

R&S® TS-PICT

ICT Expansion Module

User Manual



1152383712
Version 11

ROHDE & SCHWARZ
Make ideas real



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

- R&S®TS-PICT

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

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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.

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

Ši parinktis ar priedas skirti konkrētam Rohde & Schwarz gaminiui. Su gaminiu pateikiama saugos informācijas keliomis kalbomis. Laikykitės 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. Riadte 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. دستورالعمل های 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-PICT

In combination with the R&S TS-PSAM Measuring Module and the R&S EGTSL software, the R&S ICT Expansion module is used for the realization of in-circuit measurements.

The module's DC supply voltage is provided via the associated R&S TS-PDC Rear I/O Module. This is plugged into the associated rear-I/O slot (same slot number as R&S TS-PICT).

The R&S TS-PICT module is plugged into the front of PXI based R&S TSVP base units. At the rear the R&S TS-PICT module is connected to the PXI control bus and the PXI trigger bus. Analog measuring signals can be accessed using the analog measuring bus on the base unit.

Features of the R&S TS-PICT

- Programmable AC voltage source (AOS) for the frequencies 100 Hz, 1 kHz, 10 kHz
- Programmable DC voltage source (AOS) for the generation of offsets, ± 5 V, 50 mA
- ICT Current Measuring Unit (CMU)
 - Active current measurement, 5 μ A to 250 mA
 - Triggered measurements via PXI trigger bus
 - 2 triggers derived from the measurement signal with programmable threshold
 - 4 filters
 - 16 bit converter (max. signal sampling rate 200 kHz and memory for 8 k sampling points)
- Self-test capability in conjunction with the R&S TS-PSAM module

Features of the R&S TS-PDC

The R&S TS-PDC module is used as a floating DC voltage source for the R&S TS-PICT module. It is configured with two identical DC/DC converters. The following floating direct voltages are obtained from an input voltage of 5 VDC:

- +15 VDC $\pm 5\%$, 0,5 A (2x)
- -15 VDC $\pm 5\%$, 0,5 A (2x)
- +5 VDC $\pm 5\%$, 0,5 A (2x)
- +3,3 VDC $\pm 5\%$, 0,25 A (2x)

4 Module tour

4.1 R&S TS-PICT

The R&S TS-PICT module is designed as a long plug-in module for mounting in the front of PXI based R&S TSVP base units. The front panel is provided with a locating pin to ensure that it is correctly inserted into the base unit. The module is secured in place with the two retaining screws on the front panel.

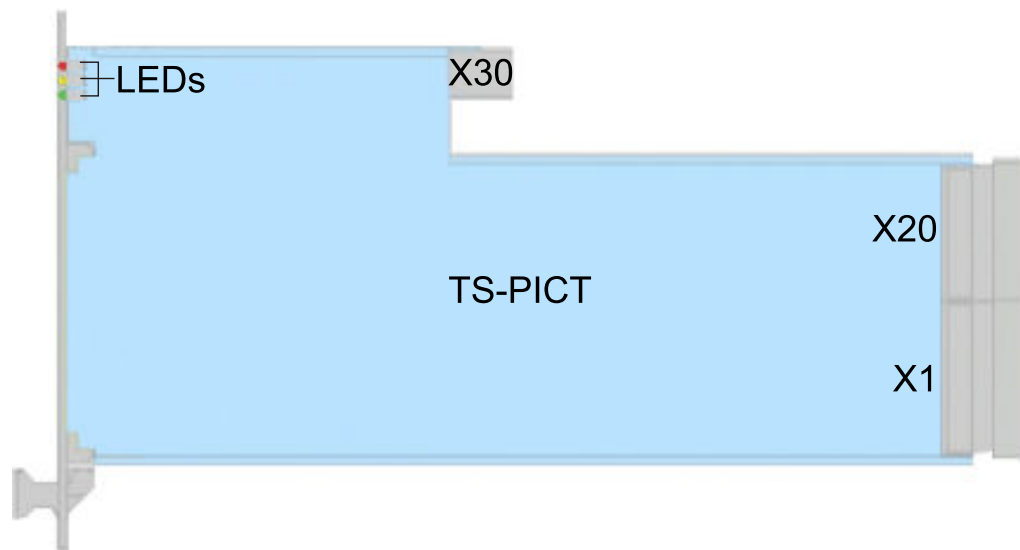


Figure 4-1: Overview of the connectors on the R&S TS-PICT module

LEDs = [Chapter 4.1.1, "Status LEDs"](#), on page 12

X1 = [Chapter 4.1.2, "Connectors X1 and X20"](#), on page 13

X20 = [Chapter 4.1.2, "Connectors X1 and X20"](#), on page 13

X30 = [Chapter 4.1.3, "Connector X30"](#), on page 13

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: PXI bus

Interface to connect the module to the PXI backplane of PXI based R&S TSVP base units.

