

R&S® TSMA6

Autonomous Mobile Network Scanner User Manual



4900805702
Version 12

ROHDE & SCHWARZ
Make ideas real



This manual describes the following R&S®TSMA6 models:

- R&S®TSMA6 (4900.8005.02)

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Muehldorfstr. 15, 81671 Muenchen, Germany
Phone: +49 89 41 29 - 0
Email: info@rohde-schwarz.com
Internet: www.rohde-schwarz.com

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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 R&S TSMA6 is intended as an integrated solution for efficient drive and walk testing. It offers maximum performance, autonomy and connectivity with an integrated high-performance PC and a mobile network scanner to comply with the latest requirements for state-of-the-art mobile network testing. Together with optional equipment (battery pack, carrying bag) it is the ideal companion for remote or unattended operation during drive and walk test campaigns.

The R&S TSMA6 is intended to enhance the R&S TSMx scanner family via a vibration-proof mechanical connection to allow mobile operation. It contains two easily accessible, rechargeable and hot-swappable batteries.

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 11. 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 dam-

aged or broken, stop using the product. Contact Rohde & Schwarz customer service at <https://www.rohde-schwarz.com/support>.

Operating the product

The product is intended for mobile use. The maximum weight of the product is provided in the data sheet. If the product casing is not waterproof, use an adequate weather protection to carry the product outdoors with you.

When using the product in a vehicle or aircraft, make sure that the product is properly secured. If stacking is possible, secure the whole stack of products so that they cannot fall over and cause injury.

Observe the ambient conditions such as altitude, operating temperature and climatic loads; see the data sheet.

Due to their exposed location, mobile communications systems are at risk of damage from lightning. This also poses a risk to persons nearby. Vehicles carrying mobile communications systems require an electrically conductive body, a grounded antenna and also equipotential bonding that includes the cables routed into the vehicle.

Connecting to power

The product runs on DC voltage. For the specifications of the supply voltage for the product, refer to the data sheet. Under normal conditions, contact with DC voltage in this range poses a low risk of electric shock.

Take the following measures for your safety:

- If you connect the product to an external power supply, use one recommended in the product documentation.
- If you connect the product to a battery, observe the safety information delivered with the battery.
- Before switching on the product, ensure that the voltage and frequency indicated on the product match the available power source.
- Only use intact cables and route them carefully so that they cannot be damaged. Also ensure that nobody can trip over loose cables.

Handling batteries safely

The product contains exchangeable or built-in lithium polymer or lithium ion cells or batteries. The use of the word battery in the following always means all types. Only the battery contents are potentially hazardous. As long as a battery is undamaged and the seals remain intact, there is no danger.

Impact, shock or heat can cause damage such as dents, punctures and other deformations. A damaged battery poses a risk of personal injury. Handle a damaged or leaking battery with extreme care. Immediately ventilate the area since the battery releases harmful gases. If you come into contact with the battery fluid, immediately remove all contaminated clothing. Irritation can occur if the battery fluid comes in contact with your skin or eyes. Immediately and thoroughly rinse your skin or eyes with water and seek medical aid.

For safe handling, follow these rules:



- Do not short-circuit the battery.
- Do not mechanically damage the battery. Do not open or disassemble the battery.
- Do not expose the battery to high temperatures such as open flames, hot surfaces and sunlight.
- Only use the battery with the designated Rohde & Schwarz product.
- Only use the appropriate Rohde & Schwarz charger to charge the batteries. If the batteries are improperly charged, there is a risk of explosion. For charging and discharging temperature ranges, see the product documentation.
- Replace exchangeable batteries only with the same battery type.
- Store the battery in the product or use the product packaging.
- Dispose of exchangeable batteries separately from normal household waste as specified by the local waste disposal agency.

If you disregard these rules, you risk serious personal injury or even death due to explosion, fire or hazardous chemical substances. The product documentation provides further details.

If exchangeable batteries or products with built-in batteries are defective, contact the Rohde & Schwarz customer service. Rohde & Schwarz classifies the severity of the defect. When returning batteries or Rohde & Schwarz products containing batteries, use a carrier qualified to transport dangerous goods and notify the carrier of this classification. Follow the carrier's transport stipulations in line with IATA-DGR, IMDG-Code, ADR or RID.

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>DC - direct current</p> <p>Connect to a DC power supply of the specified voltage range.</p>

1.2 Labels on the product

Labels on the casing inform about:

- Personal safety, see ["Meaning of safety labels"](#) on page 13
- Product and environment safety, see [Table 1-1](#)
- Identification of the product, see bottom label of the R&S TSMA6.

Table 1-1: Labels regarding product and environment safety

	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. For more information, see "Disposing of electrical and electronic equipment" on page 141.
	Labeling in line with directive 2006/66/EC for disposal of batteries after they have come to the end of their service life. For more information, see "Disposing batteries" on page 141.

1.3 WLAN/Bluetooth adapter

The R&S TSMA6 has built-in WLAN/Bluetooth module.

This wireless adapter complies with Part 15 of the FCC Rules and with Industry Canada license-exempt RSS standards. Operation of the device is subject to the following two conditions:

- This device may not cause harmful interference.
Cet appareil ne peut pas causer d'interférences.
- This device must accept any interference that may cause undesired operation.
Cet appareil doit accepter des interférences, y compris des interférences qui peuvent causer des opérations non désirées de l'appareil.

Radio frequency interference requirements

This wireless adapter is restricted to indoor use due to its operation in the 5.15 GHz to 5.25 GHz frequency range. The wireless adapter requires to be used indoors for the frequency range 5.15 GHz to 5.25 GHz to reduce the potential for harmful interference to co-channel Mobile Satellite systems. High power radars are allocated as primary users of the 5.25 GHz to 5.35 GHz and 5.65 GHz to 5.85 GHz bands. These radar stations can cause interference with and /or damage this device.

Canada-specific enhancement

When using IEEE 802.11a wireless LAN, this product is restricted to indoor use due to its operation in the 5.15 GHz to 5.25 GHz frequency range. Industry Canada requires this product to be used indoors for the frequency range of 5.15 GHz to 5.25 GHz to reduce the potential for harmful interference to co-channel mobile satellite systems. High power radar is allocated as the primary user of the 5.25 GHz to 5.35 GHz and 5.65 GHz to 5.85 GHz bands. These radar stations can cause interference with and/or damage to this device.

L'utilisation d'un réseau sans fil IEEE802.11a est restreinte à une utilisation en intérieur à cause du fonctionnement dans la bande de fréquence 5.15 GHz to 5.25 GHz. Industry Canada requiert que ce produit soit utilisé à l'intérieur des bâtiments pour la bande de fréquence 5.15 GHz - 5.25 GHz afin de réduire les possibilités d'interférences nuisibles aux canaux co-existants des systèmes de transmission satellites. Les radars de puissances ont fait l'objet d'une allocation primaire de fréquences dans les bandes 5.25 GHz-5.35 GHz et 5.65 GHz to 5.85 GHz. Ces stations radar peuvent créer des interférences avec ce produit et/ou lui être nuisible.

Usage in specific environments

- The use of wireless adapters in hazardous locations is limited by the constraints posed by the safety directors of such environments.
- The use of wireless adapters in hospitals is restricted to the limits set forth by each hospital.

Usage on aircraft

Regulations of the FCC, FAA and individual airlines prohibit airborne operation of some radio-frequency wireless devices (wireless adapters) because their signals could interfere with critical aircraft instruments.

Local restrictions on 802.11a, 802.11b, 802.11g, 802.11n, and 802.16e radio usage

Due to the fact that the frequencies used by 802.11a, 802.11b, 802.11g, 802.11n, and 802.16e wireless LAN devices may not yet be harmonized in all countries, 802.11a, 802.11b, 802.11g, 802.11n, and 802.16e products are designed for use only in specific countries, and are not allowed to be operated in countries other than those of designated use.

As a user of these products, you are responsible for ensuring that the products are used only in the countries for which they were intended and for verifying that they are configured with the correct selection of frequency and channel for the country of use. The device transmit power control (TPC) interface is part of the Intel® PROSet/Wireless Wi-Fi Connection Utility Software. Operational restrictions for Equivalent Isotropic Radiated Power (EIRP) are provided by the system manufacturer.

Any deviation from the permissible power and frequency settings for the country of use is an infringement of national law and may be punished as such.

1.4 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.

NOTICE

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

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 Welcome

2.1 Documentation overview

This section provides an overview of the R&S TSMA6 user documentation. Unless specified otherwise, you find the documents at:

www.rohde-schwarz.com/manual/tsmx

2.1.1 Getting started manual

Introduces the R&S TSMA6 and describes how to set up and start working with the product. Includes basic operations, typical measurement examples, and general information, e.g. safety instructions, etc. A printed version is delivered with the product.

2.1.2 User manuals and help

Contains the description of all instrument modes and functions. Includes the contents of the getting started manual. Also describes the usage of options and extras (down-converter R&S TSMExxDC and battery pack R&S TSMA6-BP).

2.1.3 Printed safety instructions

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

2.1.4 Data sheets and brochures

The data sheet contains the technical specifications of the R&S TSMA6. It also lists the firmware applications and their order numbers, and optional accessories.

The brochure provides an overview of the instrument and deals with the specific characteristics.

See www.rohde-schwarz.com/brochure-datasheet/tsmx

2.1.5 Release notes and open source acknowledgment (OSA)

The release notes list new features, improvements and known issues of the current firmware version, and describe the firmware installation.

The software makes use of several valuable open source software packages. An open-source acknowledgment document provides verbatim license texts of the used open source software.

See www.rohde-schwarz.com/firmware/tsmx

2.2 Key features

As in-building traffic in cellular networks grows, there is an increased need for indoor measurements. While traditional drive test systems consist of a laptop with test mobile phones and scanners, there are also walk-test solutions that use tablets and smartphones.

The R&S TSMA6 enhances such solutions, providing the user with accurate insight into the RF environment.

The R&S TSMA6 combines the technology of the R&S TSME6 ultra-compact drive test scanner with a high-performance Intel processor. The scanner can run PC-based drive test software, and smartphones can be connected via USB.

With its ultra-broadband front end, the integrated scanner measures all supported technologies 350 MHz to 6000 MHz simultaneously. The future-proof architecture and the in-field upgradability for both, hardware and software, allow up to 4x4 MIMO measurements and pave the way for the upcoming 5G technology.

Outstanding key features are:

- No limitation in 3GPP (LTE, WCDMA, GSM, NB-IoT...) frequency bands up to 6 GHz incl. a Multi-GNSS receiver for uninterrupted location tracking
- More than 10 technologies simultaneously in one system
- Future-proof for upcoming 5G related measurements
- Compact and lightweight design with customized mechanical concept for cascading multiple scanner hardware
- Maximum connectivity supporting additional scanner hardware, Windows-based PC, Android-based UEs or tablets using wireless and wired connections
- Integrated high-performance Intel i7 CPU-based PC

3 Getting started

3.1 Preparing for use

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

3.1.1 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.

3.1.2 Preparing for walk test

If you want to perform a walk test, the R&S TSMA6 needs weather protection. The R&S TSMA6-ZCB2 carrying bag is especially designed for this purpose. See also ["Operating the product"](#) on page 12.

3.1.3 Setting up indoors

3.1.3.1 Placing the product on a bench top

If you want to set up the R&S TSMA6 on a benchtop or prepare the R&S TSMA6 for mobile use, proceed as follows.

To place the product on a bench top

1. Place the R&S TSMA6 on a stable, flat and level surface.
2. If you want to stack R&S TSMx products, proceed as described in [Chapter 7.1, "Connecting R&S TSMA6/6B with other devices"](#), on page 64.
3. If you want to stack the R&S TSMA6 together with other products:
 - a) Follow the instructions given for the other products.
 - b) Place the R&S TSMA6 on top.

3.1.3.2 Mounting the product in a rack

To mount the product in a rack

1. Use an adapter kit to prepare the product for rack mounting.
 - a) Order the rack adapter kit designed for the product. For the order number, see data sheet.
 - b) Mount the adapter kit. Follow the assembly instructions provided with the adapter kit.
2. Grab the product by the handles and push it onto the shelf until the rack brackets fit closely to the rack.
3. Tighten all screws on the rack brackets with a tightening torque of 1.2 Nm to secure the product in the rack.

3.1.4 Considerations for test setup

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.

Signal input and output levels

Information on signal levels is provided in the data sheet. Keep the signal levels within the specified ranges to avoid damage to the product and connected devices.

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.

3.1.5 Connecting antennas



The SMA connector is sensitive to mechanical stress. Use the following handling precautions.

- Always use a torque wrench and mount the cable end with 60 Ncm.
- Do not stack adapters directly at the SMA connector. If you need to use adapters (e.g: SMA to N), then always use a specific adapter cable (Rohde & Schwarz order no. 4900.1700.00).

To connect RF and GPS antenna

1. Connect the RF antenna to the RF IN connector (see [Figure 3-8 - 14](#)).
2. Connect the GPS antenna to the GPS ANT port (see [Figure 3-8 - 4](#)).

3.1.6 Connecting devices for local operation (mouse, keyboard, monitor) (optional)

To connect devices

- ▶ Connect mouse and keyboard a free USB 2.0 port (see [Figure 3-8 - 11](#)) and a monitor to the appropriate monitor port (HDMI, USB-C), (see [Figure 3-8 - 13, 9](#)).

3.1.7 Connecting LAN

The R&S TSMa6 provides two different LAN interfaces.

- SCAN port:
Gbit LAN interface with a fix IP address as default setting. It used to connect a second scanner.
- LAN port:
Gbit LAN interface with auto IP address as default setting. It is used to connect the R&S TSMa6 to a LAN and allows the remote control of the R&S TSMa6.

For configuration details, see [Chapter 6.2, "Connecting to LAN/WAN from a remote PC"](#), on page 44.

3.1.8 Connecting USB to LAN adapter (optional)

To extend the available number of Gbit LAN ports, various optional USB to LAN adapters are available:

- R&S TSPC-U2L (Single Gbit LAN port adapter)
- R&S TSPC-U2L2 (Dual Gbit LAN port adapter)
- R&S TSPC-U2L4 (USB-C to 4-port Ethernet)

For R&S TSPC-U2L4, no driver needs to be loaded. The firmware automatically configures the port (see [Chapter A.2.2.6, "LAN EXT2 / EXT3 / EXT5 / EXT6"](#), on page 156).

For R&S TSPC-U2L and R&S TSPCU2L2, check if driver updates are required.

For information how to connect an additional adapter, see <https://www.rohde-schwarz.com/driver/tsma6/>.

3.1.9 Connecting test mobile phones (optional)

When you connect a test mobile phone to a USB port for the first time, the installation of the appropriate drivers is mandatory.

Currently following driver is available.

- Samsung USB driver

For information how to connect Qualcomm based mobiles and required driver updates, see <https://www.rohde-schwarz.com/driver/tsma6/>.

To connect test mobile phones

- ▶ Connect test mobile phones to USB 3.0 / USB-C ports (see [Figure 3-8 - 2, 14](#)).

For information on how to connect other test mobile phones and install appropriate drivers, refer to related manuals (e.g. R&S SmartONE user manual).

3.1.10 Connecting to power

This section describes how to connect the R&S TSMa6 to a power supply unit.

3.1.10.1 Connecting to a vehicle DC power supply via cigarette lighter

The R&S TSMa6 is delivered with a 12 V DC power supply cable with a cigarette lighter connector.

1. Check the rating of the vehicle DC power supply.
2. Connect the 7-pin connector to DC IN.
3. Connect the cigarette lighter adapter to the 12 V outlet of the vehicle.

3.1.10.2 Connecting to the vehicle power supply via terminal

1. Ensure that the rating of the DC supply network matches the requirements printed on the casing next to the DC input, see (8) in [Figure 3-8](#).
2. Demount the cigarette lighter adapter from the cable.
3. Connect the open ends of the cable to the DC supply.

Ensure that the polarity is correct (see [Figure 3-1](#)).

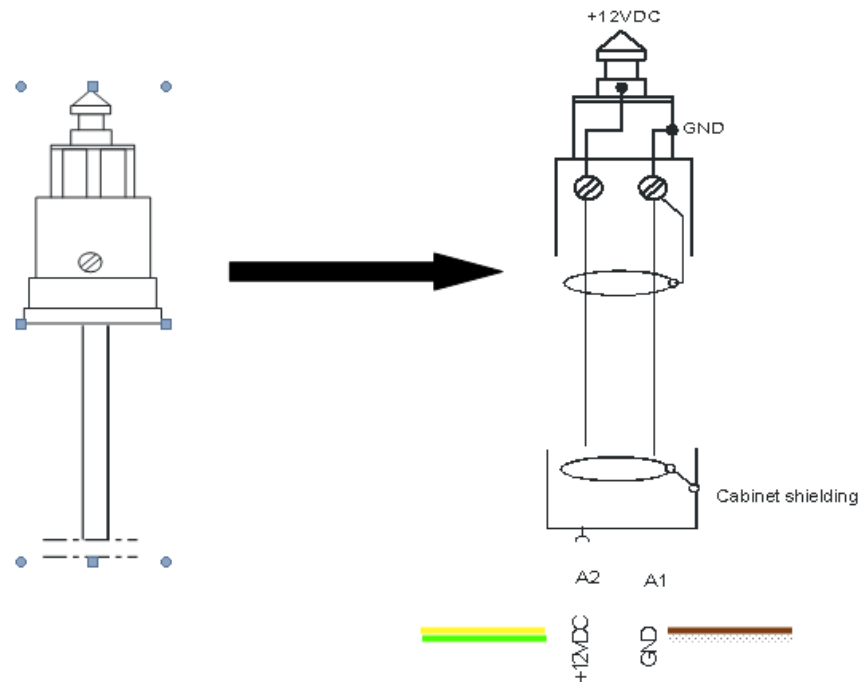


Figure 3-1: Supplied power cable with cigarette lighter adapter

+12 V DC = green/yellow cabling
GND = brown/white cabling

3.1.10.3 Connecting to an AC power supply

If you operate the product with an external power supply, you can use it indoors only in pollution degree 2 environments where nonconductive contamination can occur. Suitable AC power supplies are listed in the data sheet. They differ in the output power:

- R&S TSMA6-Z1 has an output power of 105 W and is suitable for multiple R&S TSMx products.

1. Ensure that the required ratings listed in the data sheet are matched.
2. Connect the round connector to DC IN.

Note:

If the R&S TSMA6 is connected with an R&S TSMA6-BP, DC power must be connected to the R&S TSMA6-BP (1).

Do not connect the DC power to the R&S TSMA6 (2).



Figure 3-2: DC IN connectors

- 1 = DC IN connector R&S TSMA6-BP
2 = DC IN connector R&S TSMA6

3. Insert the AC power plug into a power outlet with ground contact.

3.1.10.4 Connecting to a battery pack

You can use the R&S TSMA6-BP battery pack as power supply.



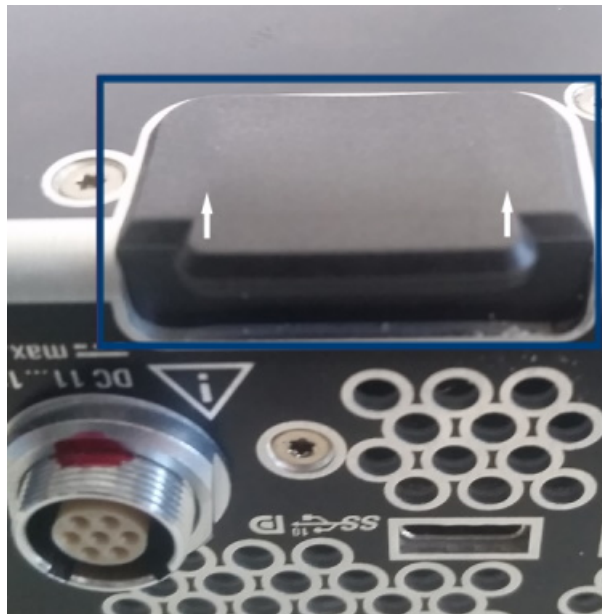
If you use an R&S TSMA6 together with an R&S TSMAx-BP, connect the DC power to the DC IN connector of the R&S TSMAx-BP (see [Figure 3-2](#)).



If the R&S TSMA6 is not used for more than one day, remove the batteries from R&S TSMA6-BP to prevent discharge. For details, see the manual of the R&S TSMA6-BP battery pack.

To connect a battery pack

1. Remove the cover cap from the docking connector of the R&S TSMA6/6B.



2. Screw the collar screws (standard accessory of R&S TSMA6-BP) on the top of the R&S TSMA6 with a Torx 8 screw driver.
 - Torque: $0.66 \text{ Nm} \pm 0.05 \text{ Nm}$

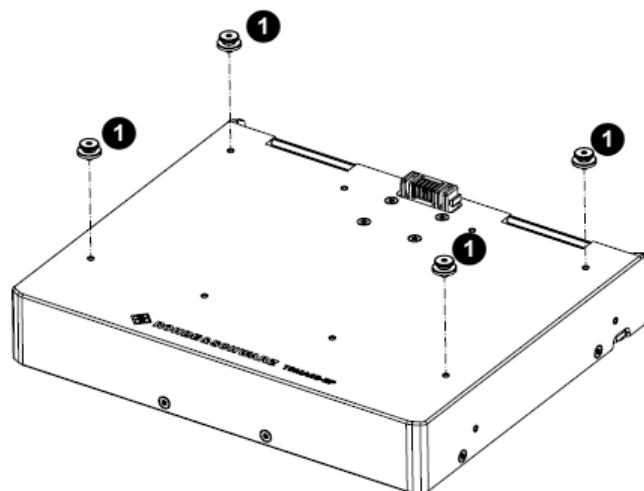


Figure 3-3: Collar screws

1 = Collar screws

3. Align the collar screws with the snap-in holes on the bottom of an R&S TSMA6/6B and press the device down.

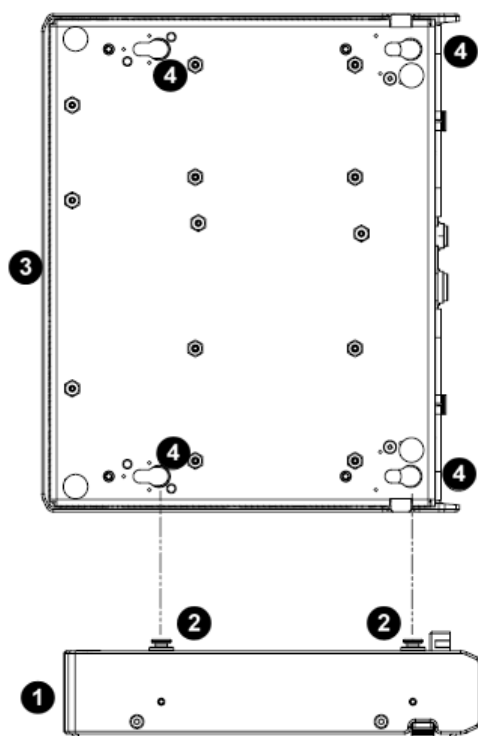


Figure 3-4: Aligning R&S TSMA6-BP and R&S TSMA6/6B

1 = R&S TSMA6-BP

2 = Collar screws

3 = R&S TSMA6/6B

4 = Snap in holes on the bottom pane of R&S TSMA6/6B

4. Move the R&S TSMA6/6B to the rear side (2) until you hear a click when the collar screws are locked in.



Figure 3-5: Connected R&S TSMA6/6B and R&S TSMA6-BP

- 1 = Attach R&S TSMA6 to R&S TSMA6-BP
- 2 = Move R&S TSMA6/6B to the rear side
- 3 = Power connection established (docking connector is snapped in)

3.1.11 Switching on or off R&S TSMA6

The behavior depends on the configured "Startup Settings" (see ["Startup Settings"](#) on page 149).

- "Auto Power ON"
The R&S TSMA6 starts automatically.
- "Remember Last State"
If you have powered down the R&S TSMA6 in the previous measurement session, you have to switch on the device next time manually.

To switch on the device

The device is off but connected to power.

- ▶ Press the power on/off button.
The Pwr LED starts green blinking. After booting, the color changes to green resp. blue continuous depending on the state of the WLAN access point (see [Chapter 3.2.5, "Status LEDs"](#), on page 33).

To shut down the device

- ▶ Press the power on/off button.
The Pwr LED starts blinking green. The operating system shuts down and the Pwr LED is switched off.



Figure 3-6: Power button

For the power state LEDs, see [Chapter 3.2.5, "Status LEDs"](#), on page 33.

For a coldstart, hold the power on/off button at least 5 s.

3.1.12 Calibrating GPS for dead reckoning

The following steps are necessary to enable untethered dead reckoning with the integrated receiver (see [Chapter 3.2, "Instrument tour"](#), on page 29) of the R&S TSMA6.

1. Mount the R&S TSMA6 device fixed to the frame of a car.
2. Power on the R&S TSMA6 device.
3. Activate "Dead Reckoning" in the used software (for details, refer to R&S ROMES, R&S NESTOR or R&S ViCom documentation).
4. Wait until the used software reports a "3D fix" (time may vary depending on the configured GNSS).
5. To calibrate the instrument, perform the following driving procedures in a safe environment.
 - a) 720 degrees right turn
 - b) 720 degrees left turn
 - c) Drive in a straight line with a velocity exceeding 40 km/h.

After finishing the calibration, the used software should report a fix state "GPS+DR" or "3D+DR", in case satellite reception is lost the fix state will change to "DR only".



If using "DR only", the accuracy of the reported position will decrease over time. If it falls below a certain threshold, the receiver reports the state "No Fix".



The GPS calibration is saved in the module. Whenever the device is switched off, the calibration procedure must be repeated for the next usage of dead reckoning.

3.2 Instrument tour

3.2.1 Front panel view

The front panel of the R&S TSMA6 does not provide any connectors or control elements for operation. The black caps on the left and right contain the WLAN antennas.



Figure 3-7: R&S TSMA6 - Front Panel

3.2.2 Rear panel view

The following figure provides an overview of the control elements and the connectors on the rear panel of the instrument.

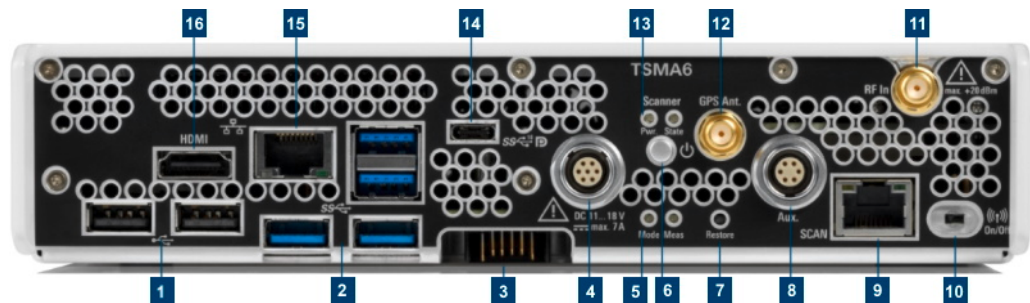


Figure 3-8: R&S TSMA6 - Rear Panel

- 1 = "USB 2.0 (2x, Type A)" on page 30)
- 2 = "USB 3.0 (4x, Type A)" on page 30
- 3 = "Docking connector" on page 30
- 4 = "DC IN connector" on page 30
- 5 = Status LEDs - Mode, Meas
- 6 = "Power on/off" on page 30
- 7 = "Restore button" on page 30
- 8 = "AUX connector (SMA) - synchronization R&S TSME4/6 / R&S TSMExxDC" on page 31
- 9 = "SCAN port - GBit LAN interface - external R&S TSME4/6 (RJ45 connector)" on page 31
- 10 = "WLAN/Bluetooth on/off" on page 31
- 11 = "RF IN connector (SMA)" on page 31
- 12 = "GPS Ant. connector (SMA) - GPS antenna input" on page 31
- 13 = Status LEDs Pwr / State
- 14 = "USB-C (multiport for Thunderbolt, display and standard USB-C 3.1)" on page 31
- 15 = "LAN Port - remote control (RJ45 connector)" on page 32
- 16 = "HDMI connector" on page 32

USB 2.0 (2x, Type A)

See (1) in [Figure 3-8](#).

Connecting external devices, e.g. keyboard, mouse or software dongle.

Power limit: max. 500 mA / port

Overall USB current (USB-C, USB 3.0 and USB 2.0): max. 3 A

USB 3.0 (4x, Type A)

See (2) in [Figure 3-8](#).

Connecting external storage devices, data sticks and test mobile phones.

Power limit: max. 900 mA / port

Overall USB current (USB-C, USB 3.0 and USB 2.0): max. 3 A

Docking connector

See (3) in [Figure 3-8](#).

Connector for the battery pack unit R&S TSMA6/B-BP.

DC IN connector

See (4) in [Figure 3-8](#).

Connecting external DC power supply.

Ensure that the voltage and current indicated on the R&S TSMA6 match the available power source.

Input voltage range: 11 V to 18 V

Input current: max. 8.5 A

Status LEDs

The four status LEDs, [Scanner State], [Scanner Pwr], [Mode], and [Meas] indicated different states of the R&S TSMA6. For a detailed description, see [Chapter 3.2.5, "Status LEDs"](#), on page 33.

Power on/off

See (6) in [Figure 3-8](#).

Turns the device on and off.

Coldstart: holding the button > 5 sec.

For details, see [Chapter 3.1.11, "Switching on or off R&S TSMA6"](#), on page 27.

Restore button

See (7) in [Figure 3-8](#).

System recovery to factory or user default.

Use a slim, dull object for pressing the button.

Min button hold time for detection: 20 sec

AUX connector (SMA) - synchronization R&S TSME4/6 / R&S TSMExxDC

See (8) in [Figure 3-8](#).

The AUX connector has two functions.

- Input/output: Synchronization with up to 4 connected R&S TSME6 resp. R&S TSMExxDC (requires sync cable R&S TSME6-ZC2, R&S no. 4900.1800.02 or R&S TSME6-ZC4, R&S no. 4900.1817.02)
- Input: Synchronization of R&S TSMA6 with an external 10 MHz reference (requires dedicated sync cable)

SCAN port - GBit LAN interface - external R&S TSME4/6 (RJ45 connector)

See (9) in [Figure 3-8](#).

The SCAN port provides a high-speed 1 Gbit Ethernet interface with an RJ 45 connector. It is used to connect the R&S TSMA6 to a separate R&S TSME6 as a second scanner. It can be used for MIMO scenarios and for increasing bandwidth and measurement rate.

WLAN/Bluetooth on/off

See (10) in [Figure 3-8](#).

Switches WLAN and Bluetooth on and off.

RF IN connector (SMA)

See (11) in [Figure 3-8](#).

RF input of the device.

The maximum input power is +20 dBm/10 V DC.

Do not overload the maximum allowed input of +20 dBm.

Non-compliance destroys the input mixer.

GPS Ant. connector (SMA) - GPS antenna input

See (12) in [Figure 3-8](#).

Active GPS antenna port (output voltage 3V, max 25 mA).

USB-C (multiport for Thunderbolt, display and standard USB-C 3.1)

See (14) in [Figure 3-8](#).

Connecting external storage devices, tablets and test mobile phones.

Total power (USB-C): max. 3 A

Overall USB current (USB-C, USB 3.0 and USB 2.0): max. 3 A

LAN Port - remote control (RJ45 connector)



See (15) in [Figure 3-8](#).

The LAN port provides a high-speed 1 Gbit Ethernet interface with an RJ 45 connector. It is used to connect the R&S TSMA6 to a LAN/WAN.

The LAN interface can be used for the following scenarios.

- Remote Control via web-GUI
- Remote Control via Remote Desktop Connection
- LAN interface in NESTOR Probe Mode

Table 3-1: LAN port LEDs

Status	LED
Link status	 yellow
Activity status	 green

HDMI connector

See (16) in [Figure 3-8](#).

Connecting an external monitor. (max. resolution: 2560 x 1600 pixel).

3.2.3 Built-In GPS receiver

The integrated multi-GNSS (GPS / BeiDou / Galileo / GLONASS) receiver allows to use three satellite systems in parallel. It offers an accuracy improvement of 30 % to 50 % by using a second constellation of satellites.

Following combinations are allowed:

- GPS only
- GPS / GLONASS / Galileo
- GPS / BeiDou

The R&S TSMA6 can perform dead reckoning in tunnels to provide position information even if no satellites are available. The dead reckoning is performed by the device with its built-in electronic gyroscopes.

For enabling untethered dead reckoning, see [Chapter 3.1.12, "Calibrating GPS for dead reckoning"](#), on page 28.



Depending on the intended use, the respective valid regulations regarding lightning protection of the antennas and regarding vehicle installation must be observed during installation.

3.2.4 Built-In WLAN / Bluetooth adapter

The R&S TSMA6 has built-in WLAN/Bluetooth module (Intel® Wireless AC 8265).

The R&S TSMA6 WLAN / Bluetooth adapter allows the following modes.

- Client connection to a distant WLAN network
- Serving as a WLAN access point

Per default, the R&S TSMA6 WLAN access point is switched on. The login credentials are found on the bottom label of the device. The WLAN / Bluetooth can be switched off (flight mode) via rear panel switch.

Configure the WLAN and Bluetooth settings via web-GUI.

- [Chapter A.2.2.1, "Bluetooth"](#), on page 151
- [Chapter A.2.2.2, "WLAN"](#), on page 152
- [Chapter A.2.2.3, "WLAN AP"](#), on page 154

3.2.5 Status LEDs

The four LEDs on the rear panel display the following states.

- [Scanner State / Scanner Pwr]
Indicates the state of the scanner component
- [Mode]
Indicates the device status
- [Meas]
Indicates the state of the SW application

Device		Scanner		
[Mode] LED	[Meas] LED	[Pwr] LED	[State]LED	Comment
Off	Off	Off	Off	Power Off
green (BLINKING, 1 Hz)	---	---	---	Power On Selftest / Power Down
green (CONT.)	---	---	---	Power On / WLAN Off
blue (CONT.)	---	---	---	Power On / WLAN On
---	---	green (BLINKING rapidly => ON)	red (Off-On < 5s => Off)	Scanner configuration ongoing
---	---	green (CONT.)	---	Scanner ready
---	yellow (CONT.)	green (CONT.)	green (BLINKING)	SW loading
---	green (CONT.)	green (CONT.)	green (CONT.)	SW ready
---	green (BLINKING, 0.5 Hz)	green (CONT.)	green (BLINKING)	SW measuring
---	green/blue (BLINKING rapidly)	green (CONT.)	green (BLINKING)	SW recording
---	yellow (BLINKING, 2 Hz)	---	---	SW warning

Device		Scanner		
[Mode] LED	[Meas] LED	[Pwr] LED	[State]LED	Comment
blue (BLINKING, 1 Hz)	---	---	---	Restore/ Backup/FW, SW installation (in progress)
green (BLINKING, 0.2 Hz, ton = 1 s)	---	---	---	Delayed start activated
Error States				
blue (BLINKING rapidly)	---	---	---	Selftest Failed/ Scanner Interface not accessible
---	---	---	red (BLINKING, 2 Hz)	Scanner Error Temperature Warning
---	---	---	red (CONT.)	Scanner Error Temperature Error
---	red (BLINKING rapidly)	---	---	SW error

4 Option concept

The option concept is designed as follows.

- Optional accessories
 - R&S TSMA6-ZCB2 (Carrying bag)
 - R&S TSMA6-Z1 (AC adapter)
 - R&S TSMA6-Z2 (19" rack adapter)
 - R&S TSMA6-Z5 (Carrying box)
 - R&S TSMA6B-Z62 (NESTOR dongle lock)
- Hardware options
 - R&S TSMA6-B1T (Enhancement of 1Tbyte SDD and 16 Gbyte RAM)
- Scanner options
- Software options

4.1 Scanner options

The scanner options are available with registered licenses.

4.1.1 Technology options

Technology options allow the R&S TSMA6 to scan the input based on a specific technology, for example, LTE. All technology options can be installed on the same instrument; the R&S TSMA6 can measure various technologies simultaneously.

Following technology options are available:

Table 4-1: Available R&S TSMA6 technology options

Option	Order Number	Description
R&S TSMA6-K10	4901.0989.02	Block IQ data
R&S TSMA6-K21	4901.0789.02	WCDMA scanning
R&S TSMA6-K22	4901.0766.02	CDMA2000 scanning
R&S TSMA6-K23	4901.0795.02	GSM scanning
R&S TSMA6-K24	4901.0750.02	1xEV-DO scanning
R&S TSMA6-K25	4901.0814.02	CW scanning
R&S TSMA6-K26	4901.0743.02	TETRA scanning
R&S TSMA6-K27	4901.0720.02	RF power scan
R&S TSMA6-K28	4901.0737.02	WiMAX™ scanning
R&S TSMA6-K29	4901.0772.02	LTE scanning
R&S TSMA6-K30	4901.0714.02	LTE-MIMO scanning

Option	Order Number	Description
R&S TSMA6-K32	4901.0643.02	LTE eMBMS scanning
R&S TSMA6-K34	4901.0808.02	NB-IoT/Cat NB1 scanning
R&S TSMA6-K35	4901.0208.02	LTE-M scanning
R&S TSMA6-K36	4901.0272.02	C-V2X LTE scanning
R&S TSMA6-K40	4901.0614.02	Automatic channel detection (ViCom only, not for R&S ROMES4)
R&S TSMA6-K50	4901.0966.02	5G NR scanning
R&S TSMA6-K51	4901.0250.02	5G NR scanning add-ons
R&S TSMA6-K61	4901.0820.02	MNT software installation (QualiPoc® support)
R&S TSMA6-K62	4901.0266.02	R&S NESTOR software installation

4.1.2 Band options

The R&S TSMA6 hardware measures in all wireless communications bands from 350 MHz to 6 GHz simultaneously. Using band licenses, more cost-efficient configurations are available for applications where only a limited number of bands need to be measured simultaneously. These configurations limit the number of bands that can be measured in parallel. You can reconfigure the bands for each measurement as desired.

Upgrade options are available to increase the bandwidth of the R&S TSMA6 from a limited number of bands to full bandwidth.

Following band options are available:

Table 4-2: Available R&S TSMA6 band options

Option	Order Number	Description
R&S TSMA6-KAB	4901.0708.02	All bands measured simultaneously
R&S TSMA6-K1B	4901.0695.02	1 band measured simultaneously
R&S TSMA6-K2B	4901.0689.02	2 bands measured simultaneously
R&S TSMA6-K3B	4901.0672.02	3 bands measured simultaneously
R&S TSMA6-K4B	4901.0666.02	4 bands measured simultaneously
R&S TSMA6-K5B	4901.0650.02	5 bands measured simultaneously
R&S TSMA6-KUB	4901.0950.02	Upgrade: 1 additional band measured simultaneously

4.2 Software options

4.2.1 R&S NESTOR options

The R&S NESTOR options are preinstalled on the R&S TSMA6, if the R&S NESTOR application is ordered within the TSMA6 KMAT.

A later installation of additional R&S NESTOR options can be done via the R&S TSMA6 web GUI (see ["Install NESTOR Options"](#) on page 158). In this case, you have to order option-specific NESTOR license keys. Therefore, the serial number of R&S NESTOR, which is available on the product label, is required.

5 General workflows

Prerequisites

- Antennas connected (RF, GPS)
- Software license available. With WiBu following solutions are possible.
 - Wibu dongle
 - Wibu software license - requires no dongle
- Power supply connected (DC/AC/Battery Pack) and TSMA6B switched on
- LAN/WLAN connection to host PC established
 - LAN

Connect the R&S TSMA6 LAN socket with an RJ45 cable to the LAN. By default the R&S TSMA6 is configured to use DHCP and no static IP address is set. The R&S TSMA6 shows the IP address in the local web-GUI.

