TEMS™ Investigation 25.0 Release Note

1   About This Release

TEMS is a trademark of Infovista. All other trademarks are the property of their respective holders. Apple, the Apple logo, and iPhone are trademarks of Apple Inc., registered in the U.S. and other countries.

2   Important Information

2.1   Disabling Wi-Fi for Mobile Network Testing

Before using a device for mobile network data service testing, be sure to **turn off Wi-Fi** on the device. If Wi-Fi is enabled, the device may run data transfers over Wi-Fi rather than over the mobile network it is camping on (even if a correct APN (Access Point Name) has been entered).

2.2   Keeping Down Logfile Size When Running Data Services on Qualcomm and Samsung Chipset Based Devices

This section applies to Qualcomm chipset-based and Samsung chipset-based devices, unless otherwise stated. It is **strongly recommended** to follow these steps, since otherwise the PC processing load will become excessive.

- When testing **data services** only, use a Log Configuration activity with the option "Optimized for Data KPI Reports" selected. It is recommended that small data services are executed prior to the Log Configuration to configure the Log Configuration activity in the most optimal way.

- For Qualcomm chipset devices, you can alternatively either disable the DPL log (0x11EB) or set USB mode to RNDIS+DM+MODEM. Be aware that in RNDIS+DM+MODEM mode it is not possible to apply certain control functions such as RAT and band lock. In TEMS™ Investigation the DPL log is by default turned off in RNDIS+DM+MODEM mode.

- When testing both **VoLTE and data services** concurrently, use a Log Configuration script activity with the option "Optimized for Voice/Data KPI Reports" selected. It's recommended that small data services are executed prior to the Log Configuration to configure the Log Configuration activity in the most optimal way.

3 TEMS™ Investigation 25.0

3.1 General

This release contains vendor specific decoding updates of messages for devices based on Qualcomm and Samsung.

3.2 New TEMS Devices

- TEMS Asus ROG Phone 6 ASUS_AI2201_A, B, C, D, E, F
  - TEMS Connect License: Qualcomm R

*There might be regional differences in band support, please refer to https://www.devicespecifications.com, https://www.gsmarena.com or https://phonedb.net for details

3.3 New Connectable Devices

- Samsung S23 Series (U/U1/W/B/BE/E/N/0)
  - TEMS Connect License: Qualcomm R
- Qualcomm MTP X70
  - TEMS Connect License: Qualcomm R

*There might be regional differences in band support, please refer to https://www.devicespecifications.com, https://www.gsmarena.com or https://phonedb.net for details

3.4   New Features

3.4.1   Improved Parameter Substitution

It is now possible to reload the parameter substitution file directly from the Parameter Selection dialog without the need of restarting the application. It is also possible to open the parameter substitution file location directly from the editor for easy access to the configuration file.
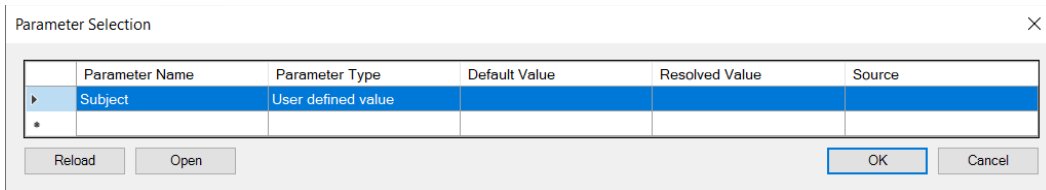
The file format for the ParmeterSubstitution.txt is now supporting line comments by prefix #.

E.g.

```
# Format: %key%=value
# Example:
# %URL_Demo%=http://www.infovista.com
```

3.4.2   Compiled Python Script

The Scripting activity for PC based Python now supports compiled Python files with the .PYC extension.

3.4.3   Typed Tags

The *Tags* field in the *Start Recording Activity* for service control scripts has been enhanced to support typed tags; key and value.
The type tags improve the classification possibilities for logfile meta data, which will make it easier to search for logfiles with certain tags or typed tags with certain keys or values.
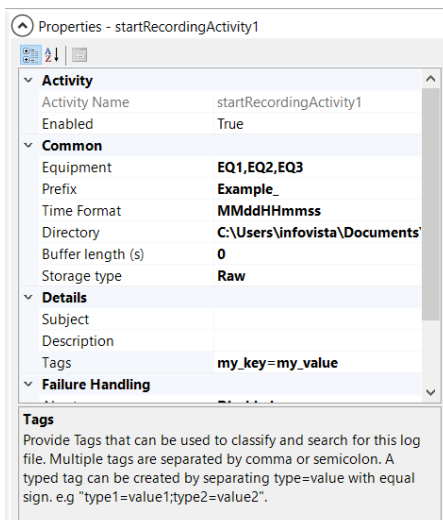
3.4.4   Improved Zoom in Offline Map

It is now possible to zoom in without limitations while using offline map data, even if there are no detailed map tiles available. This enables the possibility to see all radio details on the route driven, even if detailed map data for the area is not downloaded.


