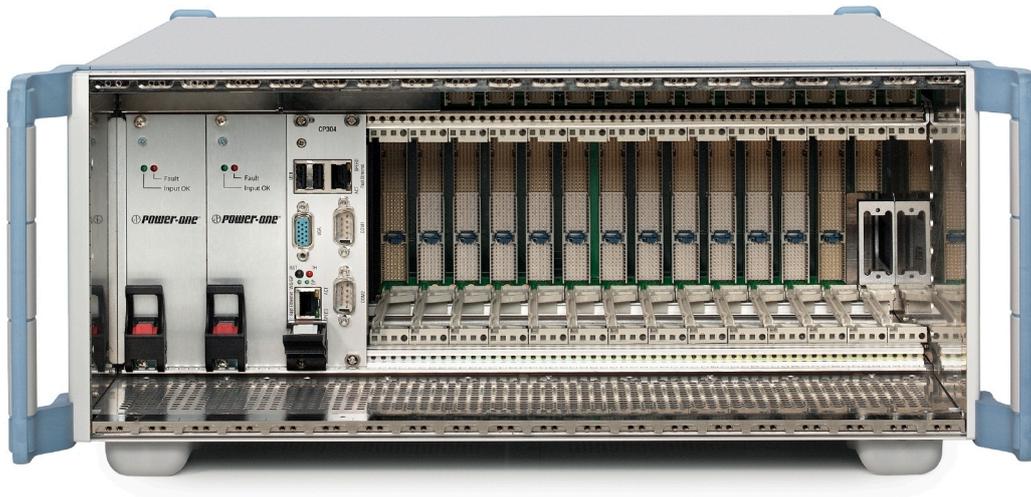


R&S®TSVP

Test System Versatile Platform

System Manual



1178322802
Version 07

ROHDE & SCHWARZ
Make ideas real



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

- R&S®CompactTSVP (1152.2518.02)
- R&S®PowerTSVP (1157.8043.02)
- R&S®ExpressTSVP (1158.1542K02)

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1178.3228.02 | Version 07 | R&S®TSVP

Throughout this manual, products from Rohde & Schwarz are indicated without the ® symbol , e.g. R&S®TSVP is indicated as R&S TSVP. R&S®TSVP refers to both the R&S CompactTSVP and the R&S PowerTSVP test system platforms.

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1 Safety and regulatory information

The product documentation helps you use the product safely and efficiently. Follow the instructions provided here and in the following chapters.

Intended use

The product is intended for development, production and verification of electronic components and devices in industrial, administrative, and laboratory environments. Use the product only for its designated purpose.

Observe the operating conditions and performance limits stated in the data sheet.

Target audience

This manual describes the tasks required to set up, operate or maintain an R&S TSVP. It is written for electrically skilled persons who have training or experience in the use of electronic equipment. Skilled persons are expected to use their training and experience to recognize energy sources capable of causing pain or injury and to protect themselves from injury from those sources.

Where do I find safety information?

Safety information is part of the product documentation. It warns you of potential dangers and gives instructions on how to prevent personal injury or damage caused by dangerous situations. Safety information is provided as follows:

- In [Chapter 1.1, "Safety instructions"](#), on page 5. The same information is provided in many languages as printed "Safety Instructions". The printed "Safety Instructions" are delivered with the product.
- Throughout the documentation, safety instructions are provided when you need to take care during setup or operation.

1.1 Safety instructions

Products from the Rohde & Schwarz group of companies are manufactured according to the highest technical standards. To use the products safely, follow the instructions provided here and in the product documentation. Keep the product documentation nearby and offer it to other users.

Use the product only for its intended use and within its performance limits. Intended use and limits are described in the product documentation such as the data sheet, manuals and the printed "Safety Instructions". If you are unsure about the appropriate use, contact Rohde & Schwarz customer service.

Using the product requires specialists or specially trained personnel. These users also need sound knowledge of at least one of the languages in which the user interfaces and the product documentation are available.

Reconfigure or adjust the product only as described in the product documentation or the data sheet. Any other modifications can affect safety and are not permitted.

Never open the casing of the product. Only service personnel authorized by Rohde & Schwarz are allowed to repair the product. If any part of the product is damaged or broken, stop using the product. Contact Rohde & Schwarz customer service at <https://www.rohde-schwarz.com/support>.

Lifting and carrying the product

The product is heavy. Do not move or carry the product by yourself. A single person can only carry a maximum of 18 kg safely depending on age, gender and physical condition. Look up the maximum weight in the data sheet. Use the product handles to move or carry the product. Do not lift by the accessories mounted on the product. Accessories are not designed to carry the weight of the product.

To move the product safely, you can use lifting or transporting equipment such as lift trucks and forklifts. Follow the instructions provided by the equipment manufacturer.

Choosing the operating site

Only use the product indoors. The product casing is not waterproof. Water that enters can electrically connect the casing with live parts, which can lead to electric shock, serious personal injury or death if you touch the casing. If Rohde & Schwarz provides accessories designed for your product, e.g. a carrying bag, you can use the product outdoors.

Unless otherwise specified, you can operate the product up to an altitude of 2000 m above sea level. The product is suitable for pollution degree 2 environments where nonconductive contamination can occur. For more information on environmental conditions such as ambient temperature and humidity, see the data sheet.

Setting up the product

Always place the product on a stable, flat and level surface with the bottom of the product facing down. If the product is designed for different positions, secure the product so that it cannot fall over.

If the product has foldable feet, always fold the feet completely in or out to ensure stability. The feet can collapse if they are not folded out completely or if the product is moved without lifting it. The foldable feet are designed to carry the weight of the product, but not an extra load.

If stacking is possible, keep in mind that a stack of products can fall over and cause injury.

If you mount products in a rack, ensure that the rack has sufficient load capacity and stability. Observe the specifications of the rack manufacturer. Always install the products from the bottom shelf to the top shelf so that the rack stands securely. Secure the product so that it cannot fall off the rack.

Connecting to power

The product is an overvoltage category II product. Connect the product to a fixed installation used to supply energy-consuming equipment such as household appliances and similar loads. Keep in mind that electrically powered products have risks, such

as electric shock, fire, personal injury or even death. Replace parts that are relevant to safety only by original parts, e.g. power cables or fuses.

Take the following measures for your safety:

- Before switching on the product, ensure that the voltage and frequency indicated on the product match the available power source. If the power adapter does not adjust automatically, set the correct value and check the rating of the fuse.
- If a product has an exchangeable fuse, its type and characteristics are indicated next to the fuse holder. Before changing the fuse, switch off the product and disconnect it from the power source. How to change the fuse is described in the product documentation.
- Only use the power cable delivered with the product. It complies with country-specific safety requirements. Only insert the plug into an outlet with protective conductor terminal.
- Only use intact cables and route them carefully so that they cannot be damaged. Check the power cables regularly to ensure that they are undamaged. Also ensure that nobody can trip over loose cables.
- If you connect the product to an external power supply, use the one delivered with the product or recommended in the product documentation. The external power supply must conform to the country-specific regulations.
- Only connect the product to a power source with a fuse protection of maximum 20 A.
- Ensure that you can disconnect the product from the power source at any time. Pull the power plug to disconnect the product. The power plug must be easily accessible. If the product is integrated into a system that does not meet these requirements, provide an easily accessible circuit breaker at the system level.

Working with hazardous voltages

Voltages higher than 30 V RMS, or 42 V peak, or 60 V DC are regarded as hazardous contact voltages. Direct contact with them can cause serious injuries.

Make sure that only electrically skilled persons use the products for measurements on hazardous contact voltages. These working conditions require special education and experience to perceive risks and to avoid hazards which electricity can create.

When working with hazardous contact voltages, use protective measures to preclude direct contact with the measurement setup:

- Do not touch exposed connections and components when power is applied.
- Switch off the test circuit while connecting and disconnecting probe leads.
- Use only insulated voltage probes, test leads and adapters.
- Do not use 4 mm banana plugs without protection against contact.

Cleaning the product

Use a dry, lint-free cloth to clean the product. When cleaning, keep in mind that the casing is not waterproof. Do not use liquid cleaning agents.

Meaning of safety labels

Safety labels on the product warn against potential hazards.

	<p>Potential hazard</p> <p>Read the product documentation to avoid personal injury or product damage.</p>
	<p>Heavy product</p> <p>Be careful when lifting, moving or carrying the product. Carrying the product requires a sufficient number of persons or transport equipment.</p>
	<p>Electrical hazard</p> <p>Indicates live parts. Risk of electric shock, fire, personal injury or even death.</p>
	<p>Hot surface</p> <p>Do not touch. Risk of skin burns. Risk of fire.</p>
	<p>Protective conductor terminal</p> <p>Connect this terminal to a grounded external conductor or to protective ground. This connection protects you against electric shock if an electric problem occurs.</p>

1.2 Labels on the product

Labels on the casing inform about:

- Personal safety, see "[Meaning of safety labels](#)" on page 8
- Product and environment safety, see [Table 1-1](#)
- Device information is provided on a sticker attached to the rear panel of the instrument. The sticker contains a barcode and the device ID. The device ID is a combination of the order number, the serial number and a checksum.

Table 1-1: Labels regarding product and environment safety

	<p>Labeling in line with EN 50419 for disposal of electrical and electronic equipment after the product has come to the end of its service life.</p>
	<p>Take care when handling electrostatic sensitive devices.</p>

1.3 Warning messages in the documentation

A warning message points out a risk or danger that you need to be aware of. The signal word indicates the severity of the safety hazard and how likely it will occur if you do not follow the safety precautions.

WARNING

Potentially hazardous situation. Could result in death or serious injury if not avoided.

NOTICE

Potential risks of damage. Could result in damage to the supported product or to other property.

1.4 Where to find key documents on Rohde & Schwarz

Certificates issued to Rohde & Schwarz that are relevant for your country are provided at www.rohde-schwarz.com/key-documents, e.g. concerning:

- Quality management
- Environmental management
- Information security management
- Accreditations

1.5 Korea certification class A



이 기기는 업무용(A급) 전자파 적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.

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/>

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 PXI based base units and the 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 Getting Started

3.1 Product overview

3.1.1 Production test platforms

The Test System Versatile Platform R&S TSVP is a standardized modular platform for program-controlled testing of modules and terminals in a factory or laboratory. With its flexible configuration and the use of worldwide standards, it can be perfectly adapted to suit your needs. You can create larger ATE (Automatic Test Equipment) systems by combining an R&S CompactTSVP or R&S ExpressTSVP and an R&S PowerTSVP.



3.1.1.1 R&S ExpressTSVP

The R&S ExpressTSVP concept represents true innovation in state-of-the-art PC-based instrumentation while offering traditional capabilities found in high-performance ATE systems. The versatile platform accelerates the adoption of CompactPCI and PXI in all major fields of industrial test-and-measurement applications.

With its large number of cPCI/cPCIs/PXI/PXIe slots and the tight integration of ATE functionality provided by TSVP instrumentation and switching modules, the R&S ExpressTSVP is the ideal platform for highly productive system engineering.

Compact modules are used to configure complex ATE functionality which can be interfaced to DUTs by the standardized mass interconnect interface concept that provides multiple application flexibility and easy handling on the factory floor.

Unique data-acquisition and stimulation modules provide floating potential measurements and DUT stimulation.

Key features

- 21-slot Multi-Standard chassis
- 1 cPCI Serial system slot (rear, PCIe Gen2, x8 links)

- 1 cPCI Serial slot (rear, PCIe Gen2, x8 links)
- 5 PXI Express slots (PCIe Gen2, x4 links)
- 13 R&S PXI/cPCI/CAN slots with Rear I/O
- 1 R&S CAN slot with Rear I/O
- Compact 19" design
- Compatible to R&S CompactTSVP chassis and R&S TSVP modules

3.1.1.2 R&S CompactTSVP

The R&S CompactTSVP production test platform is intended for use with a control processor, which performs the test on the unit under test (UUT) using peripheral modules. This control processor is referred to as the system controller and is usually installed in the R&S CompactTSVP. However, you can also use a standard PC connected to the R&S CompactTSVP by a suitable interface. The system controller executes custom sequences that define the test procedures and specification limits.

The functionality of the R&S CompactTSVP depends essentially on the installed plug-in modules and the related software. The R&S CompactTSVP is suitable for all types of production tests.

The modules plugged into the R&S CompactTSVP can be used to create test and control signals for the UUT, and to measure and evaluate the response from the UUT. Thus, they are able to pass signals between each other, to select signals under program control, and pass them to external measuring systems.

The peripheral modules can be quickly and flexibly adapted to the test devices using an adapter frame mounted to the R&S CompactTSVP. The adapter frame connects the signals securely and with a low rate of wear.

If the production test requires switching functions with many channels or switching high currents, then the R&S CompactTSVP can be supplemented by a R&S PowerTSVP. The R&S PowerTSVP is controlled via the CAN bus of the R&S CompactTSVP by the system controller.

System characteristics

The use of standard industrial PCs as system controllers makes it possible to run a wide range of software packages, including:

- **Operating system:** Microsoft Windows
- **Test software:** LabWindows/CVI™, Visual Studio®, TestStand™
- **Card drivers:** Drivers based on VISA/IVI

Key features

- Modular instrument chassis for CompactPCI and PXI modules
- CompactPCI backplane conforming to PICMG 2.0 Rev. 3.0 specification
- Rear I/O support for easy system cabling (IEEE 1101.11-1998)
- Sophisticated analog measurement bus subsystem
- Support of PXI trigger concept

- 14 peripheral slots for versatile instrumentation
- Mass interconnect interface in different sizes (optional)
- High pin count switching expansion by cascading an R&S PowerTSVP chassis

3.1.1.3 R&S PowerTSVP

The R&S PowerTSVP is primarily intended as a flexible switching unit for measurement signals, signal sources and UUT loads. Thus, you can easily migrate existing and proprietary "rack and stack" systems to a production test platform.

By combining R&S CompactTSVP and R&S PowerTSVP, you can create larger ATE (Automatic Test Equipment) systems with many test pins. All modules in the R&S PowerTSVP are controlled by a serial bus system (CAN bus). If the R&S PowerTSVP is connected to a R&S CompactTSVP, the modules are controlled by the system controller of the R&S CompactTSVP. Otherwise, the R&S PowerTSVP is connected to an external PC with a CAN bus controller installed.

The R&S PowerTSVP can be fitted with special Rohde & Schwarz switching and load modules. The unit provides an analog bus that can be used to make complex connections.

Key features

- Modular switching instrument chassis
- Chassis extension for R&S CompactTSVP
- Standard 19" rackmount 4 HU enclosure
- 16 peripheral slots for switching instrumentation and dedicated further instrumentation
- Rear I/O support for easy system cabling (IEEE 1101.11-1998)
- Sophisticated analog measurement bus subsystem
- Support of system-wide trigger concept
- Easily expandable ATE instrumentation and switching
- High pin count switching applications, e.g. for in-circuit test (ICT)
- High-power switching

3.1.2 Software components

The R&S TSVP is controlled entirely by the additionally installed software.

For details on the software and its operation, see the specific user manuals provided with the installation. For information on installing the software, see [Chapter 3.4, "R&S GTSL download from GLORIS"](#), on page 34.

R&S GTSL

The Generic Test Software Library R&S GTSL is a collection of libraries for specific test tasks like measurements, switching and signal generation. An ASCII file contains the relevant configuration data which can be assigned to certain test sequences. So mea-

surement parameters can be changed and adjusted easily and quickly with a standard editor.

You can use any test sequencer software to control the test sequence. This software combines the individual test sequences to form an executable test program. It also adds all other functions important to the production operation, such as user administration, execution of multiple test sequences in multi-threading or parallel operation, collection and storage of relevant measurement results and report generation.

R&S EGTSL

The Enhanced Generic Test Software Library R&S EGTSL is part of an extension to the Generic Test Software Library R&S GTSL. Using R&S EGTSL, you can prepare and perform in-circuit tests.

R&S IC-Check

Using Generic Test Software Library R&S IC-Check you can prepare and perform tests on pins of ICs or other mounted electronic circuit devices.

3.1.3 Plug-in test modules

The functionality of the R&S TSVP depends essentially on the installed plug-in modules and the related software. The R&S TSVP is suitable for all types of production tests.

The modules plugged into the R&S TSVP frames can be used to create test and control signals for the UUT, and to measure and evaluate the response from the UUT. Thus, they are able to pass signals between each other, to select signals under program control, and pass them to external measuring systems.

For details on the individual module types, see the module documentation (product brochures and manuals).

3.1.4 In-system calibration

The R&S TSVP in-system calibration R&S TS-ISC enables the modules of the R&S TSVP production testing platforms to be calibrated in the system and readjusted if required. This means that it is no longer necessary to remove the modules.

For details on the in-system calibration tool, see the R&S TS-ISC user manual.

3.2 Preparing for use

Here, you can find basic information about setting up the product for the first time.

3.2.1 Lifting and carrying

You can carry the R&S TSVP by its handles on the side. Do not apply excessive external force to the handles.

See "[Lifting and carrying the product](#)" on page 6.

3.2.2 Unpacking and checking

1. Unpack the product carefully.
2. Retain the original packing material. Use it when transporting or shipping the product later.
3. Using the delivery notes, check the equipment for completeness.
4. Check the equipment for damage.

If the delivery is incomplete or equipment is damaged, contact Rohde & Schwarz.

3.2.3 Choosing the operating site

Specific operating conditions ensure proper operation and avoid damage to the product and connected devices. For information on environmental conditions such as ambient temperature and humidity, see the data sheet.

For safety information, see "[Choosing the operating site](#)" on page 6.

Electromagnetic compatibility classes

The electromagnetic compatibility (EMC) class indicates where you can operate the product. The EMC class of the product is given in the data sheet.

- Class B equipment is suitable for use in:
 - Residential environments
 - Environments that are directly connected to a low-voltage supply network that supplies residential buildings
- Class A equipment is intended for use in industrial environments. It can cause radio disturbances in residential environments due to possible conducted and radiated disturbances. It is therefore not suitable for class B environments. If class A equipment causes radio disturbances, take appropriate measures to eliminate them.

3.2.4 Setting up the product

See also:

- "[Setting up the product](#)" on page 6
- "[Intended use](#)" on page 5

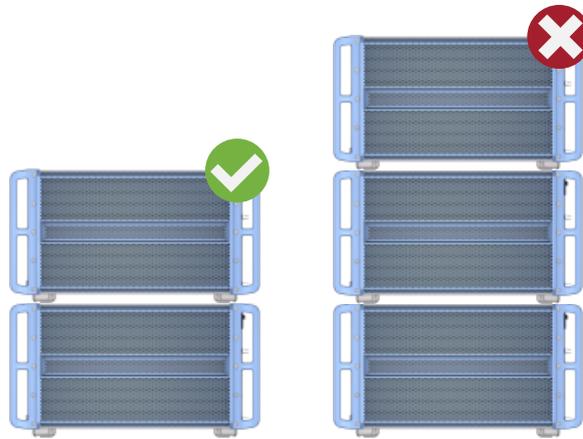
3.2.4.1 Placing the product on a bench top

To place the product on a bench top

1. Place the product on a stable, flat and level surface. Ensure that the surface can support the weight of the product. For information on the weight, see the data sheet.
2. **WARNING!** A stack of products can fall over and cause injury. Never stack more than two products. Otherwise, mount them in a rack.

Stack as follows:

- All products must have the same dimensions (width and length).
- Do not exceed a total load of 50 kg placed on the product at the bottom of the stack.



Left = Stacked correctly

Right = Stacked incorrectly, too many products

3. **NOTICE!** Overheating can damage the product.
To prevent overheating, leave a space of at least 22 mm (half a height unit or the height of the chassis feet) above and below each chassis.

Operating positions

The R&S TSVP can be set up in the following positions:

- Horizontally, with the bottom of the device facing down.
- Upright.

If the instrument is mounted securely in an appropriate rack, it can also be operated in a tilted position.

3.2.4.2 Mounting the product in a rack

To prepare the rack

1. Observe the requirements and instructions in "[Setting up the product](#)" on page 6.
2. **NOTICE!** Insufficient airflow can cause overheating and damage the product. Design and implement an efficient ventilation concept for the rack.

Ensure a minimum clearance of 22 mm (half a height unit) above and below the R&S TSVP for ventilation.

The process of mounting the R&S TSVP in a rack depends on the model.

- The R&S ExpressTSVP requires no additional accessory.
- The R&S CompactTSVP and R&S PowerTSVP require an additional rack adapter kit.

Mounting the product in a rack (R&S ExpressTSVP)

Mounting an R&S ExpressTSVP is designed to fit in a 19-inch rack and requires no additional equipment. You only have to unscrew the feet.

1. Unscrew the 4 feet from the bottom of the instrument casing.
2. Attach the self-adhesive plastic slide rails (see [Figure 3-2 \[5\]](#)). The slide rails are part of the delivery.
3. **WARNING!** The product is heavy. Use lifting equipment, see also "[Lifting and carrying the product](#)" on page 6. Lift the product to shelf height.
4. Place the unit in the rack on the prepared aluminum rails. Push it onto the shelf until the rack brackets fit closely to the rack.
5. Fix the R&S TSVP by screwing the 19-inch side brackets to the rack.
6. Tighten all screws on the rack brackets with a tightening torque of 1.2 Nm to secure the product in the rack.

Mounting the product in a rack (R&S CompactTSVP and R&S PowerTSVP)

The R&S CompactTSVP and R&S PowerTSVP require an additional rack mounting kit. Refer to the datasheet for ordering details.

1. Attach the adapter kit to the R&S TSVP. The handles remain on the casing when it is mounted in the rack.

- a) Unscrew the 4 feet from the bottom of the instrument casing [1].

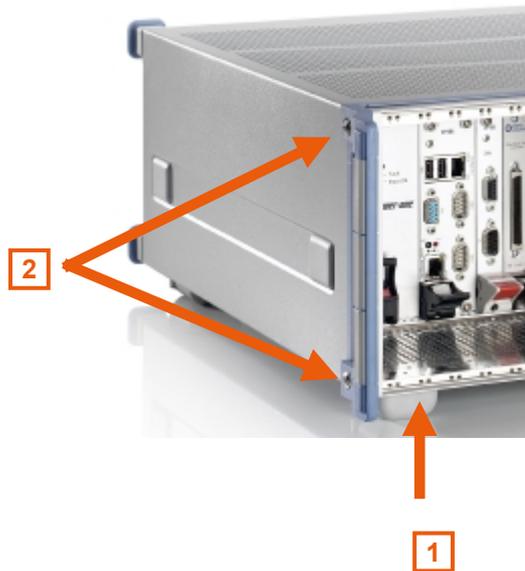


Figure 3-1: Prepare the instrument for adapter kit installation

- b) Unscrew the side handles of the instrument, without removing the handles [2].
 c) Place the 19-inch brackets contained in the rack adapter kit over the side handles of the instrument.
 d) Replace the old handle screws with the longer screws from the rack adapter kit [3].

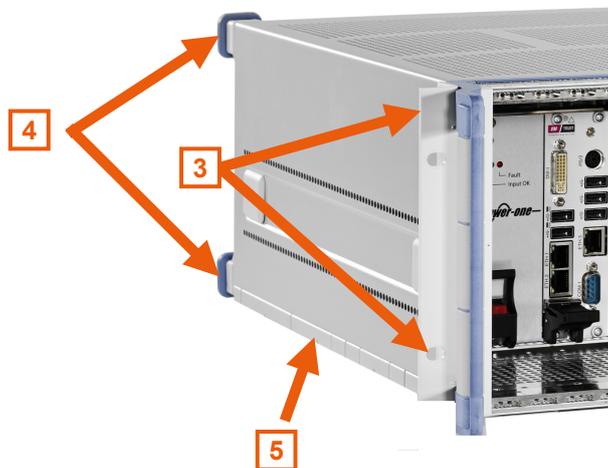


Figure 3-2: Install adapter kit

- e) Screw on the brackets and the handles.
 f) Remove the 4 rubber tips from the feet at the rear of the instrument [4].
 Do not unscrew the 4 feet on the rear panel to avoid loosening the body of the casing.
 g) Attach the self-adhesive plastic slide rails [5].
 The slide rails are part of the rack mount kit.

Note: Check the position of the locknuts in the rack before sliding in the R&S TSVP.

2. **WARNING!** The product is heavy. Use lifting equipment, see also "[Lifting and carrying the product](#)" on page 6.
Lift the product to shelf height.
3. Place the unit in the rack on the prepared aluminum rails. Push it onto the shelf until the rack brackets fit closely to the rack.
4. Fix the R&S TSVP by screwing the 19-inch side brackets to the rack.
5. Tighten all screws on the rack brackets with a tightening torque of 1.2 Nm to secure the product in the rack.

To unmount the product from a rack

1. Loosen the screws at the rack brackets.
2. **WARNING!** The product is heavy. Use lifting equipment, see also "[Lifting and carrying the product](#)" on page 6.
Bring the lifting equipment to shelf height.
3. Remove the product from the rack.
4. R&S CompactTSVP and R&S PowerTSVP only:
Unmount the adapter kit. Follow the steps described in [step 1](#) in reverse order.
5. Screw the four feet to the bottom of the casing to ensure the minimum distance for ventilation.

3.2.5 Designing the plug-in module configuration

The R&S TSVP allows for a highly versatile module configuration. Before you install the modules, design a module installation concept, because there are some dependencies between components that you have to consider before configuring the test platform.

For more information about the slot configuration, see [Chapter 5, "Production test platforms"](#), on page 40.

3.2.6 Installing and uninstalling plug-in modules

Installing modules

1. Switch off the R&S TSVP.
2. **WARNING!** Risk of electric shock. UUT or additional power supplies connected to a module can apply hazardous active voltages to the module. If you touch a module with hazardous voltages applied, you risk an electric shock. Never install or

uninstall modules while the instrument is connected to an external power supply or a UUT providing high voltages.

Disconnect the R&S TSVP from the power supply.

3. Unscrew the cover of the slot that you want to use for the module.
4. **NOTICE!** Risk of instrument damage. Insert the module carefully to avoid damage to the connecting pins on the backplane. When mounting short and long modules into adjacent slots, the front panel of the short module can cause short circuits on the long module. Ensure adequate clearance between the modules and insert the plastic insulation plate (1152.3443.00) that is part of the delivery between the modules.



Figure 3-3: Install insulation plate (1152.3443.00)

Push in the module using moderate pressure until you feel it snap into place.

5. Secure the module by tightening the screws at the top and bottom of the module.



Installing rear I/O modules

Install rear I/O modules the same way as modules on the front. Make sure to use the matching rear panel slot when you install such modules.

Uninstalling modules

1. Switch off the R&S TSVP.
2. **WARNING!** Risk of electric shock. UUT or additional power supplies connected to a module can apply hazardous active voltages to the module. If you touch a module with hazardous voltages applied, you risk an electric shock. Never install or uninstall modules while the instrument is connected to an external power supply or a UUT providing high voltages.
Disconnect the R&S TSVP from the power supply.
3. Unscrew the screws at the top and bottom of the module.
4. Press the ejection lever at the bottom of the module to disconnect it from the backplane.
5. Remove the module from the slot.
6. Replace the cover of the slot if you do not insert another module.

Driver installation

The drivers for Rohde & Schwarz modules are installed together with the R&S GTSL software. The installation procedure is described in [Chapter 3.4, "R&S GTSL download from GLORIS"](#), on page 34 and in the R&S GTSL manual.

For third-party or customized modules, consult the documentation supplied by the module manufacturer.

Cabling the modules

For details on cabling the modules, see the module documentation.

3.2.7 Connecting an R&S PowerTSVP to a PXI based base unit

You can create larger ATE (Automatic Test Equipment) systems by combining R&S CompactTSVP or R&S ExpressTSVP and R&S PowerTSVP. You connect the two instruments via the X2 connector (analog bus) on the rear panel of the instruments and the X30 connector on the R&S PSYS (CAN bus) modules in the rear.

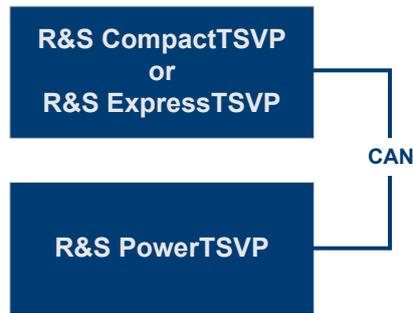


Figure 3-4: R&S CompactTSVP to R&S PowerTSVP connection

Only use the R&S TS-PK01 analog bus extension cable (order no. 1166.4147.02) and R&S TS-PK02 CAN bus extension cable (order no. 1166.4160.02) to ensure EMC compatibility.

1. Switch off the instruments.
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 instruments. Thus, you avoid the risk of touching the X2 connector with a possibly hazardous voltage applied.

Disconnect both instruments from any external power supply or UUTs providing high voltages.

3. Connect the R&S TS-PK01 cable to the X2 connector on the rear panel of the R&S CompactTSVP or R&S ExpressTSVP.
4. Connect the other end of the R&S TS-PK01 cable to the X2 connector on the rear panel of the R&S PowerTSVP.
5. Configure the jumpers of the CAN bus for the R&S TS-PSYS modules as required.
6. Connect the end of the R&S TS-PK02 cable that contains the ferrite to the X30 connector on the R&S PSYS1 module in the rear of the R&S CompactTSVP or R&S ExpressTSVP.
7. Connect the other end of the R&S TS-PK02 cable to the X30 connector on the R&S PSYS2 module in the rear of the R&S PowerTSVP.

Both instruments can be controlled by the same control software and used for the same measurement setup.

3.2.8 Connecting PXI based base units to a control PC

The R&S TSVP is intended for use with a system controller. This system controller is either an embedded computer or a remote control interface connected to an external host computer.

