

R&S® TSMA

Autonomous Mobile Network Scanner User Manual



1177561002

This manual describes firmware version FW 01.32.00.04 and later of the R&S®TSMA. It describes the following R&S®TSMA models and options:

- R&S®TSMA (1514.6520.20)
- TD-SCDMA Option R&S®TSME-K20 (1510.0079.02)
- WCDMA Scanner Option R&S®TSME-K21 (1514.6820.02)
- CDMA2000® Option R&S®TSME-K22 (1514.6836.02)
- GSM Scanner Option R&S®TSME-K23 (1510.0085.02)
- 1xEVDO Option R&S®TSME-K24 (1510.0010.02)
- CW Scanner Option R&S®TSME-K25 (1522.6954.02)
- TETRA Scanner Option R&S®TSME-K26 (1514.6920.02)
- RF Power Scan Option R&S®TSME-K27 (1514.6813.02)
- WiMAX Scanner Option R&S®TSME-K28 (1514.6842.02)
- LTE Scanner Option R&S®TSME-K29 (1514.6859.02)
- LTE MIMO 2x2, 4x2, 4x4 R&S®TSME-K30 (1514.6871.02)
- LTE DL Allocation Analyzer R&S®TSME-K31 (1522.6990.02)
- LTE eMBMS Option R&S®TSME-K32 (1522.6960.02)
- LTE UL Allocation Analyzer R&S®TSME-K33 (4900.5112.02)
- NB-IoT/Cat NB1 Scanning R&S®TSME-K34 (1522.6731.02)
- Automatic Channel Detection R&S®TSME-K40 (1514.7232.02)

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1 Preface

1.1 Documentation Overview

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

www.rohde-schwarz.com/manual/tsmx

1.1.1 Getting Started Manual

Introduces the R&S TSMA 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 instrument.

1.1.2 User Manuals and Help

Contains the description of all instrument modes and functions. Includes the contents of the getting started manual .

1.1.3 Basic Safety Instructions

Contains safety instructions, operating conditions and further important information. The printed document is delivered with the instrument.

1.1.4 Data Sheets and Brochures

The data sheet contains the technical specifications of the R&S TSMA. 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

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

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

1.2 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 TSMA enhances such solutions, providing the user with accurate insight into the RF environment.

The R&S TSMA combines the technology of the R&S TSME 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. The scanner measures up to eight technologies simultaneously in the 350 MHz to 4400 MHz wireless communications bands. It can be combined with an R&S TSME to perform LTE MIMO measurements.

- User-definable input frequency range from 350 MHz to 4400 MHz
- RF and signal processing path with a bandwidth of 20 MHz
- Parallel measurement of all technologies in all bands (up to eight technologies simultaneously)
- Integrated Intel PC with Microsoft® Windows operating system which allows to install any drive test software supporting the R&S TSMA (e.g R&S ROMES)
- Open remote ViCom interface in order to integrate into Windows and Android-based software tools.
- Automatic detection of active channels in a specified band (Automatic Channel Detection (ViCom only), R&S TSMA-K40, Order No. 1524.6339.02 or R&S ROMES4ACD)
- Analysis of the DL allocations of the strongest eNodeBs during measurement (LTE Downlink Allocation Analyzer, R&S TSMA-K31, Order No. 1524.6322.02)

2 Safety Information

The product documentation helps you use the R&S TSMA safely and efficiently. Follow the instructions provided here and in the printed "Basic Safety Instructions". Keep the product documentation nearby and offer it to other users.

Intended use

The R&S TSMA is intended for the development, production and verification of electronic components and devices in industrial, administrative, and laboratory environments. Use the R&S TSMA only for its designated purpose. Observe the operating conditions and performance limits stated in the data sheet.

Where do I find safety information?

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

- The printed "Basic Safety Instructions" provide safety information in many languages and are delivered with the R&S TSMA.
- Throughout the documentation, safety instructions are provided when you need to take care during setup or operation.

3 System Overview

3.1 R&S TSMA Base Unit

The R&S TSMA base unit consists of the following components:

- R&S TSME drive test scanner unit
- Integrated Intel PC with a high-performance i5 processor and an embedded Microsoft Windows Operating System (Windows 7, 64 bit).
- Internal SSD ensuring high data processing speeds and sufficient memory (128 Gbyte) for measurement data.

Equipment	Availability
Antennas	<ul style="list-style-type: none"> • GPS: active antenna with cable and SMA connector included in package • RF antenna: 700 MHz to 2600 MHz paddle antenna included in package • Bluetooth®/WiFi antennas included in package • optionally: R&S TSME accessory antennas: (See the product page on the Rohde & Schwarz website at: https://www.rohde-schwarz.com/product/TSMA > "Options") <ul style="list-style-type: none"> – TSME-ZA1 (1506.9817.02): Antenna-mount magnetic – TSME-ZA2 (1506.9823.02): Antenna-mount fixed – TSME-ZA3 (1506.9830.02): Antenna-mount magnetic with GPS – TSME-ZA4 (1506.9846.02): Antenna-mount fixed with GPS – TSMW-ZE2 (1117.8165.00): Antenna Emitter 406 MHz - 440 MHz – TSMW-ZE9 (1519.5709.03): Antenna Emitter 430 MHz - 470 MHz – TSMW-ZE10 (3625.6742.02): Antenna Emitter 698 MHz - 3800 MHz – TSMW-Z7 (1518.1845.02): MIMO Antenna, 700 MHz – TSME-Z10 (4900.1917.02): Antenna Emitter 698 MHz - 6000 MHz – TSME-Z11 (4900.1923.02): Antenna Emitter 698 MHz - 2690 MHz – TSME-Z12 (4900.1930.02): Antenna Emitter 698 MHz - 2700 MHz – TSME-Z13 (4900.1946.02): Antenna Emitter 698 MHz - 3800 MHz – TSME-Z14 (4900.1952.02): Antenna Emitter 698 MHz - 3500 MHz
Connection cables	<ul style="list-style-type: none"> • 12V DC power supply cable with a cigarette lighter connector (included in package) • LAN cable to connect host PC (RJ45 Patch cable CAT6 2 m, included in package) • LAN cable to connect scanner unit and internal PC unit (5016.1890.00, included in package)
AC power supply	TSMA-Z1 (1523.8450.02), optional
Battery Pack, Batteries and Dual Charger	R&S TSMA-BP (1523.8009.02), optional R&S TSMA-BAT (1523.8021.03), optional R&S TSMA-BC2 (1523.8015.02), optional
Adapter	R&S TSPC-DPDH (3592.4060.02), Display Port Adapter to DVI/HDMI, optional R&S TSPC-DPVG (3592.4076.02) Display Port Adapter to VGA, optional

Equipment	Availability
Carrying Bag and Carrying Box	R&S TSMA-ZCB (1523.8467.02), optional Accommodates the R&S TSMA with battery pack, two spare batteries, a mobile phone, and the R&S TSME-Z7 antenna (frequency range: 700 MHz to 2.6 GHz). R&S TSMA-Z6 (3593.36909.02), optional
MIMO Setup	R&S TSPC-U2L (3593.8430.02), USB to LAN Adapter R&S TSME-ZC2 (1522.6560.02), SYNC cable R&S TSMA-MIMO kit including DC cable to connect R&S TSME to R&S TSMA-BP, metal brackets to allow different configurations, Ethernet patch cable 15 cm
Other	R&S TSPC-DVDD (3592.4053.02), External DVD Drive, optional R&S TSPC-MHDM (3592.4082.02), Mini HDMI Cable, optional R&S TSPC-MMON (3592.4047.02), 10" Portable Monitor, HDMI, optional R&S TSPC-KEYB (1508.1607.02), Compact Keyboard, US, with trackball, USB, optional R&S TSPC-SF3P (3591.3024.02). Surface Pro 3, remote tablet, optional

3.2 R&S TSMA-BP Battery Pack Unit - Optional Unit

The R&S TSMA-BP Battery Pack Unit features two rechargeable hot-swappable batteries (R&S TSMA-BAT, 1523.8021.03), which can be charged directly if the battery pack is connected to an external power supply. Alternatively, a separate battery charger (R&S TSMA-BC2, 1523.8015.02) can be used for recharging the batteries.



Figure 3-1: R&S TSMA with R&S TSMA-BP battery pack unit (containing two batteries)



Use only Li-ion batteries of the type RRC2054.



The recharging of the batteries is only allowed via the separate charger (R&S TSMA-BC2, 1523.8015.02) or via an external power supply. In this case, the batteries must be inside the R&S TSMA.

4 Instrument Tour

4.1 Front Panel

The front panel of the R&S TSMA does not provide any connectors or control elements for operation.

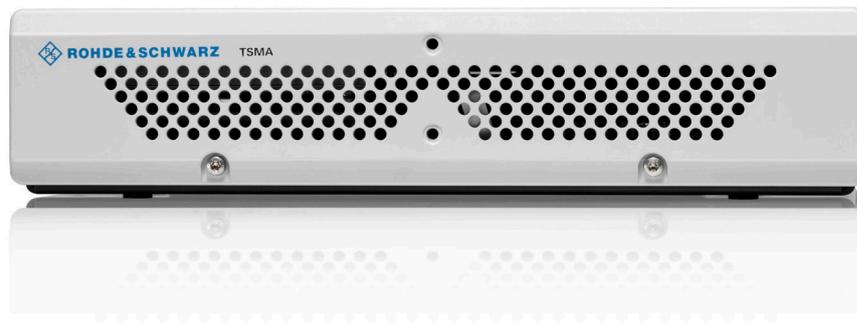


Figure 4-1: R&S TSMA - Front Panel

4.2 Rear Panel

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

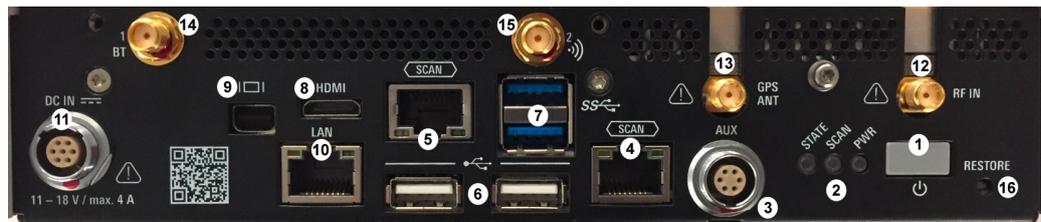


Figure 4-2: R&S TSMA - Rear Panel

- 1 = POWER ON/OFF
- 2 = STATUS LEDs
- 3 = AUX Connector
- 4 = SCAN (scanner port from scanner)
- 5 = SCAN (scanner port to embedded PC)
- 6 = USB 2.0 (2x)
- 7 = USB 3.0 (2x)
- 8 = mini HDMI
- 9 = MINI Display Port
- 10 = LAN Connector CPU
- 11 = DC IN Connector

- 12 = RF IN Connector
- 13 = GPS Antenna Connector
- 14 = Antenna 1 Connector (Bluetooth® / WLAN MIMO)
- 15 = Antenna 2 Connector (WLAN)
- 16 = RESTORE

POWER ON/OFF

The POWER ON/OFF key turns on and off the device if power is supplied via the DC IN connector.

STATUS LEDs

The three status LEDs, STATE, SCAN, PWR, indicate the operating status of the R&S TSMA. For a detailed description, see [Chapter 4.3, "Status LEDs"](#), on page 18.

AUX Connector

The AUX connector can be used to synchronize the R&S TSMA with the external 10 MHz reference frequency output of a signal generator or to synchronize multiple R&S TSMA/TSME in a MIMO setup; the Sync cable is necessary.

SCAN (2x)

The two SCAN connectors are used to establish a high-speed data link between the R&S TSMA scanner unit (SCAN connector on the **right** side) and the R&S TSMA internal PC unit (SCAN connector on the **left** side).

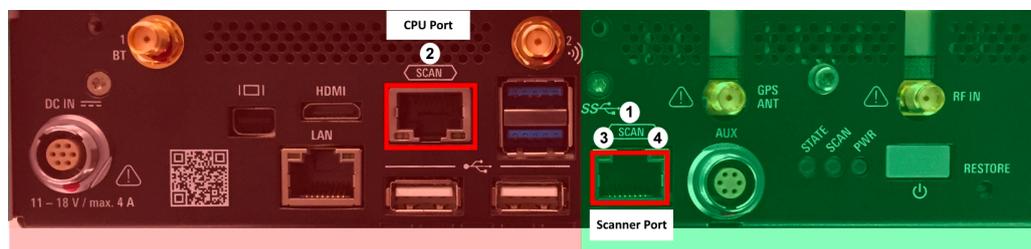


Figure 4-3: Connectors of the R&S TSMA

- red side = Internal PC unit of R&S TSMA
- green side = Scanner Unit of the R&S TSMA
- 1 = SCAN Link: Scanner port (used for PC connection in mode "Scanner only")
- 2 = SCAN Link: CPU port of R&S TSMA
- 3 = SCAN Link LED1 (link status)
- 4 = SCAN Link LED2 (activity status)

SCAN Link LEDs

The LEDs on the SCAN connectors display the status of the scan link interconnection. For a detailed description, see [Chapter 4.3.2, "SCAN LINK"](#), on page 20.

USB 2.0 (2x)

The two USB 2.0 ports can be used for connecting external devices as keyboard, mouse or other devices.

USB 3.0 (2x)

The two USB 3.0 ports can be used for connecting external storage devices, data sticks and test mobile phones.

Mini-HDMI Port

The MINI-HDMI port can be used for connecting an external monitor. (max. resolution: 2560 x 1600 pixel)

MINI-Display Port

The MINI-Display port can be used for connecting an external monitor. (max. resolution: 5120 x 2880 pixel)

LAN

The LAN connector provides a high-speed 100 Mbit Ethernet interface with an RJ 45 connector using IPv4. It is used to connect the R&S T SMA to a host PC in a local network.



The LAN interface can be used for Remote Control / Remote Desktop Connections. In this case, the device must not be in the "Scanner Only" mode.

Alternatively, it can also be used for distributed versions of R&S ROMES and R&S NESTOR.

The LEDs on the LAN connector indicate the status of the connection to the host PC. LED 1 (yellow, link status) is on the left side of the connector, LED 2 (green, activity status) is on the right.

DC IN Connector

The DC IN connector is used to supply the R&S T SMA with DC power. A wide DC input range 10 to 18 V / max. 4 A is supported.



Use only cable type with R&S No. 1523.7948.00 (included in delivery package).

RF IN Connector

The RF IN connector is the RF input of the R&S T SMA. The multi-band RF paddle antenna (700 MHz to 2.6 GHz), which is included in the shipment of R&S T SMA or any customer side RF source is connected to this SMA connector. The maximum input power is +20 dBm/10 V DC.



For the multi-band RF paddle antenna (700 MHz to 2.6 GHz), no adapter is required.

NOTICE**Risk of instrument damage**

Do not overload the maximum allowed input of 20 dBm.

Non-compliance destroys the input mixer.

GPS ANT

This SMA port is used for the GPS antenna input. It is an active antenna port with output voltage 3 V / max. 35 mA.

The accessory GPS antenna is connected to this input.

Antenna Connector 1 BT

The port with the label "1 BT" is a combined Bluetooth / WLAN antenna port. Connect the accessory WLAN / Bluetooth stub antenna to this SMA connector.

Antenna Connector 2 WLAN

The port with the label "2 ㉿" is the WLAN antenna port. Connect one of the accessory WLAN / Bluetooth antennas to this SMA connector.

RESTORE

With the RESTORE button, it is possible to bring the R&S TSMA back to factory default.

NOTICE**Loss of user data after RESTORE**

Executing restore brings the R&S TSMA irreversible back to the condition of delivery or any other later stored backup version.

All user data since last restore is lost.

4.3 Status LEDs

4.3.1 PWR, SCAN, STATE

The three status LEDs on the rear panel indicate the following states.

LEDs			Mode	Comment
PWR	SCAN	STATE	x	x
green (blinking slowly)	off	off	Delayed start enabled	R&S TSMA will auto power on after a delay which was configured in the web-GUI during previous session.
off	-	amber (cont.)	"Scanner Only" Mode	Only the scanner module is powered.
blue (10 sec) -> green (10 sec) -> off	-	green (blinking 1Hz)	Power up / selftest	Power up cycle in progress after switching on via power button.
blue	off	amber (cont.)	Idle / WLAN On	Device powered / idle state / WLAN AP is on
blue	off	green (cont.)	Idle / WLAN Off	Device powered / idle state / WLAN AP is off
blue	green	LED controlled by software application	Ready	Scanner module connected / no measurement
blue	green (flashing rapidly)	LED controlled by software application	Busy	Active scanner measurement running
blue	amber (2 sec.) -> red (2 sec.) -> off	green (blinking 1Hz)	Power down in progress	Power down in progress when switched off via power button.
blue	-	white	Firmware update – microcontroller flash in progress	-
blue / green (alternating)	-	-	CPU in sleep mode	-
Error States				
blue	red (blinking 2 Hz)	-	Temperature warning scanner module	-
blue	red (cont.)	-	Temperature error scanner module	-
blue	-	red	Scanner link failed	See Chapter 9.2, "The Scanner Unit could not be loaded from Software (R&S ROMES, R&S NESTOR)" , on page 99



This description of the STATE LED is based on the initial firmware. If the R&S TSMA is working in a specific mode, e.g. ROMES, NESTOR, ViCom or QualiPoc, the STATE LED may be used for these applications.

4.3.2 SCAN LINK

Table 4-1: SCAN Link LED1 (link) states and their meaning

LED state	Description
off	No link
yellow, blinking	Identify scanner module (TSME Device Manager test), (synchronous with SCAN LED and SCAN Link LED2)
yellow	Link established

Table 4-2: SCAN Link LED2 (activity) states and their meaning

LED state	Description
off	No data
green, blinking	Identify scanner module (TSME Device Manager test), (synchronous with SCAN LED and SCAN Link LED1)
green, flashing	Data transfer on scan link

5 R&S TSMA Option Concept

The R&S TSMA scanner consists of the R&S TSMA hardware and a set of (specified) technology and band options when it comes from the factory.

5.1 Technology Options

Technology options allow the R&S TSMA 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 TSMA can measure various technologies simultaneously.

Following technology options are available:

Table 5-1: Available R&S TSMA technology options

Option	Order Number	Description
R&S TSMA-K20	1524.6080.02	R&S TSMA scanner option: TD-SCDMA
R&S TSMA-K21	1524.6097.02	R&S TSMA scanner option: WCDMA
R&S TSMA-K22	1524.6100.02	R&S TSMA scanner option: CDMA2000
R&S TSMA-K23	1524.6116.02	R&S TSMA scanner option: GSM
R&S TSMA-K24	1524.6122.02	R&S TSMA scanner option: 1xEV-DO
R&S TSMA-K26	1524.6145.02	R&S TSMA scanner option: TETRA
R&S TSMA-K27	1524.6151.02	R&S TSMA scanner option: RF Power Scan
R&S TSMA-K28	1524.6168.02	R&S TSMA scanner option: WiMAX™
R&S TSMA-K29	1524.6174.02	R&S TSMA scanner option: LTE
R&S TSMA-K30	1524.6197.02	R&S TSMA scanner option: LTE-MIMO
R&S TSMA-K31	1524.6322.02	R&S TSMA scanner option: LTE Downlink Allocation Analyzer
R&S TSMA-K32	1524.6416.02	R&S TSMA scanner option: LTE eMBMS
R&S TSMA-K33	4900.5112.02	R&S TSMA scanner option: LTE UL Allocation Analyzer
R&S TSMA-K34	1522.6731.02	R&S TSMA scanner option: NB-IoT/Cat NB1-Scanning
R&S TSMA-K40	1524.6339.02	R&S TSMA scanner option: Automatic Channel Detection (ViCom only, not for R&S ROMES4)
R&S TSMA-K61	1524.6345.02	R&S TSMA scanner option: QualiPoc® Support



Ordering software options

When ordering a software option, the serial number of the R&S TSMA must be supplied. 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>).

5.2 Band Options

The R&S TSMA hardware simultaneously measures in all wireless communications bands from 350 MHz to 4.4 GHz. 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 TSMA from a limited number of bands to full bandwidth.

Following band options are available:

Table 5-2: Available R&S TSMA band options

Option	Order Number	Description
R&S TSMA-KAB	1524.6297.02	All bands measured simultaneously
R&S TSMA-K1B	1524.6068.02	1 band measured simultaneously
R&S TSMA-K2B	1524.6180.02	2 bands measured simultaneously
R&S TSMA-K3B	1524.6200.02	3 bands measured simultaneously
R&S TSMA-K4B	1524.6216.02	4 bands measured simultaneously
R&S TSMA-K5B	1524.6222.02	5 bands measured simultaneously
R&S TSMA-KUB	1524.6300.02	Upgrade: 1 additional band measured simultaneously

5.3 R&S NESTOR Options

The R&S NESTOR options are available on the internal smart card of the R&S TSMA, if the R&S NESTOR application is part of the initial installed R&S TSMA.

A later enhancement of the R&S TSMA with the R&S NESTOR application requires a dongle (with the NESTOR options) and an installation DVD.

The installation is done via R&S TSMA Web-GUI (see ["Install NESTOR Options"](#) on page 122).

5.4 R&S ROMES Options

A later enhancement of the R&S TSMA with the R&S ROMES application requires a dongle (with the ROMES options) and installation DVD.

The installation of the `option<serial number>.dat` file is done via R&S TSMA Web-GUI (see [Chapter A.4.2, "Install"](#), on page 122).

6 Preparing for Use

WARNING

Risk of injury and instrument damage

The instrument must be used in an appropriate manner to prevent electric shock, fire, personal injury, or damage.

- Do not open the instrument casing.
- Read and observe the "Basic Safety Instructions" delivered as a printed brochure with the instrument.
In addition, read and observe the safety instructions in the following sections.
Notice that the data sheet may specify additional operating conditions.

NOTICE

Risk of instrument damage during operation

An unsuitable operating site or test setup can cause damage to the instrument and to connected devices. Ensure the following operating conditions before you switch on the instrument:

- The instrument is dry and shows no sign of condensation.
- The instrument is positioned as described in the following sections.
- Signal levels at the input connectors are all within the specified ranges.



EMI Suppression

Electromagnetic interference (EMI) may affect the measurement results.

To suppress generated electromagnetic interference (EMI):

- Use suitable shielded cables of high quality. For example, use double-shielded RF and LAN cables.
- Always terminate open cable ends.
- Note the EMC classification in the data sheet.

6.1 Unpacking the Instrument

The following section describes how to setup the instrument.

NOTICE**Risk of instrument damage due to inappropriate operating conditions**

Specific operating conditions are required to ensure accurate measurements and to avoid damage to the instrument. Observe the information on appropriate operating conditions provided in the basic safety instructions and the instrument's data sheet.

Check the equipment for completeness using the delivery note and the accessory lists for the various items. Check the instrument for any damage. If there is damage, immediately contact the carrier who delivered the instrument. Make sure not to discard the box and packing material.

**Packing material**

Retain the original packing material. If the instrument needs to be transported or shipped later, you can use the material to protect the control elements and connectors.

Accessory list

The following items are included with shipment of the R&S TSMA:

- SCAN Link interconnection cable (SCAN <-> SCAN)
- 12 V DC power supply cable with a cigarette lighter connector
- Wide range RF paddle antenna (700 MHz to 2600 MHz)
- Active GPS patch antenna
- Two stub antennas for WLAN/Bluetooth®



Figure 6-1: Scope of R&S TSMA Delivery

- 1 = SCAN Link interconnection cable
- 2 = Car Adapter cable
- 3 = RF Antenna
- 4 = GPS Antenna
- 5 = WiFi/Bluetooth Antennas

6.2 Connecting External Devices

The following external devices must be connected before connecting the power supply.

To select the correct connectors, refer to [Figure 4-2](#).

1. Connect the SCAN ports of scanner and PC unit of the R&S TSMA.



Figure 6-2: Connection between scanner unit and internal PC unit

- 1 = SCAN Link connector (CPU port)
- 2 = SCAN Link connector (Scanner Port)
- 3 = SCAN Link interconnection cable

Note: Use only the LAN interconnection cable (R&S No. 5016.1890.00) for connecting the SCAN ports.

2. Connect the RF antenna to the RF IN connector.
3. Connect the GPS antenna to the GPS ANT port.
4. Connect the accessory WLAN / Bluetooth stub antennas to ANT1 and ANT 2.
5. Connect mouse and keyboard to the USB 2.0 ports and a monitor to the appropriate monitor port (mini HDMI or MINI Display port) if you want to use local operation. (optional)

If necessary, following display port adapters can be used:

- Display Port Adapter to DVI/HDMI, R&S TSPC-DPDH (R&S No. 3592.4060.02)



Figure 6-3: Display Port Adapter to DVI/HDMI

- Display Port Adapter to VGA, R&S TSPC-DPVG (R&S No. 3592.4076.02)



Display Port Adapter to VGA

6. Connect a LAN cable to the LAN port if you want to use the R&S TSMA via Remote Desktop or as distributed system. (optional)
7. Connect external devices/storage devices and test mobile phones to USB 2.0/USB 3.0 ports.

Note: The length of the connected USB cables should not exceed 3 m.

6.3 Connecting Power Supply

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

6.3.1 Connecting to a Vehicle DC Power Supply

Use the accessory DC cable with cigarette lighter adapter to power the R&S TSMA from the vehicle power supply. Connect the 7-pin connector to DC IN.



For DC Supply Only

The R&S TSMA is to be used with a 12 V vehicle power supply only.
DC-based lab networks are not allowed to be used for power supply!

6.3.2 Connecting an AC Power Supply

To operate the R&S TSMA with an AC power supply, connect the DC IN connector with the AC power supply (R&S TSMA-Z1, R&S No. 1523.8450.02).



Use only the R&S TSMA-Z1, R&S No. 1523.8450.02 as AC power supply.



Figure 6-4: TSMA-Z1 AC Power Supply

6.3.3 Connecting the R&S TSMA-BP Battery Pack Unit

Alternatively, it is possible to power the R&S TSMA via the R&S TSMA-BP Battery Pack Unit.

To use the R&S TSMA with the battery pack, the following steps must be performed.

1. Insert the batteries into the R&S TSMA.

Note: The R&S TSMA may be used only with closed battery cover.

Note: Make sure, that the batteries are inserted in the correct orientation.



Figure 6-5: R&S TSMA - Battery Orientation

1 = Battery insert orientation

2. Attach the R&S TSMA base unit with the bottom side (see [Figure 6-7](#)) on top of the R&S TSMA-BP (see [Figure 6-6](#)).



Figure 6-6: R&S TSMA-BP

1 = Connectors for R&S TSMA base unit



Figure 6-7: R&S TSMA Base Unit (bottom side)

1 = Connectors for R&S TSMA-BP

3. Move the R&S TSMA base unit to the front side (2) until the connectors are locked.



Figure 6-8: Connected R&S TSMA Base Unit and R&S TSMA-BP

- 1 = Vertical attachment of R&S TSMA base unit (bottom) with R&S TSMA BP (top)
- 2 = Move T&S TSMA base unit to the front side

4. Lock the interconnection using the lock (3).



Figure 6-9: Connection of R&S TSMA with R&S TSMA

- 1 = R&S TSMA Base Unit
- 2 = R&S TSMA
- 3 = Lock (front side)

5. Via the cable (3), you have to connect the DC IN connector on the R&S TSMA (1) with the TSMA connector (7 pins) on the R&S TSMA-BP (2).



Figure 6-10: Cabling of R&S TSMA with R&S TSMA

- 1 = DC IN Connector of R&S TSMA Base Unit
- 2 = TSM Connector R&S TSMA-BP
- 3 = Interconnection Cable (R&S TSMA Base Unit <-> R&S TSMA-BP)

Note: The interconnection cable (3) is included in the delivery package of the R&S TSMA-BP.

The cable plugs are marked at both sides with a red spot.



Figure 6-11: Cable

Connected at the DC IN (1) of the R&S TSMA, this red spot must face upwards, at the TSM connector (2) of the R&S TSMA-BP it must face downwards.

The boot behavior after connecting the R&S TSMA-BP Battery Pack Unit (including charged batteries or connected to an external DC power supply) with the R&S TSMA depends on the system settings on the R&S TSMA (see [Chapter A.2.1.2, "Power"](#), on page 115).

The R&S TSMA-BP Battery Pack Unit can be connected with an external power supply. The following steps must be performed.

1. **DC powered from a vehicle supply** (see [Figure 6-13](#))

Connect the DC IN connector (4) of the R&S TSMA-BP Battery Pack Unit with the 7-pin plug cable (5) and connect the 4-pin socket with the accessory car adapter cable of the R&S TSMA.

Note: The 7-pin to 4-pin adapter cable is a standard accessory of the R&S TSMA-BP Battery Pack Unit



Figure 6-12: 7-pin to 4-pin adapter cable

2. AC powered

Connect the DC IN connector (4) of the R&S TSMA-BP Battery Pack Unit with the 7-pin to 4-pin adapter cable (5) and connect the 4-pin socket with AC power supply (R&S TSMA-Z1, R&S No. 1523.8450.02).

If a valid DC input voltage is applied to DC IN of the R&S TSMA-BP, the R&S TSMA is powered from this external DC supply and the batteries inside the R&S TSMA-BP are charged.

If the external DC supply is not available the R&S TSMA is powered from the batteries.



