

R&S® TSMA

Autonomous Mobile Network Scanner

Getting Started



1177560402

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

- R&S®TSMA (1514.6520.20)

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Throughout this manual, products from Rohde & Schwarz are indicated without the ® symbol , e.g. R&S®TSMA is indicated as R&S TSMA.

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1 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.

2 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

2.1 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.

2.2 User Manuals and Help

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

2.3 Basic Safety Instructions

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

2.4 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

2.5 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

3 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)

4 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.

4.1 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 4-1: 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

4.2 Connecting External Devices

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

To select the correct connectors, see the following picture.

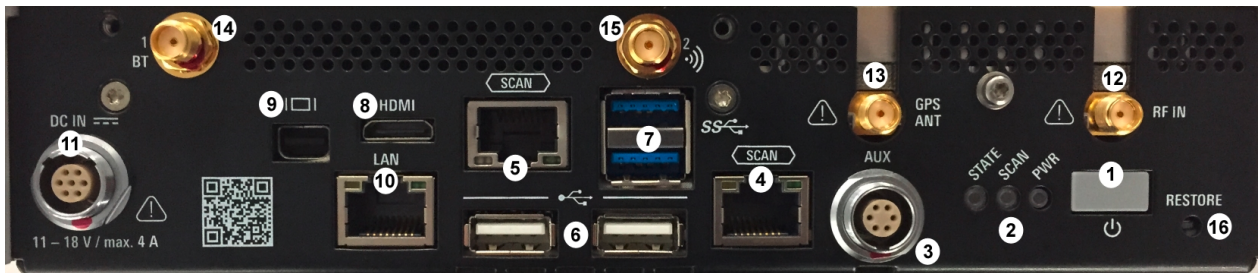


Figure 4-2: R&S TSMA - Rear Panel

- 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

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



Figure 4-3: 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 4-4: 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.

4.3 Connecting Power Supply

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

4.3.1 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!

4.3.2 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 4-5: TSMA-Z1 AC Power Supply

4.3.3 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.

Connecting Power Supply

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 4-6: R&S TSMA - Battery Orientation

1 = Battery insert orientation

2. Attach the R&S TSMA base unit with the bottom side (see [Figure 4-8](#)) on top of the R&S TSMA-BP (see [Figure 4-7](#)).



Figure 4-7: R&S TSMA-BP

1 = Connectors for R&S TSMA base unit



Figure 4-8: 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.

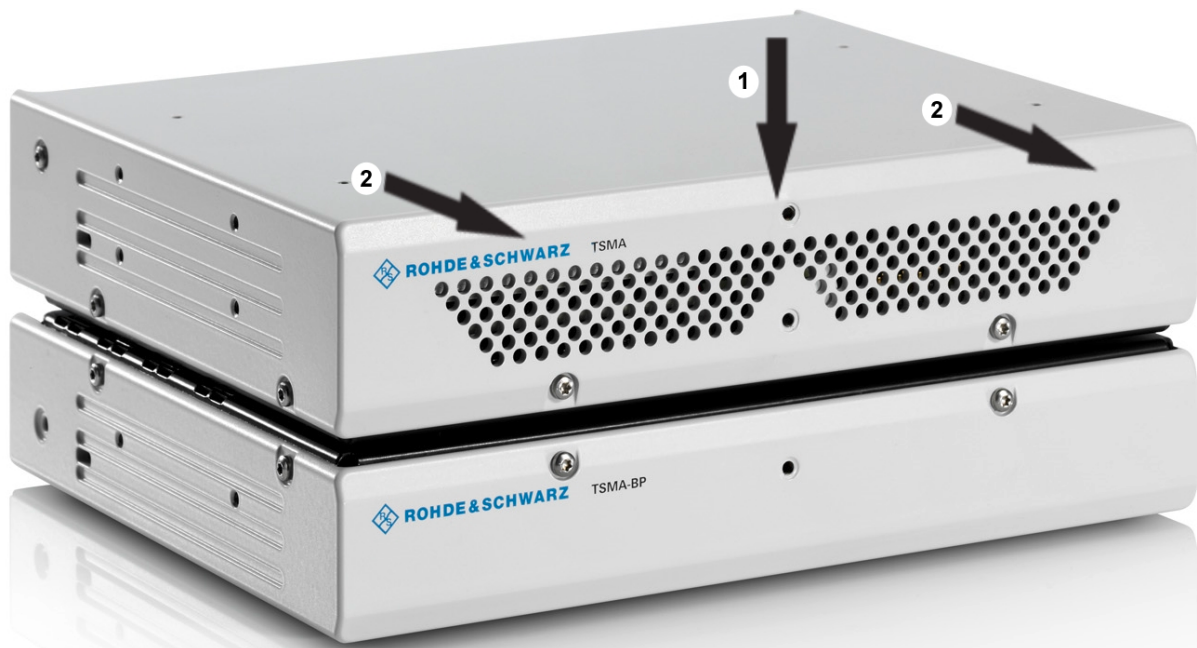


Figure 4-9: Connected R&S TSMA Base Unit and R&S TSMA-BP

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 4-10: 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 4-11: Cabling of R&S TSMa with R&S TSMa