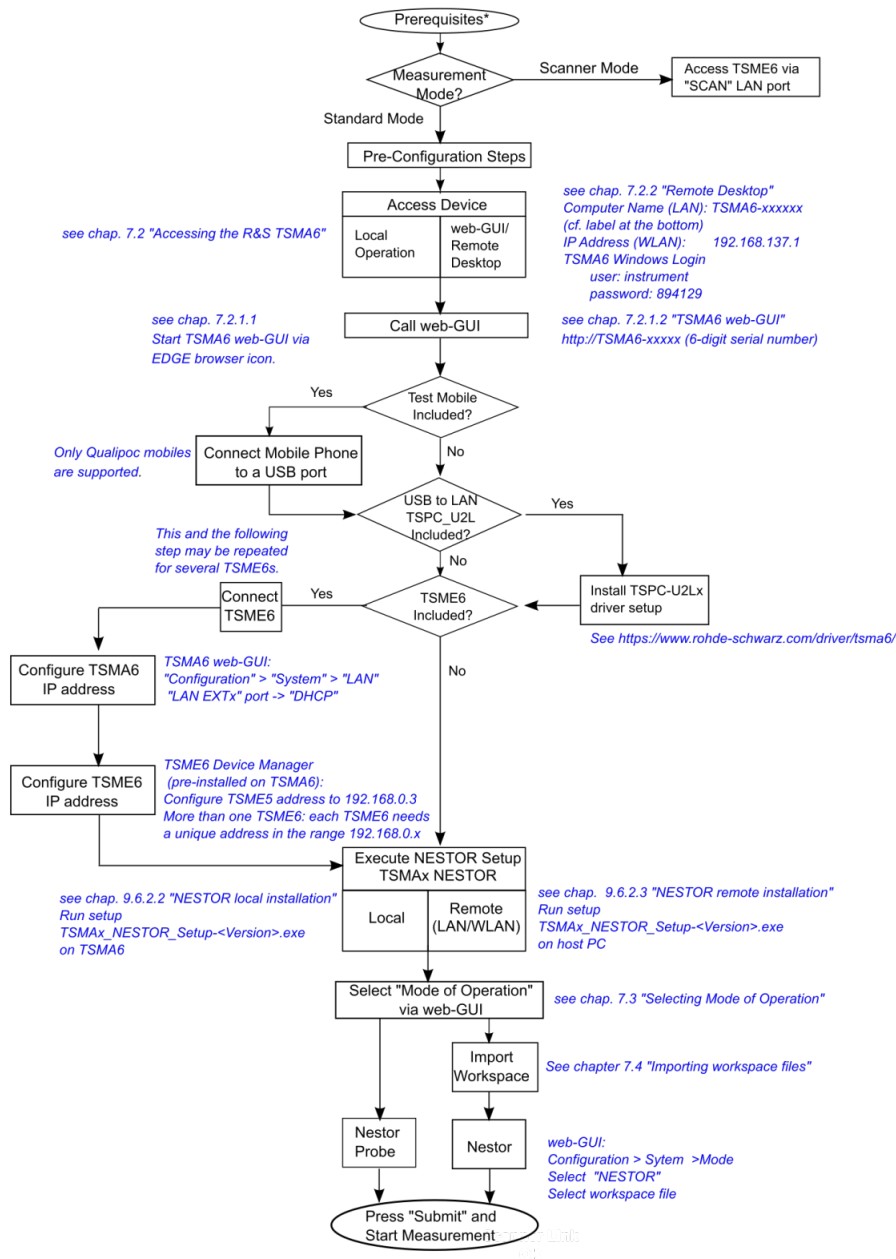
Start a web browser on the remote device and enter the following URL:
`http://TSMA6-<xxxxxx>.local` (xxxxxx is the serial number of this specific R&S TSMA6) or use the IP displayed from the local web-GUI.
 - WLAN (see [Chapter 6.4, "Connecting with R&S TSMA6 WLAN access point"](#), on page 45)

Default WLAN-Access point
 SSID: *TSMA6-xxxxxx* (xxxxxx is the serial number of this specific R&S TSMA6)
 Default key: *instrument*
- License Keys installed
 - Scanner
 - Software
 - QualiPoc mobile
- Optional: mouse, keyboard and monitor for local control
- Optional: Additional cabling for R&S TSME6 and R&S TSMExxDC connection
 - LAN cable: TSME6 "LAN" connector <-> TSMA6B "SCAN" connector
 - AUX cable: TSME6 "AUX" connector <-> TSMA6B "AUX" connector
 - Power cable: TSME6 "DC IN" connector <-> Power Supply

See [Chapter 7.2, "Use cases"](#), on page 68.
- Optional: USB2LAN converter (TSPC-U2Lx)
 Connect TSPC-USL2 / TSPC-U2L to blue USB3.0 port

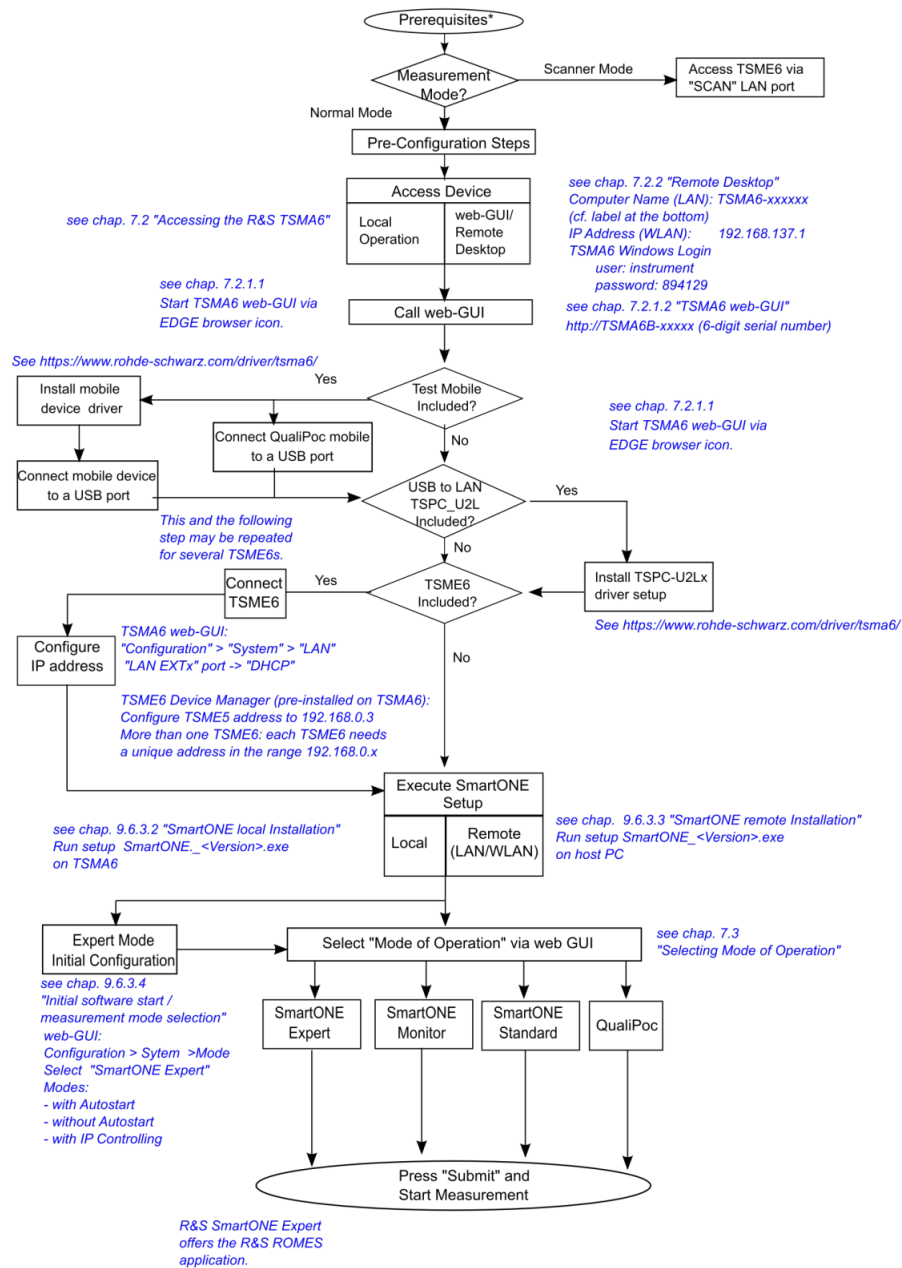
5.1 R&S NESTOR-based workflow

* For details about the prerequisites, see ["Prerequisites"](#) on page 38.



5.2 R&S SmartONE based workflow

* For details about the prerequisites, see "Prerequisites" on page 38.



6 Configuring the R&S TSMA6

6.1 Accessing the R&S TSMA6

There are different ways to control measurements on the R&S TSMA6.

- Local operation
To use the R&S TSMA6 as an ordinary PC, an external monitor, mouse and keyboard have to be connected to the R&S TSMA6.
- Remote access
The remote access to the R&S TSMA6 can be realized via the following options.
 - Using the web GUI of the R&S TSMA6 (see [Chapter 6.1.1, "Using the R&S TSMA6 web GUI"](#), on page 41).
 - Establishing a remote desktop connection (via LAN/WLAN) (see [Chapter 6.1.2, "Using a remote desktop connection"](#), on page 42).

6.1.1 Using the R&S TSMA6 web GUI



The Microsoft EDGE browser replaces the former used Internet Explorer for the TSMAx web-GUI and is used as default browser.

The R&S TSMA6 web GUI gives the user the full access to control and measure with the R&S TSMA6. Following tasks can be done:

- Recalling of system information / hardware software versions / IP settings
- Configuring measurement mode / power-up/down behavior / band selection
- Configuring LAN / WLAN & Bluetooth settings / IP configuration
- File transfer (upload / download)
- Showing and installing SW licenses
- Updating firmware and software
- Creating a user backup
- Restarting device / scanner part
- Accessing online help

To access the R&S TSMA6 web GUI, use one of the following options.

6.1.1.1 Using the web GUI locally

1. Connect a mouse, a keyboard and a monitor to the R&S TSMA6.
2. Press the Microsoft EDGE browser icon in the Windows task bar.

The R&S TSMA6 web GUI opens automatically. If not, type the following URL:
http://localhost

6.1.1.2 Using WLAN from a remote PC or smartphone

1. On the remote device, search for the TSMA6 WLAN network. The WLAN access point on the R&S TSMA6 starts automatically by factory default.
NOTE: WLAN AP start-up configuration (see [Chapter A.2.2.3, "WLAN AP"](#), on page 154).
2. Connect to the access point using the login credentials found at the bottom label of the R&S TSMA6.
Default SSID: *TSMA6-xxxxxx* (xxxxxx is the serial number of this specific R&S TSMA6)
Default key: *instrument*
Note:
The SSID and the key are configurable via the web GUI (see [Chapter A.2.2.3, "WLAN AP"](#), on page 154).
3. Open the browser in the remote device and enter the IP address of the TSMA6 web GUI.
http://192.168.137.1/
The TSMA6 web-GUI is displayed on the browser.

6.1.2 Using a remote desktop connection

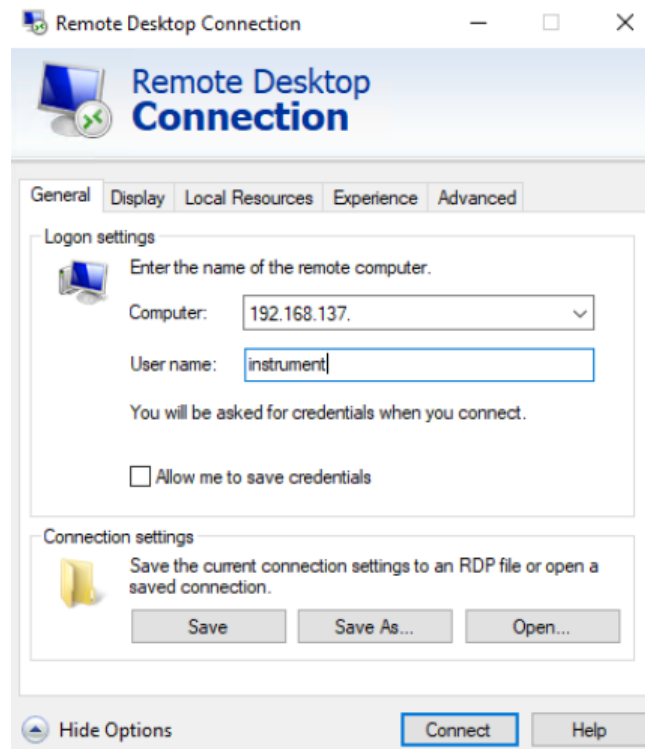
To establish a remote desktop connection with a Windows PC (Win10 is recommended), the following steps have to be performed.

1. Establish a WLAN/LAN connection between the R&S TSMA6 and the remote PC (see [Chapter 6.1.1, "Using the R&S TSMA6 web GUI"](#), on page 41).
2. On the keyboard, press [Win-Logo] + [R].
The command window opens.
3. Enter *mstsc.exe*.
The "Remote Desktop Connection" window opens.
4. In the "Remote Desktop Connection" window, click "Show Options".
5. In the "General" tab, enter following parameters:
 - Computer: The input depends on the selected connection type and is as follows.
 - WLAN: *192.168.137.1*
 - LAN: IP address of the R&S TSMA6

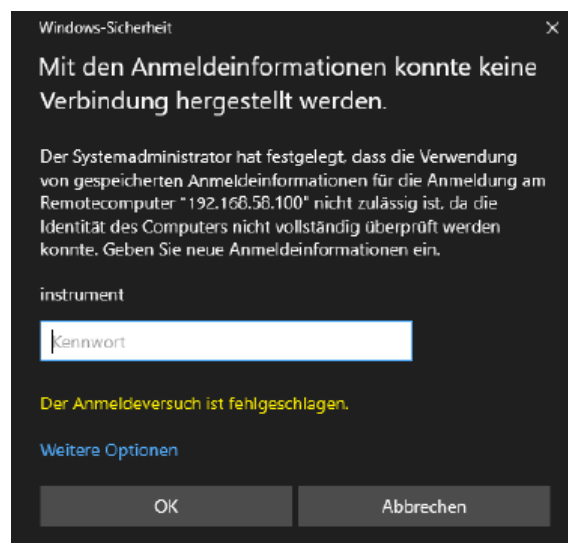
NOTE:

If you connect the R&S TSMA6 LAN interface with a PC via LAN cable, the IP addresses are negotiated automatically by default. The IP address of the R&S TSMA6 can be read from the local web GUI (see [Chapter 6.1.1, "Using the R&S TSMA6 web GUI"](#), on page 41).

- User name: *instrument*



6. Click "Connect".
7. Enter the password (default: 894129) and click "OK".



8. The remote desktop connection is established.

The R&S TSMA6 can be controlled from the remote PC.

6.2 Connecting to LAN/WAN from a remote PC

Network environment

Before connecting the product to a local area network (LAN), consider the following:

- Install the latest firmware and patches for the Windows operating system to reduce security risks.
- For internet or remote access, use secured connections if applicable.
- Ensure that the network settings comply with the security policies of your company. Contact your local system administrator or IT department before connecting your product to your company LAN.
- When connected to the LAN, the product may potentially be accessed from the internet, which may be a security risk. For example, attackers might misuse or damage the product.

1. Connect the R&S TSMA6 LAN connector with an RJ45 cable to the local area network.



2. Configure the LAN port IP address settings in the R&S TSMA6 web-GUI (see [Chapter A.2.2.4, "LAN"](#), on page 154) in accordance with your administrator guidelines:
 - a) Local configuration, see [Chapter 6.1.1.1, "Using the web GUI locally"](#), on page 41.
 - b) Remote configuration, see [Chapter 6.1.1.2, "Using WLAN from a remote PC or smartphone"](#), on page 42
3. Alternatively, use the assigned IP address for remote access (see [Chapter A.1.2, "IP settings"](#), on page 145).

The default IP setting is "DHCP" (configure IP address automatically). The assigned IP address for remote access when using DHCP is displayed in the web-GUI (see [Chapter A.1.2, "IP settings"](#), on page 145).

6.3 Changing IP addresses

To change the IP addresses, refer to the following.

- [Chapter A.2.2.4, "LAN"](#), on page 154

- [Chapter A.2.2.5, "LAN SCAN"](#), on page 155

6.4 Connecting with R&S TSMA6 WLAN access point

The R&S TSMA6 has a built-in WLAN access point.

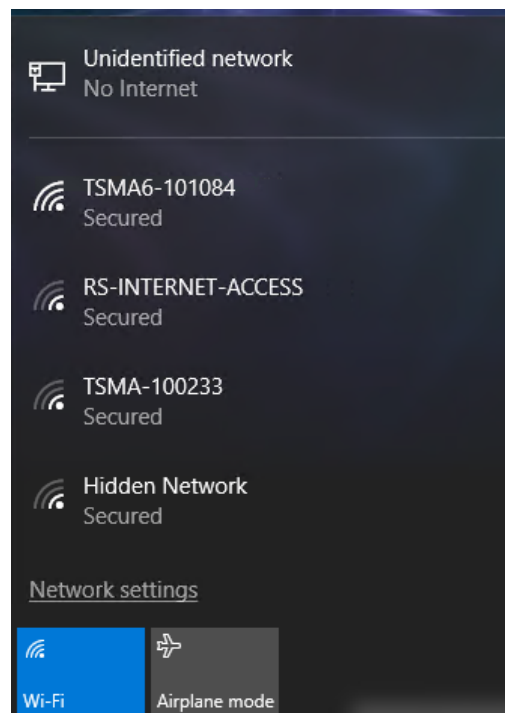


The usage of WLAN is restricted to indoor use.

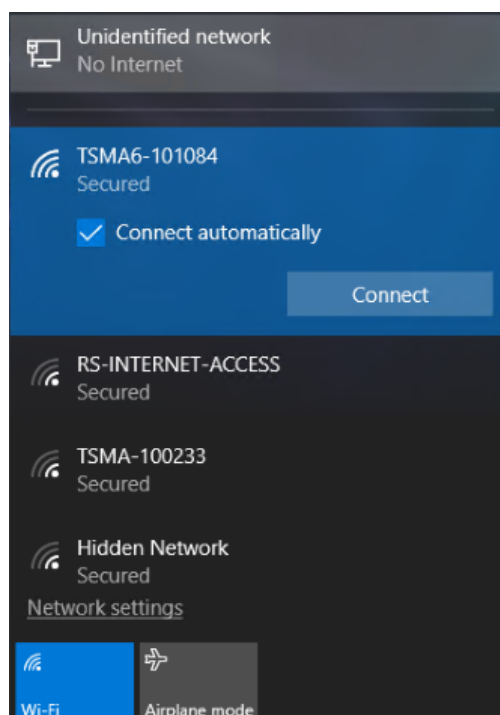
1. On the host PC, click the Network symbol in the task bar.



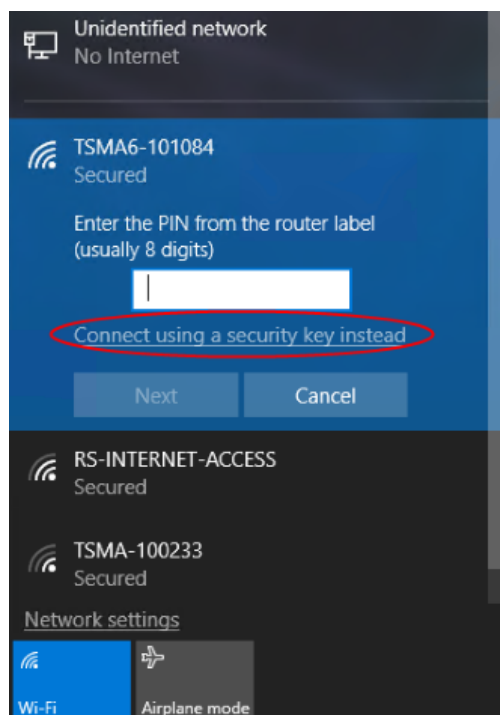
2. Select the correct WLAN (in this example: "TSMA6-101084").



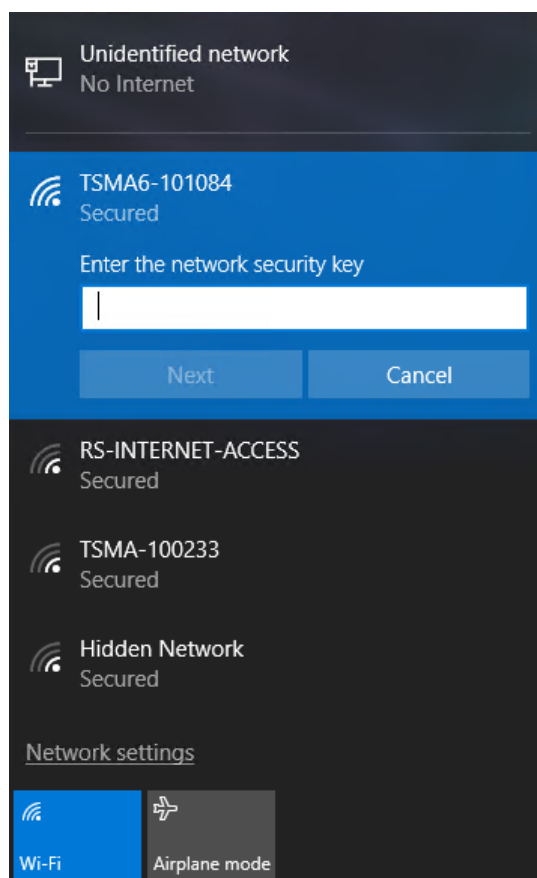
3. Select "Connect automatically" and click "Connect".



4. Select "Connect using a security key instead".



5. Enter the network security key and click "Next".
Default security key: *instrument*



The connection to the WLAN access point is established, when it is reported as "Connected".

6.5 Changing WLAN settings

To change the WLAN settings (WLAN mode and preferred band), proceed as follows.

To change WLAN mode and preferred band.

1. Start the web-GUI of the R&S TSMa6.
2. Navigate to "Configuration" > "Connectivity" > "WLAN".
3. Select the following settings according to your needs or back to the default settings.
 - "Wireless Mode"
 - "Preferred band"
 - "Wireless Mode Ext"

See also ["WLAN Settings"](#) on page 153.

Connectivity

Bluetooth WLAN WLAN AP LAN LAN EXT1

WLAN Adapter

Status On Off

SSID Select SSID to connect Refresh

Network Key

Connect

TCP/IP Mode ☒ DHCP ☐ Static

IP Address . . .

Subnet Mask . . .

Default Gateway . . .

DNS Server(s) . . .

Submit

WLAN Settings

Wireless Mode 4. 2.4GHz 802.11b/g Change Default

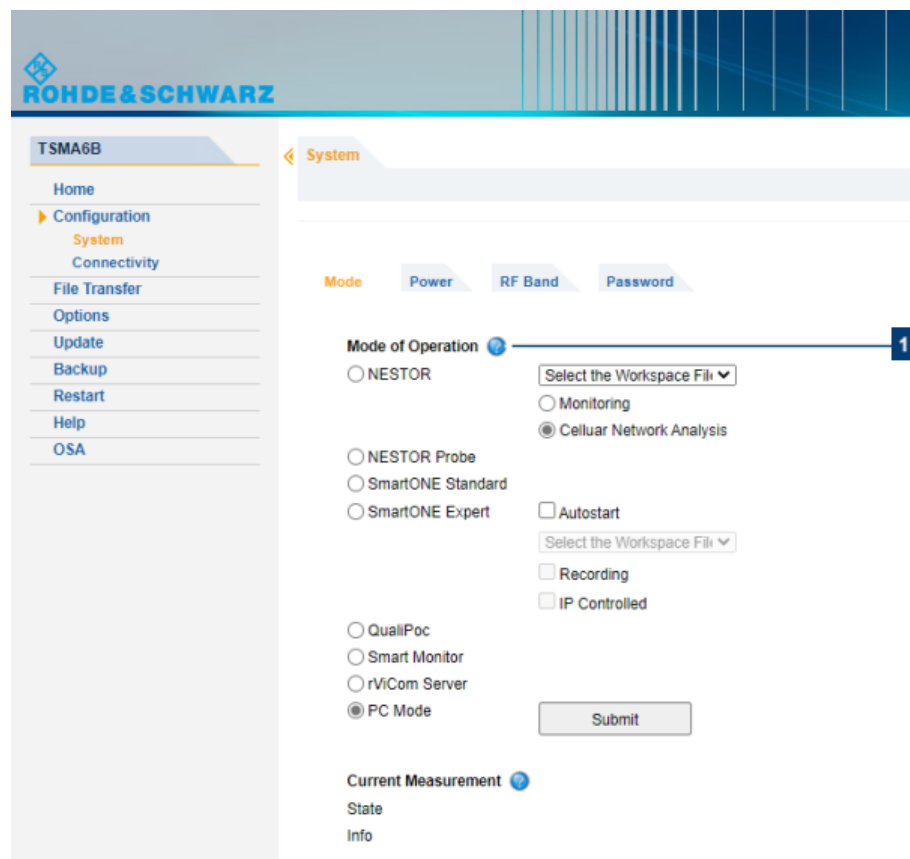
Preferred band 2. Prefer 2.4GHz band Change Default

Wireless Mode Ext 2. 802.11n Change Default

6.6 Selecting measurement mode

Select the measurement mode with the following steps.

1. Start the R&S TSMA6 web GUI (see [Chapter 6.1.1, "Using the R&S TSMA6 web GUI"](#), on page 41).
2. The measurement modes can be configured via the radio button from the web GUI under "Configuration" > "System" > "Mode".



Measurement modes are only selectable, if the appropriate SW applications are installed (see [Chapter 8.6, "Software update - details"](#), on page 93). The "PC Mode" is always selectable.

6.6.1 Measurement modes

6.6.1.1 PC mode

In this mode, none of the following measurement modes are active and the device is in idle state.

This is the preferred mode for updating R&S TSMa6 firmware and software.

6.6.1.2 Remote ViCom server mode



The "rViCom Server" mode is only selectable if the R&S Remote ViCom server software is installed (see [Chapter 8.6.1, "Remote ViCom server software"](#), on page 94).

This mode starts the Remote ViCom server on the R&S TSMa6. Measurement configuration and data collection are done from a remotely connected handheld device (smartphone or tablet PC). The Remote ViCom client application need to be developed by customer side. For details, see R&S ViCom manual.

The connection between the Remote ViCom server on the R&S TSMa6 and the client application (Remote ViCom client) on the handheld device can be realized via Bluetooth® or WLAN.

The selection which wireless interface to use depends on the expected data throughput and measurement task.



The WLAN connection allows a data throughput, which is about 10 times higher compared to Bluetooth®.

The Bluetooth® connection is less influenced by radio interference.

- Using the Bluetooth interface:
See [Chapter 6.8, "Pairing Bluetooth® devices"](#), on page 57.
- Using the WLAN connection:
Connect the tablet/smartphone with the R&S TSMa6 WLAN AP. See [Chapter 6.4, "Connecting with R&S TSMa6 WLAN access point"](#), on page 45.

6.6.1.3 QualiPoc mode



The QualiPoc mode selector is only displayed if the R&S SmartONE software is installed (see [Chapter 8.6.3, "R&S SmartONE setup \(SmartBenchmark, ROMES, QualiPoc\)"](#), on page 100).

Prerequisites

- The appropriate scanner license must be installed on the QualiPoc® handheld device. If you do not have the correct license, contact the R&S service.
- On the R&S TSMa6, Bluetooth® must be activated and visible (see [Figure 6-6](#)).

To use the R&S TSMa6 with QualiPoc®, the following steps must be performed.

1. Turn on the R&S TSMa6 scanner.
2. In the web-GUI, set the "Mode of Operation" to "QualiPoc" (1) and press "Submit" (2).

Mode of Operation ⓘ

☐ NESTOR Select the Workspace File ▼

☐ Monitoring

☒ Cellular Network Analysis

☐ NESTOR Probe

☐ SmartONE Standard

☐ SmartONE Expert ☐ Autostart

Select the Workspace File ▼

☐ Recording

☐ IP Controlled

1 ☒ QualiPoc

☐ Smart Monitor

☐ rViCom Server

2 ☐ PC Mode Submit

Current Measurement ⓘ

State

Info

3. On the handheld device, start the QualiPoc® application.
4. Touch the main menu ⓘ, and then touch "Device manager"
5. Touch the plus sign (+) at the top of the screen and touch "NCM".

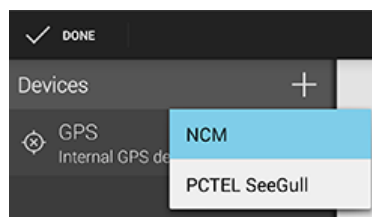


Figure 6-1: Add NCM

QualiPoc® displays "NCM" under "Devices".

Note: The NCM provides the Bluetooth® connection to the scanner.

6. Touch "Scan" at the top of the screen and wait until the scanning process stops.

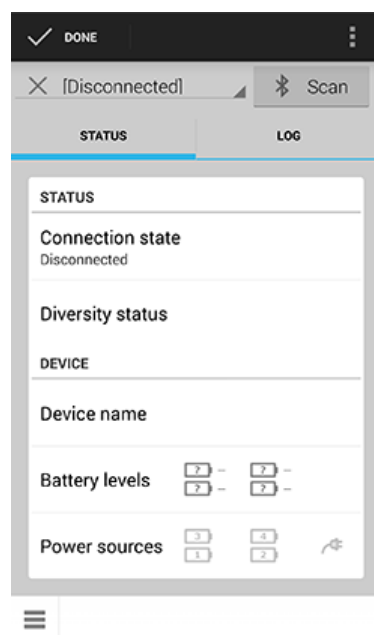


Figure 6-2: Scan for NCM

7. Touch "[Disconnected]", touch the TSMA6 scanner in the list, for example, "TSMA6-900012", and then touch "OK" to accept the pairing request.

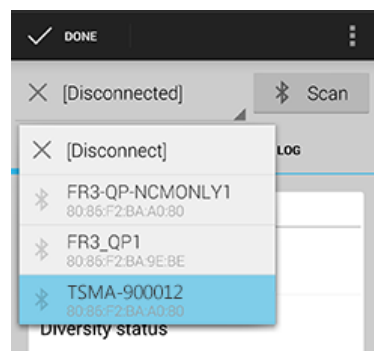


Figure 6-3: Pair NCM

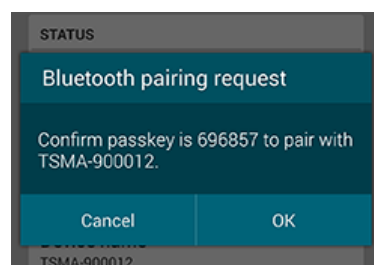


Figure 6-4: Bluetooth pairing request

8. The scanner appears in the "Devices" list upon successful detection.

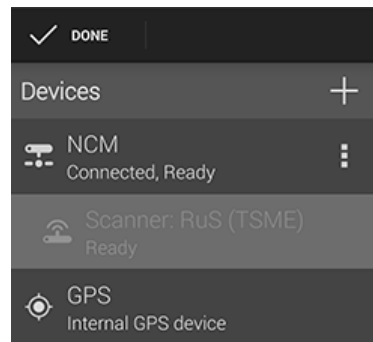


Figure 6-5: Scanner ready

For more details about the QualiPoc configuration and usage, refer to the user documentation of QualiPoc®.

6.6.1.4 NESTOR and NESTOR probe mode



The NESTOR mode is only displayed if the NESTOR software is installed (see [Chapter 8.6.2, "R&S NESTOR software"](#), on page 97).

General

- **NESTOR mode**
The NESTOR UI engine and the NESTOR measurement engine are hosted on the R&S TSMa6.
- **NESTOR probe mode**
The R&S TSMa6 hosts only the NESTOR measurement engine. The NESTOR UI engine is hosted on a remote PC connected via LAN/WLAN with the R&S TSMa6. This master PC is required to control the measurement.

Prerequisites

- For NESTOR and NESTOR probe mode:
 - NESTOR option licenses are either installed on the internal SD card or connected as an external USB dongle
- For NESTOR mode only:
 - NESTOR workspace file imported (see ["Import NESTOR workspace file"](#) on page 56)
 - NESTOR license dongle connected to a USB port
- For NESTOR probe mode only:
 - WAN / LAN connection with the NESTOR host (see [Chapter 3.1.7, "Connecting LAN"](#), on page 21)
 - NESTOR Probe mode requires a master PC to control the measurement
 - Optional: NESTOR license dongle connected to a USB port

NESTOR mode

To use the R&S TSMA6 NESTOR mode, the following steps must be performed.

1. In the web-GUI, set the "Mode of Operation" to "NESTOR".

Mode of Operation ?

1 — ☒ NESTOR ☐ Autostart

Select the Workspace File ▼

☐ Monitoring ☐ Cellular Network Analysis

☐ SmartONE Standard ☐ SmartONE Expert ☐ Autostart

Select the Workspace File ▼

☐ Recording ☐ IP Controlled

☐ QualiPoc ☐ Smart Monitor ☐ rViCom Server ☐ PC Mode

2 —

Current Measurement ?

State

Info

2. Select or unselect "Autostart".
 - Unselected: NESTOR starts without workspace parameter and the workspace selector box is inactive.
 - Selected: Select a workspace file for mode activation. The workspace selector box is active.
3. Select a scenario ("Monitoring" or "Cellular Network Analysis").
4. Press "Submit".

The R&S TSMA6 is switched into "NESTOR" mode. In the status bar, the entry is "Changing mode of operation in progress...".

The selected mode is active when the status bar displays "No error". The scanner "State" LED starts blinking rapidly.

NESTOR probe mode

1. On the "Mode" tab, select "NESTOR Probe" mode.
2. Press "Submit".

The R&S TSMA6 is switched into "NESTOR Probe" mode. In the status bar, the entry is "Changing mode of operation in progress...".

The selected mode is active when the status bar indicates "No error". The scanner "State" LED starts blinking rapidly.

The NESTOR measurement is started and controlled from the host PC.

For more details about the R&S NESTOR configuration and usage, refer to the user documentation for R&S NESTOR.

6.6.1.5 SmartONE mode



The SmartONE modes are only displayed if SmartONE software is installed (see [Chapter 8.6.3, "R&S SmartONE setup \(SmartBenchmarker, ROMES, QualiPoc\)"](#), on page 100).

To use the R&S TSMa6 with R&S SmartONE, the following steps must be performed.

1. In the web GUI, set the "Mode of Operation" to one of the following SmartONE modes and press "Submit".
 - "SmartONE Standard" (1)
Activating this mode, a web-based UI with the SmartBenchmarker application software, designed for efficient data collection and remote control support in combination with SmartMonitor can be used.
 - "SmartONE Expert" (1)
Activating this mode, an expert UI with the ROMES4 application software for complex measurement tasks and detailed data investigation during the measurement can be used.
For the initial settings after installation, see [Chapter 8.6.3.5, "Initial software start / measurement mode selection"](#), on page 103.
 - "Smart Monitor" (2)
Activating this mode, a central, web-based module for controlling and monitoring a fleet of QualiPoc android probes can be used.

Mode of Operation ⓘ

☐ NESTOR Select the Workspace File ▼

☐ Monitoring

☒ Cellular Network Analysis

☐ NESTOR Probe

1 ☐ SmartONE Standard

☒ SmartONE Expert ☐ Autostart ☐ IP Controlled

Select the Workspace File ▼

☐ Recording

2 ☐ QualiPoc

☒ Smart Monitor

☐ rViCom Server

☐ PC Mode

3

Current Measurement ⓘ

State

Info

2. Configure the additional settings for "SmartONE Expert" mode only.
 - Autostart
R&S SmartONE Expert is automatically started in this mode with a workspace file. The workspace file need to be selected via the drop-down menu.
 - Workspace File
In "Autostart" mode, select via the drop-down menu a workspace file (see ["Import of SmartONE Expert workspace file"](#) on page 57).
 - Recording
Activating this checkbox, the SmartONE measurement data are written to the TSMa6 hard disk.
 - IP Controlled
Activating this checkbox, you can control the SmartONE measurement via IP from an external host PC. No "Autostart", "Workspace File" and "Recording" setting is needed in this mode.
3. Click "Submit" (3) activate the selected measurement configuration.

For more details about the R&S SmartONE configuration and usage, refer to the user documentation for R&S SmartONE.

6.7 Importing workspace files (NESTOR, SmartONE Expert)

Import NESTOR workspace file

1. Start the R&S TSMa6 web GUI from the host PC (see [Chapter 6.1.1, "Using the R&S TSMa6 web GUI"](#), on page 41).
2. Navigate to "Configuration" > "System" > "Mode" and set measurement mode to "NESTOR Probe".
3. Press "Submit" and wait until the device is in "NESTOR Probe" mode. (The status bar displays "No error".)
4. Navigate to "File Transfer" and press the "Browse..." button in the "Upload" section.
5. Search on the host PC for the NESTOR workspace file to be imported and confirm the dialog with "Open".
6. Press "Upload".
The file is copied to the NESTOR workspace directory (default:
D:\Users\Instrument\Documents\NESTOR\FavoriteWorkspaces).
This path can be configured in the "File Transfer" menu.
7. Navigate back to "Configuration" > "System" > "Mode".
8. The imported workspace file is selectable from the list box in the "Mode" tab.

Import of SmartONE Expert workspace file

Importing of the R&S SmartONE Expert workspace file is an additional requirement for operating in the "SmartONE Expert" mode.

1. Start the R&S TSMA6 web GUI (see [Chapter 6.1.1, "Using the R&S TSMA6 web GUI"](#), on page 41).
2. Navigate to "File Transfer" menu and go to section "Upload File to TSMA".
3. Press the "Browse" button, select the desired ROMES workspace file on the remote PC and click "Upload File".

4. The file is copied by default in the directory

C:\ProgramData\Rohde&Schwarz\My ROMES\Workspace.

Note: The target directory for file upload depends on the selected mode. The mentioned directory is only valid in ROMES mode.

6.8 Pairing Bluetooth® devices

To pair the R&S TSMA6 with a remote device, the following steps must be performed.



For Bluetooth® preparation, the device must be in the "PC Mode". Check it via the web GUI ("Home" > "Overview").

To change the operation mode, navigate to "Configuration" > "System" > "Mode" and select an operation mode.

1. In the web-GUI, verify the Bluetooth® settings on R&S TSMA6.

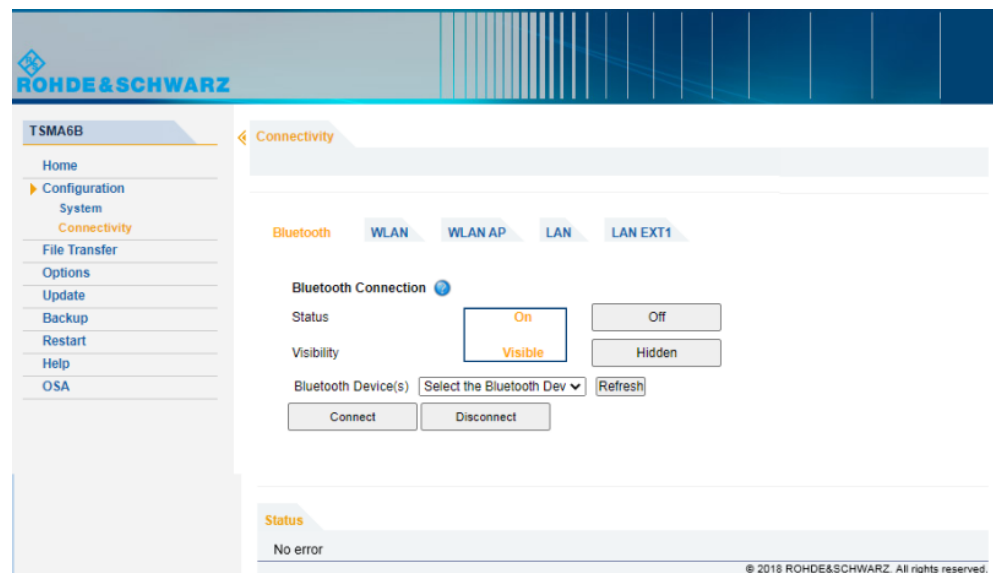


Figure 6-6: Bluetooth settings

2. Navigate to "Configuration" > "Connectivity" > "Bluetooth" and verify the settings:

- STATUS = On
- Visibility = Visible

If necessary, change the settings via the buttons on the right.

3. On the remote device, activate Bluetooth and enable visibility.

Note: For devices with Android versions ≥ 5.0 , there may be problems with visibility of the device.

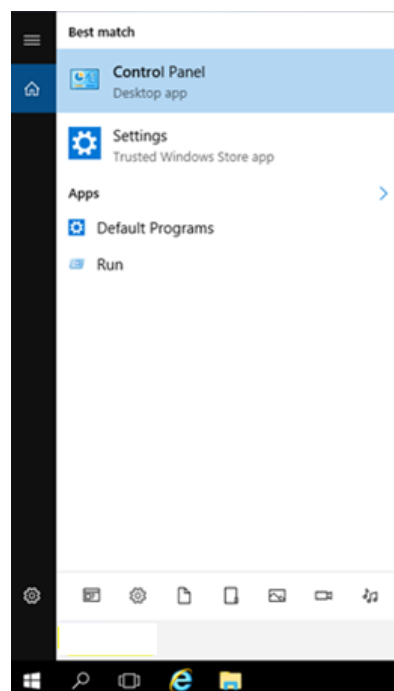
Refer to [Chapter 11.14, "Bluetooth® device not detected by R&S TSMA6"](#), on page 136.

4. In the R&S TSMA6 web GUI, click "Refresh Device List".
The status text shows the following: "Refreshing device list in progress".
Wait until "No Error" is shown.
5. Click the arrow next to the "Refresh Device List" button and open the Bluetooth adapter list box
6. Select the device to be paired and click "Connect".
7. On the remote device, confirm the Bluetooth pairing code.

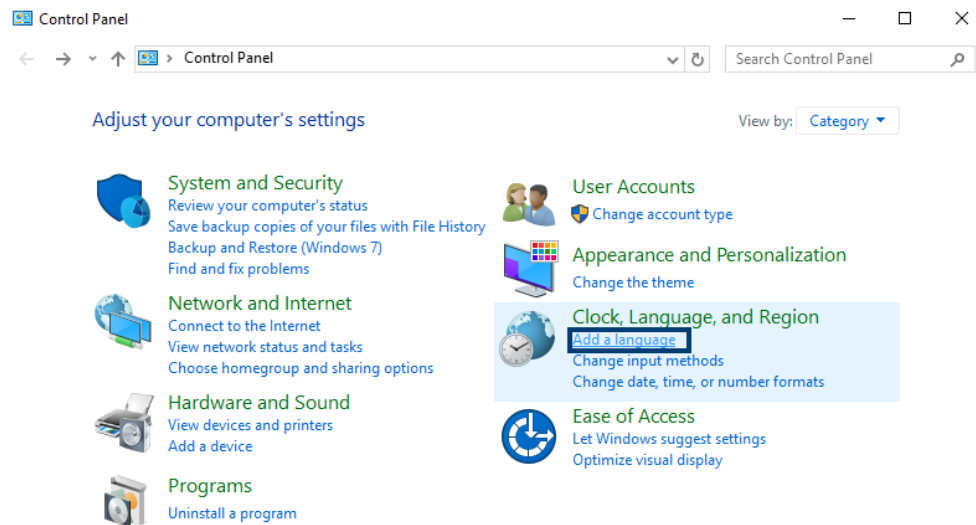
6.9 Changing keyboard language

By default, the R&S TSMA6 is delivered with the English version of Windows® 10 and it supports the English keyboard. To use the german keyboard (or any other one), proceed as follows.

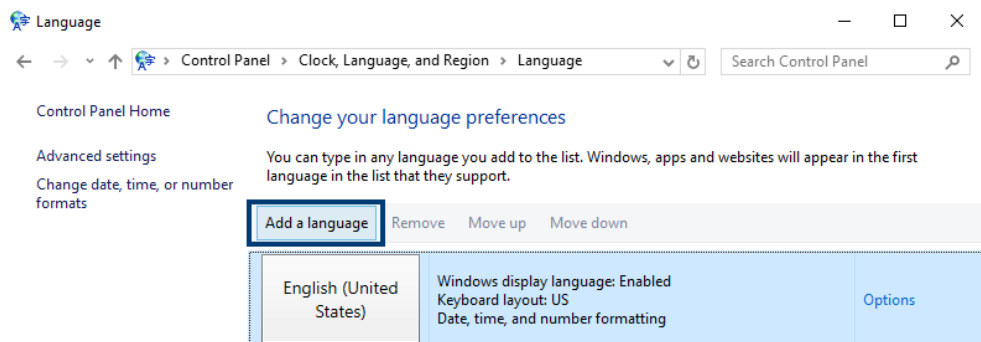
1. Open the "Control Panel".