Figure 6-13: Connecting the R&S TSMA with an AC power supply

- 1 = DC IN connector R&S TSMA Base Unit
- 2 = TSM A connector R&S TSMA-BP Battery Pack Unit
- 3 = DC power interconnection cable (R&S TSMA Base Unit <-> R&S TSMA-BP Battery Pack Unit)
- 4 = DC IN connector R&S TSMA-BP Battery Pack Unit
- 5 = Adapter cable (7-pin to 4-pin)
- 6 = DC IN (TSM A-Z1 resp. car adapter cable, standard accessory of R&S TSMA)

6.4 Connecting an Additional R&S TSME for MIMO Support

MIMO measurements with the R&S TSMA require to extend the device with one R&S TSME.

To make this extension the following is needed:

- MIMO 2x2 Upgrade Kit, R&S No. 15246439.02
- R&S TSMA driver update software, `TSMA_DriverUpdate_1.00.exe`, which can be downloaded from the Rohde & Schwarz web site.



The R&S TSMA driver update must be performed before connecting the additional R&S TSME.



Figure 6-14: R&S TSMA with R&S TSMA-BP battery pack unit and mounted R&S TSME (front side view)



Figure 6-15: R&S TSMA with R&S TSMA-BP battery pack unit and mounted R&S TSME (rear side view, emphasized is USB 3.0 lower port)

6.4.1 MIMO 2x2 Upgrade Kit

The upgrade kit includes the mechanical components to mount the R&S TSME and the needed cables to connect the devices.

The following items are included in the MIMO 2x2 Upgrade Kit:

- R&S TSPC-U2L USB 3.0 to LAN Adapter (3593.8430.02)
- DC Cable TSMA-BP/TSME to connect R&S TSMA+BP with R&S TSME (1523.8480.00)

- SYNC Cable 2 TSME (1522.6577.00)
- RJ45 Patch cable shielded CAT5E, 15 cm (5016.1890.00)
- Holder TSMA+PB/TSME (1523.8415.00)
- VS 7985/ISR-M3X5-A4-PA (3565.7210.009)
- VS 7985/ISR-M2.5X5-A4-PA (1148.2617.00)
- Installation Instruction R&S TSMA-ZM (1523.8438.00)
- Documents folder (5001.8913.00)



Figure 6-16: Some items of the upgrade kit

- 1 = SYNC cable for TSME
- 2 = Holders
- 3 = Turnlock fasteners

6.4.2 Mounting R&S TSME

1. Screw the delivered holders to both devices. Note the differences when screwing the holders.

Connecting an Additional R&S TSME for MIMO Support



Figure 6-17: Holders screwed on the devices

2. Fasten the R&S TSME onto the R&S TSMA, attaching the R&S TSME as shown in the following figure.



Figure 6-18: Mounting R&S TSME on R&S TSMA

3. Connect devices using the cables including the MIMO 2x2 Upgrade Kit.



Figure 6-19: Cabling of R&S TSME with R&S TSMA

- 1 = Connection TSME DC IN to TSMA-BP AUX port (DC Cable TSMA-BP/TSME)
- 2 = Connection TSME LAN port to R&S TSPC-2UL USB 3.0 to LAN Adapter (RJ45 Patch cable shielded CAT5E)
- 3 = Connection lower USB 3.0 port of the R&S TSMA (the port marked in the figure displaying the rear side of the combination TSMA+BP/TSME) to R&S TSPC-2UL USB 3.0 to LAN Adapter
- 4 = SCAN Link interconnection cable (not included in MIMO 2x2 Upgrade Kit)
- 5 = Connection TSME AUX port to TSMA AUX port (SYNC Cable 2 TSME)

6.5 Connecting Test Mobile Phones

To use the R&S TSMA with test mobile phones the following steps must be performed.

1. Install the driver package for the test mobile phones (see [Chapter 6.6, "R&S TSMA Driver Update"](#), on page 38).
2. Connect the test mobile phones to the USB2.0 / USB3.0 ports.



The length of the connected USB cables should not exceed 3 m.

6.6 R&S TSMA Driver Update



- The package "R&S TSMA ThinkPad USB LAN Setup 1.00" is required to extend the R&S TSMA with an additional scanner LAN port for MIMO LTE operation.
- The packages "R&S TSMA Samsung Android USB Setup 1.00" and "R&S TSMA Qualcomm Driver Setup 1.00" are the R&S ROMES/NESTOR mobile device drivers, which are needed when a Samsung test mobile phone is connected to the R&S TSMA.

The up-to-date instrument driver is available for download under <https://www.rohde-schwarz.com/driver/tsma/>.

6.6.1 Installation MIMO Extension



For the installation of the driver update package "R&S TSMA ThinkPad USB LAN Setup 1.00", the R&S TSPC-U2L USB 3.0 to LAN Adapter (3593.8430.02) must be connected to the R&S TSMA.

1. Connect the LAN adapter to the R&S TSMA USB port.
2. Download the `TSMA_DriverUpdate_1.00.exe` file from the Rohde & Schwarz web site and run it.

The "R&S Software Distribution" welcome to install page opens.

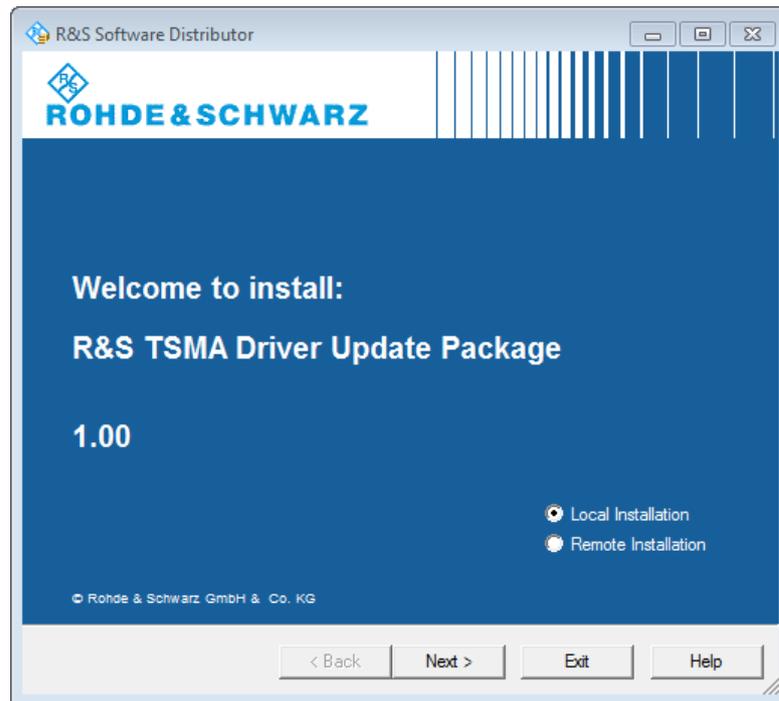


Figure 6-20: R&S Software Distributor opening page

3. Select "Local Installation" and click "Next".

The opened page shows the contents of the "R&S TSMA Driver Update Package 1.00".

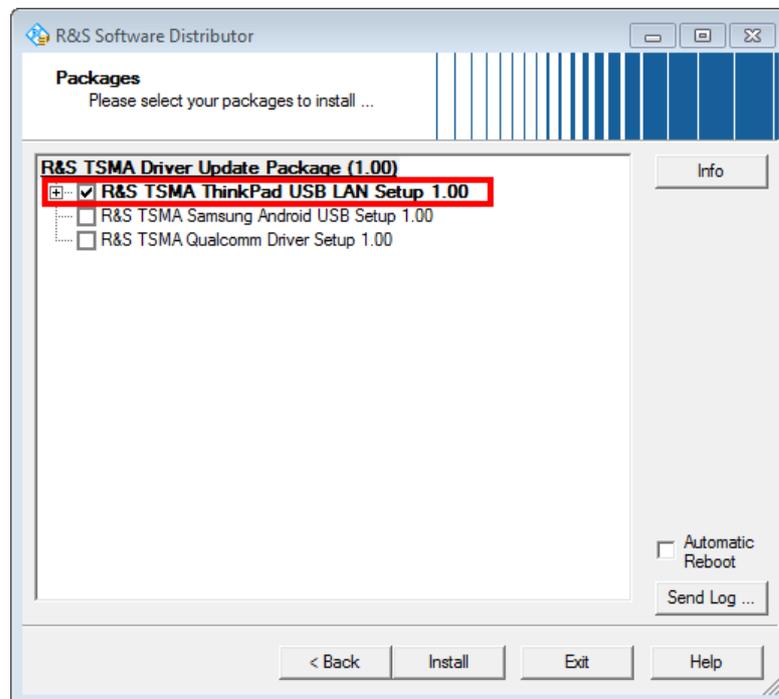


Figure 6-21: Contents of the R&S TSMA Driver Update Package

4. Select the "R&S TSMA ThinkPad USB LAN Setup 1.00" entry and click "Install".
5. Close the installation.

The tool installs the required package and assigns the 192.168.2.1 IPv4 address to Ethernet adapter automatically.

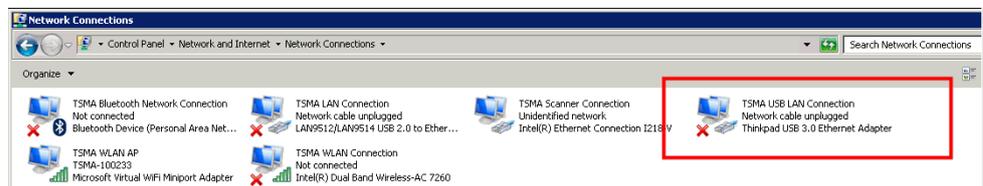


Figure 6-22: Installed package



Make sure, that the IPv4 address 192.168.2.1 is not used by any other LAN adapter.

The R&S TSME IP address has to be set to 192.168.2.x to support the R&S TSMA MIMO measurements.

How to change the address: see "R&S TSME Ultra Compact Drive Test Scanner User Manual" version 06, chapter 4.3.

6.6.2 Installation ROMES/NESTOR Mobile Device Drivers



Install the mobile device drivers before connecting a test mobile phone.

1. Download the `TSMA_DriverUpdate_1.00.exe` file from the Rohde & Schwarz web site and run it.

The "R&S Software Distribution" welcome to install page opens.

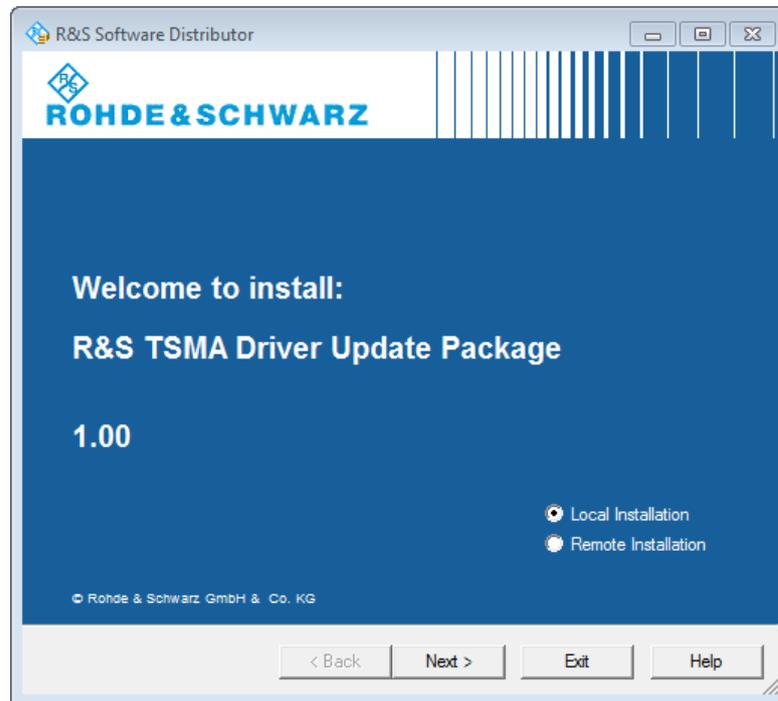


Figure 6-23: R&S Software Distributor opening page

2. Select "Local Installation" and click "Next".

The opened page shows the contents of the "R&S TSMA Driver Update Package 1.00".

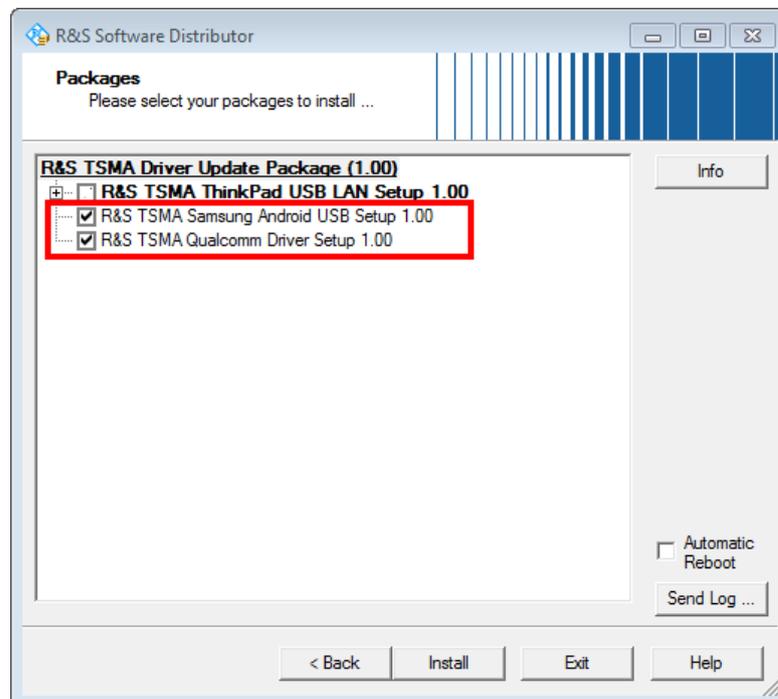


Figure 6-24: Contents of the R&S TSMA Driver Update Package

3. Select "R&S TSMA Samsung Android USB Setup 1.00" and "R&S TSMA Qualcomm Driver Setup 1.00" and click "Install".
4. Close the installation.

The tool installs the required packages.

For more, see [ROMES UE Application.pdf](#) included in the delivered R&S ROMES DVD.

7 Configuring the R&S TSMA

7.1 Accessing the R&S TSMA

There are different ways to access the R&S TSMA.

- Local operation
To use the R&S TSMA as an ordinary PC, an external monitor, mouse and keyboard have to be connected to the R&S TSMA.
- Remote access
The remote access to the R&S TSMA can be realized via the following options.
 - Using the Web-GUI of the R&S TSMA (see [Chapter 7.1.1, "Start the R&S TSMA Web-GUI"](#), on page 43).
 - Establish a remote desktop connection (via LAN/WLAN) (see [Chapter 7.1.2, "Establish a Remote Desktop Connection"](#), on page 44).

7.1.1 Start the R&S TSMA Web-GUI

To start the R&S TSMA Web-GUI via a remote PC, three possible ways are available.

WLAN

1. Via a tablet or smartphone, you have to establish a WLAN connection to R&S TSMA WLAN access point.
 - a) Search for a TSMA WLAN network. The WLAN access point on the R&S TSMA is started automatically by default during the boot process of the device.
NOTE: This behavior can be switched off (see [Chapter A.2.2.2, "WLAN"](#), on page 117).
 - b) Connect your tablet or smartphone with the TSMA WLAN network. The required login information can be found on a label on the bottom side of the R&S TSMA base unit.

WLAN-Access Point SSID: *TSMA-xxxxxx* (xxxxxx is the serial number of this specific R&S TSMA)

Key: *instrument*

The WLAN connection between the tablet or smartphone and the R&S TSMA device is established.

2. On the tablet or smartphone start a web browser and enter the following URL:
http://192.168.1.10/

The configuration Web-GUI of the R&S TSMA is started.

For details about the Web-GUI, see [Chapter A, "Usage of the Web GUI"](#), on page 111.

LAN

1. Connect the R&S TSMA LAN port with the host PC port.
2. Use the R&S TSMA default IP settings, that is, the DHCP Client. The R&S TSMA and the remote host PC automatically negotiate the IP address.
3. Alternatively, use the fixed address. Start a web browser via the R&S TSMA Web-GUI and enter the following URL:
http://TSMA-<xxxxxx>.local (xxxxxx is the serial number of this specific R&S TSMA)

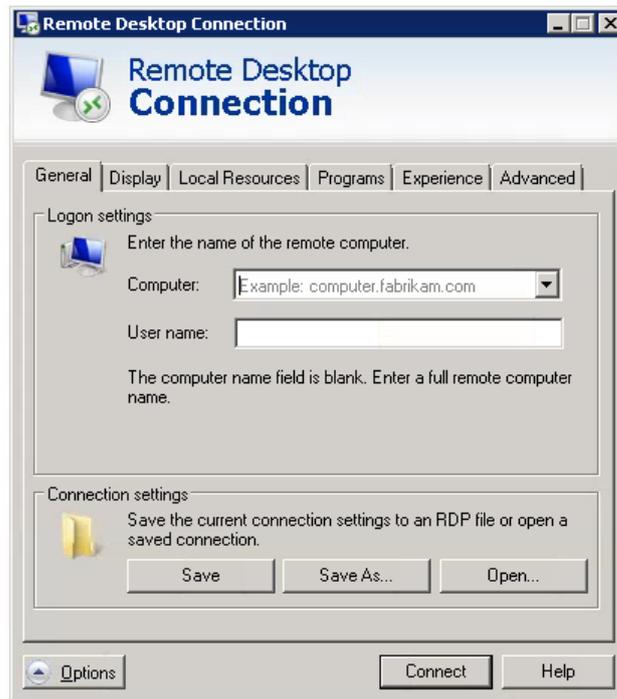
Local access from the R&S TSMA and Windows Explorer

- ▶ Open Internet Explorer using mouse, keyboard and monitor. The R&S TSMA Web-GUI opens automatically. If not, type the following:
http://localhost

7.1.2 Establish a Remote Desktop Connection

To establish a remote desktop connection, the following steps must be performed:

1. A WLAN/LAN connection between the R&S TSMA and the remote PC has to be established, see [Chapter 7.1.1, "Start the R&S TSMA Web-GUI"](#), on page 43.
2. On the external PC, navigate to "Programs" > "Accessories" > "Remote Desktop Connection".
3. In the "Remote Desktop Connection" window, click "Options".
4. In the "General" tab, enter following parameters:
 - Computer: The input depends on selected connection type, see the [Chapter 7.1.1, "Start the R&S TSMA Web-GUI"](#), on page 43 and is .
 - WLAN: *192.168.1.10*
 - LAN: IP address of the R&S TSMA
 - User name: *instrument*



Note: For access via IP address, use the following IP addresses:

- WLAN: 192.168.1.10
- LAN: IP address is assigned by the host PC

5. Click "Connect".
6. Enter the password *894129* and click "OK".



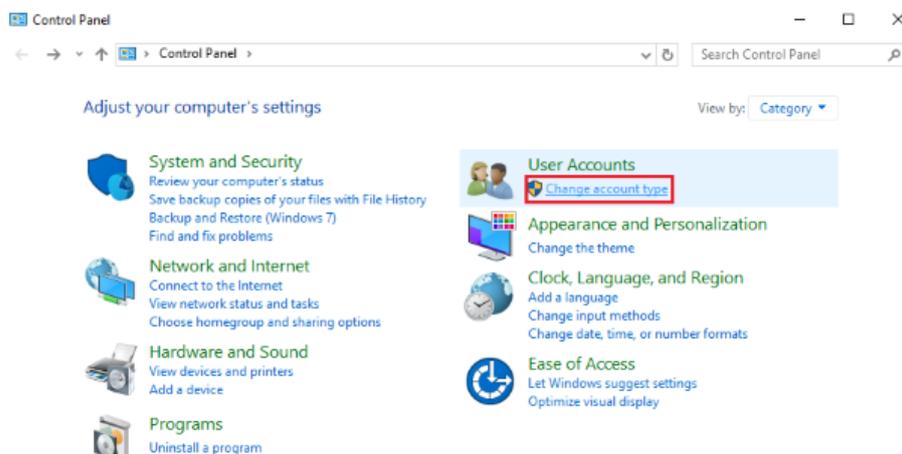
7. The remote desktop connection is established.
The R&S T SMA can be controller as a standard PC.

7.2 Changing Password of R&S TSMA

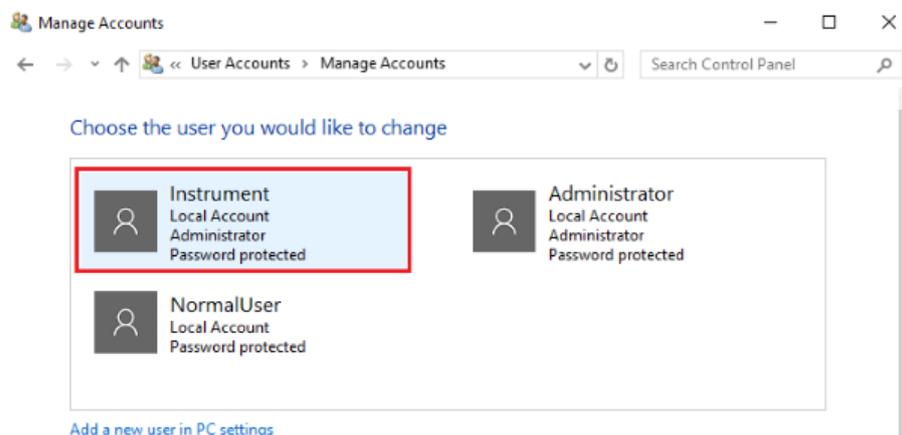
To change the default password (default PW: 894129) of R&S TSMA, proceed as follows. After changing the password, additional steps has to be performed for "Autologin".

Change Password

1. On R&S TSMA, open the "Control Panel".
2. Navigate to "User Accounts" > "Change account type".

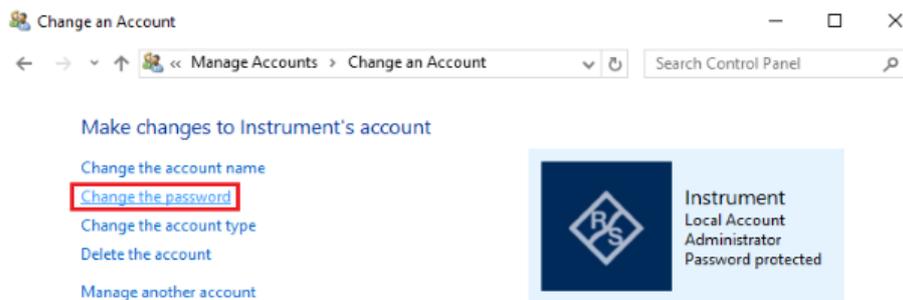


3. In the following window, double-click the account "instrument" to edit the settings.

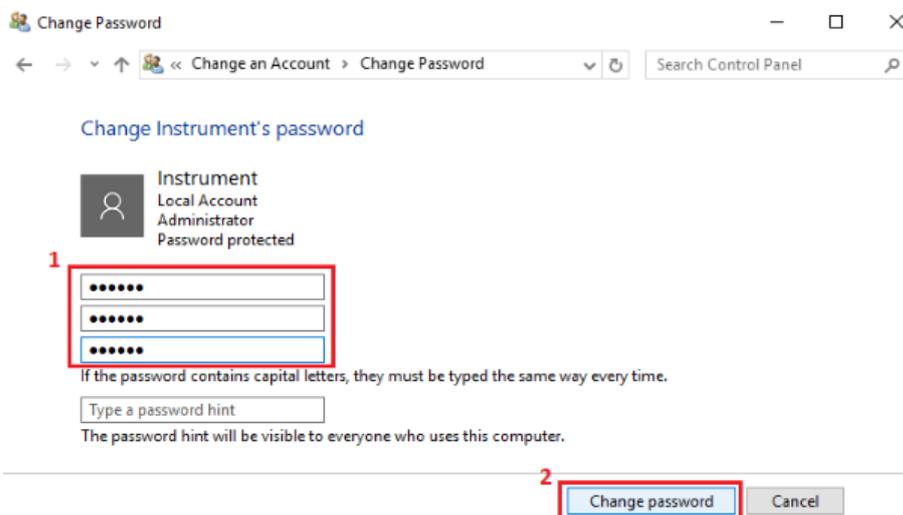


4. Click "Change the password".

Changing Password of R&S T SMA



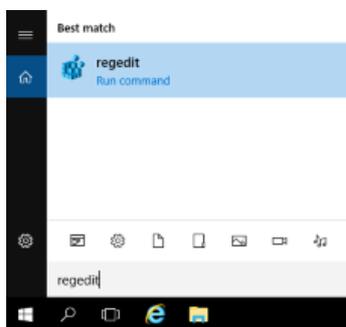
5. Fill in the fields (1) and click "Change password" (2).



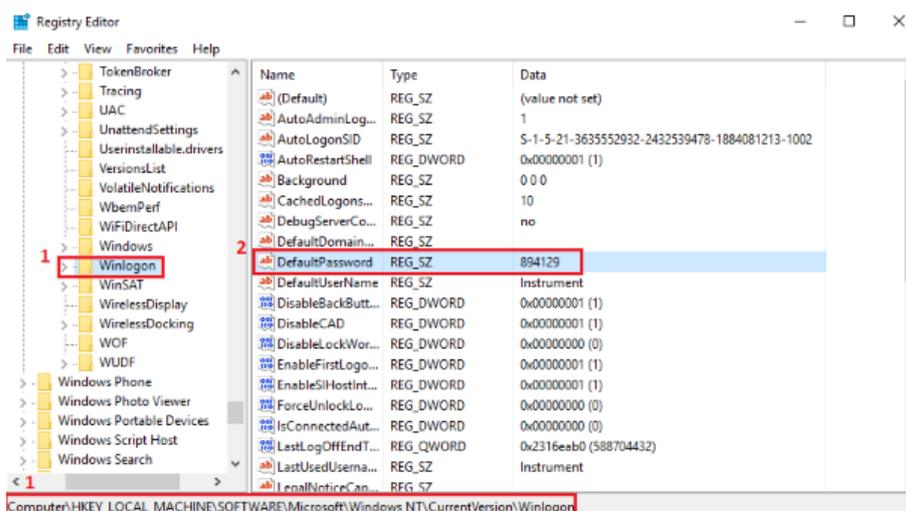
Enable Autologin

After changing the password, change the password also in "Autologin" settings. To change the "Autologin" settings, proceed as follows.

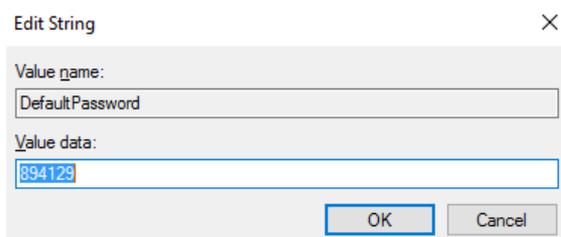
1. Open the "Registry Editor".



2. In the "Registry Editor", navigate to HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows NT\CurrentVersion\Winlogon (1) and double-click the parameter "Default Password" (2).



- The "Edit the default password" window is opening. Under "Value data", type in the new password.



- Click "OK". The changes are accepted. After powering, the R&S T SMA automatically login.

7.3 Measurement Setup

The measurement setup procedure is performed in the following steps.

- Start the R&S T SMA Web-GUI (see [Chapter 7.1.1, "Start the R&S T SMA Web-GUI"](#), on page 43).
- Check the prerequisites of the desired measurement mode (see [Chapter 7.4, "Measurement Modes"](#), on page 49) and adjust your device according these requirements.
- If the required application is not yet installed, install the application according to the procedures described in [Chapter 8.2, "Software Installation"](#), on page 69.
- Select the measurement mode in the R&S T SMA Web-GUI; the modes are described in [Chapter 7.4, "Measurement Modes"](#), on page 49.



The R&S Remote ViCom Server is installed on all the R&S TSMA. The other software applications, that is, the R&S NESTOR, R&S ROMES and Quali-Poc are installed only if ordered.

7.4 Measurement Modes

To setup a measurement, see [Chapter 7.3, "Measurement Setup"](#), on page 48.



The R&S Remote ViCom Server is installed on all the R&S TSMA. The other software applications, that is, the R&S NESTOR, R&S ROMES and Quali-Poc are installed only if ordered.

7.4.1 Remote ViCom Server Mode

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

Based on the connection type, different steps are necessary.

The selection of the connection type depends on the measurement task.



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

On the other hand, the Bluetooth connection is less influenced by interference.

Requirements for using the Bluetooth® interface



The device must be in the PC Mode. Check it via the Web-GUI ("Overview" > "Mode of Operation").

To change the operation mode, see [Chapter A.2.1.1, "Mode"](#), on page 115).

1. Switch on Bluetooth® on R&S TSMA (see [Chapter A.2.2.1, "Bluetooth"](#), on page 117).
2. The tablet/smartphone must be paired with the R&S TSMA.

Requirements for using the WLAN interface

1. Switch on the WLAN AP on the R&S TSMA (see [Chapter A.2.2.3, "WLAN AP"](#), on page 118).
2. Switch on WLAN on the tablet/smartphone.

3. Connect the tablet/smartphone with the R&S TSMA WLAN AP.

Measurement

To run measurements, the requirements for operating the rViCom Sample App have to be fulfilled, see [Chapter B.2.1, "General Requirements"](#), on page 126.