The embedded computer or the remote control interface is installed in the R&S ExpressTSVP or the R&S CompactTSVP. The external host computer is typically a desktop computer, an industrial PC (IPC) or any other host controller with a free PCI Express slot to accommodate a PCIe-to-PCIe bridge card.

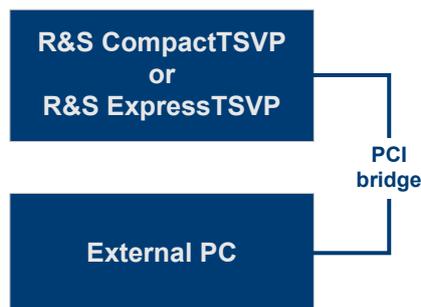


Figure 3-5: Connection of a PXI based R&S TSVP to an external PC

For this solution, a PCI card is installed on an external PC. One of the following R&S CompactPCI modules is installed in rear slot 1:

- R&S TS-PSC08-x
- R&S TS-PSC07 (obsolete)
- R&S TS-PSC0 (obsolete)

For details and prerequisites, see the module documentation.



If the base unit is connected to an external control PC, always switch on the R&S TSVP first. Then switch on the control PC. Otherwise, the PC cannot detect and initialize the R&S TSVP modules correctly.

See also [Chapter 3.2.12, "Switching on or off"](#), on page 27.

To install a PCI-to-PCI bridge connection using R&S TS-PSC08

1. On the external PC, install the R&S TS-PSC08-A PCI card.
2. For R&S CompactTSVP:
 - Install the R&S TS-PSC08-B module in rear slot 1.
 - Do not plug any other module into slot 1 on the front panel.
3. For R&S ExpressTSVP:
 - Install the R&S TS-PSC08-E module in rear slot 1.
4. Connect the "Upstream" connector on the R&S TSVP to the external PC using the supplied cable (R&S TS-PSC08-C, available with a length of 1 m or 2 m).



Figure 3-6: Cabling of the R&S TS-PSC08 components.

3.2.9 Connecting the R&S PowerTSVP to a control PC

If the R&S PowerTSVP is not connected to a R&S CompactTSVP, the modules must be controlled by an external PC. In this case, a CAN bus interface supported by the IXXAT VCI software is required (e.g. IXXAT USB-to-CAN).



Figure 3-7: R&S PowerTSVP to external PC connection

To set up a CAN bus connection to the R&S PowerTSVP

1. Connect the CAN interface to the external PC.
2. Connect the CAN bus lines of the interface to the CAN bus pins on the X30 connector of the R&S TS-PSYS2 module on the R&S PowerTSVP.

3.2.10 Considerations for test setup

Connecting high-voltage UUT

A connected UUT can apply hazardous active voltages (above 30 V_{RMS} and 42.4 V_{peak} or 60 V DC) to the instrument. In this case, the voltage is also available at the signal output connectors on the rear panel of the R&S TSVP. You risk an electric shock if you touch any of the output connectors with hazardous voltages applied. Only electrically skilled persons must operate test setups using hazardous active voltages. See also "Target audience" on page 5.

Ensure that all measurement equipment in the test setup is designed for the applied voltages. The R&S CompactTSVP, R&S ExpressTSVP and R&S PowerTSVP instruments are designed to cope with operating voltages up to 120 V DC, 50 V AC (RMS).

Always connect both ends of the TS-PK01 cable to connect the instruments via the analog bus and the X2 connectors. Thus, you avoid the risk of touching the X2 connector with a possibly hazardous voltage applied.

Cable selection and electromagnetic interference (EMI)

Electromagnetic interference (EMI) can affect the measurement results.

To suppress electromagnetic radiation during operation:

- Use high-quality shielded cables, for example, double-shielded RF and LAN cables.
- Always terminate open cable ends.
- Ensure that connected external devices comply with EMC regulations.

Preventing electrostatic discharge (ESD)

Electrostatic discharge is most likely to occur when you connect or disconnect a DUT.

- ▶ **NOTICE!** Electrostatic discharge can damage the electronic components of the product and the device under test (DUT).

Ground yourself to prevent electrostatic discharge damage:

- a) Use a wrist strap and cord to connect yourself to ground.
- b) Use a conductive floor mat and heel strap combination.

Ensuring repeatability

To ensure repeatability of measurements, note the ambient conditions recommended for the installation site of a R&S TSVP:

- Temperature variance within 24 hours not to exceed approximately 3 °C.
- Maximum temperature variance within one hour not to exceed approximately 0.5 °C.
- Avoid extreme vibrations from mechanical or dynamic sources such as presses or power punches.

- Warm up the R&S TSVP for approximately 15 minutes before starting measurements. The duration depends on the type of measuring modules and can be longer.

3.2.11 Connecting to power

The R&S TSVP is equipped with an AC power supply connector. The R&S TSVP can be used with different AC power voltages and adapts itself automatically to it. Refer to the data sheet for requirements of voltage and frequency.

For safety information, see "[Connecting to power](#)" on page 6.

1. Plug the AC power cable into the AC power connector on the rear panel of the product. Only use the AC power cable delivered with the product.
2. Plug the AC power cable into a power outlet with ground contact.

The required ratings are listed next to the AC power connector and in the data sheet.

3.2.12 Switching on or off

To switch on the product

The product is off but connected to power.

1. If the R&S TSVP is connected to an external control PC via a PCI-to-PCI bridge, always switch on the R&S TSVP before you switch on the control PC. Otherwise, the PC cannot detect and initialize the R&S TSVP modules correctly.
2. **WARNING!** Risk of electric shock. When you switch on the R&S TSVP, any plugged in modules are initialized. If a connected UUT applies hazardous active voltages (above $30 V_{\text{RMS}}$ and $42.4 V_{\text{peak}}$ or 60 V DC) to the instrument, the voltage is also available at the signal output connectors on the rear panel of the R&S TSVP. You risk an electric shock if you touch any of the output connectors with hazardous voltages applied. Only skilled persons must operate test setups using such hazardous voltages. See also "[Target audience](#)" on page 5.

Ensure all measurement equipment in the test setup is designed for the applied voltages. The R&S TSVP instruments are designed to cope with operating voltages up to 120 V DC, 50 V AC (RMS).

Set the switch on the power supply to position [I]. See [Chapter 3.3.3.2, "Power switch"](#), on page 33.

The plug-in modules are initialized and the R&S TSVP is ready for operation.

To disconnect from power

The operating system of the controller is shut down.

1. **NOTICE!** Risk of data loss. If you disconnect the product from power when it is in the ready state, you can lose settings and data. Shut it down first.
Set the switch on the power supply to position [0]. See [Chapter 3.3.3.2, "Power switch"](#), on page 33.
2. Disconnect the product from the power source.

3.2.13 Operating the R&S TSVP

The R&S TSVP is controlled entirely by the installed generic test software, e.g.:

- Generic Test Software Library (R&S GTSL), including tools (e.g. instrument soft panels, self-test application)
- Enhanced Generic Test Software Library (R&S EGTSL), including tools (e.g. Automatic Test Generator, ICT Correction, EGTSL Debugger, ICT Fixture Compensation)
- R&S IC-Check

For details on the software and their operation, see the corresponding user manuals provided with the installation. For installation, see [Chapter 3.4, "R&S GTSL download from GLORIS"](#), on page 34.

To operate the R&S TSVP via the optional internal system controller

1. Connect a monitor, keyboard and mouse to the system controller module of the R&S TSVP.
2. Switch on the R&S TSVP.
3. Log on to Windows. You do not require a password.
4. For systems with the initial hardware configuration (as delivered):
Select "Start" > "R&S GTSL TSVP Self Test".
5. For systems with a changed hardware configuration since the delivery:
 - a) Select "Start" > "R&S GTSL Instrument Soft Panels".
The R&S TSVP soft panel starts and all installed R&S TSVP modules are listed in the main window.
 - b) In the instrument soft panels application, select "Tools" > "Create Physical.ini..." to generate the configuration file automatically.
For details, see the R&S GTSL software manual.
 - c) Select "Start" > "R&S GTSL TSVP Self Test".

The self-test checks whether the instrument is operating properly.

For information on starting and performing the self-test, and a detailed description of the tested parameters and procedures, refer to the R&S TSVP service manual.

To operate the R&S TSVP via an external control PC

Prerequisites:

Connect the R&S TSVP to a computer.

For details about connecting the R&S TSVP to a computer, see [Chapter 3.2.8, "Connecting PXI based base units to a control PC"](#), on page 24 and [Chapter 3.2.9, "Connecting the R&S PowerTSVP to a control PC"](#), on page 25.

The R&S GTSL software is installed on the control PC. See the R&S GTSL user manual for details.

1. Switch on the R&S TSVP.
2. Switch on the control PC *after* you switched on the R&S TSVP.
3. Select "Start" > "R&S GTSL Instrument Soft Panels".
The R&S TSVP soft panel starts and all installed R&S TSVP modules are listed in the main window.
4. In the instrument soft panels application, select "Tools" > "Create Physical.ini..." to generate the configuration file automatically.
For details, see the R&S GTSL software manual.
5. Select "Start" > "R&S GTSL TSVP Self Test".
The self-test checks whether the instrument is operating properly.
For information on starting and performing the self-test, and a detailed description of the tested parameters and procedures, refer to the R&S TSVP service manual.

3.3 Instrument tour

The features available on the front and rear panel depends on the variant of the R&S TSVP base unit you are using.

- The front panel has the same features on all variants.
- Rear panel R&S ExpressTSVP: [Chapter 3.3.2, "Rear panel \(R&S ExpressTSVP\)"](#), on page 30
- Rear panel R&S CompactTSVP and R&S PowerTSVP: [Chapter 3.3.3, "Rear panel \(R&S CompactTSVP and R&S PowerTSVP\)"](#), on page 32

3.3.1 Front panel

The front panel has the same features on all three variants of the base units.

Other than the slots for the plug-in modules, the front module has no connectors or interfaces.

Possible module configurations are different for all three variants. For more information, refer to the system manual available on the internet.

You can mount a mass interconnect interface receiver to the front panel by a flange to connect the test devices to the R&S TSVP securely, quickly, and with a low rate of wear.



Figure 3-8: Example of R&S TSVP with a flange-mounted mass interconnect interface receiver

3.3.2 Rear panel (R&S ExpressTSVP)

The rear panel provides various interfaces and connectors.

The basic configuration comes with the following connectors and interfaces:

- AC power connector
- Analog bus connector
- System module connector

All other connections are optional.

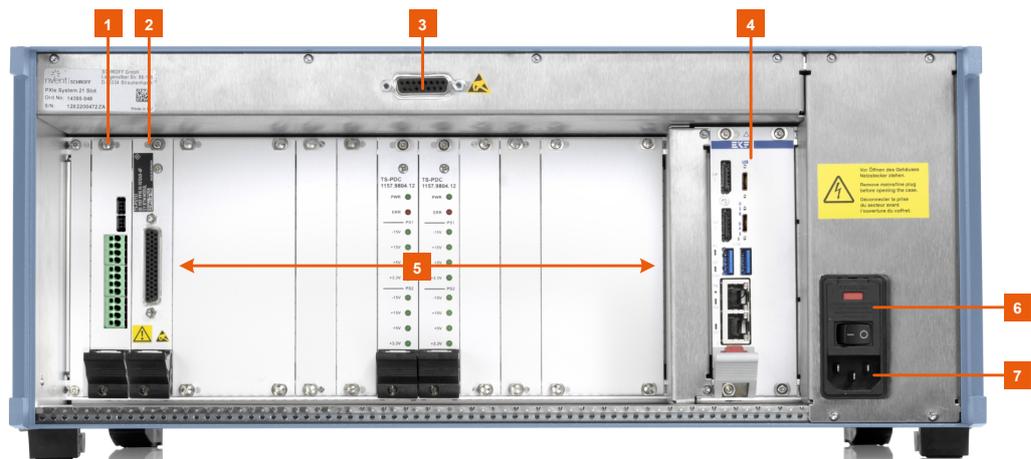


Figure 3-9: Rear panel of the R&S ExpressTSVP

- 1 = Slot for R&S TS-PRIO2 rear I/O module (for R&S TS-PSM4)
- 2 = Slot for R&S TS-PSYS1 module, incl. [X30 connector](#)
- 3 = [Analog bus connector X2](#)
- 4 = Slot for the system controller R&S TS-PSCE1x
- 5 = Slots S3 to S14 for rear I/O modules
- 6 = [Power switch](#)
- 7 = [AC power supply](#), including fuse holder

3.3.2.1 AC power supply

AC input for a connection to the AC mains supply. You can connect the R&S TSVP to networks with different voltage levels in the following range:

- 110 VAC / 60 Hz
- 230 VAC / 50 Hz

The power supply automatically adapts itself to the voltage level of the power source. Refer to the datasheet for details. The power cord necessary to connect the panel to the power supply is part of the delivery (with country-specific plug).

The power supply requires fuse protection no higher than 16 A.

The AC power supply contains a fuse (IEC 127 T6.3H250V). For more information about the fuse, refer to the user manual.

3.3.2.2 Power switch

Turns the R&S TSVP on and off.

The power switch has the following states.

- Position 1: The instrument is connected to the AC power supply and in operation.
- Position O: The entire instrument is disconnected from the AC power supply.

For details, refer to "[Connecting to power](#)" on page 6 and [Chapter 3.2.11, "Connecting to power"](#), on page 27.

3.3.2.3 Analog bus connector X2

Provides an interface to combine an R&S ExpressTSVP and an R&S PowerTSVP.

For details about connecting an R&S ExpressTSVP to an R&S PowerTSVP, refer to [Chapter 3.2.7, "Connecting an R&S PowerTSVP to a PXI based base unit"](#), on page 22.

The analog bus connector X2 is connected to the analog bus connector X21 located on the analog bus backplane.

Analog bus lines are designed for a maximum current strength of 1 A.

3.3.2.4 Signal output connector X30 for system module R&S TS-PSYS

Interface to control setups that combine an R&S ExpressTSVP and an R&S PowerTSVP.

The X30 connector connects the R&S TS-PSYS1 module in PXI based base units to the R&S TS-PSYS2 module on the R&S PowerTSVP. R&S TS-PSYS1 modules provide system functions such as voltage and temperature monitoring, switchable trigger signals and an optocoupler interface.

Connect an R&S TS-PK02 cable to this connector to control a R&S PowerTSVP.

For details about connecting an PXI based base unit to an R&S PowerTSVP, refer to [Chapter 3.2.7, "Connecting an R&S PowerTSVP to a PXI based base unit"](#), on page 22.

3.3.3 Rear panel (R&S CompactTSVP and R&S PowerTSVP)

The rear panel provides various interfaces and connectors.

The basic configuration comes with the following connectors and interfaces:

- AC power connector
- Analog bus connector
- System module connector

All other connections are optional.

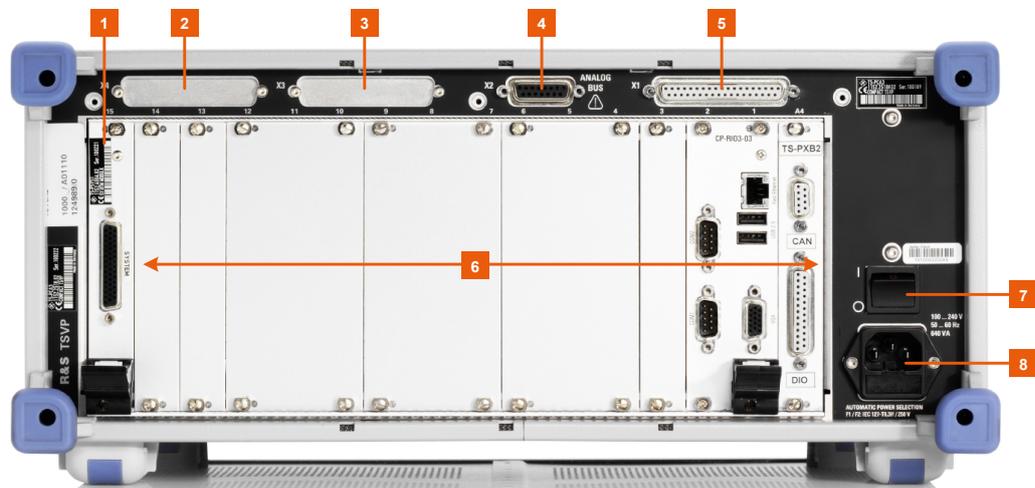


Figure 3-10: Rear panel of the R&S CompactTSVP - the rear of the R&S PowerTSVP looks similar

- 1 = Signal output connector X30 for system module R&S TS-PSYS
- 2, 3 = Signal output connectors X3, X4
- 4 = Analog bus connector X2
- 5 = X1, for system and user-specific connections
- 6 = Slots for plug-in modules
- 7 = Power switch
- 8 = AC power supply with fuse

• AC power supply	33
• Power switch	33
• Analog bus connector X2	33
• Signal output connectors X3, X4	33
• Signal output connector X30 for system module R&S TS-PSYS	34

3.3.3.1 AC power supply

AC input for a connection to the AC mains supply.

You can connect the R&S TSVP to networks with different voltage levels in the following range:

- 110 VAC / 60 Hz
- 230 VAC / 50 Hz

The power supply automatically adapts itself to the voltage level of the power source. Refer to the datasheet for details. The power cord necessary to connect the panel to the power supply is part of the delivery (with country-specific plug).

The power supply requires fuse protection no higher than 16 A.

3.3.3.2 Power switch

Turns the R&S TSVP on and off.

The power switch has the following states.

- Position 1: The instrument is connected to the AC power supply and in operation.
- Position O: The entire instrument is disconnected from the AC power supply.

For details, refer to "[Connecting to power](#)" on page 6 and [Chapter 3.2.11, "Connecting to power"](#), on page 27.

3.3.3.3 Analog bus connector X2

Provides an interface to combine an R&S CompactTSVP and an R&S PowerTSVP.

For details about the connector, see [Chapter 3.3.2.3, "Analog bus connector X2"](#), on page 31.

For details about connecting an R&S CompactTSVP to an R&S PowerTSVP, refer to [Chapter 3.2.7, "Connecting an R&S PowerTSVP to a PXI based base unit"](#), on page 22.

3.3.3.4 Signal output connectors X3, X4

Connectors X3 and X4 on the rear panel can provide signal output from the optional R&S TS-PSM1 to R&S TS-PSM5 modules. The output is provided in slot 15 or 16. Output requires the optional cabling kit R&S TS-PK04 (order no. 1157.9104.02) or R&S TS-PK04P (1157.9104.03).

For more details, refer to the documentation of the modules.

3.3.3.5 Signal output connector X30 for system module R&S TS-PSYS

Interface to control setups that combine an R&S CompactTSVP and an R&S PowerTSVP.

For details about the connector, see [Chapter 3.3.2.4, "Signal output connector X30 for system module R&S TS-PSYS"](#), on page 32.

For details about connecting an R&S CompactTSVP to an R&S PowerTSVP, refer to [Chapter 3.2.7, "Connecting an R&S PowerTSVP to a PXI based base unit"](#), on page 22.

3.4 R&S GTSL download from GLORIS

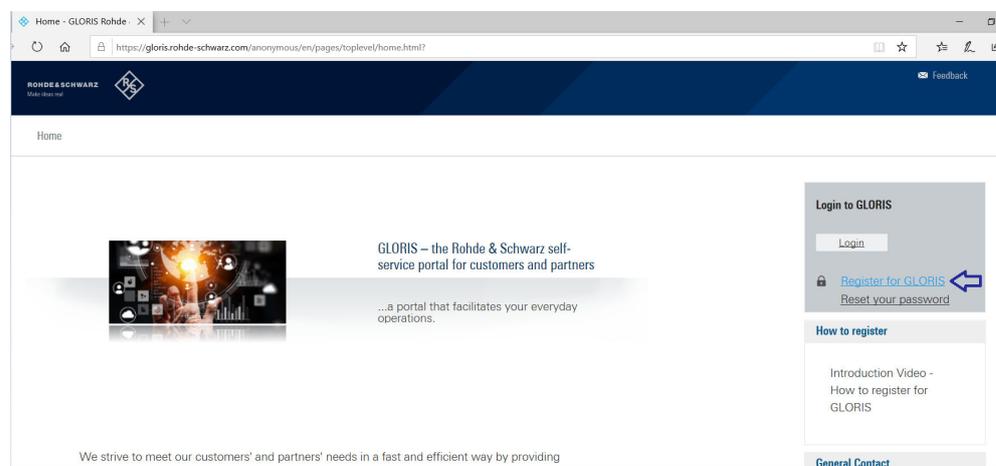
The R&S TSVP is controlled entirely by the installed generic test software. The software is installed either on the optional internal system controller of the R&S TSVP, or on an external control PC.

The Generic Test Software Library ("R&S GTSL") installation package contains the software to control the R&S TSVP, and all product manuals. The installation package is available from the global Rohde & Schwarz information system (GLORIS) after registration.

3.4.1 Registering for GLORIS and the R&S TSVP software

You need to register before you can use GLORIS. The procedure is quick and simple.

1. Start a browser and go to <https://gloris.rohde-schwarz.com/>.
2. Select "Register for GLORIS".



3. Enter all required information.

4. Enter your business email address (check carefully for typing errors) and all other required fields.
5. Enter your password.
The password rules are:
 - Minimum 9 characters
 - At least one upper case letter
 - At least one lower case letter
 - At least one of these special characters: * % = ? !/ + - . #
 - Only use English letters, numbers and the specified characters.
6. Use the "Remark" field to enter your required applications. Ask for activation of the "T&M Production Download" for the R&S TSVP.
7. Optionally, subscribe to our newsletter service, which is tailored to your selected interests.
8. Accept the "Terms and Conditions".
9. Select "Register".

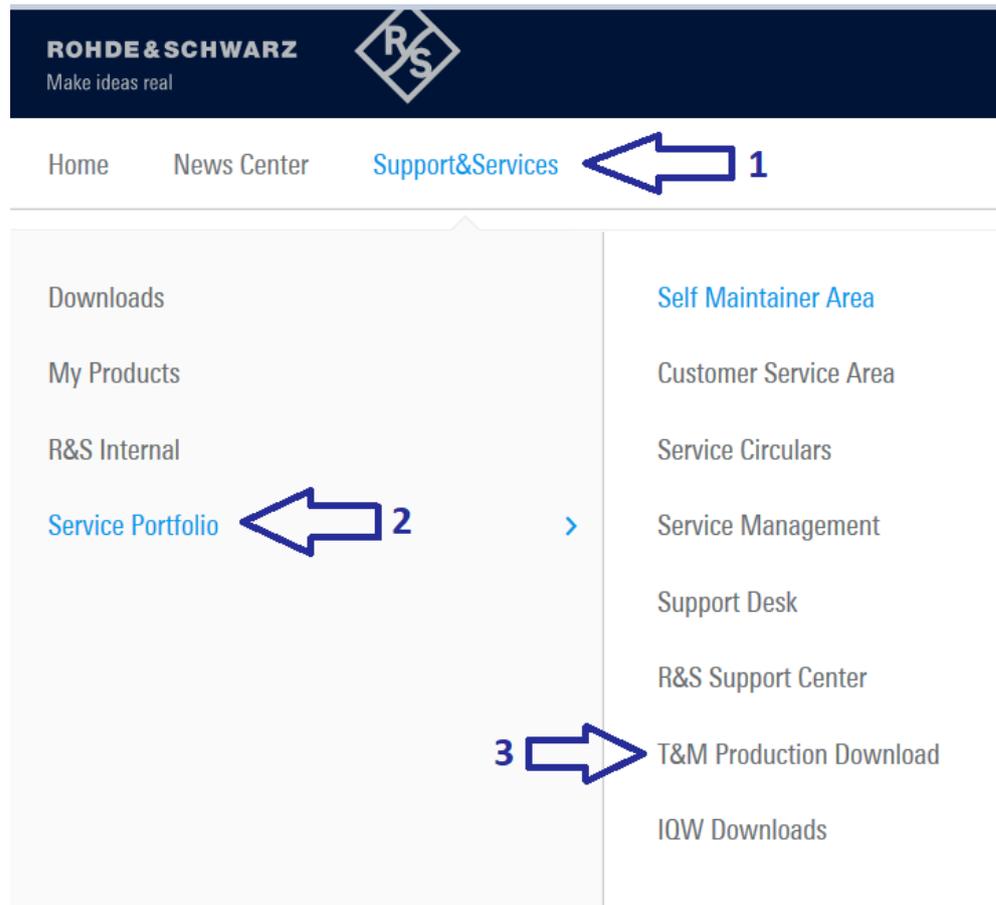
After you submit your registration, you receive a confirmation email, which you must confirm within 48 h. Once you submit your application, we verify it and send you an email again to state that the account is ready.

In case you need assistance during the process, contact our customer support (see [Chapter 11.11, "Contacting customer support"](#), on page 114).

3.4.2 Download area

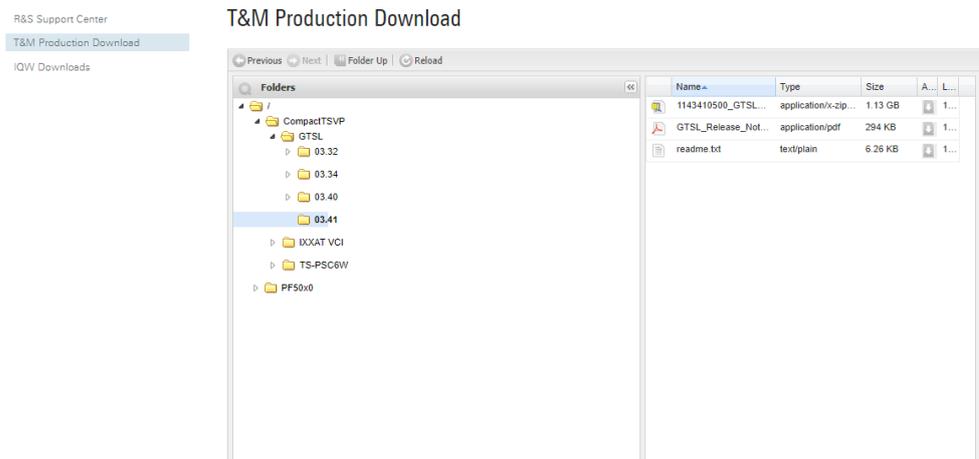
Log in to GLORIS using your credentials (email address and password) and go to the download area as described here:

1. Place the cursor over "Support&Services".
2. Select "Service Portfolio".
3. Select "T&M Production Download".



Note: If "T&M Production Download" is not visible, contact customer support asking for activation of the "T&M Production Download" for the R&S TSVP (see [Chapter 3.4.1, "Registering for GLORIS and the R&S TSVP software"](#), on page 34).

4. Navigate through the folder structure: CompactTSVP -> GTSL.



5. Select the required version of the R&S GTSL, as described in [Chapter 3.4.3, "Required version"](#), on page 37.

3.4.3 Required version

Install the latest R&S GTSL version supported for the Microsoft Windows version running on the controller or external PC of your R&S TSVP System.

Table 3-1: Overview of the dependencies with Microsoft Windows

Windows version	R&S GTSL version	Date of first support
Windows 10 64 bit with secure boot feature activated Windows 11 64 bit with secure boot feature activated	03.42	09.2023
Windows 10 with secure boot feature activated	03.41 03.40	07.2021 01.2020
Windows 10 Windows 7	03.34 03.33	09.2018 10.2017
Windows 7 Windows XP	03.32	09.2016

For details on the software, refer to the R&S TSVP "System Manual". The manuals are included in the documentation folder (ZIP file).

3.4.4 Installation package contents

The installation package contains at least the following 3 files (see [Figure 3-11](#)):

- ZIP file: includes the installer and all product manuals
- PDF file: R&S GTSL release notes
- `Readme.txt`: installation instructions

T&M Production Download

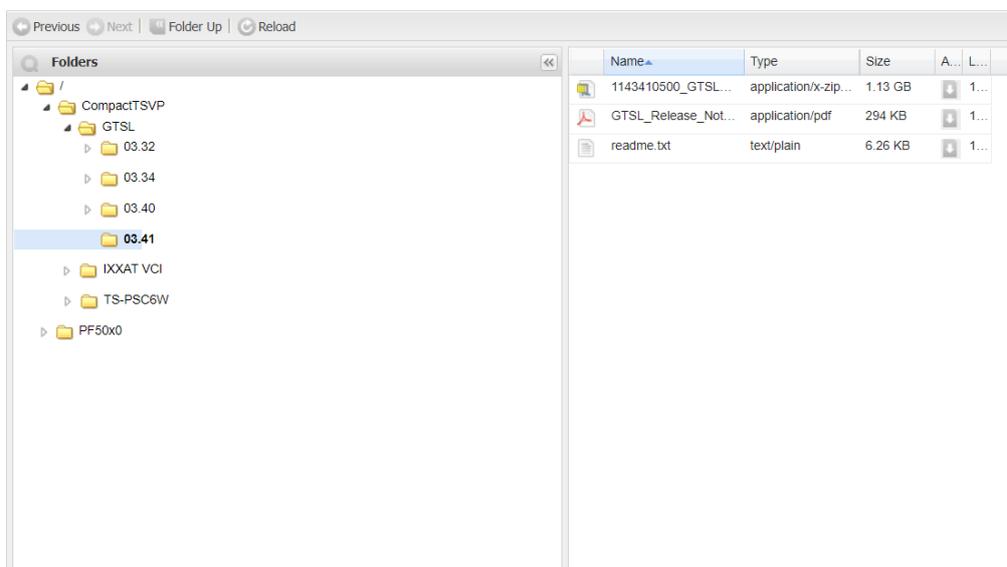


Figure 3-11: Installation package contents

The ZIP file is rather large, so depending on the speed of your internet connection, it can take some time to download.

Follow the instructions in the `Readme.txt` file to install the R&S GTSL software.