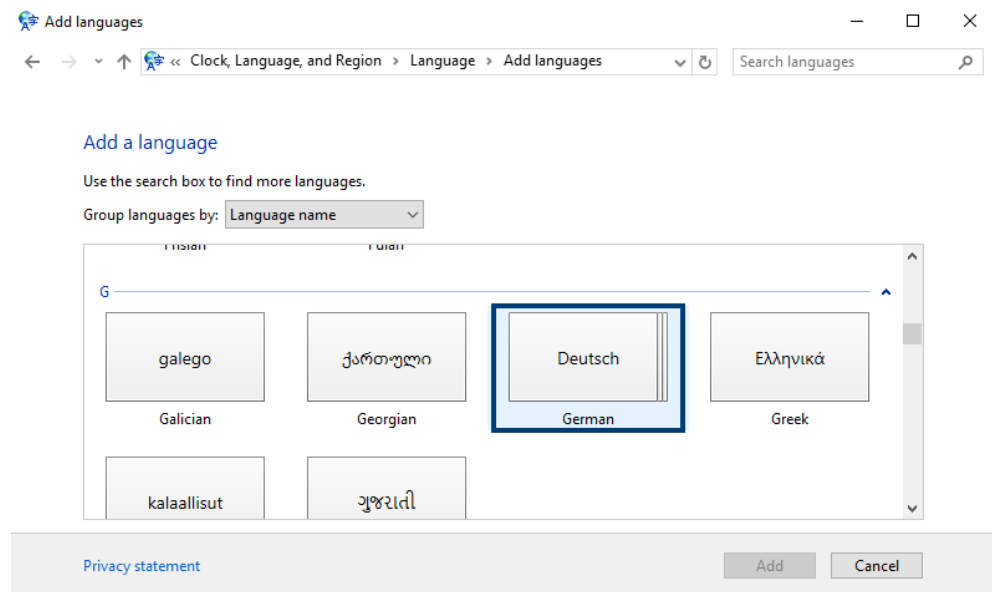
2. Select "Add a language" under "Clock, Language, and Region".



3. The "Language" settings window opens and by default only English is listed there. To add a new language, click the "Add a language" tile.



4. The selectable languages are listed. Select the desired language by double-clicking the language tile (in the example German is selected).

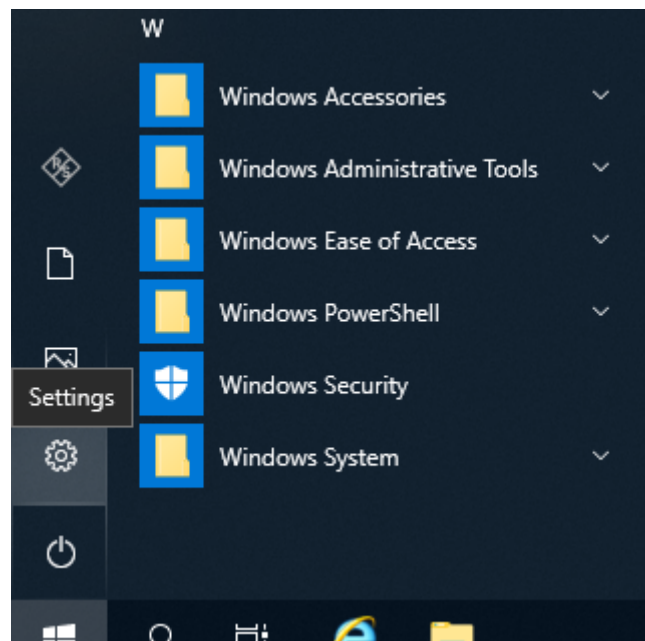


5. Next, select the version of the chosen language.
6. After successfully adding the language, it should be listed as selectable language.
7. Change the keyboard language via windows taskbar.

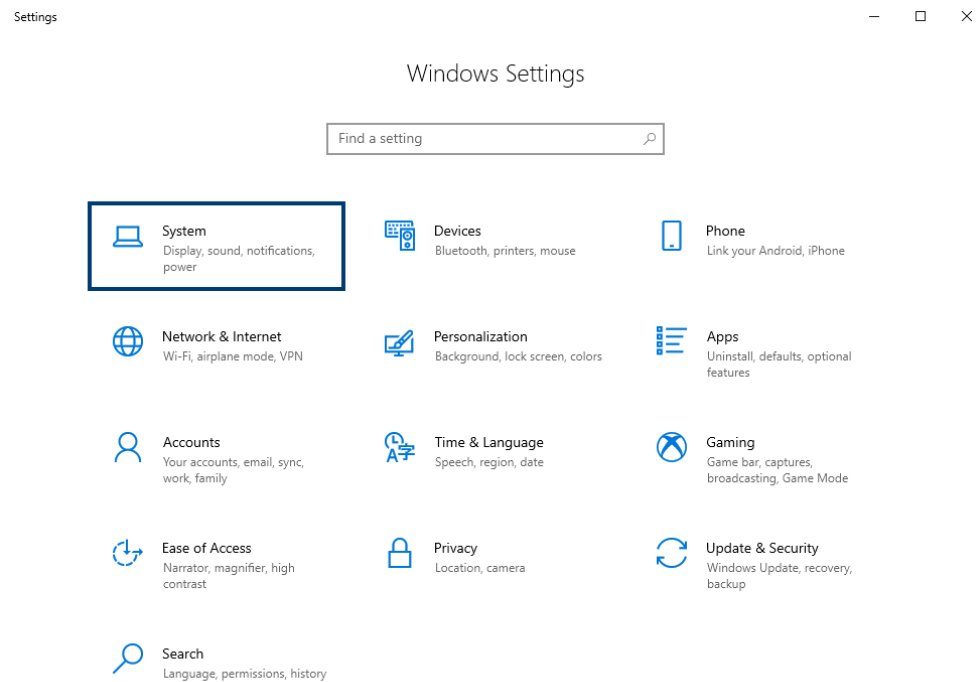
6.10 Enabling virtual memory

To enable virtual memory on the R&S TSMA6, perform the following steps:

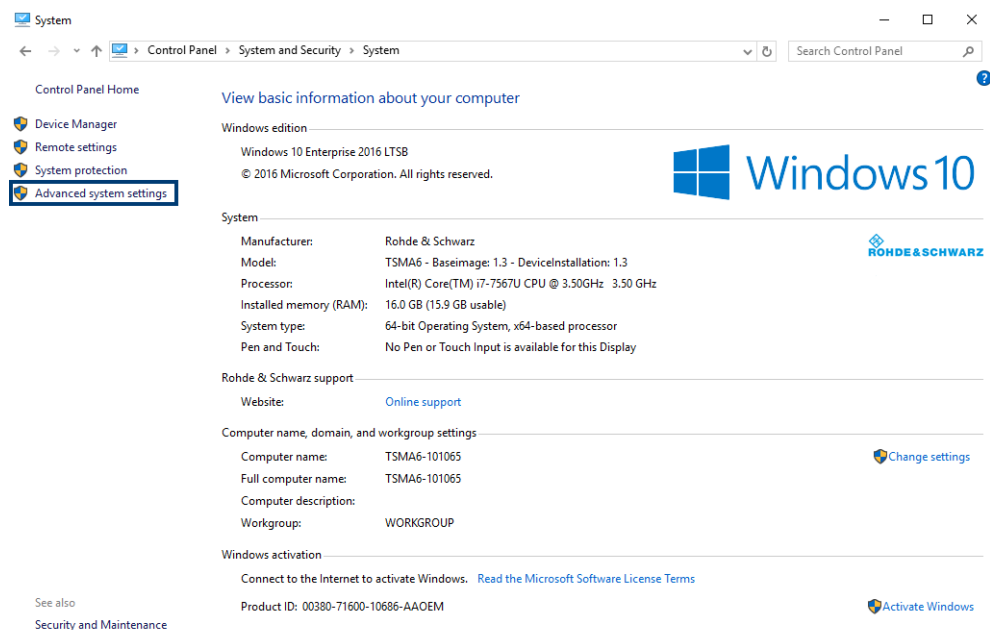
1. Open "Settings".



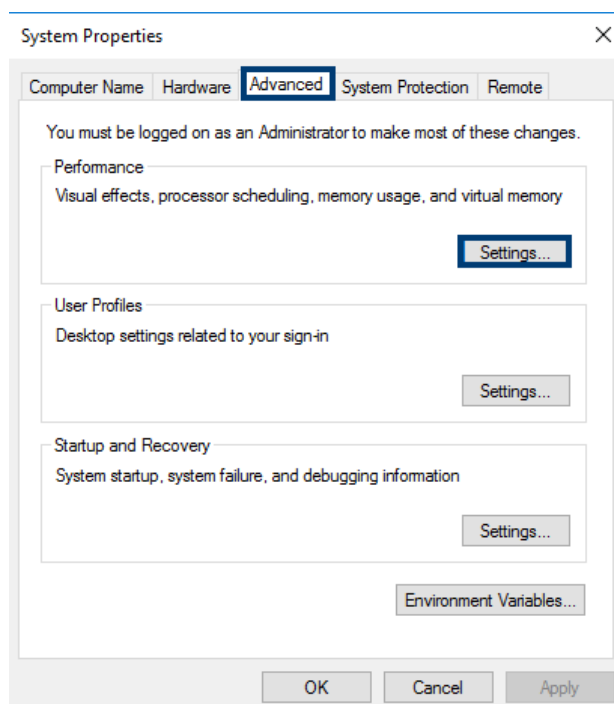
2. Select "System and Security".



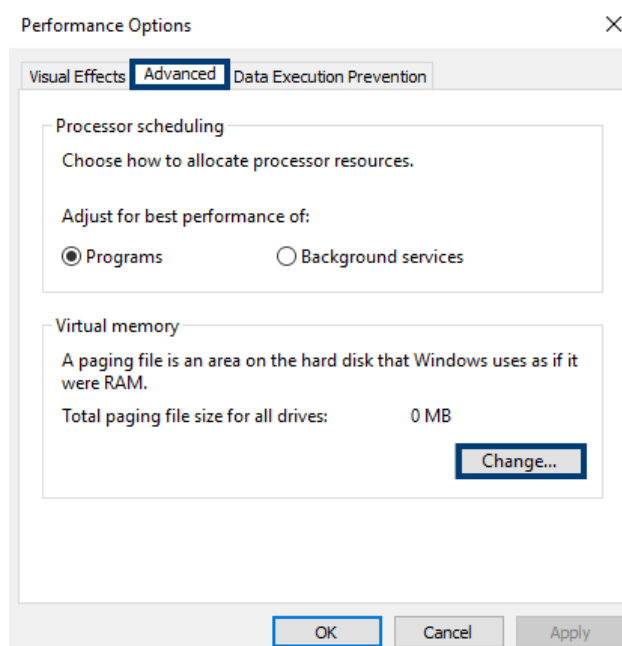
3. Select "Advanced System Settings".



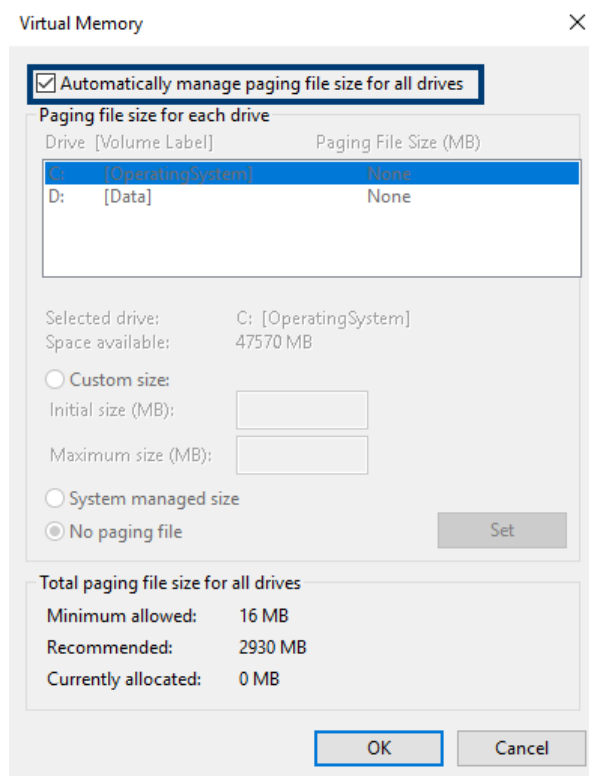
4. Select the tab "Advanced".



5. Select "Settings..." in the section "Performance".
6. Select the tab "Advanced".



7. Select "Change..." in the section "Virtual memory".
8. Enable "Automatically manage paging file size for all devices".



9. Click "OK" to close the dialog.
10. Reboot the device.

7 Measurement Setup

7.1 Connecting R&S TSMA6/6B with other devices



4 collar screws are part of the standard accessory of the R&S TSMA6. Additional collar screws are part of the R&S TSME6/TSMExxDC accessory or can be ordered as spare parts (R&S no. 4900.0804.00).

7.1.1 Cascading R&S TSMA6/6B and R&S TSME6

To connect R&S TSMA6/6B and R&S TSME6

1. Screw the connecting elements (order no. 4900.0804.00) on the top of the R&S TSMA6/6B.
 - Torque: $0.66 \text{ Nm} \pm 0.05 \text{ Nm}$
 - Secure with liquid plastic

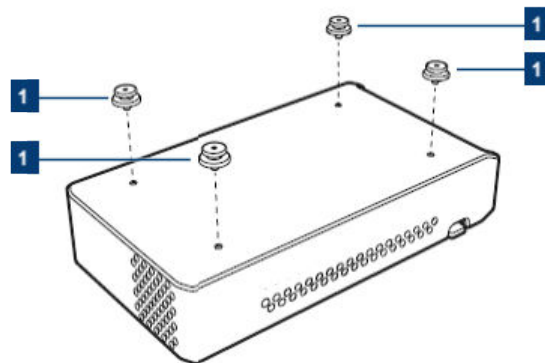


Figure 7-1: Connecting elements

1 = Connecting elements (order no.4900.0804.00)

2. **NOTICE!** An insufficient airflow can cause the instrument to overheat, which disturbs the operation and even cause damage. Make sure that all fan openings are unobstructed and that the airflow perforations are unimpeded, particularly when you install the instrument in a rack or packed in a backpack. Ensure that the following surrounding spaces to the instrument are kept clear:
 - Front pane: minimum 2 cm
 - Left/right panes: minimum 1 cm

Align the connecting elements with the holes on the bottom of an R&S TSME6 and press the R&S TSME6 down.

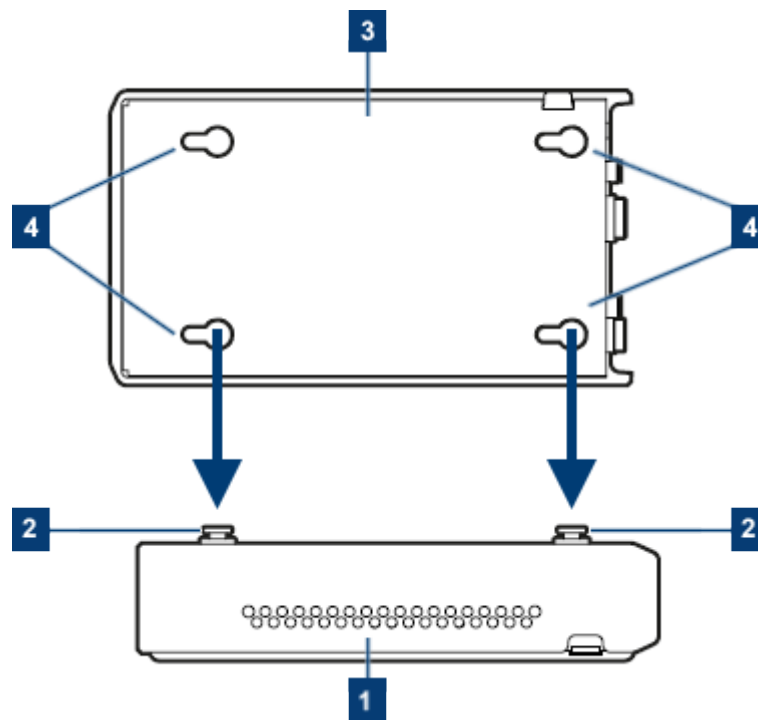


Figure 7-2: Aligning R&S TSMA6/6B and R&S TSME6

- 1 = R&S TSMA6/6B
- 2 = Connecting screws
- 3 = R&S TSME6
- 4 = Holes on the bottom pane of R&S TSME6

7.1.2 Connecting R&S TSMA6/6B-BP with R&S TSME6 and R&S TSMExxDC/TSMS53DC



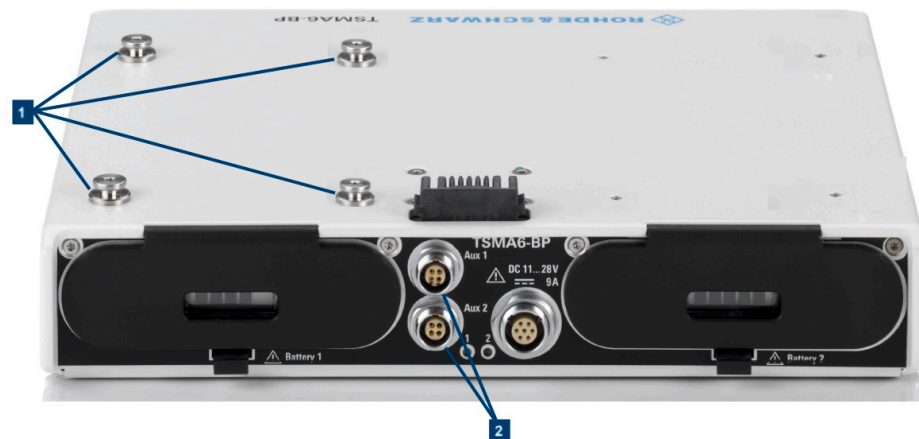
The following steps are valid for R&S TSME6 and downconverter R&S TSMExxDC/R&S TSMS53DC.

For the cabling of the devices, the accessory cables R&S TSMA6-BPPT or R&S TSMA6-BP2T are necessary.



Additional cabling may be necessary for proper operation. For complete cabling instructions, refer to the R&S TSME6 user manual and the R&S TSMExxDC/R&S TSMS53DC manual.

1. Screw the collar screws (1) on the top of the R&S TSMA6/6B-BP with a Torx 8 screw driver.
 - Torque: 0.66 Nm \pm 0.05 Nm



1 = Collar screws for connecting R&S TSME6

2 = Aux 1 / Aux 2 (auxiliary power out for connecting R&S TSME6/TSMExxDC/TSMS53DC via power cable R&S TSME-ZYC)

2. Align the collar screws with the snap-in holes on the bottom of an R&S TSME6/TSMExxDC/TSMS53DC and press the device down.

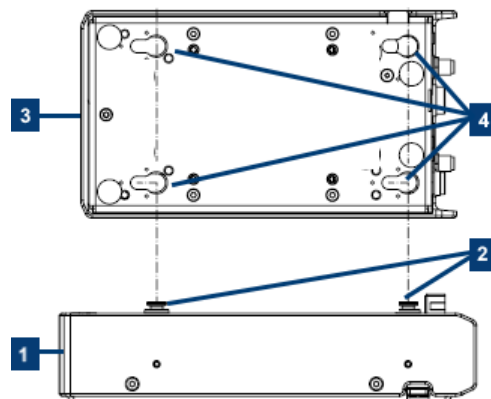


Figure 7-3: Example: Aligning R&S TSM A6/6B-BP and R&S TSME6

1 = R&S TSM A6/6B-BP

2 = Collar screws

3 = R&S TSME6/TSMExxDC/TSMS53DC

4 = Snap-in holes on the bottom pane of R&S TSME6/TSMExxDC/TSMS53DC

3. Move the R&S TSME6/TSMExxDC/TSMS53DC to the back side, until you hear a click when the collar screws are locked in.

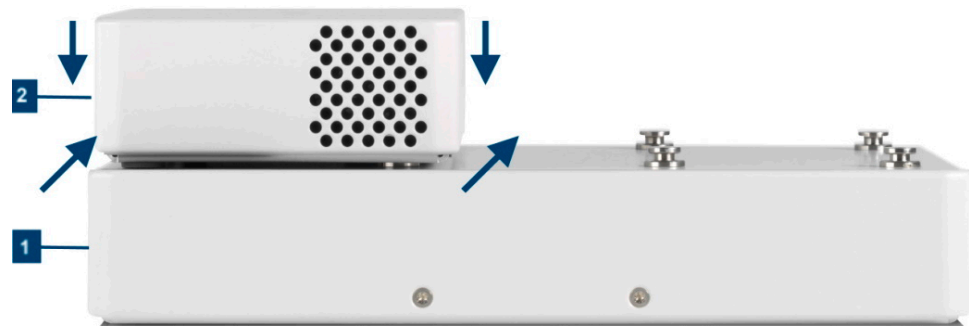


Figure 7-4: Connected R&S TSME6/TSMExxDC/TSMS53DC and R&S TSMA6/6B-BP

1 = R&S TSMA6/6B-BP

2 = R&S TSME6/TSMExxDC/TSMS53DC

4. Connect the power cable R&S TSMA6-BPPT resp. R&S TSMA6-BP2T from AUX1 resp. AUX2 to DC IN of R&S TSME6/xxDC/TSMS53DC.

7.1.3 Disconnecting the R&S TSMA6 from R&S TSMA6/6B-BP and other R&S TSMx devices

To disconnect the R&S TSMA6 from R&S TSMA6/6B-BP and R&S TSMx devices (R&S TSMA6/6B, R&S TSME6, R&S TSMExxDC/TSMS53DC), proceed as follows.

1. Power off all connected R&S TSMx devices.
2. Disconnect the DC power cables of the devices.
3. Disconnect all other cables of the devices.
4. Remove the R&S TSMx devices.
5. **Only for R&S TSMA6/6B:** Lift the release button (1) on both sides of the R&S TSMA6/6B and slide it in direction (2) until the device is released.



Figure 7-5: Disconnect R&S TSMa6/6B

7.2 Use cases

In the following, you find several uses cases with different combinations of TSMaX devices.

7.2.1 R&S TSMa6 with R&S TSME6 and R&S TSMa6-BP

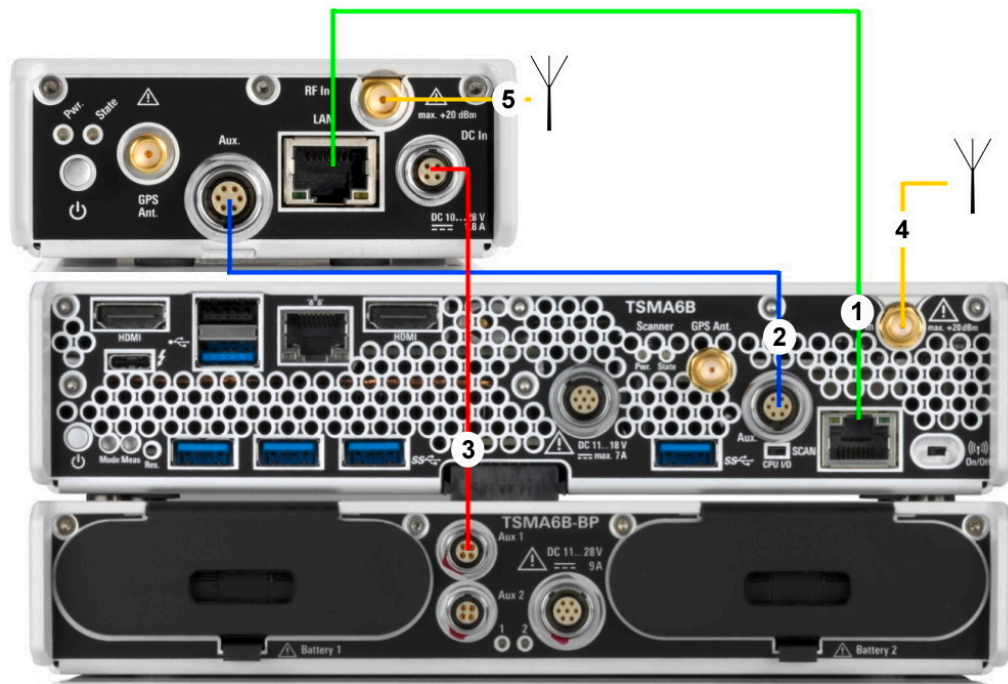


Figure 7-6: R&S TSMa6 + R&S TSME6

- 1 = LAN connection: R&S TSMa6 (SCAN port) - R&S TSME6
- 2 = Synchronization: R&S TSMa6 - R&S TSME6
- 3 = DC power: R&S TSMa6-BP - R&S TSME6
- 4 = RF: R&S TSMa6 RF In < 6 GHz
- 5 = RF: R&S TSME6

For the LAN connection between R&S TSMa6 and R&S TSME6, you need LAN cable of type CAT6.

Change the SCAN port of the R&S TSMa6 via the web-GUI to DHCP (see "[TCP/IP Mode \(LAN SCAN\)](#)" on page 155). This allows to connect aE6 without IP address change.

For the synchronization between R&S TSMa6 and R&S TSME6, you need the synchronization cable R&S TSME6-ZC2.

For the DC power between R&S TSMa6-BP and R&S TSME6, you need the power cable R&S TSMa6-BPPT.

For the RF input connector, you need an antenna according to your needs.



Additional devices like R&S TSME6 and R&S TSMExxDC can also be mounted to the side.

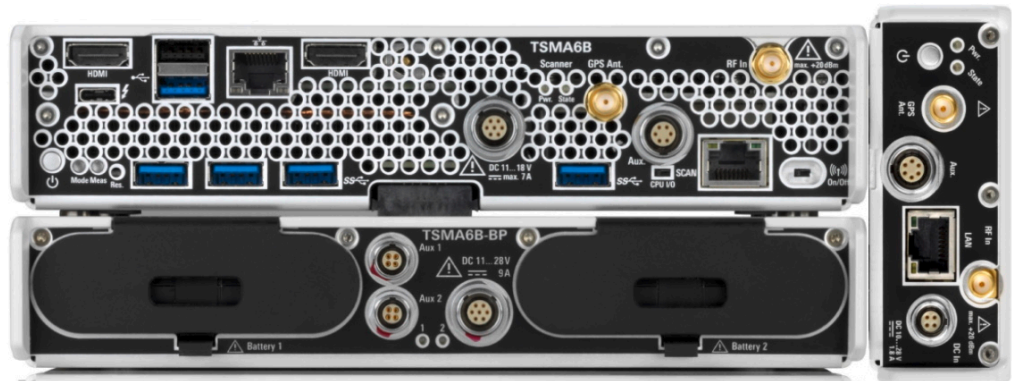


Figure 7-7: Example: R&S TSM A6 with R&S TSME6 mounted to the side

7.2.2 R&S TSM A6 with R&S TSMExxDC and R&S TSM A6-BP

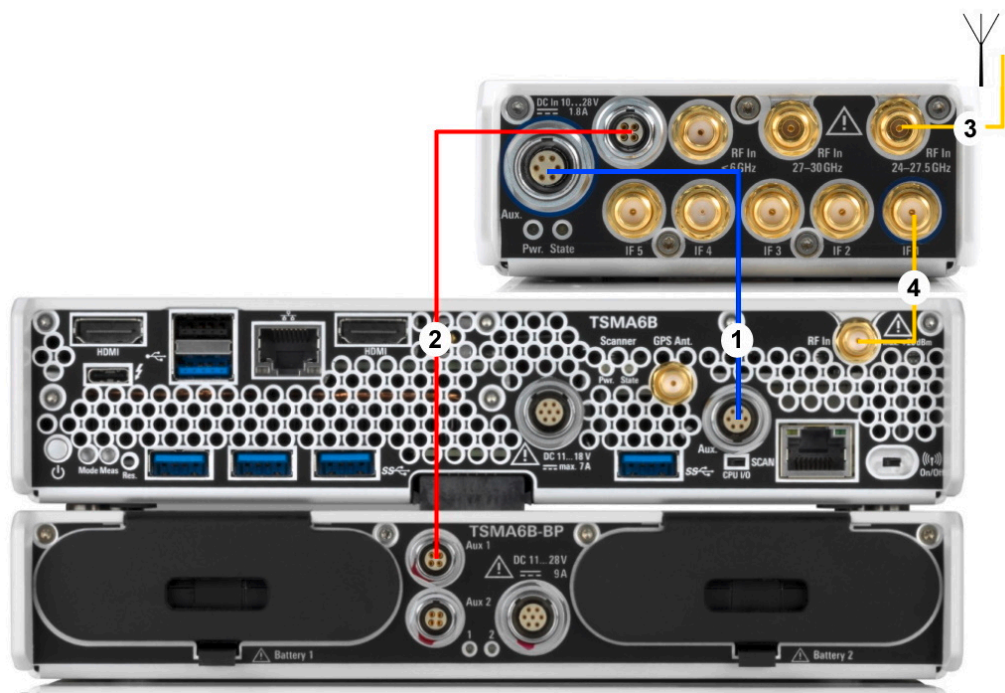


Figure 7-8: R&S TSM A6 + R&S TSMExxDC

- 1 = Synchronization: R&S TSM A6 - R&S TSMExxDC
- 2 = DC power: R&S TSM A6-BP - R&S TSMExxDC
- 3 = RF: R&S TSMExxDC RF In 24 GHz to 27.5 GHz (R&S TSME30DC as example)
- 4 = RF: R&S TSMExxDC IF1 - R&S TSM A6 RF In

For the synchronization between R&S TSM A6 and R&S TSMExxDC, you need the synchronization cable R&S TSME6-ZC2.

For the DC power between R&S TSM A6-BP and R&S TSME6, you need the power cable R&S TSM A6-BPPT.

Using an R&S TSME30DC (see [Figure 7-8](#)), you can connect the RF antenna to two RF connectors with different frequency ranges (24 GHz to 27.5 GHz and 27 GHz to 30 GHz). The R&S TSME44DC offers only one RF connector with a frequency range from 24 GHz to 44 GHz.

7.2.3 R&S TSM A6 with R&S TSMExxDC, R&S TSME6 and R&S TSM A6-BP

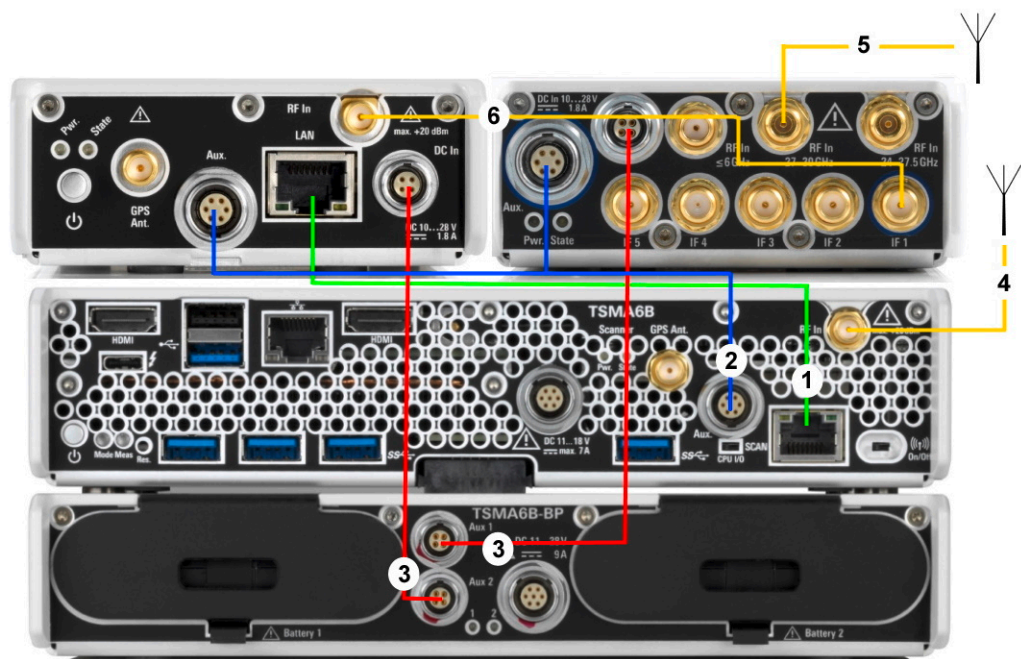


Figure 7-9: R&S TSM A6 + R&S TSMExxDC + R&S TSME6

- 1 = LAN connection: R&S TSM A6 - R&S TSME6
- 2 = Synchronization: R&S TSM A6 - R&S TSME6 / R&S TSMExxDC
- 3 Aux 1 = DC power: R&S TSM A6-BP - R&S TSMExxDC
- 3 Aux 2 = DC power: R&S TSM A6-BP - R&S TSME6
- 4 = RF: R&S TSM A6 RF In < 6 GHz
- 5 = RF: R&S TSMExxDC RF In 27 GHz to 30 GHz
- 6 = RF: R&S TSMExxDC IF1 - R&S TSME6 RF In

For the LAN connection between R&S TSM A6 and R&S TSME6, you need LAN cable of type CAT6.

For the synchronization between R&S TSM A6 and R&S TSMExxDC / R&S TSME6, you need the synchronization cable R&S TSME6-ZC4, which is required for 3 and more devices.

For the DC power between R&S TSM A6-BP and R&S TSME6 / R&S TSMExxDC, you need two times the power cable R&S TSM A6-BPPT. Alternatively you can use the dual power cable R&S TSM A6-B2T. It connects the R&S TSMExxDC and R&S TSME6 via Aux1 of the R&S TSM A6.



If the R&S TSMA6 is connected with a R&S TSMA6-BP, DC power must be connected to the R&S TSMA6-BP (1).

Do not connect the DC power to the R&S TSMA6 (2).



Figure 7-10: DC IN connectors

1 = DC IN connector R&S TSMA6-BP

2 = DC IN connector R&S TSMA6

8 Installing firmware and software updates

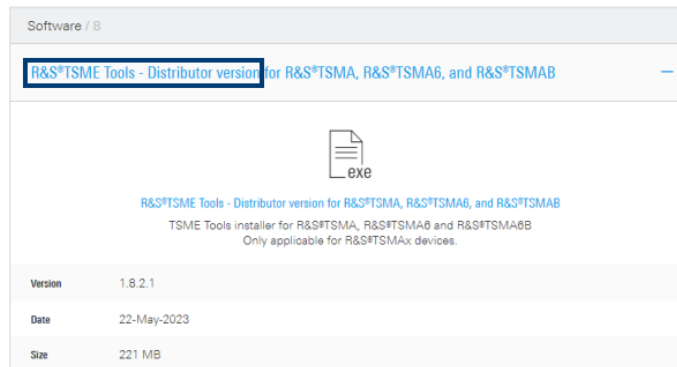
8.1 Downloading setup file

Firmware and R&S TSM A6 Windows operating system update packages for the R&S TSM A6 can be downloaded from the Rohde & Schwarz web page <https://www.rohde-schwarz.com/us/firmware/tsmx>. The firmware setup file can be found under the title *R&S TSM A_x Firmware V ww.xx.yy.zz*.

The EDGE browser setup package can be downloaded from the Rohde & Schwarz web page <https://www.rohde-schwarz.com/us/software/tsmx>.



The R&S TSME Tools setup package must be downloaded as **distributor version** from the Rohde & Schwarz web page <https://www.rohde-schwarz.com/us/software/tsmx>.



For R&S NESTOR, R&S SmartONE and R&S ViCom, contact the appropriate sales channel.

8.2 Prerequisites

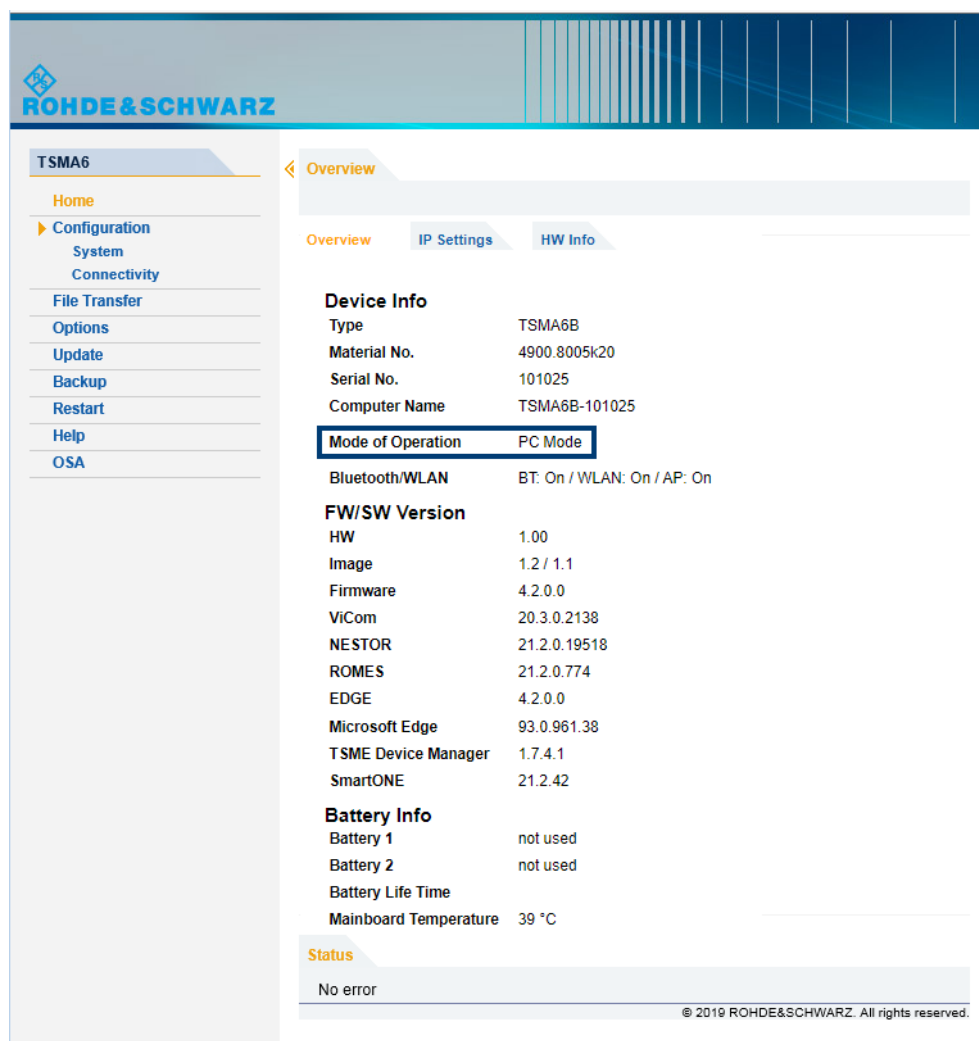
To execute the setup on the R&S TSM A6, the mode of operation has to be "PC Mode".



The PC Mode is not necessary for the following software packages.

- R&S NESTOR
- R&S SmartONE

1. Open the R&S TSM A6 web GUI (see [Chapter 8.3.4, "Calling R&S TSM A6 web GUI"](#), on page 86).
2. The mode of operation is displayed in the "Overview" page. If the mode is already "PC Mode", you can skip this section.



TSMa6

- Home
- Configuration
 - System
 - Connectivity
- File Transfer
- Options
- Update
- Backup
- Restart
- Help
- OSA

Overview

Overview IP Settings HW Info

Device Info

Type	TSMa6B
Material No.	4900.8005k20
Serial No.	101025
Computer Name	TSMa6B-101025

Mode of Operation PC Mode

Bluetooth/WLAN BT: On / WLAN: On / AP: On

FW/SW Version

HW	1.00
Image	1.2 / 1.1
Firmware	4.2.0.0
ViCom	20.3.0.2138
NESTOR	21.2.0.19518
ROMES	21.2.0.774
EDGE	4.2.0.0
Microsoft Edge	93.0.961.38
TSME Device Manager	1.7.4.1
SmartONE	21.2.42

Battery Info

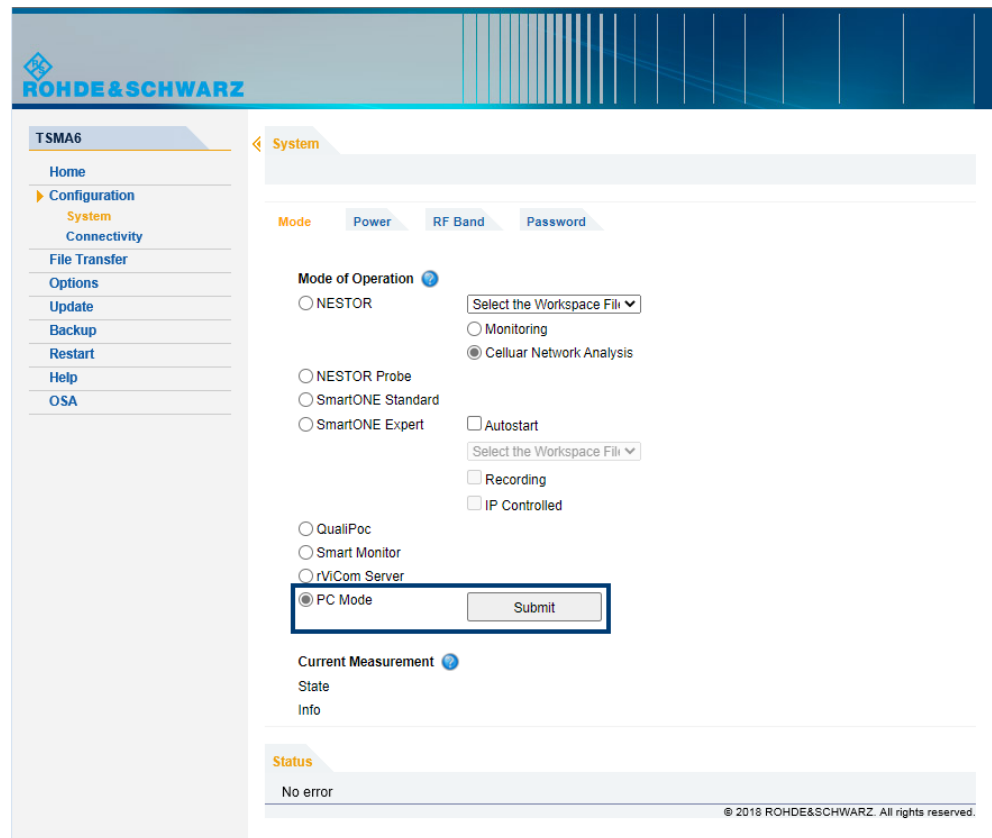
Battery 1	not used
Battery 2	not used
Battery Life Time	
Mainboard Temperature	39 °C

Status

No error

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- If a different mode is activated, navigate to "Configuration" > "System" > "Mode", select the "PC Mode" and press the "Submit" button.