1. Activate the rViCom Server mode (see [Chapter 7.3, "Measurement Setup"](#), on page 48).
2. Start one of the following applications
 - a) Start the OEM rViCom client application on the mobile device.
 - b) Start the rViCom Sample App on the mobile device.
For more details, see [Chapter B.3, "Usage"](#), on page 127.

7.4.2 QualiPoc Mode

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

Prerequisites

- A scanner license must be installed on the QualiPoc® handheld device.
 - On the R&S TSMA, Bluetooth® must be activated and visible (see ["Visibility"](#) on page 117).
 - The "Mode of Operation" must be set to "QualiPoc" (see [Chapter 7.3, "Measurement Setup"](#), on page 48 and [Chapter A.2.1.1, "Mode"](#), on page 115).
1. After selecting mode of operation, the R&S TSMA reboots.
 2. The complete startup of the "QualiPoc" mode takes about 3 minutes.
 3. In QualiPoc®, touch the main menu **☰**, and then touch "Device manager".
 4. Touch the plus sign (+) at the top of the screen and touch "NCM".

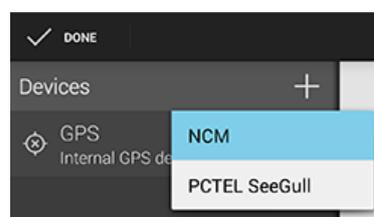


Figure 7-1: Add NCM

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

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

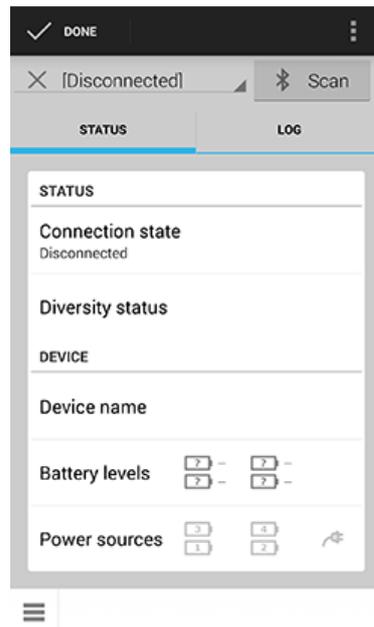


Figure 7-2: Scan for NCM

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

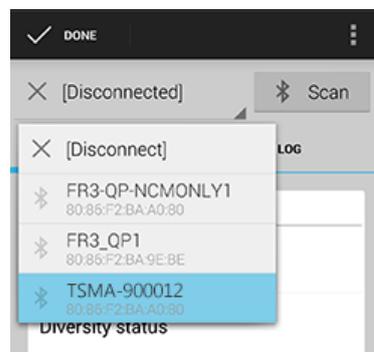


Figure 7-3: Pair NCM

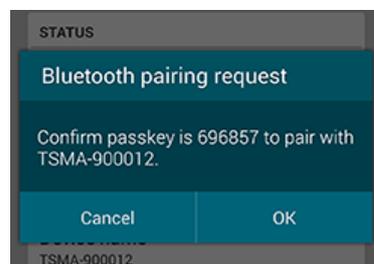


Figure 7-4: Bluetooth pairing request

7. Touch the scanner again in the list to connect to the scanner.
8. Touch the context menu icon  and touch "Start scanner detection".

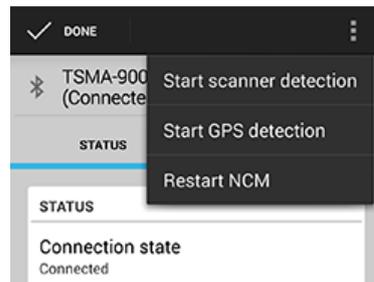


Figure 7-5: Start scanner detection

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

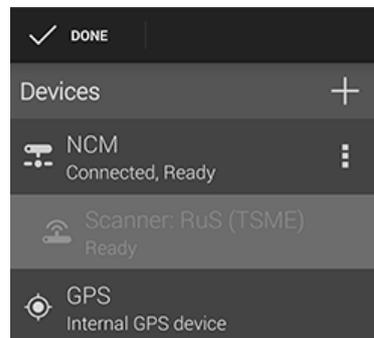


Figure 7-6: Scanner ready

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

7.4.3 NESTOR and NESTOR Probe Mode

In the "**NESTOR**" mode, which can be started only if the R&S NESTOR is installed, otherwise is dimmed, the R&S NESTOR software is hosted on the R&S TSMA. The selection of a valid workspace file is required.

In the "**NESTOR Probe**" mode, the NESTOR application operates in a distributed mode and only the NESTOR measurement engine is hosted on the R&S TSMA. Configuration and control of the measurement is done on a remote PC.

To use the R&S TSMA in "NESTOR" mode, the following steps must be performed.

Prerequisites:

- R&S TSMA-NESTOR software package must be installed on the R&S TSMA. The software package is pre-installed at delivery when the R&S TSMA is ordered with NESTOR TSMA Option. (R&S No. 1522.8870.03).
Note: The R&S®NESTOR software installation can be executed as a post process to shipment (see [Chapter 8.2.2, "R&S NESTOR Software"](#), on page 73).
- **Only for "NESTOR" mode**
A dongle containing a smart card with R&S NESTOR option licenses must be available.

Note: If the R&S TSMA is delivered with a pre-installed R&S NESTOR software, the NESTOR smart card is integrated inside the TSMA instrument and no license dongle is necessary.

- **Only for "NESTOR Probe" mode**

The R&S TSMA and the external PC must be connected via WLAN or the LAN port of the R&S TSMA.

Import of NESTOR Workspace File

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

1. Start the R&S TSMA Web-GUI.
2. Navigate to "File Transfer/Update" menu and go to section "Upload File to TSMA".
3. Press the "Browse" button, select the desired workspace file on the remote PC and click "Upload File" (see ["File Transfer"](#) on page 121).

The file will be copied in the directory

D:\Users\Instrument\Documents\NESTOR\FavoriteWorkspace.

The file is available from the "System" > "Operation Mode" > "NESTOR" workspace select-box.

Measurement

To use the "NESTOR" or "NESTOR Probe" mode, the following steps must be performed.

1. In the Web-GUI, change the "Mode of Operation" to "NESTOR" or "NESTOR Probe" (see [Chapter 7.3, "Measurement Setup"](#), on page 48).
2. According to the selected mode, following additional settings are required.
 - a) **"NESTOR"** mode
Select a workspace (see [Chapter A.2.1.1, "Mode"](#), on page 115).
 - b) **"NESTOR Probe"** mode
Client and server detect each other automatically when connected via LAN resp. WLAN.
The NESTOR application must be started on the host PC/tablet. The NESTOR software installed on the host PC controls the measurement.
3. Click "Submit" to save your selection.

In the case, the TSMA is rebooted and starts a NESTOR measurement with the selected workspace file.
In the case, Client and Server detect each other automatically if connected via LAN resp. WLAN.

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

7.4.4 ROMES Mode

In the "**ROMES**" mode, the ROMES software is hosted on the R&S TSMA and the selection of a valid workspace file is required.



The ROMES mode is only displayed if the ROMES setup has been executed (see [Chapter 8.2.4, "R&S ROMES Setup"](#), on page 79).



For the first time after installation, R&S ROMES has to be started from the Windows desktop icon. After closing R&S ROMES, now it is possible to start R&S ROMES via the R&S TSMA Web-GUI.

To use the R&S TSMA with R&S ROMES, the following steps must be performed.

Prerequisites:

- R&S TSMA-ROMES software package (`TSMA-ROMES-setup-<version>.exe`) has to be installed on the R&S TSMA (see [Chapter 8.2.4, "R&S ROMES Setup"](#), on page 79)
- A ROMES license dongle must be connected to a USB port of the R&S TSMA.

Import of ROMES Workspace File

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

1. Start the R&S TSMA Web-GUI.
2. Navigate to "File Transfer/Update" 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" (see ["File Transfer"](#) on page 121).
4. The file will be copied by default in the directory
`C:\ProgramData\Rohde&Schwarz\My ROMES\Workspace.`

Measurement

To use the "ROMES" mode, the following steps must be performed.

1. In the Web-GUI, change the "Mode of Operation" to "ROMES" or "ROMES Probe" (see [Chapter 7.3, "Measurement Setup"](#), on page 48).
2. Configure the following settings (see [Chapter A.2.1.1, "Mode"](#), on page 115):
 - Workspace File
In the drop-down menu, select a ROMES workspace file.
 - Recording
Activating this checkbox, the ROMES measurement data are written to the TSMA hard disk.
 - IP Controlled

Activating this checkbox, the ROMES measurement can be controlled via IP from an external host PC. To use this feature, the ROMES option ROMES4RCO is required.

3. Click "Submit" to save your selection.

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

7.4.5 PC Mode

The "PC Mode" is used for software update of the R&S TSMA.

7.4.6 Scanner Only Mode

In the *scanner only* mode, only the scanner unit of the R&S TSMA is active, the PC unit is in stand-by mode. In this case, the scanner unit (R&S TSME) can be connected via the SCAN port 1 with a host PC.

To use the R&S TSMA in *scanner only* mode, the following steps must be performed.

1. Switch off the R&S TSMA and activate the *scanner only* mode by pressing the POWER ON/OFF button more than 2 s and less than 5 s.
The STATE LED lights yellow.
2. Connect the scan port (1) with your PC.



Figure 7-7: Scan ports of R&S TSMA

1 = Scan port to be connected with PC in scanner only mode

The default IP address of the R&S TSMA scanner component is 192.168.0.2.

7.5 Power Settings

The power settings for an R&S TSMA can be modified according to following rules.

With the setting "Auto Power On", the R&S TSMA starts automatically, when a DC power supply is connected.

With the setting "Remember Last State", the R&S TSMA uses the last state before the R&S TSMA was powered off.

Additionally, the setting "Auto Power Off" can be activated. In this case, the R&S TSMA is powered off, if a DC power supply is no longer available.

See also [Chapter A.2.1.2, "Power"](#), on page 115.

8 Update and Restore

8.1 Firmware Update

8.1.1 Preparing Installation

Firmware update packages for the R&S TSMa 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 TSMa_x Firmware V *ww.xx.yy.zz**.

There are several ways how to install firmware and software components on the R&S TSMa. Select the preferred way.

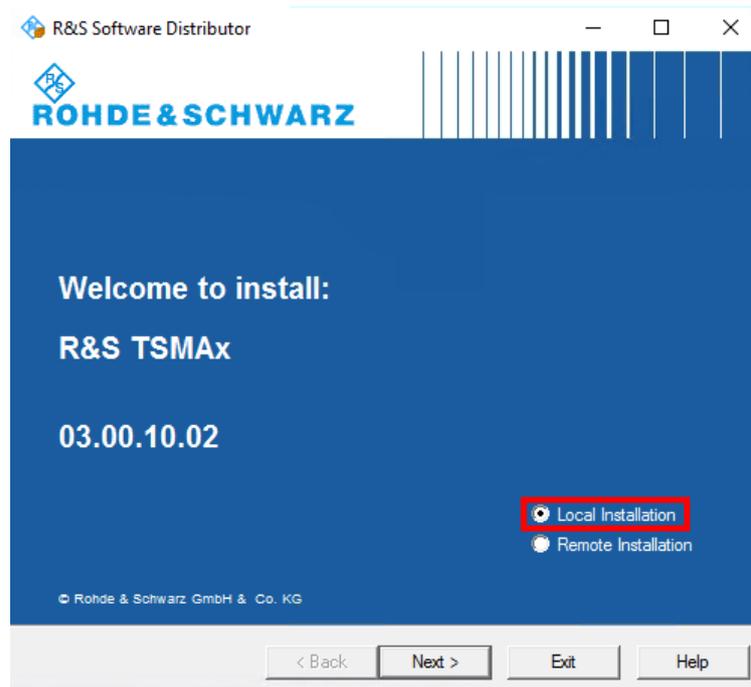


For software installations (NESTOR, ROMES, DiversityProbe for QualiPoc), use only the TSMa-specific setup files (TSMa-*<AppName>*-|*<version>*-setup.exe).

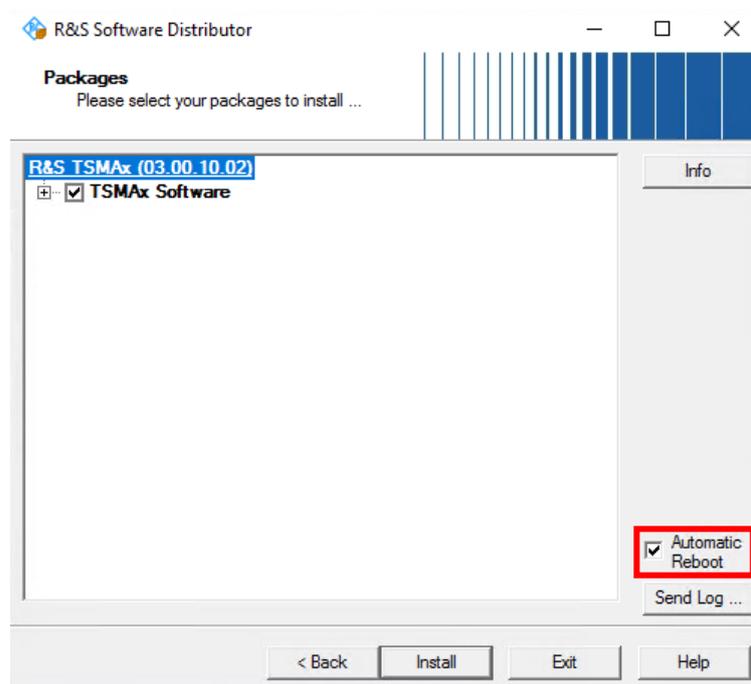
8.1.2 Executing Setup

8.1.2.1 Local Execution of the Setup File

1. Connect mouse and keyboard to USB ports and a monitor to the mini display port. The setup file must be available on the R&S TSMa or on a USB stick.
2. Switch on the R&S TSMa via the power button.
3. Copy the setup file.
 - a) For firmware installation:
Copy the firmware setup file `TSMax-Setup-<Version>.exe` into a temporary directory on the local disk of the R&S TSMa.
 - b) For software installation:
Copy the corresponding setup file into a temporary directory on the local disk of the R&S TSMa.
4. Check that R&S TSMa is in "PC Mode", see [Chapter 8.1.4, "Checking Mode of Operation"](#), on page 67.
5. Open the Windows Explorer and execute the setup file `TSMax-Setup-<Version>.exe`.
6. The "R&S Software Distributor" comes up. Select "Local Installation" and press "Next >".



- The package dialog lists all the available packages in the setup. Normally, this dialog can be skipped without any changes. Select "Automatic Reboot".



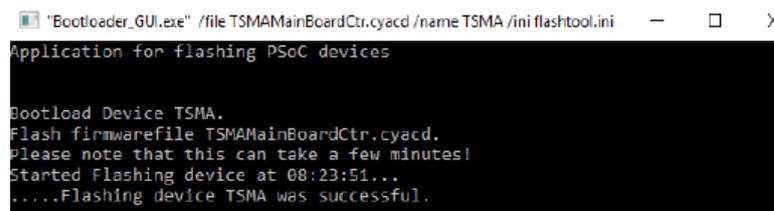
- Press "Install >".

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

9. Finally, when all firmware/software packages are installed, a restart is executed.
10. When the R&S TSMAx firmware comes up again, the mainboard firmware is updated.

Note: Step [step 10](#) and [step 11](#) are only performed during firmware update, if the firmware package contains a new mainboard firmware.

The following dialog appears:



```

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

Bootload Device TSMA.
Flash firmwarefile TSMAMainBoardCtr.cyacd.
Please note that this can take a few minutes!
Started Flashing device at 00:23:51...
....Flashing device TSMA was successful.

```

The mainboard flash is indicated like following:

- STATE LED = white
- SCAN LED = off

11. After the flash of the mainboard firmware, the device switches off hard and reboots.
12. The firmware/software installation has finished, when the LEDs display the following state.
STATE LED = yellow resp. green (depends on the state of the WLAN access point)
13. Reload the web GUI and verify the displayed firmware/software version in the "Overview" menu. The installed version needs to be indicated.

The R&S TSMA is ready for operation.

8.1.2.2 Remote Installation of the Setup File

1. Copy the setup file.
 - a) For firmware installation:
Copy the firmware setup file `TSMAX-Setup-<Version>.exe` into a temporary directory on the remote PC.
 - b) For software installation:
Copy the corresponding setup file into a temporary directory on the remote PC.
2. Establish a LAN respectively WLAN connection between the remote PC and the R&S TSMA.
 - a) **Using LAN Connection**
 - Connect the LAN port of the R&S TSMA with the host PC LAN port.
The LAN port is marked with LAN.
The default IP setting of this port is "DHCP client". For details on how to configure the remote PC, contact your network administrator.
 - Switch on the R&S TSMA via power button.

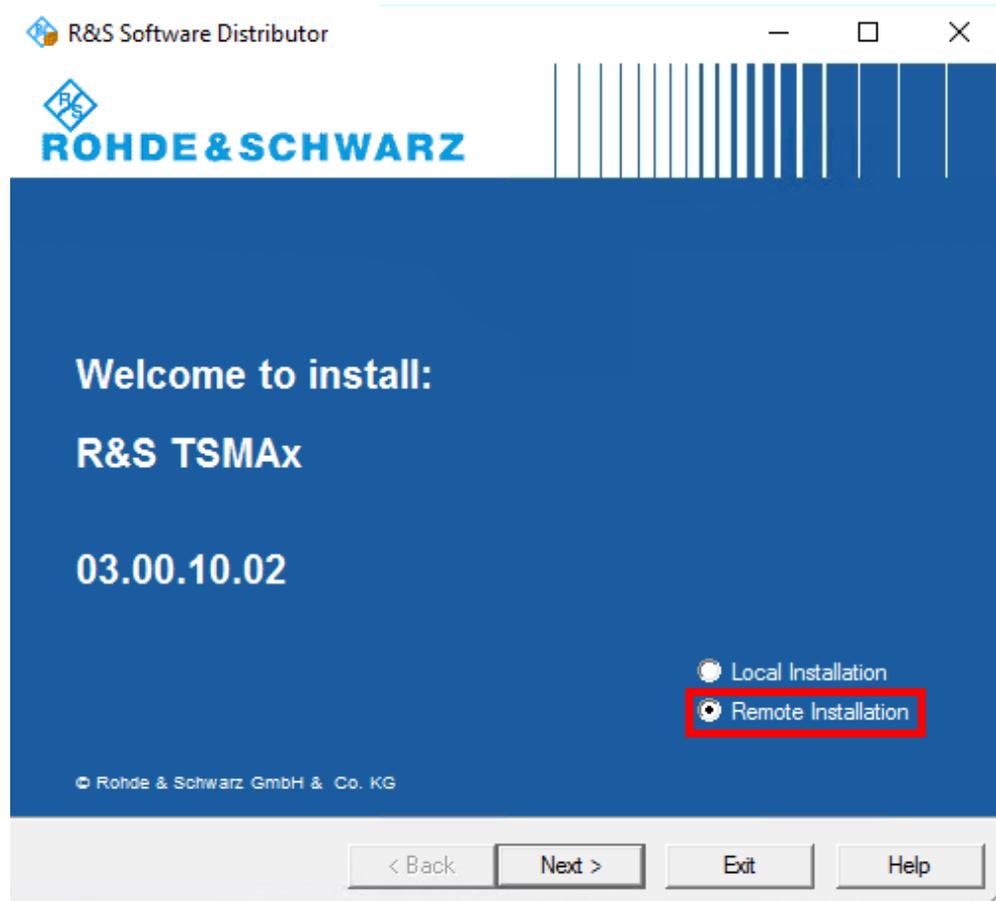
b) Using WLAN Connection

- Switch on the R&S TSMA via power button.
- On the remote PC, search for the R&S TSMA WLAN and connect to the network. The necessary access parameters can be found on a label at the bottom of the device.

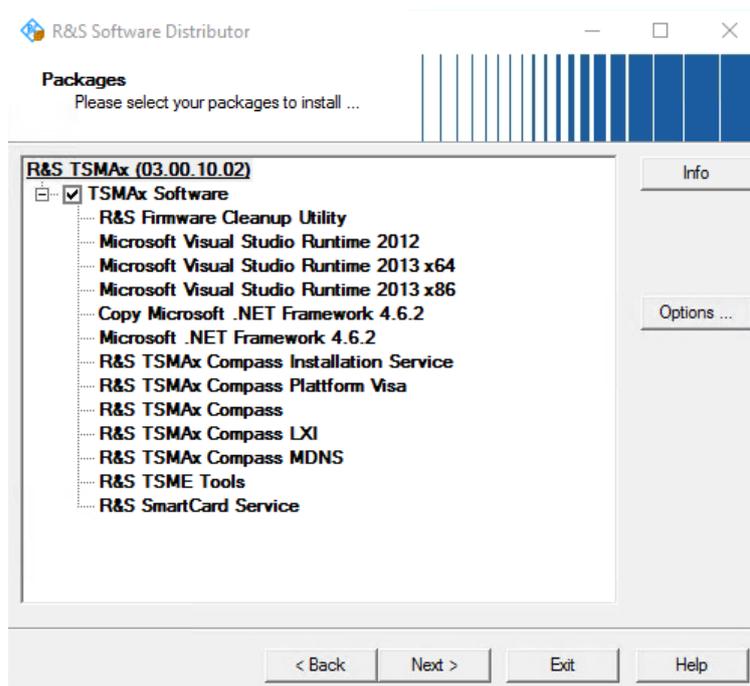
WLAN SSID: *TSMA-<xxxxxx> xxxxxx*: individual serial number

WLAN key: *instrument* (default)

3. Execute the firmware setup file on the connected remote PC. The "R&S Software Distributor" dialog box is coming up



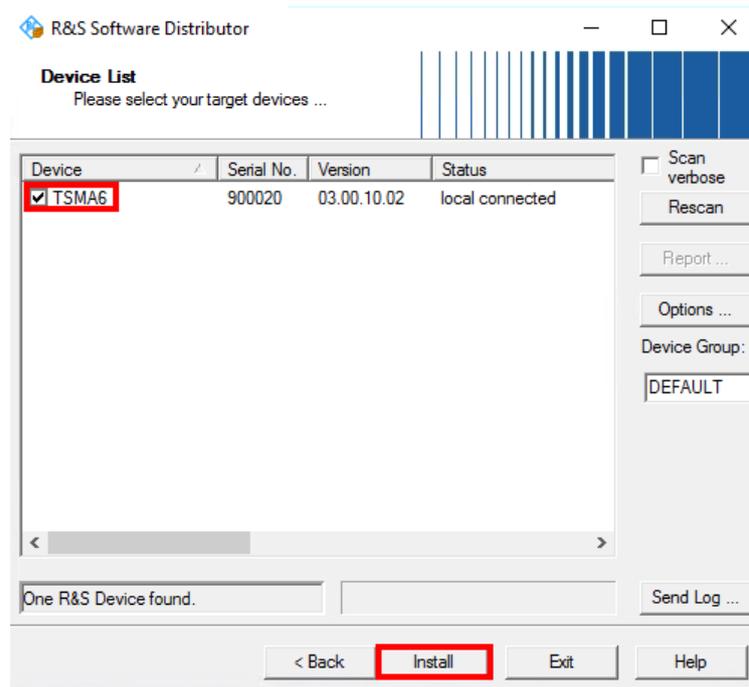
4. Select "Remote Installation" and click "Next>".
5. The package dialog list all the available packages to install.



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

6. Click "Next>".
7. After a while, all R&S TSMA devices in the network are listed in the "Device List" dialog.

Devices with a firmware version > 02.xx.yy.zz are only listed, if the device is in "PC Mode" (see [Chapter 8.1.4, "Checking Mode of Operation"](#), on page 67). 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.



8. Click "Install".

Note: Do not switch off or unplug from power while running firmware/software update.
9. The state of the installation process is displayed in the "Status" column. The process is finished when the status indicates "Ready...".
10. Press "Exit".
11. Reload the R&S TSMA web GUI (see [Chapter 8.1.3, "Calling R&S TSMA Web GUI"](#), on page 66) and verify the installed firmware /software version in the "Overview".

The R&S TSMA is ready for operation.

8.1.2.3 Installation Using a USB Stick

The setup will be initiated via the web GUI of the R&S TSMA. In this case, the setup file must be available in the root directory of a USB stick, which is connected to the R&S TSMA.

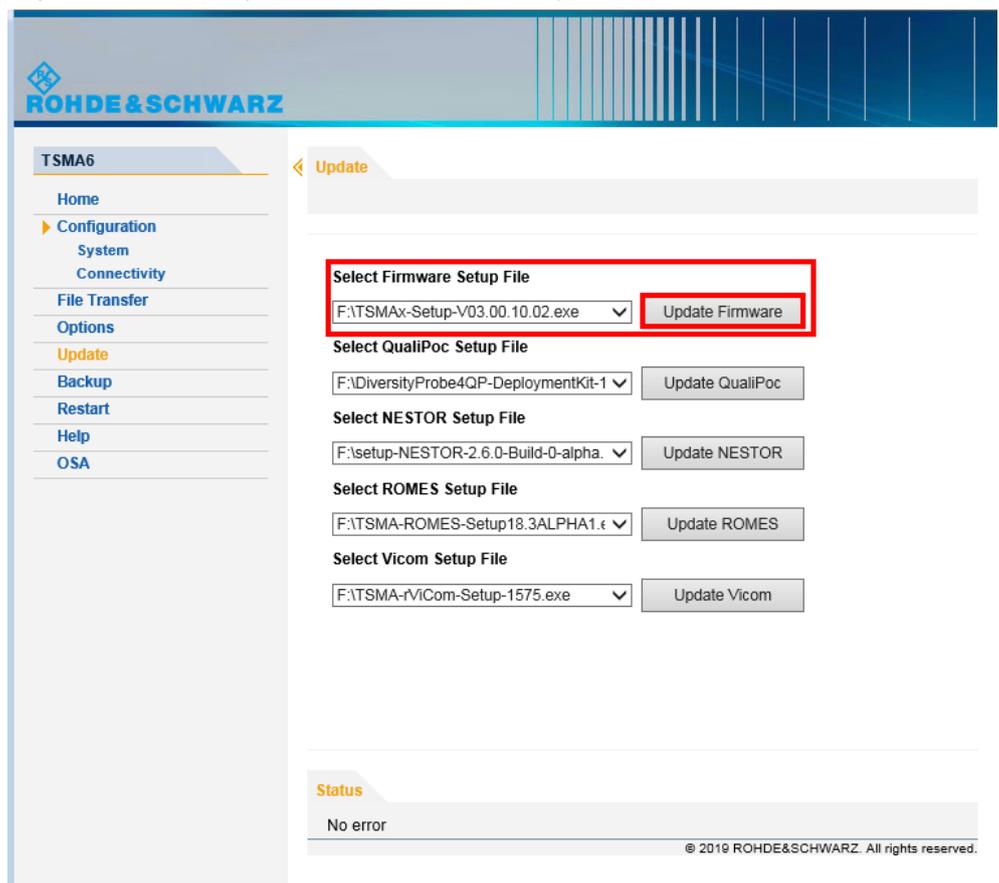


If a restart is performed during the setup, the message *System is Restarting* is displayed in the status bar. For a short time, the web GUI is not accessible.

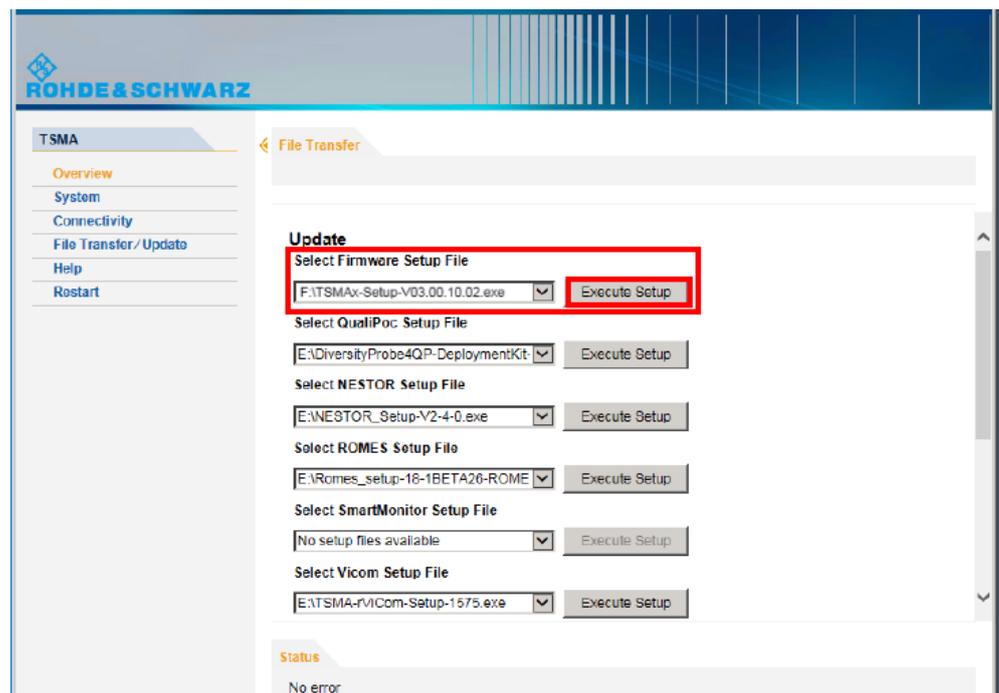
Do not interrupt the browser session on the remote PC. After a successful update, the web GUI will be refreshed.