- 1 = DC IN Connector of R&S TSMA Base Unit
- 2 = TSMA 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 4-12: Cable

Connected at the DC IN (1) of the R&S TSMA, this red spot must face upwards, at the TSMA 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.

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 4-14](#))

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 4-13: 7-pin to 4-pin adapter cable

2. AC powered

Connecting Power Supply

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 4-14: Connecting the R&S TSMA with an AC power supply

- 1 = DC IN connector R&S TSMA Base Unit
- 2 = TSM 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 (TSMA-Z1 resp. car adapter cable, standard accessory of R&S TSMA)

4.4 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 4-15: R&S TSMA with R&S TSMA-BP battery pack unit and mounted R&S TSME (front side view)



Figure 4-16: 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)

4.4.1 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)

Connecting an Additional R&S TSME for MIMO Support



Figure 4-17: Some items of the upgrade kit

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

4.4.2 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 4-18: 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 4-19: Mounting R&S TSME on R&S TSMA

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



Figure 4-20: 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)

4.5 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 4.6, "R&S TSMA Driver Update"](#), on page 25).
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.

4.6 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/>.

4.6.1 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.

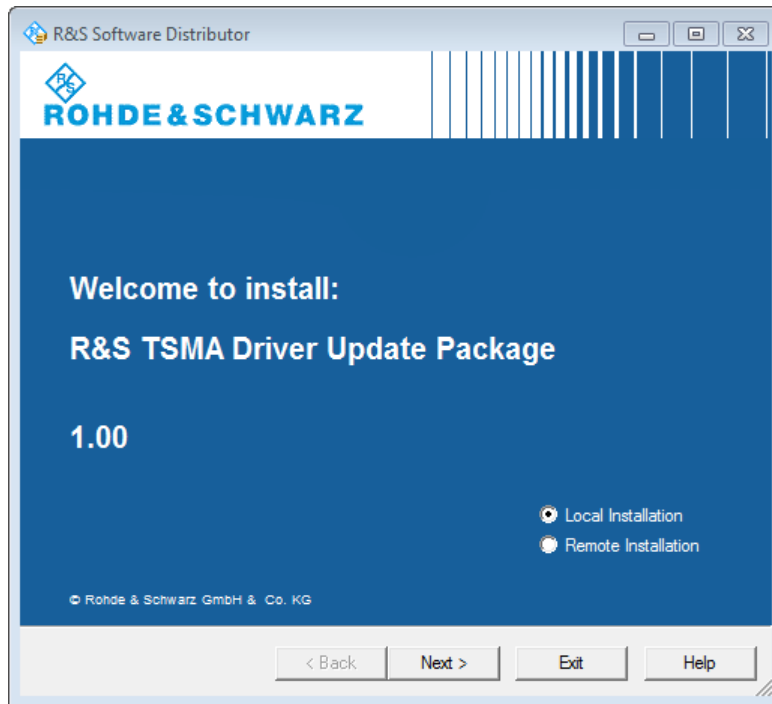


Figure 4-21: R&S Software Distributor opening page

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

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

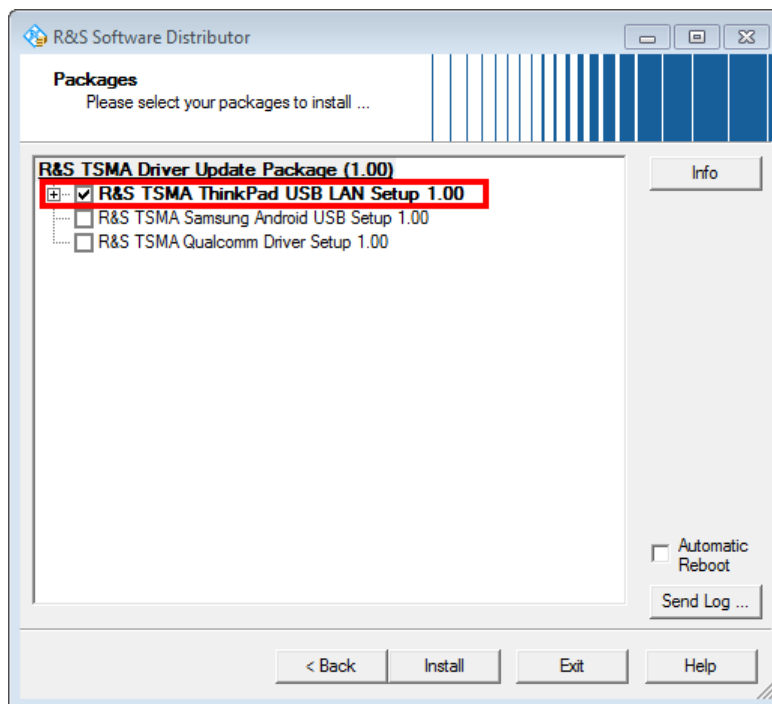


Figure 4-22: Contents of the R&S TSMA Driver Update Package

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.

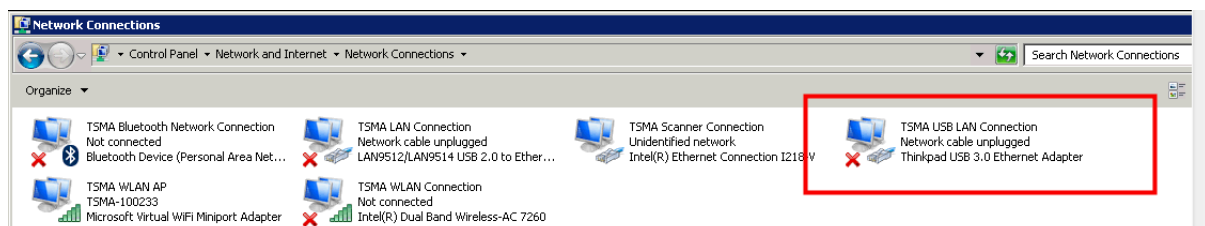


Figure 4-23: Installed package



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.

4.6.2 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.