3.4.5   Cell File Clustering in Map

It is now possible to configure the Cell Layer in the map to automatically group cells within a pixel distance meeting the threshold, this to increase visibility when rendering areas with a high density of cells.
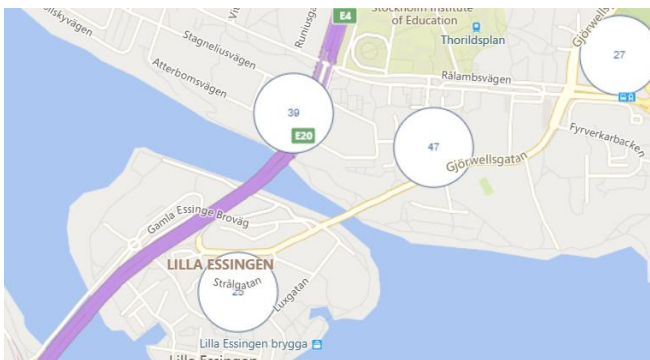
3.4.6   Session Statistics Monitor

A new monitor has been added to display Session Statistics events. This new monitor in combination with the Event Counter monitor and Service Control monitor provides a good overview of the testing results and detailed statistics of each session.
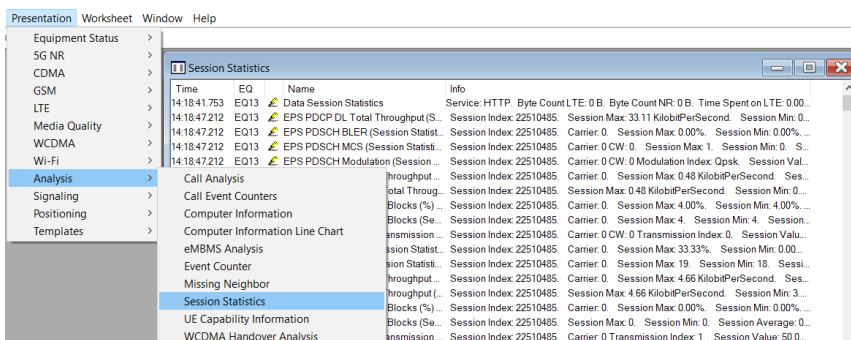
3.4.7   Support for TEMS Call Generator on Windows Server Standard 2022

TEMS Investigation 25.0 can now be used towards TEMS Call Generator version 4.2 that supports Windows Server 2022 and SQL Express 2022.

3.4.8   Support for TEMS SIP Server v1.0

TEMS Investigation 25.0 now supports TEMS SIP server version 1.0.
For more information contact your sales representative.

3.4.9   Improved Control Functions on Samsung Exynos

Samsung Exynos Control function response times have been improved which reduces time spent while performing the control function and increasing the available time for testing.

3.4.10 SIM Card hot swapping

It is now possible to switch SIM card without the need to reboot the UE; though the IMSI will only be updated in the application after a redetect of the UE.

3.4.11 Improved OTT SIP logs

OTT SIP logs will now contain complete headers regardless of protocol used (UDP or TLS).

3.4.12 User Equipment Capability Report

User Equipment information is now presented in the new UE Capability Monitor, which is available in TEMS Investigation 25.0. It displays equipment band support for LTE and NR. This monitor will be improved with additional radio access technologies in upcoming TEMS Investigation releases.

3.4.13 On-device Multi-RAB support on Apple iPhone

It is now possible to do multi-RAB testing with Apple iPhone utilizing TEMS On-device services.

This feature requires On-device 3.5 or later to be installed on the Apple iPhone.

3.4.14 Test Remote Meetings with On-device OTT Media

With **OTT Remote Meeting**, you can test remote meetings with several parties using real OTT applications real-time/during drive testing on mobile devices with or without TEMS firmware.

This is part of the OTT Media framework, a generic QoS/QoE testing framework on which you can sample the huge pool of real OTT applications with some specific chosen ones in which you can test and get some KPI information.