See [Chapter C.1.1, "Connector X1 \(cPCI bus connector\)"](#), on page 28 and [Chapter C.1.2, "Connector X20 \(extension connector\)"](#), on page 29 for a detailed description of the connectors.

4.1.3 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.1.3, "Connector X30"](#), on page 30 for a detailed description of the connector.

4.2 R&S TS-PDC

The R&S TS-PDC is a rear panel I/O module that you must connect with the R&S TS-PICT in a PXI based base unit.



The module R&S TS-PDC exists in 3 different models:

- Grouted in a black housing - version up to 1.8 (1157.9804.02 obsolete)
- Encapsulated in metal housing with cooling fins - version 1.9 (1157.9804.02 obsolete)
- Without case - version from 2.0 (1157.9804.12 current version)

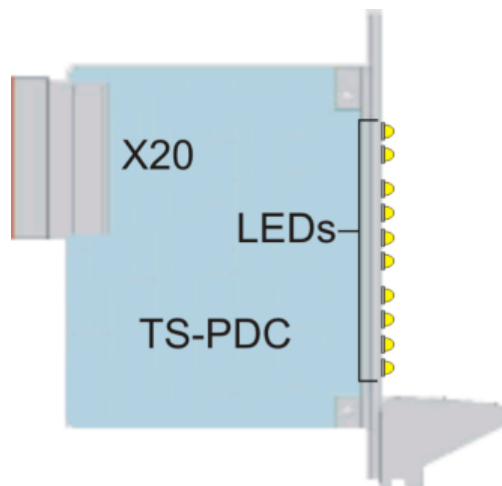


Figure 4-2: Overview of the connector and LEDs on the R&S TS-PDC module

LEDs = [Chapter 4.2.1, "Status LEDs"](#), on page 14

X20 = [Chapter 4.2.2, "Connector X20"](#), on page 15

4.2.1 Status LEDs

The meaning of the status LEDs depend on the module version.

Module version < 2.0 (1157.9804.02)

Eight green LEDs indicate the status of the module. Each LED indicates the presence of an output voltage.

In fault free operation all 8 LEDs must light up simultaneously.

Module version \geq 2.0 (1157.9804.12)

Ten LEDs indicate the status of the module. The LEDs have the following meaning.

- "PWR" (green color)
Indicates that the module is on and running.
- "ERR" (orange color)
Indicates that the module has shut down because of an overload or a temperature that is too high.
- "<xx> V" (eight LEDs in green color)
Indicate the presence of an output voltage.
In fault free operation all 8 voltage LEDs must light up simultaneously.

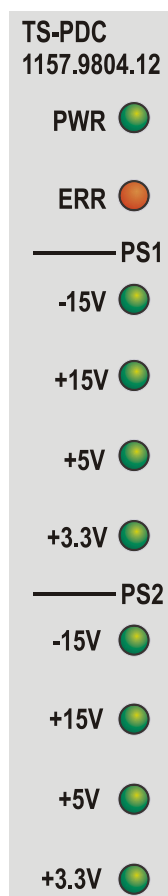


Figure 4-3: LEDs on the R&S TS-PDC module from Version 2.0

4.2.2 Connector X20

Interface to connect the R&S TS-PDC to the backplane in a PXI based base unit.

See [Chapter C.2, "R&S TS-PDC"](#), on page 30 for a detailed description of the connector.

5 Installing the module

The R&S TS-PICT is a module installed on the front panel of PXI based base units. Installation is possible in slots 5 to 15, preferably slot 9. Using slot 9 allows you to install the R&S TS-PSAM module in slot 8 for an in-circuit test configuration. We recommend installing the R&S TS-PSAM and the ICT Expansion Module in adjacent slots.

1. Install the R&S TS-PICT front module as described in the user manuals for the base units.
2. Install the R&S TS-PDC supply module in the matching rear I/O slot as described in the user manuals for the base unit.
3. **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 R&S CompactTSVP and R&S PowerTSVP.