4. Reload the web GUI after changing the mode, and ensure that the "Mode of Operation" is "PC Mode".

8.3 Updating firmware/software/tools - general instructions

After a firmware update, perform the following steps.

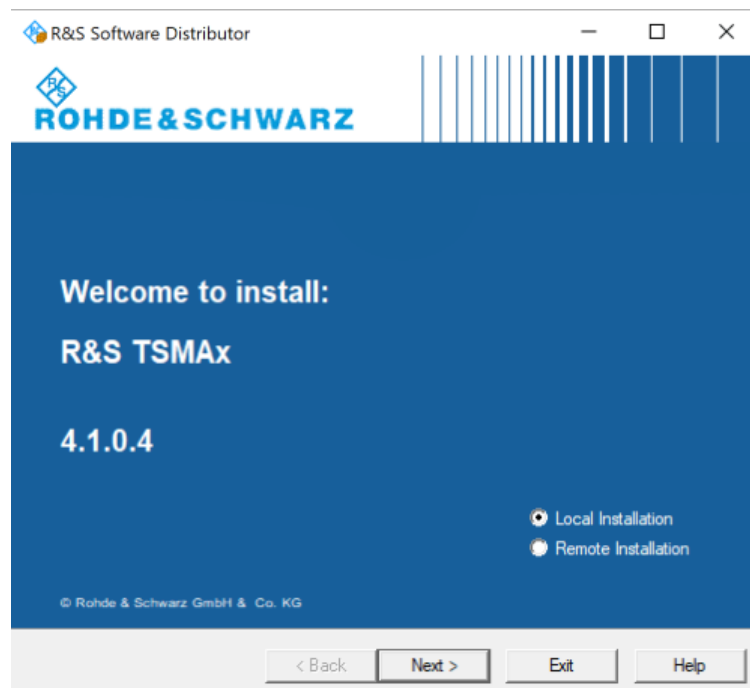
- [Chapter 8.4, "R&S TSME tools update"](#), on page 87)
- [Chapter 8.5, "Microsoft EDGE browser update"](#), on page 90

8.3.1 Local execution of the setup file

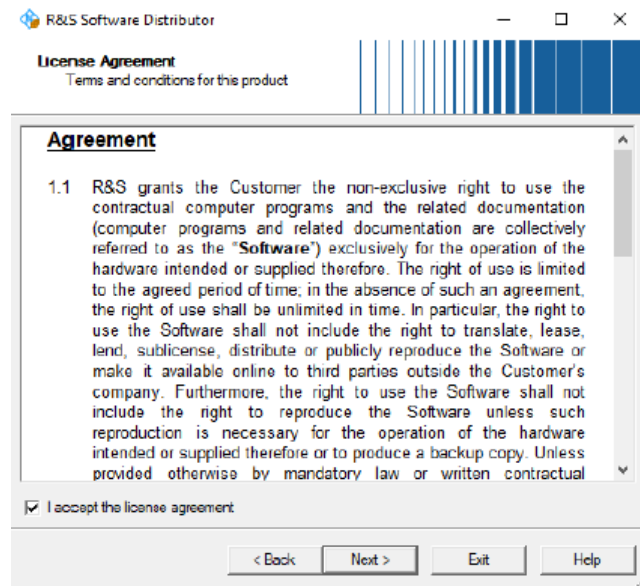
The local setup is executed from a remote PC and useful, if you have the device at your own workplace. Mouse, monitor and keyboard must be connected to the device directly. A LAN or WLAN connection must be established between the R&S TSMa6 and the remote PC.

1. Connect a mouse and a keyboard to USB ports and a monitor to the HDMI port. The setup file must be available on the R&S TSMa6 or on a USB stick.

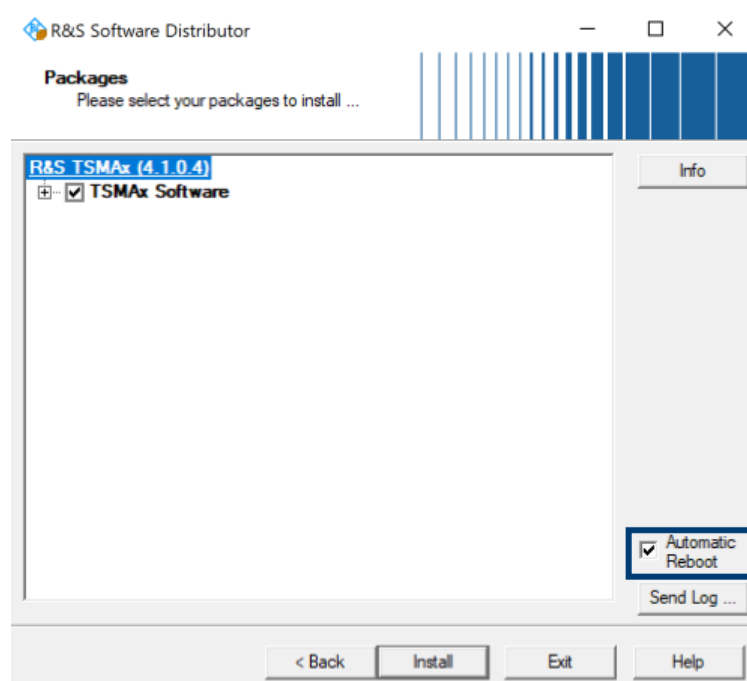
2. Switch on the R&S TSMA6 via the power button.
3. Copy the setup file for firmware/software/EDGE/TsmeTools (.zip or .exe) into a temporary directory on the R&S TSMA6.
4. Check that R&S TSMA6 is in "PC Mode", see [Chapter 8.2, "Prerequisites"](#), on page 73.
5. Open the Windows Explorer and execute the setup file TSMAx-Setup-<Version>.exe.
6. The "R&S Software Distributor" window comes up. Select "Local Installation" and "Next >".



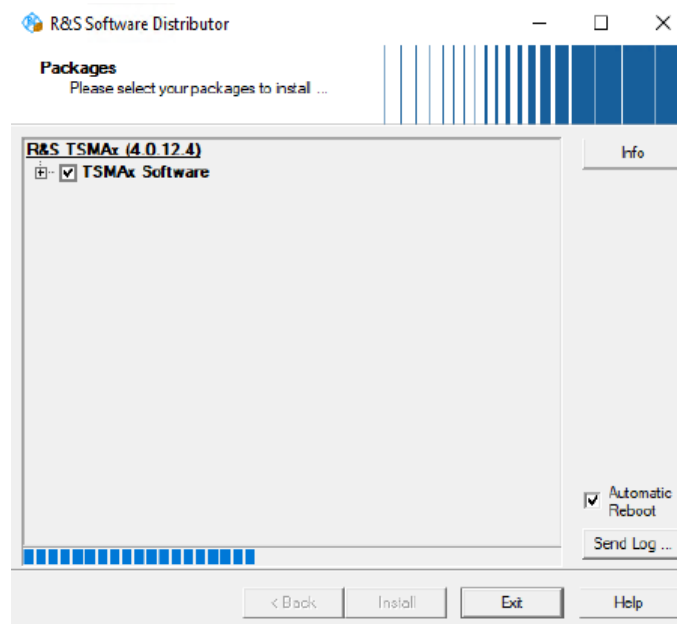
7. In the License Agreement window, check "I accept the license agreement".



8. Select "Next>".
9. The package dialog lists all the available packages in the setup. In general, you can skip this dialog without any changes. Select "Automatic Reboot".

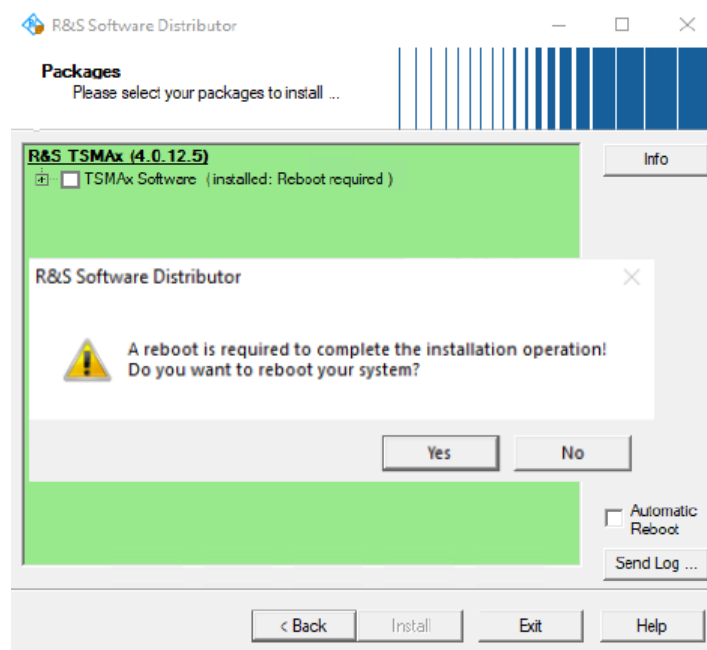


10. Select "Install >".
The progress bar indicates the installation process.



Note: Do not switch off or unplug from power while running firmware/software update.

11. The device reboots automatically after the installation is complete.
If the automatic reboot does not start, reboot manually.



12. If the firmware package contains a new mainboard firmware, a separate flash routine starts in a post process, see [Chapter 8.3.5, "Subsequent steps after firmware update"](#), on page 87).
13. Reload the web GUI and verify the displayed firmware/software version in the "Overview" menu. The installed version needs to be indicated.

14. The firmware update is completed successfully and the device is ready for operation, when the LEDs display the following state.
Mode LED = green resp. blue (depends on the state of the WLAN access point)
15. To configure the required measurement mode, see [Chapter 6.6, "Selecting measurement mode"](#), on page 48.

The R&S TSMA6 is ready for operation.

8.3.2 Remote installation of the setup file

The remote setup is the preferred way, if the device is not accessible on site or if multiple TSMAx devices are to be updated simultaneously.

1. Copy the setup file (firmware `TSMAx-Setup-<Version>.zip` or software) into a temporary directory on the remote PC.
2. Establish a LAN respectively WLAN connection between the remote PC and the R&S TSMA6. Make sure that the "Mode of Operation" is "PC Mode", see [Chapter 8.2, "Prerequisites"](#), on page 73.

a) Using LAN connection

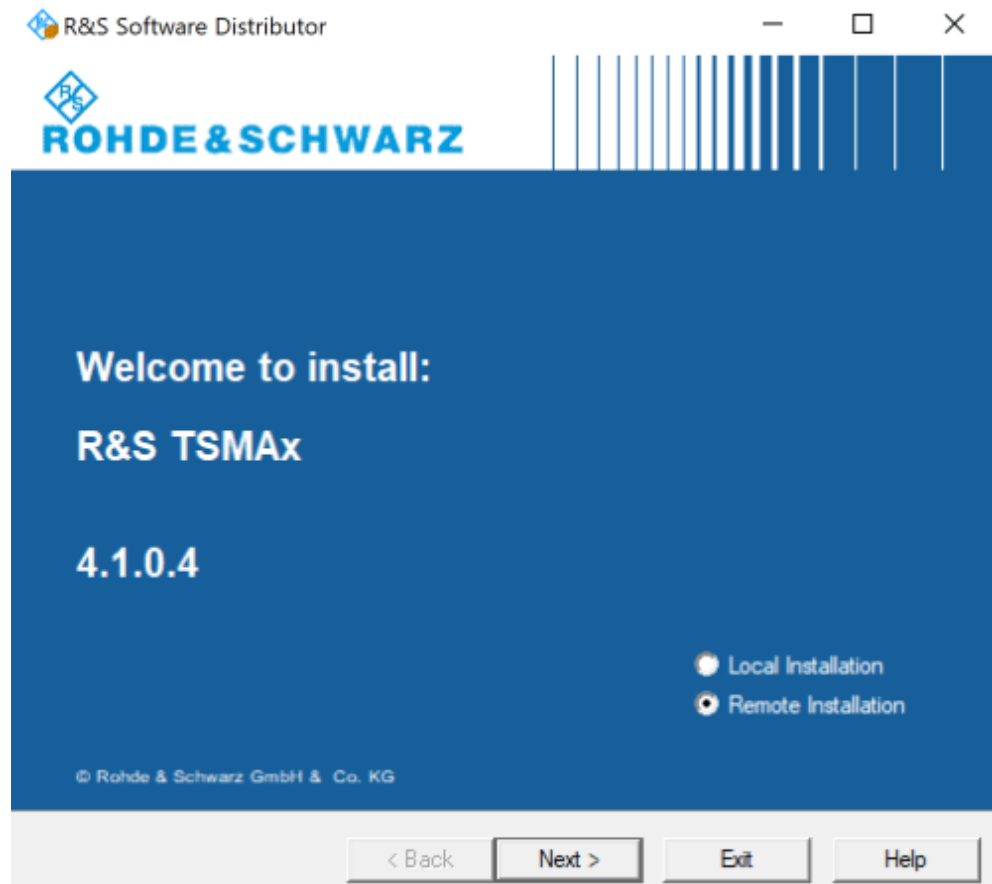
- Connect the LAN port of the R&S TSMA6 with the host PC LAN port.
The LAN port is marked with the LAN symbol.



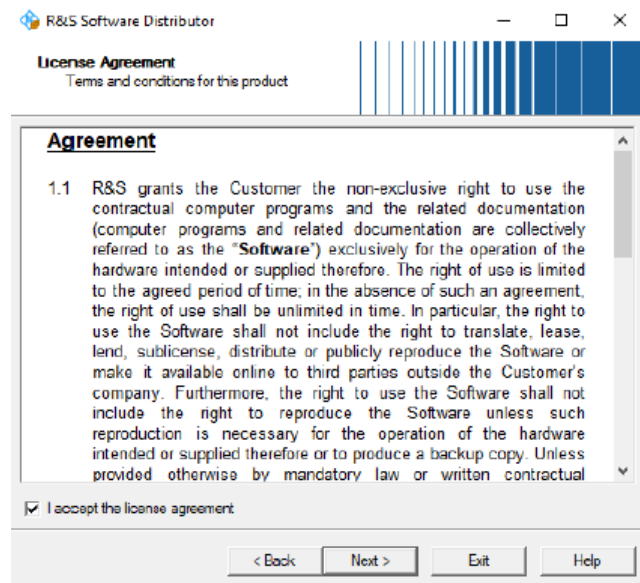
The default IP setting of this port is "DHCP client". For details on how to configure the remote PC, contact your network administrator.

b) Using WLAN connection

- The WLAN/Bluetooth switch must be "On".
 - On the remote PC, search for the R&S TSMA6 WLAN and connect to the network. You find the parameters for the TSMAx WLAN access on a label on the bottom of the device.
WLAN SSID `TSMA6-<xxxxxx> xxxxxx`: device serial number (see bottom label)
WLAN key: *instrument* (default)
3. Execute the firmware/software setup file on the connected remote PC. The "R&S Software Distributor" dialog box is coming up

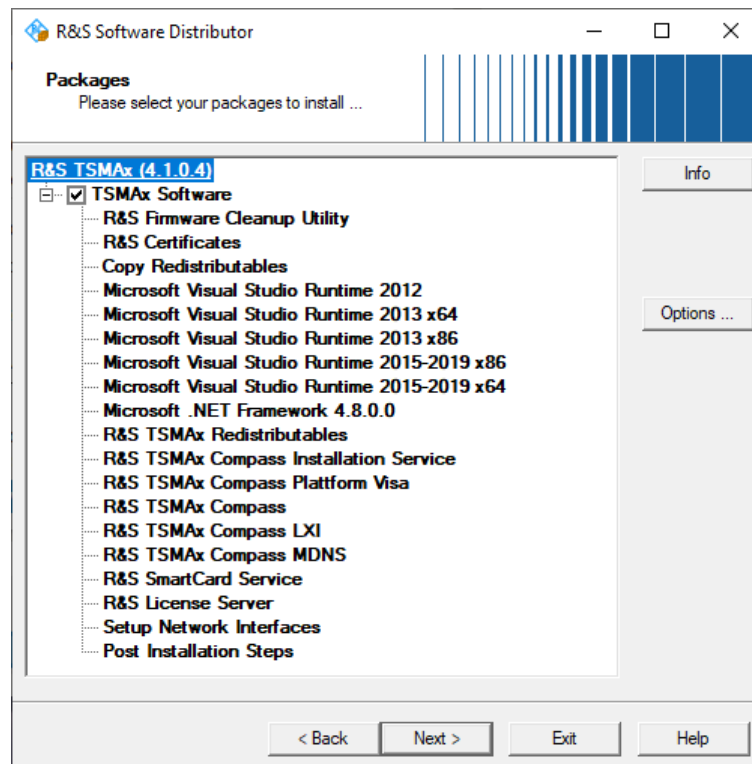


4. Select "Remote Installation" and "Next>".
5. In the License Agreement window, check "I accept the license agreement".



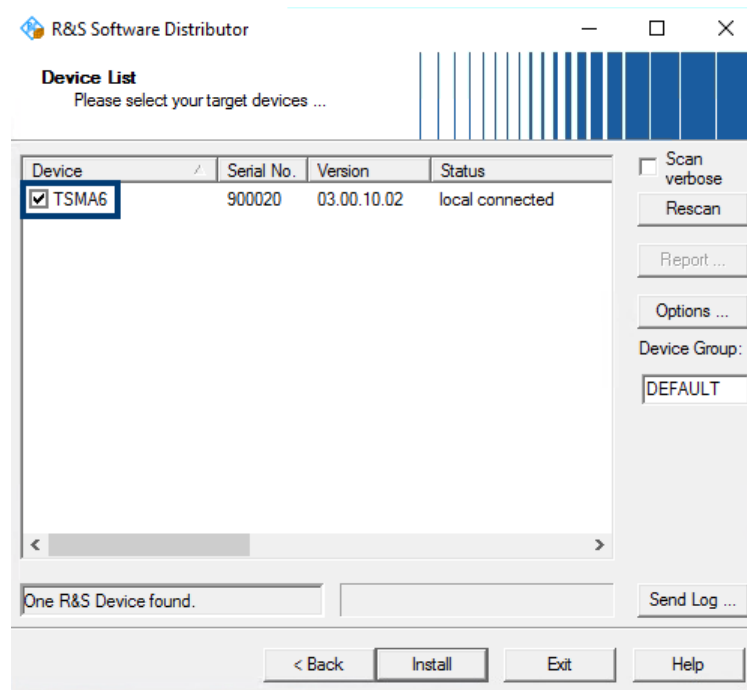
6. Select "Next>".

7. The package dialog lists all the available packages to install.



All packages, which you need to install, are already pre-selected.

8. Select "Next>".
9. After a while, all R&S TSMa6 devices in the network are listed in the "Device List" dialog.
- Devices are only listed, if the device is in "PC Mode" (see [Chapter 8.2, "Prerequisites"](#), on page 73). Tick one or more devices to update. If the column "Serial No." is not filled, move the mouse pointer over the listed items to get related device information.



10. Select "Install".

Note: Do not switch off or unplug from power while running firmware/software update.

11. The state of the installation process is displayed in the "Status" column. The process is finished when the status indicates "Ready, see report for details!".

Note: If you are connected via WLAN, a reconnect to the R&S TSMA6 WLAN access point may be necessary as the R&S TSMA6 reboots after the firmware/software update.

12. Select "Exit" to end the setup program on the remote PC.

13. **Only** for firmware update.

If the firmware package contains a new mainboard firmware, a separate flash routine is started in a post process, see [Chapter 8.3.5, "Subsequent steps after firmware update"](#), on page 87.

Note: If you are connected via WLAN, a reconnect to the R&S TSMA6 WLAN access point may be necessary as the R&S TSMA6 reboots after the firmware/software update.

14. Reload the R&S TSMA6 web GUI (see [Chapter 8.3.4, "Calling R&S TSMA6 web GUI"](#), on page 86) and verify the installed firmware /software version in the "Overview".

15. The firmware/software update is completed successfully and the device is ready for operation when the firmware / software is listed correctly in the "Overview" page of the R&S TSMA6 web-GUI.

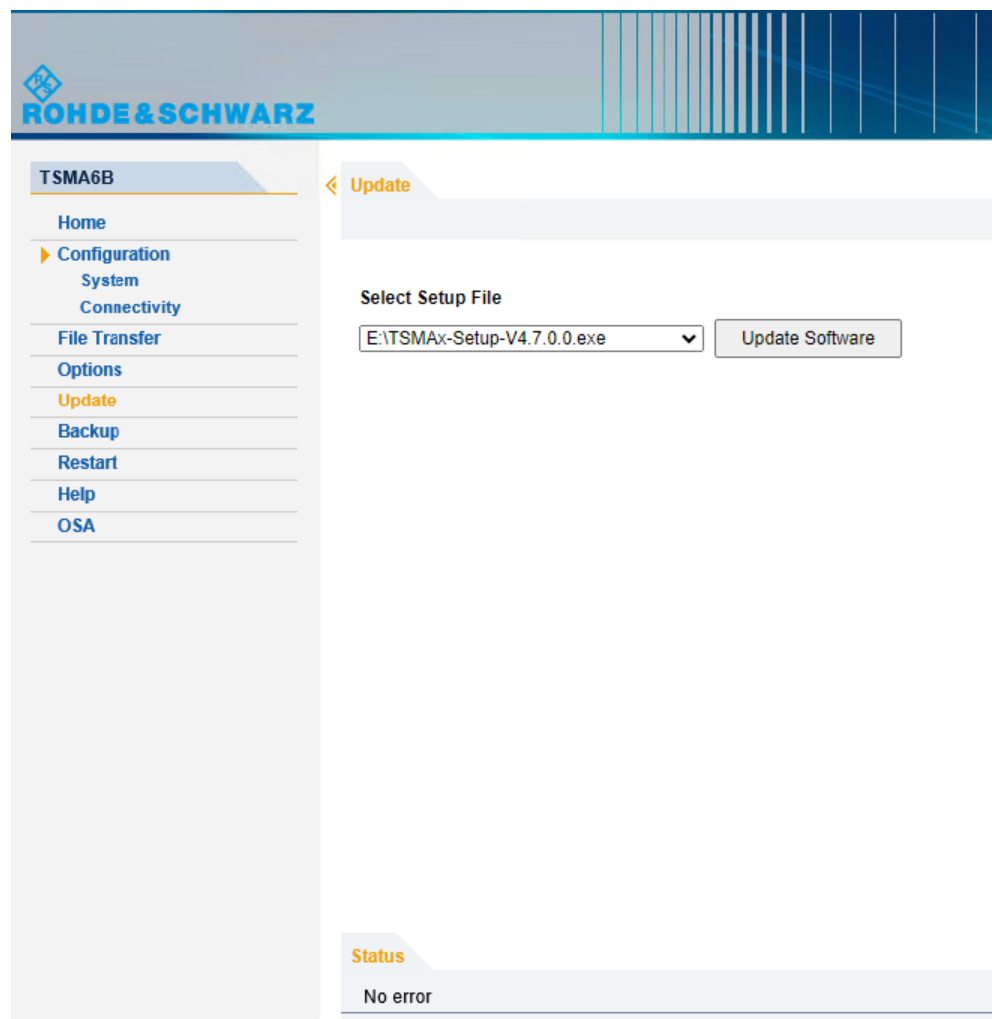
16. To configure the required measurement mode, see [Chapter 6.6, "Selecting measurement mode"](#), on page 48.

The R&S TSMA6 is ready for operation.

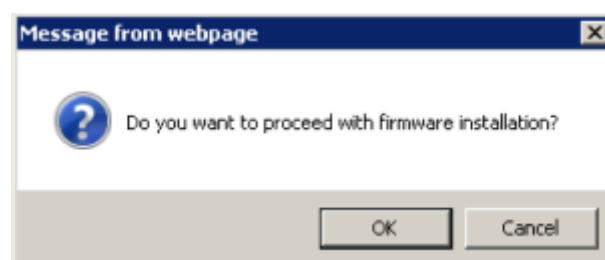
8.3.3 Installation using a USB stick

The setup is initiated via the web GUI of the R&S TSMA6. In this case, the setup file must be available in the root directory of a USB stick, which is connected to the R&S TSMA6. To initiate the setup, a tablet or handheld device is used usually, which is connected via LAN or WLAN with the R&S TSMA6.

1. Connect a mouse and a keyboard to the USB ports and a monitor to the HDMI port.
2. Switch on the R&S TSMA6 via the power button.
3. Copy the setup file for firmware/software/EDGE/TsmeTools (.exe) into the root directory of the USB memory stick.
4. Open the R&S TSMAx web GUI (see [Chapter 8.3.4, "Calling R&S TSMA6 web GUI"](#), on page 86).
5. In the R&S TSMAx web GUI, navigate to the menu "Update".
6. Select the appropriate setup file in the combo box.
7. Select "Update Software" next to the select box.
The "Update" button is only active, if a valid TSMAx-Setup-<Version>.exe setup file is available in the root directory of the connected USB stick. For some of the installer packages, the measurement mode of the device needs to be "PC Mode" to be selectable, see [Chapter 8.2, "Prerequisites"](#), on page 73.



8. A confirmation dialog appears. Confirm with "OK" to start the update.



9. The firmware/software installation starts. The status text in the web GUI displays "Installation in progress...".



The Mode LED starts blinking blue.

Note: Do not switch off or unplug from power while running firmware/software update.

10. Once the installation of all firmware/software packages has finished, the R&S TSMA6 reboots.

After reboot, the firmware is running a selftest (Mode LED is blinking green).

Note: If you are connected via WLAN, a reconnect to the R&S TSMA6 WLAN access point may be necessary.

11. Open the web GUI. After a while, the status text in the web GUI changes to
No error.

The reboot is finished when the Mode LED changes into steady blue (WLAN AP On) or green (WLAN AP Off) color.

12. **Only** for firmware installation.

If the firmware package contains a new mainboard firmware, a separate flash routine is started in a post process, see [Chapter 8.3.5, "Subsequent steps after firmware update"](#), on page 87.

Note: If you are connected via WLAN, a reconnect to the R&S TSMA6 WLAN access point may be necessary as the TSMAx reboots after the mainboard flash.

13. Reload the R&S TSMA6 web GUI (see [Chapter 8.3.4, "Calling R&S TSMA6 web GUI"](#), on page 86) and verify the installed firmware /software version in the "Overview".

14. The device is ready for operation when the firmware/software is listed correctly and the TSMaX is in the "Ready" state.

TSMa6/TSMa6B: Mode LED = green resp. blue (depends on the state of the WLAN access point)

15. To configure the required measurement mode, see [Chapter 6.6, "Selecting measurement mode"](#), on page 48.

8.3.4 Calling R&S TSMa6 web GUI

The R&S TSMa6 web GUI has to be loaded prior to executing firmware / software setup.

- Remote from a WLAN connected device
Start the web browser and enter the following URL:
`http://192.168.137.1`
- Remote from a LAN connected device
Enter the URL `http://TSMaX-xxxxxx.local` into the browser.

TSMAX-xxxxxxx = R&S TSM A6 host name

This information can be found on a label at the bottom.

- Local
Open the web browser (Microsoft EDGE or Internet Explorer). The web GUI starts automatically. If not, enter the URL `http://localhost` into the browser.

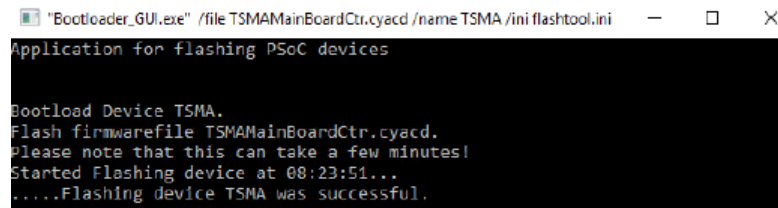
8.3.5 Subsequent steps after firmware update

The following steps are only performed during a firmware update, if the firmware package contains a new mainboard firmware.

1. About one minute after the operating system is up again, the mainboard firmware starts flashing.

The following dialog appears:

NOTE: The dialog is only visible for local installation procedure.



```
"Bootloader_GUI.exe" /file TSMAMainBoardCtr.cyacd /name TSM A /ini flashtool.ini
Application for flashing PSoC devices

Bootload Device TSM A.
Flash firmwarefile TSMAMainBoardCtr.cyacd.
Please note that this can take a few minutes!
Started Flashing device at 08:23:51...
.....Flashing device TSM A was successful.
```

The mainboard flash is indicated via rear panel LEDs like following:

- Meas LED = green / red
 - Mode LED = blue
 - Internal fans are set to full speed
2. After flashing the mainboard firmware, the device reboots.

8.4 R&S TSME tools update

The R&S TSME Tools are used for diagnostics and maintenance purposes of the TSMAX devices. It is recommended to always install the latest version on the devices.



For the R&S TSME Tools installation on the TSMAX devices, use only the R&S Distributor version `TSMAX-TsmeTools-<version>.exe`.

Example: `TSMAX-TsmeTools-v1.7.4.1.exe` (current version).

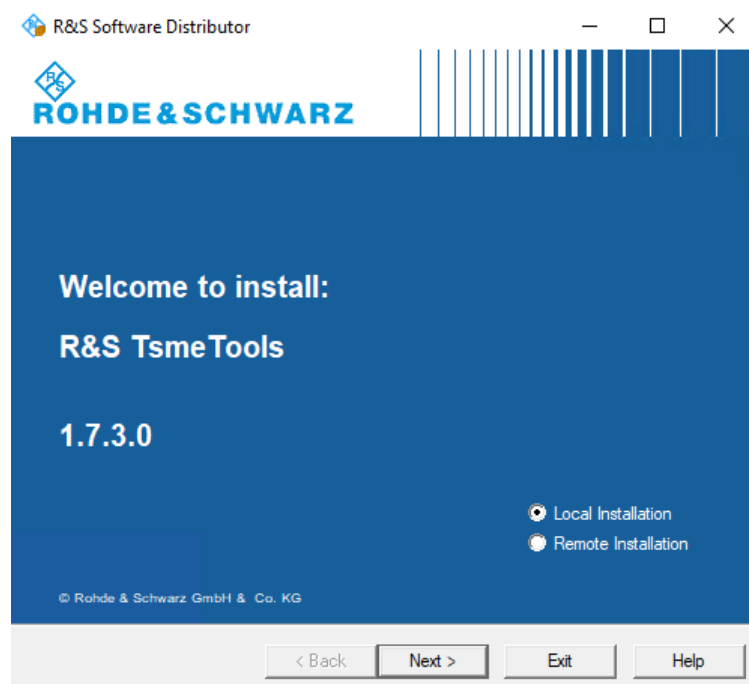
8.4.1 Preparation

1. Download the R&S TSME Tools setup file
TSMaX-TsmeTools-v<x.y.z.z1>.exe from <https://www.rohde-schwarz.com/software/tsmx/>.
2. Choose the way of installation (local, remote, USB stick) and follow the instructions on how to update the R&S TSME Tools (see [Chapter 8.3, "Updating firmware/software/tools - general instructions"](#), on page 75).

8.4.2 R&S TSME tools local installation

Follow the general instructions in [Chapter 8.3.1, "Local execution of the setup file"](#), on page 75, [step 1](#) to [step 6](#).

The "R&S Software Distributor" window comes up. Select "Local Installation" and "Next".



All subsequent steps are similar to local firmware installation, see [Chapter 8.3.1, "Local execution of the setup file"](#), on page 75, [step 7](#) and following.

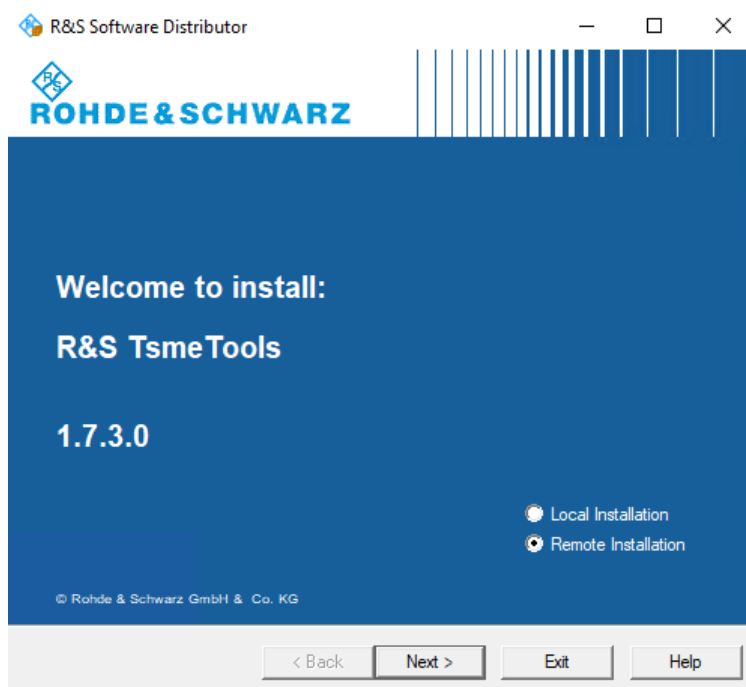


Do not switch off or unplug from power while running firmware/software update.

8.4.3 R&S TSME tools remote installation

Follow the general instructions in [Chapter 8.3.2, "Remote installation of the setup file"](#), on page 79, [step 1](#) to [step 3](#).

The "R&S Software Distributor" comes up. Select "Remote Installation" and "Next >".



All subsequent steps are similar to remote firmware installation, see [Chapter 8.3.2, "Remote installation of the setup file"](#), on page 79, [step 5](#) and following.

8.4.4 R&S TSME tools installation using a USB stick

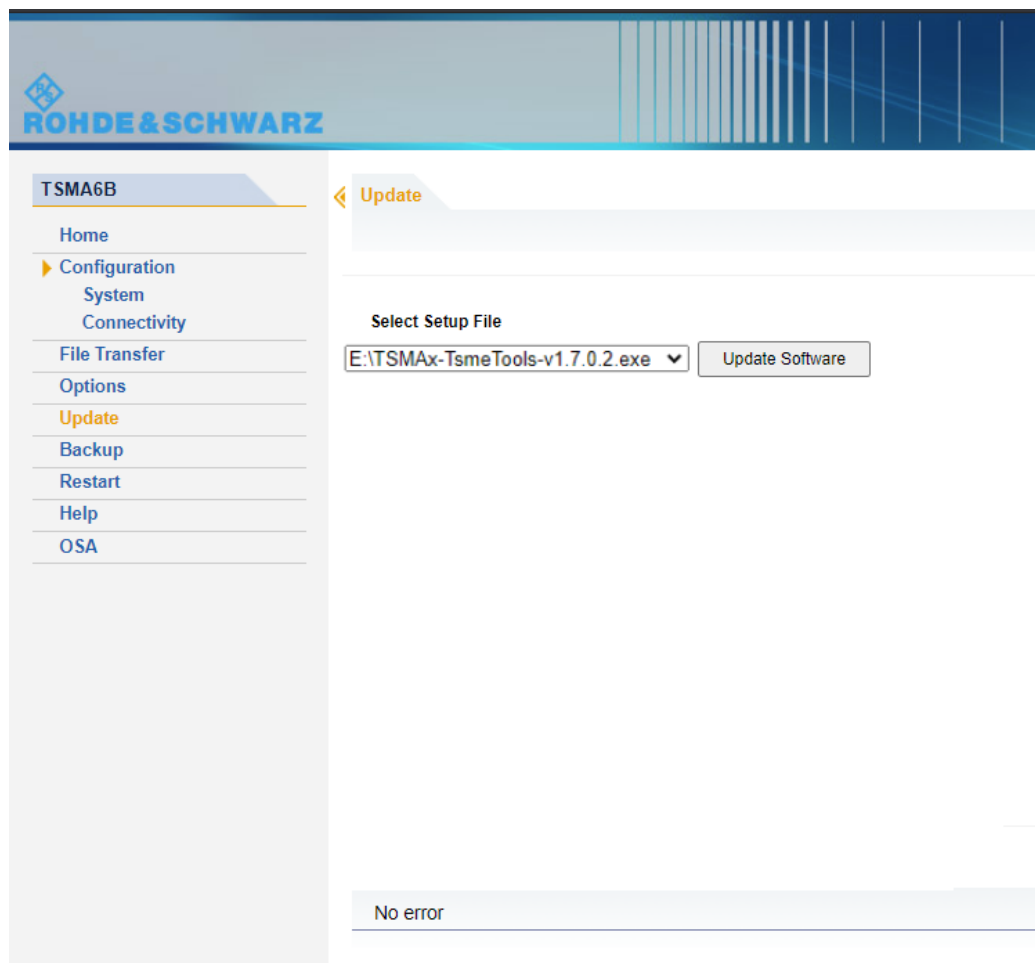
Follow the general instructions in [Chapter 8.3.3, "Installation using a USB stick"](#), on page 83, [step 1](#) to [step 6](#).

Select the appropriate R&S TSME Tools setup file

TSMaX-TsmeTools-v<x.y.z.z1>.exe and press "Update Software" next to the select box.

The "Update Software" button is only active, if a valid

TSMaX-TsmeTools-<Version>.exe setup file is available in the root directory of the connected USB stick and the device is in "PC Mode".



The following steps are similar to the installation using a USB stick, see [Chapter 8.3.3, "Installation using a USB stick"](#), on page 83, [step 8](#) and following.

8.5 Microsoft EDGE browser update

Starting with firmware version 4.1.0.4 there is also a Microsoft EDGE browser installation available for R&S TSMa6/TSMa6B.

The Microsoft EDGE browser replaces the former used Internet Explorer for the TSMaX web-GUI as the Internet Explorer is no longer supported by Microsoft. It also brings a better compatibility with the web-based tools R&S SmartBenchmarker and R&S SmartAnalytics as the Internet Explorer is incompatible with these products.



For the Microsoft EDGE browser installation on the R&S TSMa6/TSMa6B, use the dedicated TSMaX EDGE setup. TSMaX-EDGE-Setup-<version>.zip.

Example: TSMaX-EDGE-Setup-V4.1.0.5.zip (current version).

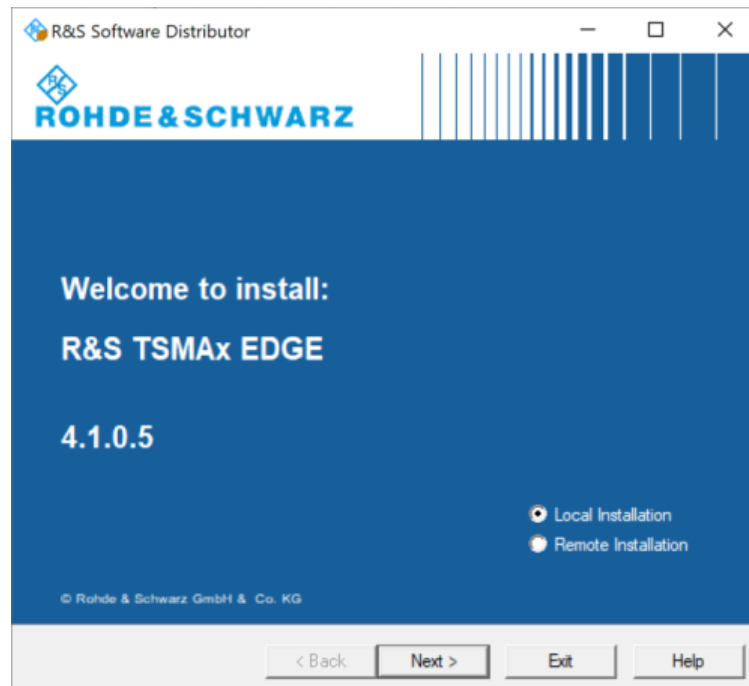
8.5.1 Preparation

1. Download the Microsoft EDGE browser setup file
TSMaX-EDGE-Setup-<version>.zip from <https://www.rohde-schwarz.com/us/software/tsmx>.
2. Choose the way of installation and follow the instructions how to update the browser.

8.5.2 Microsoft EDGE browser local installation

Follow the general instructions in [Chapter 8.3.1, "Local execution of the setup file"](#), on page 75, [step 1](#) to [step 6](#).

The "R&S Software Distributor" window comes up. Select "Local Installation" and "Next".



All subsequent steps are similar to local firmware installation, see [Chapter 8.3.1, "Local execution of the setup file"](#), on page 75, [step 7](#) and following.

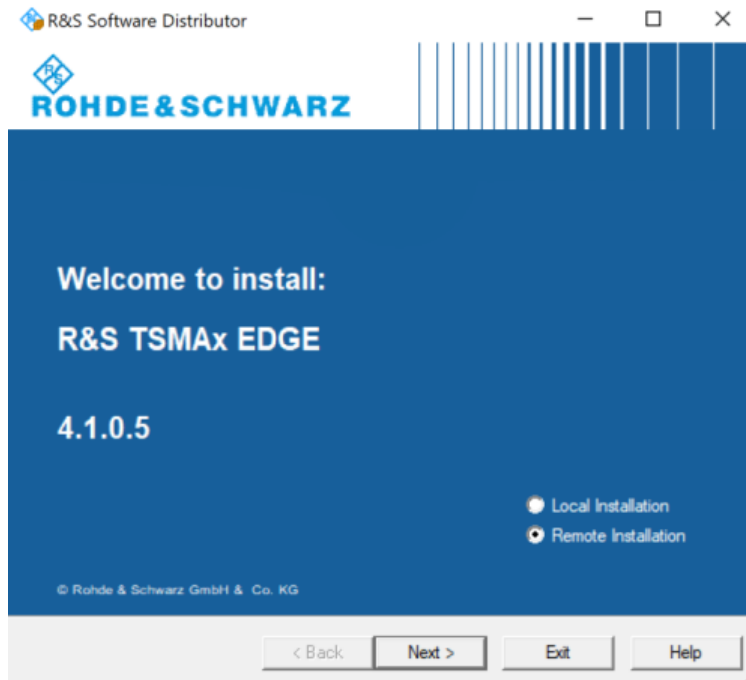


Do not switch off or unplug from power while running firmware/software update.

8.5.3 Microsoft EDGE browser remote installation

Follow the general instructions in [Chapter 8.3.2, "Remote installation of the setup file"](#), on page 79, [step 1](#) to [step 3](#).

The "R&S Software Distributor" comes up. Select "Remote Installation" and "Next >".



All subsequent steps are similar to remote firmware installation, see [Chapter 8.3.2, "Remote installation of the setup file"](#), on page 79, [step 5](#) and following.