4 System overview

Testing departments need to configure the required functions in compact units as flexibly as possible so that future requirements can be covered without any need for large additional investments.

Moreover, constantly reduced product development times call for powerful, easy-to-operate and standardized software components which can be integrated as reusable modules in a multitude of applications.

Customer requirements, particularly in the telecommunications and automotive electronics sector, emphasize power density and modularity, thus clearly pointing to platform-based test and measurement equipment that is favorably priced and suitable for industry.

System Architecture

The R&S TSVP test platform provides an extremely wide portfolio of test and measurement methods of modern test equipment. It consistently uses open industrial standards such as PXI Express, CompactPCI / PXI and CAN. In addition to Rohde & Schwarz modules, you can integrate other commercially available hardware components that support these standards into the system without any modifications.

The measurement and switching modules are designed for flexible use in the function test of electronics modules. Optionally, you can combine the test with in-circuit testing of components. This unique capability is based on the CompactPCI/PXI standard.

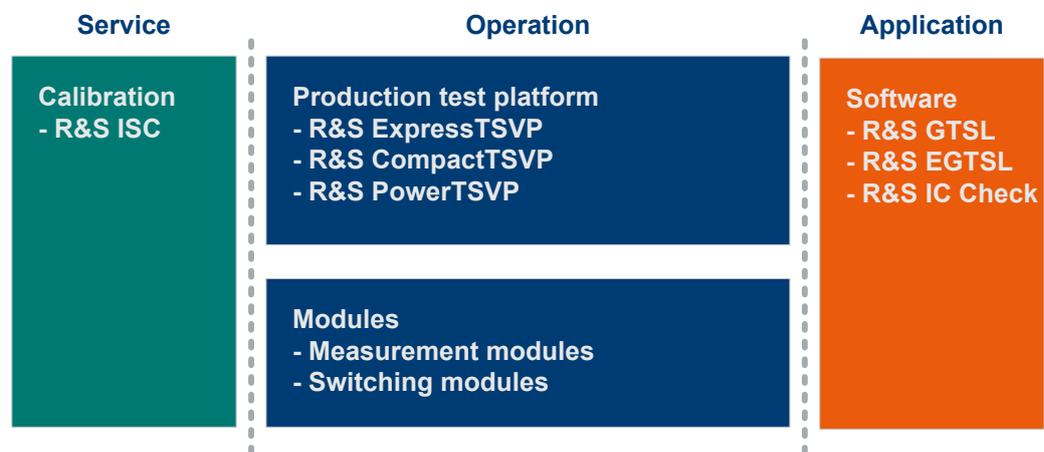


Figure 4-1: Modular system architecture of the R&S TSVP test platform

5 Production test platforms

The open test platform from Rohde & Schwarz provides different variants:

- R&S ExpressTSVP: based on PXI Express bus for general test and measurement tasks
- R&S CompactTSVP: based on cPCI/PXI bus for general test and measurement tasks
- R&S PowerTSVP: based on CAN bus for dedicated high-power or switching applications

5.1 Considerations for module installation

When installing modules, consider the following:

- Cover unused slots by front subpanels that maintain the integrity of the RF immunity. Contact springs are mounted between the individual front subpanels for this purpose.
- Observe EMC regulations. You can only achieve sufficient shielding using sectional front panels and shield springs on the inner and outer fastening level. Connect the 2 levels of module front panels using the appropriate RF shield wall kit. One slot is lost in this process. See also [Chapter 8, "Shielding kit installation"](#), on page 66.
- For R&S CompactTSVP:
When mixing short and long modules, if possible, install the shorter ones close to the controller and the longer ones further to the right.
- If long cards are plugged in next to short ones, make sure that the sectional front panel of the short module cannot touch the lines of the adjacent module to prevent the risk of short circuiting. For safe operation, insert the insulation plate that is part of the delivery between the modules (see ["Installing modules"](#) on page 20).
- For R&S CompactTSVP and R&S ExpressTSVP:
Connect the in-circuit measuring unit, consisting of R&S TS-PSAM and R&S TSPICT, to slots 8 and 9 to achieve even residues.
- For R&S CompactTSVP and R&S ExpressTSVP:
Connect R&S TS-PSM1, R&S TS-PSM3, R&S TS-PSM4, and R&S TS-PSM5 to slot 16. Thus, signal output from the power plug is directed to the X3 and X4 connectors on the rear panel (if the optional cabling kit R&S TS-PK04 is installed).
If you require an additional R&S TS-PSM1 or R&S TS-PSM4, connect it to slot 15.
See also [Chapter 3.3.3.4, "Signal output connectors X3, X4"](#), on page 33
For more details, refer to the documentation of the individual modules.

5.2 Compatibility

The following table shows the types of modules that you can use in the different base unit models.

Backplane	Specification	R&S ExpressTSVP	R&S CompactTSVP	R&S PowerTSVP
cPCI serial	PCIe Gen2, x8 (CPCI-S.0 R2.0)	S1 (system) S2 (peripheral)	---	---
cPCIe/PXle	PCIe Gen2, x4 (CPCI-S.0 R2.0)	A1 - A4, A6	---	---
cPCI	32 bit, 33 MHz (PICMG 2.0 rev. 3.0)	S3 - S15 ^{*2)} ^{*4)}	S1 - S15 ^{*2)} ^{*3)} ^{*4)}	---
PXI-1	32 bit, 33 MHz (PICMG 2.0 rev. 3.0) with PCI eXtensions for Instrumentation	S3 - S15 ^{*1)}	S5 - S15 ^{*1)}	---
R&S CAN	2.0b, 1 Mbit	S3 - S16	A1, A2, S3 - S16	A1, A2, S1 - S16
R&S analog bus	8 lines, 120 V / 1 A	S3 - S16	S3 - S16	S1 - S16
cPCI-RTM	backplane rear I/O (IEEE 1101.11-1998)	S3 - S14, S16	S3 - S14, S16	S1 - S14, S16
R&S RTM	backplane rear I/O ^{*5)}	S3 - S16	S5 - S16	S5 - S16

RTM: rear transmission module

*1) all Rohde & Schwarz specific PXI modules

*2) 32 bit cPCI modules equipped **without** J2 rear I/O connector

*3) S3, S4: 32 bit cPCI modules equipped **with** or **without** J2 rear I/O connector

*4) S15 only for R&S modules or CompactPCI modules equipped only with J1 connector

Signal compatibility against the interface description has to be checked by reading the dedicated R&S TSVP user manual, as only parts of the PXI concepts are supported.

*5) supporting R&S TS-PDC rear I/O DC supply modules additionally PXI trigger PXI_TRIG[0-7], PXI_CLK10

5.3 R&S ExpressTSVP

The R&S ExpressTSVP concept represents true innovation in state-of-the-art PC-based instrumentation while offering traditional capabilities found in high-performance ATE systems. The versatile platform accelerates the adoption of CompactPCI and PXI in all major fields of industrial test-and-measurement applications.



With its large number of cPCI/cPCIs/PXI/PXIe slots and the tight integration of ATE functionality provided by R&S TSVP instrumentation and switching modules, the R&S ExpressTSVP is the ideal platform for highly productive system engineering.

Compact units are used to configure complex ATE functionality which can be interfaced to DUTs by the standardized mass interconnect test receiver concept that provides multiple application flexibility and easy handling on the factory floor.

Unique data-acquisition and stimulation modules provide floating potential measurements and DUT stimulation.

5.3.1 Slot configuration

The R&S ExpressTSVP provides 21 slots on the front that you can use for plug-in modules with a height of 3 units.

Slots on the front:

- A1 to A4 and A6 for PXI Express modules
- A5 is a blank slot that allows you to install a 2-slot module in A4 without wasting one of the other slots)
- S3 to S15 for cPCI, PXI or R&S CAN modules
- S16 for R&S CAN modules

Slots on the rear:

- S1 for cPCI serial (system slot) modules
- S2 for cPCI serial (peripheral slot) modules
- S3 to S14, S16 for rear I/O modules
- S15 for R&S TS-PSYS1 module

Unused slots are covered by front subpanels that maintain the integrity of the HF-immunity. Contact springs are mounted between the individual front subpanels for this purpose.

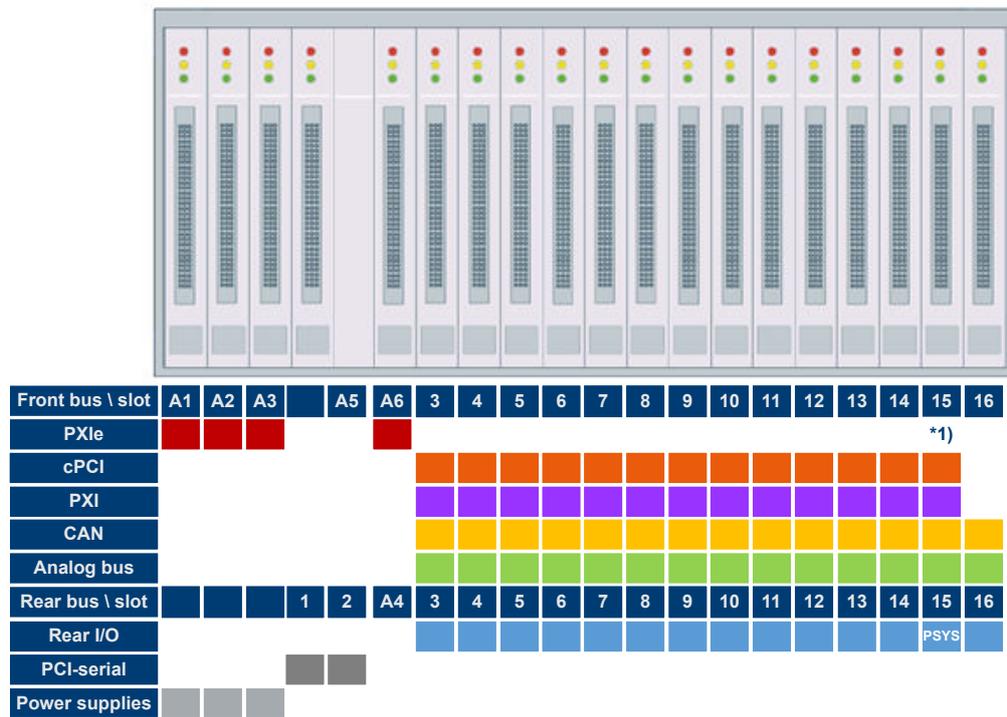


Figure 5-1: Configuration of the R&S ExpressTSVP slots

1 = Slot 15 only for R&S modules or CompactPCI modules equipped only with J1 connector. Rear I/O is pre-allocated by the R&S TS-PSYS1 module in general

5.3.2 Module configuration

Because of the different properties of plug-in modules, there are restrictions on the use of plug-in slots.

Table 5-1 shows an overview of which modules can be operated in which plug-in slots.

Table 5-1: R&S ExpressTSVP backplane

Front side	A1	A2	A3	A4	A5	A6	3	4	5	6	7	8	9	10	11	12	13	14	15 ⁵	16
TS-PSAM ⁰	-	-	-	-		-	x	x	x	x	x	x	x	x	x	x	x	x	-	-
TS-PICT ⁰	-	-	-	-		-	x	x	x	x	x	x	x	x	x	x	x	x	-	-
TS-PFG ⁰	-	-	-	-		-	x	x	x	x	x	x	x	x	x	x	x	x	-	-
TS-PAM ⁰	-	-	-	-		-	x	x	x	x	x	x	x	x	x	x	x	x	-	-
TS-PSU ⁰	-	-	-	-		-	x	x	x	x	x	x	x	x	x	x	x	x	-	x
TS-PSU12 ⁰	-	-	-	-		-	x	x	x	x	x	x	x	x	x	x	x	x	-	x
TS-PIO2 ⁰	-	-	-	-		-	x	x	x	x	x	x	x	x	x	x	x	x	-	x
TS-PIO4	-	-	-	-		-	x	x	x	x	x	x	x	x	x	x	x	x	x	-
TS-PIO5	-	-	-	-		-	x	x	x	x	x	x	x	x	x	x	x	x	x	-

Front side	A1	A2	A3	A4	A5	A6	3	4	5	6	7	8	9	10	11	12	13	14	15 ⁵	16		
TS-PDFT	-	-	-	-		-	x	x	x	x	x	x	x	x	x	x	x	x	x	x	-	
TS-PHDT	-	-	-	-		-	x	x	x	x	x	x	x	x	x	x	x	x	x	x	-	
TS-PTRF	-	-	-	-		-	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
TS-PXM1 ⁸	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
TS-PMB ⁶	-	-	-	-		-	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x ⁶	
TS-PSM2 ⁶	-	-	-	-		-	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x ⁶	
TS-PSM1	-	-	-	-		-	x ³	x	x ⁴													
TS-PSM3 ¹	-	-	-	-		-	x ³	x ⁴	-													
TS-PSM4	-	-	-	-		-	x ³	x	x													
TS-PSM5 ¹	-	-	-	-		-	x ³	x	-													
TS-PSCBRR ¹	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	-	
TS-PAIM	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
TS-PAIM+	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
TS-PFP6	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
TS-PFP9 ¹	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	-	
Shielding kit	-	-	-	-	x	x	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Mid	A1	A2	A3	A4	A5	A6	3	4	5	6	7	8	9	10	11	12	13	14	15 ⁵	16	
TS-PIO3B	-	-	-	-		-	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
TS-PTR	-	-	-	-		-	x	x	x	x	x	x	x	x	x	x	x	x	-	x	
TS-PSCBRRX ²	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	-	
TS-PXI6141	-	-	-	-		-	x	x	x	x	x	x	x	x	x	x	x	x	-	-	
TS-PXI6153	-	-	-	-		-	x	x	x	x	x	x	x	x	x	x	x	x	-	-	

Rear side	A1	A2	A3	S2	S1	A6	3	4	5	6	7	8	9	10	11	12	13	14	15 ⁵	16
TS-PSCE1W ⁷				-	x		-	-	-	-	-	-	-	-	-	-	-	-		-
TS-PSCE1S ⁷				-	x		-	-	-	-	-	-	-	-	-	-	-	-		-
TS-PSC08-E				-	x		-	-	-	-	-	-	-	-	-	-	-	-		-
TS-PRIO				-	-		x	x	x	x	x	x	x	x	x	x	x	x		x
TS-PRIO2				-	-		-	-	-	-	-	-	-	-	-	-	-	-		x
TS-PRIO4				-	-		x	x	x	x	x	x	x	x	x	x	x	x		x
TS-PCAL2				-	-		x	x	x	x	x	x	x	x	x	x	x	x	x	x

- 0) R&S TS-PDC respectively R&S TS-PAC is configured by default
- 1) 2-slot module
- 2) Requires R&S TS-PSCBRR as carrier module
- 3) Requires R&S TS-PRIO4 or R&S TS-PRIO if configured at slot 3 to 14 (the relays on R&S TS-PRIO cannot be controlled by the appropriate front module)
- 4) The R&S TS-PRIO2 can be combined by reduced functionality together with R&S TS-PSM1 (excepting IL1_COM and IL2_COM), R&S TS-PSM3 (excepting CH15_COM and CH16_COM), R&S TS-PSM5 (excepting CH6_COM and CH7_COM)
- 5) only for R&S modules or CompactPCI modules equipped only with J1 connector. R15 is preallocated by the TS-PSYS1 module in general
- 6) only possible if no rear-IO module with a projecting power connector like the R&S TS-PRIO2 is configured at slot S16
- 7) External connections can require an USB-C to USB-A adapter
- 8) For use with R&S TS-PTRF; must be within range and depends on the length of the control ribbon cable of 320 mm which equals the range of 8 slots. Max. 8 modules can be controlled by one R&S TS-PTRF

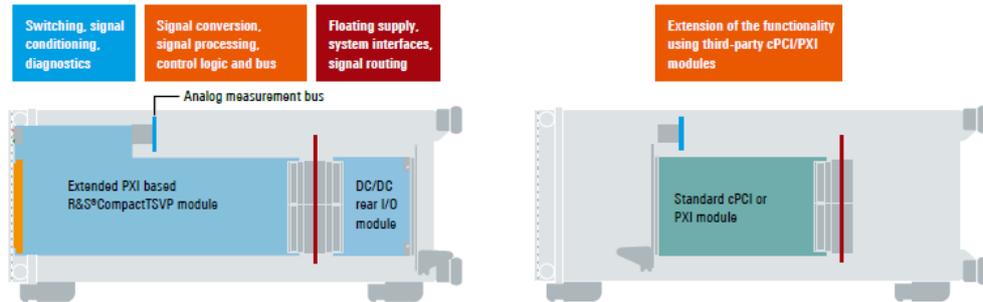
5.4 R&S CompactTSVP

The main objective behind the R&S CompactTSVP is to offer an inherently flexible and cost-effective modular test and measurement platform.



The performance of the platform product should be sophisticated enough that even VXI test system applications can be addressed by the platform technology. Although tight integration and electronic miniaturization help when building powerful devices with smaller footprints, available board space is still a major issue. The board space of a 3 HU CompactPCI or PXI module is the same as the Eurocard mechanical packaging measuring 160 mm × 100 mm (length × height), and the application-specific space is reduced by the CompactPCI bus interface chip and circuitry. Therefore, the R&S CompactTSVP module format was extended by 130 mm in length to bring primary switching and signal conditioning on board

R&S®CompactTSVP – Extended cPCI/PXI system functionality



5.4.1 Slot configuration

Up to 13 cPCI/PXI modules can be fitted in the R&S CompactTSVP in addition to the system controller (slot 1). A further slot (slot 16) is provided for special Rohde & Schwarz plug-in modules (without J1 connector).

Slots A3 and A4 are fitted with a power supply by default.

An optional R&S TS-PCPA power pack or the optional R&S TS-PXB2 backplane extension are installed into slots A1 and A2 at the factory only, if ordered.

Slots 1 to 16 provide access to the analog bus. The CAN bus is available at slots 5 to 16 (starting with backplane version V4.x in slots 3 and 4 as well).

If an optional R&S TS-PXB2 is used, the CAN bus is also available at slots A1 and A2.

There is space for rear I/O modules in the rear section of the R&S TSVP.

The case is suitable for plug-in boards with a height of 3 units.

Unused slots are covered by front subpanels that maintain the integrity of the RF-immunity. Contact springs are mounted between the individual front subpanels for this purpose.

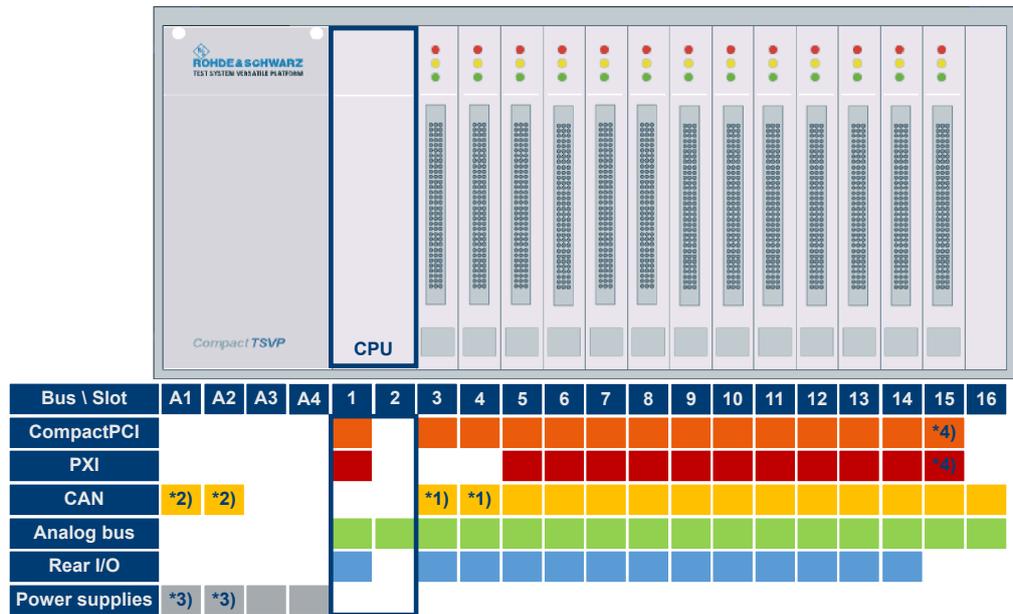


Figure 5-2: Configuration of the R&S CompactTSVP slots

- *1) = with backplane version v4.x
- *2) = with option R&S TS-PXB2
- *3) = with option R&S TS-PCPA
- *4) = only for R&S modules or CompactPCI modules equipped only with J1 connector

You can use the remaining space in the casing to adapt to the standard UUT connector or for concealed (cross) cabling.

5.4.2 R&S CompactTSVP configuration

Because of the different properties of plug-in modules, there are restrictions on the use of plug-in slots.

Table 5-2 and Table 5-3 show an overview of which modules can be operated in which plug-in slots.

Table 5-2: R&S CompactTSVP backplane V4.0 (for instrument part no. 1152.2518.02, starting with serial no. 100109, as of September 2005)

Front side	A1	A2	A3	A4	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Power supply			x		-		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Power supply ext.	x ⁵		-		-		-	-	-	-	-	-	-	-	-	-	-	-	-	-
System controller			-		x ²		-	-	-	-	-	-	-	-	-	-	-	-	-	-
TS-PSAM			-		-		-	-	x	x	x	x	x	x	x	x	x	x	-	-
TS-PICT			-		-		-	-	x	x	x	x	x	x	x	x	x	x	-	-
TS-PFG			-		-		-	-	x	x	x	x	x	x	x	x	x	x	-	-
TS-PAM			-		-		-	-	x	x	x	x	x	x	x	x	x	x	-	-

Front side	A1	A2	A3	A4	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
TS-PDFT			-		-		-	-	x	x	x	x	x	x	x	x	x	x	x	x	-
TS-PIO4/5			-		-		-	-	x	x	x	x	x	x	x	x	x	x	x	x	-
TS-PHDT ³			-		-		-	-	x	x	x	x	x	x	x	x	x	x	x	x	-
TS-PMB (V. ≥ 3.0)			-		-		x ¹	x	x	x	x	x	x	x	x	x	x	x	x	x	x ⁸
TS-PMB (V. 2.x)			-		-		-	-	x ⁹	x	x										
TS-PSM1			-		-		-	-	x ⁰	x	x										
TS-PSM2			-		-		x ¹	x	x	x	x	x	x	x	x	x	x	x	x	x	x ⁸
TS-PSM3/4/5 ¹⁷			-		-		-	-	x ⁰	x	x										
TS-PIO2			-		-		x ¹	x	x	x	x	x	x	x	x	x	x	x	-	-	
TS-PSU / PSU12			-		-		x ¹	x	x	x	x	x	x	x	x	x	x	x	-	-	
TS-PIO3B / PTR	x ⁴	x ⁴	-		-		x	x	x	x	x	x	x	x	x	x	x	x	-	-	

Rear side	A1	A2	A3	A4	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
TS-PSYS1					-		-	-	-	-	-	-	-	-	-	-	-	-	-	x	
TS-PSYS2 ⁷					-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	
TS-PDC (V. ≥ 1.4) ¹¹					-		x	x	x	x	x	x	x	x	x	x	x	x	-		
TS-PSCx-RIO					x ⁶		-	-	-	-	-	-	-	-	-	-	-	-	-	-	
TS-PSC0/ TS-PSC07/ TS-PSC08					x ²		-	-	-	-	-	-	-	-	-	-	-	-	-	-	
TS-PAC ¹³					-		x	x	x	x	x	x	x	x	x	x	x	x	-		
TS-PRIO ¹⁵ TS-PRIO4 ¹⁶					-		x	x	x	x	x	x	x	x	x	x	x	x	-		
TS-PK04																					x

- 0) Only with R&S TS-PRIO or R&S TS-PRIO4
- 1) Module solder side must be isolated against left neighbor slot if a system controller is installed (see "Installing modules" on page 20)
- 2) Front slot must remain empty if a bridge module (R&S TS-PSC0, R&S TS-PSC07, R&S TS-PSC08) is installed on the rear
- 3) Only in slot 9 to 15 if system controller R&S TS-PSC3 is used
- 4) Only with optional backplane extension R&S TS-PXB2; Cannot be combined with power supply extension R&S TS-PCPA
- 5) Only with optional backplane extension R&S TS-PCPA; Cannot be combined with R&S TS-PXB2
- 6) System controller RIO module must match CPU type in front slot
- 7) R&S TS-PSYS2 is not allowed in a R&S CompactTSVP with backplane Version 4
- 8) Only if option R&S TS-PK04 is not installed
- 9) Only with R&S TS-PRIO or R&S TS-PRIO4 and R&S TS-PMB versions 02.14 or later
- 11) Only for R&S TS-PSAM, R&S TS-PICT, R&S TS-PFG, R&S TS-PAM, R&S TS-PSU12, R&S TS-PIO2
- 13) Only for R&S TS-PSU
- 14) Only for R&S TS-PMB
- 15) Only for R&S TS-PMB, R&S TS-PSM2; the relays of the R&S TS-PRIO can not be controlled by the R&S TS-PMB
- 16) Only for R&S TS-PMB, R&S TS-PIO3B, R&S TS-PTR, R&S TS-PSM1/3/4/5
- 17) R&S TS-PSM3 and R&S TS-PSM5 need two slots

Table 5-3: R&S CompactTSVP Backplane V2.1 and V3.x (for instrument part no. 1152.2518.02, up to serial no. 100108, before September 2005)

Front side	A1	A2	A3	A4	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Power supply			x		-		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Power supply ext.	x ⁵		-		-		-	-	-	-	-	-	-	-	-	-	-	-	-	-
System controller			-		x ²		-	-	-	-	-	-	-	-	-	-	-	-	-	-
TS-PSAM			-		-		-	-	x	x	x	x	x	x	x	x	x	x	-	-
TS-PICT			-		-		-	-	x	x	x	x	x	x	x	x	x	x	-	-
TS-PFG			-		-		-	-	x	x	x	x	x	x	x	x	x	x	-	-
TS-PAM			-		-		-	-	x	x	x	x	x	x	x	x	x	x	-	-
TS-PDFT			-		-		-	-	x	x	x	x	x	x	x	x	x	x	x	-
TS-PIO4 / TS-PIO5			-		-		-	-	x	x	x	x	x	x	x	x	x	x	x	-
TS-PHDT ³			-		-		-	-	x	x	x	x	x	x	x	x	x	x	x	-
TS-PMB			-		-		-	-	x	x	x	x	x	x	x	x	x	x	x	x ⁸
TS-PSM1			-		-		-	-	x	x	x	x	x	x	x	x	x	x	x	x
TS-PSM2			-		-		-	-	x	x	x	x	x	x	x	x	x	x	x	x ⁸
TS-PSM3 / TS-PSM4 / TS-PSM5 ¹⁴			-		-		-	-	x	x	x	x	x	x	x	x	x	x	x	x
TS-PIO1			-		-		-	-	x	x	x	x	x	x	x	x	x	x	x	x
TS-PIO2			-		-		-	-	x	x	x	x	x	x	x	x	x	x	-	-

Front side	A1	A2	A3	A4	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
TS-PSU / PSU12			-		-		-	-	x	x	x	x	x	x	x	x	x	x	-	-
TS-PIO3B / PTR	x ⁴	x ⁴	-		-		x	x	x	x	x	x	x	x	x	x	x	x	-	-

Rear side	A1	A2	A3	A4	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
TS-PSYS1					-		-	-	-	-	-	-	-	-	-	-	-	-	x	
TS-PSYS2 ⁷					-		-	-	x	x	-	-	-	-	-	x	x	x	-	
TS-PDC ⁹					-		-	-	x	x	x	x	x	x	x	x	x	x	-	
TS-PSCx-RIO ⁶					x		-	-	-	-	-	-	-	-	-	-	-	-	-	
TS-PSC0 ²					x		-	-	-	-	-	-	-	-	-	-	-	-	-	
TS-PAC ¹⁰					-		-	-	x	x	x	x	x	x	x	x	x	x	-	
TS-PCAL2 ¹¹					-		-	-	x	x	x	x	x	x	x	x	x	x	-	
TS-PRIO ¹² TS-PRIO4 ¹³					-		-	-	x	x	x	x	x	x	x	x	x	x	-	
TS-PK04																				x

1) Module solder side must be isolated against left neighbor slot if a system controller is installed (see ["Installing modules"](#) on page 20)

2) Either a bridge card (R&S TS-PSC0) OR a CPU module (R&S TS-PSC3, R&S TS-PSC4) can be used; R&S TS-PSC4 only for backplane version 3.x

3) Only in slot 9 to 15 if system controller R&S TS-PSC3 is used; Not allowed in backplane Version 3.x

4) Only with optional backplane extension R&S TS-PXB2; Cannot be combined with power supply extension R&S TS-PCPA

5) Only with optional backplane extension R&S TS-PCPA; Cannot be combined with R&S TS-PXB2

6) System controller RIO module must match CPU type in front slot

8) For versions 3.0 and later: Only if option R&S TS-PK04 is not installed

9) Only for R&S TS-PSAM, R&S TS-PICT, R&S TS-PFG, R&S TS-PAM, R&S TS-PIO2, R&S TS-PSU12

10) Only for R&S TS-PSU

11) Only for R&S TS-PMB

12) Only for R&S TS-PMB, R&S TS-PSM2; the relays of the R&S TS-PRIO can not be controlled by the R&S TS-PMB

13) Only for R&S TS-PMB, R&S TS-PIO3B, R&S TS-PTR

14) R&S TS-PSM3 and R&S TS-PSM5 need two slots

5.5 R&S PowerTSVP



The R&S PowerTSVP chassis is a cost-efficient subsystem for high-power and switching applications. It can be used to build systems ranging from dedicated switching instruments to more complex switching applications in test and measurement systems. The chassis contains a mechanical frame, digital backplane, analog measurement bus, mains switching and filtering, power supply and diagnostic extensions, controlled via CAN bus.