6 Typical applications

In combination with the R&S TS-PSAM module and the R&S EGTSL software, the module is used for the realization of in-circuit measurements. For this purpose there is a programmable AC and DC voltage source (AOS) as well as a special Current Measuring Unit (CMU) for guarded measurements during the ICT (In-Circuit Test). The AC and DC voltage source (AOS) can be operated in two operating modes:

- AC mode
 - In this mode the AOS supplies AC voltages of varying frequency and voltage. If necessary with DC offset.
- DC mode
 - In this mode the AOS is used as a programmable DC voltage source.

The following in-circuit measurements are possible (only in combination with R&S TS-PSAM and the R&S EGTSL software):

- Guarded resistance measurements (3, 4 and 6 wire)
- Guarded impedance measurements (3, 4 and 6 wire)
- Diode test

During the ICT the units under test are connected via the R&S TS-PMB Matrix Modules. The two modules (R&S TS-PICT and R&S TS-PSAM) are synchronized when the signals are measured using the 10 MHz signal on the CPCI backplane and the PXI trigger wires.

Examples of use

On this topic, see also [Figure 6-1](#) and [Figure 6-2](#).

Connection examples for guarded measurements are given in the following section.

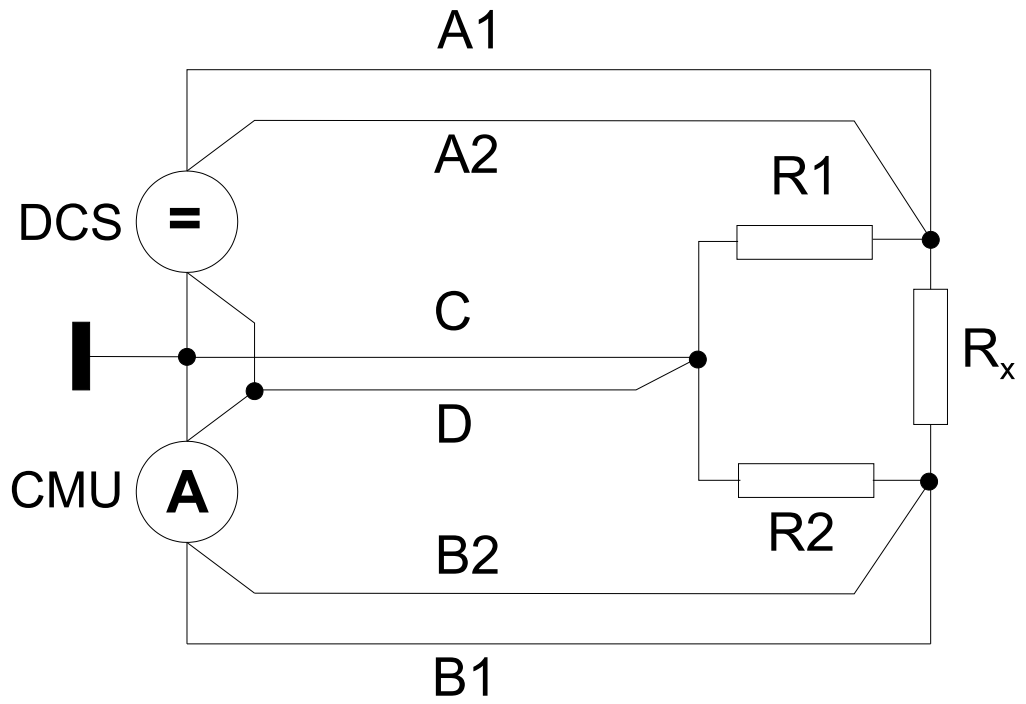


Figure 6-1: Circuit for a guarded resistance measurement (6-wire)