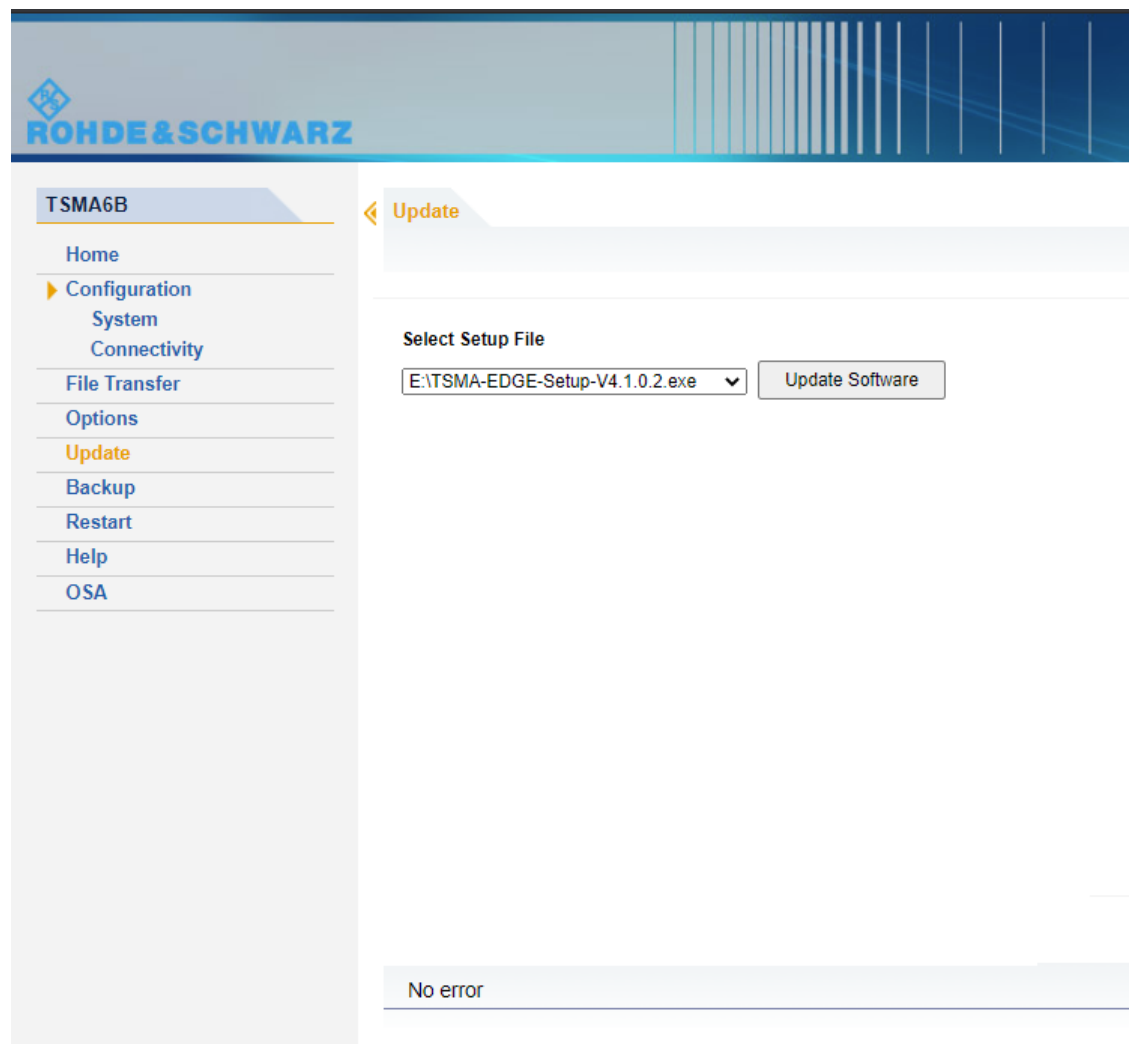
8.5.4 Microsoft EDGE browser installation using a USB stick

Follow the general instructions in [Chapter 8.3.3, "Installation using a USB stick"](#), on page 83, [step 1](#) to [step 6](#).

Select the appropriate Microsoft EDGE setup file

TSMaX-EDGE-Setup-<Version>.exe and press "Update Software" next to the select box.

The "Update Software" button is only active, if a valid TSMaX-EDGE-<Version>.exe setup file is available in the root directory of the connected USB stick and the device is in "PC Mode".



The following steps are similar to the installation using a USB stick, see [Chapter 8.3.3, "Installation using a USB stick"](#), on page 83, [step 8](#) and following.

8.6 Software update - details



Make sure, that the latest firmware is installed on the device before you start with the installation of software packages.



For software installations (NESTOR, SmartONE, ViCom) installation, only use the TSMa6-specific setup files (TSMaX-<AppName>-|<version>-setup.exe).

8.6.1 Remote ViCom server software

The Remote ViCom server (rViCom) is an additional software package for the R&S TSMa6.



An upgrade of the Remote ViCom package is only recommended when operating the R&S TSMa6 in "rViCom Server" mode.

The update of the Remote ViCom package installation could be neglected for other modes of operation (NESTOR, ROMES, QualiPoc).



The installed version of the Remote ViCom server on the R&S TSMa6 needs to match with the applied version of rViCom client API on the remote Android device.

In cases of a client / server mismatch, there are the following possibilities:

- Downgrade the rViCom server version on the R&S TSMa6 to match with the applied rViCom client version on the Android device.
- Upgrade the rViCom client version on the connected tablet / smartphone to comply with the installed rViCom server version on the R&S TSMa6.

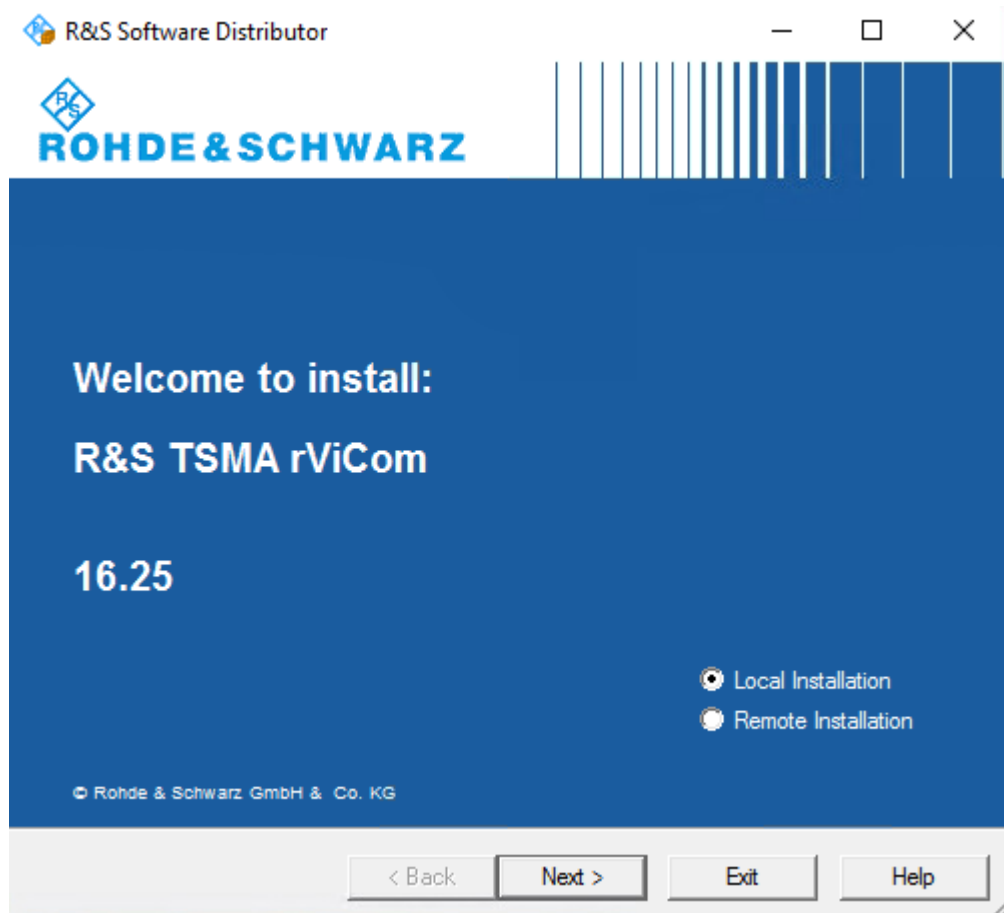
8.6.1.1 Preparation

1. To get the setup file `TSMaX-rViCom-Setup-<Version>.exe`, contact the R&S customer support.
2. Choose the way of installation and follow the instructions on how to prepare.

8.6.1.2 ViCom server local installation

Follow the general instructions in [Chapter 8.3.1, "Local execution of the setup file"](#), on page 75, [step 1](#) to [step 6](#).

The "R&S Software Distributor" window comes up. Select "Local Installation" and "Next".



All subsequent steps are similar to local firmware installation, see [Chapter 8.3.1, "Local execution of the setup file"](#), on page 75, [step 7](#) and following.

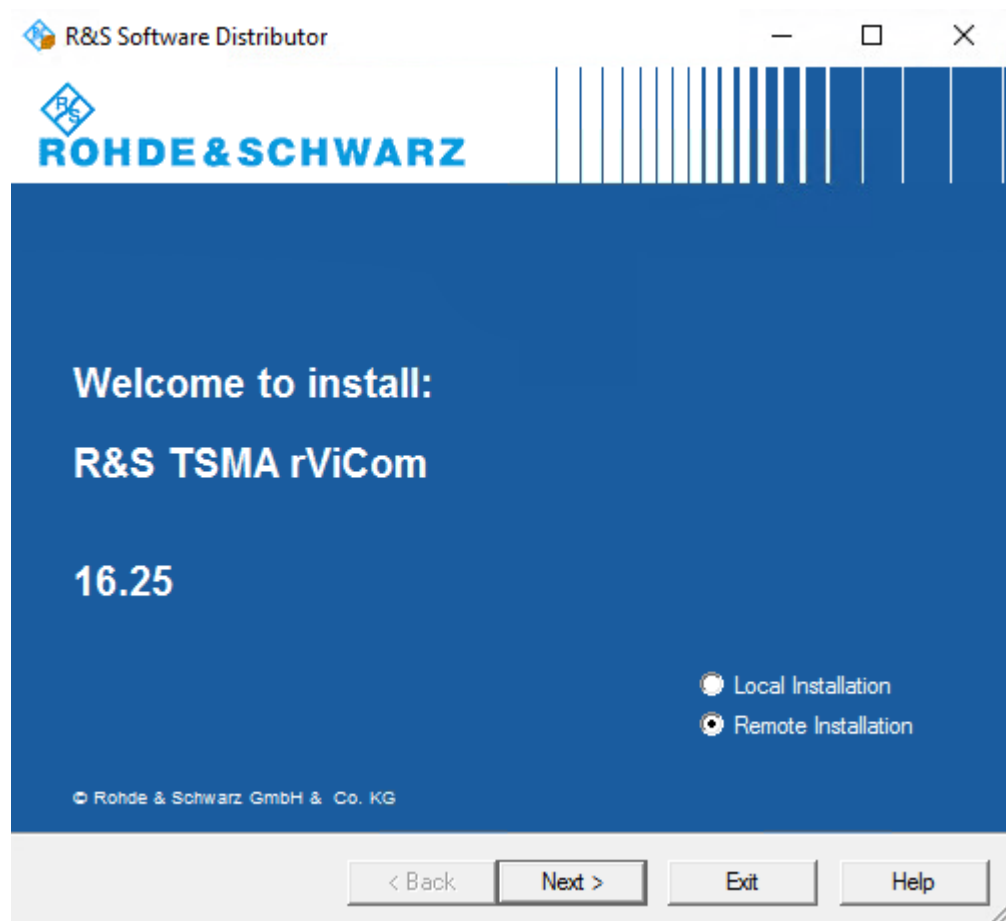


Do not switch off or unplug from power while running firmware/software update.

8.6.1.3 ViCom server remote installation

Follow the general instructions in [Chapter 8.3.2, "Remote installation of the setup file"](#), on page 79, [step 1](#) to [step 3](#).

The "R&S Software Distributor" comes up. Select "Remote Installation" and "Next >".



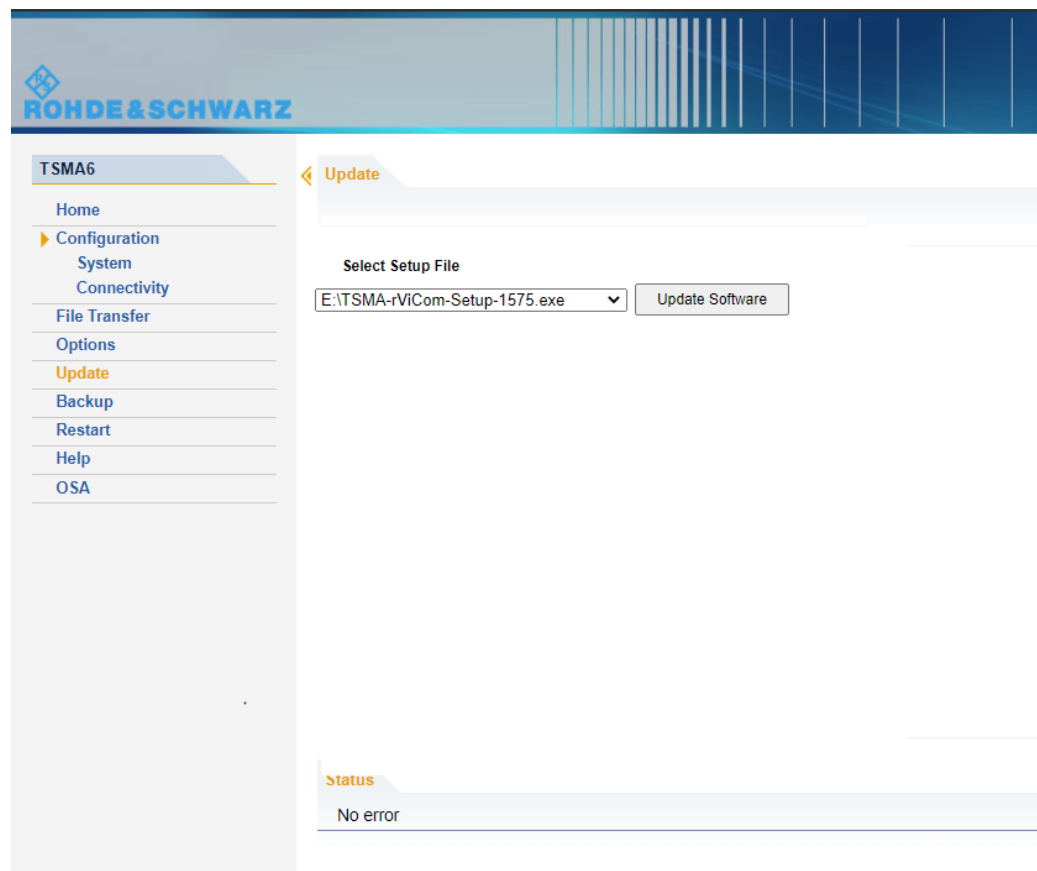
All subsequent steps are similar to remote firmware installation, see [Chapter 8.3.2, "Remote installation of the setup file"](#), on page 79, [step 5](#) and following.

8.6.1.4 ViCom server installation using a USB stick

Follow the general instructions in [Chapter 8.3.3, "Installation using a USB stick"](#), on page 83, [step 1](#) to [step 6](#).

Select the appropriate setup file `TSMaX-rViCom-Setup-<Version>.exe` and press "Update Software" next to the select box.

The "Update Software" button is only active, if a valid `TSMaX-rViCOM-Setup-<Version>.exe` setup file is available in the root directory of the connected USB stick and the device is in "PC Mode".



The following steps are similar to the installation using a USB stick, see [Chapter 8.3.3, "Installation using a USB stick"](#), on page 83, [step 8](#) and following.

8.6.2 R&S NESTOR software



Only execute the dedicated NESTOR setup for R&S TSMa6. The setup file is named `TSMax_NESTOR_Setup-<Version>.exe`.

8.6.2.1 Preparation

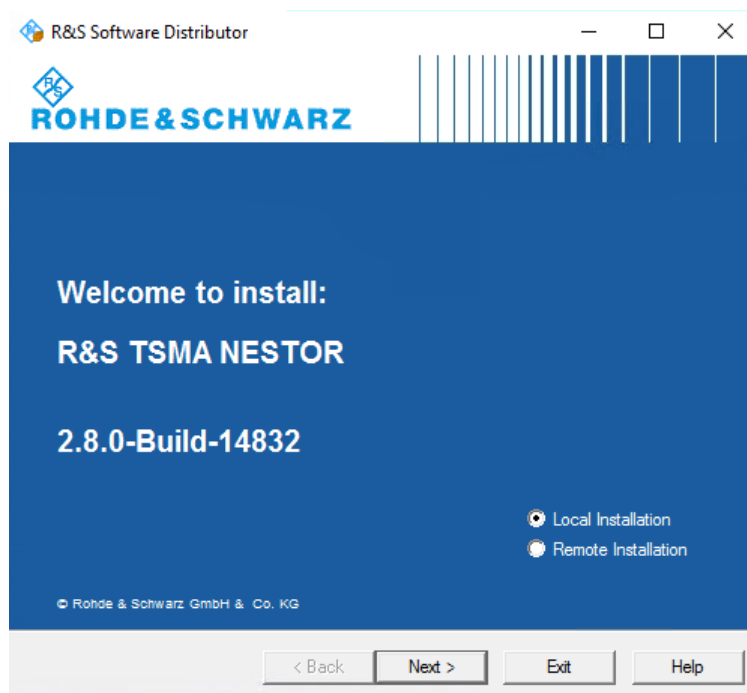
This software package is pre-installed at delivery when the R&S TSMa6 is ordered with NESTOR TSMa6 option (R&S No. 1522.8870.03).

1. Download the software setup file `TSMax_NESTOR_Setup-<Version>.exe` from the Rohde & Schwarz FTP server respectively NESTOR CD-ROM.
2. Choose the way of installation and follow the instructions on how to prepare.

8.6.2.2 NESTOR local installation

Follow the general instructions in [Chapter 8.3.1, "Local execution of the setup file"](#), on page 75, [step 1](#) to [step 6](#).

The "R&S Software Distributor" comes up. Select "Local Installation" and "Next".



All subsequent steps are similar to local firmware installation, see [Chapter 8.3.1, "Local execution of the setup file"](#), on page 75, [step 7](#) and following.

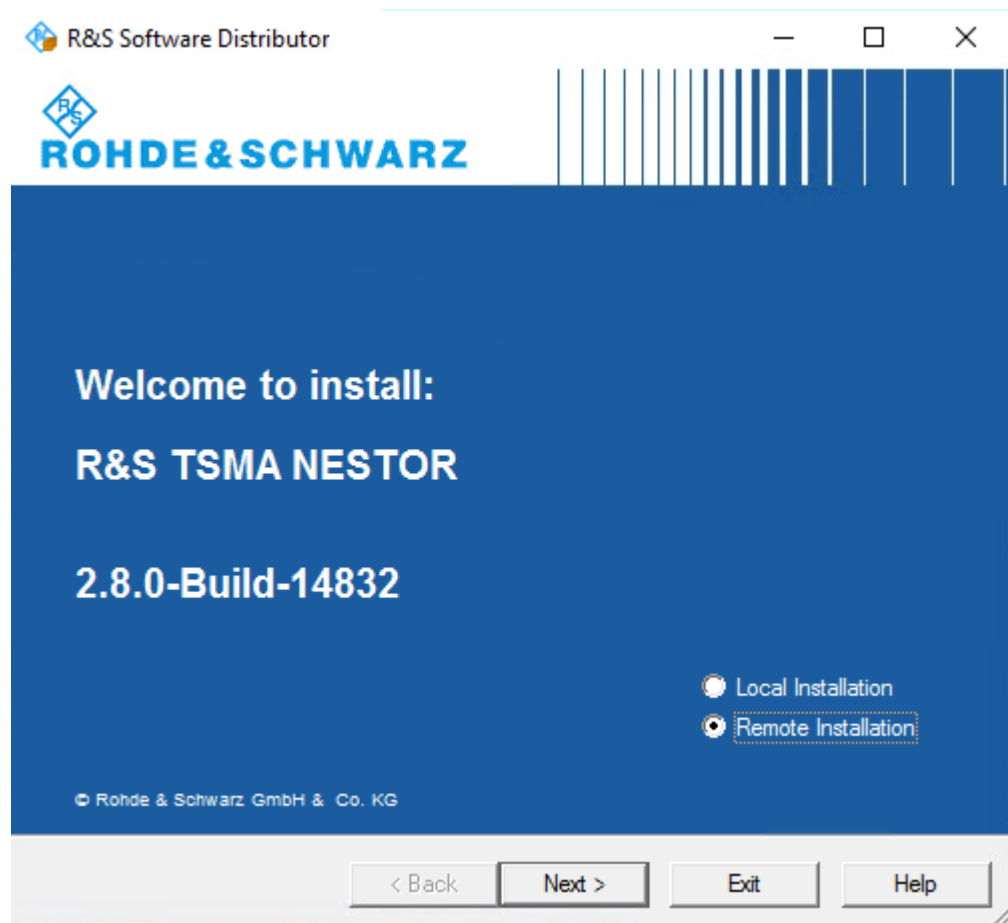


Do not switch off or unplug from power while running firmware/software update.

8.6.2.3 NESTOR remote installation

Follow the general instructions in [Chapter 8.3.2, "Remote installation of the setup file"](#), on page 79, [step 1](#) to [step 3](#).

The "R&S Software Distributor" comes up. Select "Remote Installation" and "Next >".



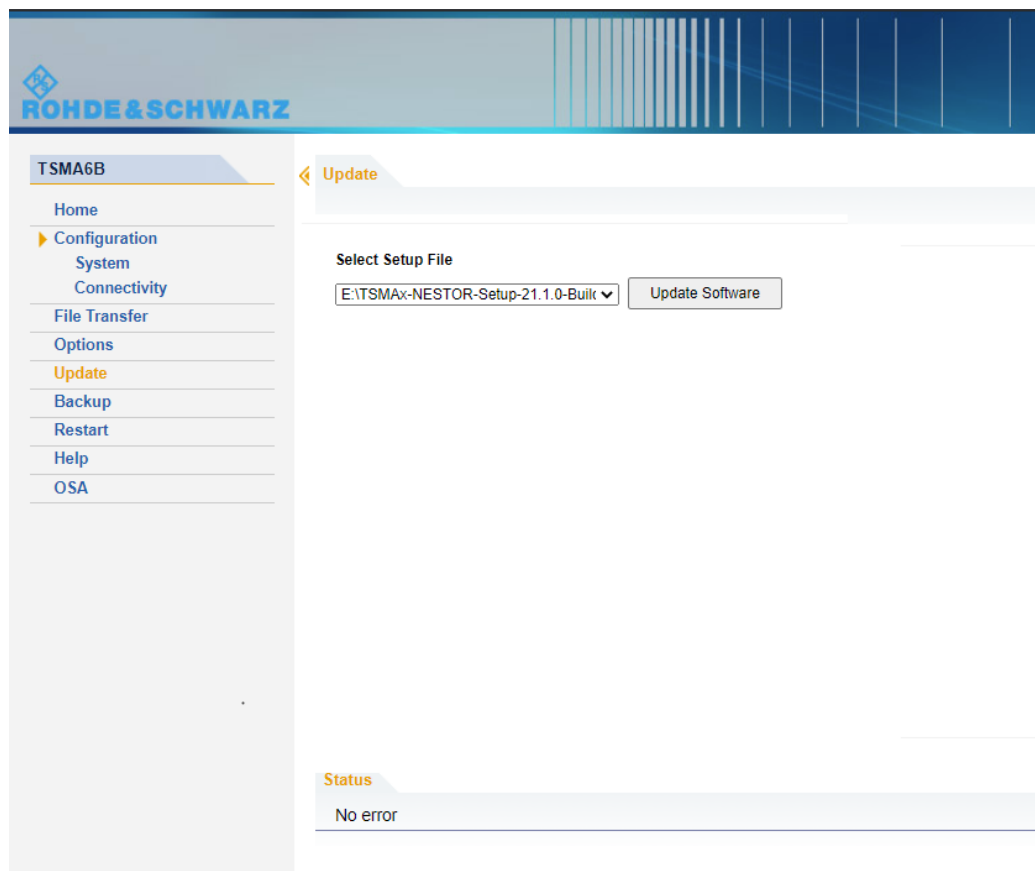
All subsequent steps are similar to remote firmware installation, see [Chapter 8.3.2, "Remote installation of the setup file"](#), on page 79, [step 5](#) and following.

8.6.2.4 NESTOR installation using a USB stick

Follow the general instructions in [Chapter 8.3.3, "Installation using a USB stick"](#), on page 83, [step 1](#) to [step 6](#).

Select the appropriate NESTOR setup file `TSMAX_NESTOR_Setup-<Version>.exe` and press "Update Software" next to the select box.

The "Update Software" button is only active, if a valid `TSMAX-NESTOR-Setup-<Version>.exe` setup file is available in the root directory of the connected USB stick.



The following steps are similar to the installation using a USB stick, see [Chapter 8.3.3, "Installation using a USB stick"](#), on page 83, [step 8](#) and following.

8.6.3 R&S SmartONE setup (SmartBenchmarker, ROMES, QualiPoc)



It is recommended to install and use the Microsoft Edge browser with R&S SmartONE.



The setup file is named `TSMaX-SmartONE_x.y.z.exe` (example: `TSMaX-SmartONE_20.3.35.exe`).

The R&S SmartONE installation contains the following applications.

- R&S SmartBenchmarker
- R&S ROMES
- R&S QualiPoc
- R&S SmartMonitor

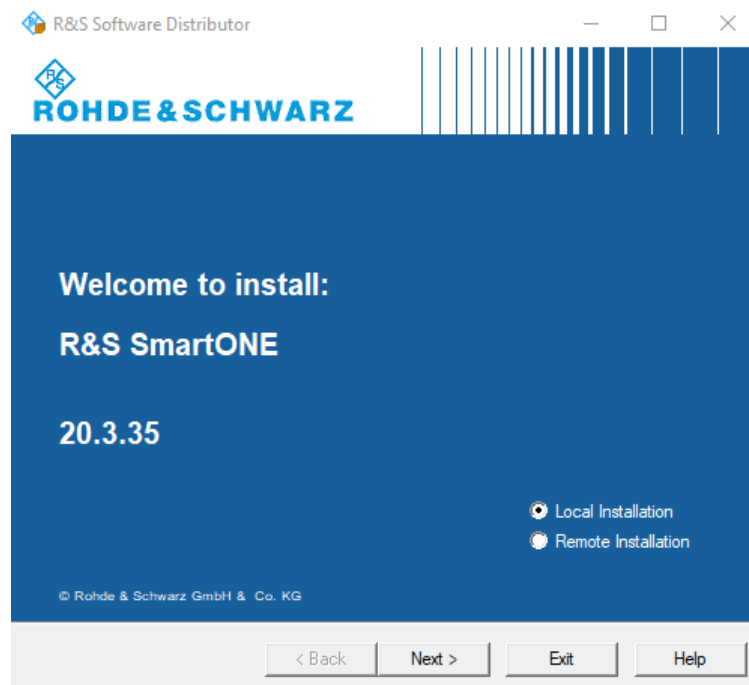
8.6.3.1 Preparation

1. Download the SmartONE setup file TSMaX-SmartONE_x.y.z.exe from the Rohde & Schwarz FTP server respectively SmartONE CD-ROM.
2. Choose the way of installation and follow the instructions how to prepare.

8.6.3.2 SmartONE local installation

Follow the general instructions in [Chapter 8.3.1, "Local execution of the setup file"](#), on page 75, [step 1](#) to [step 6](#).

The "R&S Software Distributor" comes up. Select "Local Installation" and "Next".



All subsequent steps are similar to local firmware installation, see [Chapter 8.3.1, "Local execution of the setup file"](#), on page 75, [step 7](#) and following.

8.6.3.3 SmartONE remote installation

Follow the general instructions in [Chapter 8.3.2, "Remote installation of the setup file"](#), on page 79, [step 1](#) to [step 3](#).

The "R&S Software Distributor" comes up. Select "Remote Installation" and "Next >".

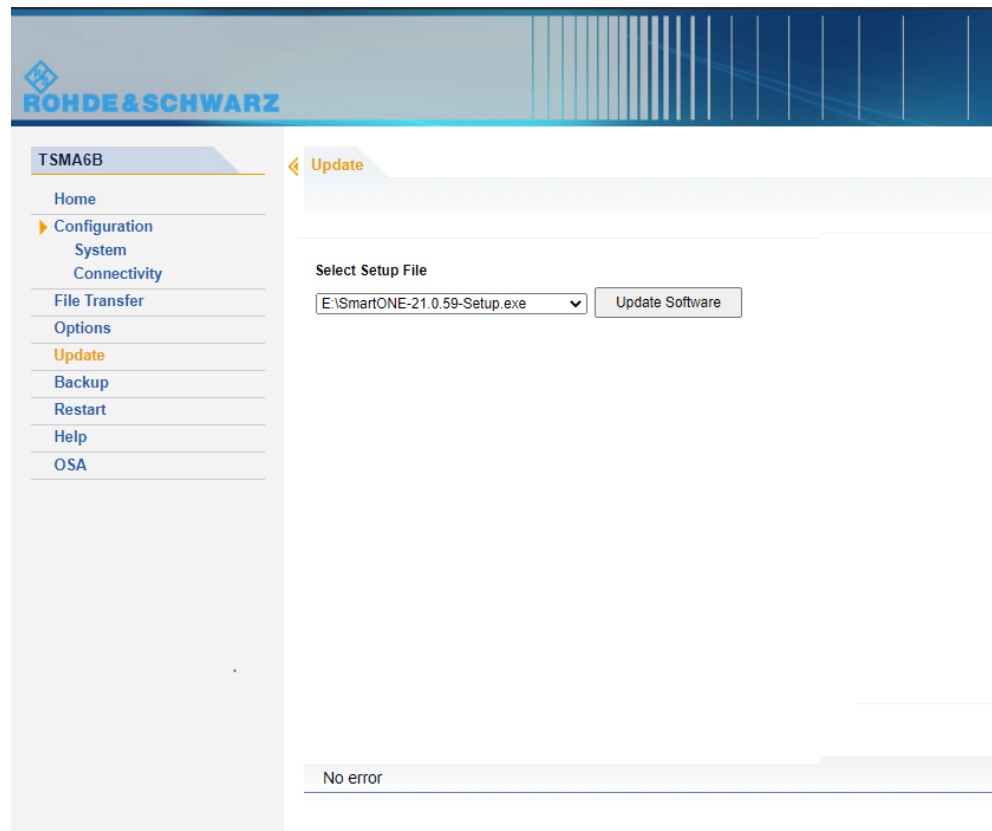


All subsequent steps are similar to remote firmware installation, see [Chapter 8.3.2, "Remote installation of the setup file"](#), on page 79, [step 5](#) and following.

8.6.3.4 SmartONE installation using a USB stick

Follow the general instructions in [Chapter 8.3.3, "Installation using a USB stick"](#), on page 83, [step 1](#) to [step 6](#).

1. Select the appropriate SmartONE setup file `SmartONE_x.y.z.exe` and press "Update Software" next to the select box.
The "Update Software" button is only active, if a valid `TSMaX-SmartONE-<Version>.exe` setup file is available in the root directory of the connected USB stick.



2. The following steps are similar to the installation using a USB stick, see [Chapter 8.3.3, "Installation using a USB stick"](#), on page 83, [step 8](#) and following.

8.6.3.5 Initial software start / measurement mode selection

After the successful installation of R&S SmartONE, the device always is in "QualiPoc" mode.

Initial starting of SmartONE Expert (R&S ROMES)

1. Start the web GUI.
2. Navigate to "Configuration" > "System" > "Mode".
3. As "Mode of Operation" select "SmartONE Expert".

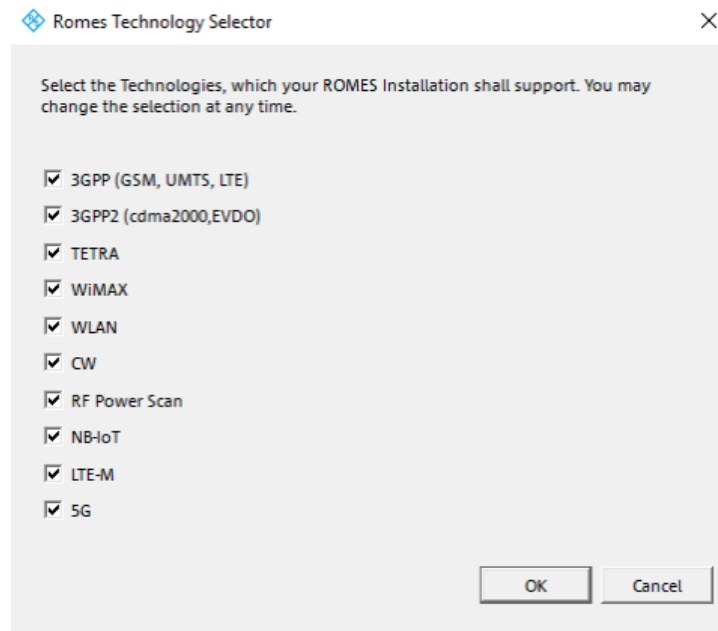
Make sure, that "Autostart" is deselected and no workspace is selected.

The screenshot displays the Rohde & Schwarz TSMa6B web interface. On the left is a navigation menu with options: Home, Configuration (expanded), System (selected), Connectivity, File Transfer, Options, Update, Backup, Restart, Help, and OSA. The main content area is titled 'System' and contains several tabs: Mode (selected), Power, RF Band, and Password. Under the 'Mode' tab, the 'Mode of Operation' section shows two radio buttons: 'SmartONE Standard' and 'SmartONE Expert' (which is selected). To the right of these is an 'Autostart' checkbox, which is checked. Below this is a dropdown menu labeled 'Select the Workspace File'. Further down are two checkboxes: 'Recording' and 'IP Controlled'. At the bottom of this section is a 'Submit' button. Below the 'Submit' button is the 'Current Measurement' section, which includes 'State', 'Info', and 'Set State' labels, and a 'Toggle' button. At the very bottom of the interface is a 'Status' bar indicating 'No error'.

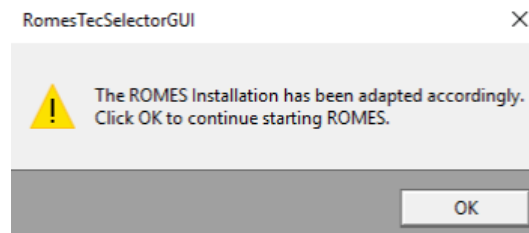
4. Select "Submit".

After starting R&S ROMES, configure the following settings.

1. In the "Romes Technology Selector", select the technologies to be supported by your ROMES installation.



2. Select "OK".
3. In the "ROMESTecSelectorGUI" window, select "OK".



The current installation is adapted according to your selection and the ROMES start process continues.

4. In the "User" window, check that the "User Level" is "Normal".
5. Select "Don't Ask again".

6. In the "Installation Check", select "Don't Ask again" and "Continue".

Initial starting of SmartONE Standard (R&S SmartBenchmarker)

1. Start the web GUI.
2. Navigate to "Configuration" > "System" > "Mode".
3. As "Mode of Operation", select "SmartONE Standard".

For further details about using R&S SmartBenchmarker, refer to *R&S SmartBenchmarker - Manual*.

9 Installing software options (Scanner, NESTOR)

9.1 Installing scanner options

To install scanner options, perform the followings steps.

1. Start the web GUI of the R&S TSMA6.
2. Navigate to "Options" > "Install" Tab (see ["Install Scanner Options"](#) on page 158)
3. Add the license key code of a specific scanner option in the field "Install Scanner Options" manually and select "Install".
4. Alternatively, you can install a scanner option by selecting a license .xml file and selecting "Install XML file."

9.2 Installing R&S NESTOR options

A later enhancement of the R&S TSMA6 with options requires a USB license dongle.

To install R&S NESTOR options, perform the following steps.

1. Start the web GUI of the R&S TSMA6.
2. Navigate to "Options" > "Install" Tab (see ["Install NESTOR Options"](#) on page 158).
3. Add the license key code of a specific NESTOR option in the field "Install NESTOR Options" manually and select "Install".

10 User backup and restore

10.1 Creating a user backup

The user backup creates an image copy of partition C:/ on a hidden partition on the device.



The backup procedure takes up to 15 minutes.

During the backup, do not interrupt the procedure or disconnect the power supply.

To create a user backup, click the "Backup" button in the web GUI menu "Backup", see ["Backup TSM A6 System"](#) on page 159.

If there is already a user backup available a dialog comes up, which alerts that the existing user backup will be overwritten. The backup creation proceeds, if you confirm the dialog.

The status of the backup generation process is displayed via the [Mode] LED, see [Table 10-1](#).

After the creation of the backup image has finished, the device reboots.

Table 10-1: LED states (Backup)

[Mode] LED	Status
Red blinking	Backup process running
Green continuous	Backup process finished, WLAN AP off
Blue continuous	Backup process finished, WLAN AP on

10.2 Restoring a backup

The Restore button brings the device back to factory / user default configuration according to [Table 10-2](#).

Use a blunt pen (diameter 1 mm to 2 mm) for pressing the Restore button.

Min. button hold time for restore trigger: 20 s.

The restore process is indicated by the [Mode] LED (see [Table 10-3](#)).



The restore procedure takes up to 15 minutes.

During this time, do not interrupt the procedure or disconnect the power supply.



Loss of user settings after restore

Executing restore brings the R&S TSMA6 irreversible back to the condition of delivery or any other subsequently created user backup state.

On the C:\ drive, all user settings and installed programs since the last backup will be deleted.

The D:\ partition is deleted too, if enabled in the backup / restore configuration of the web-GUI, see ["Delete Data partition D:"](#) on page 159.

Table 10-2: Restore conditions

Initiate Restore / Available Partitions	Restore button	Restore button	Restore factory backup (see Chapter 10.3, "Restoring the factory backup" , on page 109)
Factory Backup	X	X	X
User Backup (see Chapter 10.1, "Creating a user backup" , on page 108)	No user backup (factory default)	X	X
Condition after restore			
Partition C:\	C:\factory backup	C:\user backup	C:\factory backup
Partition D:\ (default)	Unchanged	Unchanged	Unchanged
Partition D:\ (web-GUI setting "Delete Data partition D:" on page 159)	deleted	deleted	deleted

When the restore procedure has been completed, the R&S TSMA6 reboots. The color of the [Mode] LED depends on the state of the WLAN AP (see [Table 10-3](#)).

Table 10-3: LED states (Restore)

[Mode] LED	Status
Blue blinking	Restore process running
Green	Restore process finished, WLAN AP off
Blue	Restore process finished, WLAN AP on

10.3 Restoring the factory backup

The system recovery via the "Restore" button recovers always to the latest user backup if available on the device (see [Table 10-2](#)). Only if no user backup exists the recovery via the restore button will recover the factory backup.

To restore the factory backup at the presence of a user backup, perform the following steps.

1. Connect mouse, keyboard and monitor to the R&S TSMA6.
2. Press the [Shift] key and reboot the operating system.
3. The R&S TSMA6 reboots in the R&S recovery environment.
4. Select "Factory Default Restore".
5. Select "Start Recovery".
The R&S TSMA6 recovery starts and the "Mode" LED blinks green.
NOTE: Do not interrupt the recovery process.
6. When the recovery has finished, press Exit/Reboot.
7. After the reboot, check if a microcontroller flash is performed (LED blue/green).

10.4 Capturing and applying R&S TSMA6 images

Use the R&S TSMA6 image stick to capture and apply Windows images.

- [Creating an R&S TSMA6 image stick](#)..... 110
- [Booting from the R&S TSMA6 image stick](#)..... 111
- [Capturing an image from R&S TSMA6](#)..... 111
- [Applying an image to R&S TSMA6](#)..... 113

10.4.1 Creating an R&S TSMA6 image stick

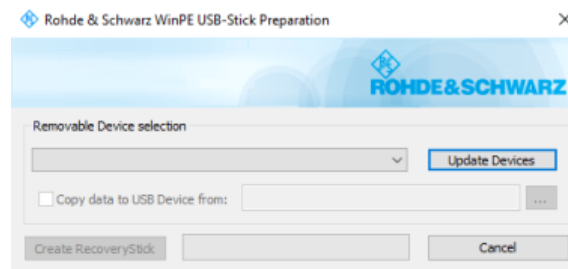


You need administrator rights on the PC, where you create the image stick.

To create an R&S TSMA6 image stick, proceed as follows.

Prerequisites:

- A bootable USB stick (USB 3.1 Gen1) with a capacity of at least 64 GB. Make sure that the data on the USB stick is no longer needed as it will be formatted during process of R&S TSMA6 image stick creation.
 - Download the "R&S TSMA6 Image Stick" (TSMA6_ImageStick-v<x.y>.zip) tool (<https://www.rohde-schwarz.com/us/software/tsmx>).
 - On a PC, unzip the file TSMA6_ImageStick-v<x.y>.zip to a directory of your own choice. The extracted directory contains the PrepareWinPEStick.exe file.
1. Insert the USB stick into a free USB3.1 port of a PC.
 2. Execute the PrepareWinPEStick.exe file in the directory, where you have saved the file.
 3. Select the USB stick via the "Removable Device Selection" drop-down box.



4. Press "Create RecoveryStick".

In the main directory of the image stick, following directories and files are created automatically:

- /Boot
- /Device
- /EFI
- /sources
- bootmgr
- bootmgr.efi

When the creation of the image stick has finished, you can boot the R&S TSMA6 from this stick.

10.4.2 Booting from the R&S TSMA6 image stick

To boot from the R&S TSMA6 image stick, proceed as follows.

1. Connect mouse, keyboard and monitor to the R&S TSMA6.
2. Insert the created R&S TSMA6 image stick (see [Chapter 10.4.1, "Creating an R&S TSMA6 image stick"](#), on page 110) into a free USB 3.0 port ([Figure 3-8](#)) on the R&S TSMA6.
3. Power on the R&S TSMA6.
4. During boot up, press [F10] to enter the boot menu.
5. Select the R&S TSMA6 image stick from the list of boot devices and press <Enter>.

The Windows PE environment starts.