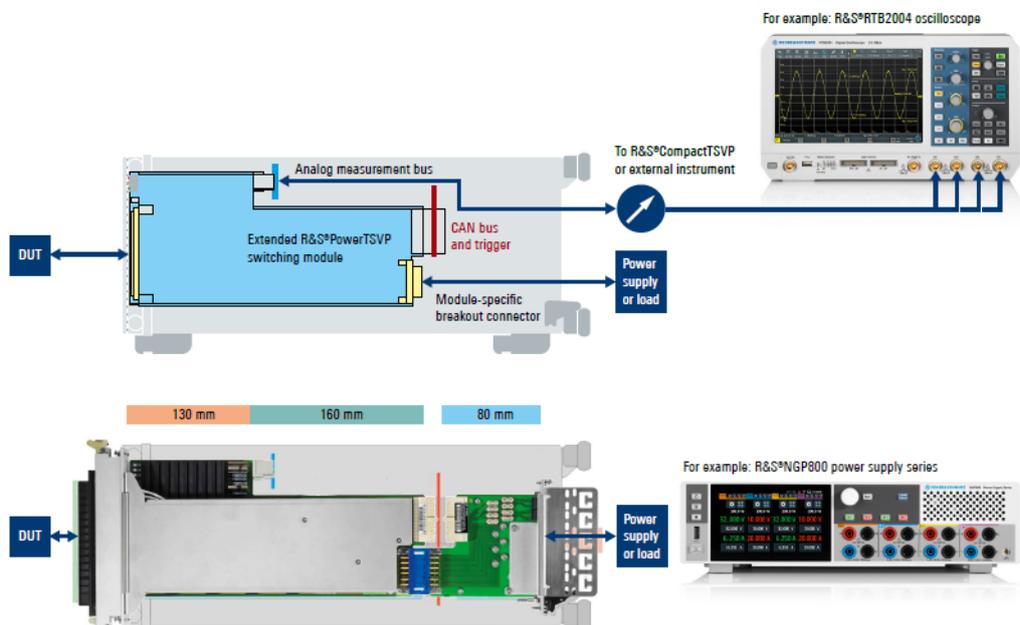


Figure 5-3: General concept of the R&S PowerTSVP module format

5.5.1 Slot configuration

The R&S PowerTSVP contains 16 slots for front plug-in modules conforming to Rohde & Schwarz format. The connector P2 that is defined in the cPCI standard is referred to as P20 here, because of a different assignment.

Slots A3, A4 are fitted with a PSU by default.

An optional R&S TS-PCPA power pack or the optional R&S TS-PXB2 backplane extension are installed into slots A1 and A2 at the factory only, if ordered.

Slots 1 to 16 provide access to the PXI trigger bus, CAN bus and analog bus. If you use an optional R&S TS-PXB2, the CAN bus is also available at slots A1 and A2.

There is space for rear I/O modules in the rear section of the R&S PowerTSVP.

Unused slots are covered by front subpanels that maintain the integrity of the HF-immunity. Contact springs are mounted between the individual front subpanels for this purpose.

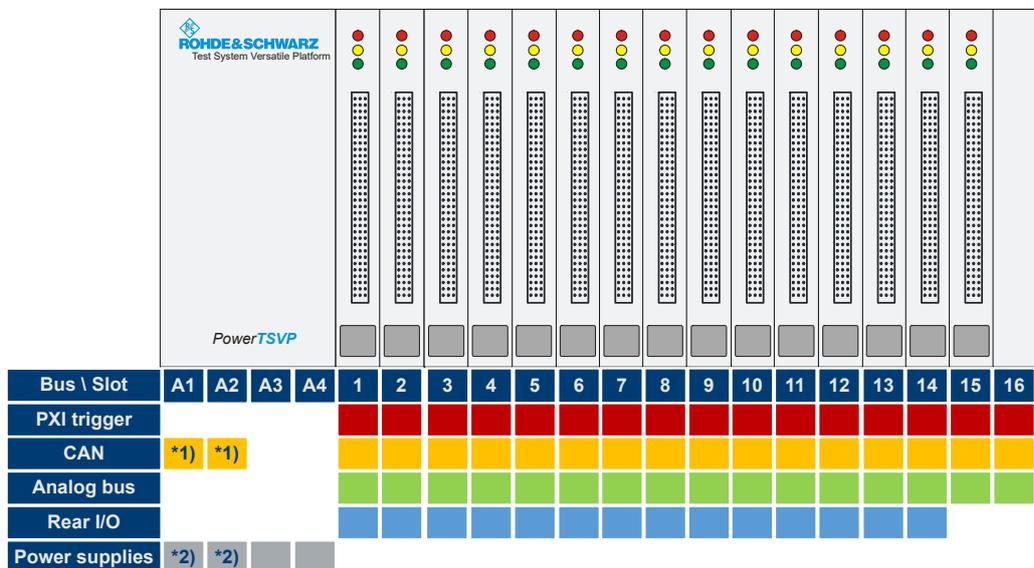


Figure 5-4: Configuration of the R&S PowerTSVP slots

*1) = with option R&S TS-PXB2

*2) = with option R&S TS-PCPA

You can use the remaining space in the casing to adapt to the standard UUT connector or for concealed (cross) cabling.

5.5.2 R&S PowerTSVP configuration

Because of the different properties of plug-in modules, there are restrictions on the use of plug-in slots.

Table 5-4 shows an overview of which modules can be operated in which plug-in slots.

Table 5-4: R&S PowerTSVP backplane

Front side	A1	A2	A3	A4	1 ¹	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Power supply			x		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Power supply ext.	x ²		-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TS-PMB			-		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x ⁴
TS-PSM1			-		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
TS-PSM2			-		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x ⁴
TS-PSM3 / TS-PSM4 / TS-PSM5 ¹³			-		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
TS-PIO1			-		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
TS-PIO2			-		x	x	x	x	x	x	x	x	x	x	x	x	x	x	-	-
TS-PSU / PSU12			-		x	x	x	x	x	x	x	x	x	x	x	x	x	x	-	-
TS-PIO3B / PTR	x ³	x ³	-		x	x	x	x	x	x	x	x	x	x	x	x	x	x	-	-

Rear side	A1	A2	A3	A4	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
TS-PSYS2																			x	
TS-PSYS2 (1157.8508.02 only)					-	-	x	x	x	x	x	x	x	x	x	x	x	x	-	
TS-PDC ⁵					x	x	x	x	x	x	x	x	x	x	x	x	x	x	-	
TS-PAC ⁶					x	x	x	x	x	x	x	x	x	x	x	x	x	x	-	
TS-PCAL2 ⁷					x	x	x	x	x	x	x	x	x	x	x	x	x	x	-	
TS-PRIO ⁸ TS-PRIO2 ⁹ TS-PRIO3 ¹⁰ TS-PRIO4 ¹¹ TS-PRIO5 ¹²					x	x	x	x	x	x	x	x	x	x	x	x	x	x	-	
TS-PK04P																				x

- 1) Module solder side must be isolated against left neighbor slot (see ["Installing modules"](#) on page 20)
- 2) Only with optional backplane extension R&S TS-PCPA; Cannot be combined with R&S TS-PXB2
- 3) Only with optional backplane extension R&S TS-PXB2; Cannot be combined with power supply extension R&S TS-PCPA
- 4) For version 3.0 and later: only if option R&S TS-PK04 is not installed
- 5) Only for R&S TS-PIO2, R&S TS-PSU12
- 6) Only for R&S TS-PSU
- 7) Only for R&S TS-PMB
- 8) Only for R&S TS-PMB, R&S TS-PSM2
- 9) Only for R&S TS-PSM4
- 10) Only for R&S TS-PSM3
- 11) Only for R&S TS-PIO3B, R&S TS-PTR
- 12) Only for R&S TS-PSM5
- 13) R&S TS-PSM3 and R&S TS-PSM5 need two slots

5.6 Analog measurement bus

All base units provide an internal analog bus.

The analog measurement bus offers short routing of signals to the measurement modules and electrical immunity to the digital PCI backplane. It also allows for combining a PXI based base unit and an R&S PowerTSVP. The analog bus is located directly above the front connector area where space is provided for onboard signal conditioning and signal routing using coupling relays for the analog bus. The eight lines of the system-wide analog measurement bus are available at all peripheral slots. They are used to temporarily interconnect DUT signals routed via switching modules and various measurement or stimulus modules that have access to the analog measurement bus. The implementation is a physically dedicated backplane located 160 mm from the digital CompactPCI/PXI backplane.

6 Software

The R&S TSVP is controlled entirely by the additionally installed software.

6.1 R&S GTSL

The Generic Test Software Library R&S GTSL is an ANSI-C compliant collection of libraries for specific test tasks like measurements, switching and signal generation. An ASCII file contains the relevant configuration data which can be assigned to certain test sequences.

Test application developers can use any software development suite capable to link to ANSI-C compliant libraries (dll's) to create their own test applications.

6.1.1 Functional description

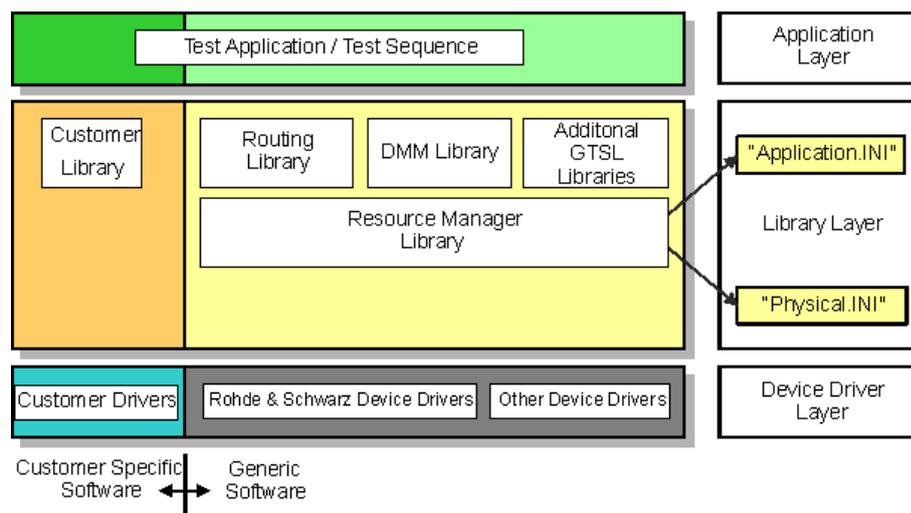


Figure 6-1: R&S GTSL layer model

In terms of its structure, the Generic Test Software Library R&S GTSL developed by Rohde & Schwarz is divided into different supply components and software layers.

We distinguish between the software components supplied by Rohde & Schwarz, and the components which must be supplied or adapted by the customer. The software components to be provided by the customer are specific to the customer and to the unit under test, for example:

- Device drivers
- Calibration data
- Test libraries
- Test sequences

The software used in the R&S GTSL is divided into three different layers.

- The **lowest level** of the R&S GTSL accommodates the device drivers needed for the used hardware (Device Driver Layer). They include the device drivers for the following hardware:
 - Hardware developed and used by Rohde & Schwarz
 - Standard hardware
- The **middle level** of the R&S GTSL accommodates the different test libraries (Library Layer). These test libraries provide the functions needed to execute test sequences. At this level, further information concerning the two files `PHYSICAL.INI` and `APPLICATION.INI` is transferred to the Resource Manager Library. The different device drivers of the lowest level are called from this level.
- The **highest level** accommodates the test sequences for the execution of the individual test functions (Application Layer). The test sequences call functions from the libraries in the middle level.

6.1.2 Configuration files

PHYSICAL.INI

In the file `PHYSICAL.INI` (Physical Layer Configuration File), all hardware assemblies available in the Generic Test Software Library are described along with the corresponding definitions and settings. This file also contains definitions which are applicable to all test applications to be executed on the system (e.g. type definition). The information entered in this file is used by all test libraries and thus by each test step.

The `PHYSICAL.INI` file normally exists only once in the system as it reflects the exact physical structure. The file is only modified if the hardware changes.

The Resource Manager calls and administers the information from the `PHYSICAL.INI` file.

APPLICATION.INI

In the `APPLICATION.INI` file (Application Layer Configuration File) is a description of how the individual test libraries and the test functions use the hardware components. Different hardware components can be combined into groups (bench). This bench can then be used within the test function. Furthermore, definitions are made in this file which apply to certain test applications to be executed on the system (e.g. definition of designations for multi-channel operation).

The Resource Manager calls and administers the information from the `APPLICATION.INI` file.

6.1.3 GTSL test libraries

- `AUDIOANL.DLL`, Audio Analysis

Used for RMS calculation, frequency calculation, distortion, filter- and comparator analysis

- `DCPWR.DLL`, DC Power Supply
Used for R&S TS-PSU and power supplies with IVI-compliant device drivers and for control of internal and external power supply units
- `DIOMGR.DLL`, Digital I/O Manager
Used for R&S TS-PDFT, R&S TS-PIO3B and modules using „IVI digital“ compliant device drivers.
Allows the creation of digital i/o bus topologies including more modules and a digital pattern configuration
- `DMM.DLL`, Digital Multi-meter
Used for R&S TS-PSAM and devices using „IVI DMM“ compliant device drivers
Allows the configuration and execution of analogue measurements (DCV, ACV, DCC, ACC, resistor)
- `FUNCGEN.DLL`, Function Generator
Used for R&S TS-PFG and devices using „IVI generator“ compliant drivers
Allows the creation of usual signals as sine, rectangle, triangle, the creation of arbitrary waveforms and the handling of sequences
- `SIGANL.DLL`, Signal Analyzer
Used for R&S TS-PAM and devices using „IVI scope“ compliant drivers
Allows the creation of WFA measurements and the readout of data and measurement results
- `RSMGR.DLL`, Resource Manager
Used for administration functions for any hardware defined in the `PHYSICAL.INI` file
- `ROUTE.DLL`, Signal Routing
Used for supporting functions for complex path management
Includes any switching module
NOTE:
Not in combination with `SWMGR.DLL`
- `SWMGR.DLL`, Switch Manager
Used for supporting functions to switch off single paths at single modules
NOTE:
Not in combination with `ROUTE.DLL`
- `ICT.DLL` and `ICCHECK.DLL`, In-Circuit Test
Used for supporting functions for In-Circuit and IC-Check test methods
- `FIXTCOMP.DLL`, Fixture Compensation
Provides functions to acquire and handle compensation values automatically for ICT measurements of small capacitors (together with the in-circuit test library).
- `FTBLIB.DLL`, Factory Toolbox
Used for supporting functions for R&S TS-PIO3B and extensions
- `SFT.DLL`, Self Test Support
Used for controlling functions for the execution of TSVP modules self test
- `TOOLKITTESTSTAND.DLL`, Toolkit TestStand
Used for supporting functions for test sequencer "TestStand" from National Instruments Corp.

- OPERINT.DLL, Operator Interface
Offers a configurable "TestStand" operator interface

6.2 R&S EGTSL

The Enhanced Generic Test Software Library R&S EGTSL is part of an extension to the Generic Test Software Library R&S GTSL. Using R&S EGTSL it is possible to prepare and perform in-circuit tests. The individual R&S EGTSL software components are arranged in individual layers exactly like R&S GTSL.

Note that the ICT test library (ict.dll) works until GTSL 3.42 only for 32 bit test applications.

6.2.1 Functional description

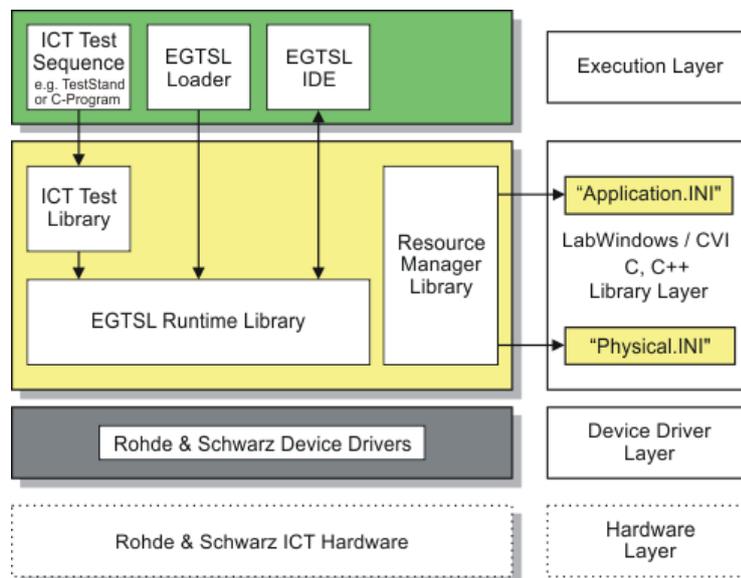


Figure 6-2: R&S EGTSL Layer Model

The bottom layer (device driver layer) of the R&S EGTSL contains the device drivers necessary for the test hardware used. The test hardware is accessed using these device drivers.

The middle layer (library layer) of the R&S EGTSL contains the ICT test library and the R&S GTSL runtime library. The ICT test library provides the functions necessary for performing the in-circuit test. Using the R&S GTSL runtime library (runtime engine) the internal R&S GTSL program processes are run. In this layer further information is passed to the resource manager library via the two files `PHYSICAL.INI` and `APPLICATION.INI`. The various device drivers from the lowest level are called from this layer.

The top layer (execution layer) contains the test sequences for performing the in-circuit test. The test sequences call functions from the ICT test library in the middle layer. The function calls include, e.g.

- Loading ICT programs
- Running ICT programs
- Debugging ICT programs
- Generating reports

The calls for the individual functions from the ICT test library can, e.g., be made using a sequence editor (TestStand) or a dedicated C program. The top layer (execution layer) also contains the R&S EGTSL Loader and the R&S EGTSL User Interface (R&S EGTSL IDE). The R&S EGTSL IDE is opened using the R&S EGTSL runtime library either by the R&S EGTSL Loader or a function call from the ICT test library.

6.2.2 Automatic test generation (ATG)

Using the Automatic Test Generator ATG utility, an executable ICT program is generated from the circuit description and the description of the available hardware. The program can be run in the Enhanced Generic Test Software Library R&S EGTSL. [Figure 6-3](#) shows the general sequence for automatic test generation using the Automatic Test Generator ATG.

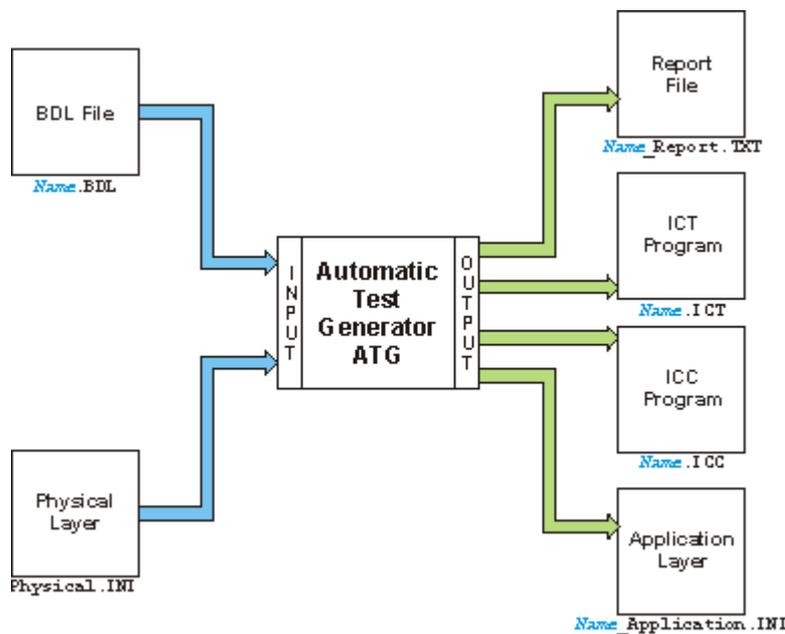


Figure 6-3: ATG sequence

The circuit description must be available in the BDL circuit description language. The test hardware available is described using the file `PHYSICAL.INI`. When the ATG is started, the file names for the BDL file (`Name.BDL`) and the file name for the Physical Layer Configuration File (`PHYSICAL.INI`) must be given.

Following the generation process, the ATG creates the following files:

- Name_Report.TXT
Report with the data on the generation process
- Name.ICT
ICT program for execution in R&S EGTSL
- Name.ICC
ICC program for execution in R&S IC-Check
- Name_Application.INI
Application Layer Configuration File for the execution of the ICT program generated in R&S EGTSL

Any errors that have occurred during the generation process are indicated in the report using error messages and warning messages. The ICT program and the ICC program is only created when there are no more error messages.

The result of the automatic test generation is essentially defined by realistic entry of the circuit description. The circuit description must correspond to the actual topology of the circuit. Otherwise, it cannot be ensured that the automatically generated ICT and ICC programs work.



The circuit description (BDL object) from which the automatically generated ICT and ICC programs are to be generated must be free of logical data entry errors. The defined circuit must correspond as far as possible to reality.

6.2.3 Test methods

Test Hardware

To perform the individual tests, the following test hardware is required.

- R&S TS-PSAM Source and Measurement Module
- R&S TS-PICT In-Circuit Test Module
The R&S TS-PICT In-Circuit Test Module is only required for the diode test, the impedance test and the guarded resistor test.
- R&S TS-PSU Power Supply/Load Module and R&S TS-PSU12 Power Supply/Load Module 12V
The R&S TS-PSU Power Supply/Load Module and the R&S TS-PSU Power Supply/Load Module 12V are only required for the zener diode test and the transistor beta test.
- R&S TS-PMB Matrix Module B
Used for the connection of the individual measuring pins (nodes). The measuring and stimulation hardware are connected to the Unit Under Test (UUT) using the R&S TS-PMB and the analog bus.

Ground Wiring

During the in-circuit tests, the UUT (Unit Under test) must be floating, i.e. it must not be connected with the ground of the test system. The correct ground wiring is shown in [Figure 6-4](#).

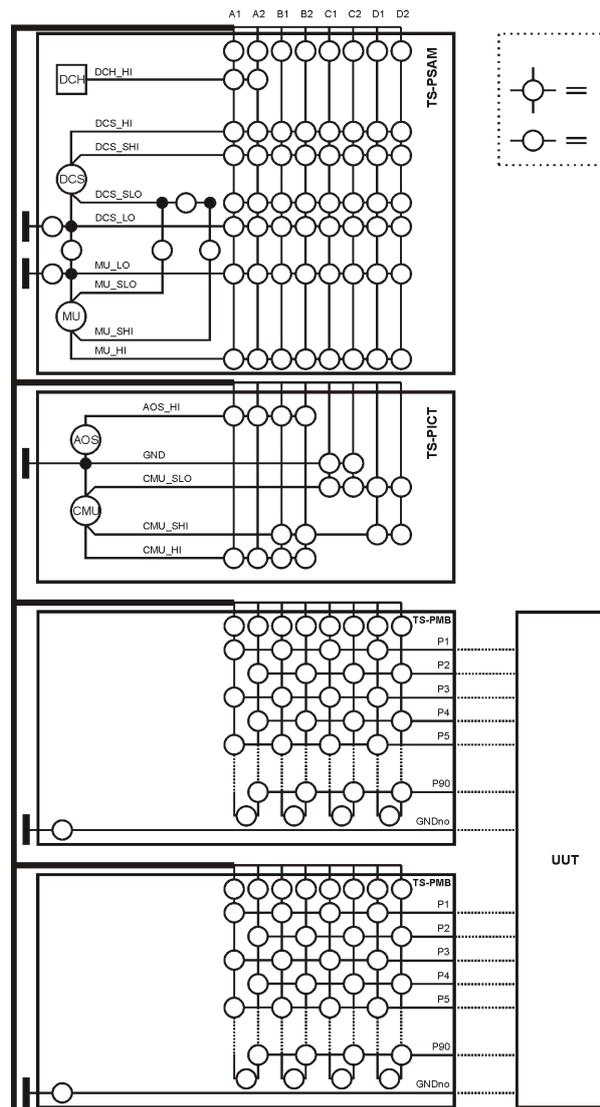


Figure 6-4: Test hardware

The ground of the UUT is connected with the GNDno connectors of the matrix card, e.g. using a relay with the system ground GND. During the in-circuit tests, these relays must be opened. For the function test, they can be closed.

- Contact Test
- Continuity Test
- Diode Test
- Discharging Capacitors
- FET Test
- Impedance Test
- Resistor Test
- Short-circuit Test
- Transistor Test

- Transistor Beta
- Zener Diode

6.3 R&S R&S IC-Check

Using Generic Test Software Library R&S IC-Check it is possible to prepare and perform tests on pins of ICs or other mounted electronic circuit devices. The individual R&S IC-Check software components are arranged in layers exactly like R&S GTSL.

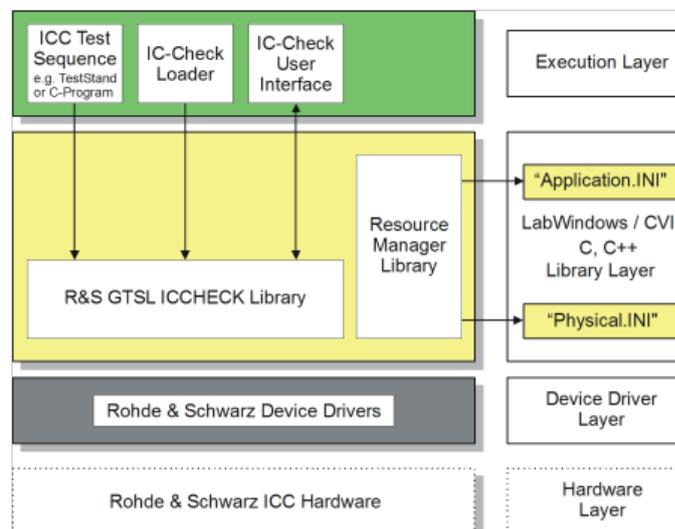


Figure 6-5: R&S IC-Check Layer Model

- The **bottom layer** (device driver layer) of the R&S IC-Check contains the device drivers necessary for the test hardware used. The test hardware is accessed using these device drivers.
- The **middle layer** (library layer) of the R&S IC-Check contains the R&S GTSL IC-Check library. The R&S IC-Check library provides the functions necessary for performing the IC-Check tests.
In this layer further information is passed to the resource manager library via the two files `PHYSICAL.INI` and `APPLICATION.INI`. The various device drivers from the lowest level are called from this layer.
- The **top layer** (execution layer) contains the test sequences for performing the IC-Check tests. The test sequences call functions from the R&S IC-Check test library in the middle layer. The function calls include, e.g.
 - Loading ICC programs
 - Running ICC programs
 - Debugging ICC programs
 - Generating reports

The calls for the individual functions from the R&S IC-Check test library can be made using a sequence editor (e.g. TestStand) or a dedicated C program.

The top layer (execution layer) also contains the R&S IC-Check Loader and the R&S IC-Check User Interface which is opened using a function call from the R&S IC-Check test library.

R&S IC-Check includes the following parts and programs:

- R&S IC-Check test library
- R&S IC-Check Loader
- R&S IC-Check User interface

6.3.1 Running R&S IC-Check

The Generic Test Software Library R&S IC-Check can be executed in two ways:

- By calling a function from the R&S IC-Check test library.
- Using the R&S IC-Check Loader.

Calling R&S IC-Check Test Library Functions

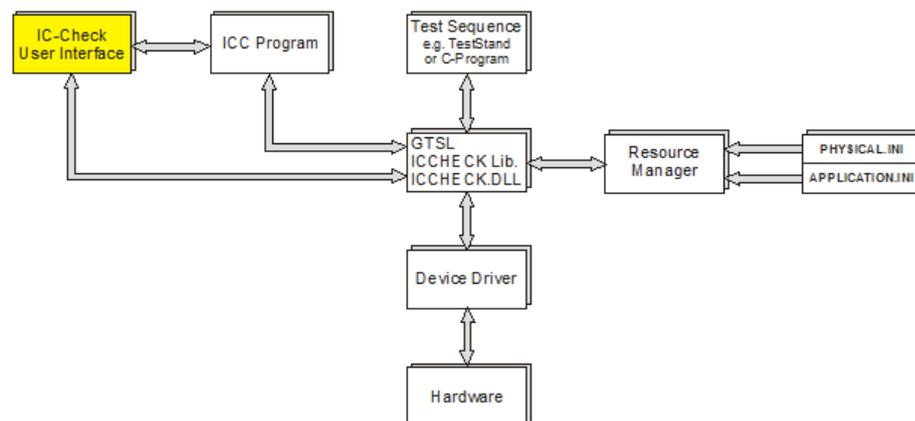


Figure 6-6: Running R&S IC-Check by calling R&S IC-Check library functions

R&S IC-Check test library functions are called from the test sequence (e.g. test sequence in a dedicated C program). The test hardware available is managed using the resource manager with the aid of the configuration files (`PHYSICAL.INI` and `APPLICATION.INI`). The R&S IC-Check library opens the R&S IC-Check User Interface and the corresponding ICC program. The ICC program opened can now be configured in the R&S IC-Check User Interface. The ICC program can be executed on the test hardware directly from the R&S IC-Check User Interface. An ICC program can also be loaded and executed without opening the R&S IC-Check User Interface.

