45		46	GND
47		48	GND
49	CH5_SIDECON_HI	50	GND
51	CH5_SIDECON_LO	52	GND
53	CH6_SIDECON_HI	54	GND
55	CH6_SIDECON_LO	56	GND
57	CH7_SIDECON_HI	58	GND
59	CH7_SIDECON_LO	60	GND
61	CH8_SIDECON_HI	62	GND
63	CH8_SIDECON_LO	64	GND

## C.1.8 Connector X50

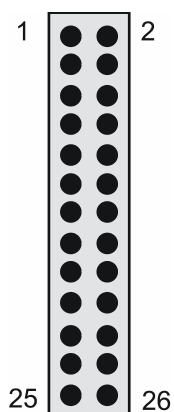


Figure C-10: R&S TS-PSM2 Connector X50 (view: mating side)

Table C-7: R&S TS-PSM2 assignment of x50

Pin	Signal	Pin	Signal
1	RRST/	2	RCS
3	RSCLK	4	RSDI
5	RSDO	6	RSA0
7	RSA1	8	GA0
9	GA1	10	GA2
11	GA3	12	GA4
13	CAN_H	14	CAN_L
15	SYSCON_IO_0	16	SYSCON_IO_1
17	SYSCON_IO_2	18	SYSCON_IO_3
19	SYSCON_IO_4	20	SYSCON_IO_5
21	SYSCON_IO_6	22	SYSCON_IO_7
23	PRO_CLK10	24	PRO_RST_IN
25	+5V	26	GND

## C.2 R&S TS-PRIO

### C.2.1 Connector X20

X20 connector type: CPCI design AB22, socket terminal connector, 110-pin



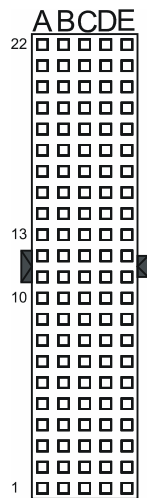


Figure C-11: R&amp;S TS-PRIO Connector X20

Table C-8: R&amp;S TS-PRIO assignment of connector x20

Pin	Z	A	B	C	D	E	F
22	GND						GND
21	GND						GND
20	GND			+5V_PXI_OUT	GND	+5V_PXI_OUT	GND
19	GND	-12V_PXI	GND	+5V_PXI_OUT	AUX2_X20	AUX1_X20	GND
18	GND				CAN_EN_i		GND
17	GND		GND	+5V_PXI_IN	+5V_PXI_IN		GND
16	GND			+5V_PXI_IN	GND		GND
15	GND		GND	+5V_PXI_IN	+5V_PXI_OUT		GND
14	NC						NC
13	NC						NC
12	NP	CH5A_COM_X20		CH1B_COM_X20		CH1A_COM_X20	NP
11	NP	CH5_CTR_L_X20		CH2B_COM_X20		CH1_CTR_L_X20	NP
10	NC	CH6A_COM_X20		CH3B_COM_X20		CH2A_COM_X20	NC
9	NC	CH6_CTR_L_X20		CH4B_COM_X20		CH2_CTR_L_X20	NC
8	NC	CH7A_COM_X20		CH5B_COM_X20		CH3A_COM_X20	NC

Pin	Z	A	B	C	D	E	F
7	NC	CH7_CTR L_X20		CH6B_CO M_X20		CH3_CTR L_X20	NC
6	NC	CH8A_CO M_X20		CH7B_CO M_X20		CH4A_CO M_X20	NC
5	NC	CH8_CTR L_X20		CH8B_CO M_X20		CH4_CTR L_X20	NC
4	NC						NC
3	GND	RSDO	GND		RRST#	RSA0	GND
2	GND	RSCLK		RSA1	RSDI	+12V_PXI	GND
1	GND	RCS#	GND			+5V_PXI_ OUT	GND
Pin	Z	A	B	C	D	E	F

## C.2.2 Rear connector X34

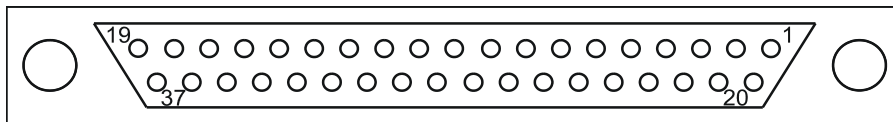


Figure C-12: R&S TS-PRIO Connector X34

Table C-9: R&S TS-PRIO assignment of connector x34

Pin	Signal		Pin	
1	GND		20	R_AUX1
2	R_AUX2		21	R_AUX3
3	R_AUX4		22	CH1B_NO
4	CH1A_NO		23	CH1B_COM
5	CH1A_COM		24	CH2B_NO
6	CH2A_NO		25	CH2B_COM
7	CH2A_COM		26	CH3B_NO
8	CH3A_NO		27	CH3B_COM
9	CH3A_COM		28	CH4B_NO
10	CH4A_NO		29	CH4B_COM
11	CH4A_COM		30	CH5B_NO
12	CH5A_NO		31	CH5B_COM
13	CH5A_COM		32	CH6B_NO
14	CH6A_NO		33	CH6B_COM

Pin	Signal		Pin	
15	CH6A_COM		34	CH7B_NO
16	CH7A_NO		35	CH7B_COM
17	CH7A_COM		36	CH8B_NO
18	CH8A_NO		37	CH8B_COM
19	CH8A_COM			

### C.2.3 Jumper



The jumpers available on the module have been correctly configured ex works for the function described above.

The delivery status is described in the following.	
X401	3-4 5-6
X201	5-6
X202	3-4 5-6
X203	1-2 9-10
X204	1-2 7-8
X205	5-6 7-8
X206	3-4
X207	1-2
X301	1-3 2-4 8-10
X302	1-3 2-4 8-10

X303	1-3 2-4 8-10
X304	1-3 2-4 8-10