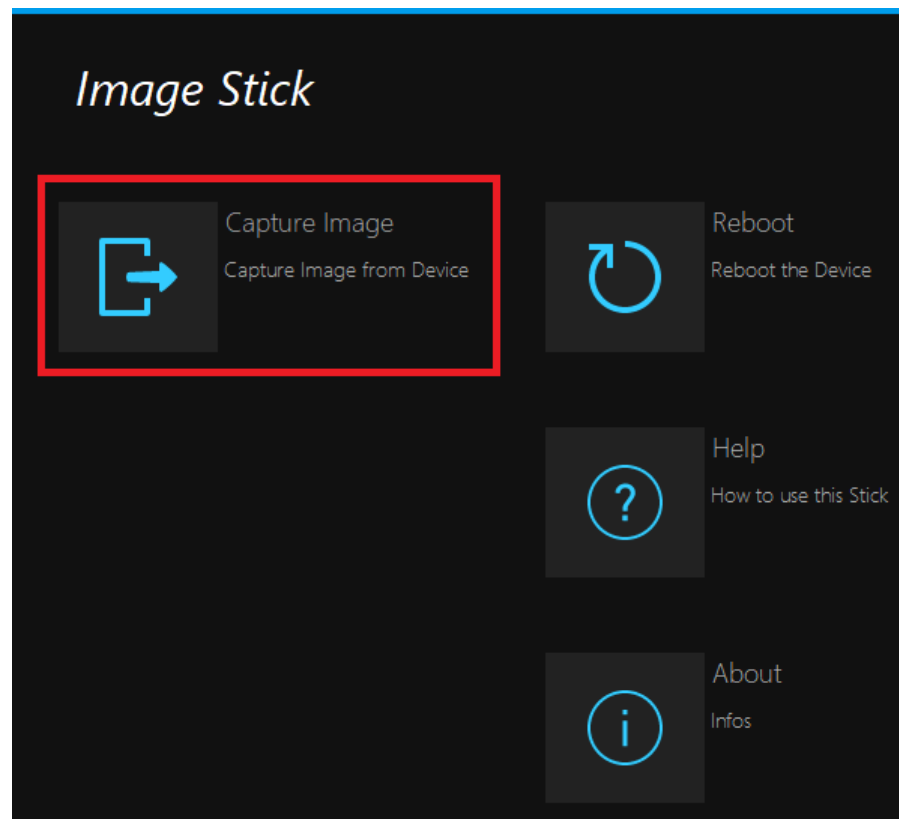
10.4.3 Capturing an image from R&S TSMA6

To capture an image from an R&S TSMA6 device, proceed as follows:

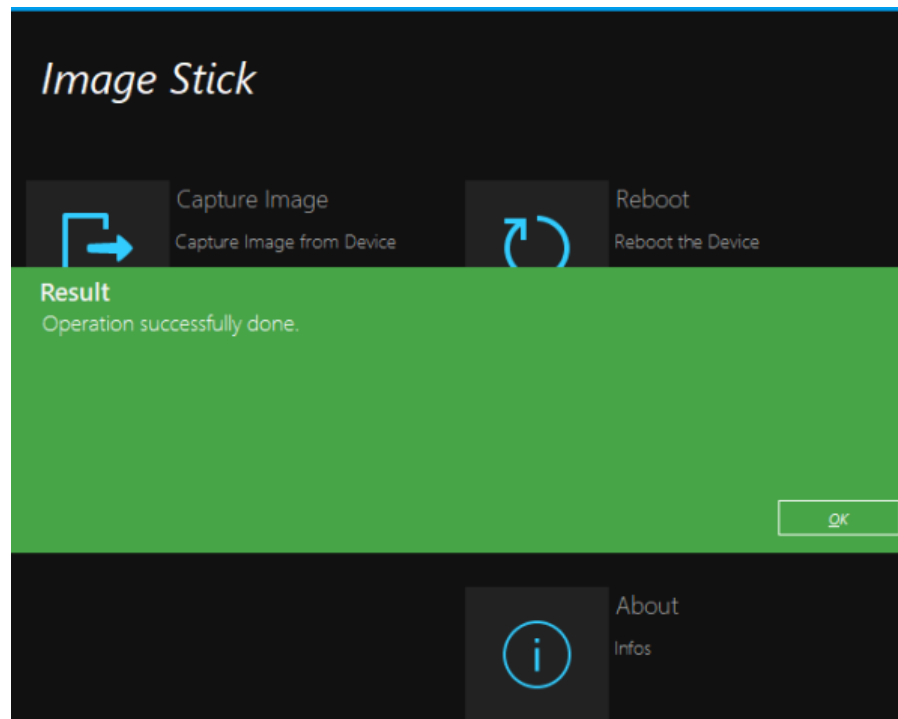
NOTE: No image files may be present on the R&S TSMA6 image stick in the directory `Device/Images`. Otherwise, capturing the image from an R&S TSMA6 master device is not possible.

1. Boot from the R&S TSMA6 master device via image stick (see [Chapter 10.4.2, "Bootting from the R&S TSMA6 image stick"](#), on page 111).
2. In the main menu, press "Capture Image".

The capture process starts automatically and the image files of the R&S TSMA6 master device are saved on the R&S TSMA6 image stick.



3. After the capture process has finished, the message "Operation successfully done." appears.



4. Press "OK".
5. Remove the R&S TSMA6 image stick.
The R&S TSMA6 image stick now contains the image files (/Device/Images).
6. Press "Reboot".
The R&S TSMA6 reboots normally in the previously selected mode of operation.



The image files, which are available on the R&S TSMA6 image stick in the directory (/Device/Images) can be saved manually on a PC. So, the image files can be used to be applied on more than one device.

10.4.4 Applying an image to R&S TSMA6

To apply an image to an R&S TSMA6 device, the following files must be available in the directory `Device/Images` on the R&S TSMA6 image stick.

- `BACKUP.wim`
- `Data.wim`
- `RECOVERY.wim`
- `SYSTEM.wim`

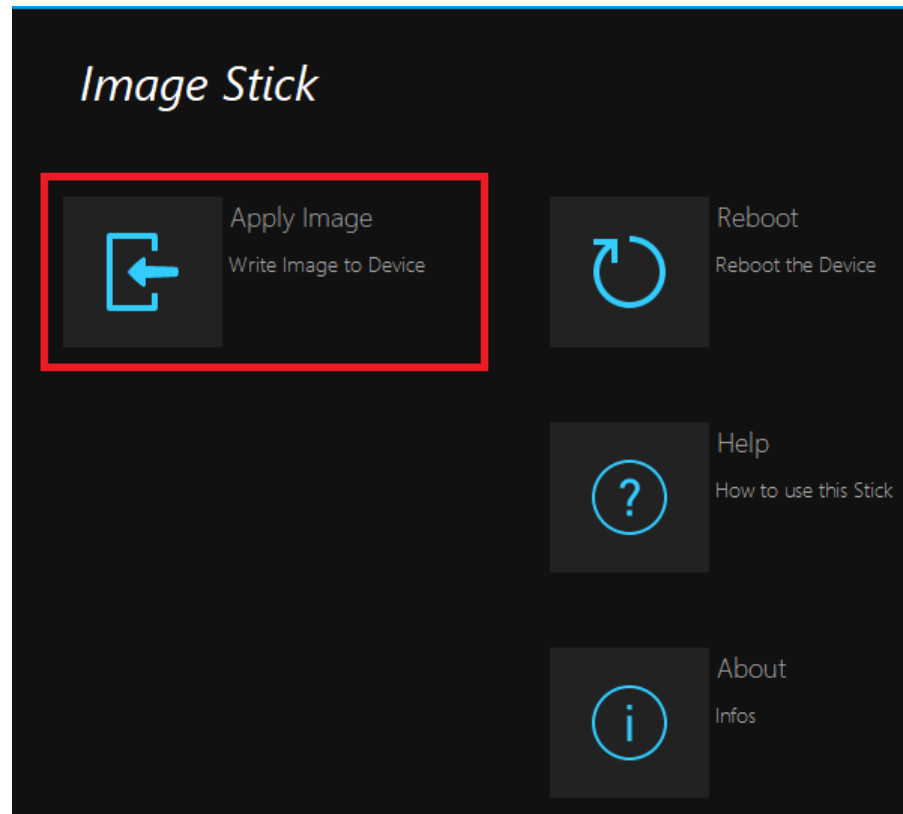


These files can be copied manually from a PC to the image stick or are the result of capturing an image (see [Chapter 10.4.3, "Capturing an image from R&S TSMA6"](#), on page 111).

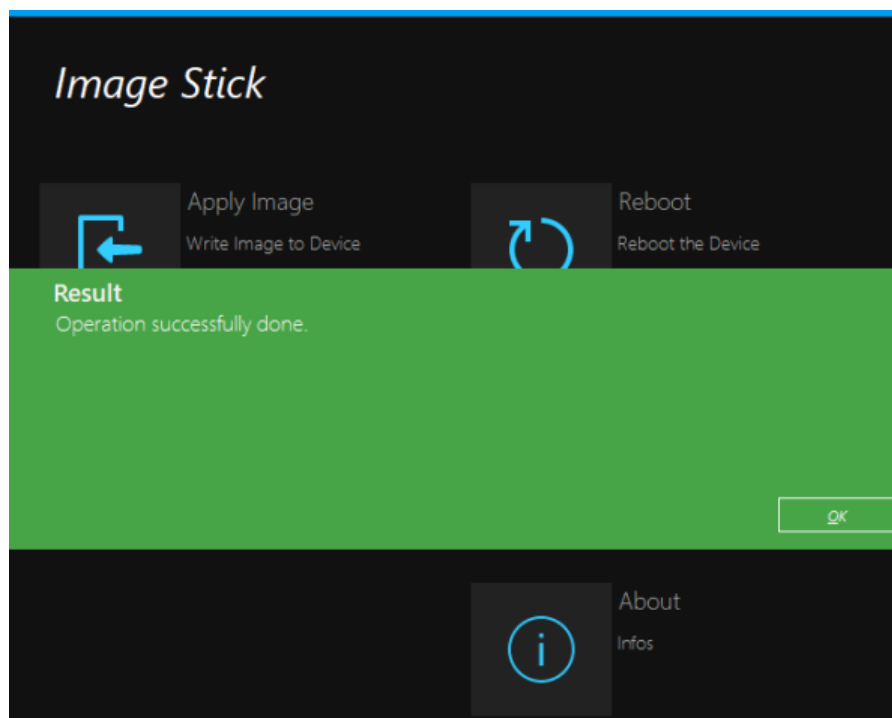
To apply an image to an R&S TSMA6, proceed as follows:

1. Boot the R&S TSMA6 image stick from the target device (see [Chapter 10.4.2, "Booting from the R&S TSMA6 image stick"](#), on page 111).
2. In the main menu, press "Apply Image".

The apply process starts automatically. The image files from the R&S TSMA6 master device are transferred to the R&S TSMA6 target device.



3. After the apply process has finished, the message "Operation successfully done." appears.



4. Press "OK".
5. Remove the R&S TSMA6 image stick.
6. Press "Reboot".
The R&S TSMA6 reboots from the deployed image.

11 Troubleshooting



For all troubleshooting procedures, connect keyboard, mouse and a monitor to the R&S TSM A6.

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• No RF / GPS data	138
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11.1 LED indicated errors

- "Mode" LED blue blinking fast – **Selftest Error**
 - Check the scanner connection (see [Chapter 11.8, "Verify LAN settings \(internal scanner connection\)"](#), on page 126).
 - Evaluate the `Selftestresult.txt` (see [Chapter 11.2, "Evaluate selftest file"](#), on page 117).
- "State" LED red blinking (2 Hz) – **Temperature Warning**
 - Check the ventilation openings and the operating temperature.
 - Switch off the device and let it cool down.
- "State" LED red continuous – **Overheated Unit**
 - Switch off the device and let it cool down.
 - Check the ventilation openings and switch on the device. If the problem occurs again, analyze the `Selftestresult.txt` (see [Chapter 11.2, "Evaluate selftest file"](#), on page 117).
- "Meas" LED red blinking (2 Hz) – **Application Error**
 - Refer to the application note of the used software.
- "Pwr" LED off after startup – **Power Error**
 - Contact R&S support.

11.2 Evaluate selftest file

- Path: C:\ProgramData\Rohde-Schwarz\TSMa\Selftestresults
- Filename: Selftestresult.txt

Entries in the `Selftestresult.txt` are created during the boot process of the device and every 5 minutes.

To open the `Selftestresult.txt`, proceed as follows.

1. Open a file explorer.
2. Enter the path to the directory where the selftest file is stored.
3. Open the selftest file.

Following device parameters and values are stored.

- Internal voltages (nominal values / actual values)
- Temperatures (scanner / mainboard)
- Battery status info
- Status of fans
- Status of scanner interface

11.3 Access the firmware log file

The firmware log file is created once per day. A maximum of 15 files are available for download (see ["App Log"](#) on page 157).

To check the log file entries

1. Navigate to "File Transfer" > "App Log".
2. Under "Firmware Log Trace", you see the content of the current log file.

To download a log file

1. Navigate to "File Transfer" > "App Log".
2. Under "Firmware Log File", select the log file according to your needs.
The log files have the following format: `Log_YYYY-mm-dd.txt`.

11.4 Write battery info into firmware log file

As an option, you can write the battery info also into the firmware log file (see ["Battery"](#) on page 150).

To write battery info into firmware log file

1. Navigate to "Configuration" > "System" > "Power".
2. Under "Battery", press "Start".

The battery info is written to the firmware log file (see [Chapter 11.3, "Access the firmware log file"](#), on page 117).

11.5 Verify scanner link / recall device info using TSME device manager

1. To start the R&S TSME Device Manager, double-click the desktop icon or select in Windows:
"Start" > "R&S TSME Tools" > "TSME Device Manager"
2. Following error messages may occur.
 - **TSME Device Manager Application has stopped**
In the web GUI, check "Mode of Operation". If necessary, change to "PC Mode" and try again.
 - **No TSME connected**
In the web GUI, verify "Scanner LAN Port Settings".
3. If the "Device Info" tab (see [Figure 11-1](#)) contains scanner data, the scanner connection has been established successfully.
4. Check the "Device Analysis Output" (see [Chapter 11.5.2, "Device analysis output"](#), on page 120) and the "Options" (see [Chapter 11.5.3, "Verify installed license keys"](#), on page 121).



If the connection to an R&S TSMA6 is not established correctly, for example due to a mismatch of the scanner link IP configuration, only limited information is displayed. In this case, no information about installed options is available.

11.5.1 Obtaining device information - "Device Info"

The most important configuration settings for each available R&S TSMA6 are displayed in the "Device Info" tab of the "R&S TSME Device Manager".

Verify scanner link / recall device info using TSME device manager

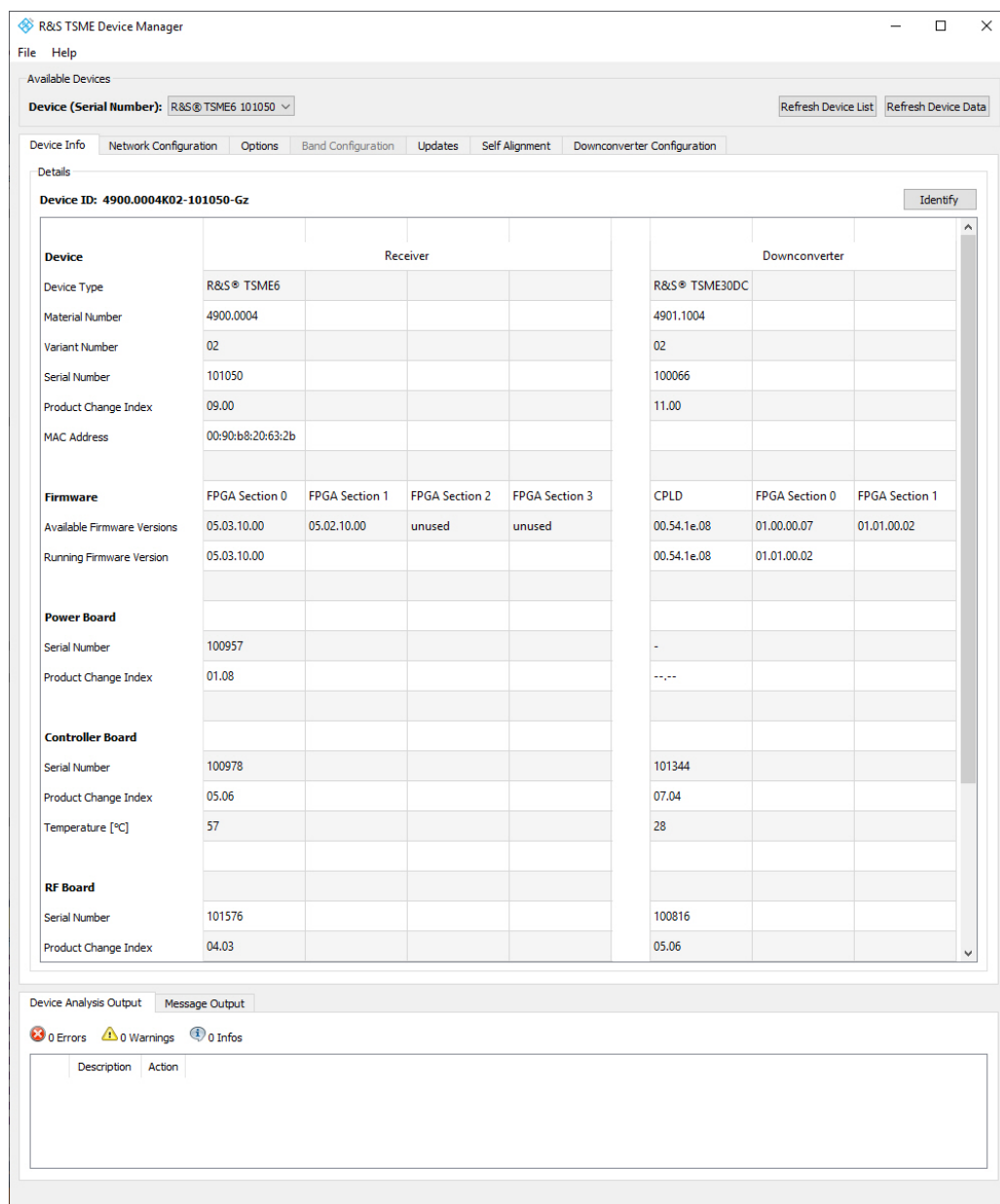


Figure 11-1: Tab "Device Info"

The table includes the following information:

Table 11-1: R&S TSMA6 device information

Label	Description
Device	
Device Type	Type of device (TSME family, TSMA family)
Material Number	Order number of the R&S TSMA6
Variant Number	Precise device type (variant)
Serial Number	Unique ID of the R&S TSMA6

Verify scanner link / recall device info using TSME device manager

Label	Description
Product Change Index	Version of the device
MAC Address	Network address of the R&S TSMA6
FPGA	
Available FPGA Bit File Versions	Previous firmware version backups stored on the device)
Current FPGA Bit File Version	Currently used firmware version
Power Board	
Serial Number	Unique ID of the power board
Product Change Index	Version of the power board
Controller Board	
Serial Number	Unique ID of the controller board
Product Change Index	Version of the controller board
Temperature	Current temperature of the hardware in [°]C
RF Board	
Serial Number	Unique ID of the RF board
Product Change Index	Version of the RF board
Temperature	Current temperature of the hardware in [°]C
Correction Data	
Version	Current version of the calibration data saved on the device
Type	<ul style="list-style-type: none"> • Factory The original factory calibration data are saved on the device. • Update An improved set of calibration data is available and saved on the device.
Date	Timestamp of creating and saving the calibration data on the device
TCXO Date	Date of correction data for the internal reference

11.5.2 Device analysis output

Furthermore, any warnings, errors or information concerning the device status that may be available are displayed in the "Device Analysis Output" table. This table is available on all tabs, at the bottom of the "R&S TSME Device Manager" window (see [Figure 11-1](#)).

Depending on their relevance, the messages are assigned to the following categories:

- **Info:** information for the user, no action required
- **Warning:** warning on behalf of the instrument - should be solved
- **Error:** error on behalf of the instrument - must be solved before further operation

Verify scanner link / recall device info using TSME device manager



In case measurement problems occur with the R&S TSM A6, check the "Device Analysis Output" table for any errors that may have been detected. If available, a repair function is provided.

11.5.3 Verify installed license keys

Available Devices

Device (Serial Number): R&S® TSME6 100844

Refresh Device List Refresh Device Data

Options

Install Option Key

R&S® TSME option order(s) are shipped as *.xml-files on a data carrier. For option installation, press the "Browse..." button, select the corresponding option file on the data carrier and press "Install".

Option-File: Browse... Install

Alternatively to option-file input, the option key could be entered manually.

Key: Install

Active Options:

	Option Type	Option Material No.	Option Key	Privilege	Time Stamp	License Count	Activation Type	Valid From	Valid To	Time
1	TSME6-K5B	4900.2059.02	263848707926127147323067566699	Customer Order	2019-02-06 09:23	1	Permanent	-	-	-
2	TSME6-KAB	4900.2107.02	317147754241024444610880619227	Customer Order	2019-02-06 09:23	1	Permanent	-	-	-
3	TSME6-K300	4900.2213.02	128988531002595423131183773755	Customer Order	2019-02-06 09:23	1	Permanent	-	-	-
4	TSME6-K60	4900.2265.02	394089057842435993061792176357	Customer Order	2019-02-06 09:23	1	Permanent	-	-	-

Inactive Options:

	Option Type	Option Material No.	Option Key	Privilege	Time Stamp	License Count	Activation Type	Valid From	Valid To
1	TSME6-K0	4900.2236.90	070652295315623597342658979881	Demo	2017-07-18 08:33	1	Temporary Duration	2019-01-18 10:00	2020-07-19 10:00

Device Analysis Output Message Output

0 Errors 0 Warnings 0 Infos

Description	Action
-------------	--------

Figure 11-2: Tab "Options"

Table 11-2: Software license key information

Label	Description
Option Type	Band or technology option name
Option Material No.	Order number of the option
Option key	Software license key number
Privilege	Usage type (customer, services, demo)
Time Stamp	Time the software license key was installed
License Count	Number of times the (band upgrade) option is installed

R&S TSMA6 automatically switches off after power on

Label	Description
Activation Type	Activation can be permanent or temporary
Valid From	Start of validity for temporary license
Valid To	End of validity for temporary license
Time to Expiration	Time left until license expires
Option Index	For internal use only
Format ID	For internal use only

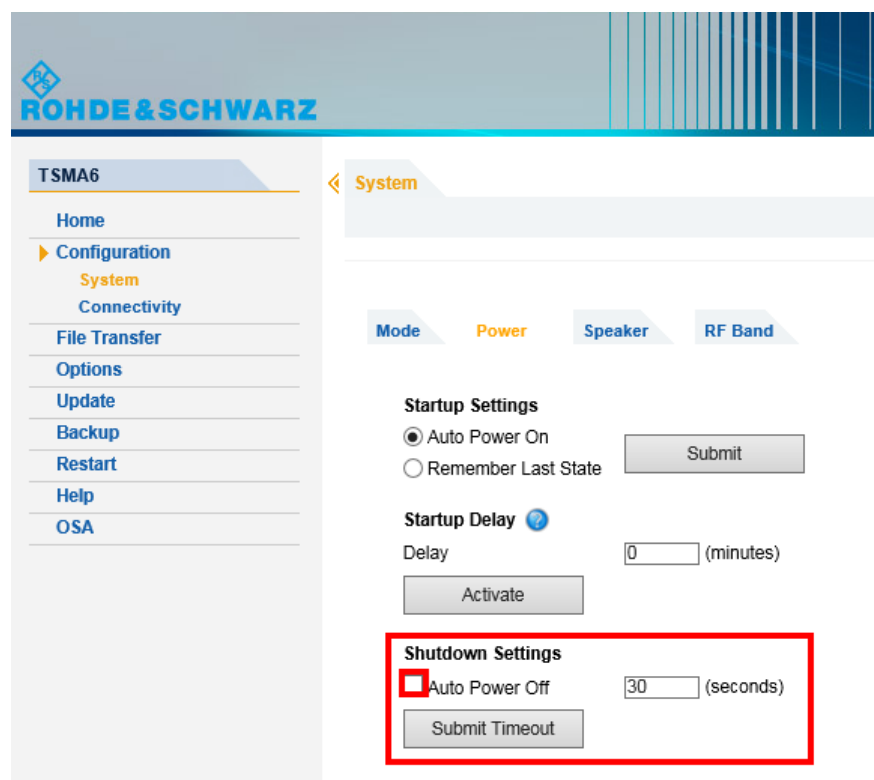
11.6 R&S TSMA6 automatically switches off after power on

1. Check if there is a battery pack unit connected.
 - If yes, continue with [step 2](#).
 - If no, contact R&S support.
2. Check the state of charge of the batteries.
 - If the charging state is > 20% (charging indicator displays one loading bar), continue with [step 4](#).
 - If the charging state is < 20%, an auto power off of the device is performed due to insufficient remaining battery charge. Continue with [step 3](#)
3. Perform one of the following actions.
 - a) Replace the batteries with fully charged ones and try again.
 - b) Charge the batteries in an external charger and retry later.
 - c) Connect DC supply to the R&S TSMA6 battery pack unit and charge the batteries inside the bay. Keep the R&S TSMA6 switched off.
4. Connect DC supply to the R&S TSMA6 battery pack unit and check in the web GUI the "Shutdown Settings".

Navigate to "Configuration" > "System" > "Power" and check the state of "Auto Power Off".

 - If enabled, check the shutdown delay.
 - If not enabled, contact R&S support.

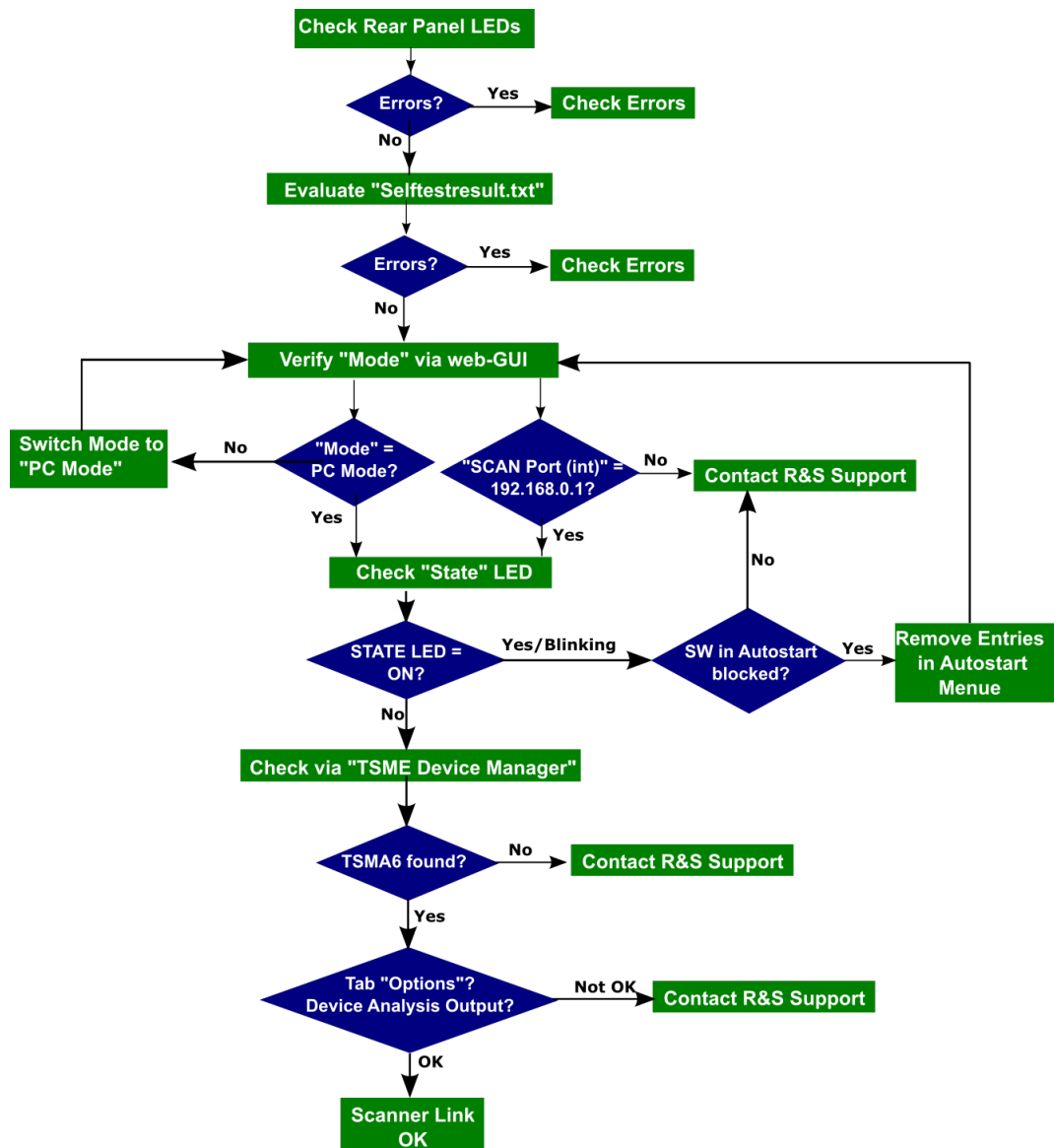
Scanner is not found from software (R&S ROMES, R&S NESTOR)



11.7 Scanner is not found from software (R&S ROMES, R&S NESTOR)

To check if the scanner unit is working properly, perform the following steps.

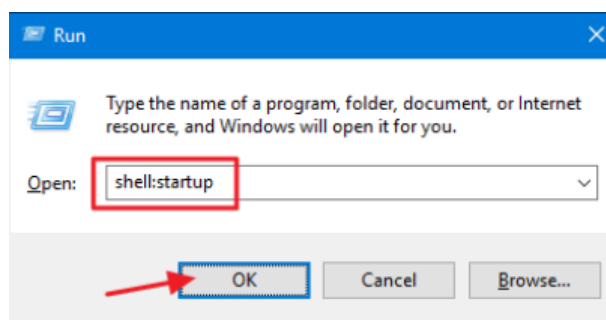
Scanner is not found from software (R&S ROMES, R&S NESTOR)



1. Check the LEDs of the device (see [Chapter 11.1, "LED indicated errors"](#), on page 116).
 - If an error is indicated, follow the instructions according to the indicated error.
 - If no error is indicated, continue with [step 2](#).
2. Evaluate the results of the selftest (see [Chapter 11.2, "Evaluate selftest file"](#), on page 117).
 - If an error is listed, check the error type.
 - If no error is listed, continue with [step 3](#)
3. Start the web GUI (see [Chapter 6.1.1, "Using the R&S TSMA6 web GUI"](#), on page 41).
Check "Mode of Operation" and "IP Settings".
 - If the "Mode of Operation" = "PC Mode", continue with [step 4](#).

Scanner is not found from software (R&S ROMES, R&S NESTOR)

- If the "Mode of Operation" != "PC Mode", switch mode to "PC Mode". Restart the R&S TSMA6 via web GUI and check the LEDs, see [step 1](#).
 - If the IP address of the "SCAN Port (int)" = "192.168.0.1", continue with [step 4](#).
 - If the IP address of the "SCAN Port (int)" != "192.168.0.1", contact R&S support.
4. Check the scanner [State] LED.
 - If it is off, continue with [step 6](#).
 - If it is on, continue with [step 5](#).
 5. The scanner module may be blocked due to a program in Windows "Startup". To open the "Startup" folder, press *Windows + R* to open the "Run" dialog box, type in `shell:startup` and then press "OK".



An explorer window right to the "Startup" folder opens.

- Remove any program entry which could interface the scanner module, restart the R&S TSMA6 via the web GUI and repeat with [step 3](#).
 - If there is no entry, contact R&S support.
6. Start the "TSME Device Manager" via the Windows "Start" menu.
"Start" > "R&S TSME Tools" > "TSME Device Manager"

Verify LAN settings (internal scanner connection)

Available Devices

Device (Serial Number): R&S®TSMA6 900020 Refresh Device List Refresh Device Data

Device Info **Network Configuration** Options Band Configuration Updates Self Alignment

Details

Device ID: 4900.8005K02-900020-eQ Identify

Device				
Device Type	R&S® TSMA6			
Material Number	4900.8005			
Variant Number	2			
Serial Number	900020			
Product Change Index	05.00			
MAC Address	00:90:b8:20:67:cd			
FPGA	Section 0	Section 1	Section 2	Section 3
Available FPGA Bit File Versions	04.08.10.00	04.08.10.00	unused	unused
Current FPGA Bit File Version	04.08.10.00			
Power Board				

7. Check in the "Info" tab, if any device is available.
 - If the R&S TSMA6 device is found, check the "Device Analysis Output".
 - If the R&S TSMA6 device is not found, contact the R&S support.
8. Check the "Device Analysis Output".
 - If there is an error, check if autofix is possible.
If autofix is possible => continue with [step 9](#).
If autofix is not possible => contact R&S support.
 - If there is no error, continue with [step 9](#)
9. Check the "Options" tab (see [Figure 11-2](#)).
 - If all required options are active, the scanner works correctly.
 - If necessary options are missing, contact R&S support.

11.8 Verify LAN settings (internal scanner connection)

1. Check the IP setting of the TSMA6 scanner connection.
Navigate to "Windows" > "Settings" > "Network & Internet" > "Network & Sharing Center" > "Change Adapter Options".
The entry "TSMA6 Scanner Connection Int" must be available.

Verify LAN settings (internal scanner connection)

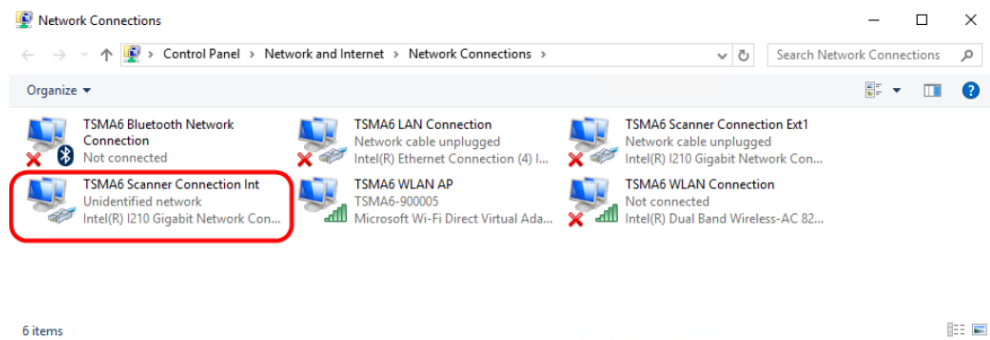
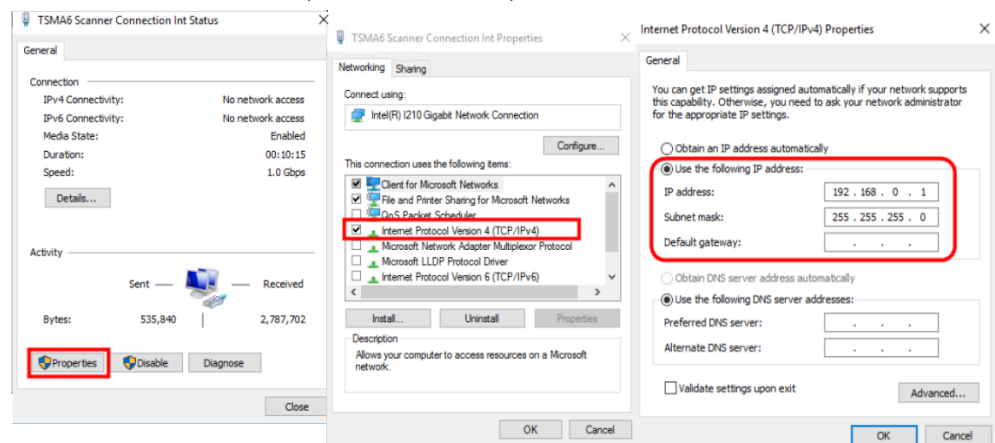


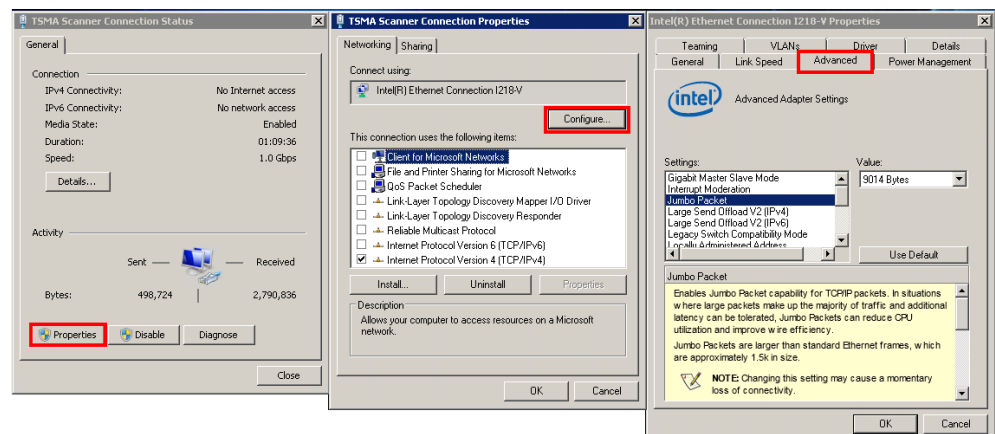
Figure 11-3: TSM A6 scanner connection

- Double-click the "TSM A6 Scanner Connection Int" entry and verify the following settings.

- IP address: 192.168.0.1 (static IP address)



- "Jumbo Packet": 9014 Bytes



11.9 No remote access via LAN port

If the R&S TSMA6 could not be accessed for remote control or remote desktop session via the LAN port, check following issues:

Optical check

1. Check on the rear panel, if the LAN cable is connected to the remote control LAN port (see connector (12) in [Figure 3-8](#).
The LAN port is marked with the LAN symbol.



The default setting for this port is "DHCP client". The R&S TSMA6 obtains the IP address automatically.

2. If the LAN cable was not connected to the correct LAN port, correct the cabling and try the remote access again. Otherwise, continue with [Verify LAN Settings in the web GUI](#).
3. Check the LEDs at the LAN port.
 - LED on the left (Link)
Orange permanent
 - LED on the right (Activity)
Yellow blinking

Verify LAN settings in the web GUI

1. Open the web GUI (see [Local access from the TSMA6 and Windows Explorer](#)).
The predefined start page is `http://localhost`.
Note: If the web GUI cannot be started local, contact the R&S support.
2. Check if an IP address is displayed in the web GUI. This IP address match must match with the IP settings of the remote PC (IP subnet range).
See [Figure 11-4](#).
If no LAN Port address is displayed, continue with [Check R&S TSMA6 Network Connections](#).

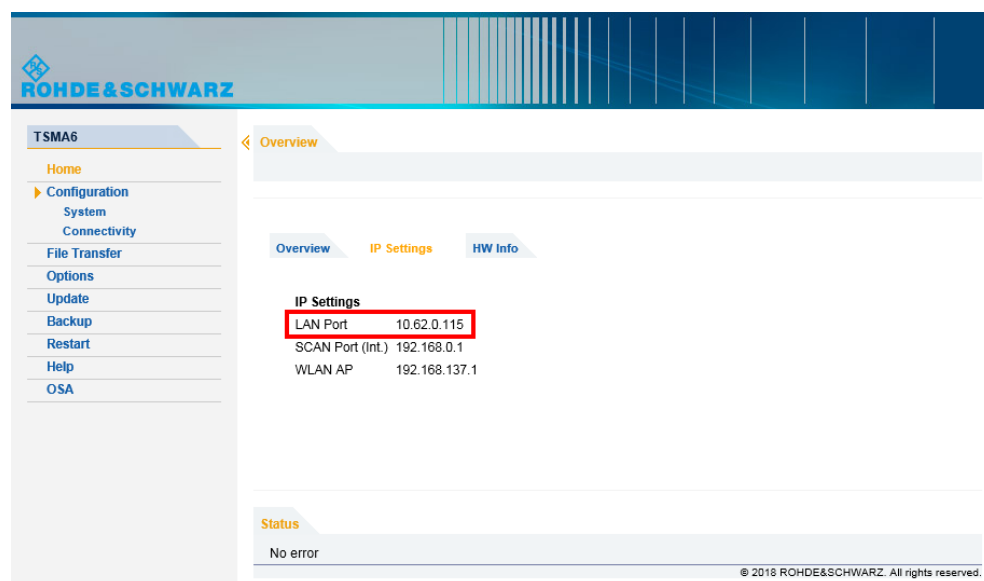


Figure 11-4: Web GUI - Overview > IP Settings

3. Check the setting of the R&S TSMa6 LAN port (see Figure 11-5). The default setting is "DHCP".

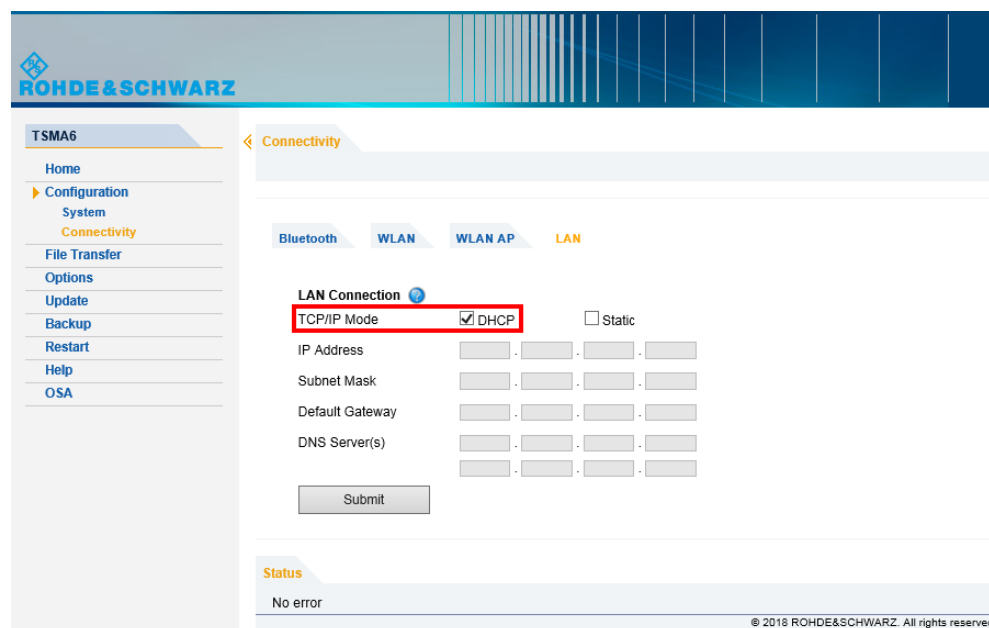


Figure 11-5: Web GUI - LAN Connection

Ping command

Execute the `ping` command from the Windows command prompt on the host PC.