Using the R&S IC-Check Check Loader

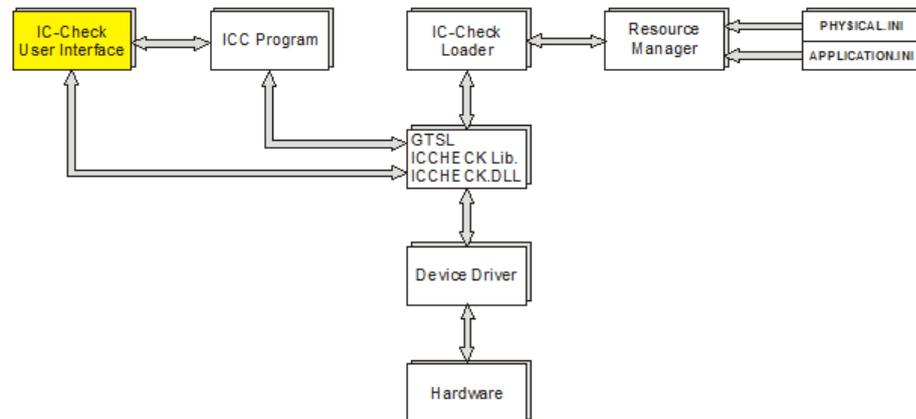


Figure 6-7: Running R&S IC-Check by starting R&S IC-Check Loader

The R&S IC-Check Loader initiates the function calls to the R&S IC-Check test library. In the R&S IC-Check Loader the names of the configuration files (`PHYSICAL.INI` and `APPLICATION.INI`) must be entered. Hardware management is performed using the resource manager. The R&S IC-Check Loader opens the R&S IC-Check User Interface and the selected ICC program. The ICC program can now be configured in the R&S IC-Check User Interface. The ICC program can be executed on the test hardware directly from the R&S IC-Check User Interface.

7 Plug-in test modules

The functionality of the R&S TSVP depends essentially on the installed plug-in modules and the related software. The R&S TSVP is suitable for all types of production tests.

The modules plugged into the R&S TSVP frames can be used to create test and control signals for the UUT, and to measure and evaluate the response from the UUT. Thus, they are able to pass signals between each other, to select signals under program control, and pass them to external measuring systems.

For details on the individual module types, see the module documentation (product brochures and manuals).

8 Shielding kit installation

The shielding kit provides sufficient shielding to comply to EMC regulations.

- For R&S CompactTSVP and R&S PowerTSVP, use the R&S TS-PSK1.
- For R&S ExpressTSVP, the shielding kit is already part of the delivery.

8.1 Installing the shielding kit (R&S ExpressTSVP)

The shielding kit is already part of the delivery and occupies one slot. You can install the shielding kit in slots A5, A6 or S3. The default location of the shielding kit depends on the device configuration, but usually it is installed in slot A5.

To install the shielding kit in another slot, proceed as follows.

1. Remove the two screws from the front with a Torx screwdriver.
2. Remove the two screws from the center of the shielding kit using a Torx screwdriver.
Note that you have to use a screwdriver that allows you to reach the screws inside the housing.
3. Remove the shielding kit.
4. Move the shielding kit to its new position.
5. Screw the shielding kit to the housing with the four screws.

8.2 Installing the shielding kit (R&S TS-PSK1)

1. Switch off the R&S TSVP.
2. **WARNING!** Risk of electric shock. UUT or additional power supplies connected to a module can apply hazardous active voltages to the module. If you touch a module with hazardous voltages applied, you risk an electric shock. Never install or uninstall modules while the instrument is connected to an external power supply or a UUT providing high voltages.

Disconnect the R&S TSVP from the power supply.

3. Remove the slot covers or modules from the required slots.

The number of slots you have to clear depends on the shielding kit version.

- Version 01 requires at least slots A1 to 4.
- Version 02 requires at least slots A1 to 8.
- Version 03 requires at least slots A1 to 12.
- Version 04 requires all slots.

Installing the shielding kit (R&S TS-PSK1)

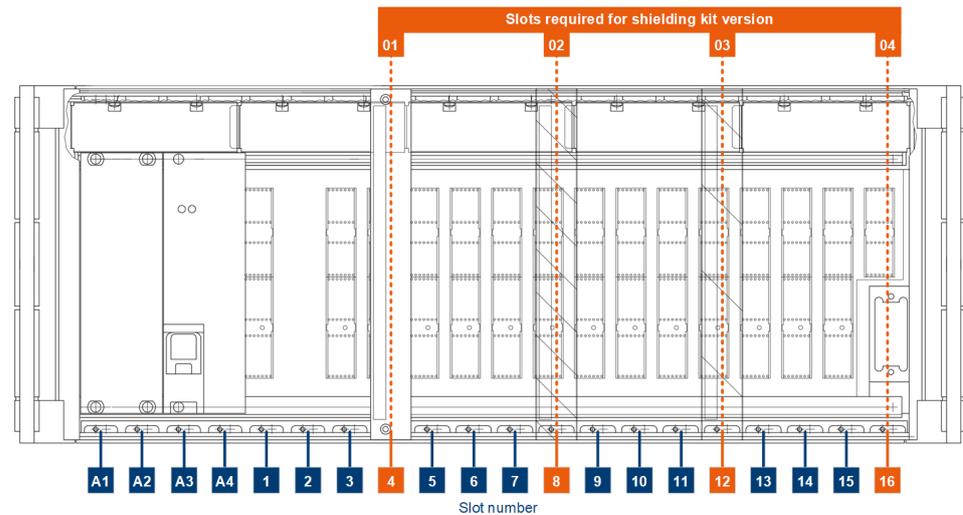


Figure 8-1: Slot requirement for installation of shielding kit

A1 to 16 = Front panel slot number

01 to 04 = Slot requirement for shielding kit versions 01 to 04

4. Screw in the screws that hold the elements to the backplane with two turns. The number of screws you have to use depends on the number of shielding kit elements you have to install. The number of shielding kit elements depends on the shielding kit version.



Figure 8-2: Mount shielding kit covers (front view)

1 = Screws that hold the shielding kit elements

2 = Shielding kit elements

5. Attach the shielding kit elements to the screws. Each element spans over two slots. Start with the element on the left and finish with the one on the right.
 - Version 01: Elements in slots A1 to 4.
 - Version 02: Elements in slots A1 to 8.
 - Version 01: Elements in slots A1 to 12.
 - Version 01: Elements in slots A1 to 16.

Installing the shielding kit (R&S TS-PSK1)

Note that the delivery has three different shielding kit elements.

- 1 x element for slots A1 to A4
- 3 x element for slots 1 to 12
- 1 x element for slots 13 to 16

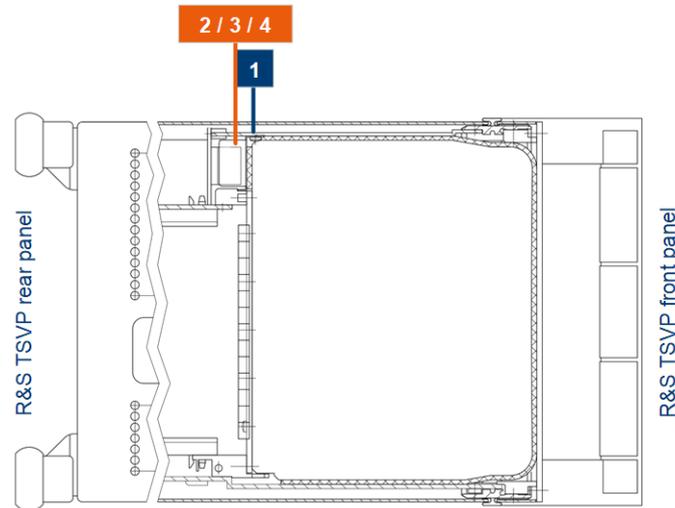


Figure 8-3: Mount shielding kit element (side view)

- 1 = Screws that hold the shielding kit elements
2 = Shielding kit elements

6. Tighten the screws to fasten the shielding kit elements to the R&S TSVP.
7. Finish the installation of shielding kit **versions 01 to 03**:



Figure 8-4: Finish shielding kit installation

- 1 = Shielding kit wall (required in version 01 to 03 only)
2 = Slot covers for shielding kit wall (required in version 01 to 03 only)
3 = Slot cover for slots next to power supply

- a) Insert the shielding kit wall (slightly diagonally) into the intended slot.
The slot depends on the shielding kit version.
 - For version 01: Insert the wall in slot 4.
 - For version 02: Insert the wall in slot 8.
 - For version 03: Insert the wall in slot 12.
 - b) Fasten the shielding kit wall to the backplate.
 - c) Screw the slot cover over the slot next to the shielding kit wall (slot 4, 8 or 12).
 - d) Screw the slot cover to the slot to left of the power supply (slot A1 and A2).
The slot covers are part of the base unit.
8. Finish the installation of shielding kit **version 04**:
Screw the slot cover to the slot next to the power supply (slot A1 and A2). The shielding kit wall is not required, because the shielding kit elements cover the whole instrument.
The slot cover is part of the base unit.
9. Insert modules as required or close the slots with their covers.

9 R&S TS-ISC in-system calibration module

The R&S TS-ISC In-System Calibration includes the following components:

- R&S TS-PCAL2 calibration module
- Adapter and cable
- TS-LISC software license



Figure 9-1: R&S TS-PCAL2 calibration module with adapter and cable

9.1 R&S TS-PCAL2 calibration module

The R&S TS-PCAL2 card provides the signals necessary for calibration.

The module includes the following components:

- Floating 5 V reference source
- Three reference resistors
- Ground referenced current source (adjustable up to 1 A)
- Floating signal generator
 - DC voltage in range -40 V to 40 V
 - AC sinusoid:
 - 0 V_{pp} to 80 V_{pp} in frequency range 20 Hz to 50 kHz
 - 0 V_{pp} to 2 V_{pp} in frequency range 20 Hz to 1 MHz
- Floating measuring system for voltage, current and resistance measurements

- Relay matrix for connecting the components to the analog bus lines on an R&S TS-PMB module installed in the front of the R&S TSVP

9.2 Cable and adapters

The following adapter components are used:

- Calibration adapter TS-PCALA
- Calibration adapter TS-PCALB
- Calibration adapter TS-PCALC
- Cable for connecting the adapters to the external multimeter

9.3 Usage

The TSVP In-System Calibration R&S TS-ISC enables the modules of the R&S CompactTSVP and R&S PowerTSVP production testing platforms to be calibrated in the system and readjusted, if required.

9.4 Requirements and restrictions

To allow calibration of the R&S TSVP modules in the system, the following requirements need to be met:

- R&S TS-PMB module (firmware version 03.01 or higher) installed
- Agilent multimeter 3458 A installed
- "High stability option 002" installed in Agilent multimeter 3458 A, if R&S TS-PIO2 modules are to be adjusted
- GPIB USB-HS or GPIB-PXI module from National Instruments installed
- Microsoft Windows installed
- Newest R&S GTSL version installed
- A printer must be installed

Calibration is carried out using special testing software.

To calibrate the high-power switching modules R&S TS-PSM3, R&S TS-PSM4 and R&S TS-PSM5, additional equipment is required, including:

- Appropriate power supply
- Calibration resistors
- Special cable sets
A suitable cable set is available under order number 5046.4869.00.

These components are not included in the R&S TS-ISC kit.

10 Test procedure examples

10.1 Standard test procedures

According to the test goals, different types of tests can be performed.

- **In-Circuit Test**
With an In-Circuit test, each component of a printed circuit board is tested separately. The adaptation between the test system and the DUT is realized via a bed of nails adapter.
- **Functional Test**
In a Functional Test, a specific input signal is supplied to the DUT. The related output signal is measured and compared to the expected output signal.
- **Cluster Test**
The Cluster test is a combination of an in-circuit test and a functional test. In general, this test method follows the In-Circuit test.
- **Performance Test**
The Performance test is an enhancement of the Functional test and is used for processor-controlled modules with bus structure. It offers additional capabilities for emulation and test of bus-oriented VLSI modules.

To set up a use case, the following standard steps must be performed.

1. Connect the required test modules for the test use case to the correct backplane of the production test platform.
2. Prepare the circuit documentation according to the available data for the DUT.
3. Export the circuit description from the CAD system automatically. Alternatively, enter the circuit description manually in a text file and save the description as BDL file.
4. Prepare the test program by the Automatic Test Generator ATG.
5. Prepare the adapter.
6. Perform the test.

10.2 Self test procedure

The "TSVP Self Test" utility can be used to check the proper function of any R&S TSVP module.

The self test utility is by default only available for R&S TSVP modules. Additionally, it is possible to enhance the self test library for other components. Therefore, a LabWindows CVI template is offered.



A complete description of each R&S TSVP module can be found in the R&S TSVP service manual.

To perform a self test, the following steps must be performed.

1. Open the "TSVP Self Test" utility via "GTSL" > "TSVP Self Test".

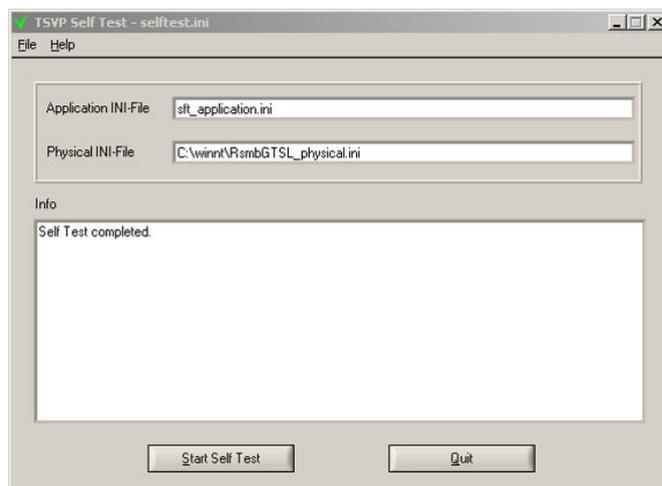


Figure 10-1: TSVP self-test - application.ini and physical.ini

- a) For "Application INI-File", add the path and the name of the selftest application.ini file.
 - b) For "Physical INI-File", add the path and the name of the physical.ini file.
2. Click "Start Self Test "to start the self test.
 3. In the window "Self Test Parts and Options", you can specify the following settings.

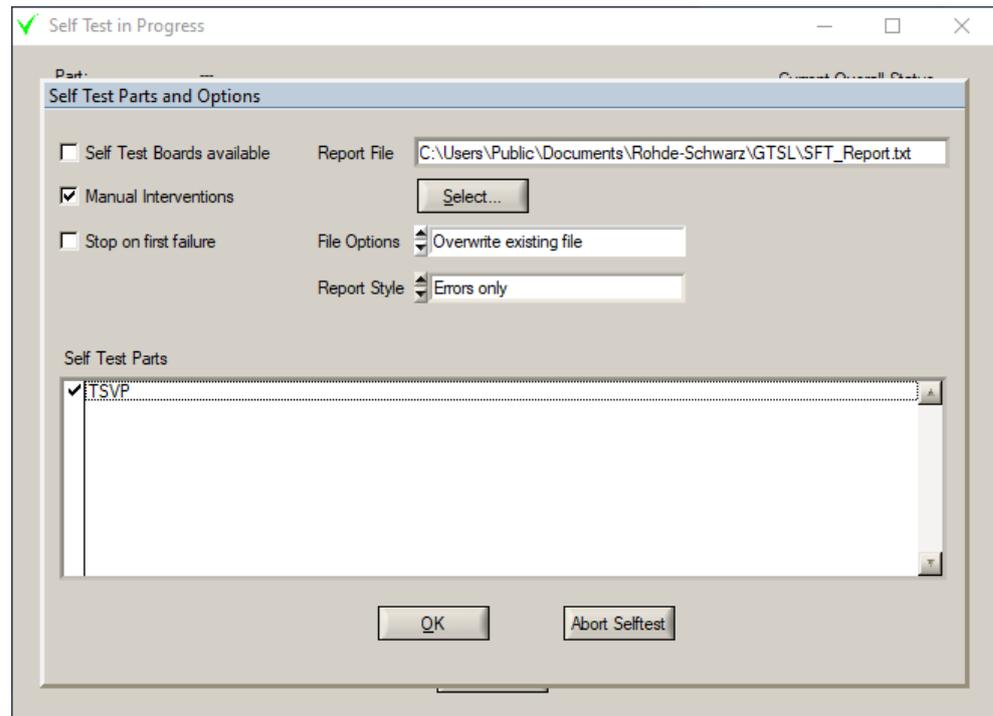


Figure 10-2: TSVP self-test - Parts and Options

- "Self Test Boards available"
If checked, an extended test with a specific test connector is enabled
 - "Manual Interventions"
If checked, some queries are displayed
 - "Stop on first failure"
If checked, the self-test stops after the first error or failure occurred
 - "Report File"
Select the path and name of the result file (ASCII format)
 - "Report Style"
Select the result logging options (*Log all* or *Errors only*)
 - "File options"
Select the required option
4. Click "OK".
 5. In the window "Part TSVP", select the modules to be tested. For "Check All", all available modules are checked.

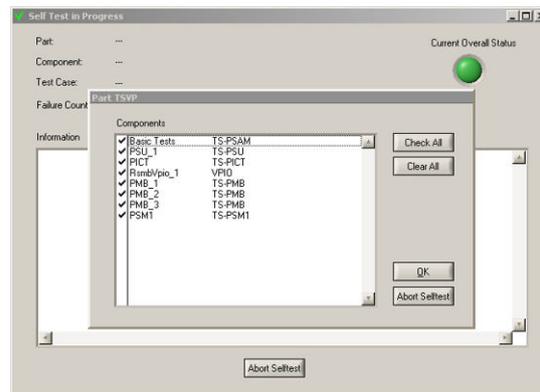


Figure 10-3: TSVP Self Test - Part TSVP

6. Click "OK".
7. After a successful self test, the message **Self Test Passed** is displayed in the window "Selftest Result". You can configure the following options.

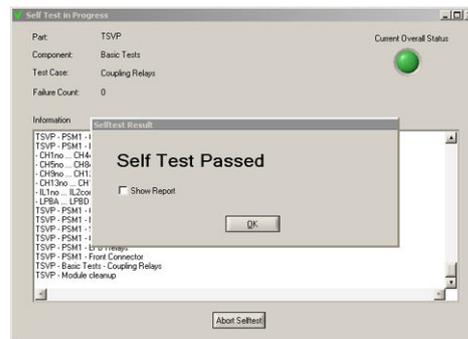


Figure 10-4: TSVP self-test - self-test result

- "Show Report"
If checked, the results are displayed in a text editor (e.g. notepad)



The capability to perform a nearby complete self test is available for Rohde & Schwarz TSVP modules only. But there is a specific self test template available to create customized and additional self tests for modules not yet included.

For a detailed description on how to implement own self test libraries, refer to the service manual and the R&S Generic Test Software Library user manual.

11 Troubleshooting installation

When you install or replace software or hardware components, incompatibilities can lead to system malfunctioning.

- Software components include firmware, R&S GTSL, runtime setup, Microsoft Windows or R&S TSVP In-System Calibration.
- Hardware components include new R&S TSVP modules, control computer or CompactPCI bridge solutions.

The following chapters describe known installation problems along with possible solutions.

- Different versions of Microsoft Windows require specific R&S GTSL versions. The dependencies are described in [Chapter 11.1, "Microsoft windows versions"](#), on page 77.
- Calibration of R&S TSVP modules requires a specific R&S GTSL version with the appropriate in-system calibration software, depending on the release date or revision status of the module. During the update process, various aspects must be considered. This process is described in [Chapter 11.2, "R&S TSVP in-system calibration"](#), on page 78.
- Depending on the hardware configuration, various problems can occur while installing or updating drivers. The driver concept for the CAN bus modules is described in [Chapter 11.3, "CAN bus modules \(VCI, R&S TS-PSYS1\)"](#), on page 83.
- Solutions to problems for systems with CompactPCI bridges (R&S TS PSC0 and R&S TS PSC07) are described in [Chapter 11.4, "Compact PCI bridges \(R&S TS-PSC08, R&S TS-PSC0 and R&S TS-PSC07\)"](#), on page 98.
- When replacing R&S TSVP modules, an R&S GTSL update can be necessary. New modules possibly require new driver versions. These dependencies are described in [Chapter 11.5, "R&S GTSL device driver updates"](#), on page 102.
- The next chapters cover aspects related to the license viewer and displaying the R&S GTSL documentation.
- Solutions to problems with the runtime setup are described in [Chapter 11.8, "Runtime setup"](#), on page 107
- TS-PSC6W issues are described in [Chapter 11.9, "TS-PSC6W \(CP3004\) system controller"](#), on page 109
- Windows 10 topics are handled in [Chapter 11.10, "Windows 10 topics"](#), on page 112

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11.1 Microsoft windows versions

Table 11-1 indicates which R&S GTSL versions are suitable for the installed version of Microsoft Windows. It also includes the appropriate runtime setup (VISA runtime, IVI compliance package, CVI runtime engine, R&S TS-PSYS driver etc.).



On Windows 10 computers with the secure boot feature activated, Windows no longer boots up if the R&S TS-PSYS driver VCI version 3.x is installed. In this case, deactivate the secure boot feature in the BIOS.

The R&S TS-PSYS driver VCI version 4.x is suitable for Windows 10 and Windows 11 with the secure boot feature activated. However, this driver only supports the current version of R&S TS-PSYS1 (material number 1157.9910.10).

Table 11-1: Microsoft Windows version dependencies

Windows version	R&S GTSL version	Date
Windows 2000 (obsolete)	02.71	10.2007
Windows XP (obsolete)	02.80	07.2008
	02.81	12.2008
	02.82	02.2009
	02.90	11.2009
	02.91	11.2010
	02.92	10.2011
Windows XP (obsolete)	03.00	09.2012
Windows 7 (obsolete)	03.10	04.2013
	03.21	07.2014
	03.30	11.2014
	03.31	04.2016
	03.32	09.2016
Windows 7 (obsolete)	03.33	10.2017
Windows 10	03.34	09.2018
Windows 10 and Windows 11 with secure boot feature activated	03.40	01.2020

Windows version	R&S GTSL version	Date
	03.41	07.2021
	03.42	09.2023

11.2 R&S TSVP in-system calibration

The "in-system calibration" software is used to calibrate the R&S TSVP modules. It basically consists of the test program (010075_pa.exe) and the R&S Test Management Software G5. The test program uses the R&S GTSL device drivers and the R&S Test Management Software G5. Therefore, always use the components that are supplied as part of an R&S GTSL version together.

To calibrate R&S TSVP modules, always use the "in-system calibration" software in the latest R&S GTSL version. It supports new modules and the latest revision status of components.

11.2.1 Overview

Table 11-2: Required R&S GTSL version for calibration of specific modules

Version R&S GTSL	Date	Version test program	Version R&S Test Management Software G5	Features / changes
R&S GTSL 2.80	10.2008	05.02	02.48	<ul style="list-style-type: none"> Windows 2000 and Windows XP compatible
R&S GTSL 2.82	09.2009	05.05	02.48	<ul style="list-style-type: none"> Improvements for R&S TS-PAM, R&S TS-PIO2, R&S TS-PSAM and R&S TS-PSU
R&S GTSL 2.90	12.2009	05.08	02.54	<ul style="list-style-type: none"> Windows 2000 and Windows XP compatible Improvement for R&S TS-PCALB, R&S Test Management Software G5 version 02.54
R&S GTSL 2.92	10.2010	05.11	02.54	<ul style="list-style-type: none"> Minor changes
R&S GTSL 3.00	09.2012	05.12	02.54	<ul style="list-style-type: none"> Support for R&S TS-PAM 1157.9410.02 R&S Test Management Software G5 version 07.02 for Windows 7
R&S GTSL 3.10	04.2013	05.15	07.02 02.54	<ul style="list-style-type: none"> Support for R&S TS-PSM3
R&S GTSL 3.21	07.2014	05.36	07.02 02.54	<ul style="list-style-type: none"> Support for R&S TS-PSM4 and R&S TS-PSM5

Version R&S GTSL	Date	Version test program	Version R&S Test Management Software G5	Features / changes
R&S GTSL 3.30	10.2014	05.37	02.54 10.16	<ul style="list-style-type: none"> New R&S Test Management Software G5 version 10.16 for Windows 7 Minor changes
R&S GTSL 3.31	05.2016	05.39	10.34	<ul style="list-style-type: none"> New R&S Test Management Software G5 version 10.34 for Windows XP and Windows 7 Support for R&S TS-PFG 1157.9610.02 Support for R&S TS-PICT from revision 4-00 (label 01.6.4-00)
R&S GTSL 3.32	09.2016	05.40	10.34	<ul style="list-style-type: none"> Support for R&S TS-PIO4 and R&S TS-PIO5
R&S GTSL 3.33	10.2017	05.41	11.11	<ul style="list-style-type: none"> New R&S Test Management Software G5 version 11.11 for Windows 7 and Windows 10 Support for R&S TS-PSYS1 1157.9910.10 Support for R&S TS-PSAM revision status from 6.00
R&S GTSL 3.34	09.2018	05.44	11.30	<ul style="list-style-type: none"> New R&S Test Management Software G5 version 11.30 for Windows 7 and Windows 10 Improvements for R&S TS-PIO4, R&S TS-PIO5 Support for alignment R&S TS-PSAM modules from revision status 6.00 R&S TS-PSAM offset error correction improved for AC voltage measurements -
R&S GTSL 3.40	01.2020	5.51	11.43	<ul style="list-style-type: none"> Compliant to ISO 17025:2017
R&S GTSL 3.41	07.2021	5.58	12.12	ISC software creates a TS-PICT protocol compliant to ISO 17025:2017
R&S GTSL 3.42	09.2023	6.00	12.13	<ul style="list-style-type: none"> Add calibration and adjustment date to the module eeprom after new calibration For R&S TS-PSM3/4/5 modules: Flash memory customized routine possible

11.2.2 Updating the R&S test management software G5

When updating the R&S Test Management Software G5 associated with the R&S TSVP in-system calibration solution, incompatibilities can arise when updating an old installation to a newer version. To prevent such problems, certain components must be manually uninstalled or deleted before updating the software (depending on the installed R&S Test Management Software G5 version).

Components can be uninstalled in the Windows control panel in the "Programs and Features" section.

The computer must be rebooted before installing the new software.

R&S GTSL versions 2.80 to 3.21 under Windows XP

This R&S Test Management Software G5 version must be manually uninstalled before installing a newer version.

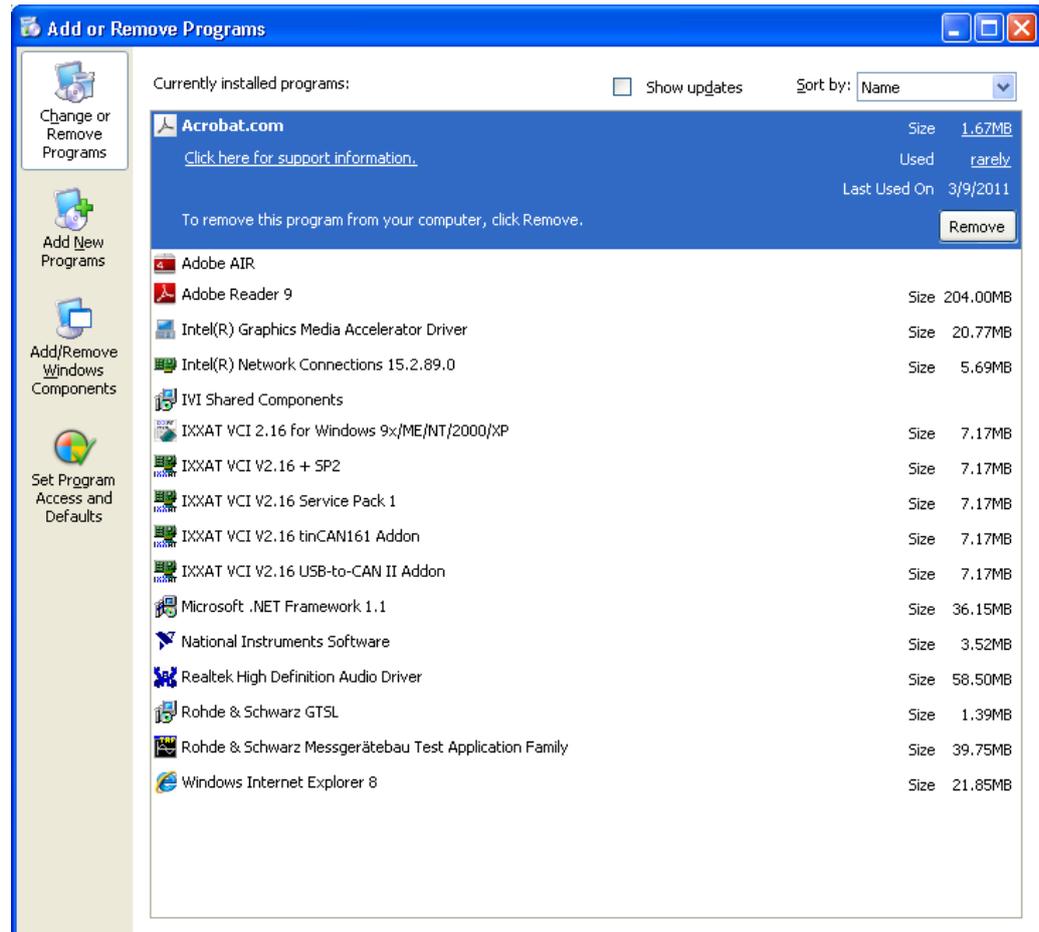


Figure 11-1: Installed R&S Test Management Software G5 components R&S GTSL 2.80 to 3.21 under Windows XP.

1. Uninstall "R&S Messgerätebau Test Application Family".
The computer automatically reboots.
2. Delete the following files and folders with the file manager:
 - C:\Windows\TESTSYSTEM.IN_
 - C:\Windows\TESTSYSTEM.INI
 - C:\Windows\system32\Rsmg5Util07.dll
 - C:\Program Files\Rohde&Schwarz\RsdmbTestApplication\TestSystem (complete folder)

R&S GTSL versions 3.00 to 3.21 under Windows 7

This R&S Test Management Software G5 version must be manually uninstalled before installing a newer version.