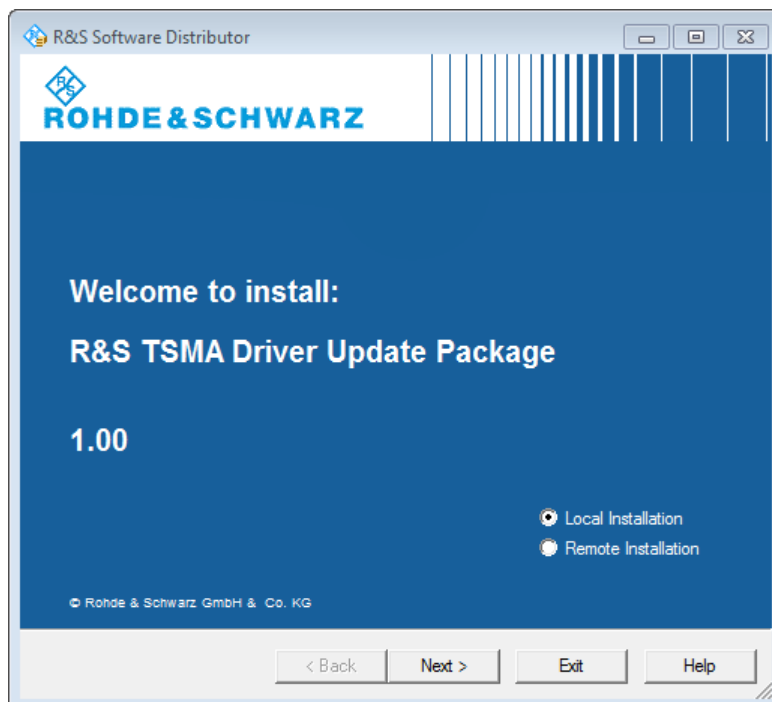


Figure 4-24: R&S Software Distributor opening page

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

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

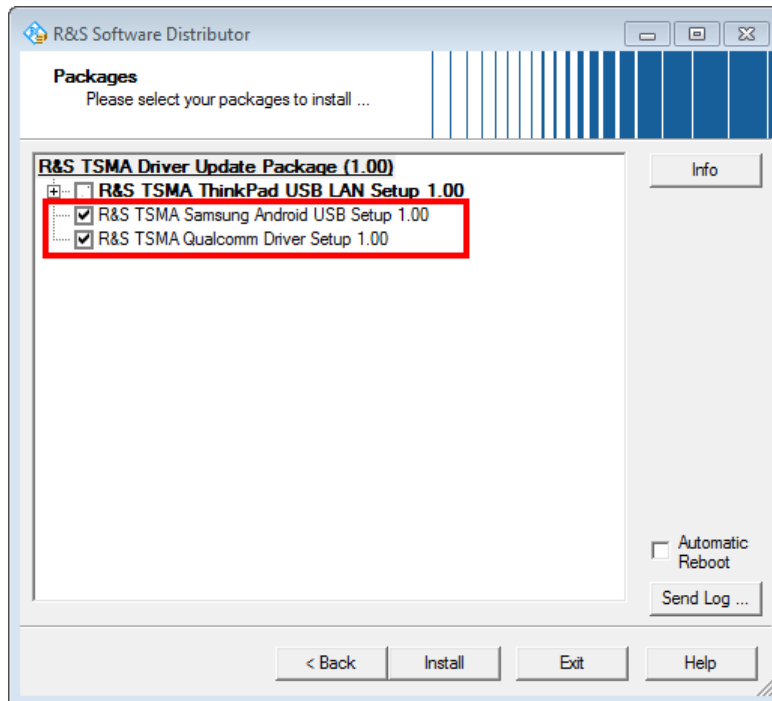


Figure 4-25: Contents of the R&S TSMA Driver Update Package

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.

5 Instrument Tour

5.1 Front Panel

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

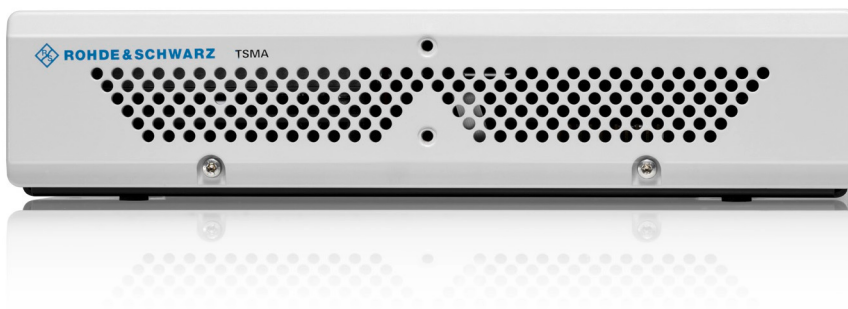