1. Use the IP address displayed in the R&S TSMa6 web GUI (see Figure 11-4).
2. Start the ping command.

Type in the command-line window `ping <IP address of the remote port of the R&S TSMA6 (LAN)>` and wait for the answer.

If the R&S TSMA6 does not answer, contact the system administrator or the R&S support.

Example:

```
C:\>ping 192.167.0.10
Pinging 192.167.0.10 with 32 bytes of data:
Reply from 192.167.0.10: bytes=32 time<1ms TTL=128
Reply from 192.167.0.10: bytes=32 time<1ms TTL=128
Reply from 192.167.0.10: bytes=32 time<1ms TTL=128
Reply from 192.167.0.10: bytes=32 time<1ms TTL=128
Ping statistics for 192.167.0.10:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Check R&S TSMA6 Network Connections

Check if the "TSMA6 LAN Connection" is available in the Windows network connections.

1. Connect keyboard, mouse and a monitor to the R&S TSMA6.
2. Navigate to "Windows" > "Settings" > "Network & Internet" > "Network & Sharing Center" > "Change Adapter Settings".
3. The entry "TSMA6 LAN Connection" must be available.

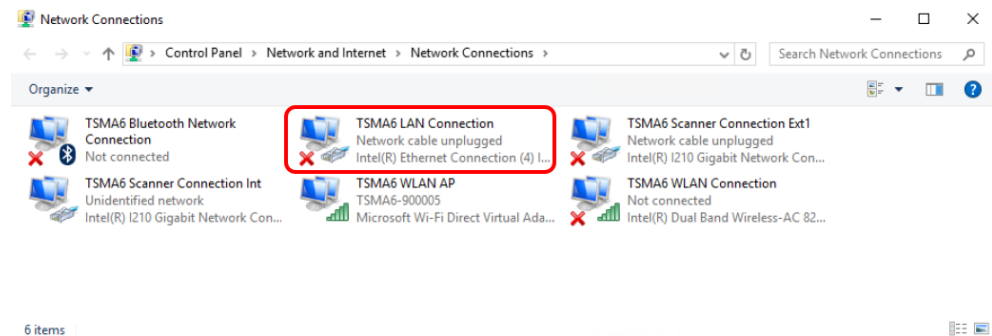


Figure 11-6: TSMA6 LAN Connection

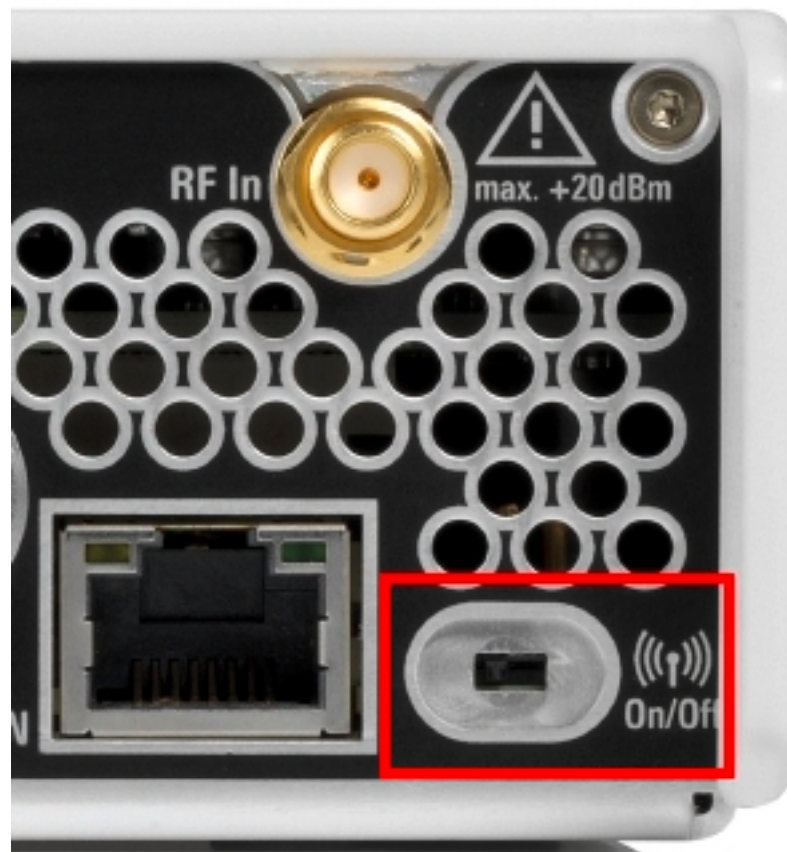
4. If the "TSMA6 LAN Connection" is not listed in the "Network Connections", a recovery of the R&S TSMA6 is recommended (see [Chapter 10, "User backup and restore"](#), on page 108).
If the "TSMA6 LAN Connection" is listed in the "Network Connections" and the IP address of the LAN port is still not displayed in the web GUI, contact R&S support.

11.10 WLAN access point not detected by external PC, mobile or tablet

With the first R&S TSMA6 devices shipped, the WLAN module is configured to use the 2.4 GHz and 5 GHz band.

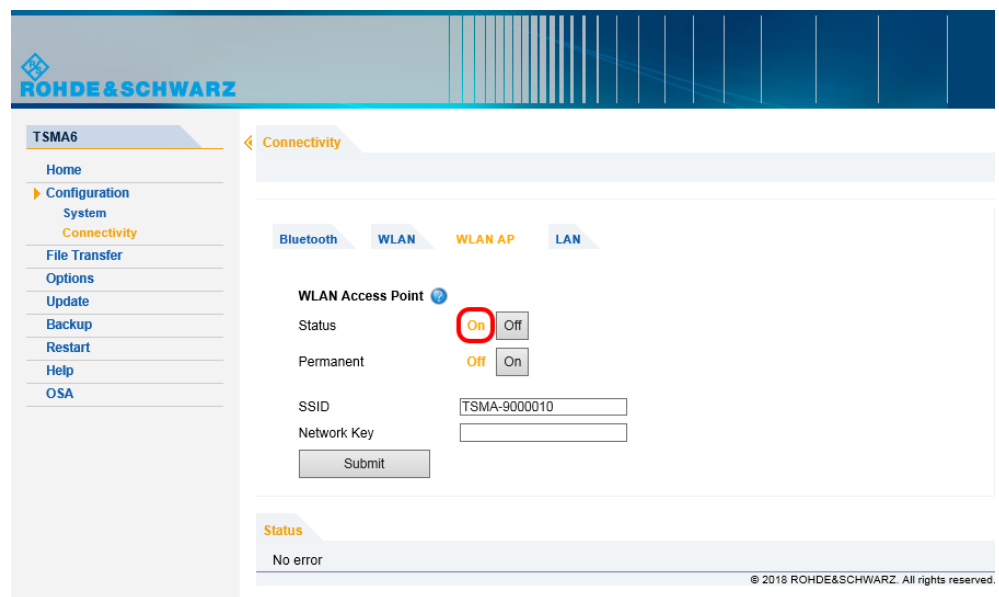
In environments with high traffic on the 2.4 GHz band, the R&S TSMA6 access point sometimes switches into the 5 GHz band after power-up. The effect is that notebooks / PCs / handheld devices with a 2.4 GHz limited WLAN module could no longer detect the TSMA6 WLAN access point. To overcome this error, the driver settings of the WLAN module of the TSMA6 need to be adapted.

1. Check the "Mode" LED.
 - "Mode" LED is permanently green => continue with [step 2](#)
 - "Mode" LED is permanently blue => continue with [step 3](#)
 - Other color => check error states (see [Chapter 11.1, "LED indicated errors"](#), on page 116)
2. Check the WLAN switch on the rear panel of the device. It must be "On".

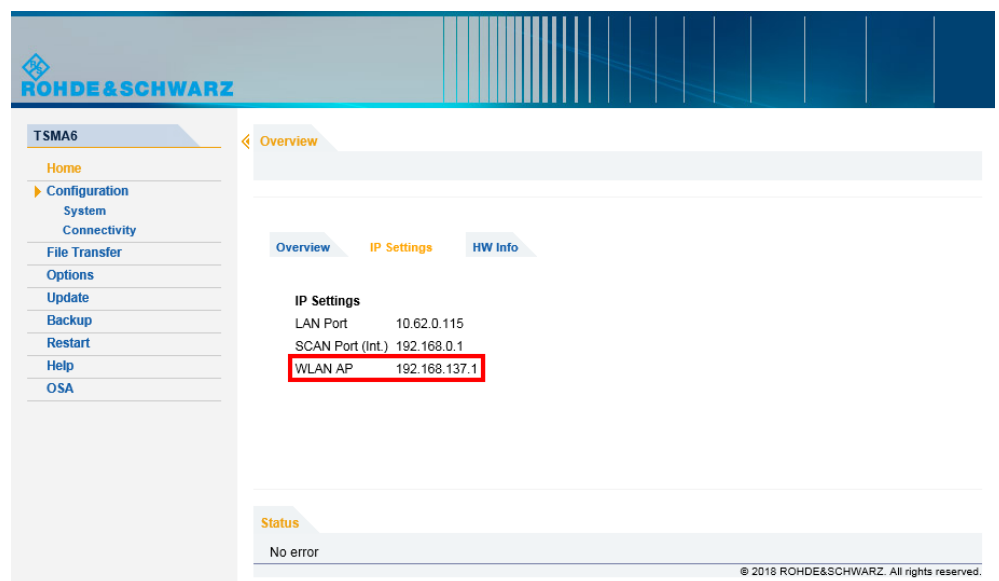


3. Verify the WLAN AP settings via the web GUI.
Navigate to "Configuration" > "Connectivity" > "WLAN AP".
The "Status" must be "On".

WLAN access point not detected by external PC, mobile or tablet



4. Verify the IP settings via the web GUI.
 Navigate to "Home" > "IP Settings".
 IP address of WLAN AP = 192.168.137.1



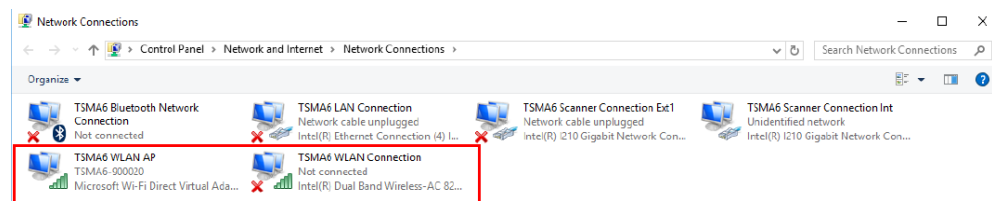
5. Verify WLAN adapter settings.
 Many of the connection troubles are based on misconfigured WLAN adapter settings or the settings does not match the WLAN adapter settings on the host device. To check and set the WLAN adapter settings back to default, see [Chapter 6.5, "Changing WLAN settings"](#), on page 47.
 Try again after settings are back to default.
6. Verify the availability of the WLAN adapters in the Windows control panel.
 Navigate to "Settings" > "Network & Internet" > "Ethernet" > "Change adapter options"

Web GUI not accessible via WLAN connection

Check for the following entries:

- "TSMA6 WLAN AP"
- "TSMA6 WLAN Connection"

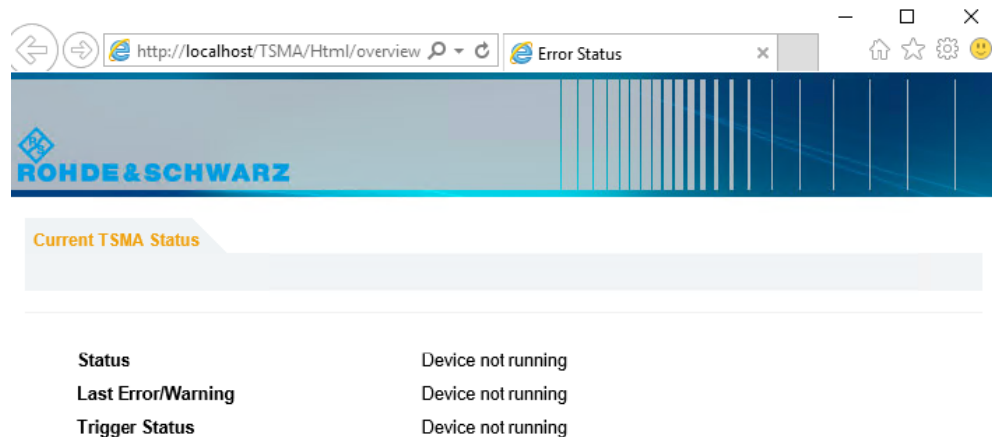
If the adapters are not listed in the view, we recommend a recovery of the factory backup (see [Chapter 10, "User backup and restore"](#), on page 108) or contact R&S support.



11.11 Web GUI not accessible via WLAN connection

If the R&S TSMA6 web GUI is not accessible, perform the following steps to solve the problem.

1. Check if the WLAN AP is activated.
 - If "Mode" LED = blue, continue with [step 2](#).
 - If Mode LED != blue, continue with [Chapter 11.10, "WLAN access point not detected by external PC, mobile or tablet"](#), on page 131.
2. For remote connection via WLAN, check if the TSMA6 WLAN is visible via your smartphone/tablet.
 - If it is visible, continue with [step 3](#).
 - If it is not visible, continue with [Chapter 11.10, "WLAN access point not detected by external PC, mobile or tablet"](#), on page 131.
3. Check if your smartphone/tablet is connected to the TSMA6 WLAN AP.
 - If the connection is established, continue with [step 4](#).
 - If the connection is not established, try to reconnect. If it fails again, contact R&S support.
4. Open the browser on the handheld device and enter the following URL:
<http://192.168.137.1>.
 If the web browser cannot load the web page, continue with [step 5](#).



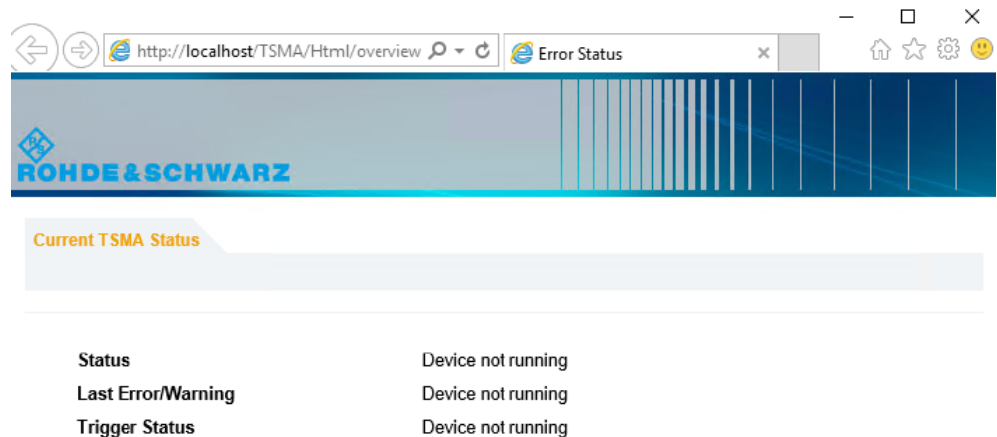
5. Check the IP address of the WLAN connection on your handheld device. It must be in the subnet *192.168.137.xxx*.
 - If the subnet is correct, continue with [Chapter 11.12, "Web GUI locally not accessible"](#), on page 134.
 - If the subnet is not correct, try to reconnect. If it fails again, contact R&S support.
6. Check the WLAN settings, see [Chapter 6.5, "Changing WLAN settings"](#), on page 47.

11.12 Web GUI locally not accessible

Open the web GUI locally. Start the Internet Explorer and enter the following URL to open the R&S TSMA6 web GUI.

http://localhost

1. Check the URL in the browser dialog. Following URL must be displayed: *http://localhost/TSMA/Html/overview.php*
 - If the URL is not correct, enter the correct URL and reload the URL. If it fails again, reinstall the firmware [Chapter 8.3, "Updating firmware/software/tools - general instructions"](#), on page 75.
 - If the URL is correct and the following error status is displayed, continue with [step 2](#).



- In the Windows "Start" menu, enter "Services" and check the state of the following services.

- R&S TSMa running?
- R&S WebServer running?

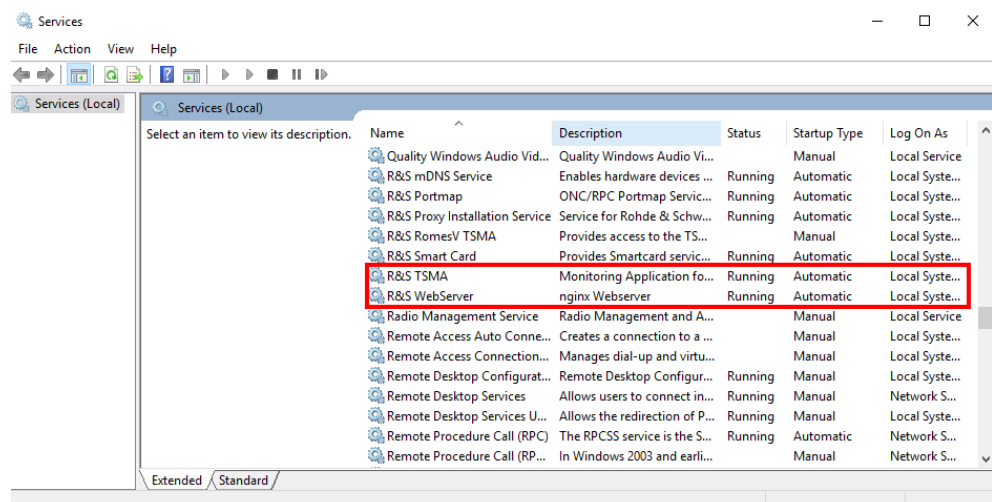


Figure 11-7: R&S TSMa6 Services

If both services are running, continue with [step 4](#).

- Start the services that are not running.
 - Select the service to be started.
 - Open the context menu with a right-mouse click.
 - Start the service.

If the services could not be started, reinstall the firmware (see [Chapter 8.3, "Updating firmware/software/tools - general instructions"](#), on page 75).

- Try again to start the web GUI locally on the R&S TSMa6 via Internet Explorer.

If the web GUI cannot be started, a complete restore must be performed (see [Chapter 10, "User backup and restore"](#), on page 108).

11.13 Slow/Instable WLAN connection

If the WLAN connection is slow or sometimes interrupted, check the WLAN settings, see [Chapter 6.5, "Changing WLAN settings"](#), on page 47.

11.14 Bluetooth® device not detected by R&S TSMA6

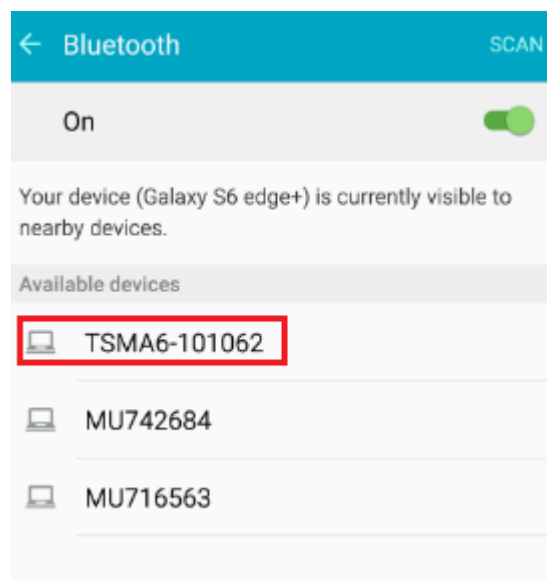
To detect/connect a Bluetooth® device with R&S TSMA6, click "Refresh Device List" in the web GUI.

If a mobile or tablet is not detected by the R&S TSMA6 as Bluetooth® device, the problem is probably the bluetooth visibility of the mobile (or tablet). This problem occurs when a new device is connected to the R&S TSMA6 for the first time.

The visibility of an Android device with firmware version ≥ 5.0 cannot be changed. The mobile (tablet) is only visible to other devices when the "Bluetooth Properties" window is open.

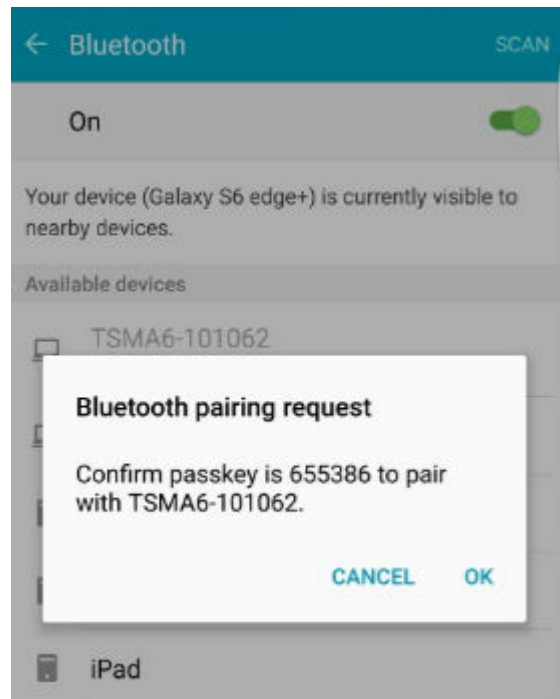
If you are controlling the R&S TSMA6 web GUI with the mobile and also want to couple the devices via Bluetooth®, then you have to perform following steps.

1. On the R&S TSMA6, enable Bluetooth® and make it visible (see [step 1](#)).
2. On the mobile device (mobile or tablet), open the Bluetooth properties. The R&S TSMA6 should be listed. Choose the entry for your R&S TSMA6.

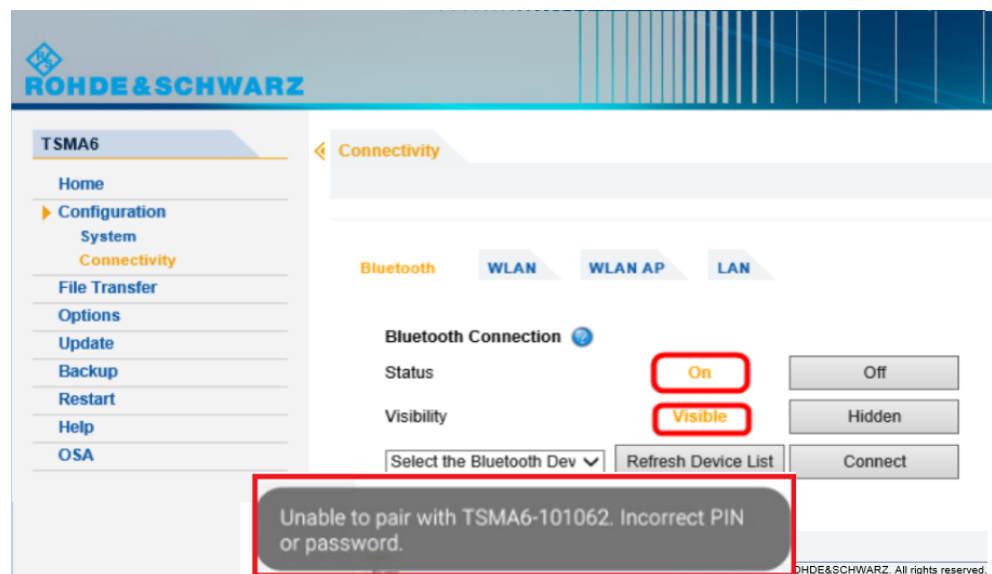


Bluetooth® device not detected by R&S TSMa6

3. After choosing the R&S TSMa6, you receive a "Bluetooth pairing request". Click "OK".



4. Open the R&S TSMa6 web GUI and navigate to "Configuration" > "Connectivity" > "Bluetooth".
5. Execute "Refresh Device List".
6. Wait until your mobile device is listed and the following message "Unable to pair with TSMa6-xxxxxx. Incorrect PIN or password".



7. Select the mobile device and press "Connect" for coupling the devices.

If you need to transport or ship the product, see [Chapter 12, "Transporting"](#), on page 140.

11.15 No RF / GPS data

1. Check if the RF antenna is connected to the RF port.

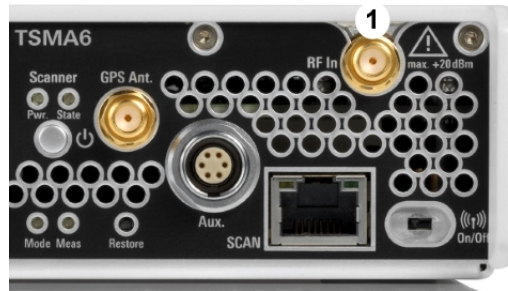


Figure 11-8: RF antenna connector

1 = RF port

2. Check if the GPS antenna is connected to GPS antenna input.

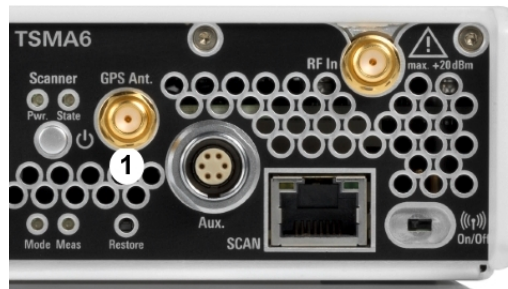


Figure 11-9: GPS antenna connector

1 = GPS antenna connector

Note: Only use the GPS antenna included in the scope of delivery.

3. Check if the LEDs indicate an error (see [Chapter 11.1, "LED indicated errors"](#), on page 116).
4. Open the web GUI (Internet Explorer, URL: <http://localhost>) and change the "Mode of Operation" to "PC Mode".
5. Start the "TSME Device Manager" via the Windows "Start" menu.
"Start > R&S TSME Tools > TSME Device Manager"
 Check if there are any error messages in the "TSME Device Manager".
 - If errors are reported in the "Device Analysis Output" window, follow the instructions.

- If no errors are reported or if the repair actions via the "Device Analysis Output" window fail, contact the R&S support.

11.16 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 11-10: QR code to the Rohde & Schwarz support page

12 Transporting

Packing

Use the original packaging material. It consists of antistatic wrap for electrostatic protection and packing material designed for the product.

If you do not have the original packaging, use similar materials that provide the same level of protection. You can also contact your local Rohde & Schwarz service center for advice.

Securing

When moving the product in a vehicle or using transporting equipment, make sure that the product is properly secured. Only use items intended for securing objects.

Transport altitude

Unless otherwise specified in the data sheet, the maximum transport altitude without pressure compensation is 4500 m above sea level.

13 Maintenance, storage and disposal

The product does not require regular maintenance. It only requires occasional cleaning. It is however advisable to check the nominal data from time to time.

13.1 Cleaning

Do not use any liquids for cleaning. Cleaning agents, solvents (thinners, acetone), acids and bases can damage the front panel labeling, plastic parts and display.

13.2 Storage

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

13.3 Disposal

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

Disposing of electrical and electronic equipment

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



Figure 13-1: Labeling in line with EU directive WEEE

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

Disposing batteries

A product that contains a battery cannot be disposed of in the normal household waste after it has come to the end of its service life. It is labeled as follows:



Figure 13-2: Disposal information in line with EU battery directive

Dispose of batteries as specified by the local waste disposal agency. Alternatively, you can contact the Rohde & Schwarz local service representative.

For information on returning batteries to Rohde & Schwarz subsidiaries, see "[Handling batteries safely](#)" on page 12.

Annex

A Web GUI reference

To start the web GUI for configuration tasks, open a browser on your PC, tablet PC or smartphone and enter the following URL:

http://192.168.137.1/

The web GUI offers the following pages for configuration tasks:

- "Home"
- "Configuration"
- "File Transfer"
- "Options"
- "Update"
- "Backup"
- "Restart"
- "Help"
- "OSA"

A.1 Home

The "System" window consists of the following tabs.

• Overview	143
• IP settings	145
• HW info	146

A.1.1 Overview

The "Overview" tab displays the following basic settings of the R&S TSMA6.

Device Info	144
L Type	144
L Material No.	144
L Serial No.	144
L Computer Name	144
L Mode of Operation (Overview)	144
L Bluetooth/WLAN	144
FW/SW Version	144
L HW	144
L Image	144
L Firmware	145
L NESTOR	145

L ROMES.....	145
L EDGE.....	145
L Windows Update Installer.....	145
L Microsoft Edge.....	145
L TSME Device Manager.....	145
L SmartONE.....	145
Battery Info.....	145
L Battery 1.....	145
L Battery 2.....	145
L Battery Life Time.....	145
L Mainboard Temperature.....	145
Status.....	145

Device Info

General device info

Type ← Device Info

Type of instrument

Material No. ← Device Info

R&S order number of the device

Serial No. ← Device Info

Serial number of the device

Computer Name ← Device Info

Computer name of the R&S TSMA6 (read-only). The name consists of a fixed part (TSMA6) and a variable part (serial number).

Example: R&S TSMA6-<Serial Number>

NOTE: The serial number can be found on the bottom side of the device.

Mode of Operation (Overview) ← Device Info

Selected mode of operation

Bluetooth/WLAN ← Device Info

Activity status of Bluetooth® and WLAN

BT Bluetooth® activity status ON/OFF

WLAN WLAN activity status ON/OFF

AP WLAN access point activity status ON/OFF

FW/SW Version

Version information of installed firmware / software / Windows image components

HW ← FW/SW Version

Hardware revision

Image ← FW/SW Version

Windows image version

- 1st number is the version of the basic image
- 2nd number is the version of the device installation

Firmware ← FW/SW Version

Firmware version

NESTOR ← FW/SW Version

Installed R&S NESTOR version (optional)

ROMES ← FW/SW Version

Installed R&S ROMES version (optional)

EDGE ← FW/SW Version

Version of TSMaX EDGE setup file

Windows Update Installer ← FW/SW Version

Version of Windows update installer

Microsoft Edge ← FW/SW Version

Installed Microsoft Edge browser version

TSME Device Manager ← FW/SW Version

Installed R&S TSME Device Manager version (optional)

SmartONE ← FW/SW Version

Installed R&S SmartONE version (optional)

Battery Info

Battery status if a battery pack unit is connected to the device.

Battery 1 ← Battery Info

Charging state of battery 1.

Battery 2 ← Battery Info

Charging state of battery 2.

Battery Life Time ← Battery Info

Estimated remaining battery life time.

Mainboard Temperature ← Battery Info

Current temperature of the mainboard.

Status

Current status of the measurement

A.1.2 IP settings

This tab lists the IP addresses of all available LAN / WLAN adapters.

LAN	146
SCAN (Int.)	146
LAN SCAN	146
LAN EXT2 / EXT3 / EXT 5 / EXT6	146
WLAN AP (Overview)	146

LAN

IP address of the remote LAN port

SCAN (Int.)

IP address of the internal scanner link

LAN SCAN

IP address of the "SCAN" port

LAN EXT2 / EXT3 / EXT 5 / EXT6

IP addresses of the external LAN adapter ports.

- R&S TSPC-U2L4: LAN EXT2, 3, 5, 6
- R&S TSPC-USL2: LAN EXT 5, 6

WLAN AP (Overview)

IP address of the WLAN access point.

A.1.3 HW info

The "HW Info" tab lists hardware-related information for the assembled modules.

- Internal scanner component
- Battery pack unit (if connected)
- RF downconverter (if connected)

Scanner Info	147
L MAC Address	147
L IP Address (Scanner)	147
L Available Config	147
L Used Config	147
Correction Data	147
L Version	147
L Date	147
L TCXO Date	147
Module Info	147
L Controller Board	147
L RF Board	147
L Mainboard	147
L Battery pack	147
CPU Info	148
Down Converter Info	148
L Available Config	148
L Used Config	148

L Used CLPD Version.....	148
Correction Data (Downconverter).....	148
L Version.....	148
L Date.....	148
Module Info (Downconverter).....	148
L Controller Board.....	148
L RF Board.....	148

Scanner Info

Displays IP and configuration settings of the internal scanner device.

MAC Address ← Scanner Info

MAC address of the internal scanner device.

IP Address (Scanner) ← Scanner Info

IP address of the internal scanner device.

Available Config. ← Scanner Info

All stored firmware versions on the internal scanner device.

Used Config. ← Scanner Info

Currently used firmware version on the internal scanner device.

Correction Data

Displays information about the calibration status of the scanner device.

Version ← Correction Data

Version of the scanner correction data.

Date ← Correction Data

Date of the scanner correction data.

TCXO Date ← Correction Data

Date of the TCXO correction data.

Module Info

Version info of the various scanner modules.

Controller Board ← Module Info

Serial number and product change index of the controller board.

RF Board ← Module Info

Serial number and product change index of the RF board.

Mainboard ← Module Info

Serial number and product change index of the main board.

Batterypack ← Module Info

Serial number and product change index of the battery pack module (TSMA6-BP).

CPU Info

CPU system information

Down Converter Info

System information of the connected downconverter device.

Available Config. ← Down Converter Info

All stored firmware versions on the downconverter device.

Used Config. ← Down Converter Info

Currently used firmware version on the downconverter device.

Used CLPD Version ← Down Converter Info

Active CPLD version on the downconverter device.

Correction Data (Downconverter)

Displays information about the calibration status of the downconverter device.

Version ← Correction Data (Downconverter)

Version of the down converter correction data.

Date ← Correction Data (Downconverter)

Date of the down converter correction data.

Module Info (Downconverter)

Displays version info of the various downconverter modules.

Controller Board ← Module Info (Downconverter)

Serial number and product change index of the controller board.

RF Board ← Module Info (Downconverter)

Serial number and product change index of the RF board.

A.2 Configuration

A.2.1 System

The "System" window consists of the following tabs.

• Mode	149
• Power	149
• Speaker	150
• RF band	150
• Password	150
• Watchdog	151

A.2.1.1 Mode

The "Mode" tab is used to configure and read back the selected mode of operation.

Mode of Operation	149
Current Measurement	149

Mode of Operation

Set of radio buttons for all supported modes of operation. The desired measurement mode is selected and activated by pressing "Submit". The selected mode is automatically started after each power-up as long as not reconfigured by the user.

In "PC Mode", no active measurement is selected in autostart.

Current Measurement

Status information and action buttons for the selected mode of operation.

A.2.1.2 Power

The "Power" tab displays all settings related to the power on/power off scenarios.

Startup Settings	149
L Auto Power ON	149
L Remember Last State	149
Delayed System Start	149
Sleep Mode Settings	149
Battery	150
Shutdown Settings	150
L Auto Power Off	150

Startup Settings

Configures different startup sequences.

Auto Power ON ← Startup Settings

The device is starting automatically when DC power is available at the DC IN connector or at the docking connector for the battery pack unit.

Remember Last State ← Startup Settings

When the device was powered down in the previous measurement session, then the device keeps this state when DC power is applied again.

Delayed System Start

Note: To support this mode, connect a R&S TSMA6 battery pack.

The delay time is configured at the R&S TSMA6x. After pressing "Activate" and "Shutdown", the device enters sleep mode and starts after the configured delay. The sleep mode is indicated with a green blinking "Mode" LED.

Sleep Mode Settings

Note: To support this mode, connect a R&S TSMA6 battery pack.

If activated, the device enters sleep mode after power down. The CPU LAN port remains powered to access the device via Intel ATM.

Battery

Press "Start" to write the battery info into the firmware log file.

Shutdown Settings

Configures the auto-power off behavior of the R&S TSMA6x.

Note: To support this mode, connect a R&S TSMA6 battery pack.

Auto Power Off ← Shutdown Settings

To enable auto power off, select "Auto Power Off" and enter the desired delay in seconds. Press "Submit Timeout" to enable this feature.

The R&S TSMA6x with a connected battery pack unit will automatically power down after the configured time delay when the DC power is removed from the R&S TSMA6 battery pack.

A.2.1.3 Speaker

The "Speaker" tab configures an acoustic warning signal.

Status (Speaker)	150
Volume	150

Status (Speaker)

Activates or deactivates an acoustic warning signal.

Volume

Specifies the volume of the acoustic warning signal.

A.2.1.4 RF band

The "RF Band" tab allows to configure and recall the desired RF band for the scanner if a limited band option is installed for the scanner.

Current Configuration	150
New Configuration	150

Current Configuration

Current valid band configuration

New Configuration

Selects a specific band.

A.2.1.5 Password

The "Password" tab allows to change the Windows password.

Change Instrument Password	151
L Current Password	151
L New Password	151
L Confirm New Password	151

Change Instrument Password

Changes and confirms a new password for the R&S TSM A6.

Current Password ← Change Instrument Password

Enter the current valid password.

New Password ← Change Instrument Password

Enter a new password.

Confirm New Password ← Change Instrument Password

To confirm the new password, enter it again.

A.2.1.6 Watchdog

In the "Watchdog" tab, you can define the behavior of the watchdog.

[Watchdog Settings](#)..... 151

Watchdog Settings

By default, the internal watchdog is disabled and does not trigger a restart if the given watchdog time interval is asserted.

A.2.2 Connectivity

The "Connectivity" window consists of the following tabs.

• Bluetooth	151
• WLAN	152
• WLAN AP	154
• LAN	154
• LAN SCAN	155
• LAN EXT2 / EXT3 / EXT5 / EXT6	156

A.2.2.1 Bluetooth

The "Bluetooth" tab is used for configuration and pairing with external Bluetooth devices.

Bluetooth Connection	151
L Status (Bluetooth)	151
L Visibility	152
L Bluetooth Device(s)	152

Bluetooth Connection

Specifies the configuration details of a Bluetooth adapter.

Status (Bluetooth) ← Bluetooth Connection

Switch The Bluetooth adapter on or off.

Visibility ← Bluetooth Connection

The Bluetooth adapter can be set to visible or hidden for external devices.

Bluetooth Device(s) ← Bluetooth Connection

Press "Refresh" to update visible Bluetooth devices. For pairing a device, select it in the file box and press "Connect".

A.2.2.2 WLAN

The "WLAN" tab is used to recall and configure settings of the embedded WLAN module.



The "WLAN" tab is only available if the switch WLAN/Bluetooth is in position "On".

WLAN Adapter.....	152
L Status (WLAN Adapter).....	152
L Permanent.....	152
L SSID.....	152
L Network Key.....	152
L TCP/IP Mode (WLAN Client).....	153
WLAN Settings.....	153
L Wireless Mode.....	153
L Preferred Band.....	153
L Wireless Mode Ext.....	153

WLAN Adapter

Specifies the configuration details for the WLAN adapter.

Status (WLAN Adapter) ← WLAN Adapter

Switch the WLAN adapter on and off.

Status = On	The WLAN is on.
Status = Off and Permanent = Off	The WLAN is switched off for the current session. After the next power cycle, the WLAN is switched on again.
Status = Off and Permanent = On	The WLAN is permanently switched off even after a power cycle.

Permanent ← WLAN Adapter

If enabled, the WLAN is permanently on.

SSID ← WLAN Adapter

Click "Refresh" to scan for available WLAN access networks. Available networks are listed in the file select box.

Network Key ← WLAN Adapter

Enter the network key to connect with the selected WLAN network as a client.

TCP/IP Mode (WLAN Client) ← WLAN Adapter

The IP address configuration in a client connection can be switched between "DHCP" (receive IP address from host) and static IP ("Static").

Enter the static IP configuration in the dialog below.

- IP address
- Subnet Mask
- Default Gateway
- DNS Server

It is possible to specify a primary and a secondary DNS server.

WLAN Settings

Specify the WLAN standard and the preferred band. If you change the default settings, the new settings are marked orange. To reset the default settings, these settings are marked green.

Wireless Mode ← WLAN Settings

Recall and change the settings of the WLAN adapter in this section. The following modes are supported:

- 5 GHz 802.11a
- 2.4 GHz 802.11b
- 2.4 GHz 802.11g
- 2.4 GHz 802.11b/g (default)
- Dual Band 802.11a/g
- Dual Band 802.11a/b/g

To change the mode, select "Change".

To reset the default settings, select "Default".

Preferred Band ← WLAN Settings

Select the following preferred band settings.

- No Preference
- Prefer 2.4 GHz band (default)
- Prefer 5 GHz band

To change the preferred band, select "Change".

To reset the default setting, select "Default".

Wireless Mode Ext ← WLAN Settings

Select one of the following wireless mode settings.

- Disabled
- 802.11n
- 802.11ac
- 802.11ax

To change the mode, select "Change".

To reset the default settings, select "Default".

A.2.2.3 WLAN AP

The "WLAN AP" tab is used to recall and configure settings of the WLAN access point.

WLAN Access Point.....	154
L Status (WLAN AP).....	154
L SSID.....	154
L Current Network Key.....	154
L New Network Key.....	154
L Confirm Network Key.....	154

WLAN Access Point

Specify the configuration details for the WLAN access point.

Note: The configuration of the WLAN access point is only possible, if the WLAN switch of the device is "On" (see "WLAN/Bluetooth on/off" on page 31).

Status (WLAN AP) ← WLAN Access Point

Status = On	The WLAN AP is on.
Status = Off and Permanent = Off	The WLAN AP is switched off for the current session. After the next power cycle, the WLAN AP is switched on again.
Status = Off and Permanent = On	The WLAN AP is permanently switched off even after a power cycle.

SSID ← WLAN Access Point

Enter SSID and network key and press "Submit" to change the default settings.

- Default SSID: *TSMA6B-<DeviceSerialNumber>*
- Default Key: *instrument*

Current Network Key ← WLAN Access Point

Enter the current valid network key for the specified SSID.

New Network Key ← WLAN Access Point

Enter a new network key for the specified SSID.

Confirm Network Key ← WLAN Access Point

To confirm the new network key, enter it again.

A.2.2.4 LAN

Configure the "LAN" port IP of the R&S TSMA6. The port is marked with the LAN symbol.



LAN Connection.....	155
L State (LAN).....	155
L R&S TSMA6TCP/IP Mode (LAN).....	155

LAN Connection

Specify the configuration details for the LAN connection.

State (LAN) ← LAN Connection

Displays the state of the LAN connection
connected | disconnected

R&S TSMA6TCP/IP Mode (LAN) ← LAN Connection

The IP address configuration can be switched between "DHCP" (receive IP address from host) and static IP ("Static").

Enter the static IP configuration in the dialog below.

- IP address
 - Subnet Mask
 - Default Gateway
 - DNS Server
- It is possible to specify a primary and a secondary DNS server.