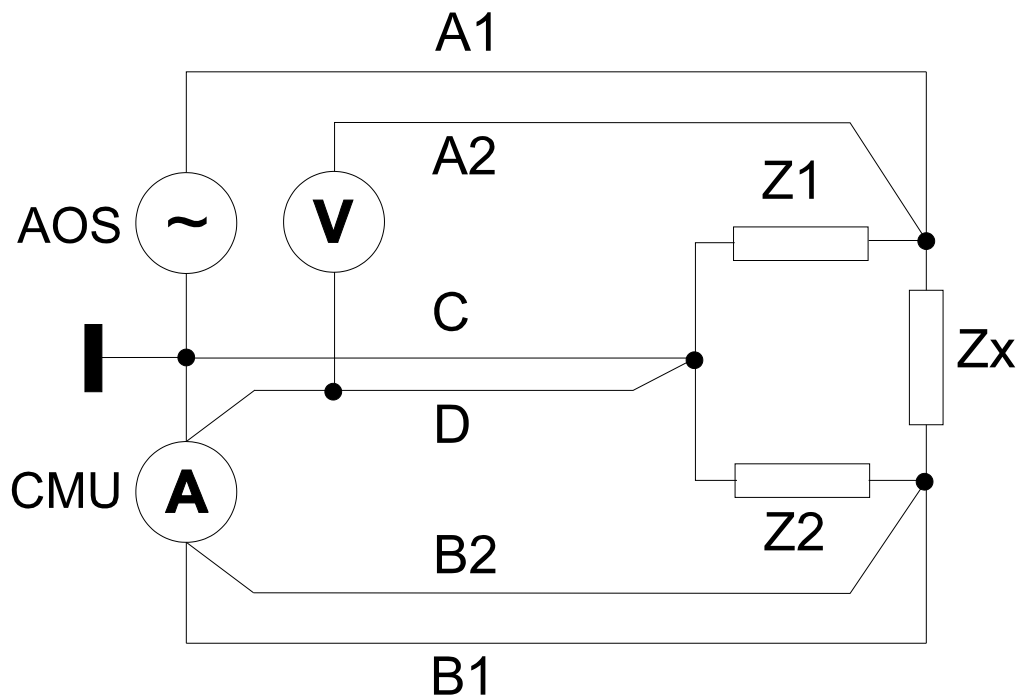


Figure 6-2: Circuit for a guarded impedance measurement (6-wire)

7 Functions

7.1 R&S TS-PICT

All operational tasks of the module R&S TS-PICT will be executed with the R&S EGTSL software. Together with the modul R&S TS-PSAM measurements will be performed as part of an In-Circuit test.

An additional driver for general usage of the module will not be offered.

7.2 R&S TS-PDC

On this topic, see also [Figure 7-1](#)

The rear I/O module R&S TS-PDC is configured as a primary switched DC/DC converter. The input voltage (5 VDC) is transferred to two secondary potentials and rectified to the nominal voltage by line controllers. The status of the output voltage is displayed in each case by an LED.

The following DC voltages are generated:

- +15 VDC, 0,5A (2x)
- -15 VDC, 0,5A (2x)
- +5 VDC, 0,5A (2x)
- +3,3 VDC, 0,25A (2x)

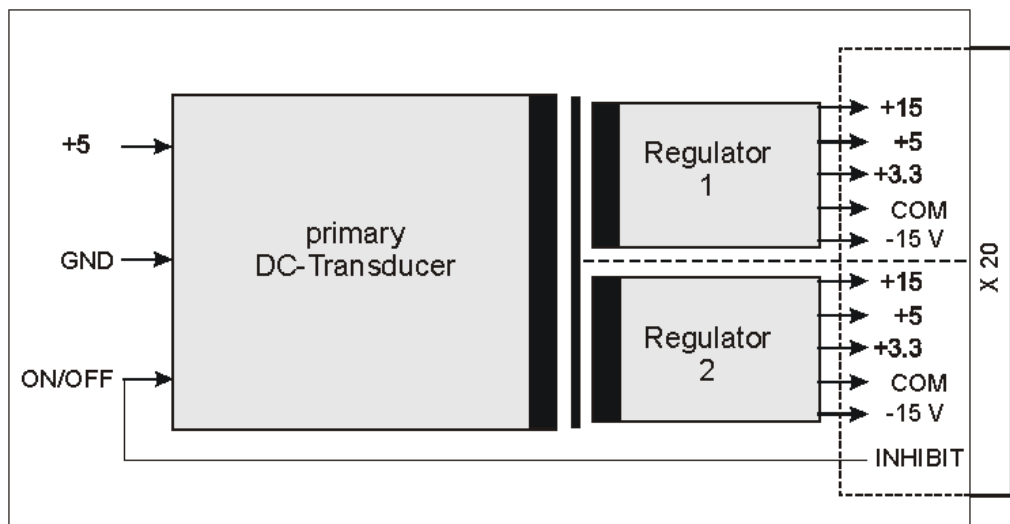


Figure 7-1: Block Diagram of R&S TS-PDC

8 Software

The R&S TS-PICT module is operated using the software R&S EGTSL. An additional driver is not provided.