Figure 5-1: R&S TSMA - Front Panel

5.2 Rear Panel

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

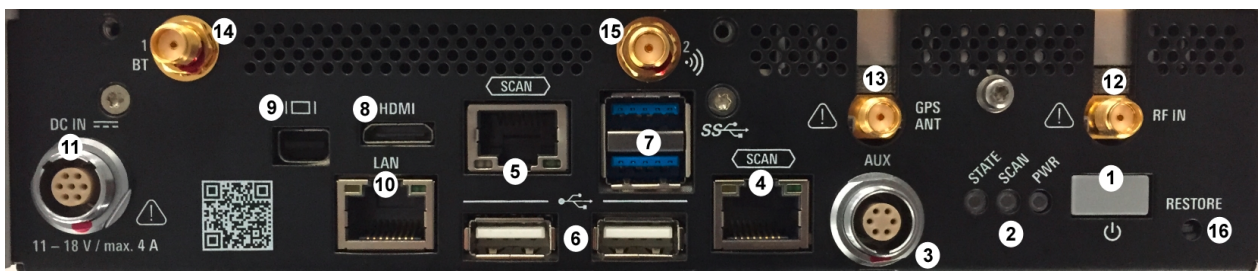


Figure 5-2: R&S TSMA - Rear Panel

- 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 5.3, "Status LEDs"](#), on page 34.

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).

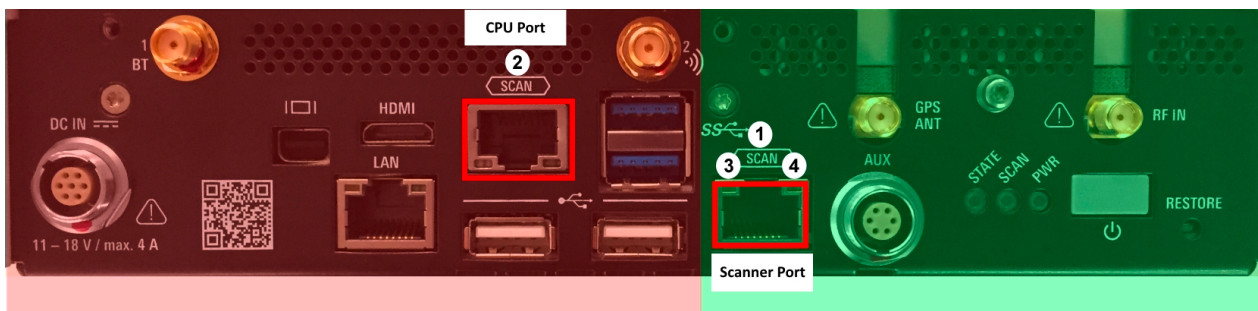


Figure 5-3: Connectors of the R&S TSMA

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 5.3.2, "SCAN LINK"](#), on page 36.