Name	Publisher	Installed On	Size	Version
Adobe Reader X MUI	Adobe Systems Incorporated	11/5/2012	470 MB	10.0.0
IVI Shared Components		10/25/2012		
DXAT VCI 2.20.761.0	DXAT Automation GmbH	11/5/2012	25.3 MB	2.20.761.0
DXAT VCI 3.4.1.3080	DXAT Automation GmbH	11/5/2012	33.3 MB	3.4.1.3080
Microsoft Visual C++ 2008 Redistributable - x64 9.0.30729.17	Microsoft Corporation	11/5/2012	788 KB	9.0.30729
Microsoft Visual C++ 2008 Redistributable - x64 9.0.30729.6161	Microsoft Corporation	8/25/2017	788 KB	9.0.30729.6161
MSXML 4.0 SP2 (KB973688)	Microsoft Corporation	11/5/2012	1.34 MB	4.20.9876.0
National Instruments - Software	National Instruments	10/25/2012		
R&S Messgerätebau Microsoft Devcon	Rohde & Schwarz Messgeräteba...	11/5/2012	44.0 KB	1.00.0000
R&S Messgerätebau Test Manager G5 Kernel	Rohde & Schwarz Messgeräteba...	11/5/2012	12.0 MB	1.00.0002
R&S Messgerätebau Test Manager G5 Kernel Documents	Rohde & Schwarz Messgeräteba...	11/5/2012	5.35 MB	1.00.0002
R&S Messgerätebau Test Manager G5 Tweak	Rohde & Schwarz Messgeräteba...	11/5/2012	436 KB	1.00.0000
R&S Messgerätebau Test Manager G5 Tweak Documents	Rohde & Schwarz Messgeräteba...	11/5/2012	200 KB	1.00.0000
R&S Messgerätebau Test Manager GIP	Rohde & Schwarz Messgeräteba...	11/5/2012	852 KB	1.00.0000
R&S Messgerätebau Test Report Manager	Rohde & Schwarz Messgeräteba...	11/5/2012	7.29 MB	1.00.0001
R&S Messgerätebau Test Report Manager Runtime Engine	Rohde & Schwarz Messgeräteba...	11/5/2012	12.5 MB	1.00.0000
R&S Messgerätebau Tms Suite First Setup	Rohde & Schwarz Messgeräteba...	11/5/2012	2.03 MB	1.00.0002
R&S Messgerätebau Tms Suite Last Setup	Rohde & Schwarz Messgeräteba...	11/5/2012	2.02 MB	1.00.0002
R&S Messgerätebau Utility	Rohde & Schwarz Messgeräteba...	11/5/2012	1.96 MB	1.00.0001
Rohde & Schwarz GTSL	Rohde & Schwarz GmbH & Co. ...	11/5/2012		03.00
VISA Shared Components 64-Bit		10/25/2012		

Figure 11-2: Installed R&S Test Management Software G5 components R&S GTSL 3.00 to 3.21 under Windows 7

1. Uninstall the following components in the following order.
 - a) "R&S Messgerätebau Test Report Manager Runtime Engine"
 - b) "R&S Messgerätebau Tms Suite Last Setup"
 - c) "R&S Messgerätebau Microsoft Devcon"
 - d) "R&S Messgerätebau Utility"
 - e) "R&S Messgerätebau Test Report Manager"
 - f) "R&S Messgerätebau Test Manager GIP"
 - g) "R&S Messgerätebau Test Manager G5 Kernel Documents"
 - h) "R&S Messgerätebau Test Manager G5 Tweak Documents"
 - i) "R&S Messgerätebau Test Manager G5 Tweak"
 - j) "R&S Messgerätebau Test Manager G5 Kernel"
 - k) "R&S Messgerätebau Tms Suite First Setup"
2. Reboot the computer.
3. Delete the following files and folders with the file manager:
 - C:\Rohde-Schwarz\RSDMB\Config\RsdmbSetupSuite.ini
 - C:\Rohde-Schwarz\RSDMB\Config\TESTSYSTEM.INI

R&S GTSL version 3.30 under Windows XP

See "R&S GTSL versions 2.80 to 3.21 under Windows XP" on page 80.

R&S GTSL version 3.30 under Windows 7

For this version, the disk must be cleaned up before the update and the computer rebooted.

R&S Messgeräteeau Test Management Software Runtime	Rohde & Schwarz Messgeräteea...	12.09.2014	124 MB	1.00.0027
R&S Messgeräteeau Test Management Software Runtime Documents	Rohde & Schwarz Messgeräteea...	12.09.2014	6,71 MB	1.00.0014

Figure 11-3: Installed R&S Test Management Software G5 components R&S GTSL 3.30 under Windows 7

1. Uninstall the following components in the following order.
 - a) "R&S Messgeräteeau Test Management Software Runtime Documents"
 - b) "R&S Messgeräteeau Test Management Software Runtime"
2. Reboot the computer.
3. Delete the following files and folders with the file manager:
 - C:\Windows\TESTSYSTEM.INI
 - \Program Files (x86)\Rohde-Schwarz\RSDMB (complete folder)
 - C:\Rohde-Schwarz\RSDMB\G5 (complete folder)
 - C:\Rohde-Schwarz\RSDMB\Config (complete folder)

R&S GTSL versions 3.31 and 3.32

Manual uninstallation is not required when updating to R&S GTSL 3.34.

R&S Test Management Software Defaults	Rohde & Schwarz	16.04.2018	2,17 MB	1.00.0005
R&S Test Management Software Documents	Rohde & Schwarz	16.04.2018	8,97 MB	1.00.0026
R&S Test Management Software Run-Time Engine	Rohde & Schwarz	16.04.2018	140 MB	1.00.0078

Figure 11-4: Installed R&S Test Management Software G5 components R&S GTSL 3.31 and 3.32

R&S GTSL versions 3.33 and 3.34

Manual uninstallation is not required when updating to R&S GTSL 3.40.

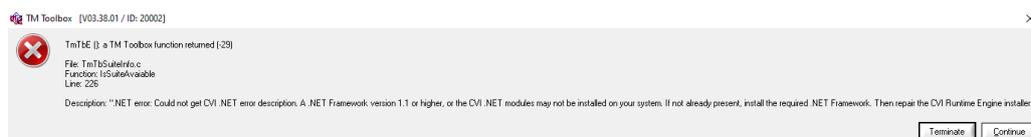
R&S Test Management Software Defaults	Rohde & Schwarz	10.09.2018	2,18 MB	1.00.0010
R&S Test Management Software Documents	Rohde & Schwarz	10.09.2018	7,08 MB	1.00.0033
R&S Test Management Software Run-Time Engine	Rohde & Schwarz	17.09.2018	161 MB	1.00.0105

Figure 11-5: Installed R&S Test Management Software G5 components R&S GTSL 3.33 and 3.34

11.2.3 TM toolbox error -29

Problem:

When starting the „in-system calibration“ software, the following error message appears:



Solutions:

Wrong CVI Runtime version installed

The In-System Calibration software (Suite version V11.43) included in GTSL 3.40 requires the LabWindows/CVI Run-Time Engine 2017 from the included runtime setup folder. A newer version is not compatible.

Wrong Installation Order

If CVI Runtime Engine has been installed without .Net Framework 3.5 available on the system, any subsequent call of GTSL In-System-Calibration leads to an initialization error.

In this case, install .Net Framework 3.5 on the system and then uninstall and install CVI Runtime Engine again. Uninstall can be done in "ControlPanel - Add/Remove Software - National Instruments Software - Modify/Delete".

Note: Reinstalling or repairing does NOT fix this problem.

11.3 CAN bus modules (VCI, R&S TS-PSYS1)

11.3.1 Overview

The CAN modules (e.g. R&S TS-PMB) are controlled by the CAN controller on the R&S TS-PSYS1 module.

The R&S TS-PSYS1 module comes in two versions:

- R&S TS-PSYS1 1152.4004.02 (obsolete)
- R&S TS-PSYS1 1157.9910.10

The R&S GTSL device drivers (for example `rspmb.dll`) are only able to control the CAN modules, when the Windows driver for R&S TS-PSYS1 is installed correctly. The Windows driver is installed via the "Runtime Setup" in the R&S GTSL package. The driver software (VCI_...) is located in the subfolder "TS-PSYS Driver". See also [Chapter 11.5.5, "R&S TS-PSYS1 system module"](#), on page 105.

Starting with R&S GTSL 03.33 (VCI 3.5.4.4592), both cards are officially supported. However, the module R&S TS-PSYS1 1157.9910.10 can also be used starting with VCI version 3.5.2.4268 (R&S GTSL 03.31). We recommend using the newer version.

The module R&S TS-PSYS1 1152.4004.02 is no longer supported by VCI version 4.

Use the R&S TS-PSYS1 1157.9910.10 module with VCI version 4 in the following cases:

- The control computer uses Windows 10 with an active secure boot feature
- To use a 32-bit or 64-bit application

Before upgrading to a newer VCI version, remove the older versions using the control panel.

Table 11-3: VCI versions

VCI version	R&S GTSL version	rscan.dll version	Supported R&S TS-PSYS1	Windows version
VCI 2.16 + SP2	Up to 02.92	1.x	R&S TS-PSYS1 1152.4004.02	XP
VCI 3.4.1.3080 and VCI 2.20.761.0	From 03.00 to 03.20	1.x	R&S TS-PSYS1 1152.4004.02	XP and Windows 7
VCI 3.5.2.4072 and VCI 2.20.851.0	From 03.21 to 03.30	1.x	R&S TS-PSYS1 1152.4004.02	XP and Windows 7
VCI 3.5.2.4268	03.31	2.x	R&S TS-PSYS1 1152.4004.02 R&S TS-PSYS1 1157.9910.10	XP and Windows 7
VCI 3.5.4.4546	03.32	2.x	R&S TS-PSYS1 1152.4004.02 R&S TS-PSYS1 1157.9910.10	XP and Windows 7
VCI 3.5.4.4592	From 03.33 to 03.34	2.x	R&S TS-PSYS1 1152.4004.02 R&S TS-PSYS1 1157.9910.10	Windows 7 and Windows 10
VCI 4.0.793.0	3.40 3.41	2.x	R&S TS-PSYS1 1157.9910.10	Windows 7 and Windows 10 (with and without secure boot activated) 32-bit and 64-bit applications
VCI 4.0.1003.0	3.42	2.x	R&S TS-PSYS1 1157.9910.10	Windows 10 and 1 (with secure boot activated) 32-bit and 64-bit applications

11.3.2 Software layers

The R&S GTSL device drivers (e.g. `rspmb.dll`) do not directly access the VCI layer. The CAN driver `rscan.dll` is present between device driver DLL and VCI.

`rscan.dll` is available in the main versions 1.x and 2.x. The version 1.x uses the interface of VCI layer version 2. The versions `rscan.dll` 2.x use the interface of VCI layer version 3.

Windows XP up to R&S GTSL 2.92

VCI version 2 is used by the R&S GTSL device drivers via `rscan.dll` version 1.x.

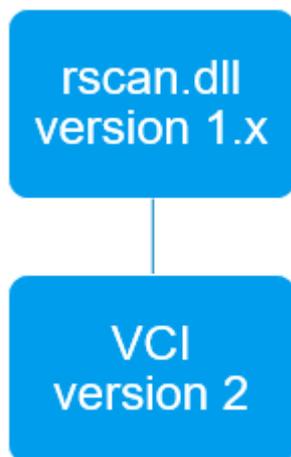


Figure 11-6: Call hierarchy up to R&S GTSL 2.92.

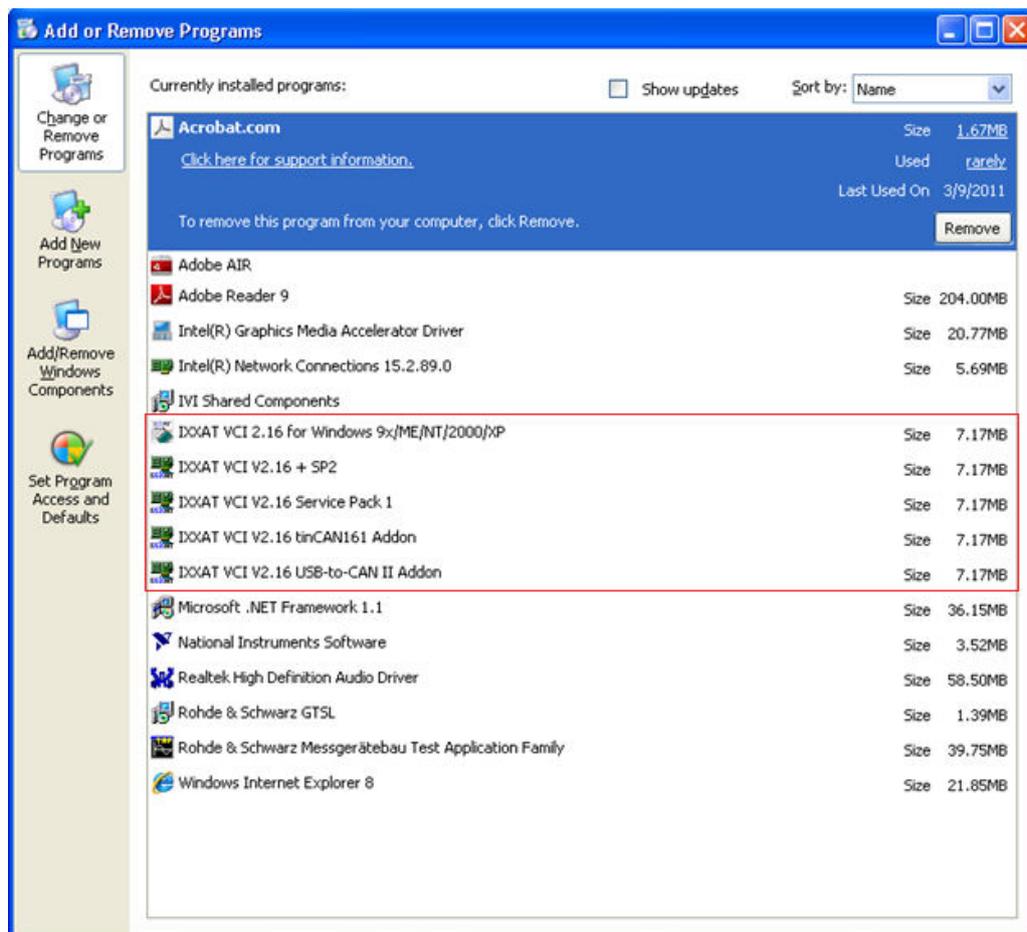


Figure 11-7: Entries in control panel – Programs and Features

Before installing VCI 3 (with or without VCI 2 wrapper), uninstall the VCI 2.16 components manually.

1. Uninstall the VCI 2.16 components in the following order.
Do not reboot the computer between the following steps.
 - a) Remove "IXXAT VCI V2.16 USB-To-CAN II Addon".
 - b) Remove "IXXAT VCI V2.16 tinCAN161 Addon".
 - c) Remove "IXXAT VCI 2.16 for Windows 9x/ME/NT/2000/XP".
 - d) Remove "IXXAT VCI V2.16 + SP2".
2. Reboot the computer.
This removes "IXXAT VCI V2.16 Service Pack 1".

Tip: If "R&S Messgerätebau Test Application Family" is also removed, an automatic reboot is performed while uninstalling this application.

Windows 7, Windows XP from R&S GTSL 3.00 to R&S GTSL 3.30

VCI 2 wrapper and VCI 3 are installed. The `rscan.dll` version 1.x calls the VCI 2 wrapper.

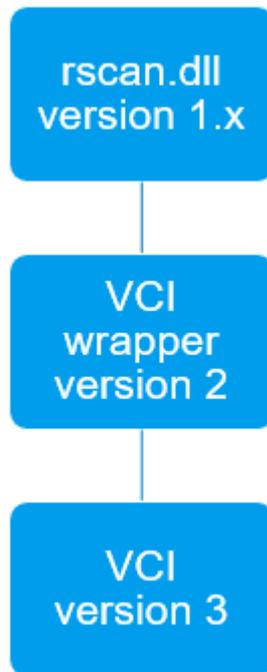


Figure 11-8: Call hierarchy from R&S GTSL 3.00 to R&S GTSL 3.30.

The wrapper and VCI 3.x appear in the list of programs.

Name	Publisher	Installed On	Size	Version
Adobe Reader X MUI	Adobe Systems Incorporated	11/5/2012	470 MB	10.0.0
IVI Shared Components		10/25/2012		
IXXAT VCI 2.20.761.0	IXXAT Automation GmbH	11/5/2012	25.3 MB	2.20.761.0
IXXAT VCI 3.4.1.3080	IXXAT Automation GmbH	11/5/2012	33.3 MB	3.4.1.3080
Microsoft Visual C++ 2008 Redistributable - x64 9.0.30729.17	Microsoft Corporation	11/5/2012	788 KB	9.0.30729
Microsoft Visual C++ 2008 Redistributable - x64 9.0.30729.6161	Microsoft Corporation	8/25/2017	788 KB	9.0.30729.6161
MSXML 4.0 SP2 (KB973688)	Microsoft Corporation	11/5/2012	1.34 MB	4.20.9876.0
National Instruments - Software	National Instruments	10/25/2012		
R&S Messgerätebau Microsoft Devcon	Rohde & Schwarz Messgeräteba...	11/5/2012	44.0 KB	1.00.0000
R&S Messgerätebau Test Manager G5 Kernel	Rohde & Schwarz Messgeräteba...	11/5/2012	12.0 MB	1.00.0002
R&S Messgerätebau Test Manager G5 Kernel Documents	Rohde & Schwarz Messgeräteba...	11/5/2012	5.35 MB	1.00.0002
R&S Messgerätebau Test Manager G5 Tweak	Rohde & Schwarz Messgeräteba...	11/5/2012	436 KB	1.00.0000
R&S Messgerätebau Test Manager G5 Tweak Documents	Rohde & Schwarz Messgeräteba...	11/5/2012	200 KB	1.00.0000
R&S Messgerätebau Test Manager GIP	Rohde & Schwarz Messgeräteba...	11/5/2012	852 KB	1.00.0000
R&S Messgerätebau Test Report Manager	Rohde & Schwarz Messgeräteba...	11/5/2012	7.29 MB	1.00.0001
R&S Messgerätebau Test Report Manager Runtime Engine	Rohde & Schwarz Messgeräteba...	11/5/2012	12.5 MB	1.00.0000
R&S Messgerätebau Tms Suite First Setup	Rohde & Schwarz Messgeräteba...	11/5/2012	2.03 MB	1.00.0002
R&S Messgerätebau Tms Suite Last Setup	Rohde & Schwarz Messgeräteba...	11/5/2012	2.02 MB	1.00.0002
R&S Messgerätebau Utility	Rohde & Schwarz Messgeräteba...	11/5/2012	1.96 MB	1.00.0001
Rohde & Schwarz GTSL	Rohde & Schwarz GmbH & Co. ...	11/5/2012		03.00
VISA Shared Components 64-Bit		10/25/2012		

Figure 11-9: Entries in control panel – Programs and Features.

Before installing VCI 3.5, uninstall the old IXXAT components manually.

1. Remove IXXAT VCI 2.20.761.0.
2. Remove IXXAT VCI 3.4.1.3080.
3. Reboot the computer.

Windows 7, Windows XP from R&S GTSL 3.31

rscan.dll version 2.x directly calls the VCI 3 layer. The VCI 2 wrapper is no longer needed. Uninstall it.

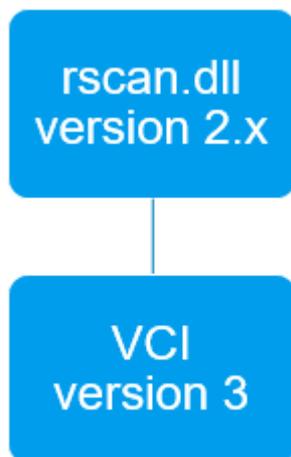


Figure 11-10: Call hierarchy from R&S GTSL 3.31.

Only one entry is left in the list of programs.

Program Name	Company	Installation Date	Size	Version
IXXAT VCI 3.5.2.4268	IXXAT Automation GmbH	10.06.2016	36,3 MB	3.5.2.4268

Figure 11-11: Entries in control panel – Programs and Features.

11.3.3 Troubleshooting CAN bus modules

After installing the runtime setup and the R&S GTSL software, the R&S TSVP soft panel must at least display the CAN module R&S TS-PSYS1 for an R&S CompactTSVP. If additional CAN modules are installed, they are also listed:

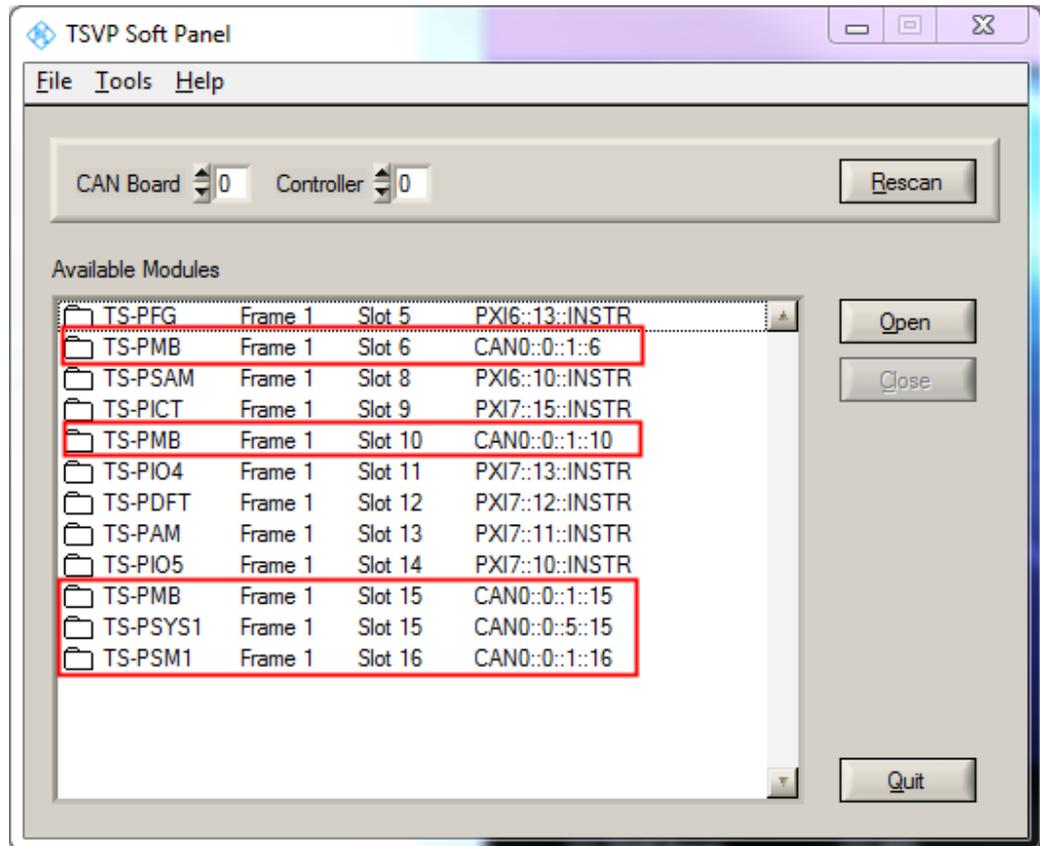


Figure 11-12: R&S TSVP soft panel

If no CAN module is displayed, there can be various reasons for the problem.

The troubleshooting process depends on the system configuration.

Systems with R&S TS-PSYS1 1152.4004.02 (obsolete)

The entry `IXXAT VCI V3 Interfaces` must appear in the device manager. "VCI3 RS TS PSYS1/PCI" are visible as a subentry below it. This is the case only if the "VCI 3..." driver is correctly assigned to the TS PSYS1 card.



This version (1152.4004.02) of the R&S TS-PSYS1 is no longer supported by VCI version 4.

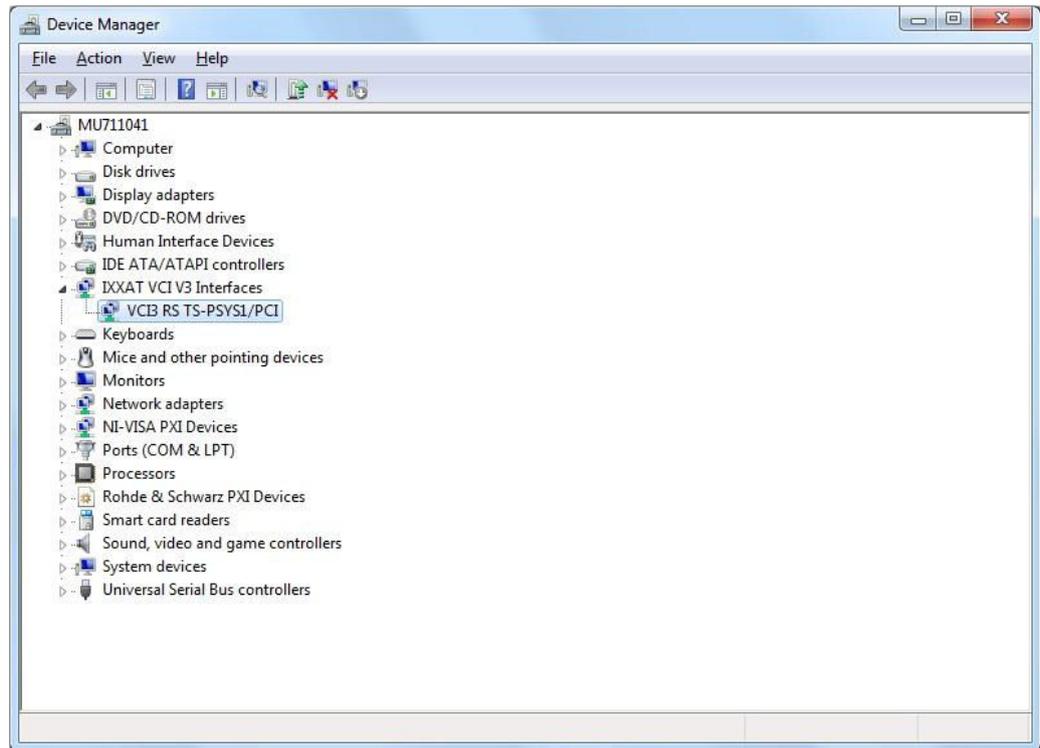


Figure 11-13: R&S TS-PSYS1 1152.4004.02 in the device manager.

In certain cases, the correct driver is not automatically assigned by the operating system to the R&S TS-PSYS1 card. The following error scenarios have occurred.

Problem with the driver installation VCI3 RS TS-PSYS1/PCI

During installation of the R&S TS-PSYS1 driver (runtime setup of R&S GTSL version VCI 2.16 + SP2 or newer), the component for the R&S TS-PSYS1 module was not copied to the hard disk. On Windows 7, each driver must sometimes be confirmed manually. In rare cases (depending on the VCI version and operating system), the "Always trust ..." checkbox does not have any effect.

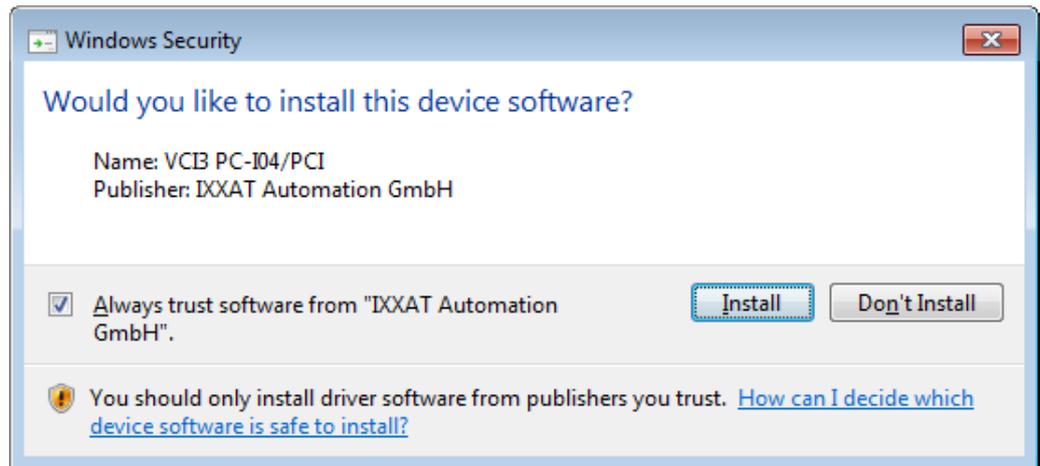


Figure 11-14: VCI3 driver installation.

Make sure that the "VCI3 RS TS-PSYS1/PCI" driver is installed.

PLX custom driver is assigned

If the control computer (internal or external with CompactPCI bridge) is booted up, Windows 7 detects the presence of the R&S TS-PSYS1 card and attempts to assign a driver to it. If R&S GTSL (and thus the "IXXAT VCI 3..." driver) was not yet installed on the PC, the operating system can assign another "suitable" driver to the R&S TS-PSYS1 card. For example, "PLX Custom PCI 9050/9052 Board" can be considered as a suitable driver since there is a PLX 9050 chip on the R&S TS-PSYS1 card.