1. Connect mouse, keyboard to the USB ports and a monitor.

2. Switch on the R&S TSMA via power button.
3. Copy the setup file onto a USB memory stick.
 - a) For firmware installation: Copy the firmware setup file `TSMAX-Setup-<Version>.exe` into the root directory of the stick.
 - b) For software installation: Copy the corresponding setup file into the root directory of the stick.
4. Open the R&S TSMAx web GUI, see [Chapter 8.1.3, "Calling R&S TSMA Web GUI"](#), on page 66.
5. In the R&S TSMAx web GUI navigate to the menu
 - "Update" (FW version \geq 02.22.03.00) or
 - "File Transfer / Update" (FW version \leq 01.32.00.04)
 Open the "Select Firmware Setup File "select box.
6. Select the appropriate firmware setup file `TSMAX-Setup-<Version>.exe` and press
 - "Update Firmware" (FW version \geq 02.22.03.00)

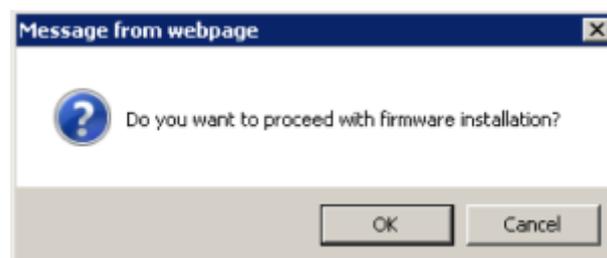


- "Execute Setup" (FW version \leq 01.32.00.04)



next to the select box.

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



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

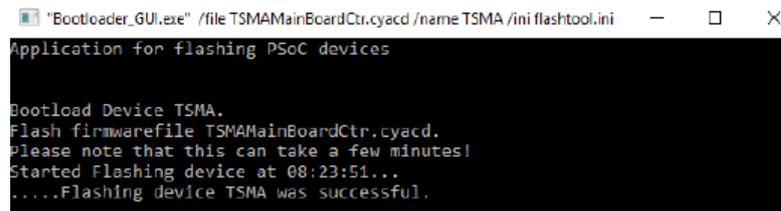


The STATE LED starts blinking blue.

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

9. After the installation of all firmware/software packages, the R&S T SMA reboots. Starting with firmware version 03.00.10.02, the mode LED changes to blinking green (selftest).
10. After the reboot, call the R&S T SMA web GUI. The status text `Installation successful` is displayed.

11. About one minute after the operating system is up again, the flash of the mainboard firmware starts.



```
"Bootloader_GUI.exe" /file TSMAMainBoardCtr.cyacd /neme TSMA /ini flashtool.ini
Application for flashing PSoC devices

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

The microcontroller flash is indicated like following:

STATE LED = white, SCAN LED = off

Note: Step [step 11](#) is only performed during firmware update, if the firmware package contains a new mainboard firmware.

12. After the reboot, call the web GUI. After a while, the status text in the web GUI changes to `No error`.
The LED changes like following:
STATE LED = yellow resp. green (depends on the state of the WLAN access point)
13. The "Overview" page in the web GUI needs to display the installed firmware/software version.

The screenshot displays the R&S T SMA Web GUI interface. On the left is a navigation menu with options like Home, Configuration, System, Connectivity, File Transfer, Options, Update, Backup, Restart, Help, and OSA. The main content area shows the 'Overview' page with tabs for Overview, IP Settings, and HW Info. The 'FW/SW Version' section is highlighted with a red box, containing the following data:

FW/SW Version	
HW	5.00
Image	1.2 / 1.2
Firmware	03.00.10.02
ViCom	16.25.0.743
ROMES	18.3.0.347

Below this, the 'Battery Info' section shows Battery 1 at 96%, Battery 2 at 99%, Battery Life Time as Ext. DC, and Mainboard Temperature at 41 °C. At the bottom, the 'Status' section indicates 'No error'.

8.1.3 Calling R&S T SMA Web GUI

The R&S T SMA 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://192.168.1.10`
- Remote from a LAN connected device
Enter the URL `http://TSMAX-xxxxxx.local` into the browser.
TSMAX-xxxxxx = R&S T SMA host name
This information can be found on a label at the bottom.
- Local
Open the Internet Explorer. The web GUI should be loaded automatically. If not, enter the URL `http://localhost` into the browser.

8.1.4 Checking Mode of Operation

In order to execute the setup on the R&S TSMA, the mode of operation has to be "PC Mode".

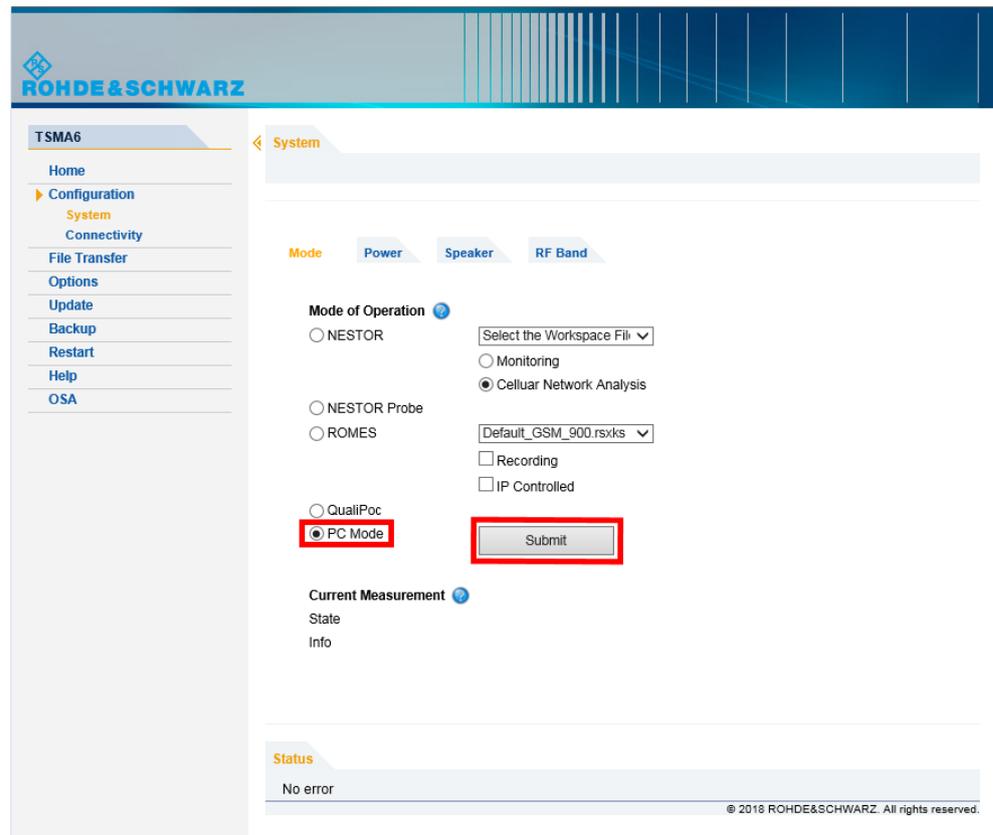
1. Open the R&S TSMA web GUI. Use one of the following options.
 - Remote from a WLAN connected device
Start the web browser and enter the following URL:
`http://192.168.1.10`
 - Remote from a LAN connected device
Enter the URL `http://TSMaX-xxxxxxx.local` into the browser.
`TSMaX-xxxxxxx` = R&S TSMA host name
This information can be found on a label at the bottom.
 - Local
Open the Internet Explorer. The web GUI should be loaded automatically. If not, enter the URL `http://localhost` into the browser.
2. The mode of operation is displayed in the "Overview" page. If the mode is already "PC Mode", you can continue with [Chapter 8.1.2, "Executing Setup"](#), on page 57.

The screenshot displays the R&S TSMA6 web interface. On the left is a navigation menu with options: Home, Configuration (System, Connectivity), File Transfer, Options, Update, Backup, Restart, Help, and OSA. The main content area is titled 'Overview' and contains three tabs: Overview (selected), IP Settings, and HW Info. Under the 'Overview' tab, there are several sections of device information:

- Device Info**
 - Type: TSMA6
 - Material No.: 4900.8005.02
 - Serial No.: 900020
 - Computer Name: TSMA6-900020
 - Mode of Operation: PC Mode** (highlighted with a red box)
 - Bluetooth/WLAN: BT: On / WLAN: On / AP: On
- FW/SW Version**
 - HW: 5.00
 - Image: 1.2 / 1.2
 - Firmware: 03.00.10.02
 - ViCom: 16.25.0.743
 - ROMES: 18.3.0.347
- Battery Info**
 - Battery 1: 96 %
 - Battery 2: 99 %
 - Battery Life Time: Ext. DC
 - Mainboard Temperature: 41 °C

At the bottom, a 'Status' section indicates 'No error'. A copyright notice at the bottom right reads: © 2019 ROHDE&SCHWARZ. All rights reserved.

3. 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".

The R&S TSMA is ready for firmware update / software installation.

8.2 Software Installation

Following software components are available for installation on the R&S TSMA.

- Remote ViCom Server
- R&S NESTOR
- R&S ROMES
- SwissQual QualiPoc



Before starting with software installation, check the latest TSMA firmware release notes under <https://www.rohde-schwarz.com/firmware/tsmx/>.

8.2.1 Remote ViCom Server Software

The Remote ViCom Server (rViCom) is an additional software package for the R&S TSMA. The latest version of this package is pre-installed on any shipped R&S TSMA.



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

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



The installed version of the Remote ViCom server on the R&S TSMA need 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 TSMA 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 TSMA.
-

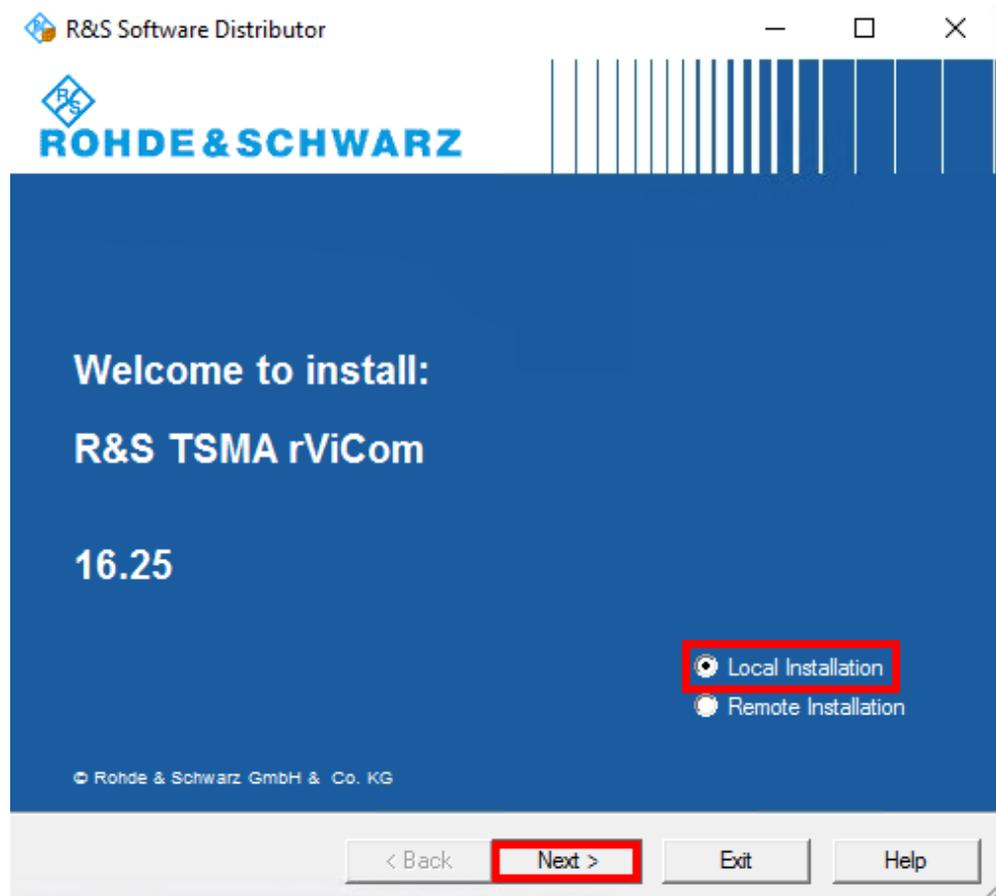
8.2.1.1 Preparation

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 how to prepare.

8.2.1.2 ViCom Server Local Installation

Follow the general instructions in [Chapter 8.1.2.1, "Local Execution of the Setup File"](#), on page 57, [step 1](#) to [step 4](#).

1. Open the Windows Explorer and execute the setup file `TSMAX-rViCom-Setup-<Version>.exe`.
2. The "R&S Software Distributor" window comes up. Select "Local Installation" and press "Next".



3. All subsequent steps are similar to local firmware installation, see [Chapter 8.1.2.1, "Local Execution of the Setup File"](#), on page 57, [step 7](#) and following.

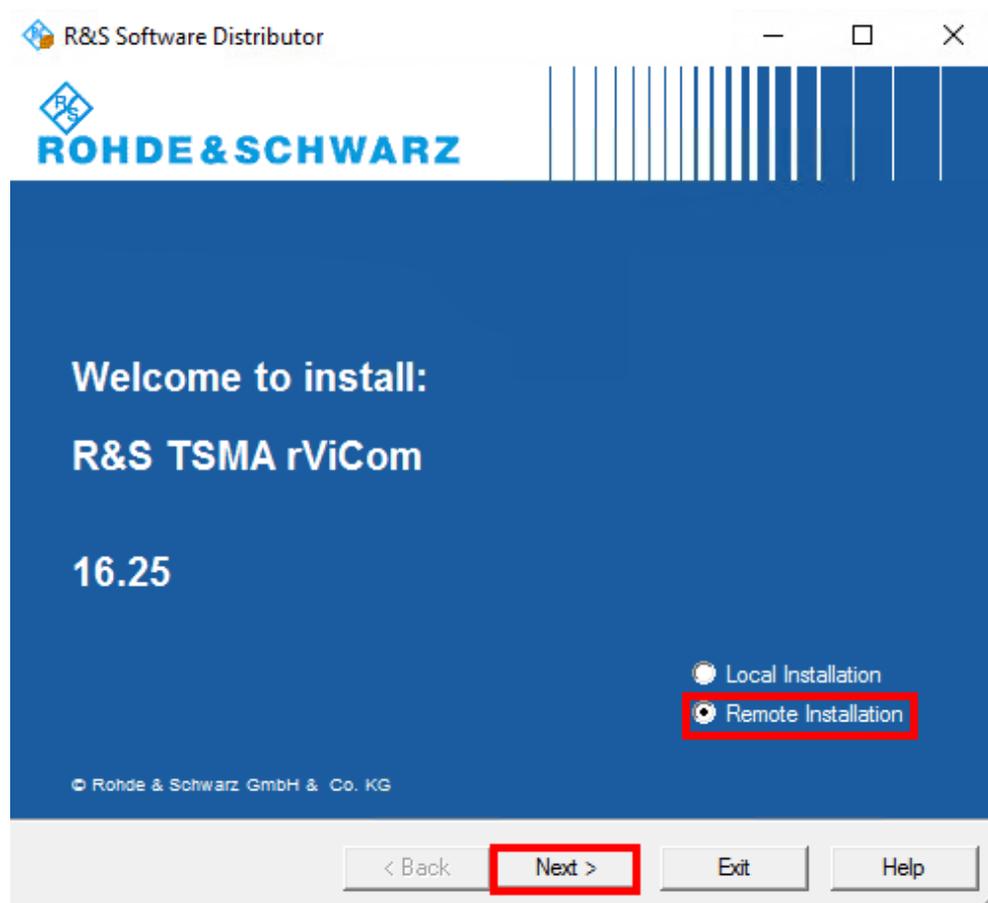


Do not switch off or unplug from power while running firmware/software update.

8.2.1.3 ViCom Server Remote Installation

Follow the general instructions in [Chapter 8.1.2.2, "Remote Installation of the Setup File"](#), on page 59, [step 1](#) to [step 2](#).

1. Execute the setup file `TSMaX-rViCom-Setup-<Version>.exe` on the remote PC.
2. The "R&S Software Distributor" comes up. Select "Remote Installation" and press "Next >".

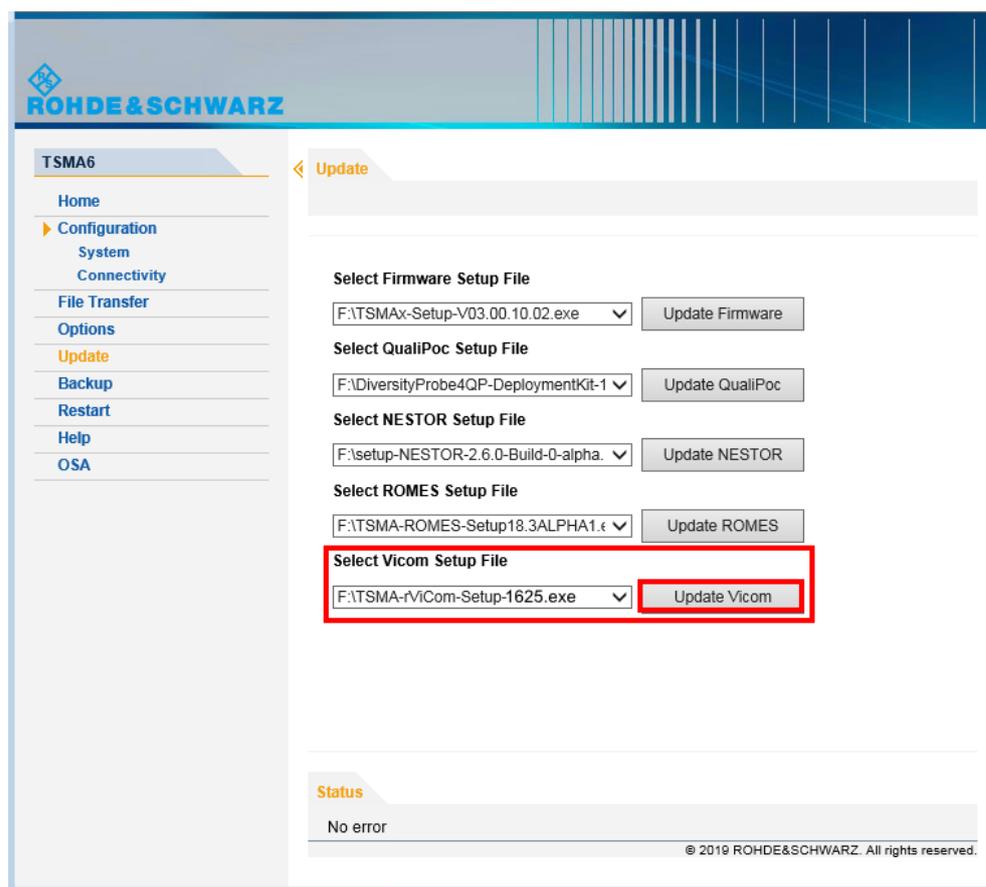


3. All subsequent steps are similar to remote firmware installation, see [Chapter 8.1.2.2, "Remote Installation of the Setup File"](#), on page 59, [step 4](#) and following.

8.2.1.4 ViCom Server Installation Using a USB Stick

Follow the general instructions in [Chapter 8.1.2.3, "Installation Using a USB Stick"](#), on page 62, [step 1](#) to [step 5](#).

1. Select the appropriate firmware setup file
`TSMaX-rViCom-Setup-<Version>.exe` and press the button next to the select box.
 - Firmware version 01.xx.yy.zz: "Execute Setup"
 - Firmware version from 02.xx.yy.zz: "Update ViCom"



2. The following steps are similar to the installation using a USB stick, see [Chapter 8.1.2.3, "Installation Using a USB Stick"](#), on page 62, [step 7](#) to [step 10](#).

8.2.2 R&S NESTOR Software



Only execute the dedicated NESTOR setup for R&S T SMA. The setup file is named TSMAX_NESTOR_Setup-<Version>.exe.

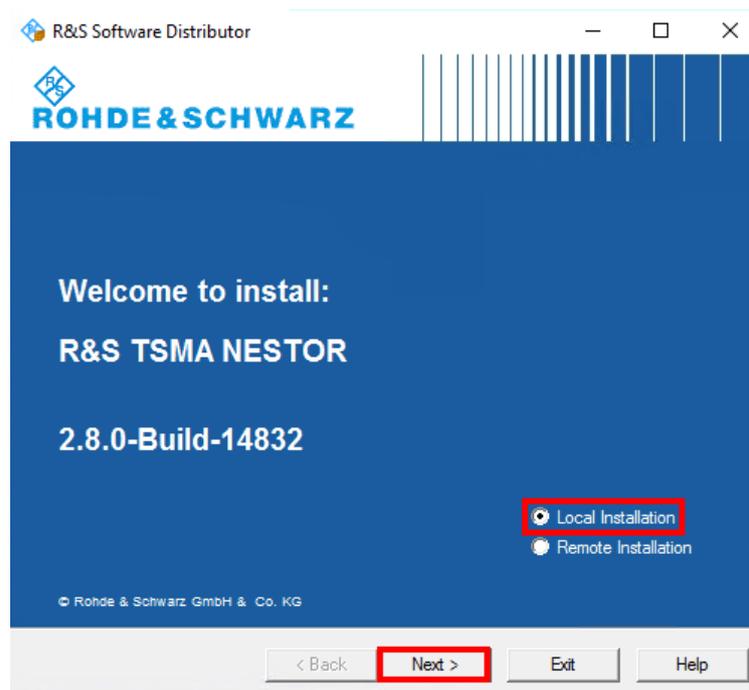
8.2.2.1 Preparation

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 how to prepare.

8.2.2.2 NESTOR Local Installation

Follow the general instructions in [Chapter 8.1.2.1, "Local Execution of the Setup File"](#), on page 57, [step 1](#) to [step 4](#).

1. Open the Windows Explorer and execute the NESTOR setup file "TSMAX_NESTOR_Setup-<Version>.exe".
2. The "R&S Software Distributor window" comes up. Select "Local Installation" and press "Next".



3. All subsequent steps are similar to local firmware installation, see [Chapter 8.1.2.1, "Local Execution of the Setup File"](#), on page 57, [step 7](#) and following.

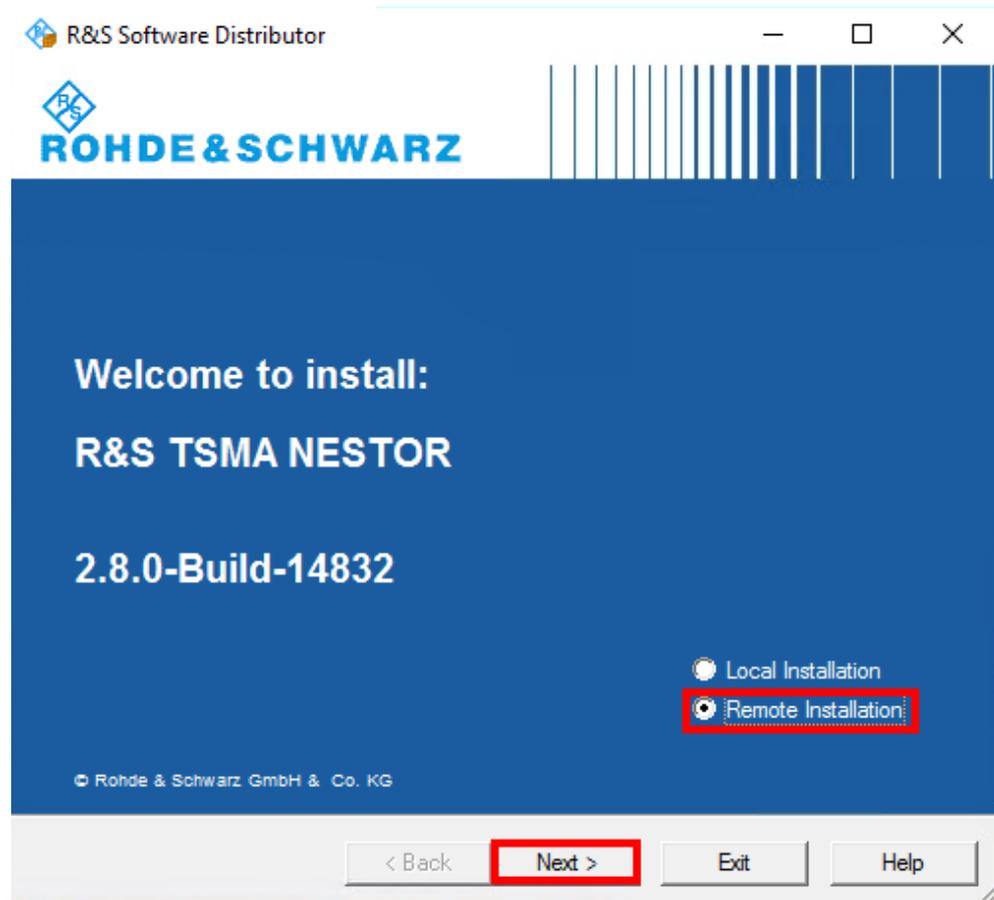


Do not switch off or unplug from power while running firmware/software update.

8.2.2.3 NESTOR Remote Installation

Follow the general instructions in [Chapter 8.1.2.2, "Remote Installation of the Setup File"](#), on page 59, [step 1](#) to [step 2](#).

1. Execute the setup file "TSMAX_NESTOR_Setup-<Version>.exe" on the remote PC.
2. The "R&S Software Distributor" comes up. Select "Remote Installation" and press "Next >".

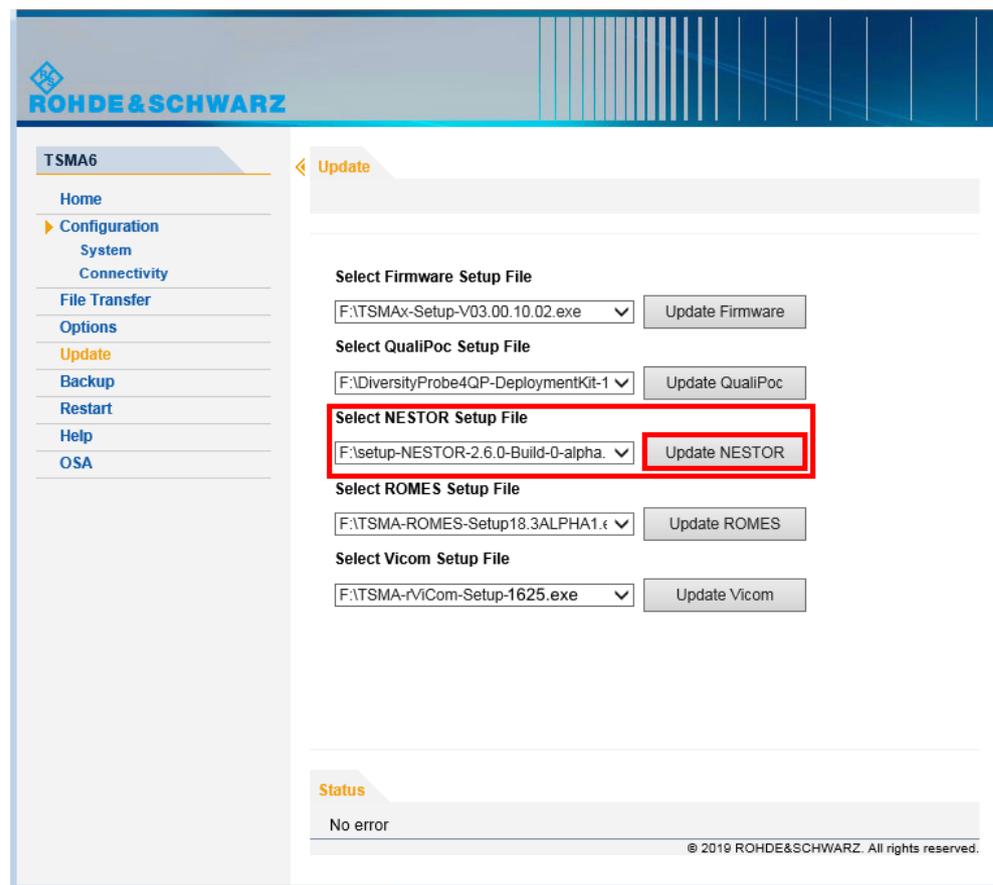


3. All subsequent steps are similar to remote firmware installation, see [Chapter 8.1.2.2, "Remote Installation of the Setup File"](#), on page 59, [step 4](#) and following.

8.2.2.4 NESTOR Installation Using a USB Stick

Follow the general instructions in [Chapter 8.1.2.3, "Installation Using a USB Stick"](#), on page 62, [step 1](#) to [step 5](#).

1. 1. Select the appropriate NESTOR setup file
`TSMaX_NESTOR_Setup-<Version>.exe` and press the button next to the select box.
 - Firmware version 01.xx.yy.zz: "Execute Setup"
 - Firmware version from 02.xx.yy.zz: "Update NESTOR"



2. The following steps are similar to the installation using a USB stick, see [Chapter 8.1.2.3, "Installation Using a USB Stick"](#), on page 62, [step 7](#) to [step 10](#).

8.2.3 SwissQual DiversityProbe for QualiPoc Software



Version 15.2.0.25 or greater must be installed on the R&S T SMA.

Only execute the dedicated QualiPoc setup for R&S T SMA. The setup file is named `DiversityProbe4QP-DeploymentKit-<Version>.exe`.

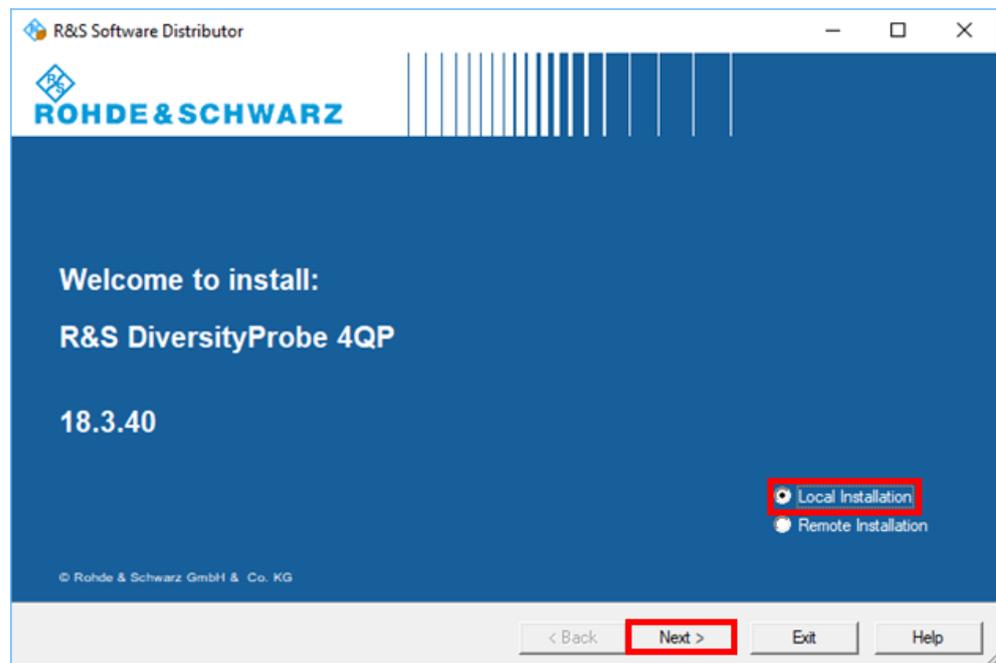
8.2.3.1 Preparation

1. Download the QualiPoc setup file `DiversityProbe4QP-DeploymentKit-<Version>.exe` from the Rohde & Schwarz FTP server respectively QualiPoc CD-ROM.
2. Choose the way of installation and follow the instructions how to prepare.

8.2.3.2 DiversityProbe for QualiPoc Local Installation

Follow the general instructions in [Chapter 8.1.2.1, "Local Execution of the Setup File"](#), on page 57, [step 1](#) to [step 4](#).

1. Open the Windows Explorer and execute the QualiPoc setup file `DiversityProbe4QP-DeploymentKit-<Version>.exe`.
2. The "R&S Software Distributor" window comes up. "Select Local Installation" and press "Next".

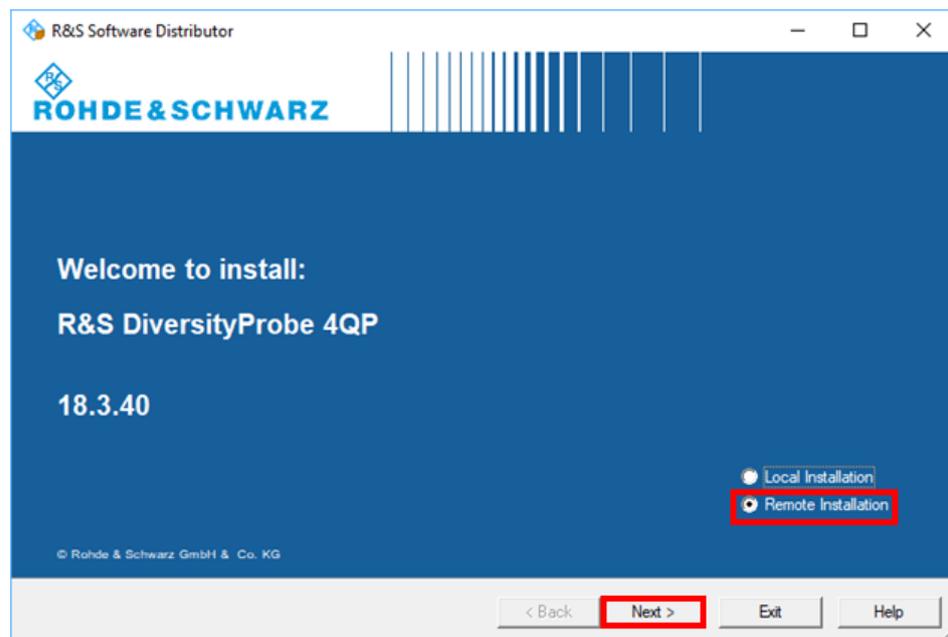


3. All subsequent steps are similar to local firmware installation, see [Chapter 8.1.2.1, "Local Execution of the Setup File"](#), on page 57, [step 7](#) and following.

8.2.3.3 DiversityProbe for QualiPoc Remote Installation

Follow the general instructions in [Chapter 8.1.2.2, "Remote Installation of the Setup File"](#), on page 59, [step 1](#) to [step 2](#).

1. Execute the QualiPoc setup file `DiversityProbe4QP-DeploymentKit-<Version>.exe` on the remote PC.
2. The "R&S Software Distributor" comes up. Select "Remote Installation" and press "Next >".

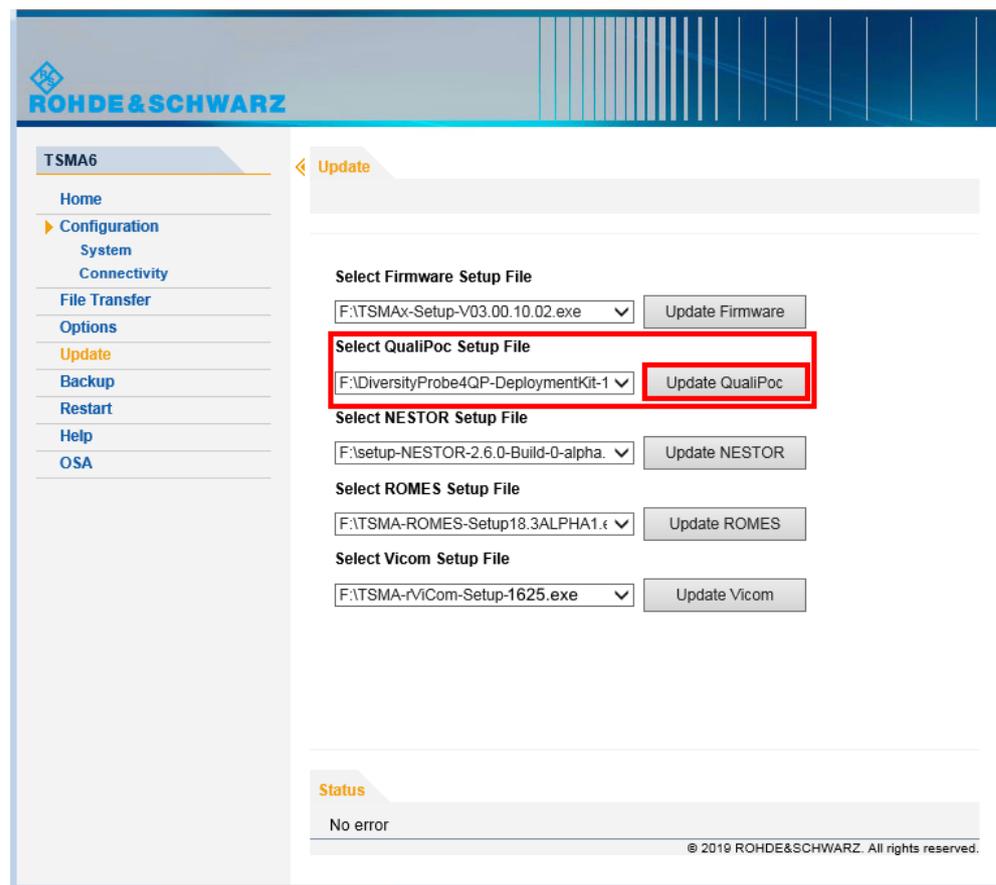


3. All subsequent steps are similar to remote firmware installation, see [Chapter 8.1.2.2, "Remote Installation of the Setup File"](#), on page 59, [step 4](#) and following.

8.2.3.4 DiversityProbe for QualiPoc Installation Using a USB Stick

Follow the general instructions in [Chapter 8.1.2.3, "Installation Using a USB Stick"](#), on page 62, [step 1](#) to [step 5](#).

1. Select the appropriate QualiPoc setup file
`DiversityProbe4QP-DeploymentKit-<Version>.exe` and press the button next to the select box.
 - Firmware version 01.xx.yy.zz: "Execute Setup"
 - Firmware version from 02.xx.yy.zz: "Update QualiPoc"



- The following steps are similar to the installation using a USB stick, see [Chapter 8.1.2.3, "Installation Using a USB Stick"](#), on page 62, [step 7](#) to [step 10](#).

8.2.4 R&S ROMES Setup



Only execute the dedicated ROMES setup for R&S TSMA. The setup file is named `TSMAX-ROMES-Setupxyy.exe` (Example: `TSMAX-ROMES-Setup490p1.exe`).



If R&S ROMES is used together with test mobile phones, a device driver update is required. For details, see [Chapter 6.6, "R&S TSMA Driver Update"](#), on page 38.

8.2.4.1 Preparation

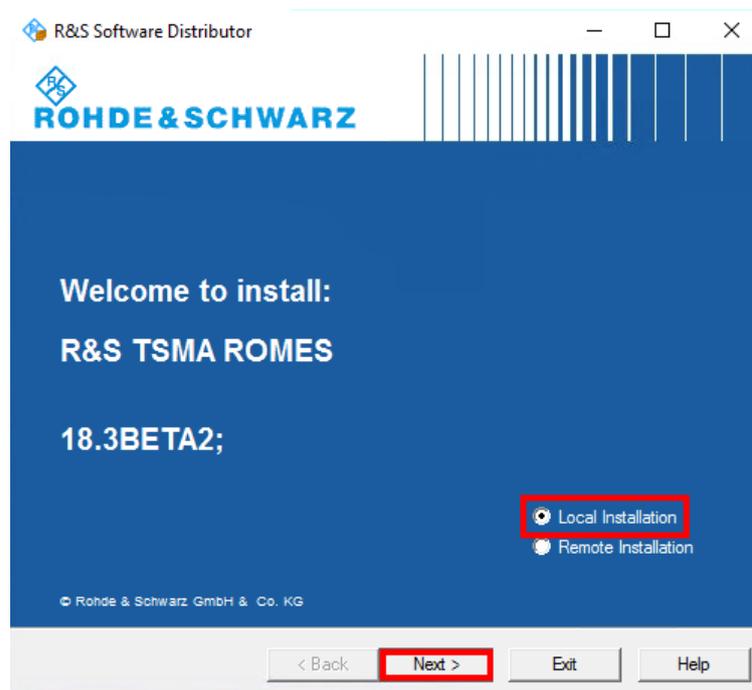
- Download the ROMES setup file `TSMAX_ROMES_Setup-<Version>.exe` from the Rohde & Schwarz FTP server respectively ROMES CD-ROM.

2. Choose the way of installation and follow the instructions how to prepare.

8.2.4.2 ROMES Local Installation

Follow the general instructions in [Chapter 8.1.2.1, "Local Execution of the Setup File"](#), on page 57, [step 1](#) to [step 4](#).

1. Open the Windows Explorer and execute the ROMES setup file `TSMaX_ROMES_Setup-<Version>.exe`.
2. The "R&S Software Distributor" window comes up. Select "Local Installation" and press "Next".

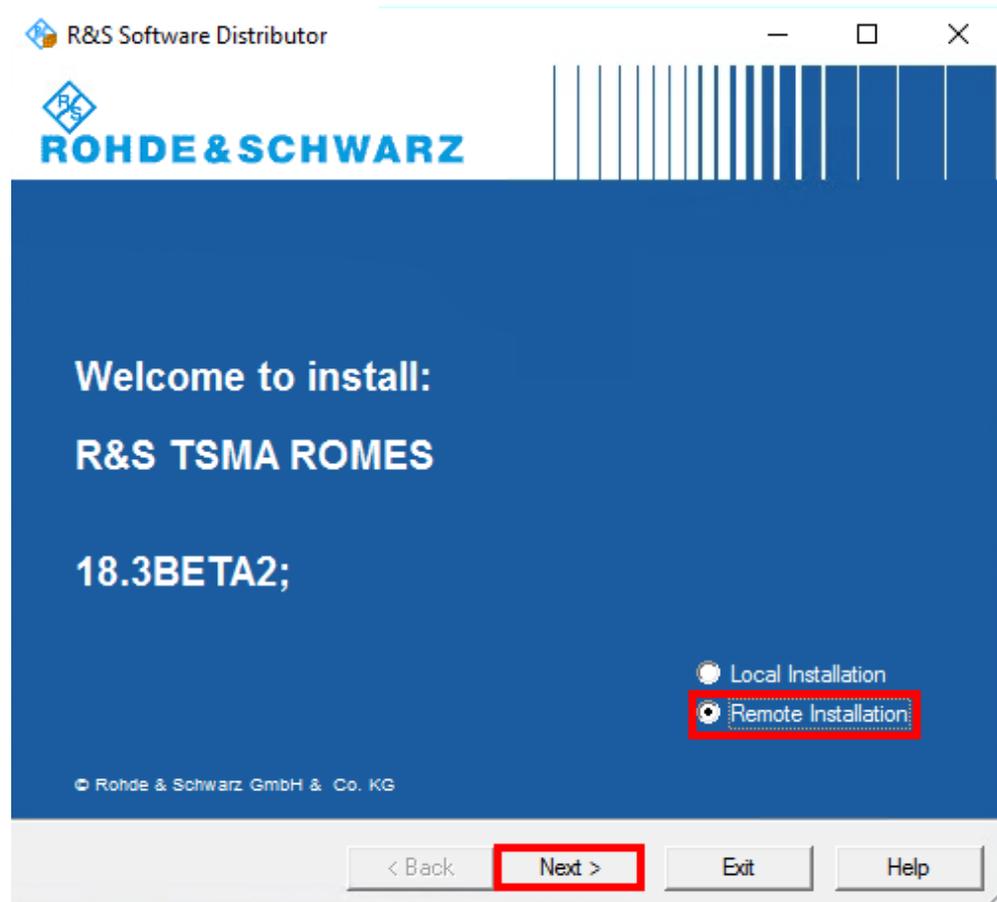


3. All subsequent steps are similar to local firmware installation, see [Chapter 8.1.2.1, "Local Execution of the Setup File"](#), on page 57, [step 7](#) and following.

8.2.4.3 ROMES Remote Installation

Follow the general instructions in [Chapter 8.1.2.2, "Remote Installation of the Setup File"](#), on page 59, [step 1](#) to [step 2](#).

1. Execute the ROMES setup file `TSMaX_ROMES_Setup-<Version>.exe` on the remote PC.
2. The "R&S Software Distributor" comes up. Select "Remote Installation" and press "Next >".

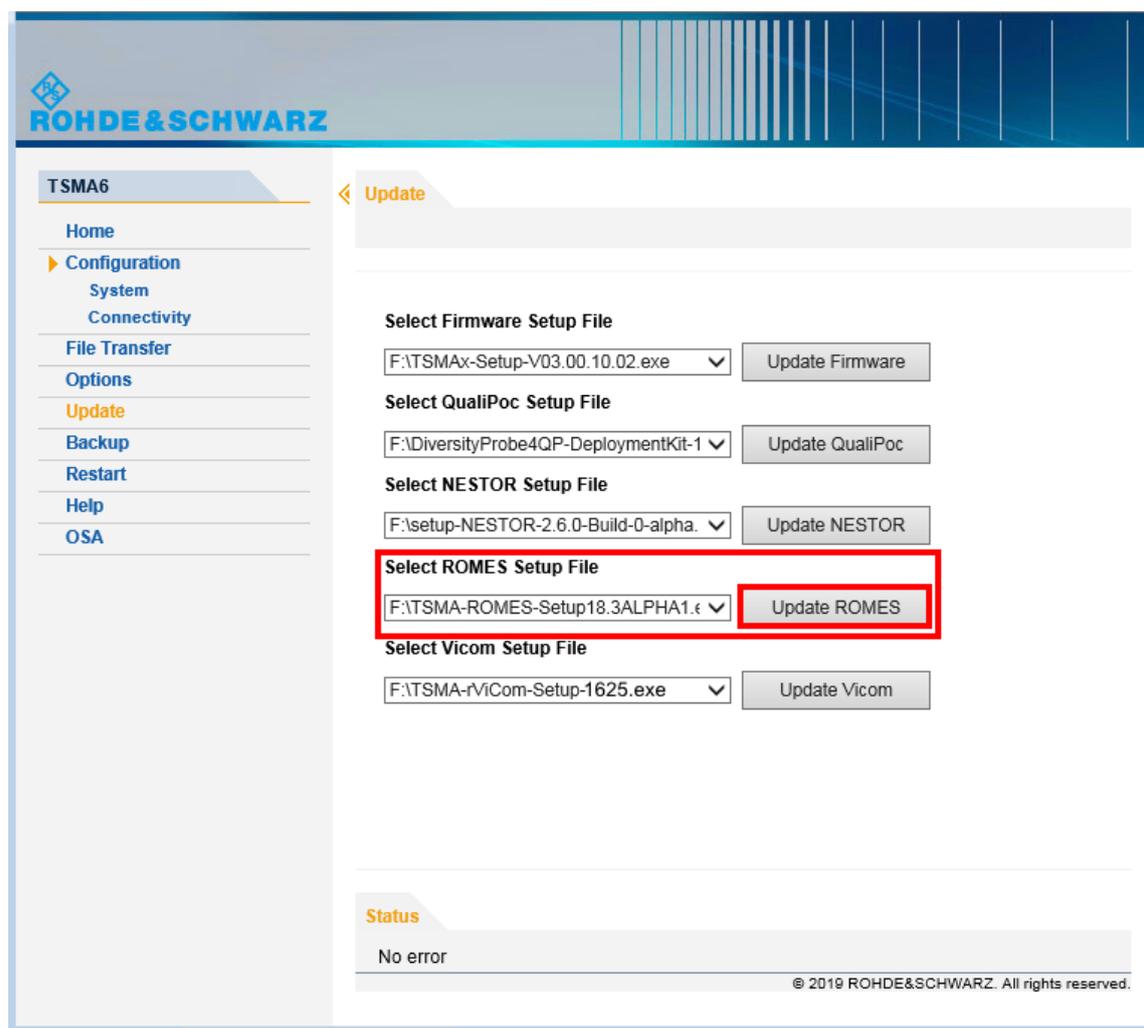


3. All subsequent steps are similar to remote firmware installation, see [Chapter 8.1.2.2, "Remote Installation of the Setup File"](#), on page 59, [step 4](#) and following.

8.2.4.4 ROMES Installation Using a USB Stick

Follow the general instructions in [Chapter 8.1.2.3, "Installation Using a USB Stick"](#), on page 62, [step 1](#) to [step 5](#).

1. Select the appropriate ROMES setup file
`TSMax_ROMES_Setup-<Version>.exe` and press the button next to the select box
 - Firmware version 01.xx.yy.zz: "Execute Setup"
 - Firmware version from 02.xx.yy.zz: "Update ROMES"



- The following steps are similar to the installation using a USB stick, see [Chapter 8.1.2.3, "Installation Using a USB Stick"](#), on page 62, [step 7](#) to [step 10](#).

8.3 Options (NESTOR, TSMA, ROMES)



The device must be in the PC Mode. Check it via the web GUI ("Overview" > "Mode of Operation").

To change the operation mode, see ["Mode of Operation"](#) on page 115).

8.3.1 Installation of NESTOR Options

In order to install R&S NESTOR options, perform the following steps.

- Start the web GUI of the R&S TSMA.

2. Navigate to "Options" > "Install" Tab (see ["Install NESTOR Options"](#) on page 122).
3. Add the license key code of a specific NESTOR option in the field "Install NESTOR Options" manually and click "Install".

8.3.2 Installation of TSMA Options

In order to install TSMA scanner options, perform the followings steps.

1. Start the web GUI of the R&S TSMA.
2. Navigate to "Options" > "Install" Tab (see ["Install Scanner Options"](#) on page 122)
3. Add the license key code of a specific scanner option in the field "Install Scanner Options" manually and click "Install".
4. Alternatively, you can install a scanner option by selecting a license xml file and clicking "Install XML file."

8.3.3 Installation of ROMES Options

In order to install an R&S ROMES option file, perform the following steps.

1. Start the web GUI of the R&S TSMA.
2. Navigate to "Options" > "Install" Tab.
3. Select the ROMES option<serial number>.dat file in the field "Install ROMES Options" and click "Install".

8.4 User Backup and Restore

8.4.1 Backup



The User Backup works only with Image Version 1.3 and later.

Image version 1.3 provides a volume size of 20 GB which is mandatory for the creation of a user backup.

In order to create a user backup, click the "User Backup" button in the web GUI ("System" > "Config" Tab), see ["Backup TSMA System"](#) on page 124. A backup of the system partition C:\ is created.

In case of an already existing user backup an acknowledgment dialog will pop up. After confirmation this user backup will be overwritten.



The backup procedure takes up to 15 minutes.

During the backup the [Mode] LED is blinking red. In the web GUI, the following status message will be displayed.

Backup is in progress...

The backup procedure has finished, when the [Mode] LED displays the normal operating state. The color of the depends on the state of the WLAN AP.

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

8.4.2 Restore

With the RESTORE button it is possible to restore the system partition R&S TSMA to the user backup (see [Chapter 8.4.1, "Backup"](#), on page 83) or to the factory backup, if no user backup exists.

In order to perform a restore, the RESTORE button must be pressed (more than 20 s) with a round, blunt pen (diameter 1-2 mm). During the recovery process, the [Mode] LED is blinking blue.



The RESTORE procedure takes up to 15 minutes!

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

When the RESTORE procedure has been completed, the color of the [Mode] LED depends on the state of the WLAN AP.

STATE LED	WLAN AP Status
green	WLAN AP off
amber	WLAN AP on

NOTICE

Loss of user settings after RESTORE

Executing restore brings the R&S TSMA irreversible back to the condition of delivery or any other subsequently stored backup version.

On the c:\ drive, all user settings and installed programs since the last restore will be deleted!

8.5 Master Image

The process of creating a master image of a R&S TSMA device and deploying this master image to other R&S TSMA devices is split into the following main steps.

- Prepare a TSMA Image Stick and a TSMA Recovery Stick (see [Chapter 8.5.1, "Prepare a TSMA Image Stick / TSMA Recovery Stick"](#), on page 85).
- Install the `RSRecoveryCreator` tool on a PC (see [Chapter 8.5.2, "Install the RSRecoveryCreator Tool"](#), on page 88).
- Capture a TSMA Image of the master device using the TSMA Image Stick (see [Chapter 8.5.3, "Capture a TSMA Image \(TSMA Image Stick\)"](#), on page 89).
- Create a TSMA Recovery Stick from a captured TSMA Image using the `RSRecoveryCreator` tool (see [Chapter 8.5.4, "Create a TSMA Recovery Stick"](#), on page 92).
- Recover the master image on a different R&S TSMA device using the TSMA Recovery Stick (see [Chapter 8.5.5, "Deploy a TSMA image from a TSMA Recovery Stick"](#), on page 94).

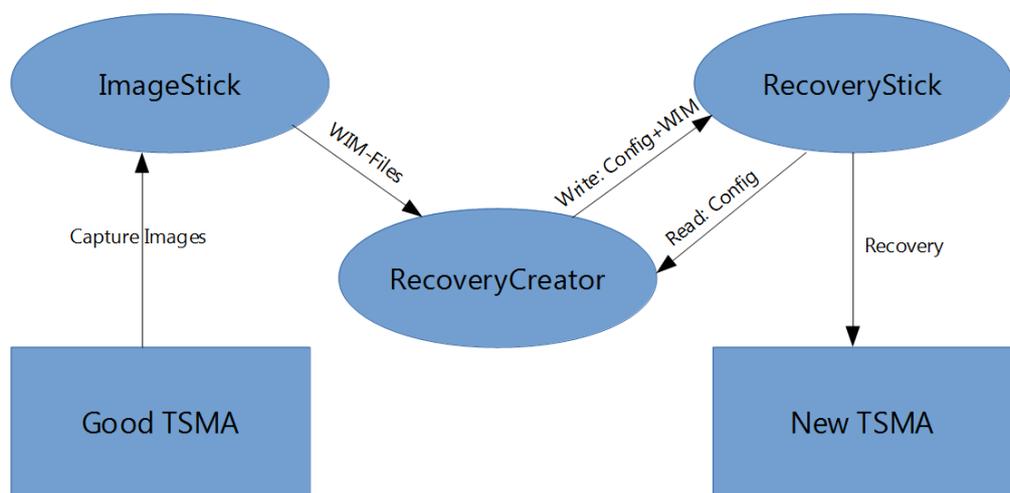


Figure 8-1: TSMA Master Image - General Overview

8.5.1 Prepare a TSMA Image Stick / TSMA Recovery Stick



The following steps must be done only once.

To create a TSMA Image Stick you need the following:

- USB 3.0 stick (minimum 16 GB memory space)
- `ImageStick_<version>.zip`
- PC with MS Windows 7 or higher operating system

To create a TSMA Recovery Stick you need the following:

- USB 3.0 stick (minimum 16 GB memory space)
- `Recovery_<version>.zip`

- PC with MS Windows 7 or higher operating system



The ImageStick_<version>.zip and Recovery_<version>.zip can be downloaded from <https://www.rohde-schwarz.com/software/tsma6/>.

8.5.1.1 USB Stick Preparation

In order to get a TSMA Image Stick / TSMA Recovery Stick out of a USB stick, the stick has to be formatted and made bootable.

Format the USB stick

1. Plug the USB stick into the USB port the PC.
2. Open the Windows explorer.
3. Select the USB device.
4. Open the context menu with a right-mouse click and select "Format".

The formatting of the stick starts.

When the formatting has finished, continue with the following procedure to make the USB stick bootable.

Make the USB stick bootable

1. Open the command prompt (`cmd.exe`) and run the DiskPart program with the `diskpart` command, see [Figure 8-2](#).