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 TSMA 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 TSMA 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 TSMA. The multi-band RF paddle antenna (700 MHz to 2.6 GHz), which is included in the shipment of R&S TSMA 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.

5.3 Status LEDs

5.3.1 PWR, SCAN, STATE

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

Status LEDs

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 / self-test	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	-

LEDs			Mode	Comment
blue	red (cont.)	-	Temperature error scanner module	-
blue	-	red	Scanner link failed	



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.

5.3.2 SCAN LINK

Table 5-1: 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 5-2: 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

6 Configuring the R&S TSMA

6.1 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 6.1.1, "Start the R&S TSMA Web-GUI"](#), on page 37).
 - Establish a remote desktop connection (via LAN/WLAN) (see [Chapter 6.1.2, "Establish a Remote Desktop Connection"](#), on page 38).

6.1.1 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.
 - 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.

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

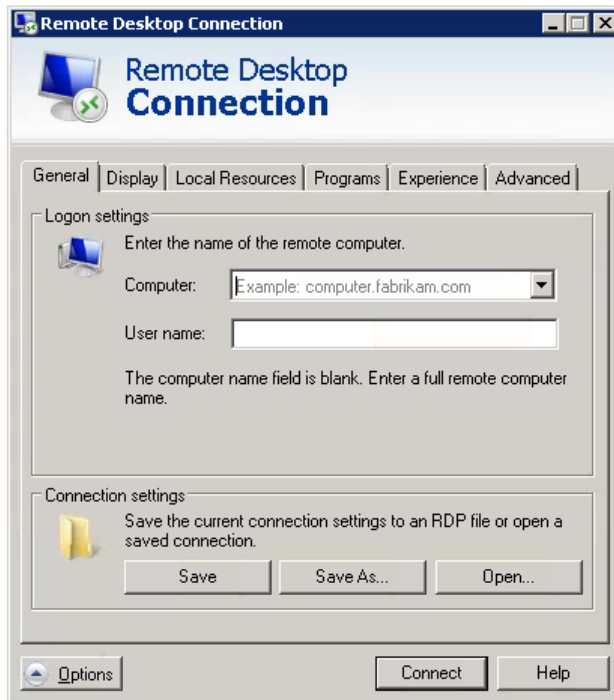
- Open Internet Explorer using mouse, keyboard and monitor. The R&S TSMA Web-GUI opens automatically. If not, type the following:
http://localhost

6.1.2 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 6.1.1, "Start the R&S TSMA Web-GUI"](#), on page 37.
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 6.1.1, "Start the R&S TSMA Web-GUI"](#), on page 37 and is .
 - WLAN: *192.168.1.10*
 - LAN: IP address of the R&S TSMA

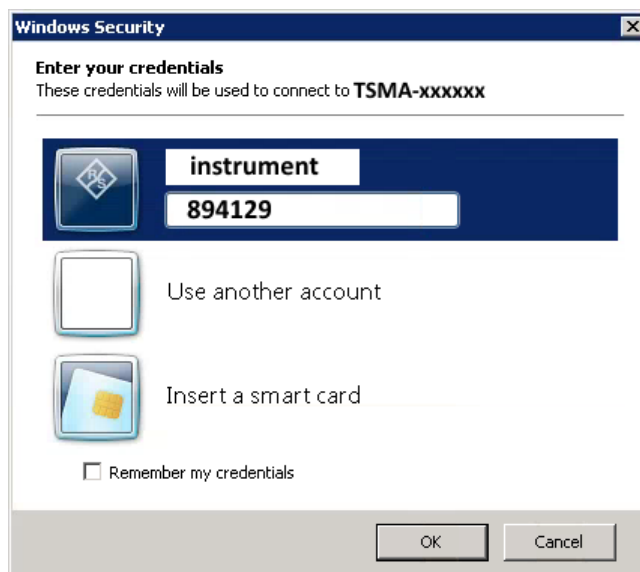
- User name: *instrument*



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.