9 Maintenance, storage and disposal

9.1 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.

9.2 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 9-1: 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.

10 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](#)..... 22
- [Power-on test](#)..... 22
- [R&S TSVP self-test](#)..... 23
- [Contacting customer support](#)..... 23

10.1 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 23.

10.2 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.

10.3 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.

10.4 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, or follow this QR code:



Figure 10-1: QR code to the Rohde & Schwarz support page

Annex

A Specifications

Table A-1: Current Measurement Unit (CMU)

Range	Accuracy ^{1) 2)}
200 mA	0.1 + 160 μ A
100 mA	0.1 + 80 μ A
50 mA	0.1 + 40 μ A
20 mA	0.1 + 16 μ A
10 mA	0.1 + 8 μ A
5 mA	0.1 + 4 μ A
2 mA	0.1 + 1.6 μ A
1 mA	0.1 + 800 nA
500 μ A	0.1 + 400 nA
200 μ A	0.1 + 160 nA
100 μ A	0.1 + 80 nA
50 μ A	0.1 + 40 nA
20 μ A	0.1 + 16 nA
10 μ A	0.1 + 8 nA
5 μ A	0.1 + 4 nA
2 μ A	0.1 + 1.6 nA
1 μ A	0.1 + 0.8 nA
1) \pm (% of reading + absolute value), 100 Hz filter, 1 year, +23 °C \pm 5 °C	
2) Temperature drift: Offset (0.005 % of range) / °C, Gain 0.02 % / °C	

Table A-2: AC Offset Source Unit (AOS)

AC mode		
Range		Accuracy ¹⁾
0.1 Vrms	\pm (% of range), 100 Hz to 10 kHz	2
0.2 Vrms	\pm (% of range), 100 Hz to 10 kHz	2
1.0 Vrms	\pm (% of range), 100 Hz to 10 kHz	2
DC mode		

AC mode		
Range		Accuracy ¹⁾
±5 V, resolution 2.5 mV	± (% of setting + absolute value), output current ≤ 50 mA	0.2 + 20 mV
1) 1 year, +23 °C ±5 °C		

Table A-3: General data

Power consumption		+5 V / 4 A, +3.3 V / 0.2 A, max. 25 W incl. R&S TS-PDC
Environmental conditions		see product brochure of base unit
Mechanical resistance		see product brochure of base unit
Product conformity		see product brochure of base unit
Dimensions	W x H x D	316 mm × 174 mm × 20 mm (12.44 in × 6.85 in × 0.79 in)
Weight	incl. R&S®TS-PDC (140 g / 0.3 lb)	0.6 kg (1.3 lb)
Recommended calibration interval		12 months

For an overview of specifications for ICT measurements, refer to the corresponding product brochure "R&S TS-ICT In-Circuit Test Option For R&S TSVP".

B Block diagrams

In the following section, both the function block diagram for the R&S TS-PICT module and the detailed block diagram are shown.

Figure B-1 shows the function block diagram for the R&S TS-PICT module.

Figure B-2 shows a detailed block diagram for the R&S TS-PICT module.