A.2.2.5 LAN SCAN

Configure the "LAN SCAN" port of the R&S TSMA6. This is the port marked with "SCAN".

LAN Connection (LAN SCAN).....	155
L State (LAN SCAN).....	155
L TCP/IP Mode (LAN SCAN).....	155

LAN Connection (LAN SCAN)

Specify the configuration details for the additional Gbit LAN connection.

It is used to connect the R&S TSMA6B to a separate R&S TSME6 as a second scanner used for MIMO scenarios and for increasing bandwidth and measurement rate.

State (LAN SCAN) ← LAN Connection (LAN SCAN)

Displays the state of the LAN SCAN connection
connected | disconnected

TCP/IP Mode (LAN SCAN) ← LAN Connection (LAN SCAN)

The IP address configuration in a client connection can be switched between "DHCP" (receive IP address from host) and static IP ("Static").

Enter the static IP configuration in the dialog below.

- IP address
 - Subnet Mask
 - Default Gateway
 - DNS Server
- It is possible to specify a primary and a secondary DNS server.

A.2.2.6 LAN EXT2 / EXT3 / EXT5 / EXT6

Configure the external LAN adapter ports.



The tabs for the additional LAN ports are only visible, if you connect a USB to LAN adapter to the R&S TSM A6.

LAN Connection (EXT2 / EXT3 / EXT5 / EXT6).....	156
L State (EXT2 / EXT3 / EXT5 / EXT6).....	156
L TCP/IP Mode (EXT2 / EXT3 / EXT5 / EXT6).....	156

LAN Connection (EXT2 / EXT3 / EXT5 / EXT6)

Specify the configuration details for the external LAN adapter ports.

- R&S TSPC-U2L4: LAN EXT2, 3, 5, 6
- R&S TSPC-USL2: LAN EXT5, 6

State (EXT2 / EXT3 / EXT5 / EXT6) ← LAN Connection (EXT2 / EXT3 / EXT5 / EXT6)

Displays the state of the external LAN adapter ports

connected | disconnected

TCP/IP Mode (EXT2 / EXT3 / EXT5 / EXT6) ← LAN Connection (EXT2 / EXT3 / EXT5 / EXT6)

The IP address configuration can be switched between "DHCP" (receive IP address from host) and static IP ("Static").

Enter the static IP configuration in the dialog below.

- IP address
 - Subnet Mask
 - Default Gateway
 - DNS Server
- It is possible to specify a primary and a secondary DNS server.

A.3 File transfer

The "File Transfer" window offers the following functions:

- Uploads and downloads of files to/from the R&S TSM A6.
- Download of the Vicom sample application to an Android device.

File Transfer.....	157
L Upload.....	157
L Download.....	157
Sample App.....	157
L Download rViCom SampleApp.....	157
App Log.....	157
L Firmware Log File.....	157
L Firmware Log Trace.....	157

File Transfer

Specifies the properties for upload and download files.

Upload ← File Transfer

Specifies the file (e.g. workspace file) to be transferred from a connected device to the R&S TSMA6. The default path is `D:\Upload`.

Note: The maximum file size for the upload is 2048 MB.

With "Apply Path", you can specify a user-specific path for uploading files.

With "Restore Default", the default path `D:\Upload` is selected.

Download ← File Transfer

Specifies the measurement data file to be transferred from the R&S TSMA6 (`D:\Download`) to a connected device.

With "Apply Path", you can specify a user-specific path for uploading files.

With "Restore Default", the default path `D:\Upload` is selected.

Sample App

Specifies the download of the sample app.

Download rViCom SampleApp ← Sample App

Specifies the sample app file (*.apk) to be downloaded to the connected Android device.

App Log

The "App Log" tab offers access to firmware log files.

Firmware Log File ← App Log

Select a log file and download it to a local directory.

Firmware Log Trace ← App Log

View into the current firmware log file.

A.4 Options

The "Options" window consists of the following tabs.

- [Available](#).....157
- [Install](#).....158

A.4.1 Available

The "Available" tab gives an overview of available active and inactive scanner and NESTOR (if installed) licenses.

Option Type.....	158
Option Material No.....	158
Activation Type.....	158
Valid From / Valid To.....	158
Option Index.....	158

Option Type

Type name of installed license key

Option Material No.

R&S order number of the SW license

Activation Type

Activation type of license key (temporary or permanent)

Valid From / Valid To

Start and expiration date of the license key

Option Index

Index number of the license key

A.4.2 Install

The "Install" tab is used to install various license key files on the R&S TSMA6.

Install NESTOR Options.....	158
Install Scanner Options.....	158

Install NESTOR Options

Enter the NESTOR license key and press "Install" to activate a new license.

Install Scanner Options

Allows to install a scanner option. Two different methods are supported.

- License Key Code: enter the license number and press "Install"
- License Key File: select the license key file (*.xml) with the "Browse" button and press "Install XML File"

A.5 Update

The "Update" page allows to install all the related software and firmware packages for the R&S TSMA6x.

**Prerequisites**

- The setup file must be located in the root directory of a USB data stick.

Select <FW/SW> Setup File.....	159
--------------------------------	-----

Select <FW/SW> Setup File
 Select the setup file and press the "Update Software" button.

Categories

- "Firmware Setup File"
- "NESTOR Setup File"
- "Windows Setup File"
- "SmartONE Setup File"
- "ViCom Setup File"
- "EDGE and TSME Tools Setup File"

The progress can be monitored in the status line of the web GUI.

A.6 Backup

The "Backup" window allows to create a backup of the R&S TSMA6 system.

Available Backup.....	159
Delete Data partition D:.....	159
Backup TSMA6 System.....	159

Available Backup
 Displays the date of the factory backup.

Delete Data partition D:
 When enabled, data partition D : \ is deleted during a device restore.

Backup TSMA6 System
 Click "Backup" to create a user backup of the system partition C : \.

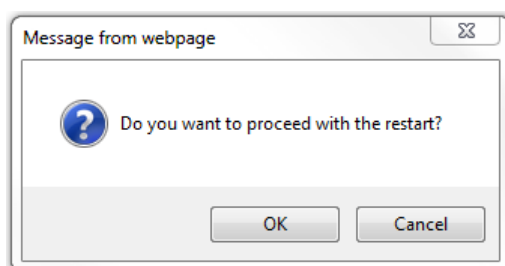
- At first, it is checked, if there is enough memory available for the backup.
- You can store only one user backup. An existing user backup is overwritten when running backup again.

A.7 Restart

The "Restart" window allows to restart the complete R&S TSMA6 and the scanner unit separately.

System restart.....	159
PowerCycle.....	160

System restart
 To restart the R&S TSMA6, click "Restart".
 The following message appears.

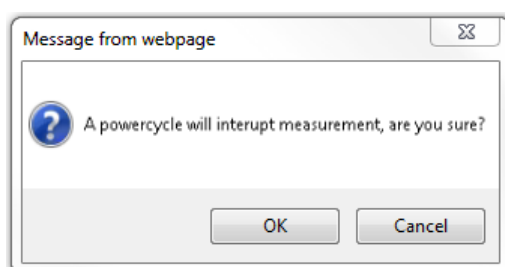


Click "OK" to reboot the R&S TSMA6.

PowerCycle

To restart the scanner unit of the R&S TSMA6, click "PowerCycle".

The following message appears.



Click "OK" to reboot the scanner unit of the R&S TSMA6.

A.8 Help

The "Help" window displays the online help system of the R&S TSMA6.

B Introduction to remote ViCom sample app

B.1 Overview

The R&S TSMA6 provides an open remote ViCom interface that allows the integration into Windows and Android-based software tools. Via rViCom API, it is possible to configure and control TSMA6 scanner measurements from a remote PC / tablet.

The R&S TSMAx Remote ViCom installation is accompanied with an rViCom sample application. The source code for this Android-based App is also available as subcomponent of the R&S ViCom scanner interface. This ready-to-use application gives the user a quick and easy impression about the capabilities of this API interface.

B.2 Requirements

B.2.1 General requirements

The following requirements must be fulfilled to use this App successfully:

- An Android device with at least Android 4.4.2 (Android 4.4.4 is recommended)
- A WLAN respectively Bluetooth connection between the Android device and the R&S TSMA6
- Remote rViCom Server on the R&S TSMA6 (default)
- An installed Sample App on the Android device
The version of the rViCom server on the R&S TSMA6 must match the version of the Sample App on the Android device.

B.2.2 Preparation

Before starting a scan or test, it is necessary to make sure that a connection can be established.

Download and installation of rViCom Sample App

To install the rViCom Sample App on an Android device, the followings steps must be performed.

1. Start the web GUI via WLAN (see [Chapter 6.1.1, "Using the R&S TSMA6 web GUI"](#), on page 41).
2. Navigate to "File Transfer" > "Sample App" > "Download TsmasampleApp".

3. Select the Sample App and click "Download".
4. Install the Sample App on the Android device.

B.3 Usage

B.3.1 Connection establishment

Start the Sample App on the Android device.

B.3.1.1 Connection type selection

To connect to the R&S TSMA6 Remote rViCom Server, it is either possible to use a WLAN connection or a Bluetooth connection.

The selection of the connection type depends on the measurement task (see [Chapter B.3.1, "Connection establishment"](#), on page 162).

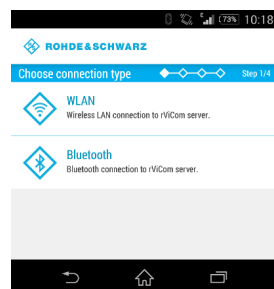


Figure B-1: Connection Type Selection

B.3.1.2 Server discovery

1. Choose a connection type, as described in [Chapter B.3.1.1, "Connection type selection"](#), on page 162.
2. The server discovery starts and the following dialog appears.

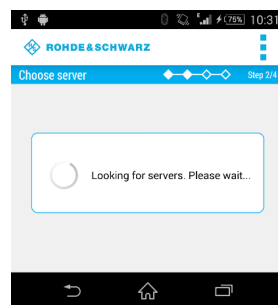


Figure B-2: Active Server Discovery

3. If a server is found, the server will be connected and the name of the server is displayed.

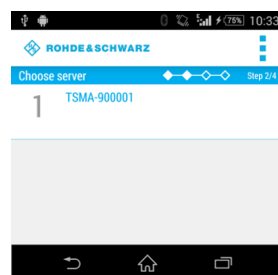


Figure B-3: Successful Server Discovery

4. Choose the server.
If a Remote rViCom server connection could be established, the "Choose scan type" window appears. See [Figure B-4](#).

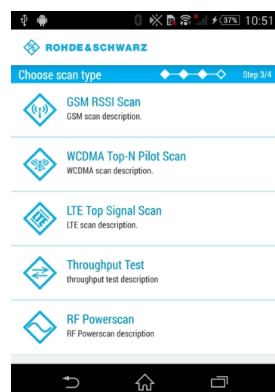


Figure B-4: Choose scan type

If no server is found, it is possible to start a new scan by selecting "Rescan" in the menu inflator in the top-right corner.



To stop the server discovery, the app has to be closed.

The following scan types are available:

- **GSM RSSI Scan**
Provides a GSM scan by selecting a band and radio channels
- **WCDMA Top-N Pilot Scan**
Provides an UMTS scan by selecting a frequency band and the UARFCN
- **LTE Top Signal Scan**
Provides an LTE scan by selecting the frequency band and the EARFCN
- **Throughput Test**
Provides a throughput test for the connection using configurable buffer size
- **RF Powerscan**
Provides a spectrum analysis by selecting the frequency range

The RAN technology for which a scan should be performed has to be selected. The selection of the technologies is described in the following chapters.

B.3.2 GSM RSSI scan

B.3.2.1 GSM preferences

To start a GSM RSSI scan, the following steps must be performed.

1. Choose a frequency band.

The channels are set automatically to the maximum range available for the selected band.

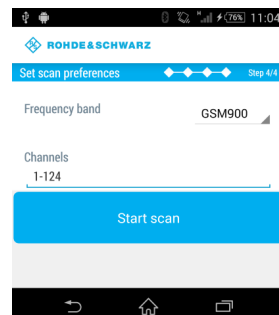


Figure B-5: Setting the GSM Preferences

2. If necessary, change the channels manually according to your needs. The input in the "Channels" field can be done like following.
 - a) Add a single number for one specific channel.
Example: 7
 - b) Add a range of channels.
Example: 1-124
 - c) Add more than one single number separated by semicolon.
Example: 2;4;7;76

- Click "Start scan" to start the scan.

B.3.2.2 GSM scan results

The GSM scan result graph displays one column for each channel selected. The height of a column represents the RSSI value (in dBm).

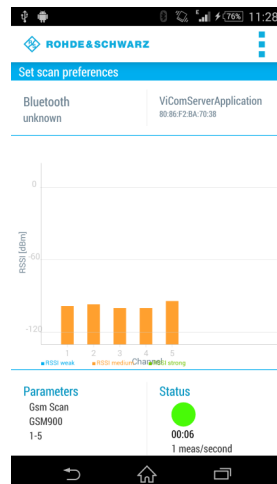


Figure B-6: GSM Scan Result View

Below the graph the measurement preferences and the status are displayed.

Parameters

Displays the configured preferences for the GSM RSSI scan.

Status

Displays the measurement duration and the measurement rate. The status button displays the following colored states.

- **Green**
The measurement is running and measurement data are received.
- **Yellow**
The measurement is running but no measurement data are received.
- **Red**
The measurement was stopped

- To stop the scan, use "Stop scan" in the menu inflator in the top-right corner.

B.3.3 WCDMA Top-N pilot scan

B.3.3.1 WCDMA Top-N pilot preferences

To start a WCDMA scan, the following steps must be performed.

1. Choose a frequency band.

The minimum UARFCN of this band is set automatically.

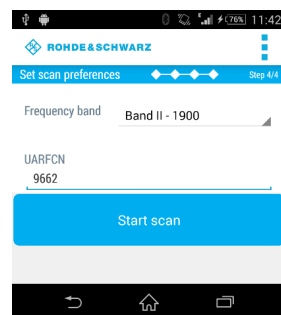


Figure B-7: Setting the WCDMA Preferences

2. If necessary, change the UARFCN according to your needs.

Note: Due to processing issues, it is not possible to select more than one UARFCN.

3. Click "Start scan" to start the scan.



In the menu inflator on top of the right corner, templates for existing preferences (Munich and surrounding areas) can be selected.

B.3.3.2 WCDMA Top-N pilot scan results

The WCDMA scan result graph displays one column for each SC found by the measurement. The height of a column represents the RSCP value (in dBm).

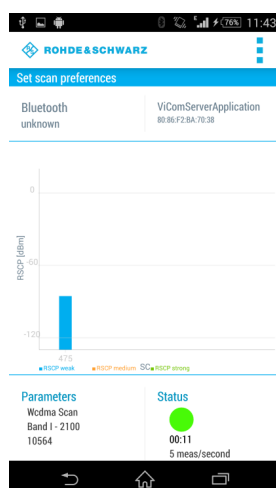


Figure B-8: WCDMA Scan Result View

Below the graph the measurement preferences and the status are displayed.

Parameters

Displays the configured preferences for the WCDMA scan.

Status

Displays the measurement duration and the measurement rate. The status button displays the following colored states.

- *Green*
The measurement is running and measurement data are received.
- *Yellow*
The measurement is running but no measurement data are received.
- *Red*
The measurement was stopped.

► To stop the scan, use "Stop scan" in the menu inflator in the top-right corner.

B.3.4 LTE top signal scan

B.3.4.1 LTE top signal preferences

To start an LTE scan, the following steps must be performed.

1. Choose a frequency band.
The minimum EARFCN of this band is set automatically.

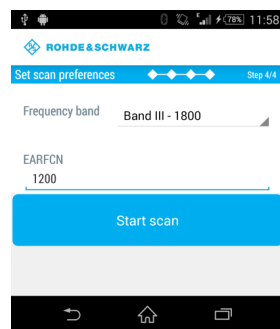


Figure B-9: Setting the LTE Preferences

2. If necessary, change the EARFCN according to your needs.

Note: Due to processing issues, it is not possible to select more than one EARFCN.

3. Click "Start scan" to start the scan.



In the menu inflator on top of the right corner, templates for existing preferences (Munich and surrounding areas) can be selected.

B.3.4.2 LTE top signal scan results

The LTE scan result graph displays one column for each PCI found by the measurement. The height of a column represents the PBCH RSRP value (in dBm).

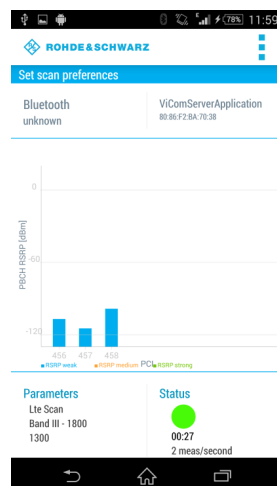


Figure B-10: LTE Scan Result View

Below the graph the measurement preferences and the status are displayed.

Parameters

Displays the configured preferences for the LTE scan.

Status

Displays the measurement duration and the measurement rate. The status button displays the following colored states.

- *Green*
The measurement is running and measurement data are received.
- *Yellow*
The measurement is running but no measurement data are received.
- *Red*
The measurement was stopped.

► To stop the scan, use "Stop scan" in the menu inflator in the top-right corner.

B.3.5 Throughput test case

The throughput test case is useful to find out the throughput speed of your connection. This allows to decide, which connection type (WLAN or Bluetooth) should be used.

B.3.5.1 Throughput preferences

To start the throughput test, the following steps must be performed.

1. Specify the parameter "Buffer size (in Byte)".
The default buffer size is 20480 bytes.

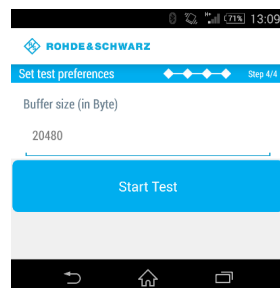


Figure B-11: Throughput Preferences

2. Click "Start Test" to start the throughput test.



For WLAN, the optimal buffer size varies between 950.000 byte and 1.000.000 byte.
For Bluetooth, the optimal buffer size varies between 81.000 byte and 165.000 byte.

B.3.5.2 Throughput results

The result of the throughput test case is a line chart with the following axes:

- X-axis
The x-axis displays the number of measurements

- Y-axis

The y-axis displays the corresponding throughput value (kB/s)

The blue line shows the measured values. The orange line represents the visualized average of all values.

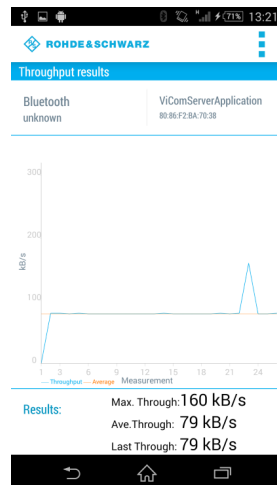


Figure B-12: Throughput Result View

Below the graph the following throughput results are displayed.

Results

- Max. Through
Displays the maximum throughput
 - Ave. Through
Displays the average throughput
 - Last Through
Displays the current throughput
- To stop the scan, use "Stop scan" in the menu inflator in the top-right corner.

B.3.6 RF power scan

B.3.6.1 RF power scan references

To start an RF power scan, the following steps must be performed.

1. Specify the parameters "Start Frequency (in Mhz)" and "End Frequency (in Mhz)" to define the frequency range of the RF power scan.
The maximum range is from 350 MHz to 4.400 MHz.

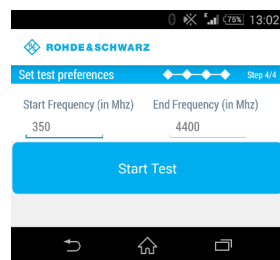


Figure B-13: RF Power Scan References

- Click "Start Test" to start the scan.

B.3.6.2 RF power scan results

The result of the RF power scan is a spectrum of the frequency range set before with the following axes:

- X-axis
The x-axis displays the frequency
- Y-axis
The y-axis displays the power level for each frequency (dBm)

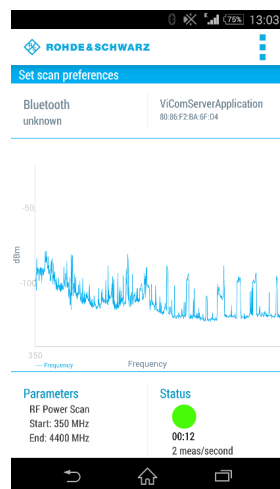


Figure B-14: RF Power Scan Results

Below the graph the measurement preferences and the status are displayed.

Parameters

- Start
Displays the start frequency
- End
Displays the end frequency

Status

Displays the measurement duration and the measurement rate. The status button displays the following colored states.

- *Green*
The measurement is running and measurement data are received.
 - *Yellow*
The measurement is running but no measurement data are received.
 - *Red*
The measurement was stopped
- To stop the scan, use "Stop scan" in the menu inflator in the top-right corner.

C Managing scanner device with R&S TSME Device Manager

The "R&S TSME Device Manager" is a configuration software tool for scanners of the R&S TSME and R&S TSMA family. This utility is part of the R&S®TSME installation package. It can also be installed together with R&S ROMES, R&S NESTOR and R&S ViCom, and is available for download from the Rohde & Schwarz product website <http://www.rohde-schwarz.com/product/TSMx.html>.

C.1 Installing and managing software license keys - "Options"

All new devices are preconfigured and specified technology and band options are already installed. Only if you obtain additional software options later, you have to enable the options with the corresponding software license keys.

License keys are shipped as a printed "License Keys List". Advance deliveries may consist of a PDF file. Unregistered software licenses can be downloaded from the Rohde & Schwarz website (<https://extranet.rohde-schwarz.com/service>). For details see the "Installation Instructions for Options".

(Note: previously, license keys were shipped as XML files.)

Prerequisites to install software license keys

To install a software license key, the following conditions must apply:

- PC/notebook is connected via Gbit LAN adapter, with Jumbo Frames (9 kB) enabled
- The (registered) software license key must be available

Software license keys are installed using the "R&S TSME Device Manager" ("Options" tab).

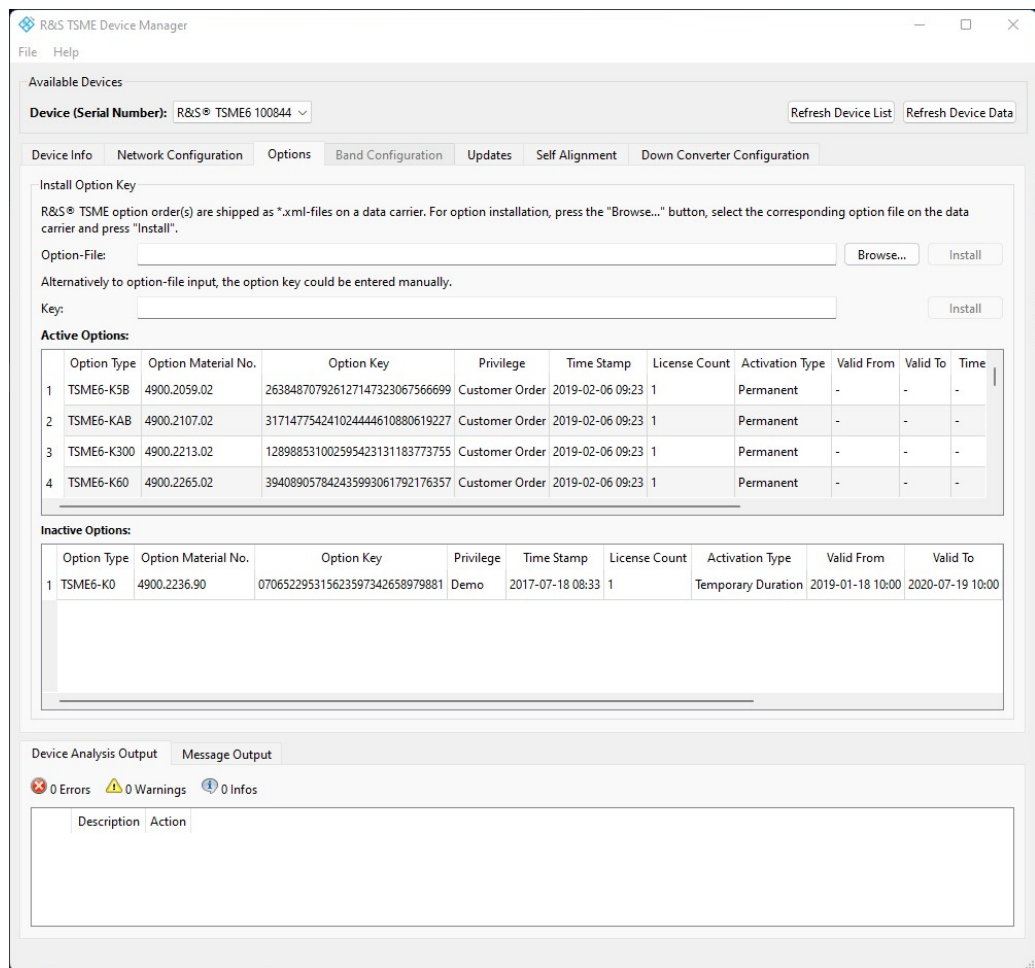


Figure C-1: Tab "Options"

For each option, the following information is displayed:



Information for options that are no longer valid because their expiry date has passed are listed as "Inactive Options".

To replace temporary by permanent software license keys, contact your Rohde & Schwarz sales representative.

Table C-1: Software license key information

Label	Description
Option Type	Band or technology option name
Option Material No.	Order number of the option
Option key	Software license key number
Privilege	Usage type (customer, services, demo)
Time Stamp	Time the software license key was installed
License Count	Number of times the (band upgrade) option is installed

Label	Description
Activation Type	Activation can be permanent or temporary
Valid From	Start of validity for temporary license
Valid To	End of validity for temporary license
Time to Expiration	Time left until license expires
Option Index	for internal use only
Format ID	for internal use only

Finding the software license key files

Previously, license keys were shipped as XML files. This function is only available for compatibility reasons.

If you do not know the precise path and file name of the required software license key, you can browse through the host PC's file system directly from the "R&S TSME Device Manager", by selecting the "Browse" button in the "Options" tab.

Entering key codes

Enter the 30-digit key code from the "License Keys List" in the "Key" field.

Alternatively, if available, copy the key code from the supplied PDF license key file and paste it in the "Key" field.

To install the software license key on the currently selected R&S TSMA6, select the "Install" button (see [Figure C-1](#)).

Installing a software license key

The software license key for which you have entered the key code in the R&S TSME Device Manager is installed on the currently selected R&S TSMA6 when you select the "Install" button. It then appears in the "Active Options" list with its validity dates and other information (see [Figure C-1](#)).

C.2 Configuring measurement bands - "Band Configuration"

Depending on which options are installed, various different bands and technologies can be scanned by the R&S TSMA6.



Before you can configure the measurement bands you must install all required software license keys, see [Chapter C.1, "Installing and managing software license keys - "Options""](#), on page 173).

The band configuration is stored permanently on the R&S TSMA6.



When using a R&S TSMA6 with a limited number of measurement bands, you must consider the band configuration of the scanner when planning a measurement task. The scanner will only provide measurement results for those bands that are currently configured on the scanner.

The band configuration is defined in the "Band Configuration" tab of the "R&S TSME Device Manager".

Select the bands that are to be scanned by the R&S TSMA6 in the "Band Table". Which bands are available is independent of the installed *technology* options; all installed technologies can be scanned in all configured bands at the same time.

The *number* of bands available for selection depends on the installed band options.

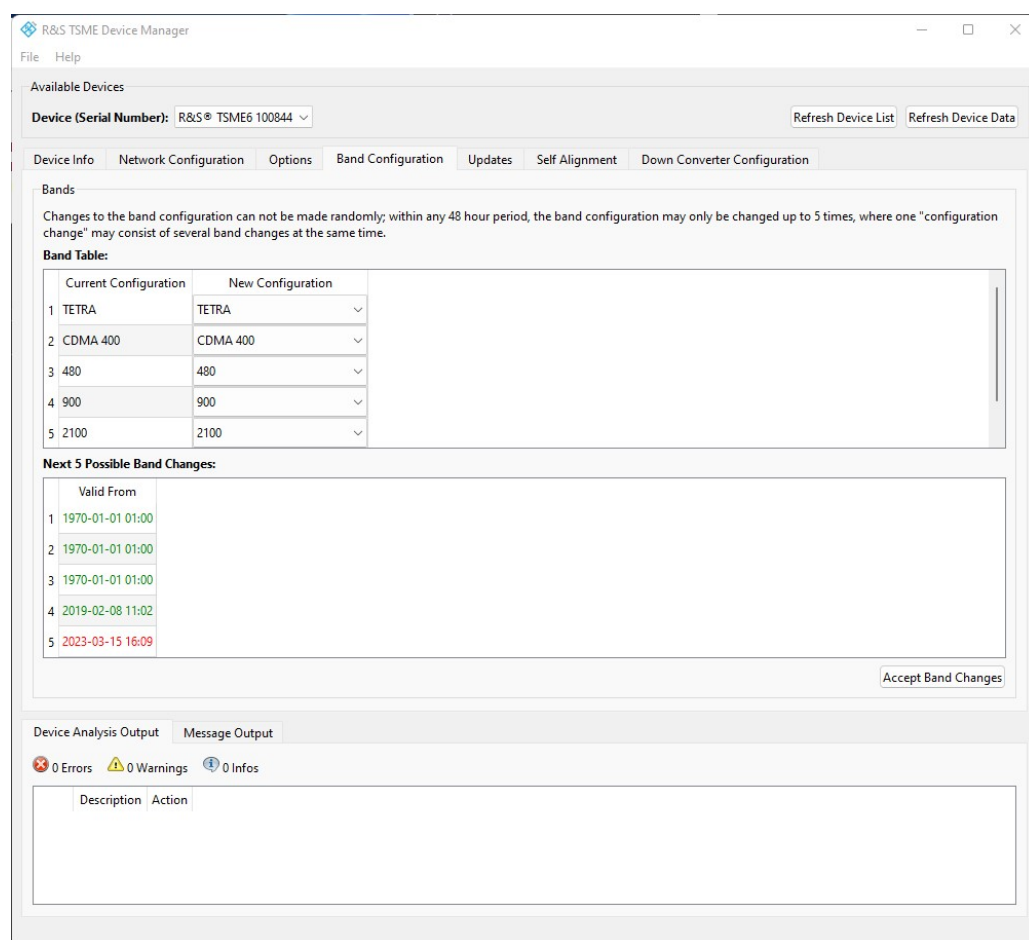


Figure C-2: Tab "Band Configuration"

The current band configuration for the selected R&S TSMA6 is displayed for reference. It remains active until you select the "Accept Band Changes" button.

**Band configuration changes**

Changes to the band configuration cannot be made randomly; within any 48-hour period, the band configuration may only be changed up to 5 times (where one "configuration change" may consist of several band changes at the same time, see ["Applying band configuration changes"](#) on page 177).

A counter is decremented after each (applied) change. How many changes have already been performed and how many are still possible within the current time frame is displayed at the bottom of the "Band Configuration" tab of the "R&S TSME Device Manager".

Red dates indicate the changes recently made, while green dates indicate possible changes left.

Applying band configuration changes

Changes to the band configuration are only applied to the R&S TSMA6 when you select the "Accept Band Changes" button in the "Band Configuration" tab of the "R&S TSME Device Manager".

Only then the counter for possible band changes (within 48 hours) is decremented.

C.3 Obtaining firmware and correction data updates - "Updates"

The "R&S TSME Device Manager" is always provided with the most recent basic FPGA (section 0). If a newer one becomes available due to security or functional issues, a message is indicated in the "Device Analysis Output" at the bottom of the "R&S TSME Device Manager" window. In this case, and only in this case, it is recommended that you install this update on your R&S TSMA6.

The correction data on your R&S TSMA6 should always be kept up to date. Available updates are also indicated in the "Device Analysis Output" and it is recommended that you install them.



If the downconverter is correctly connected, the basic FPGA and correction data for the downconverter are additionally displayed in a second line.

NOTICE**Risk of inoperability of device due to FPGA update**

Before performing an update, make sure you have a stable power supply and the LAN connection will not be interrupted. Both updates take a few minutes.

If the LAN connection is interrupted during an FPGA update, the device may become inoperable. Thus, only install such an update if it is explicitly recommended by a message in the "Device Analysis Output" of the "R&S TSME Device Manager" or by the Rohde & Schwarz support center.

You can update the basic FPGA or the correction data on your R&S TSMA6 directly from the "R&S TSME Device Manager", in the "Update" tab. The currently installed versions and the newest supported version (of the FPGA) or the minimum recommended version (of the correction data) are indicated.

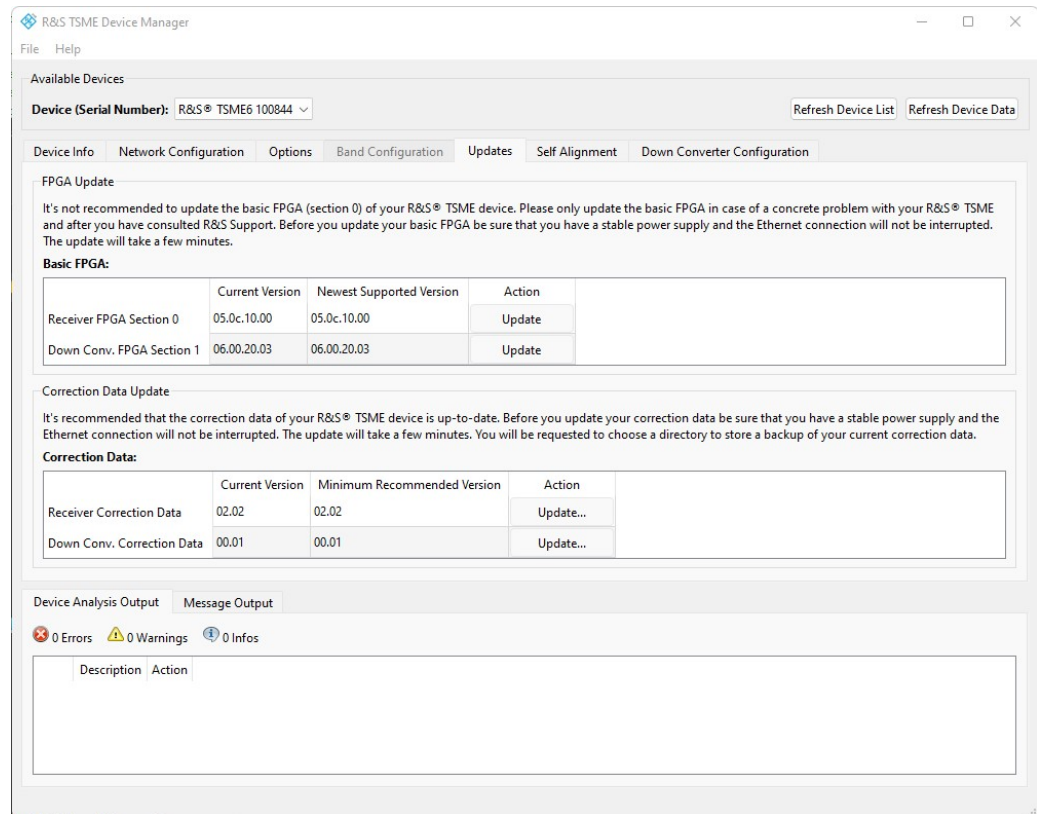


Figure C-3: Tab "Updates"

To perform an update

1. In the "R&S TSME Device Manager", select the serial number of the R&S TSMA6 to be updated.
2. In the "Updates" tab, select the "Update" button for either the "Basic FPGA" or the "Correction Data".

When updating the correction data, you are asked to select a directory to store a backup of your current correction data.

C.4 Aligning R&S TSMA6 manually - "Self Alignment"

During self-alignment, the R&S TSMA6 determines alignment values for the I/Q filter, ADC offset and the I/Q imbalance.

Configuring downconverter R&S TSME30DC/TSME44DC - "Downconverter Configuration"

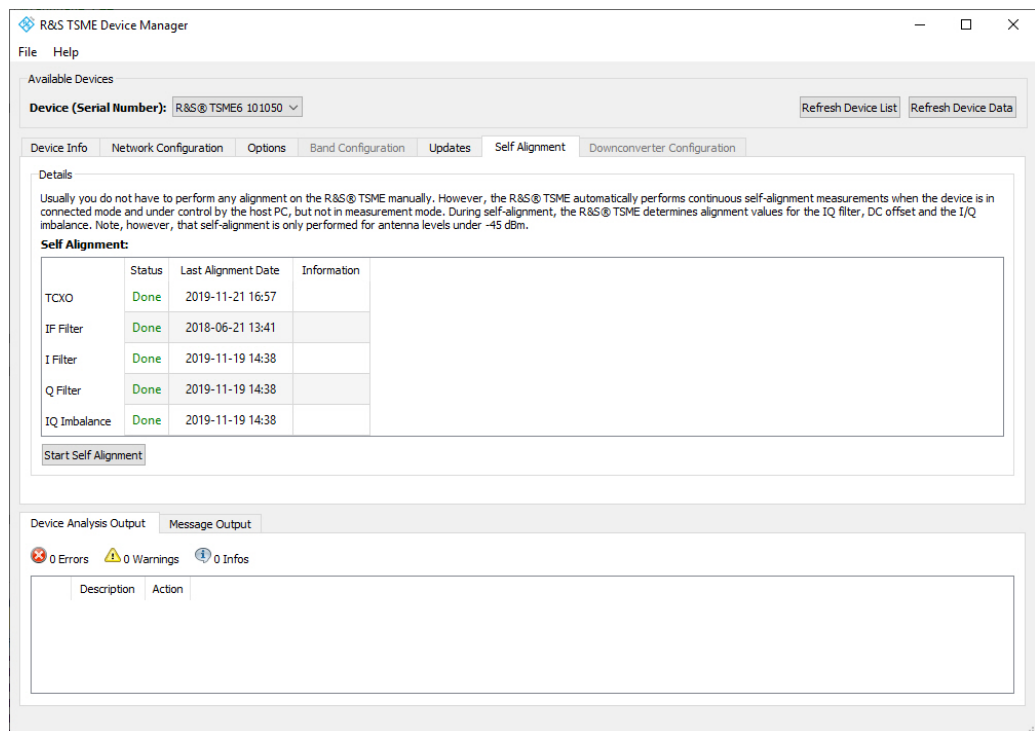


Figure C-4: Tab "Self Alignment"

Start Self Alignment

To start the self-alignment manually, select the "Start Self Alignment" button in the "Self Alignment" tab of the "R&S TSME Device Manager".

C.5 Configuring downconverter R&S TSME30DC/TSME44DC - "Downconverter Configuration"

Within this in tab, you can configure the IF output receiver and the RF input antenna of the R&S TSME30DC downconverter. For details, refer to the *R&S TSME30DC / R&S TSME44DC Getting Started*.

Configuring downconverter R&S TSME30DC/TSME44DC - "Downconverter Configuration"

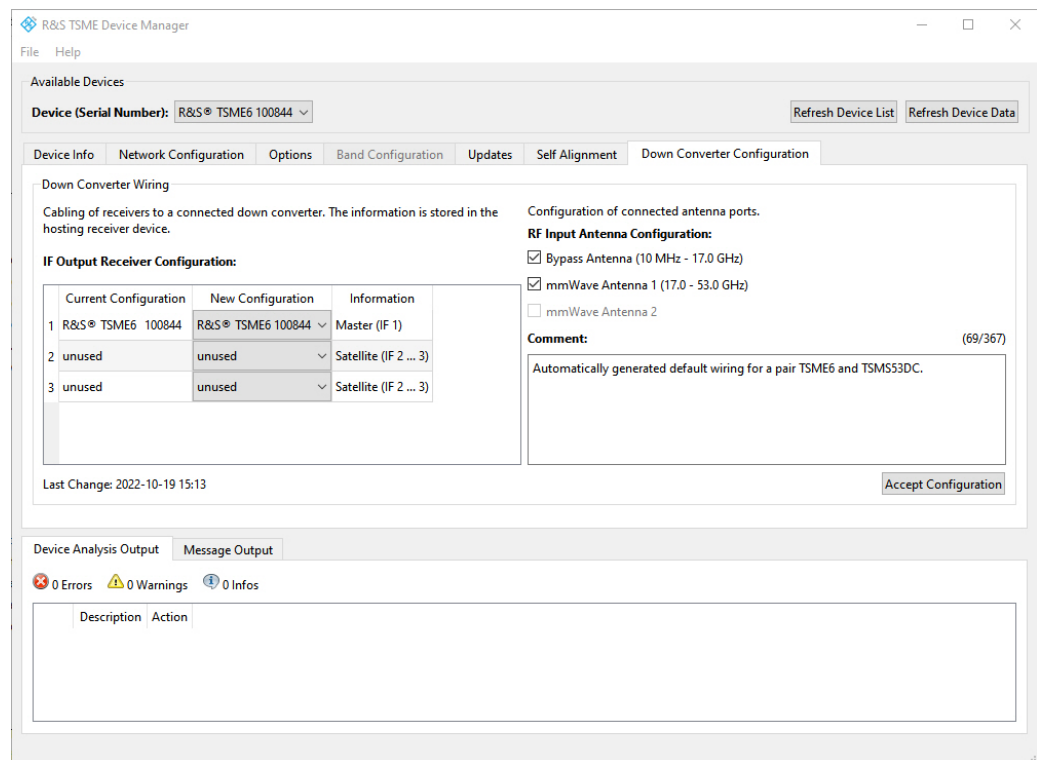


Figure C-5: Tab "Downconverter Configuration"

IF Output Receiver Configuration

Specify the configuration of the IF output connectors of the R&S TSME30DC/TSME44DC.

RF Input Antenna Configuration

- Specify the configuration of the RF input antenna connectors of the R&S TSME30DC.
 - Bypass Antenna (< 6 GHz)
 - mmWave Antenna 1 (24 GHz to 27.5 GHz)
 - mmWave Antenna 2 (27 GHz to 30 GHz)

For R&S ViCom and R&S ROMES, the API only allows the configuration of frequencies of activated antenna ports. For the overlapping frequency range 27 GHz to 27.5 GHz, the "mmWave Antenna 1" is used by default.

- Specify the configuration of the RF input antenna connectors of the R&S TSME44DC.
 - Bypass Antenna (< 6 GHz)
 - mmWave Antenna 1 (24-44 GHz)

For R&S ViCom and R&S ROMES, the API only allows the configuration of frequencies of activated antenna ports.

Accept Configuration

To confirm the current configuration settings, select the "Accept Configuration" button.

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