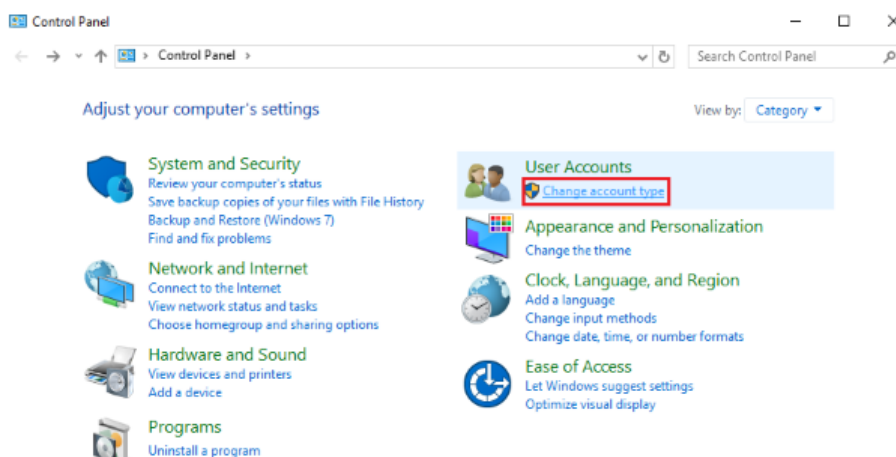
The R&S TSMA can be controller as a standard PC.

6.2 Changing Password of R&S TSMA

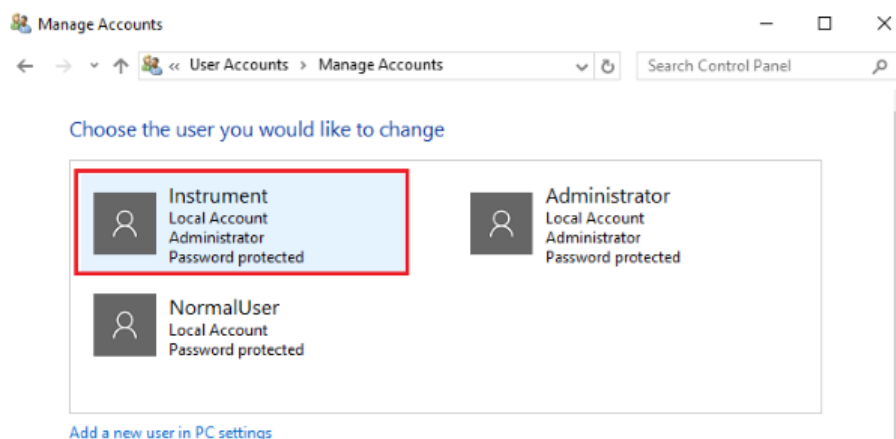
To change the default password (default PW: 894129) of R&S TSMA, proceed as follows. After changing the password, additional steps has to be performed for "Autologin".