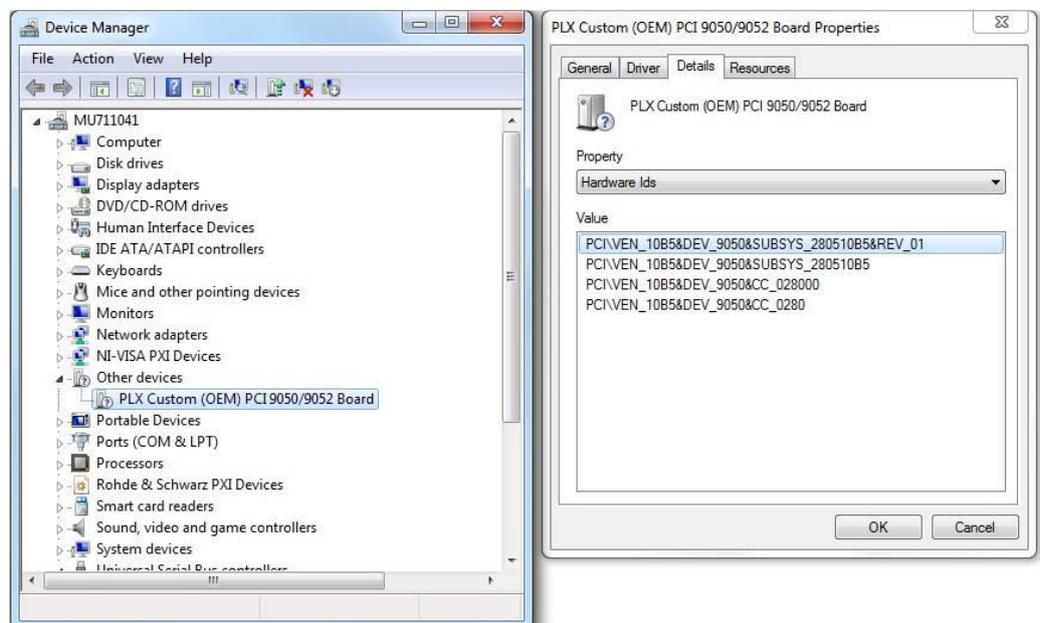


Figure 11-15: R&S TS-PSYS1 with incorrect driver assignment.

If the "IXXAT VCI 3..." driver from the R&S GTSL package is installed next and the computer is rebooted, the "IXXAT VCI 3..." driver is no longer automatically assigned

to the R&S TS-PSYS1 card. This effect can occur, because the operating system thinks a valid (different) driver is already assigned. In this case, assign the correct "IXXAT VCI 3..." driver manually to the R&S TS-PSYS1 card in the device manager.

1. Select "Update Driver Software..." from the context menu (right mouse button).
2. Select the "Browse my computer for driver software" from the "Update Driver Software" dialog.

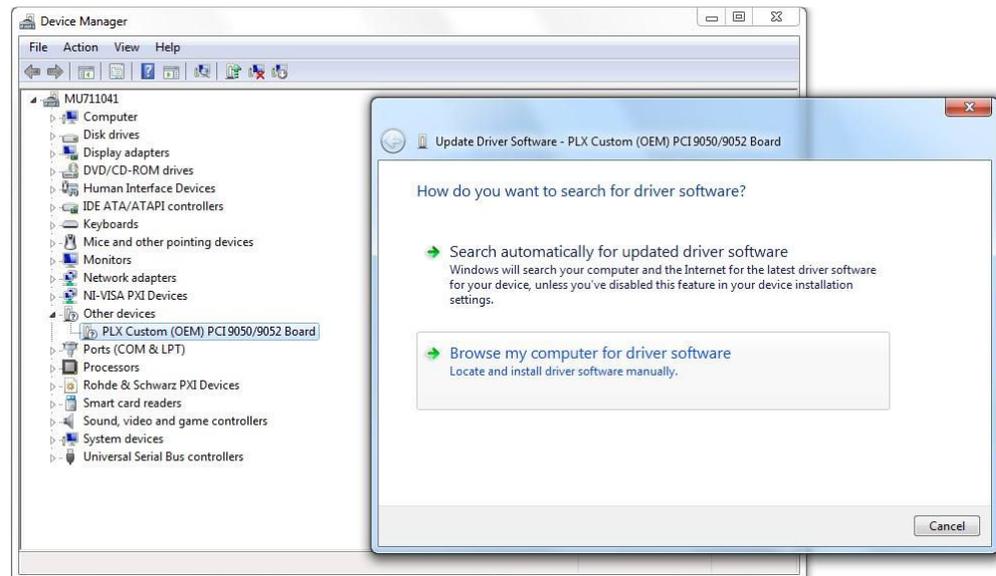


Figure 11-16: PSYS1 driver update, step 1

3. Select "Let me pick from a list of device drivers on my computer".

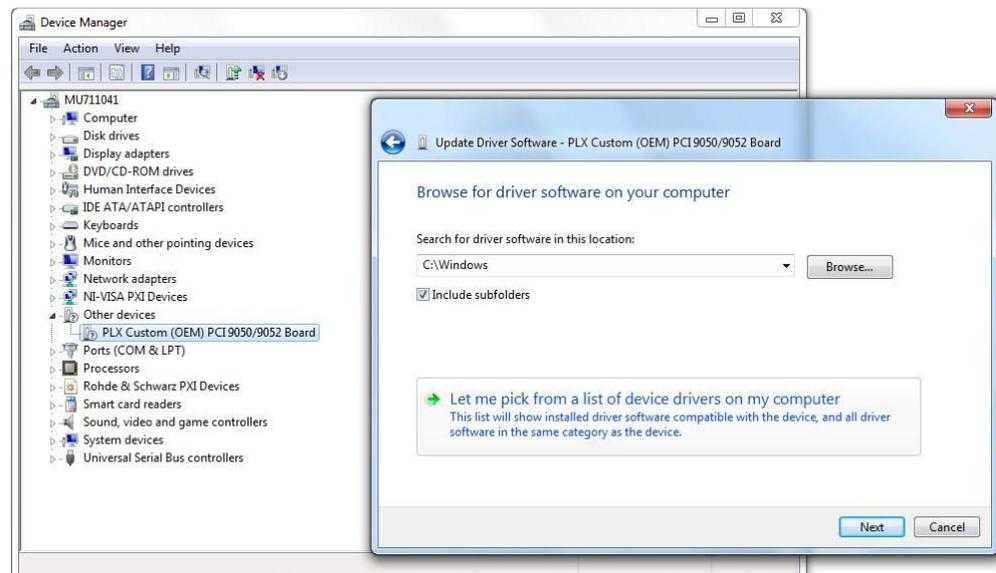


Figure 11-17: R&S TS-PSYS1 driver update, step 2.

4. Select the VCI3 RS TS-PSYS1/PCI driver which appears in the list of available drivers.

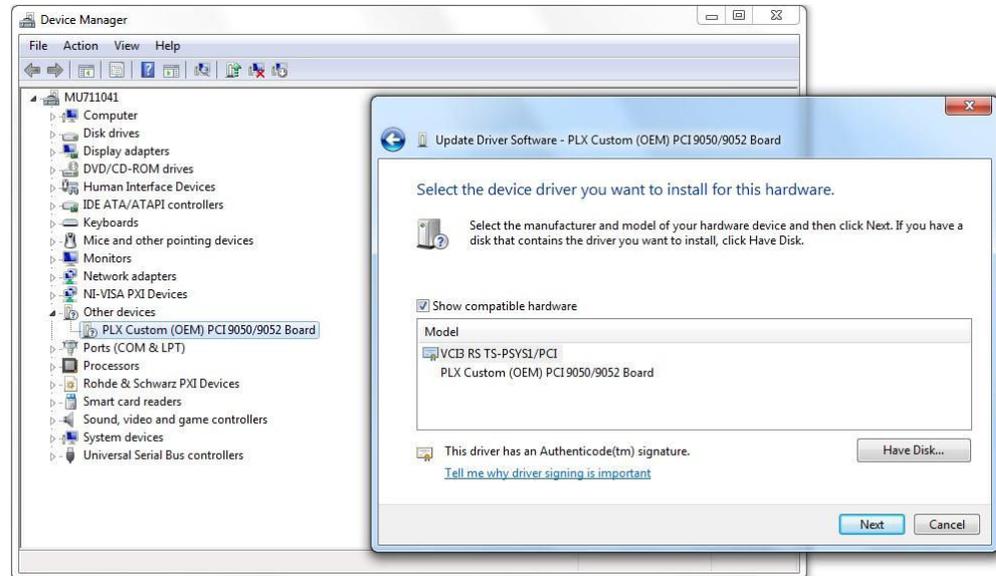


Figure 11-18: R&S TS-PSYS1 driver update, step 3.

5. After the update, a confirmation indicates that the selected driver is assigned to the hardware.

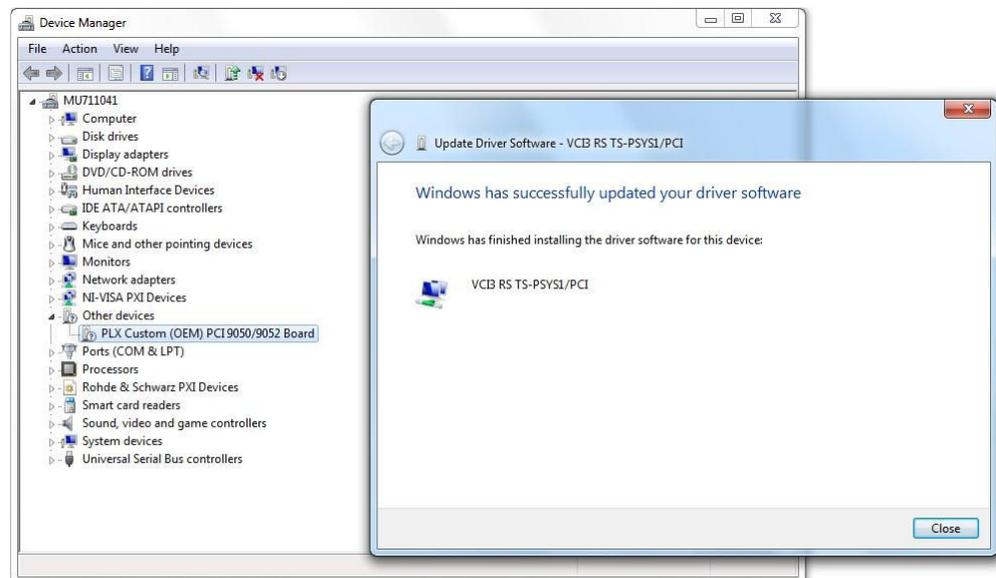


Figure 11-19: R&S TS-PSYS1 driver update, step 4.

6. Reboot the computer.

After the reboot, the "VCI 3..." driver is now assigned to the R&S TS-PSYS1 card.

Using the "Properties" context menu and the "General" tab, it is possible to confirm that the device works properly. If the device status does not show "This device is working properly" but instead reports that the driver could not be started (error code 10), then a different error scenario has occurred. See ["Systems with Windows 10 and secure boot activated"](#) on page 97.

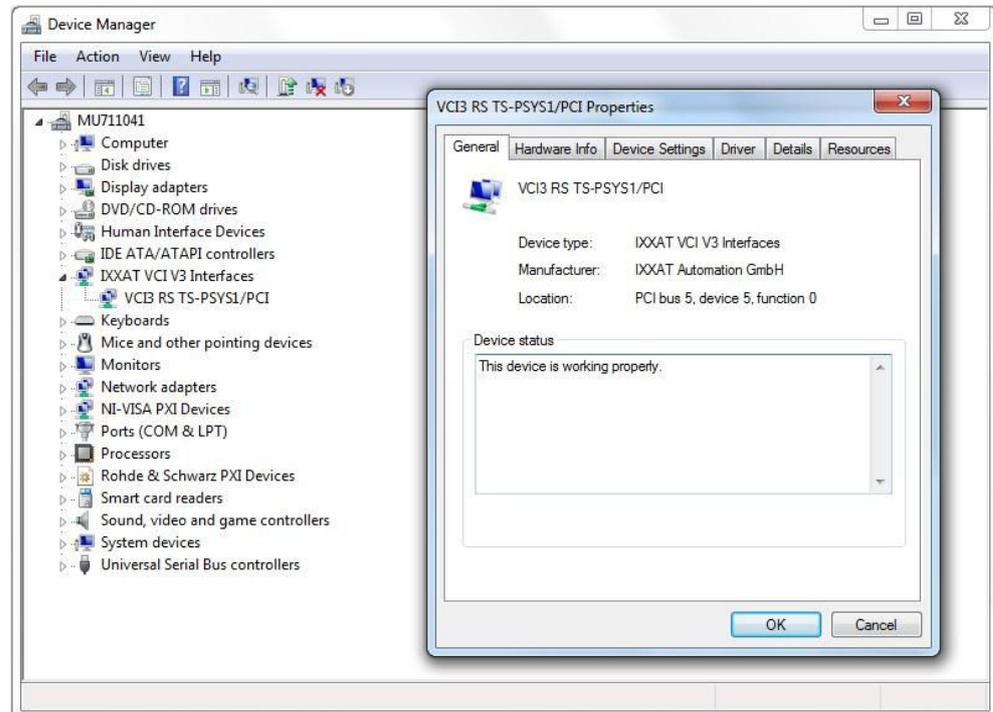


Figure 11-20: Correctly installed R&S TS-PSYS1 driver.

Driver VCI3 iPC-I165/PCI is assigned

The operating system can possibly assign the driver VCI3 iPC-I165/PCI to the R&S TS-PSYS1 card instead of the intended driver VCI3 RS TS-PSYS1/PCI. In this case, the R&S TS-PSYS1 card was not properly detected by Windows and was mistaken for an iPC-I165 card.

See ["Problem with the driver installation VCI3 RS TS-PSYS1/PCI"](#) on page 90 for general information about assigning the correct driver to the R&S TS-PSYS1 card. The differences to the procedure are as follows:

1. In the dialog for driver selection, deselect "Show compatible hardware".
This is the only way to display the VCI3 RS TS-PSYS1/PCI driver, because it is actually not compatible with the card detected by Windows 7.

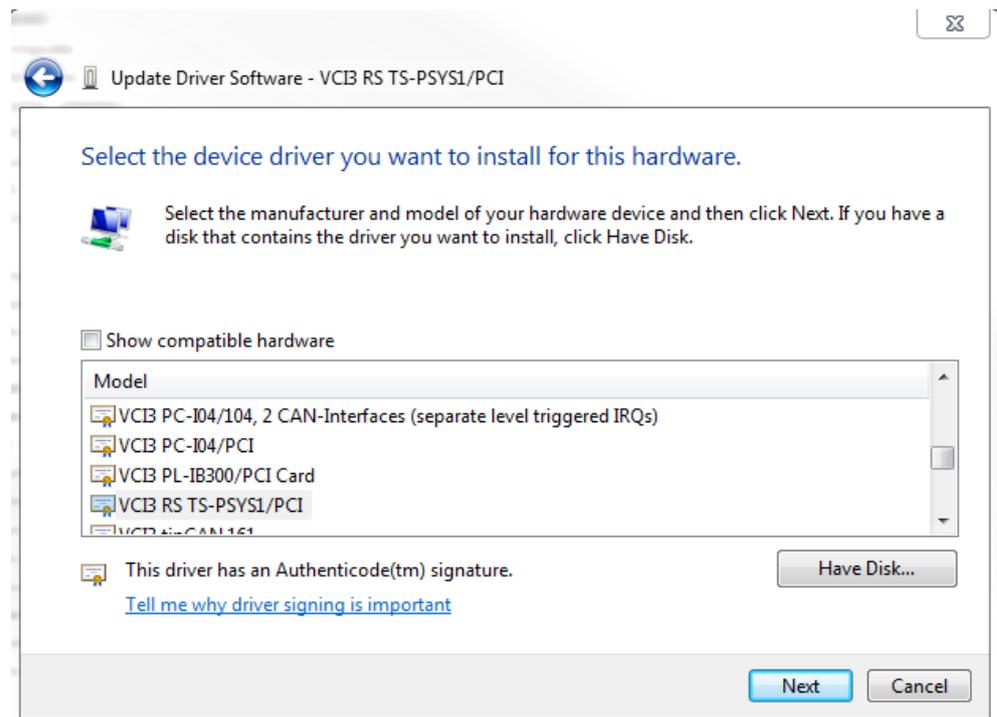


Figure 11-21:

2. Select "VCI3 RS TS-PSYS1/PCI" and continue.
3. Ignore the message to not install the driver and select to install the driver anyway.
4. Use the "Properties" context menu and the "General" tab to check whether the driver is working properly.
If error code 10 appears (meaning the driver could not be started), see ["Systems with Windows 10 and secure boot activated"](#) on page 97 for further troubleshooting steps.

Driver cannot be started

In the device manager, use the "Properties" context menu and the "General" tab to verify whether the driver for the R&S TS-PSYS card is working properly. If error code 10 appears (meaning the driver could not be started), the system changes described below can help to correct the problem. So far, this problem has occurred exclusively in combination with the option R&S TS-PSC0 or R&S TS-PSC07 in which an R&S CompactTSVP is controlled by an external control computer via a CompactPCI bridge. See ["Systems with Windows 10 and secure boot activated"](#) on page 97.

Systems with R&S TS-PSYS1 1157.9910.10 / 1544.7718.02

In the device manager, the entry "IXXAT VCI V3 Interfaces" must be present. "VCI3 TS PSYS10" is a subentry below it. Only this entry indicates that it was possible to correctly assign the "VCI 3..." driver to the R&S TS-PSYS1 card.

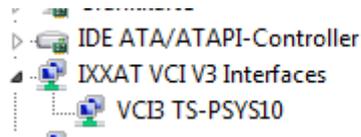


Figure 11-22: R&S TS-PSYS1 1157.9910.10 in the device manager.

If these entries are not available, consider the following possible causes.

Problem with the driver installation VCI3 TS PSYS10

During installation of the R&S TS-PSYS1 driver (runtime setup of R&S GTSL package; version VCI 3.5.2.4268 or newer), the component for the new R&S TS-PSYS1 module was not copied to the hard disk. On Windows 7, each available driver must be manually confirmed sometimes. In rare cases (depending on the VCI version and operating system), the "Always trust ..." checkbox does not have an effect.

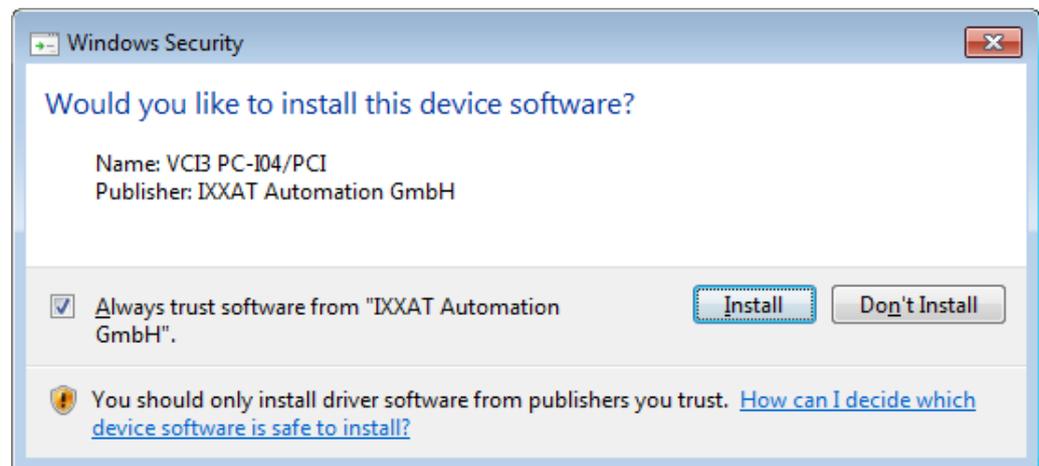


Figure 11-23: VCI3 driver installation.

Make sure that the "VCI3 TS PSYS10" driver is installed.

Problem with PCI Express Native Control

On some control computers for R&S CompactTSVP (e.g. R&S TS-PSC6), the "PCI Express Native Control" feature of Microsoft Windows must be deactivated because the PLX PCI Express bridge chip on the TS PSYS1 card does not meet the requirements. The following steps are required for this purpose:

1. Start the Windows operating system.
2. Run `cmd.exe` as administrator (right-click `C:\Windows\System32\cmd.exe` and select "Run as Administrator").
3. Enter the command: `bcdedit /set {current} pciexpress forcedisable`.
4. Reboot the computer.

Problem with Windows 10 and secure boot activated

On a control computer running Windows 10 with the secure boot feature activated, VCI version 4 must be installed. In this configuration, only the module R&S TS-PSYS1 (1157.9910.10) is supported.

On systems with CompactPCI bridge (R&S TS-PSC0 and R&S TS-PSC07), an external computer is used to control the modules in an R&S CompactTSVP. Suitable are only PCs for which the BIOS conforms exactly to the interrupt routing in accordance with the Intel/Microsoft specification min. rev. 2.1.

See also [Chapter 11.4, "Compact PCI bridges \(R&S TS-PSC08, R&S TS-PSC0 and R&S TS-PSC07\)"](#), on page 98.

R&S TS-PSC0

On the PC's R&S TS-PSC0 plug-in card, there are two links that each have an RX and a TX connection. Sometimes, driver problems for the R&S TS-PSYS1 card could be rectified by connecting the two cables that lead to the R&S CompactTSVP frame to the other link.

Sometimes, driver problems for the R&S TS-PSYS1 card could be rectified by plugging the TS PSC0 card into another PCI slot on the PC. Unfortunately, there are now also PCs that only have a single PCI slot on the motherboard (all of the other slots there are PCI Express slots).

Sometimes, driver problems for the R&S TS-PSYS1 card could be rectified by installing the StarFabric driver. Normally, this is not necessary for operation with R&S CompactTSVP. Install the driver only if the above-described problems are encountered.

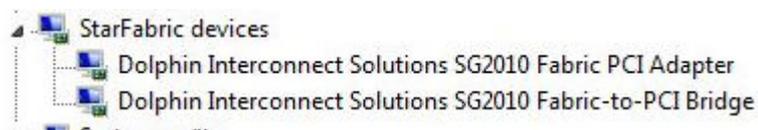


Figure 11-24: StarFabric driver entries in the device manager.

Sometimes, driver problems for the R&S TS-PSYS1 card could be rectified by removing an additional graphics card from the PC.

R&S TS-PSC07

Sometimes, driver problems for the R&S TS-PSYS1 card could be rectified by plugging the PC's R&S TS-PSC07 card into another PCI Express slot.

Systems with Windows 10 and secure boot activated

For this configuration, an R&S CompactTSVP with R&S TS-PSYS1 1157.9910.10 is required. In addition, the new VCI version 4 driver software is required. See also "[Problem with Windows 10 and secure boot activated](#)" on page 97.

11.4 Compact PCI bridges (R&S TS-PSC08, R&S TS-PSC0 and R&S TS-PSC07)

In these systems, an external computer is used to control the modules in an R&S CompactTSVP. Note: Only PCs are suitable for which the BIOS conforms exactly to the interrupt routing in accordance with the INTEL/MICROSOFT specification rev. 2.1 or later. Problems occur during boot-up or control of the R&S TSVP modules with PCs that do not comply with this specification.

The controller and its connected devices are addressed and enumerated based on BIOS and operating system algorithms and settings. For some operating systems and BIOS, these settings need to be changed to make the system work.

- Thunderbolt support has to be disabled on some machines.
- Memory-mapped I/O above 4 GB has to be disabled.
The PCI config space for the PCIe to PCI bridge is in 32-bit format. If address translation and mapping is not correct, the entire address space can be used up and error messages like "insufficient resources" appear.

When powering on the system, the R&S CompactTSVP must always be connected to the line voltage first. This is the only way for the control computer to detect and properly initialize the installed CompactPCI modules.

11.4.1 R&S TS-PSC0

In this solution, a PCI card is installed on an external PC. In the R&S CompactTSVP, the R&S CompactPCI module is installed in rear slot 1. Do not plug any card into front system slot 1.



Figure 11-25: Cabling of the R&S TS-PSC0 components.

When connecting the cables, make sure that the cables are not damaged. If other cables are used, they must always be of the same type and have the same length. Make sure that the TX and RX connections are cross-connected. See "[CompactPCI modules are not detected](#)" on page 100 about the selection of the link.

For additional information, see

- The user manual for R&S TS-PSC0 ([TS-PSC0.pdf](#))
- The user manual for StarFabric ([StarFabric.pdf](#) in the Documentation subfolder)

Boot problems

Some computers do not boot up if an R&S CompactTSVP is connected via R&S TS-PSC0. Such PCs are not suitable for operating the large number of PCI bridges and slots.

Compact PCI bridges (R&S TS-PSC08, R&S TS-PSC0 and R&S TS-PSC07)

CompactPCI modules are not detected

If modules are not detected by the operating system (device manager), a different cabling configuration can sometimes solve the problem.

Table 11-4: R&S TS-PSC0 cabling variants

External PC	Compact R&S TSVP	Note
Link 0	Link 0	Default configuration
Link 1	Link 1	First variant
Link 0	Link 1	Second variant
Link 1	Link 0	Third variant

Another possible solution is described in the next section.

R&S TS-PFG is not detected

Sometimes, driver problems could be rectified by installing the StarFabric driver. Normally, this is not necessary for operation with R&S CompactTSVP. Install the driver only if the above-described problems are encountered.

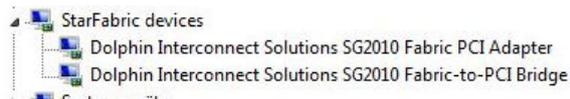


Figure 11-26: StarFabric driver entries in the device manager.

CAN modules are not detected

See [Chapter 11.3.3, "Troubleshooting CAN bus modules"](#), on page 88.

R&S TS-PFG or R&S TS-PAM do not work

In rare cases, the R&S TS-PFG or R&S TS-PAM modules cannot be used. The components are detected and displayed by the R&S TSVP soft panel. However, errors occur during the self-test (e.g. all coupling relay tests fail for R&S TS-PFG). The FPGA versions are incorrect in the identification string:

```
"Rohde & Schwarz,R&S TS-PFG,123456/002,03.03,10.00,65535,255.255"
```

Solve this problem by reassigning the slots used by the PCI modules.

11.4.2 R&S TS-PSC07



Figure 11-27: Cabling of the R&S TS-PSC08x components.

In this solution, a PCIe card is installed on an external PC. In the R&S CompactTSVP, the CompactPCI module is installed in rear slot 1. Do not plug any card into front system slot 1. The control computer is connected using the supplied cable via the "Upstream" connector on the R&S CompactTSVP.

When attaching the cable, make sure that the connector is not plugged in with a 180 degree twist.

For more information, see the user manual for R&S TS-PSC07 ([TS-PSC07.pdf](#)).

Boot problems

Some external computers do not boot up if an R&S CompactTSVP is connected via R&S TS-PSC0. Such PCs are not suitable for operating the large number of PCI bridges and slots.

Malfunction with R&S TS-PICT, R&S TS-PSAM or R&S TS-PDFT

A blue screen occurs when addressing the modules (e.g. opening the soft front panel).

Sometimes, this problem could be solved by using a different PCI Express slot in the control PC.

CAN modules are not detected

See [Chapter 11.3.3, "Troubleshooting CAN bus modules"](#), on page 88.

11.5 R&S GTSL device driver updates

Some R&S TSVP modules have had to be redeveloped due to components that were no longer available. Efforts were made to ensure maximum functional compatibility. However, since new components (interface chips, memory, etc.) were used, it was also necessary to modify the device drivers for compatibility. As a result, the R&S GTSL software must be updated when replacing old modules with newer ones.

11.5.1 R&S TS-PAM analyzer module

The R&S TS-PAM analyzer module (material number 1143.0100.02) has been replaced by a follow-up development. The new version (number 1157.9410.02) requires a driver version (rspam.dll) of 03.37 or higher. The new hardware is supported starting with R&S GTSL version 03.00.

Table 11-5: R&S TS-PAM variants

Type	Material number	Revision status	Firmware version	R&S GTSL version (minimum)	Driver version (minimum)
R&S TS-PAM (obsolete)	1143.0100.02 (1158.0100.02)	1.xx, 2.xx	01.16	R&S GTSL 02.71	rspam.dll 03.21
			01.18	R&S GTSL 02.90	rspam.dll 03.35
R&S TS-PAM	1157.9410.02	3.xx (from Sep. 2012)	02.01	R&S GTSL 03.00	rspam.dll 03.37
			02.03	R&S GTSL 03.10	
			02.04	R&S GTSL 03.20	

New R&S TS-PAM modules can also be identified based on the "firmware revision string". The fourth and fifth entries contain the digits "03.xx, 10.00":

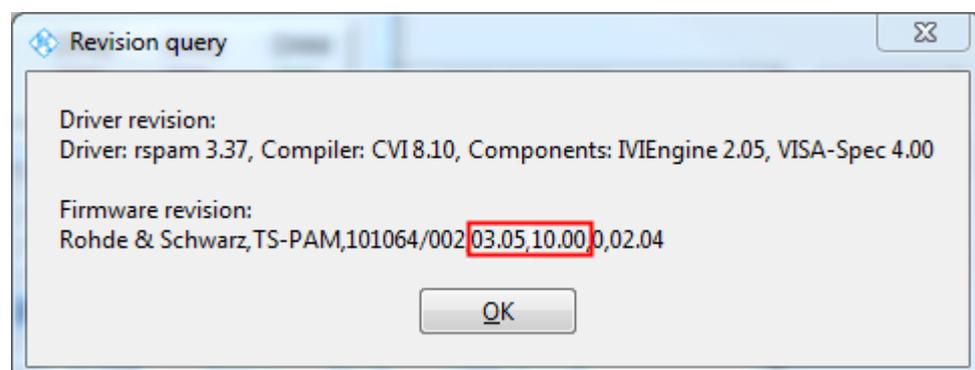


Figure 11-28: R&S TS-PAM revision query with R&S TSVP soft panel.

11.5.2 R&S TS-PFG function generator

The R&S TS-PFG function generator module (material number 1143.0068.02) has been replaced by a follow-up development. The new version (number 1157.9610.02) requires a driver version (rspfg.dll) of 01.56 or higher. The new hardware is supported starting with R&S GTSL version 03.31.