```
Administrator: C:\Windows\system32\cmd.exe - diskpart
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2010 Microsoft Corporation. All rights reserved.

C:\Users\Administrator>diskpart

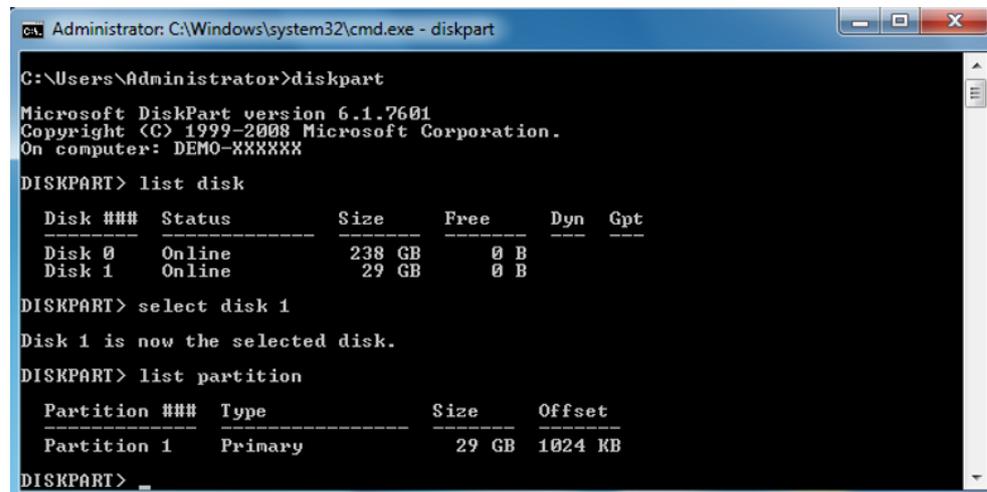
Microsoft DiskPart version 6.1.7601
Copyright (C) 1999-2008 Microsoft Corporation.
On computer: DEMO-XXXXXX

DISKPART>
```

Figure 8-2: Execution of the DiskPart program

2. Use the `List disk` command to edit all connected drives (disks).
The list of drives appears.
3. Select from the list the USB stick's drive with the `select disk [nr]` command.

In [Figure 8-3](#) the drive 1 is selected.



```
Administrator: C:\Windows\system32\cmd.exe - diskpart
C:\Users\Administrator>diskpart
Microsoft DiskPart version 6.1.7601
Copyright (C) 1999-2008 Microsoft Corporation.
On computer: DEMO-XXXXXX

DISKPART> list disk

   Disk ###  Status         Size           Free           Dyn  Gpt
   -----  -
   Disk 0    Online         238 GB         0 B
   Disk 1    Online         29 GB          0 B

DISKPART> select disk 1
Disk 1 is now the selected disk.