Change Password

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

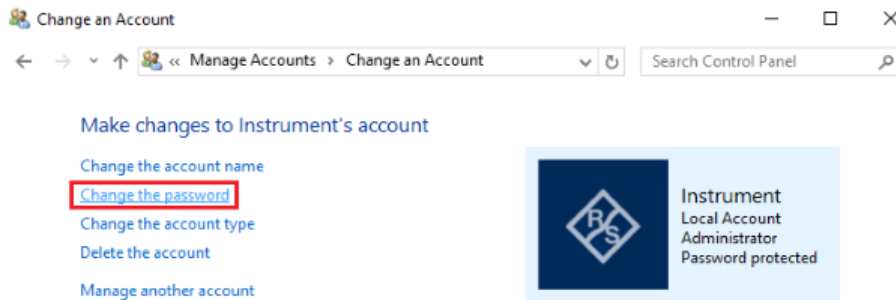


3. In the following window, double-click the account "instrument" to edit the settings.

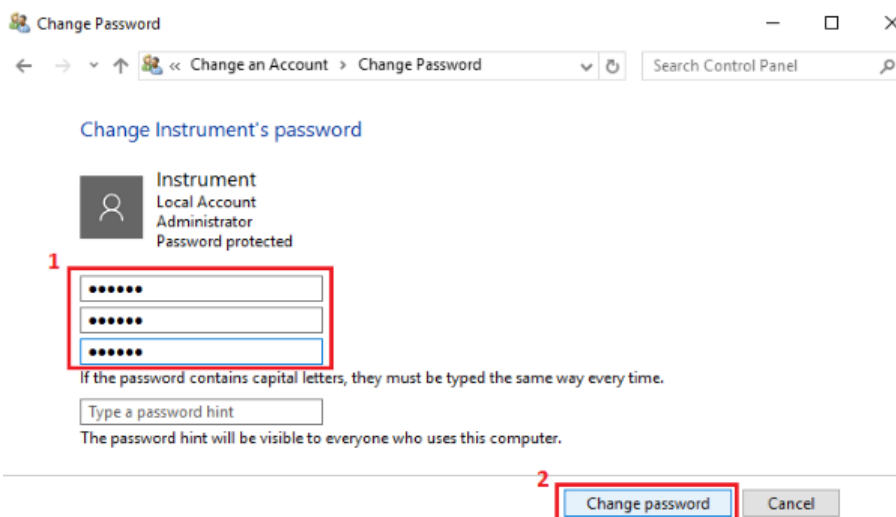


Changing Password of R&S TSMA

- Click "Change the password".



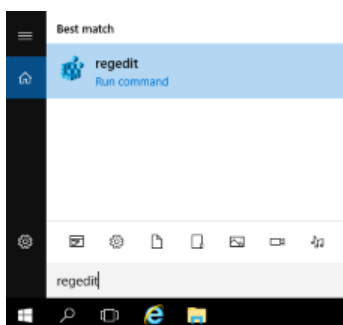
- Fill in the fields (1) and click "Change password" (2).



Enable Autologin

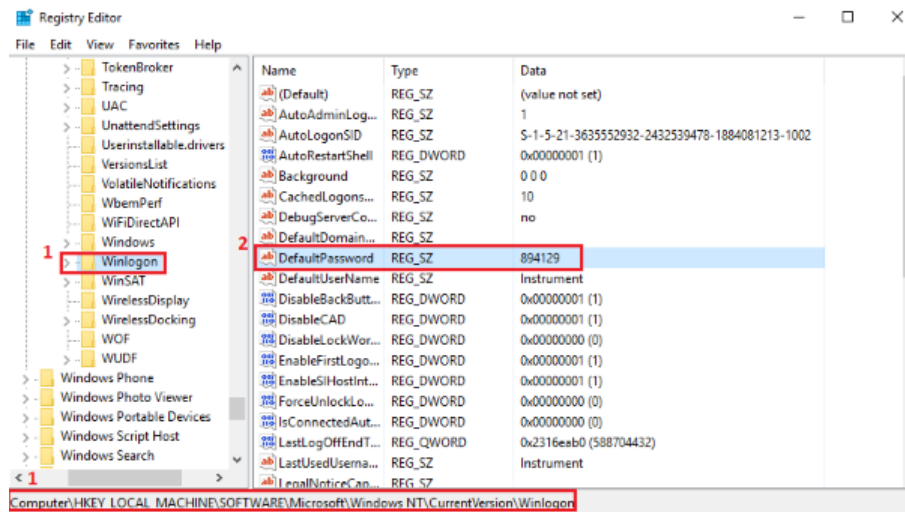
After changing the password, change the password also in "Autologin" settings. To change the "Autologin" settings, proceed as follows.

- Open the "Registry Editor".

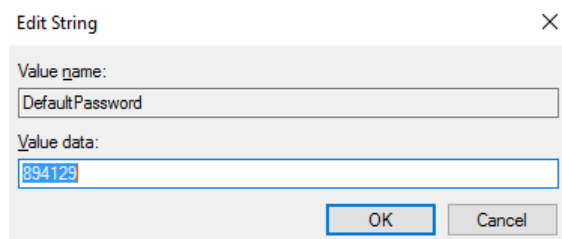


- In the "Registry Editor", navigate to
HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows NT\

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 TSMa automatically login.

6.3 Measurement Setup

The measurement setup procedure is performed in the following steps.

- Start the R&S TSMa Web-GUI (see [Chapter 6.1.1, "Start the R&S TSMa Web-GUI"](#), on page 37).
- Check the prerequisites of the desired measurement mode (see [Chapter 6.4, "Measurement Modes"](#), on page 43) and adjust your device according these requirements.

3. If the required application is not yet installed, install the required application (Details can be found in the *R&S T SMA User Manual*).
4. Select the measurement mode in the R&S T SMA Web-GUI; the modes are described in [Chapter 6.4, "Measurement Modes"](#), on page 43.



The R&S Remote ViCom Server is installed on all the R&S T SMAs. The other software applications, that is, the R&S NESTOR, R&S ROMES and QualiPoc are installed only if ordered.

6.4 Measurement Modes

To setup a measurement, see [Chapter 6.3, "Measurement Setup"](#), on page 42.