Table 11-6: R&S TS-PFG variants

Type	Material number	Revision status	Firmware version	R&S GTSL version (minimum)	Driver version (minimum)
R&S TS PFG (obsolete)	1143.0068.02 (1158.0052.02)	1.xx, 2.xx	2.11	R&S GTSL 02.71	rspfg.dll 01.50
R&S TS PFG	1157.9610.02	3.xx (from April 2016)	03.03	R&S GTSL 03.31	rspfg.dll 01.56

New R&S TS-PFG modules can also be identified based on the "firmware revision string". The fourth and fifth entry contains the digits "03.xx, 10.00":

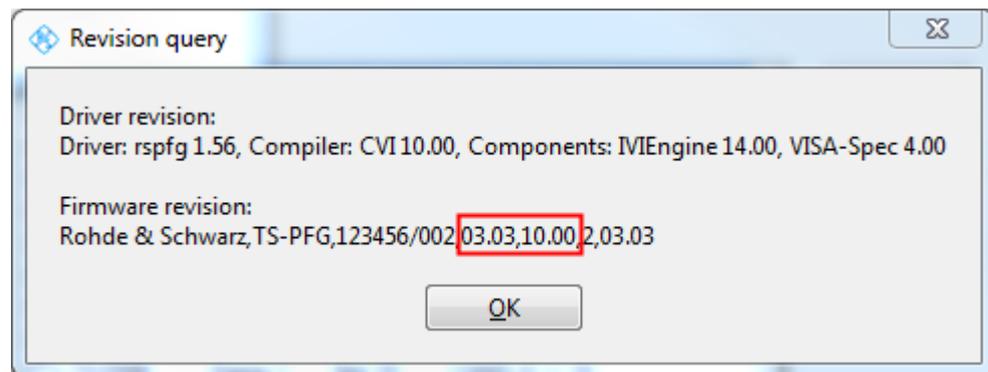


Figure 11-29: R&S TS-PFG revision query with R&S TSVP soft panel.

11.5.3 R&S TS-PICT ICT extension module

In this module, a flash memory chip had to be replaced (among other things). As a result, the new hardware version (from 4-00, hardware code 1) also requires a new driver version (rspict.dll) 01.40, which is part of R&S GTSL version 03.31.

Table 11-7: R&S TS-PICT versions

Type	Material number	Revision status	Hardware code	Firmware version	R&S GTSL version (minimum)	Driver version (minimum)
R&S TS-PICT	1143.0000.0 2 (1158.0000.0 2)	< 4.00	0	0.2	R&S GTSL 02.71	rspict.dll 01.31
		From 4.00 - Label 01.6.4-00 - From 06.2016 - From SN 100225	1	0.2	R&S GTSL 03.31	rspict.dll 01.40

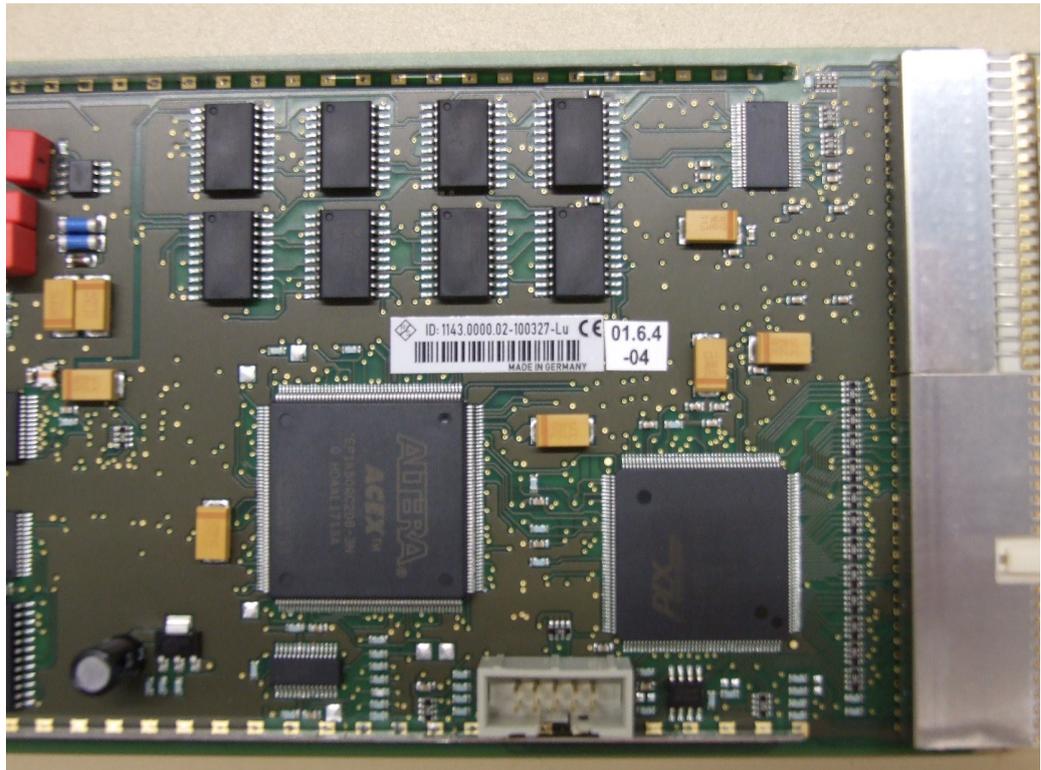


Figure 11-30: R&S TS-PICT version label

11.5.4 R&S TS-PSAM analog stimulus and measurement module

In this module, a flash memory chip had to be replaced (among other things). As a result, the new hardware version (from 6.00) also requires a new driver version (rpsam.dll from 02.90), which is part of R&S GTSL version 03.33.

R&S TS-PSAM modules from version 6.00 can also be used with restrictions with an older driver version (rpsam.dll from 02.80) (hardware code unchanged). With the old driver version, writing to the flash memory fails. A write procedure is triggered only by the in-system calibration software when replacing the correction values.

Table 11-8: R&S TS-PSAM versions

Type	Material number	Revision status	Hardware code	Firmware version	R&S GTSL version (minimum)	Driver version (minimum)
R&S TS-PSAM	1142.9503.02	< 6.00	1	0.5	R&S GTSL 02.71	rpsam.dll 02.80
		From 6.00 (Oct. 2017)	1	0.5	R&S GTSL 03.33	rpsam.dll 02.90

New R&S TS-PSAM modules can also be identified based on the "firmware revision string". The fourth entry shows the revision status.

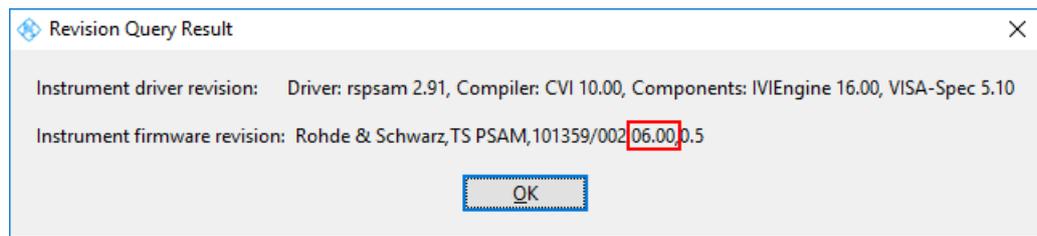


Figure 11-31: R&S TS-PSAM revision query with R&S TSVP soft panel.

11.5.5 R&S TS-PSYS1 system module

The R&S TS-PSYS1 system module (material number 1152.4004.02) was superseded in mid-2017 by the replacement development R&S TS-PSYS1 (1157.9910.10). The new module requires the appropriate VCI driver version. See also [Chapter 11.3, "CAN bus modules \(VCI, R&S TS-PSYS1\)"](#), on page 83.

Table 11-9: R&S TS-PSYS1 variants

Type	Material number	Windows version	R&S GTSL version (minimum)	Driver version (minimum)
R&S TS-PSYS1 (obsolete)	1152.4004.02	Windows 2000 and Windows XP	R&S GTSL 02.71	VCI 2.16 + SP2
		Windows XP and Windows 7	R&S GTSL 03.00	VCI 3.4.1.3080 and VCI 2.20.761.0
		Windows 7 and Windows 10	R&S GTSL 03.33	VCI 3.5.2.4592
R&S TS-PSYS1	1157.9910.10	Windows XP and Windows 7	R&S GTSL 03.31	VCI 3.5.2.4268
		Windows 7 and Windows 10	R&S GTSL 03.33	VCI 3.5.2.4592
		Windows 10 with secure boot activated	R&S GTSL 03.40	VCI 4
R&S TS-PSYS1	1544.7718.02	Windows 10 with secure boot activated	R&S GTSL 03.42	VCI 4.x
		Windows 11 with secure boot activated	R&S GTSL 03.42	VCI 4.x

New R&S TS-PSYS1 modules can also be identified based on the "firmware revision string". The fifth entry has the format 09.xx.

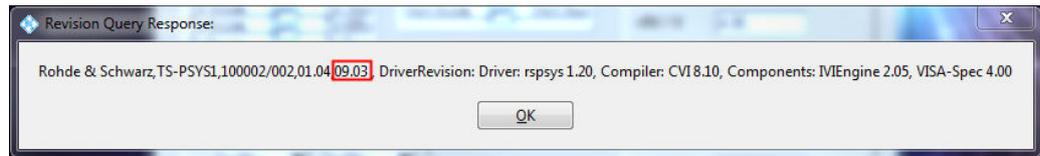


Figure 11-32: R&S TS-PSYS1 revision query with R&S TSVP soft panel.

11.6 License viewer

Starting with R&S GTSL 03.30, the installed license files are no longer evaluated. They are also no longer generated for new R&S GTSL installations. As a result, the "R&S GTSL License Viewer" displays the text "No licence files found" in the "Licensed Components" window.

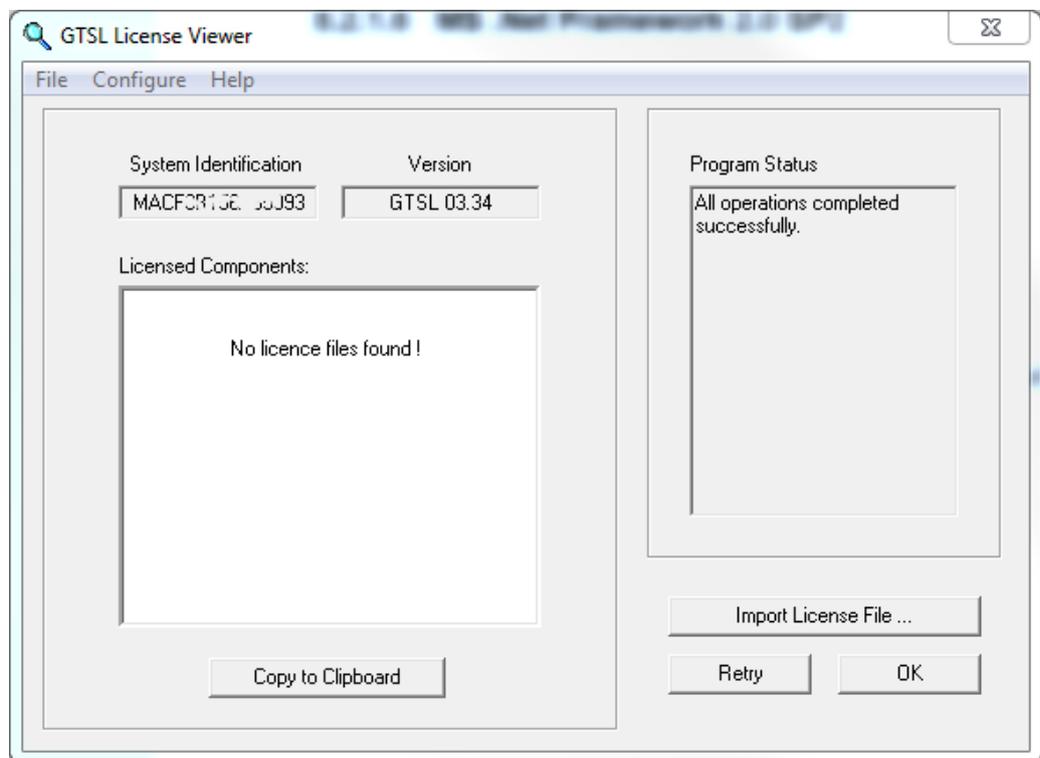


Figure 11-33: R&S GTSL License Viewer.

For system optimization, the "MAC Address" option can be selected starting with R&S GTSL 03.30 in the "Configure System Identification" configuration dialog.

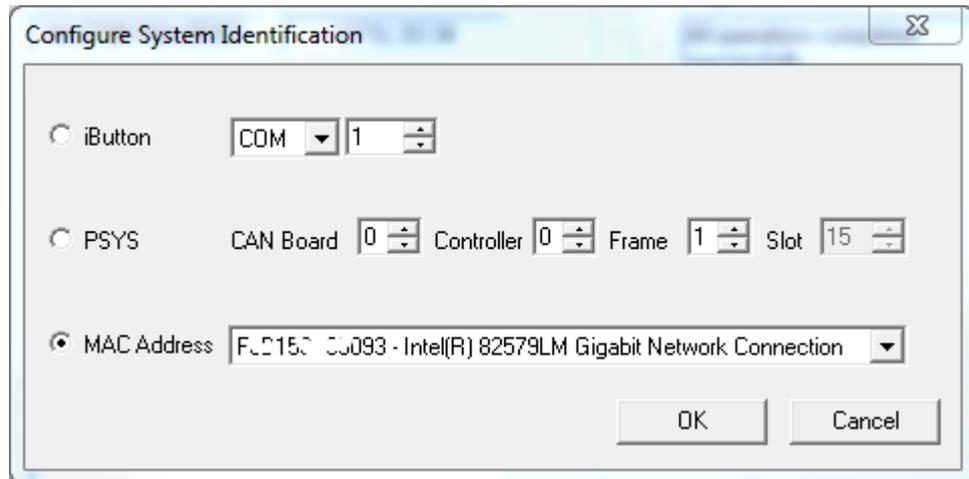


Figure 11-34: Dialog for configuring the system identification.

11.7 Adobe acrobat reader

Starting with R&S GTSL 03.33, Adobe Acrobat Reader is no longer included in the R&S GTSL installation package. To display the supplied documentation, a PDF file reader must be installed on the target system.

11.8 Runtime setup

11.8.1 NI software installer

Problem:

Under some conditions, NI software installers for VISA Runtime, IVI Compliance Package and CVI Runtime cannot run anymore. Microsoft Visual C++ Runtime Library throws an error message:

```
Runtime Error!
```

```
Program:
```

```
<Path to executable>
```

```
This application has requested the Runtime to terminate it in an unusual way.
Please contact the application's support team for more information.
```

Solution:

This issue has been known to occur on Windows 10 systems updated to version 1809 (the September 2018 update) that use a certain subset of all "Regional format"s of the form English (<My Country>). Microsoft has published an update to Windows 10 version 1809 in KB4482887 that resolves the error. The same issue occurs in Windows 10 version 1903 (released in August 2019), though as no update to Windows that resolves the error has been published, please follow the steps below. To determine what version of Windows 10 you are running, type "winver.exe" into the Windows Start Menu and hit enter. The following Regional format settings have been confirmed to cause this issue:

To determine what version of Windows 10 you are running, type `winver.exe` into the Windows Start Menu and hit "Enter".

The following Regional format settings have been confirmed to cause this issue:

- English (Sweden)
- English (Denmark)
- English (Netherlands)
- English (Switzerland)
- English (Germany)
- English (Europe)

Here are some examples that do work:

- English (United Kingdom)
- English (Belgium)
- English (United States)
- Dansk (Denmark)

To obtain the update to Windows 10:

1. Open the "Start menu"
2. Click the "Settings gear"
3. Click "Update & security"
4. Click "Check for updates"

If you are unable to install the update or attempting to fix the issue for Windows v1903, to get past this error you can:

1. Open the Windows Start Menu and type "Region Settings", then hit enter
2. Change the Region Format to one of the known working regions included above and close the dialog.
3. Run the installer and reboot if prompted.
4. Change the region setting back to its original language.
5. If there are different accounts in the computer, change the settings of the Administrator Account. Changing only the settings of other accounts may not fix the issue.

11.8.2 NI VISA update on TS-PSC6W

Blue screen after an update or reinstallation of the NI Visa.

Solution see [Chapter 11.9.1, "Update of NI VISA"](#), on page 109.

11.9 TS-PSC6W (CP3004) system controller

11.9.1 Update of NI VISA

Problem:

Windows 10 has set a wrong entry in the local registry. This leads to a non-recoverable blue screen after an update or reinstallation of the NI-VISA.

Solution:

Remove this falsely inserted registry entry before attempting to install the NI-VISA. Therefore, use the `Fix_NI_REINSTALL.reg` file in the `Runtime Setup\01 - VISA Runtime` folder. After removing the malicious registry entry, any installation attempt of the NI-VISA Runtime succeeds as usual.

Fix Bluescreen:

If the Visa installation was already attempted and the TS-PSC6W is in the blue screen loop, the solution is similar. The entry must be removed, to retain the normal boot behavior. To follow the process, the TS-PSC6W need to boot in either a WinPE environment or in a "repair console" within a "Recovery Boot". This document describes two alternative processes. If the regedit can be used, the alternative "with regedit" is way more convenient, whereas the second way uses the command "reg" and can be done without any additional application. Either way, the section "1. Start" must be done anyway.

1. Start:

1. `cmd> diskpart`
2. `diskpart> list volume`
3. `diskpart> select volume #` (where # is the volume with label "Operating System")
4. `diskpart> assign letter c` (c should be available, if not, select any free letter. Be sure to adapt the sequence later on.)
5. `diskpart> exit`
6. continue with 2.1 OR 2.2

2.1 with regedit:

1. cmd> regedit
2. regedit> Select the HKLM node
3. regedit> File->Load Hive
(if this option is grey, assure that you have selected the HKLM node in the tree)
4. regedit> select in the open file dialog the C:\Windows\system32\config\SYSTEM file
5. regedit> use a useful name, e.g. "TSVP"
6. regedit> navigate ControlSet001\Services\nipbcfk
7. regedit> remove SubKey "StartOverride"
8. regedit> File->Unload Hive
(if this option is grey, assure that you have selected the HKLM\TSVP node in the tree)
9. Close regedit
10. Reboot

2.2 without regedit:

1. cmd> reg load HKLM\TSVP C:\Windows\System32\config\SYSTEM
2. cmd> reg delete HKLM\TSVP\ControlSet001\Services\nipbcfk\StartOverride /f
3. cmd> reg unload HKLM\TSVP
4. Reboot



Since the backup factory image within the Backup / Restore solution was taken with this entry already set, the registry must be cleaned after recovering from the Factory Image. Actually, Windows 10 can insert this entry any time, executing the cleaning before any installation may prevent any future problem.

11.9.2 Malfunction of backup / restore solution

The Backup / Restore solution on a TS-PSC6W controller may not work correctly with Windows Updates installed since January 2021.

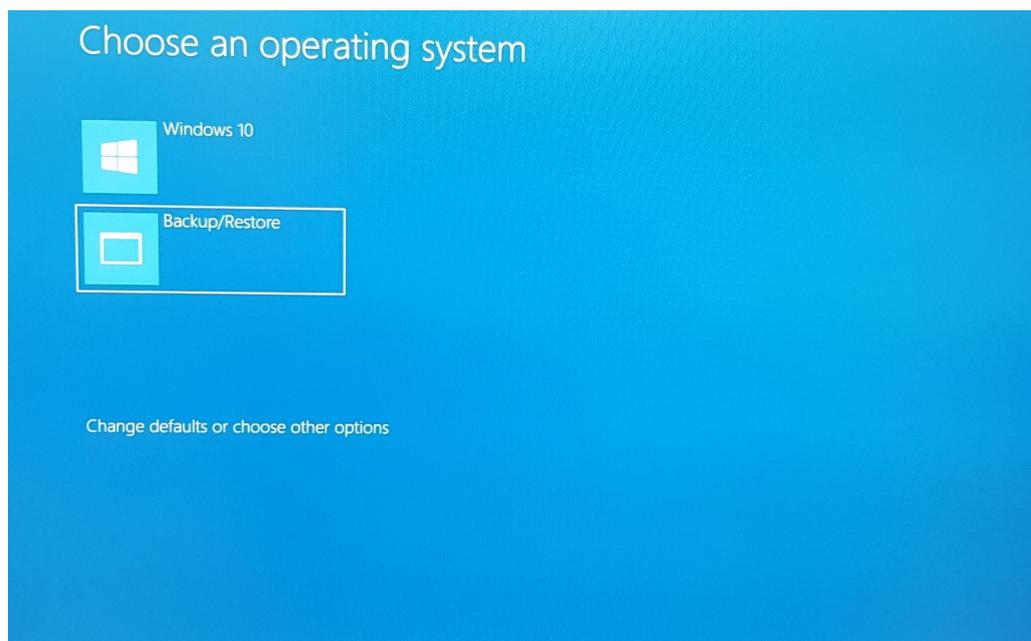
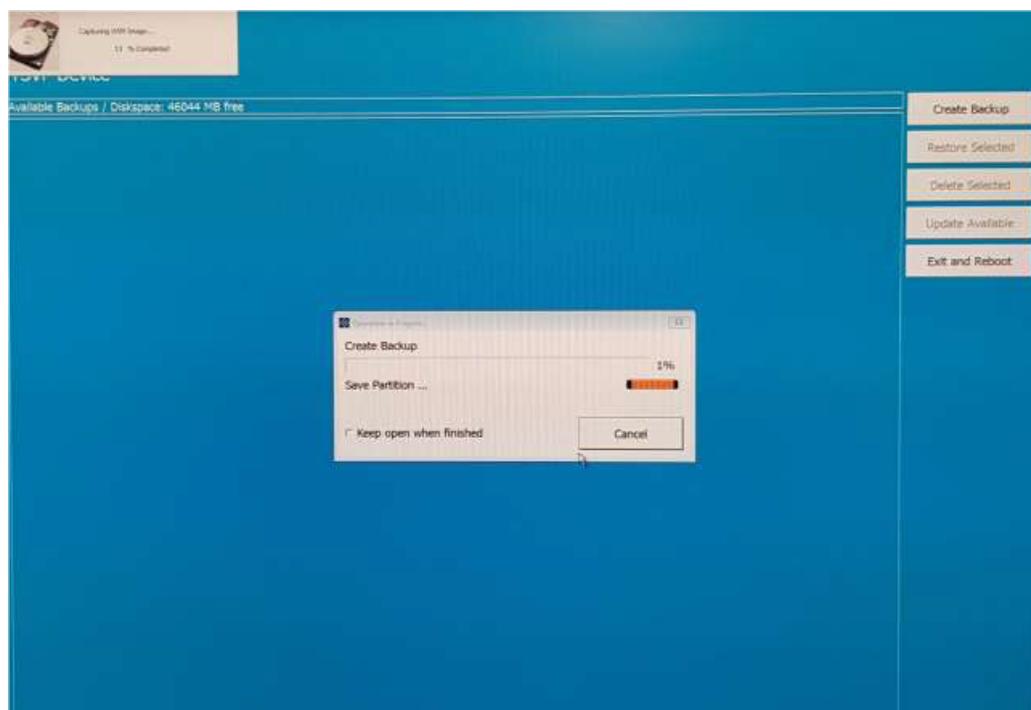


Figure 11-35: Backup / Restore Solution on TS-PSC6W

The function "Create Backup" may fail on that systems. Unfortunately, a new entry appears in the list but the image file was not created! The capturing process is terminating very fast because of an access denied error.



To fix this problem, download the hotfix from R&S GLORIS, T&M Production Download.

11.10 Windows 10 topics

11.10.1 Secure boot and TS-PSYS1

On a control computer running Windows 10 with the secure boot feature activated, VCI version 4 must be installed as TS-PSYS driver from the Runtime Setup. In this configuration, only the R&S TS-PSYS1 variant with identification number 1157.9910.10 is supported. See also [Chapter 11.3, "CAN bus modules \(VCI, R&S TS-PSYS1\)"](#), on page 83 and [Chapter 11.5, "R&S GTSL device driver updates"](#), on page 102.

11.10.2 Driver installation of R&S CompactPCI modules may fail

On Windows 10 systems with update KB4577668 (October 2020) the new installation of the drivers for the R&S CompactPCI modules may fail. GTSL Versions 3.40 or smaller are affected.

In this case the TSVP Soft Panel shows no PXI cards (e.g. TS-PSAM) and the windows device manager shows some erroneous entries (The drivers for this device are not installed. Code 28) after GTSL installation procedure.

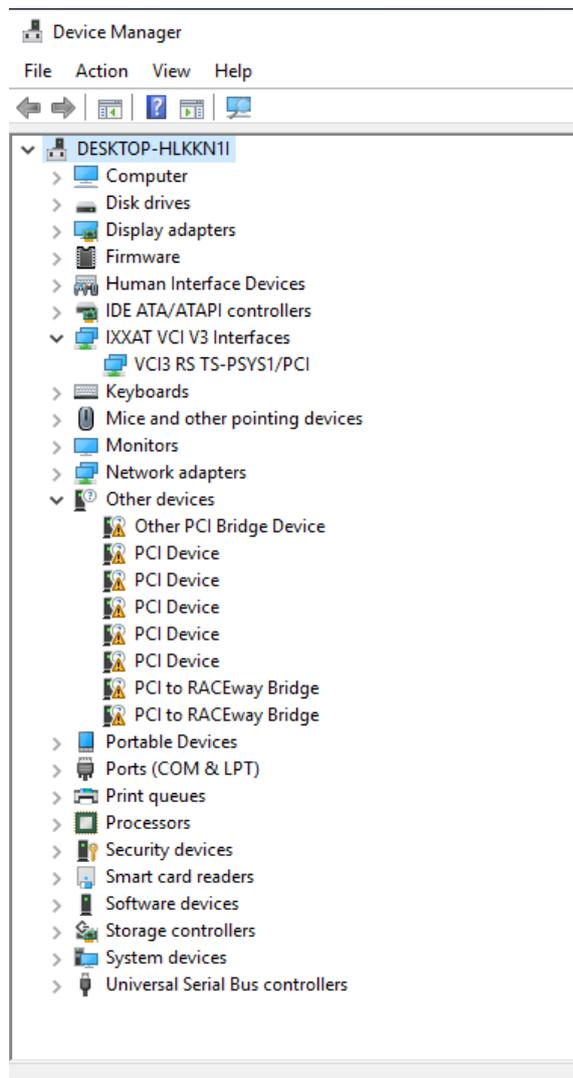


Figure 11-36: Driver installation failed

The driver installation fails, because Windows 10 requires catalog files which fulfill the new rules for this release. To install the drivers, additionally perform the following steps after the GTSL installation procedure.

1. Download the archive file `rsdrv_install.zip` from R&S GLORIS, T&M Production Download
2. Create a new folder in your file system
3. Unzip the archive file `rsdrv_install.zip`
4. Execute the cmd-file `rsdrv_install.cmd` with administrator rights (right click the file, select "Run as administrator")
5. Select "Install" in this dialog:

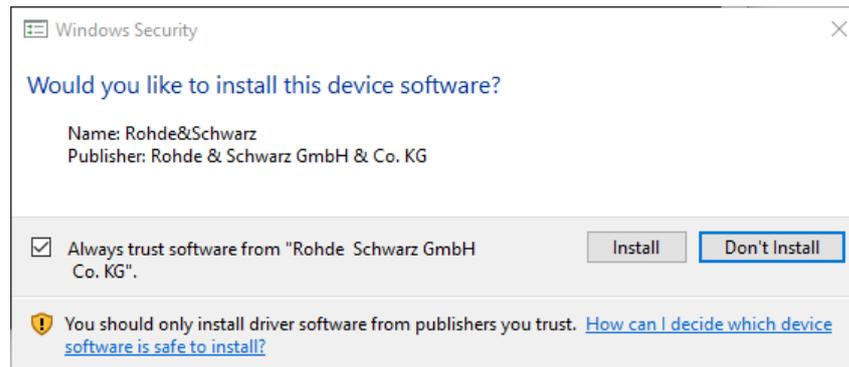


Figure 11-37: Windows Security dialog

6. You may delete the old cat-files in the C:\Windows\INF folder.
7. Check the installation with help of the windows device manager



Figure 11-38: Drivers successfully installed

11.11 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 11-39: QR code to the Rohde & Schwarz support page

Glossary

C

CAN: Controller Area Network

A serial bus system whose high system and configuration flexibility is achieved by a content-oriented addressing scheme, i.e. it defines "message identifiers" and not device addresses. Systems can be added to an existing network without the need for hardware or software modifications. The CAN protocol is defined in ISO 11898.

CompactPCI: also: cPCI

An open standard of the PICMG (PCI Industrial Manufacturers Group) that adapts the PCI standard for industrial applications. It uses high-grade connection techniques and mechanical components, and applies the same electrical specifications as the PCI standard. Thus, inexpensive components and existing PCI developments can be used even under industrial conditions. Other features include a high integration density, the option of a 19" installation and shielding for the plug-in modules. Its definition as an open standard means that a large, worldwide variety of cards is available.

cPCI: [CompactPCI](#)

P

PCI-PCI bridges: Used to connect several [cPCI](#) or [PXI](#) segments, thus increasing the number of peripheral slots in cPCI or PXI systems.

PXI: PCI eXtensions for Instrumentation

A standard defined by National Instruments which expands the [CompactPCI](#), using its mechanical specifications and the connection with the system controller. The PXI standard is fully compatible and also defines various additional signals which are useful for measuring applications, such as the PXI trigger bus.

R

Rear I/O: A design that allows input and output lines of the [cPCI](#) connectors P1 and P2 to be accessed from the rear of a backplane. Pluggable Rear I/O modules can be used for this purpose in the R&S CompactTSVP and the R&S PowerTSVP.