DISKPART> list partition

   Partition ###  Type              Size           Offset
   -----  -
   Partition 1    Primary           29 GB          1024 KB

DISKPART> _
```

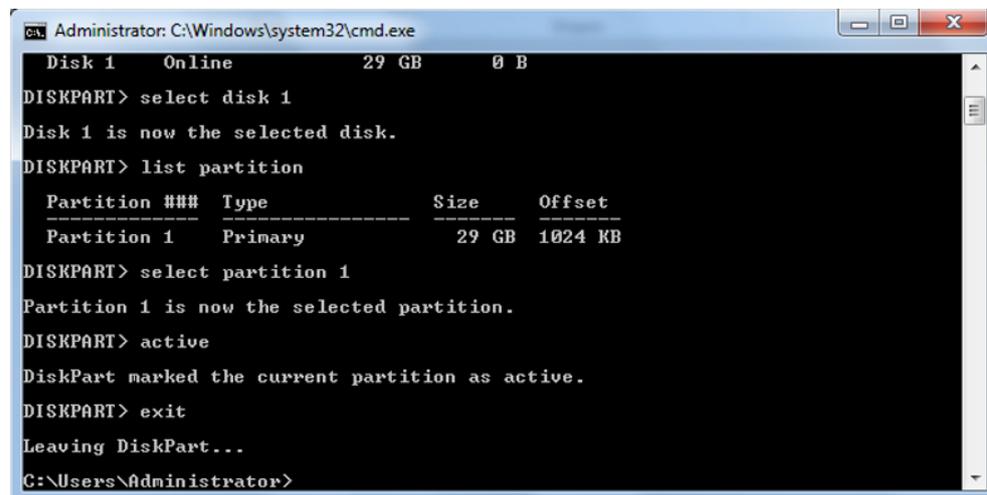
Figure 8-3: USB Stick drive and partition selection

4. To see the available partition of the selected drive use the `list partition` command.

The list of partitions appears.

5. Select the drive's partition. Use the `select partition 1` command.
6. Make the selected partition active with the `active` command.

The USB stick is now bootable. End the DiskPart program with `exit`, see [Figure 8-4](#).



```
Administrator: C:\Windows\system32\cmd.exe
   Disk 1    Online         29 GB          0 B

DISKPART> select disk 1
Disk 1 is now the selected disk.

DISKPART> list partition

   Partition ###  Type              Size           Offset
   -----  -
   Partition 1    Primary           29 GB          1024 KB

DISKPART> select partition 1
Partition 1 is now the selected partition.

DISKPART> active
DiskPart marked the current partition as active.

DISKPART> exit
Leaving DiskPart...
C:\Users\Administrator>
```

Figure 8-4: Leaving the DiskPart program

8.5.1.2 Copy File Contents on the USB Stick (Image Stick)

1. Copy `ImageStick_<version>.zip` in the root directory of the prepared USB stick, which will be used as TSMA Image Stick.
2. Select the zip-file and open the context menu with a right-mouse button click.
The menu opens automatically.
3. Select "Extract All".
Specify a folder for storing the copied archive contents.
4. Select the USB stick from the list of destinations and confirm the selection by pressing "OK".
The archive contents are copied. This can take several minutes.

This USB stick can now be used as TSMA Image Stick.

8.5.1.3 Copy File Contents on the USB Stick (Recovery Stick)

1. Copy `RecoveryStick_<version>.zip` in the root directory of the prepared USB stick, which will be used as TSMA Recovery Stick.
2. Select the zip-file and open the context menu with a right-mouse button click.
The menu opens automatically.
3. Select "Extract All".
Specify a folder for storing the copied archive contents.
4. Select the USB stick from the list of destinations and confirm the selection by pressing "OK".
The archive contents are copied. This can take several minutes.

This USB stick can now be used as TSMA Recovery Stick.

8.5.2 Install the RSRecoveryCreator Tool

The "Recovery Creator" application must be installed on PC. The `RecoveryCreator_Setup_<version>.exe` can be downloaded from <https://www.rohde-schwarz.com/software/tsma6/>.

This application allows to upload data from the TSMA Image Stick or hard disk to a Recovery Stick.

8.5.3 Capture a TSMA Image (TSMA Image Stick)



The capture of the image (partitions are GRUB, SSYSTEM, DATA, BACKUP) takes around 15 minutes with USB 3.0 stick and even longer with USB 2.0 stick.



As a prerequisite, a user backup must exist on the master device (see [Chapter 8.4.1, "Backup"](#), on page 83).

1. Connect the prepared TSMA Image Stick (see [Chapter 8.5.1.2, "Copy File Contents on the USB Stick \(Image Stick\)"](#), on page 88) to an USB 3.0 port of the R&S TSMA.
2. Reboot the R&S TSMA. The system will boot from the TSMA Image Stick.

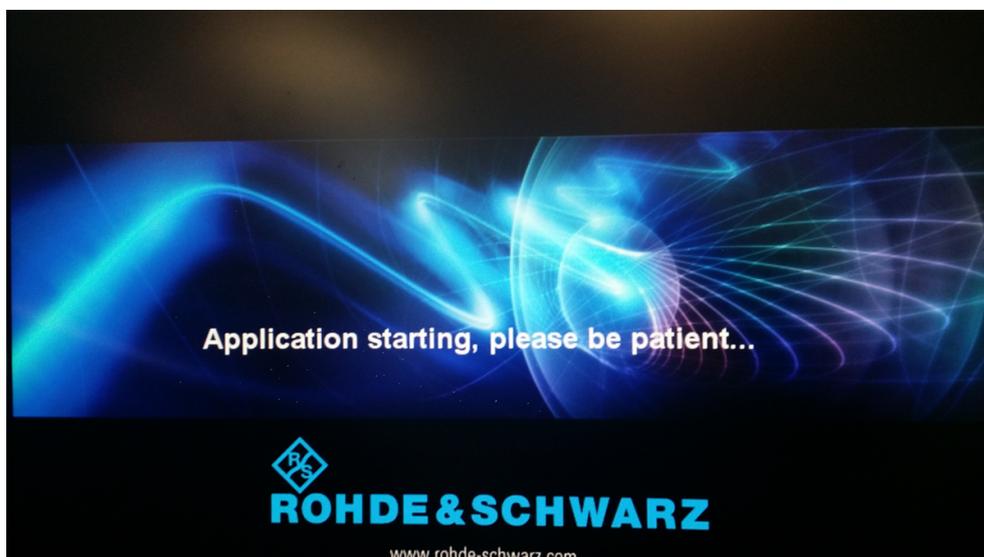


Figure 8-5: Boot TSMA Image Stick

3. In the TSMA Image Stick menu, click "Capture Image".

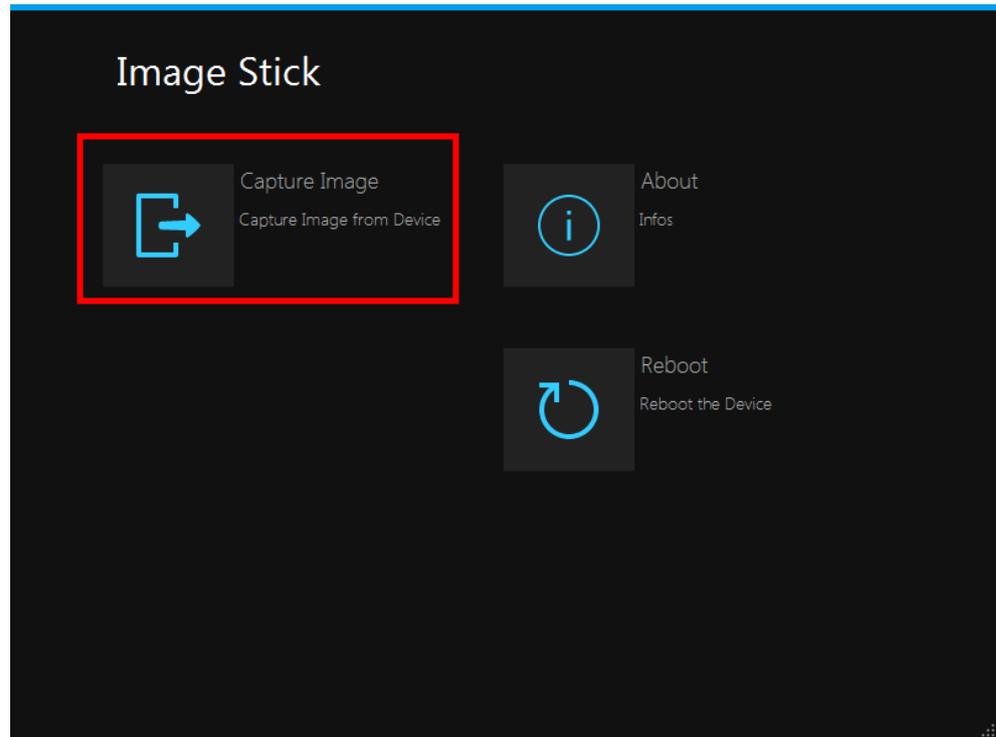


Figure 8-6: TSMa Image Stick menu

4. When the Status has changed to "Finished", click "OK" and then "Reboot".

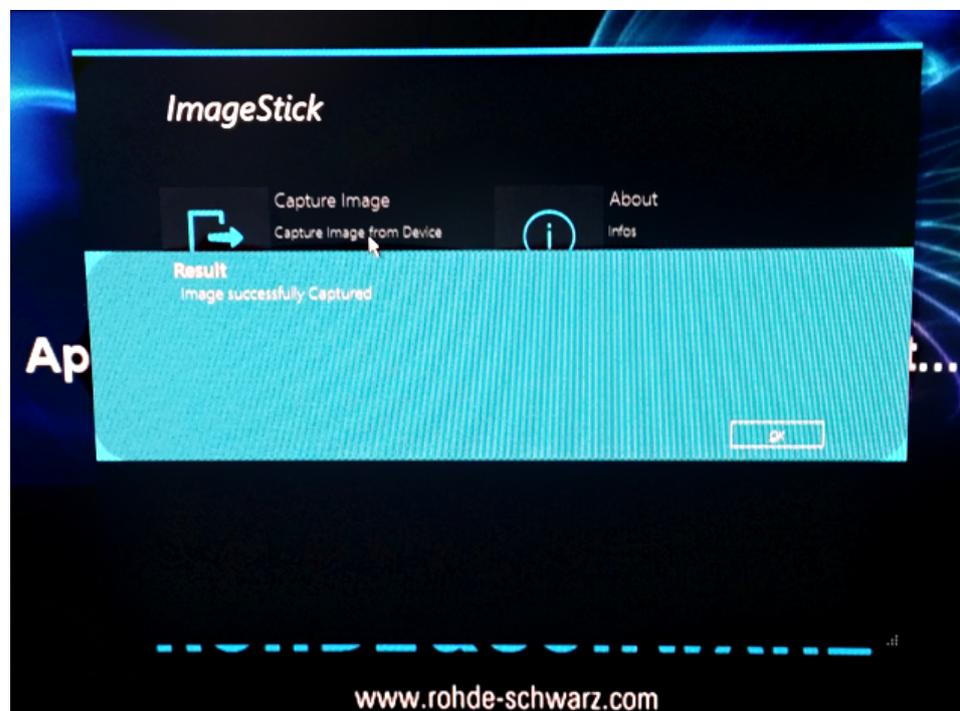


Figure 8-7: TSMa Image Stick - Image capturing finished

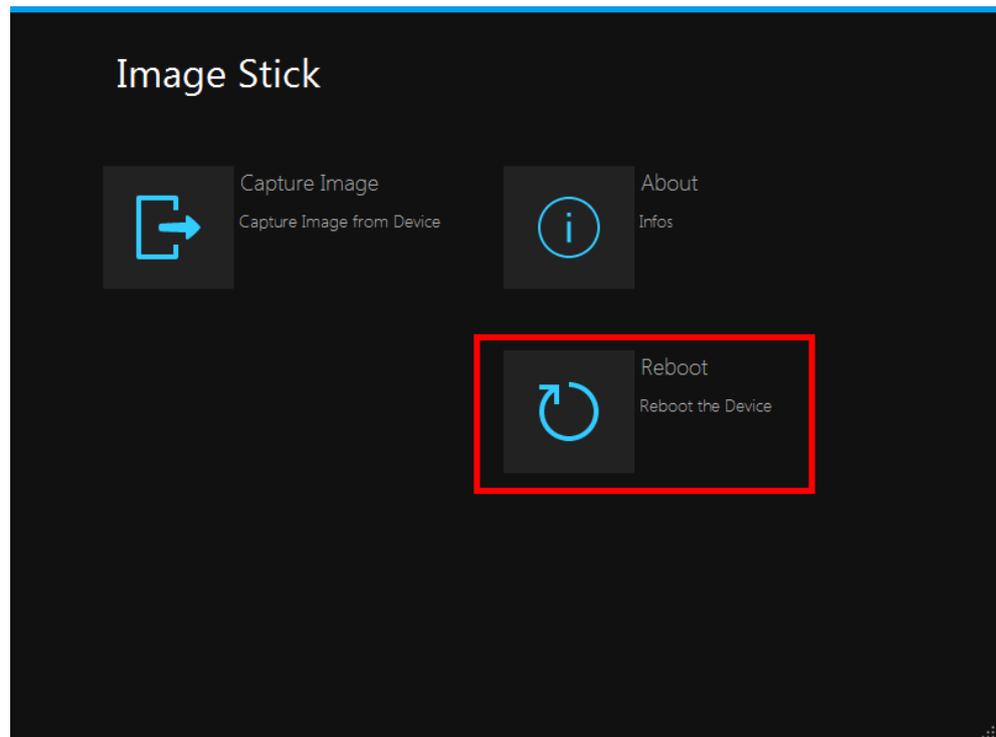


Figure 8-8: TSMA Image Stick menu - Reboot

5. Remove the TSMA Image Stick. The R&S TSMA will be rebooted.

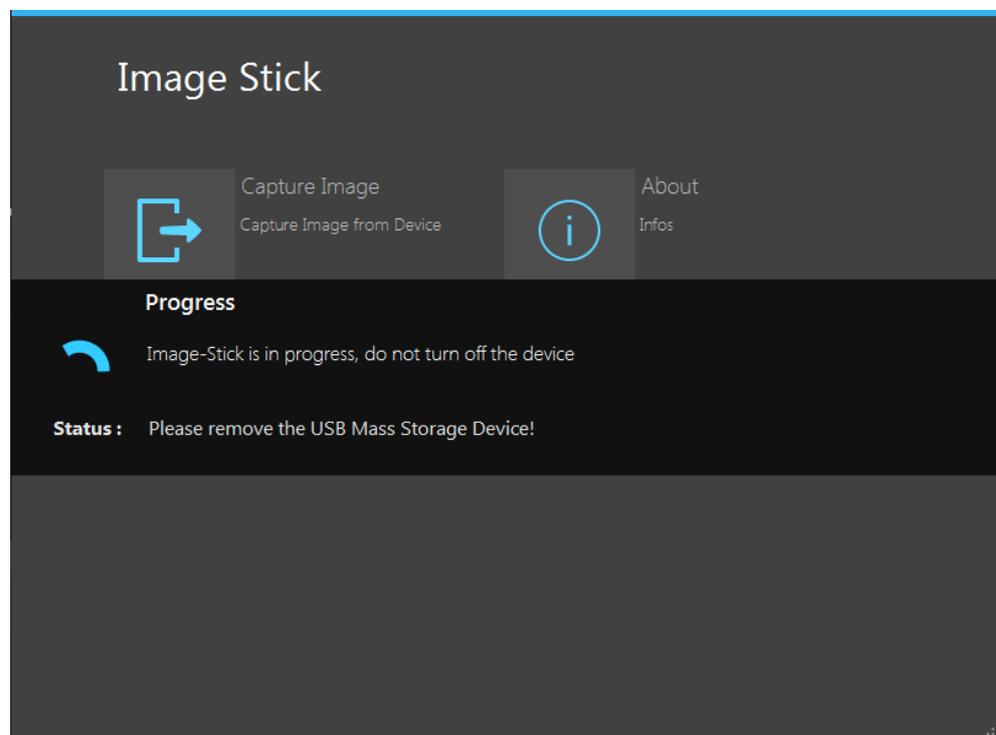


Figure 8-9: Rebooting R&S TSMA

The captured image files (BACKUP.wim, DATA.wim, GRUB.wim, SYSTEM.wim) are stored on the TSMA Image Stick in the directory \Device\Images.

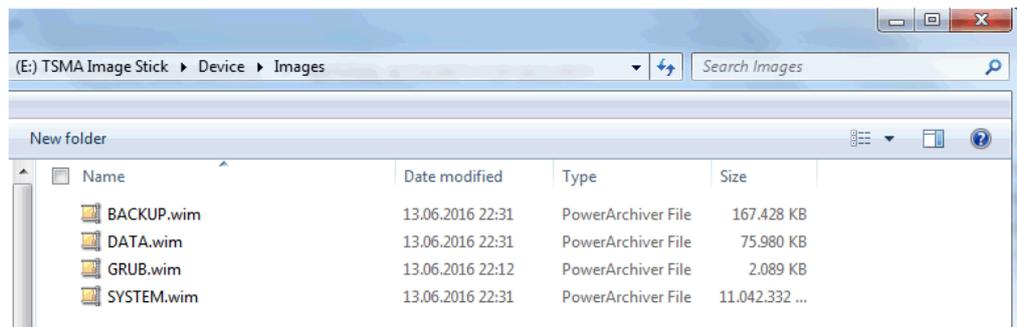


Figure 8-10: Captured Image Files on a TSMA Image Stick

The TSMA Image Stick can now be used as source for the creation of a TSMA Recovery Stick (see [Chapter 8.5.4, "Create a TSMA Recovery Stick"](#), on page 92). The image files can also be saved on a hard disk or on a network drive.



A master image consists always of the 4 image files BACKUP.wim, DATA.wim, GRUB.wim, SYSTEM.wim.

8.5.4 Create a TSMA Recovery Stick



Creating a TSMA Recovery Stick requires the following:

- TSMA Recovery Stick
- TSMA Master Images (GRUB, SYSTEM, DATA, BACKUP), available on TSMA Image Stick or PC.
- "RSRecovery Creator" tool

Create a TSMA Recovery Stick

1. Plug a prepared TSMA Recovery Stick (see [Chapter 8.5.1.3, "Copy File Contents on the USB Stick \(Recovery Stick\)"](#), on page 88) in one of the USB 3.0 ports of your PC.
2. Start the "Recovery Creator" application by clicking the desktop icon.



After starting, the application checks the Recovery Stick's data configuration and structure and reads it out. If some file contents of the TSMA Recovery Stick are incorrect or missing, the application issues an error message and offers to repeat the procedure. Otherwise, the procedure continues as described in steps 3 and 4.

- The "Images" tab offers download and upload of particular image files.

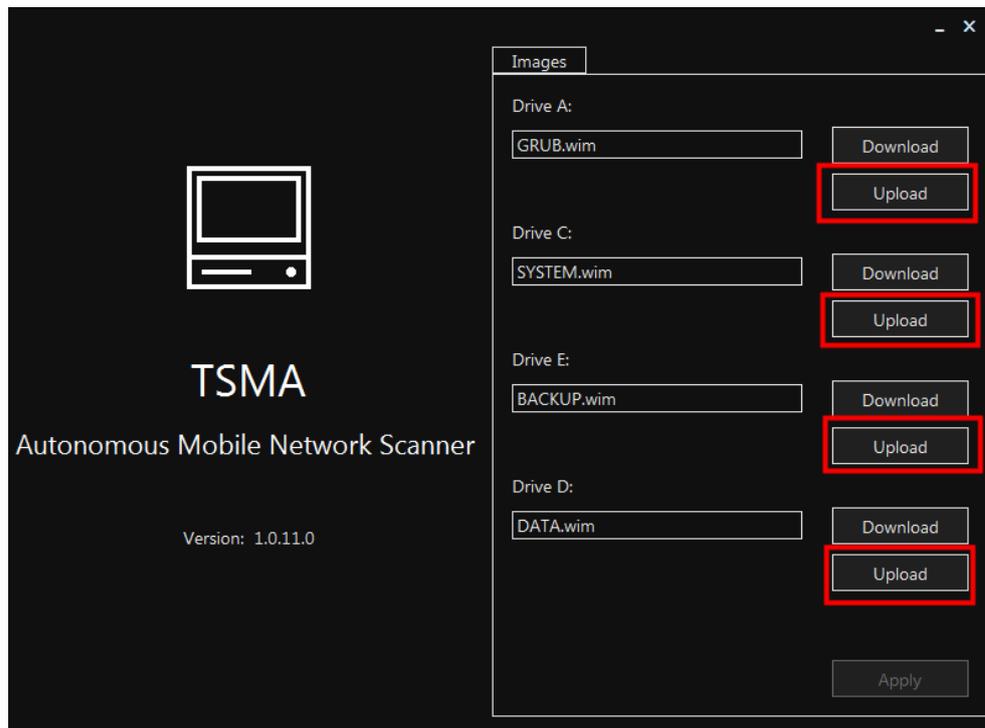


Figure 8-11: Selection of a TSMA Image for Transfer

- Use the "Upload" function associated to the file's directory and select the file you want to transfer.

Note: The file transfer must be done for all partitions:

- Drive A: "GRUB.wim"
- Drive B: "SYSTEM.wim"
- Drive C: "BACKUP.wim"
- Drive D: "DATA.wim"

The data source can be either the TSMA Image Stick or a PC storage location.

- Press "Apply" to complete the selection and start file transfer onto the TSMA Recovery Stick.

The selected TSMA image files are copied from the specified directory to the Recovery Stick (`/Device/Images`). The progress of uploading is displayed.

- When the file transfer has finished for any image file (see [Figure 8-12](#)), remove the TSMA Recovery Stick.

The TSMA Recovery Stick is now ready to deploy a master image onto any other TSMA (see [Chapter 8.5.5, "Deploy a TSMA image from a TSMA Recovery Stick"](#), on page 94).

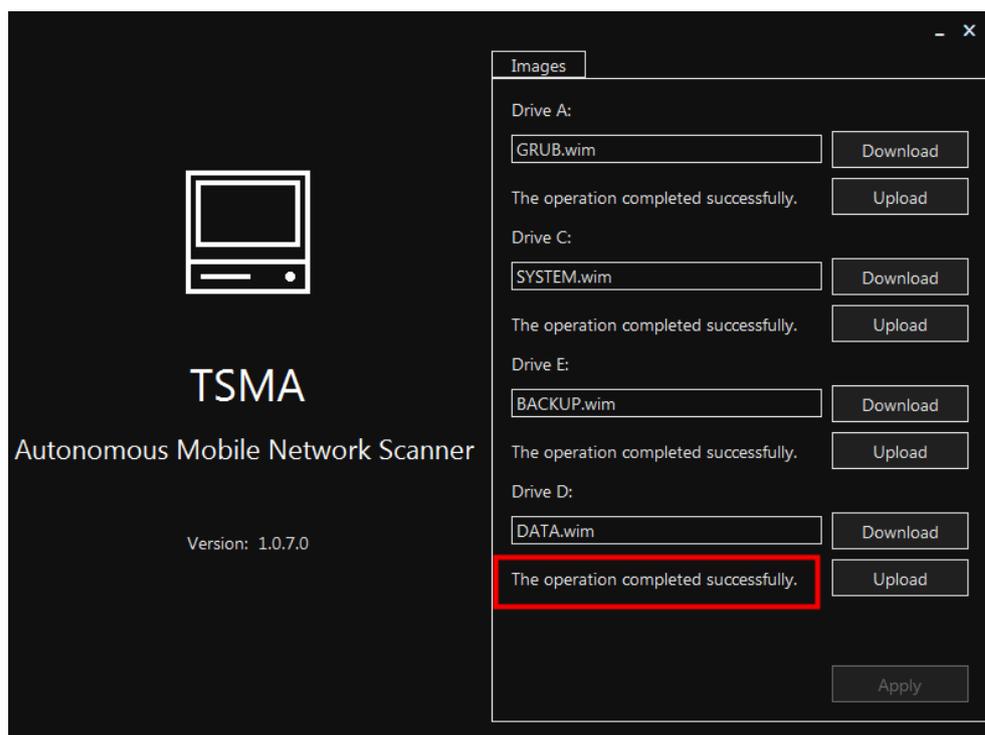


Figure 8-12: File Transfer Finished - "The operation completed successfully"



As long as the procedure is running neither the PC should be switched off nor the Recovery Stick removed.

8.5.5 Deploy a TSMA image from a TSMA Recovery Stick

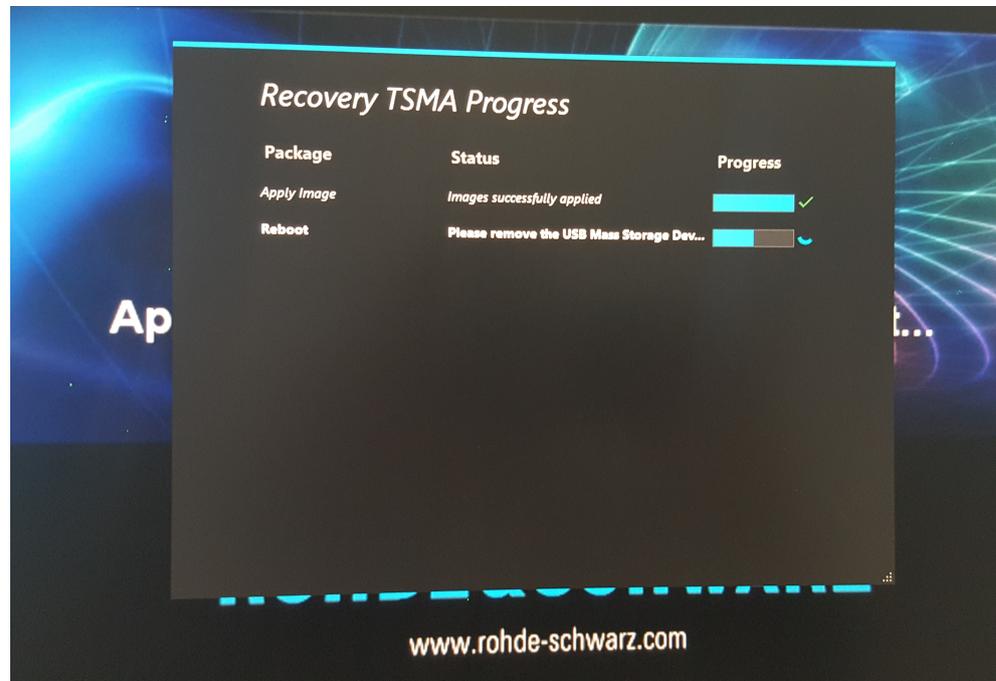


Deployment of a TSMA image requires a TSMA Recovery Stick containing the four master image files (GRUB.wim, SYSTEM.wim, DATA.wim, RECOVERY.wim).

1. Connect the TSMA Recovery Stick to an USB 3.0 port of the new R&S TSMA device.
2. Reboot the R&S TSMA. The R&S TSMA boots from the Recovery Stick and the start page of the Recovery Stick is displayed.
During the reboot, information about the target device and the image will be checked. If all requirements are fulfilled, click "Start Recovery" to start the recovery procedure, otherwise an error message will be displayed.



3. In the "Recovery TSMA Progress" window, the current status of the recovery process is displayed.



4. After a successful recovery, remove the TSMA recovery stick.
5. The R&S TSMA will be rebooted.

9 Troubleshooting

9.1 No remote access to the R&S TSMA via LAN port

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

Optical Check

- ▶ Check on the rear panel, if the LAN cable is connected to the LAN port. If the LAN cable is connected to the LAN port, continue with [Web-GUI](#).

Web-GUI

1. Connect a mouse, keyboard, and monitor and try to open the Web-GUI (see [Local access from the TSMA and Windows Explorer](#)).
The predefined start page is `http://localhost`.
Note: If the Web-GUI can not be started local, contact the R&S support.
2. Check if an IP address is displayed in the Web-GUI. Does this IP address match with the IP settings of the remote PC (IP subnet range)? See [Figure 9-1](#).
If no Remote Port address is displayed, continue with [Check R&S TSMA Network Connections](#).

No remote access to the R&S TSMA via LAN port

The screenshot displays the R&S TSMA Web-GUI Overview page. The left sidebar contains navigation options: Overview, System, Connectivity, File Transfer/Update, Help, and Restart. The main content area shows the following details:

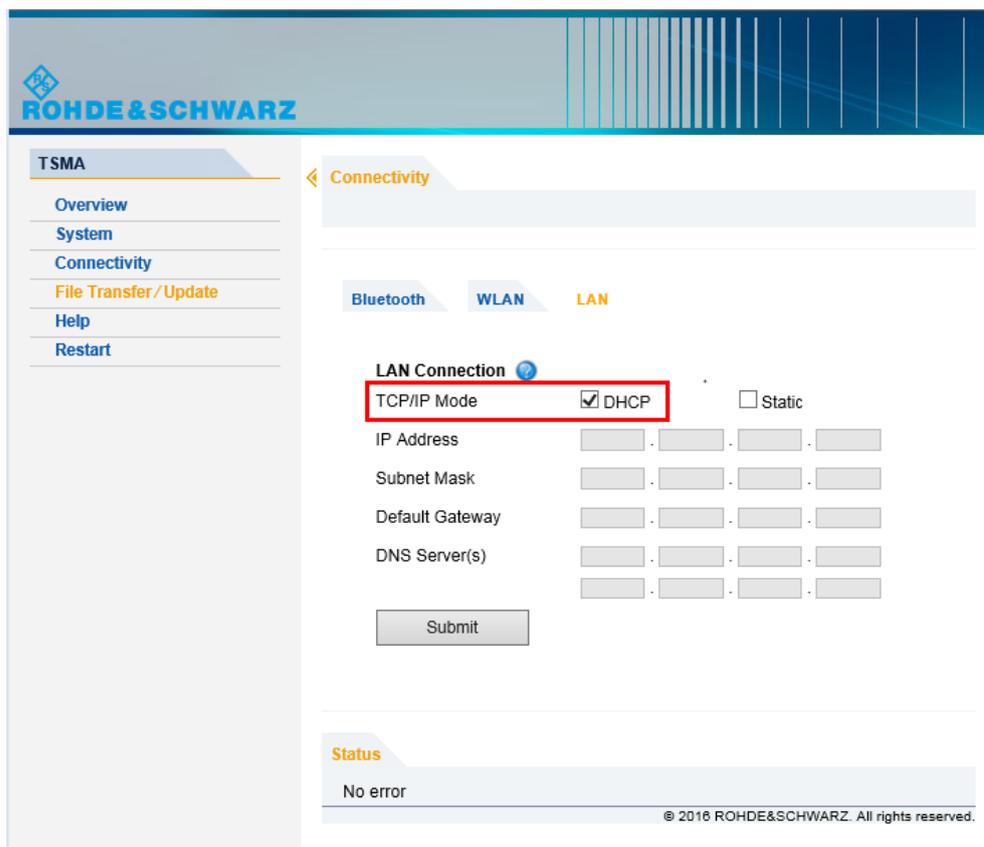
Instrument Model	TSMA
Material Number	1514.6520.20
Serial Number	900011
Computer Name	TSMA-900011
Mode of Operation	PC Mode <input checked="" type="radio"/>
HW Version	1.00
Image Version	1.3 / 1.9
Firmware Version	01.31.0.6
SW Versions	
- NESTOR	2.2.0.10576
- ROMES	4.92.0.4161
- QualiPoc	16.3.0.26
IP Settings	
- Remote Port	10.62.0.170
- Scanner Port	192.168.0.1
- WLAN AP	192.168.1.10
BT/WLAN Status:	BT: On / WLAN: On / AP: On
Battery 1	100 %
Battery 2	100 %
Remaining Battery Time	DC connected
Mainboard Temperature	49 °C

The **Remote Port** setting is highlighted with a red box. The **Status** section at the bottom indicates "No error".

Figure 9-1: Web-GUI - Overview

3. Check the setting of the R&S TSMA LAN port (see [Chapter A.2.2.4, "LAN"](#), on page 119). The default setting is "DHCP".

No remote access to the R&S TSMA via LAN port



Ping Command

The ping command must be executed on the host PC.

1. Use the IP address displayed in the R&S TSMA Web-GUI (see [Figure 9-1](#)).
2. Start the ping command.
Type in the command line window `ping <IP address of the R&S TSMA>` and wait for the answer.

If the R&S TSME 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
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
```

The Scanner Unit could not be loaded from Software (R&S ROMES, R&S NESTOR)

Check R&S TSMA Network Connections

Check if the TSMA LAN connection is available in the Windows network connections.