The R&S Remote ViCom Server is installed on all the R&S T SMAs. The other software applications, that is, the R&S NESTOR, R&S ROMES and QualiPoc are installed only if ordered.

6.4.1 Remote ViCom Server Mode

The connection between the Remote ViCom server on the R&S T SMA 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").

1. Switch on Bluetooth® on R&S TSMA.
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.
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 *R&S TSMA User Manual*.

1. Activate the rViCom Server mode (see [Chapter 6.3, "Measurement Setup"](#), on page 42).
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, refer to *R&S TSMA User Manual*.

6.4.2 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.
- The "Mode of Operation" must be set to "QualiPoc".

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".

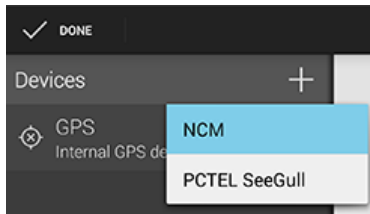


Figure 6-1: Add NCM

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.

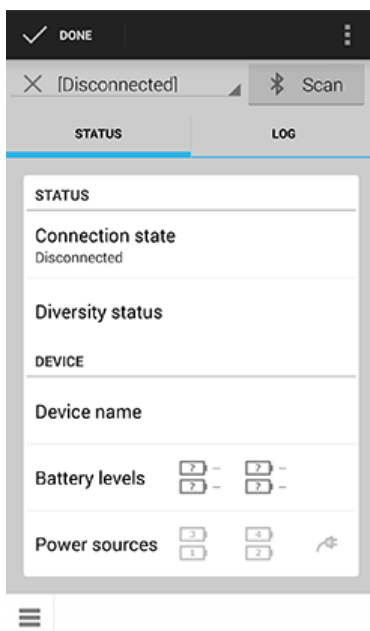


Figure 6-2: Scan for NCM

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

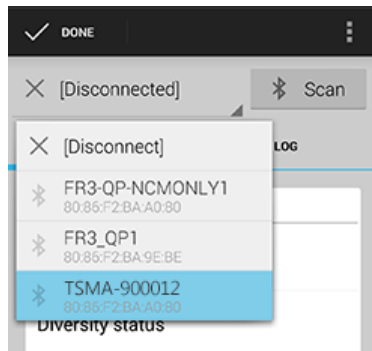


Figure 6-3: Pair NCM

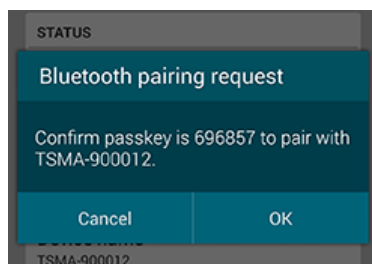


Figure 6-4: Bluetooth pairing request

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

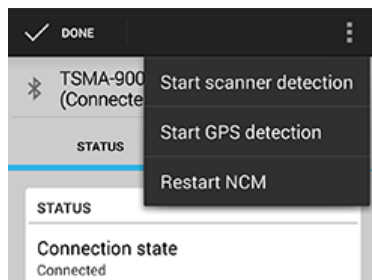


Figure 6-5: Start scanner detection

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

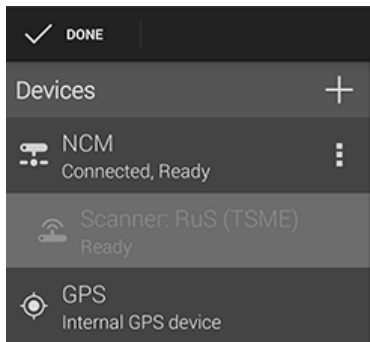


Figure 6-6: Scanner ready

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

6.4.3 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.
- **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".

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 6.3, "Measurement Setup"](#), on page 42).
2. According to the selected mode, following additional settings are required.
 - a) **"NESTOR"** mode
Select a workspace.
 - 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.

6.4.4 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 *R&S TSMA User Manual*).



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 *R&S TSMA User Manual*)
- 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".
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 6.3, "Measurement Setup"](#), on page 42).
2. Configure the following settings:
 - **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.

6.4.5 PC Mode

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

6.4.6 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.

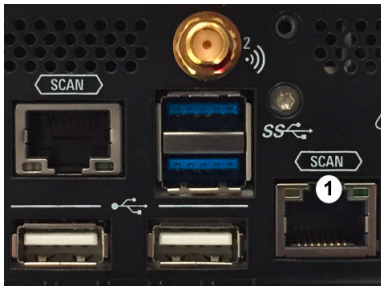


Figure 6-7: Scan ports of R&S TSMA

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.

6.5 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.

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