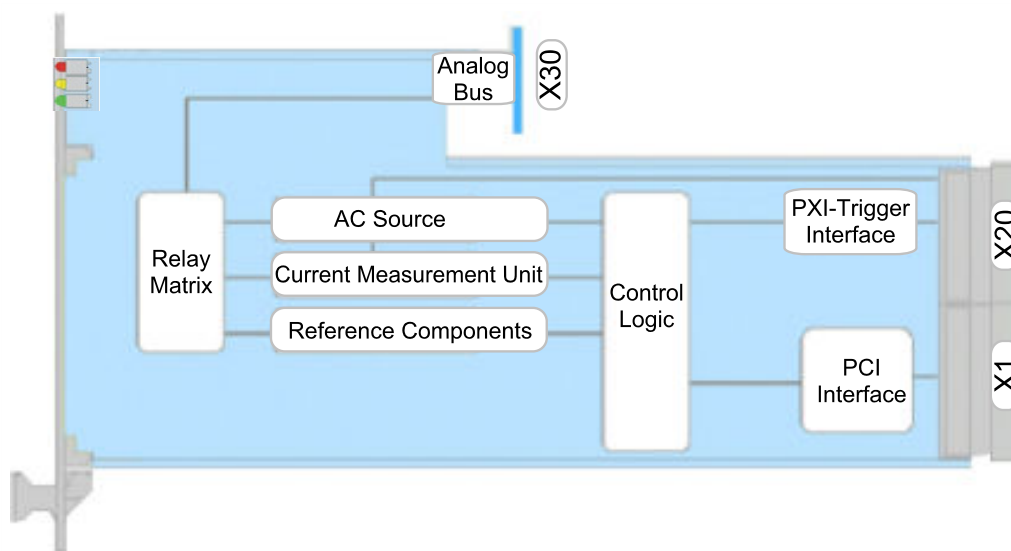


Figure B-1: Function block diagram for the R&S TS-PICT module

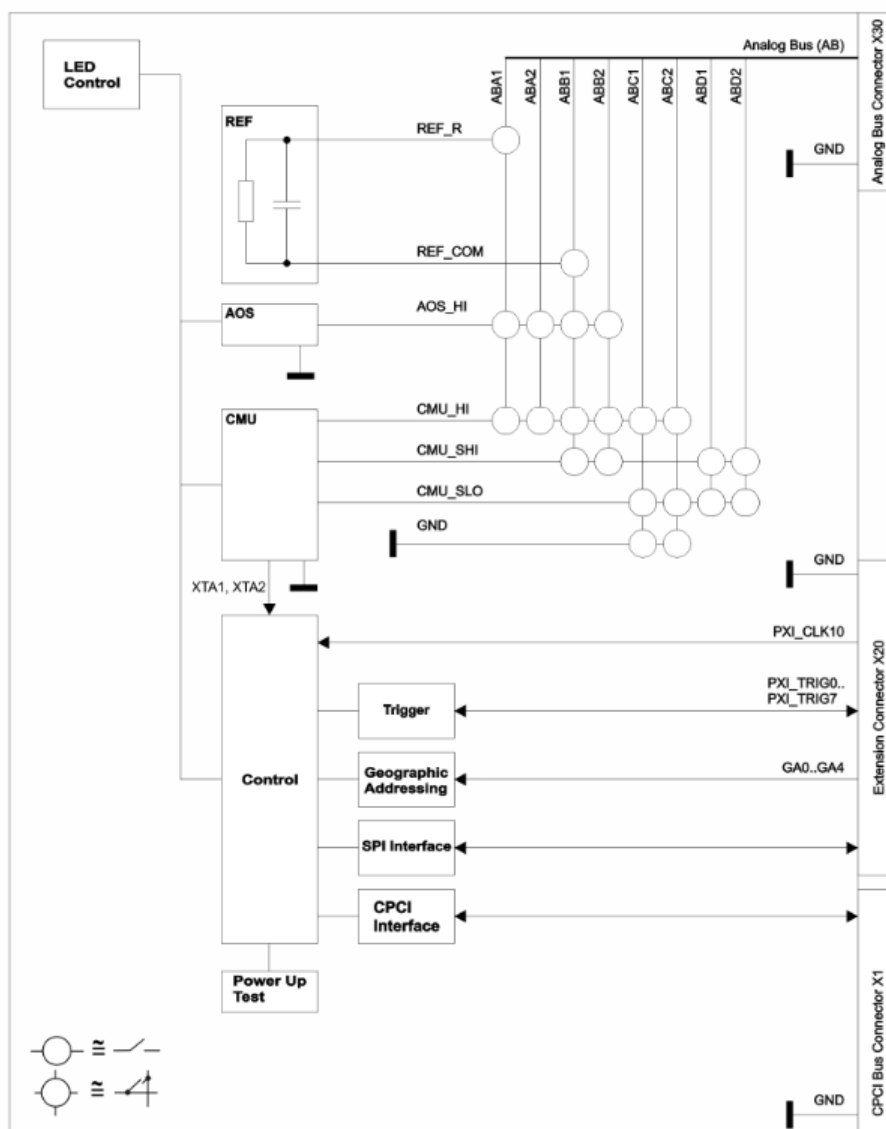


Figure B-2: Detailed block diagram for the R&S TS-PICT module

C Interface description

C.1 Interface description for R&S TS-PICT

C.1.1 Connector X1 (cPCI bus connector)