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

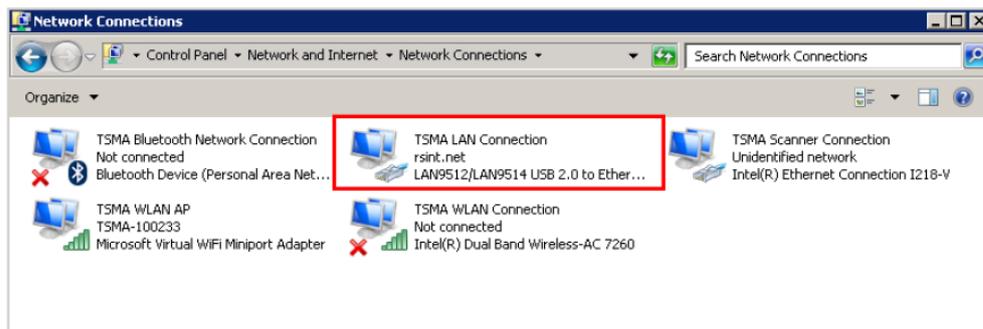


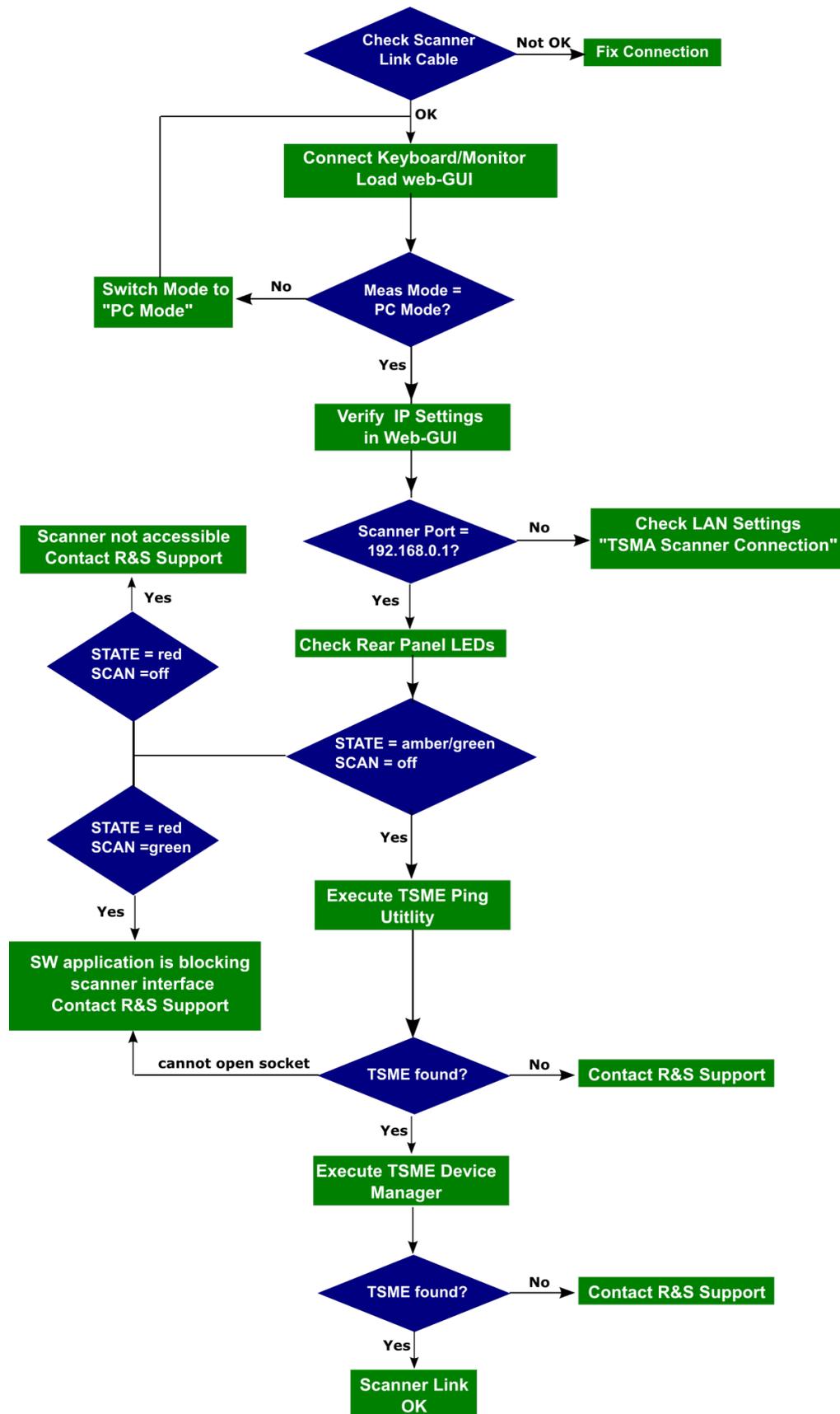
Figure 9-2: TSMA LAN Connection

4. If the "TSMA LAN Connection" is not listed in the "Network Connections", a recovery of the R&S TSMA is recommended (see [Chapter 8.4.2, "Restore"](#), on page 84). If the "TSMA 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.

9.2 The Scanner Unit could not be loaded from Software (R&S ROMES, R&S NESTOR)

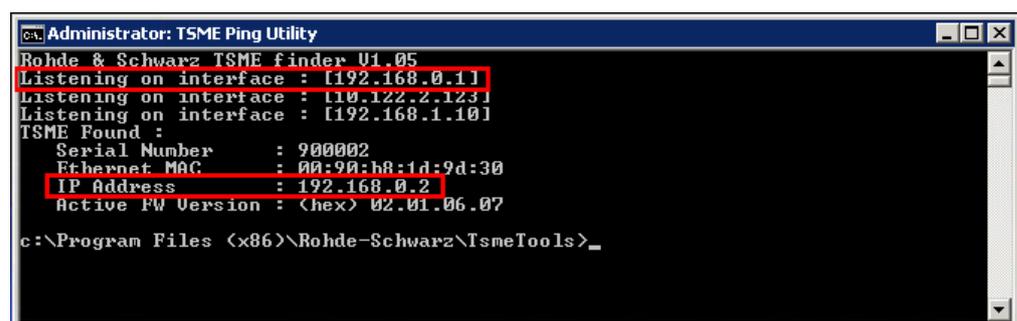
To check if the scanner unit is working properly, perform the following steps.

The Scanner Unit could not be loaded from Software (R&S ROMES, R&S NESTOR)



The Scanner Unit could not be loaded from Software (R&S ROMES, R&S NESTOR)

1. Check if the cabling between the SCAN ports is correct (see [Chapter 9.3, "Check the Cabling between Scanner Unit and CPU Unit"](#), on page 102).
2. Connect keyboard, mouse and monitor and start the Web-GUI (see [Chapter 7.1.1, "Start the R&S TSMA Web-GUI"](#), on page 43) and check the "Mode of Operation".
 - If the Web-GUI is not accessible, continue with [Chapter 9.8, "R&S TSMA Web-GUI not accessible"](#), on page 108).
 - If the "Mode of Operation" = "PC Mode", continue with [step 3](#)
 - If the "Mode of Operation" != "PC Mode", switch mode to "PC Mode". After a reboot, check the mode of operation again.
If the mode does not change to "PC Mode", contact R&S support, otherwise continue with [step 3](#).
3. In the Web-GUI, verify the IP Settings.
 - If the IP address of the scanner port = 192.168.0.1, continue with [step 4](#).
 - If the IP address of the scanner port != 192.168.0.1, continue with [Chapter 9.4, "Verify Scanner Port LAN Settings"](#), on page 103.
4. Check the Rear Panel LEDs next to the [POWER] button.
 - STATE LED = red and SCAN LED = green
A measurement application is blocking the scanner link. In this case, stop the running measurement application (R&S NESTOR, R&S ROMES, R&S ViCom server or QualiPoc) and then check the LEDs again.
 - STATE LED = red and SCAN LED = off
The scanner is not accessible. [Check the Cabling between Scanner Unit and CPU Unit](#).. If the cabling is correct, contact R&S Support.
 - STATE LED = green or amber and SCAN LED = off
Continue with [step 5](#).
5. Start the TSME Ping tool via the Windows Start menu:
"Start > All Programs > R&S TsmeTools > TSME Ping Utility"



```

Administrator: TSME Ping Utility
Rohde & Schwarz TSME finder U1_05
Listening on interface : [192.168.0.1]
Listening on interface : [10.122.2.123]
Listening on interface : [192.168.1.10]
TSME Found :
  Serial Number      : 900002
  Ethernet MAC       : 00:90:b8:1d:9d:30
  IP Address         : 192.168.0.2
  Active FW Version  : <hex> 02.01.06.07

c:\Program Files (x86)\Rohde-Schwarz\TsmeTools>_
  
```

Figure 9-3: TSME Ping Utility - Result

Check the IP addresses in the program window:

- Listening on interface : 192.168.0.1
If the line with this this IP address does not appear, continue with [Chapter 9.4, "Verify Scanner Port LAN Settings"](#), on page 103.

Check the Cabling between Scanner Unit and CPU Unit

- IP Address : 192.168.0.2
If the R&S T SMA scanner can not be found, contact the R&S support.
6. Start the TSME Device Manager via the Windows Start menu.
"Start > All Programs > TsmeTools > TsmeDeviceManager"
- If the R&S T SMA device is found, the scanner unit works properly.
 - If the R&S T SMA device is not found, contact the R&S support.

9.3 Check the Cabling between Scanner Unit and CPU Unit

In order to have a properly working connection between the scanner unit and the internal CPU unit, you have to check the following:

- Is the scanner link interconnection cable applied to the correct ports ?



Figure 9-4: Connection ports for scanner link interconnection

- Is the accessory interconnection cable used for this connection?



Figure 9-5: Connection between scanner unit and internal PC unit

- 1 = SCAN Link port (CPU)
- 2 = SCAN Link port (Scanner Unit)
- 3 = Interconnection cable

9.4 Verify Scanner Port LAN Settings

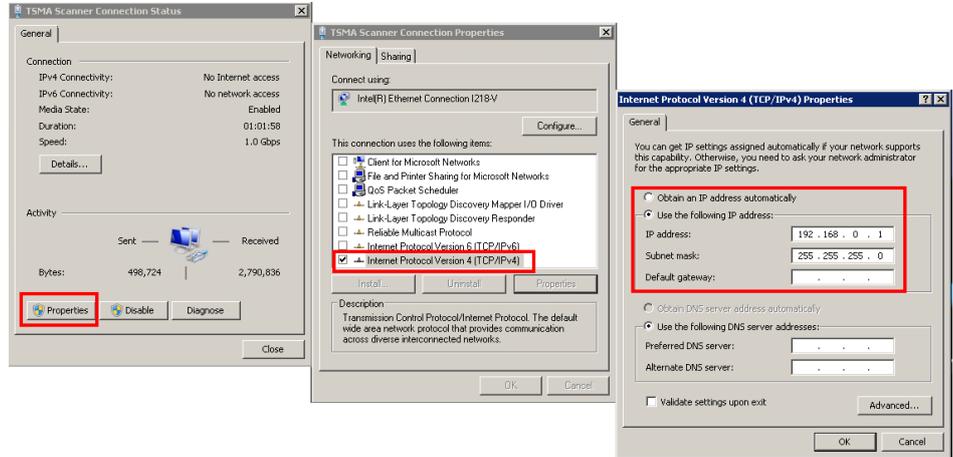
1. Connect keyboard, mouse and monitor to the R&S TSMA.
2. Check the IP setting of the TSMA scanner connection.
Navigate to "Windows" > "Control Panel" > "Network and Internet" > "Network and Sharing Center" > "Change Adapter Settings".
The entry TSMA Scanner Connection must be available.



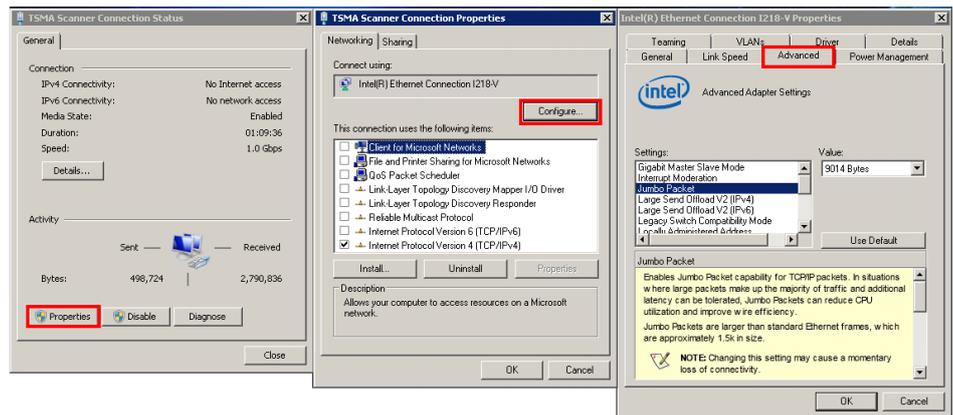
Figure 9-6: TSMA Scanner Connection

a) Double-click the TSMa Scanner Connection entry and verify the following settings.

- IP address: 192.168.0.1 (static IP address)



- Jumbo Packet: 9014 Bytes



9.5 No Navigation Data in R&S ROMES / R&S NESTOR

Check if the GPS antenna is connected to the correct port.



Figure 9-7: R&S TSMA Antenna Cabling - GPS

1 = GPS antenna

9.6 No RF Data

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



Figure 9-8: R&S TSMA Antenna Cabling - RF

1 = RF antenna

2. Connect mouse, keyboard and monitor with the R&S TSMA for local operation.
3. Open the Web-GUI (Internet Explorer, URL: <http://localhost>) and change the "Mode of Operation" to "PC Mode".
The R&S TSMA reboots automatically.
4. Start the TSME Device Manager via the Windows Start menu

Remote ViCom Sample App on Smart Phone could not connect with R&S TSMA

"Start > All Programs > TsmeTools > TsmeDeviceManager"

- a) If R&S TSMA is accessible via the TSME Device Manager, continue with [step 5](#).
 - b) If R&S TSMA is not accessible via the TSME Device Manager, continue with [Chapter 9.2, "The Scanner Unit could not be loaded from Software \(R&S ROMES, R&S NESTOR\)"](#), on page 99.
5. Check if there are any error messages in the TSME Device Manager.
 - a) If errors are reported, solve the problem and continue with [step 6](#).
 - b) If no errors are reported, contact the R&S support.
 6. Open the Web-GUI and change the "Mode of Operation" to your required mode. If there are still no RF data, contact R&S support.

9.7 Remote ViCom Sample App on Smart Phone could not connect with R&S TSMA

In order check the connection of the Remote Vicom Sample App on a smart phone with the R&S TSMA, perform the following steps.

1. Check if the WLAN antenna and the Bluetooth antenna are connected properly.



Figure 9-9: R&S TSMA Antenna Cabling - WLAN and Bluetooth

1 = Bluetooth antenna
2 = WLAN antenna

2. Open the R&S TSMA Web-GUI locally (see [Local access from the TSMA and Windows Explorer](#)).
3. In the Web-GUI, check in the "Overview" the "Mode of Operation".
 - a) If it is in "PC Mode", continue with [step 4](#).

Remote ViCom Sample App on Smart Phone could not connect with R&S TSMA

- b) If it is not in "PC Mode", change the mode to "PC Mode" (see [Chapter 7.3, "Measurement Setup"](#), on page 48). The device may reboot.
4. Check the STATUS LEDs of the device (see [Chapter 4.3, "Status LEDs"](#), on page 18).

POWER	= blue
SCAN	= off (No link)
STATE	= amber (WLAN access point = on), continue with step 8
	= green (WLAN access point = off), continue with step 5
5. Turn back on the R&S TSMA by pressing the POWER button (see [Figure 4-2](#)).
6. Open the Web-GUI and check in the "Overview" the "Mode of Operation".
 - a) If the "Mode of Operation" is "PC Mode", continue with [step 7](#).
 - b) If the "Mode of Operation" is not "PC Mode", contact the R&S support.
7. Check the STATUS LEDs again.
 - a) STATE LED = red and SCAN LED = green: A measurement application is blocking the scanner link. In this case, stop the running measurement application (R&S NESTOR, R&S ROMES, R&S ViCom server or QualiPoc). Continue with [step 10](#).
 - b) STATE LED = green and SCAN LED = Off: Continue with [step 11](#).
8. Make sure that WLAN and Bluetooth are activated via the Web-GUI (see [Chapter A.2.2.1, "Bluetooth"](#), on page 117 and [Chapter A.2.2.2, "WLAN"](#), on page 117).

Bluetooth Status	= On
Bluetooth Visibility	= Visible
Wlan	= On
Wlan Access Point	= On
9. For using the Bluetooth interface.
Verify, that the tablet/smartphone is paired with the R&S TSMA.
10. For using the WLAN interface.
Check on the remote device, if it is connected to the TSMA WLAN network / SSID:
TSMA-<xxxxxxx>.
11. Activate the "rViCom Server" mode in the R&S TSMA Web-GUI (see ["Mode of Operation"](#) on page 115).
Note: The R&S TSMA may reboot once you change the "Mode of Operation".
12. Check the STATUS LEDs.

POWER	= blue
STATE	= amber
SCAN	= green / green blinking

- a) If the LED states are correct, restart the rViCom Sample App on the Android device (see [Chapter B.3.1, "Connection Establishment"](#), on page 127).
- b) If the LED states are different, contact the R&S support.

9.8 R&S TSMA Web-GUI not accessible

If the R&S TSMA Web-GUI is not accessible, perform the following steps to solve the problem.

1. For remote connection via WLAN, check if the TSMA WLAN is visible via your smartphone/tablet.
 - If it is visible, continue with [step 2](#).
 - If it is not visible, continue with [step 4](#).For local call of the Web-GUI, go to [step 4](#).
2. Check if your smartphone/tablet is connected to the TSMA WLAN.
If the connection is established, continue with [step 4](#).
If the connection is not established, connect the smartphone/tablet with the TSMA/WLAN.
3. Start the Web-GUI in the smartphone/tablet browser via the following URL:
http://192.168.1.10 and continue with [step 9](#).
If the web browser can not load the web page, continue with [step 4](#).
4. Access to the R&S TSMA operating system via one of the following possibilities:
 - Local access with mouse, keyboard and external monitor
 - Remote desktop connection via LAN (see [Chapter 7.1.2, "Establish a Remote Desktop Connection"](#), on page 44)
5. Start the Internet Explorer and enter the following URL to open the R&S TSMA Web-GUI .
http://localhost
If the Web-GUI can be started, continue with [step 9](#).
6. In the Windows "Start" menu, select "Services" and check the state of the following services.
 - R&S TSMA running?
 - R&S WebServer running?

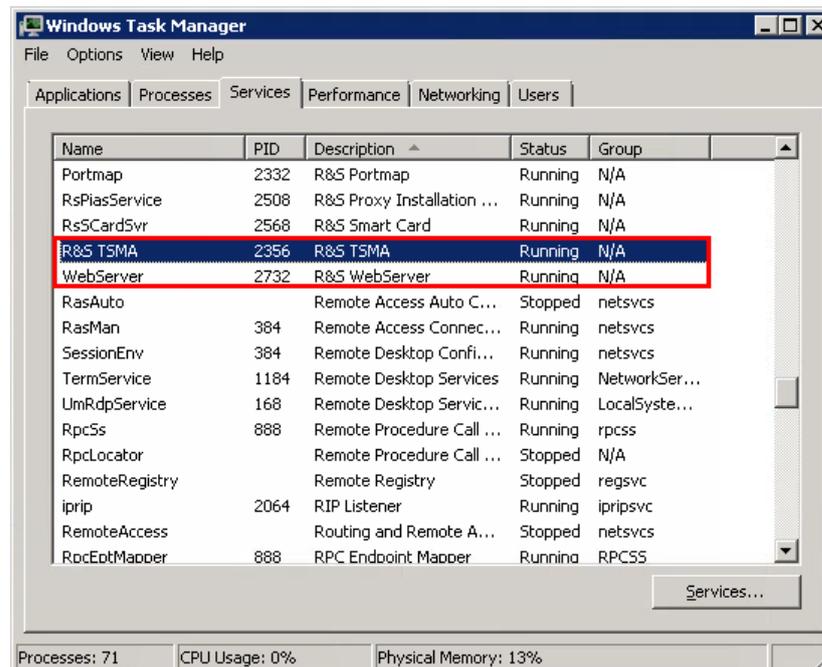


Figure 9-10: R&S TSMA Services

If both services are running continue with [step 8](#).

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

If the services could not be started, reinstall the firmware (see [Chapter 8.1, "Firmware Update"](#), on page 57).

8. Try again to start the Web-GUI locally on the R&S TSMA via Internet Explorer.

If the Web-GUI can be started, continue with [step 9](#).

If the Web-GUI can not be started, a complete restore must be performed (see [Chapter 8.4, "User Backup and Restore"](#), on page 83).

9. In the Web-GUI , navigate to "Connectivity" and check the WLAN status.

If "Wlan" is "Off" (orange), click "On" button to activate WLAN.

If "Wlan" is "On" (orange), continue with [step 11](#).

Note: The WLAN status is also visible via the STATE LED.
STATE LED = amber

WLAN Access Point = On

10. If WLAN can be activated, continue with [step 12](#).

If WLAN can not be activated, a complete restore must be performed (see [Chapter 8.4, "User Backup and Restore"](#), on page 83).
11. Change "Wlan Access Point" to "Off" and wait until "Off" is colored orange, then switch "Wlan Access Point" to "On" and wait until "On" is colored orange.

12. Check on your smartphone/tablet again, if the WLAN access point is now visible.
If the WLAN access point is visible, continue with [step 3](#).
If the WLAN access point is not visible, contact the R&S support.

Annex

A Usage of the Web GUI

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	111
• IP Settings	113
• HW Info	113

A.1.1 Overview

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

Device Info	112
L Type	112
L Material No.	112
L Serial No.	112
L Computer Name	112
L Mode of Operation (Overview)	112
L Bluetooth/WLAN	112
FW/SW Version	112
L HW	112
L Image	112
L Firmware	112
Battery Info	112

L Battery 1	113
L Battery 2	113
L Battery Life Time	113
L Mainboard Temperature	113

Device Info

Displays general information about the device.

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 TSMA (read-only). The name consists of a fixed part (TSMA) and a variable part (serial number).

Example: R&S TSMA-<Serial Number>

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

Mode of Operation (Overview) ← Device Info

Displays the mode how the device is used.

Bluetooth/WLAN ← Device Info

Displays the 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

Displays information about firmware and software .

HW ← FW/SW Version

Current hardware version.

Image ← FW/SW Version

Current image version.

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

Firmware ← FW/SW Version

Current firmware version.

Battery Info

Displays information about the battery status.

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.

A.1.2 IP Settings

The "IP Settings" tab displays the IP addresses of the R&S TSMA.

LAN Port	113
SCAN Port (Int.)	113
Lan Ext.1	113
WLAN AP (Overview)	113

LAN Port

IP address of the remote LAN port of the R&S TSMA.

SCAN Port (Int.)

IP address of the scanner port of the R&S TSMA.

Lan Ext.1

IP address of the LAN port for external connections.

WLAN AP (Overview)

IP address of the WLAN access point.

A.1.3 HW Info

The "HW Info" tab displays information about the embedded scanner module.

Scanner Info	114
L MAC Address	114
L IP Address (Scanner)	114
L Available Config	114
L Used Config	114
Correction Data	114
L Version	114
L Date	114
L TCXO Date	114
Module Info	114
L Controller Board	114

L RF Board	114
L Mainboard	114
L Batterypack	114

Scanner Info

Displays IP and configuration settings of the scanner device.

MAC Address ← Scanner Info

MAC address of the scanner port.

IP Address (Scanner) ← Scanner Info

IP address of the scanner.

Available Config. ← Scanner Info

All available FPGA versions (max. 4 versions).

Used Config. ← Scanner Info

Current valid FPGA version

Correction Data

Displays information about the calibration status of the scanner device.

Version ← Correction Data

Version of the calibration data.

Date ← Correction Data

Date of calibration.

TCXO Date ← Correction Data

Date of the internal calibration.

Module Info

Displays version information about the 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.

A.2 Configuration

A.2.1 System

The "System" window consists of the following tabs.

- [Mode](#)..... 115
- [Power](#)..... 115
- [Speaker](#)..... 116
- [RF Band](#)..... 116

A.2.1.1 Mode

The "Mode" tab displays information about the operation mode and the state of the current measurement.

- [Mode of Operation](#)..... 115
- [Current Measurement](#)..... 115

Mode of Operation

With the "Mode of Operation", the autostart sequence of the R&S TSMA can be adjusted to change the usage of the R&S TSMA.

Current Measurement

Displays information about the state of the current measurement.

A.2.1.2 Power

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

- [Startup Settings](#)..... 115
 - └ [Auto Power ON](#)..... 115
 - └ [Remember Last State](#)..... 115
- [Delayed System Start](#)..... 116
- [Shutdown Settings](#)..... 116
 - └ [Auto Power Off](#)..... 116

Startup Settings

Configures different startup sequences.

Auto Power ON ← Startup Settings

The R&S TSMA starts automatically when power is applied at the DC IN connector of the R&S TSMA or at the DC IN connector of a connected R&S TSMA Battery Pack.

Remember Last State ← Startup Settings

The R&S TSMA remembers the last state before the DC power was removed.

When DC power is applied again at the DC IN connector of the R&S TSMA or at the DC IN connector of a connected R&S TSMA Battery Pack, the power state before power removal is recovered.

Delayed System Start

Configure the power on delay (in min) and press "Activate".

The device goes in standby mode and starts automatically after the configured delay with the preconfigured measurement mode.

Shutdown Settings

Configures a shutdown sequence if the R&S TSMA is connected to a R&S TSMA Battery Pack.

Auto Power Off ← Shutdown Settings

When activated, the R&S TSMA is powered off automatically, if the DC IN power is removed from the connected R&S TSMA Battery Pack.

The time delay for powering off can be set manually (default 30s).

A.2.1.3 Speaker

The "Speaker" tab configures an acoustic warning signal.

Status (Speaker).....	116
Volume.....	116

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 recall and switch the selected RF band.

Current Configuration.....	116
New Configuration.....	116

Current Configuration

Current valid band configuration

New Configuration

Selects a specific band.

A.2.2 Connectivity

The "Connectivity" window consists of the following tabs.

• Bluetooth.....	117
• WLAN.....	117
• WLAN AP.....	118
• LAN.....	119
• Lan Ext.1.....	120

A.2.2.1 Bluetooth

The "Bluetooth" tab is used to configure the settings of the R&S TSMA Bluetooth adapter. As well this tab is used for pairing with an external BT device.

Bluetooth Connection.....	117
L Status (Bluetooth).....	117
Visibility.....	117

Bluetooth Connection

Specifies the configuration details of a Bluetooth adapter.

Status (Bluetooth) ← Bluetooth Connection

The Bluetooth adapter can be switched on or off.

Visibility

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

A.2.2.2 WLAN

In the "WLAN" tab, the WLAN adapter settings can be configured.

WLAN Adapter.....	117
L Status (WLAN Adapter).....	117
L SSID.....	117
L Network Key.....	117
L TCP/IP Mode (WLAN Client).....	118
L IP Address (WLAN Client).....	118
L Subnet Mask (WLAN Client).....	118
L Default Gateway (WLAN Client).....	118
L DNS Servers(s) (WLAN Client).....	118

WLAN Adapter

Specifies the configuration details for the WLAN adapter.

Status (WLAN Adapter) ← WLAN Adapter

The WLAN adapter can be switched on or off.

SSID ← WLAN Adapter

Click "Refresh" and select an existing WLAN network via the SSID.

Network Key ← WLAN Adapter

Enter the network key for the selected WLAN network.

TCP/IP Mode (WLAN Client) ← WLAN Adapter

The IP address can be assigned automatically via DHCP ("DHCP") or manually as fixed IP address ("Static").

IP Address (WLAN Client) ← WLAN Adapter

Specify the IP address of the R&S TSMA

Subnet Mask (WLAN Client) ← WLAN Adapter

Specify the subnet mask for the R&S TSMA

Default Gateway (WLAN Client) ← WLAN Adapter

Specify the default gateway.

DNS Servers(s) (WLAN Client) ← WLAN Adapter

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

A.2.2.3 WLAN AP

In the "WLAN AP" tab, the WLAN access point settings can be configured.



Changing SSID and network key is only possible with local access or LAN access to the web GUI.

WLAN Access Point.....	118
L Status (WLAN AP).....	118
L SSID.....	118
L Network Key.....	118

WLAN Access Point

Specify the configuration details for the WLAN access point.

Status (WLAN AP) ← WLAN Access Point

The WLAN access point can be switched on or off. When WLAN is switched to "Off", it can be selected, if this setting is permanent (resists restart) or only for the current session (WLAN AP On after restart).

On The WLAN AP remains switched off after a restart.

Off The WLAN AP is switched on again after a power cycle.

Note: The WLAN switch must be set to "On".

SSID ← WLAN Access Point

Enter the SSID.

Network Key ← WLAN Access Point

Enter the network key for the specified SSID and press "Submit".

Confirm the network key in the following prompt.



After confirmation the SSID is changed. The following status information is displayed.



A.2.2.4 LAN

In the "LAN" tab, the LAN settings can be configured.

- LAN Connection..... 119
 - L State..... 119
 - L TCP/IP Mode (LAN)..... 119
 - L IP Address (LAN)..... 119
 - L Subnet Mask (LAN)..... 119
 - L Default Gateway (LAN)..... 119
 - L DNS Servers(s) (LAN)..... 119

LAN Connection

Specify the configuration details for the LAN connection.

State ← LAN Connection

Displays the state of the the LAN connection
connected | disconnected

TCP/IP Mode (LAN) ← LAN Connection

The IP address can be assigned automatically via DHCP ("DHCP") or manually as fixed IP address ("Static").

IP Address (LAN) ← LAN Connection

Specify the IP address of the R&S TSMA.

Subnet Mask (LAN) ← LAN Connection

Specify the subnet mask for the R&S TSMA.

Default Gateway (LAN) ← LAN Connection

Specify the default gateway.

DNS Servers(s) (LAN) ← LAN Connection

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

A.2.2.5 Lan Ext.1

In the "Ext. LAN" tab, the LAN settings for the additional Gbit LAN interface can be configured.

Lan Ext.1 Connection.....	120
L State.....	120
L TCP/IP Mode (Lan Ext.1).....	120
L IP Address (Lan Ext.1).....	120
L Subnet Mask (Lan Ext.1).....	120
L Default Gateway (Lan Ext.1).....	120
L DNS Servers(s) (Lan Ext.1).....	120

Lan Ext.1 Connection

Specify the configuration details for the additional Gbit LAN connection.

State ← Lan Ext.1 Connection

Displays the state of the the Lan Ext.1 connection

connected | disconnected

TCP/IP Mode (Lan Ext.1) ← Lan Ext.1 Connection

The IP address can be assigned automatically via DHCP ("DHCP") or manually as fixed IP address ("Static").

IP Address (Lan Ext.1) ← Lan Ext.1 Connection

Specify the IP address of the R&S TSMA.

Subnet Mask (Lan Ext.1) ← Lan Ext.1 Connection

Specify the subnet mask for the R&S TSMA.

Default Gateway (Lan Ext.1) ← Lan Ext.1 Connection

Specify the default gateway.

DNS Servers(s) (Lan Ext.1) ← Lan Ext.1 Connection

Specify the 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 TSMA (File Transfer)
- Download of the Vicom sample application to an Android device.

File Transfer.....	121
L Upload.....	121
L Download.....	121
L User-defined Upload.....	121

L User-defined Download	121
Sample App	121
L Download rViCom SampleApp	121

File Transfer

Specifies the properties for upload and download files.

Upload ← File Transfer

Specifies the file (e.g. workspace file) which should be transferred from a connected device to the R&S TSMA (D:\Upload).

Note: The maximum file size for the upload is 100 MB.

Download ← File Transfer

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

User-defined Upload ← File Transfer

Specifies the file (e.g. workspace file) which should be transferred from a connected device to a user-defined directory on the R&S TSMA.

Note: The maximum file size for the upload is 100 MB.

User-defined Download ← File Transfer

Specifies the measurement data file which should be transferred from a user-defined directory on the R&S TSMA to a connected device.

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.

A.4 Options

The "Options" window consists of the following tabs.

• Available	121
• Install	122

A.4.1 Available

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

Option Type.....	122
Option Material No.....	122
Activation Type.....	122
Valid From / Valid To.....	122
Option Index.....	122

Option Type

Type of installed license key

Option Material No.

R&S order number of installed license key

Activation Type

Activation type of license key (temporary or permanent)

Valid From / Valid To

Start and expiration date of installed temporary license key

Option Index

Index number of the installed license key

A.4.2 Install

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

Install NESTOR Options.....	122
Install Scanner Options.....	122
Install ROMES Option.....	122

Install NESTOR Options

This field allows to enter the R&S NESTOR license key code manually.

Press "Install" button to finish the installation.

Install Scanner Options

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

- Manually by entering the license key code in the related field and clicking "Install".
- Via license key file (*.xml). Select the license key file using the "Browse" button and click "Install XML File".

Install ROMES Option

This field allows to install a Romes option<serial number>.dat file.

- Connect a data stick to a USB port.
NOTE: The ROMES option<serial number>.dat file must be located in the root directory of the data stick.
- Click the "Refresh" button of the browser. The license key file must be listed in the file dialog.
- Click the "Install" button.

A.5 Update

The "Update" window allows to select and update the TSMA software and additional software components.



Prerequisites for a Firmware/Software Update

- The setup file must be located in the root directory of the data stick.
- Software and firmware updates are only possible, when the mode is "PC Mode".

Select Firmware Setup File	123
Select QualiPoc Setup File	123
Select NESTOR Setup File	123
Select ROMES Setup File	123
Select Vicom Setup File	123

Select Firmware Setup File

Select a firmware setup file from the "Select Firmware Setup File" box and click "Update Firmware". The setup is started. The progress can be monitored in the status line of the web GUI.

Select QualiPoc Setup File

Select the setup file from the "Select QualiPoc Setup File" box and click "Update QualiPoc". The setup is started. The progress can be monitored in the status line of the web GUI.

Select NESTOR Setup File

Select the setup file from the "Select NESTOR Setup File" box and click "Update NESTOR". The setup is started. The progress can be monitored in the status line of the web GUI.

Select ROMES Setup File

Select the setup file from the "Select ROMES Setup File" box and click "Update ROMES". The setup is started. The progress can be monitored in the status line of the web GUI.

Select Vicom Setup File

Select the setup file from the "Select Vicom Setup File" box and click "Update Vicom". The setup is started. 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 TSMA system.

Backup TSMA System	124
--	-----

Backup TSMA System

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

- At first, it is checked, if there is enough memory available for the backup.
- Only one user backup can be created at time. An existing backup will be overwritten after an acknowledgment.
- If there is a system failure, the system can be restored by pressing the "RESTORE" button.

A.7 Restart

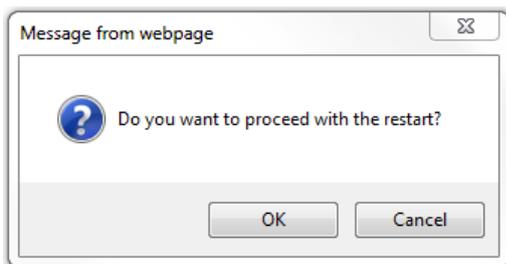
The "Restart" window allows to restart the complete R&S TSMA and the scanner unit separately.

System restart	124
PowerCycle	124

System restart

To restart the R&S TSMA, click "Restart".

The following message appears.

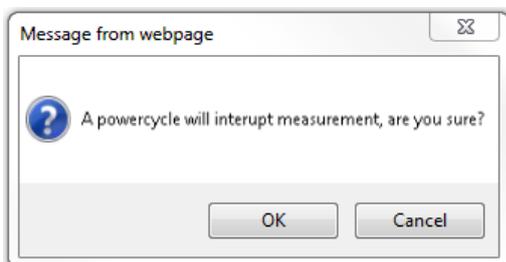


Click "OK" to reboot the R&S TSMA.

PowerCycle

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

The following message appears.



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

A.8 Help

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

B Introduction to Remote ViCom Sample App

B.1 Overview

The R&S TSMA 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 TSMA scanner measurements from a remote PC / tablet.

The R&S TSMA is shipped 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 TSMA
- Remote rViCom Server on the R&S TSMA (default)
- An installed Sample App on the Android device
The version of the rViCom server on the R&S TSMA 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 7.1.1, "Start the R&S TSMA Web-GUI"](#), on page 43).
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 TSMa 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 127).

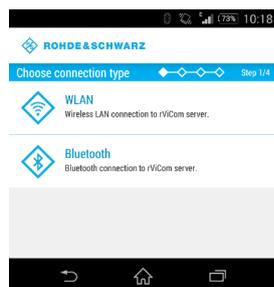


Figure B-1: Connection Type Selection

B.3.1.2 Server Discovery

1. Choose a connection type, as described in [Chapter B.3.1.1, "Connection Type Selection"](#), on page 127.
2. The server discovery starts and the following dialog appears.

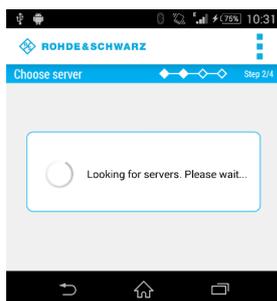


Figure B-2: Active Server Discovery

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

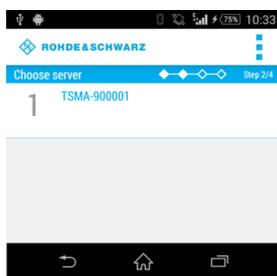


Figure B-3: Successful Server Discovery

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.

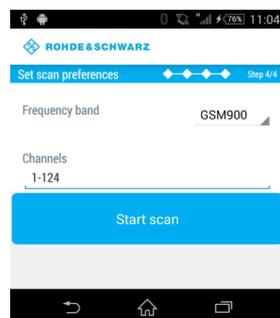


Figure B-5: Setting the GSM Preferences

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.

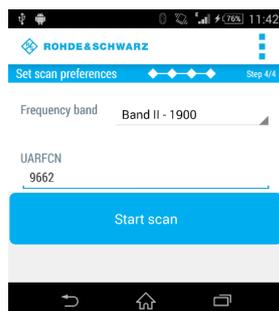


Figure B-7: Setting the WCDMA Preferences

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).

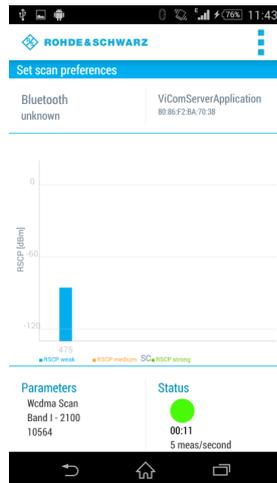


Figure B-8: WCDMA Scan Result View

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.

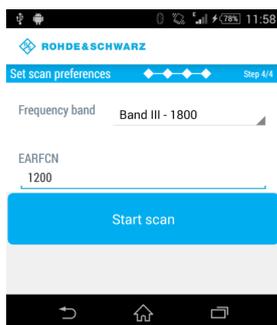


Figure B-9: Setting the LTE Preferences

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).

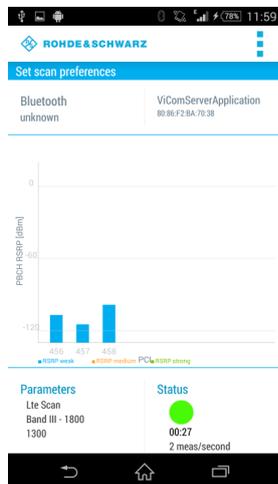


Figure B-10: LTE Scan Result View

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.

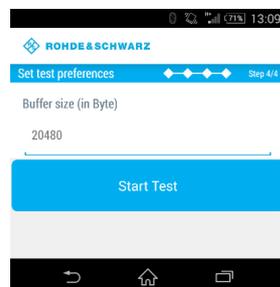


Figure B-11: Throughput Preferences

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.

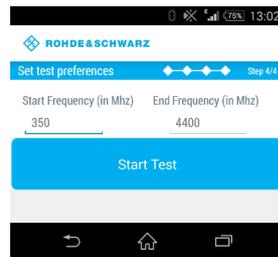


Figure B-13: RF Power Scan References

- 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)

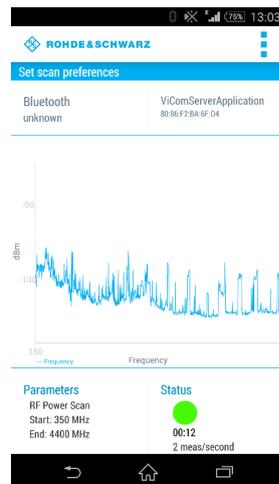


Figure B-14: RF Power Scan Results

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 Available Cellular Bands

The following cellular bands are available for selection for R&S TSMA with a limited band option (see [Chapter 5, "R&S TSMA Option Concept"](#), on page 21).

Table C-1: Available cellular bands for the R&S TSMA

ID	TSME Band	Span	Start [MHz]	Stop [MHz]
1	"TETRA"	span 1	375	435
		span 2	445	475
		span 3	865	881
		span 4	910	926
2	"CDMA 400"	span 1	410	493
3	"480"	span 1	478	486
		span 2	488	496
4	"700"	span 1	698	862
5	"810"	span 1	806	821
		span 2	851	866
6	"850"	span 1	806	940
7	"900"	span 1	917	960
		span 2	872	915
8	"1400"	span 1	1427	1496
9	"PDC Japan"	span 1	1447	1463
		span 2	1495	1511
10	"1500/1600"	span 1	1626	1661
		span 2	1525	1559
11	"AWS"	span 1	1710	1780
		span 2	2110	2200
12	"1700"	span 1	1749	1785
		span 2	1840	1880
		span 3	1695	1710
		span 4	1995	2020
13	"1800"	span 1	1710	1785
		span 2	1805	1880
14	"1900"	span 1	1850	1915
		span 2	1930	1995
15	"2100"	span 1	1920	2010

ID	TSME Band	Span	Start [MHz]	Stop [MHz]
		span 2	2110	2200
16	"S-Band"	span 1	2000	2020
		span 2	2180	2200
17	"2600"	span 1	2496	2690
18	"3500"	span 1	3410	3490
		span 2	3510	3590
19	"WiMAX 7.x"	span 1	730	770
		span 2	890	903
		span 3	915	950
20	"WiMAX 8.A/TDD 1900/2000"	span 1	1785	1805
		span 2	1880	1930
		span 3	2010	2025
21	"TDD 1800"	span 1	1800	1830
22	"TDD 1930"	span 1	1930	1990
23	"TDD 2300"	span 1	2300	2400
24	"TDD 3300"	span 1	3300	3400
25	"TDD 3400"	span 1	3400	3600
26	"TDD 3600"	span 1	3600	3800
28	"ISM-Band"	span 1	433	435
		span 2	2400	2500
29	"600"	span 1	617	698

Table C-2: Additional information on cellular bands

ID	Band Name	Included standardized bands	UL low	UL high	DL low	DL high	Duplex
1	"TETRA"	T-GSM 380	380.2	389.8	390.2	399.8	FDD
		T-GSM 410	410.2	419.8	420.2	429.8	FDD
		GSM 450	450.4	457.6	460.4	467.6	FDD
		TETRA 380 to 400	380	390	390	400	FDD
		TETRA 410 to 430	410	420	420	430	FDD
		TETRA 450 to 470	450	460	460	470	FDD
		TETRA 900	870	876	915	921	FDD
		LTE Band 31	452.5	457.5	462.5	467.5	FDD
2	"CDMA 400"	CDMA2000/EV-DO Band Class 11 (400 MHz European PAMR Band)	410	483	420	493	FDD

ID	Band Name	Included standardized bands	UL low	UL high	DL low	DL high	Duplex
		CDMA2000/EV-DO Band Class 5 (450 MHz Band)	410	483	420	493	FDD
3	"480"	GSM 480	478.8	486	488.8	496	FDD
4	"700"	WiMAX 7.A	698	862	698	862	TDD
		CDMA2000/EV-DO Band Class 19 (Lower 700 MHz Band)	698	716	728	746	FDD
		LTE Band 12 (lower 700 A/B/C)	699	716	729	746	FDD
		3GPP WCDMA XII	699	716	729	746	FDD
		LTE Band 17 (lower 700 B)	704	716	734	746	FDD
		GSM 710	698	716	728	746	FDD
		LTE Band 44 TDD	703	803	703	803	TDD
		CDMA2000/EV-DO Band Class 7 (Upper 700 MHz Band)	776	788	746	758	FDD
		Band 13 (upper 700 C)	777	787	746	756	FDD
		WiMAX 7.B	776	787	746	757	FDD
		3GPP WCDMA XIII	777	787	746	756	FDD
		CDMA2000/EV-DO Band Class 18 (700 MHz Public Safety Band)	787	799	757	769	FDD
		LTE Band 14 (upper 700 D)	788	798	758	768	FDD
		3GPP WCDMA XIV	788	798	758	768	FDD
		WiMAX 7.C	788	798	758	768	FDD
		WiMAX 7.D	788	798	758	768	FDD
		GSM 750	777	793	747	763	FDD
		LTE Band 28 (700 APT)	703	748	758	803	FDD
		LTE Band 20	832	862	791	821	FDD
		3GPP WCDMA XX	832	862	791	821	FDD
5	"810"	T-GSM 810	806	821	851	866	FDD
6	"850"	GSM 850	824	849	869	894	FDD
		3GPP WCDMA V	824	849	869	894	FDD
		LTE Band 5	824	849	869	894	FDD
		LTE Band 26	814	849	859	894	FDD
		LTE Band 18	815	830	860	875	FDD
		CDMA2000/EV-DO Band Class 0 (800 MHz Band)	815	849	860	894	FDD
		CDMA2000/EV-DO Band Class 10 (Secondary 800 MHz Band)	806	901	851	940	FDD

ID	Band Name	Included standardized bands	UL low	UL high	DL low	DL high	Duplex
		CDMA2000/EV-DO Band Class 12 (800 MHz PAMR Band)	870	876	915	921	FDD
		3GPP WCDMA VI	830	840	875	885	FDD
		3GPP WCDMA XIX	830	845	875	890	FDD
		3GPP WCDMA XXVI	814	849	859	894	FDD
		LTE Band 27	807	824	852	869	FDD
		LTE Band 6	830	840	875	885	FDD
		LTE Band 19	830	845	875	890	FDD
		TETRA 900	870	876	915	921	FDD
		CDMA2000/EV-DO Band Class 3 (JTACS Band)	887	925	832	870	FDD
7	"900"	P-GSM 900	890	915	935	960	FDD
		E-GSM 900 (includes P-GSM 900)	880	915	925	960	FDD
		R-GSM 900 (includes E-GSM 900)	876	915	921	960	FDD
		3GPP WCDMA VIII	880	915	925	960	FDD
		LTE Band 8	880	915	925	960	FDD
		WiMAX 7.G	880	915	925	960	FDD
		CDMA2000/EV-DO Band Class 9 (900 MHz Band)	880	915	925	960	FDD
		CDMA2000/EV-DO Band Class 2 (TACS Band)	872	915	917	960	FDD
8	"1400"	3GPP WCDMA XI	1427.9	1447.9	1475.9	1495.9	FDD
		LTE Band 11	1427.9	1447.9	1475.9	1495.9	FDD
9	"PDC Japan"	3GPP WCDMA XXI	1447.9	1462.9	1495.9	1510.9	FDD
		LTE Band 21	1447.9	1462.9	1495.9	1510.9	FDD
10	"1500/1600"	CDMA2000/EV-DO Band Class 20 (L-Band)	1626	1660	1525	1559	FDD
		LTE Band 24	1626.5	1660.5	1525	1559	FDD
11	"AWS"	3GPP WCDMA IV	1710	1755	2110	2155	FDD
		3GPP WCDMA X	1710	1770	2110	2170	FDD
		LTE Band 4	1710	1755	2110	2155	FDD
		LTE Band 10	1710	1770	2110	2170	FDD
		CDMA2000/EV-DO Band Class 15 (AWS Band)	1710	1755	2110	2155	FDD
		WiMAX 6.A	1710	1770	2110	2170	FDD
12	"1700"	3GPP WCDMA IX	1749.9	1784.9	1844.9	1879.9	FDD

ID	Band Name	Included standardized bands	UL low	UL high	DL low	DL high	Duplex
		LTE Band 9 (UMTS1700)	1749.9	1784.9	1844.9	1879.9	FDD
		CDMA2000/EV-DO Band Class 4 (Korean PCS Band)	1750	1780	1840	1870	FDD
13	"1800"	DCS 1800	1710	1785	1805	1880	FDD
		3GPP WCDMA III	1710	1785	1805	1880	FDD
		LTE Band 3	1710	1785	1805	1880	FDD
		CDMA2000/EV-DO Band Class 8 (1800 MHz Band)	1710	1785	1805	1880	FDD
		WiMAX 6.C	1710	1785	1805	1880	FDD
14	"1900"	PCS 1900	1850	1910	1930	1990	FDD
		3GPP WCDMA II	1850	1910	1930	1990	FDD
		3GPP WCDMA XXV	1850	1915	1930	1995	FDD
		3GPP TDD incl. TD-SCDMA b	1850	1910	1930	1990	TDD
		LTE Band 2	1850	1910	1930	1990	FDD
		LTE Band 35 TDD	1850	1910			TDD
		CDMA2000/EV-DO Band Class 1 (1900 MHz Band)	1850	1910	1930	1990	FDD
		CDMA2000/EV-DO Band Class 14 (US PCS 1.9GHz Band)	1850	1915	1930	1995	FDD
		LTE Band 25 (PCS A-G superset of band 2)	1850	1915	1930	1995	FDD
15	"2100"	3GPP WCDMA I	1920	1980	2110	2170	FDD
		LTE Band 1	1920	1980	2110	2170	FDD
		CDMA2000/EV-DO Band Class 6 (2 GHz IMT2000 Band)	1920	1980	2110	2170	FDD
		WiMAX 6.B	1920	1980	2110	2170	FDD
16	"S-Band"	LTE Band 23	2000	2020	2180	2200	FDD
		CDMA2000/EV-DO Band Class 21 (S-Band)	2000	2020	2180	2200	FDD
17	"2600"	LTE Band 7	2500	2570	2620	2690	FDD
		CDMA2000/EV-DO Band Class 13 (25 GHz IMT-2000 Extension Band)	2500	2570	2620	2690	FDD
		3GPP WCDMA VII	2500	2570	2620	2690	FDD
		CDMA2000/EV-DO Band Class 16 (US 2.5 GHz Band)	2502	2568	2624	2690	FDD
		CDMA2000/EV-DO Band Class 17 (US 2.5 GHz Forward Link Only Band)			2624	2690	FDD (DL only)
		LTE Band 41 TDD	2496	2690	2496	2690	TDD

ID	Band Name	Included standardized bands	UL low	UL high	DL low	DL high	Duplex
		WiMAX 3.A	2496	2690	2496	2690	TDD
		WiMAX 3.B	2496	2572	2614	2690	FDD
		LTE Band 38 TDD	2570	2620	2570	2620	TDD
		3GPP TDD incl. TD-SCDMA d	2570	2620	2570	2620	TDD
18	"3500"	3GPP WCDMA XXII	3410	3490	3510	3590	FDD
		LTE Band 22	3410	3490	3510	3590	FDD
19	"WiMAX 7.x"	7.x* lower	730	770	730	770	TDD
		7.x* mid	890	903	890	903	TDD
		7.x* higher	915	950	915	950	TDD
20	"WiMAX 8.A/TDD 1900/2000"	WiMAX 8.A lower	1785	1805	1785	1805	TDD
		WiMAX 8.A mid	1880	1930	1880	1930	TDD
		WiMAX 8.A upper	2010	2025	2010	2025	TDD
		3GPP TDD incl. TD-SCDMA a (lower)	1900	1920	1900	1920	TDD
		LTE Band 33 TDD	1900	1920	1900	1920	TDD
		3GPP TDD incl. TD-SCDMA c	1910	1930	1910	1930	TDD
		LTE Band 37 TDD	1910	1930	1910	1930	TDD
		3GPP TDD incl. TD-SCDMA f	1880	1920	1880	1920	TDD
		LTE Band 39 TDD	1880	1920	1880	1920	TDD
		3GPP TDD incl. TD-SCDMA a (upper)	2010	2025	2010	2025	TDD
		LTE Band 34 TDD	2010	2025	2010	2025	TDD
21	"TDD 1800"	WiMAX 8.G	1800	1830	1800	1830	TDD
22	"TDD 1930"	LTE Band 36 TDD	1930	1990	1930	1990	TDD
23	"TDD 2300"	LTE Band 40 TDD	2300	2400	2300	2400	TDD
		3GPP TDD incl. TD-SCDMA e	2300	2400	2300	2400	TDD
		WiMAX 1.A	2300	2400	2300	2400	TDD
		WiMAX 1.B	2300	2400	2300	2400	TDD
		WiMAX 2.D (lower)	2305	2320	2305	2320	TDD
		WiMAX 2.D (upper)	2345	2360	2345	2360	TDD
		WiMAX 2.E	2345	2360	2305	2320	FDD
		WiMAX 2.F	2345	2360	2305	2320	FDD
24	"TDD 3300"	WiMAX 4.A	3300	3400	3300	3400	TDD
		WiMAX 4.B	3300	3400	3300	3400	TDD

ID	Band Name	Included standardized bands	UL low	UL high	DL low	DL high	Duplex
		WiMAX 4.C	3300	3400	3300	3400	TDD
25	"TDD 3400"	LTE Band 42 TDD	3400	3600	3400	3600	TDD
		WiMAX 5L.A	3400	3600	3400	3600	TDD
		WiMAX 5L.B	3400	3600	3400	3600	TDD
		WiMAX 5L.C	3400	3600	3400	3600	TDD
		WiMAX 5L.D	3400	3500	3500	3600	FDD
26	"TDD 3600"	LTE Band 43 TDD	3600	3800	3600	3800	TDD
		WiMAX 5H.A	3600	3800	3600	3800	TDD
		WiMAX 5H.B	3600	3800	3600	3800	TDD
		WiMAX 5H.C	3600	3800	3600	3800	TDD

Glossary: Abbreviations

Symbols

1xEvDO: Evolution - Data Optimized

B

BTS: Base Transceiver Station

C

CDMA: Code Division Multiple Access

D

DHCP: Dynamic Host Control Protocol

DL: Downlink

DNS: Domain Name Service

E

EARFCN: E-UTRA Absolute Radio Frequency Channel Number

EMI: Electromagnetic Interference

G

GPS: General Positioning System

GSM: Global System for Mobile Communication

H

HDMI: High Definition Multimedia Interface

L

LAN: Local Area Network

LTE: Long Term Evolution

M

MCS: Modulation and Coding Scheme

MIMO: Multiple Input - Multiple Output

P

PBCH: Physical Broadcast Channel

PCI: Physical Cell ID

R

RNTI: Radio Network Temporary Identifier

RSCP: Received Signal Code Power

RSRP: Reference Signal Received Power

RSSI: Received Signal Strength Indication

S

SC: Scrambling Code

SSID: Service Set Identifier

T

TD-SCDMA: Time Division - Synchronous Code Division Multiple Access

TETRA: Terrestrial Trunked Radio

TTI: Transmission Time Interval

U

UARFCN: UTRAN Absolute Radio Frequency Channel Number

UL: Uplink

W

WCDMA: Wideband Code Division Multiple Access

WLAN: Wireless Local Area Network

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