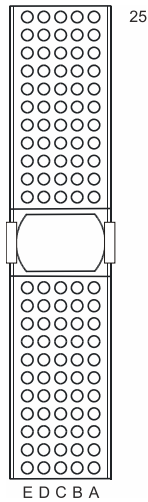


Figure C-1: Connector X1 (mating side)

Pin	F	E	D	C	B	A		
25	GND	5V	3.3V	ENUM#	REQ64#	5V	X1	
24	GND	ACK64#	AD[0]	V(I/O)	5V	AD[1]		
23	GND	AD[2]	5V	AD[3]	AD[4]	3.3V		
22	GND	AD[5]	AD[6]	3.3V	GND	AD[7]		
21	GND	C/BE[0]#	M66EN	AD[8]	AD[9]	3.3V		
20	GND	AD[10]	AD[11]	V(I/O)	GND	AD[12]		
19	GND	AD[13]	GND	AD[14]	AD[15]	3.3V		
18	GND	C/BE[1]#	PAR	3.3V	GND	SERR#		
17	GND	PERR#	GND	IPMB_SDA	IPMB_SCL	3.3V		
16	GND	LOCK#	STOP#	V(I/O)	GND	DEVSEL#		
15	GND	TRDY#	BD_SEL#	IRDY#	FRAME#	3.3V		
12..14	Key Area							C O N N E C T O R
11	GND	C/BE[2]#	GND	AD[16]	AD[17]	AD[18]		
10	GND	AD[19]	AD[20]	3.3V	GND	AD[21]		
9	GND	AD[22]	GND	AD[23]	IDSEL	C/BE[3]#		
8	GND	AD[24]	AD[25]	V(I/O)	GND	AD[26]		
7	GND	AD[27]	GND	AD[28]	AD[29]	AD[30]		
6	GND	AD[31]	CLK	3.3V	GND	REQ#		
5	GND	GNT#	GND	RST#	BSRSV	BSRSV		
4	GND	INTS	INTP	V(I/O)	HEALTHY#	IPMB_PWR		
3	GND	INTD#	5V	INTC#	INTB#	INTA#		
2	GND	TDI	TDO	TMS	5V	TCK		
1	GND	5V	+12V	TRST#	-12V	5V		

Figure C-2: Pin assignment for connector X1

C.1.3 Connector X30

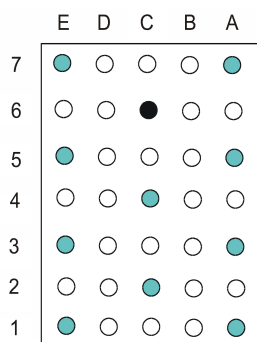


Figure C-5: Connector X30 (mating side)

Table C-1: 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.2 R&S TS-PDC

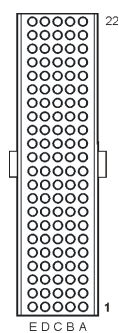


Figure C-6: Connector X20 (R&S TS-PDC mating side)

Pin	Z	A	B	C	D	E	
22	GND						J20
21	GND		GND or NC *3)				
20	GND			+5V *1)	GND	+5V *1)	
19	GND		GND	+5V *1)			
18	GND				GND or NC *4)		
17	GND		GND	+5V *2)	+5V *2)		
16	GND			+5V *2)	GND		
15	GND		GND	+5V *2)	+5V *1)		
14	NC						
13	NC						
12	NP	+15V_1	-15V_1	+5V_1	+3.3V_1	COM_1	
11	NP						
10	NC	+15V_2	-15V_2	+5V_2	+3.3V_2	COM_2	
9	NC						
8	NC	COM_1	COM_1	COM_1	COM_1	COM_1	
7	NC						
6	NC	COM_2	COM_2	COM_2	COM_2	COM_2	
5	NC						
4	NC						
3	GND		GND		RRST#		
2	GND	RSCLK			RSDI		
1	GND	RCS#	GND			+5V *1)	
Pin	Z	A	B	C	D	E	C O N N E C T O R

- *1) TS-PDC Version 1.0 is supplied via these pins from +5V, for backplanes up to Version 3.x
- *2) TS-PDC Version 1.1 or higher is supplied via these pins or pins from *1)
- *3) TS-PDC Version 1.3 or higher: This pin is not connected
- *4) TS-PDC Version 1.4 or higher: This pin is not connected

Figure C-7: Pin assignment for connector X20 (R&S TS-PDC)