Python scripts for Microsoft Teams and Zoom are available for immediate **OTT Remote Meeting** testing.
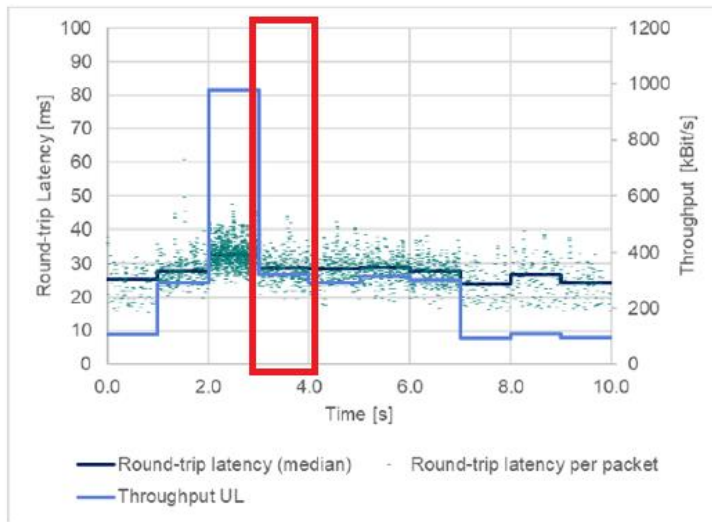
The following GLS (Global License Server) license is required:

- TI-ODM-OTT-Med-T12

This feature requires On-device 1.222 or later to be installed on the device.

3.4.15 TWAMP QI

There is now an additional Mode Report called TWAMP (Quality Index) Packet Train Chunk Log Report that provides more insights for sub-time periods compared to the test's overall duration.

Each individual Packet row in the XML configuration file will now generate a TWAMP (Quality Index) Packet Train Chunk Log Report that will contain statistical data like what is available in the TWAMP (Quality Index) Packet Train Log Report.

```xml
<EBlixtSettings>
    <PacketTrain interval="0" iterations="1" fmax="100" a="61" b="14" d="300" e="4">
        <Packet interval="8" ulPayload="100" dlPayload="100" iterations="125"/>
        <Packet interval="3" ulPayload="100" dlPayload="100" iterations="333"/>
        <Packet interval="1" ulPayload="100" dlPayload="100" iterations="1000"/>
        <Packet interval="3" ulPayload="100" dlPayload="100" iterations="1333"/>
        <Packet interval="8" ulPayload="100" dlPayload="100" iterations="375"/>
    </PacketTrain>
</EBlixtSettings>
```

This feature requires On-device 1.219 or later to be installed on the device.

There are also additional Mode Reports called TWAMP (Quality Index) DNS Report, TWAMP (Quality Index) Connection Information Report and TWAMP (Quality Index) KPI Marker Report added to provide additional valuable insight. The TWAMP (Quality Index) KPI Marker Report contains triggers for TWAMP-Control packets and the first and last TWAMP-Test uplink and downlink packets.

This feature requires On-device 1.221 or later to be installed on the device.

3.4.16 PCTEL G*flex* GSM, WCDMA Mobile Blind Scan

Added support for Gf*lex* WCDMA & GSM Mobile Blind Scan.

3.4.17 PCTEL G*flex* LTE Blind Scan Layer 3 Reporting Mode

Support is added to decode MIB/SIB1/SIB2 once per each PCI in LTE Blind scan (Network Scan). This makes it possible to keep PCI information cached, reducing scanner time and improving the scanner performance. To enable this feature, a new parameter called "Layer 3 Reporting Mode" is introduced in LTE Blind Scan (Network Scan). Select "*Decode MIB/SIB1/SIB2 once*" to let the scanner decode MIB/SIB1/SIB2 once per each PCI or select "*Continuous*" for continuous decoding of MIB/SIB1/SIB2.

Note: this flag only applies when MIB/SIB1/SIB2 is selected in LTE Block Types. If others SI's get selected the scanner continuously decodes the L3 message.

3.4.18 PCTEL LTE Signal Scan & Blind Scan to have Mib/Sib selection

Support for selectable IBlock Types for LTE Signal Scan and LTE Blind scan (LTE Network Scan) is added. This improves the performance of the scan action, the new parameter "*LTE IBlock Types*" allows users to optimize the scan by specifying a list of MIB & SIBs to scan.

3.4.19 PCTEL G*flex* NB-IoT Mobile Blind Scan

Added PCTEL G*flex* support for NB-IoT Mobile Blind Scan. Please notice that this functionality requires that a firmware supporting the feature is installed on the scanner.

3.4.20 Rohde & Schwarz TSME6 Multiple Unit Support

It is now possible to connect multiple TSME6 scanners to TEMS Investigation. Maximum four (4) TSME6 devices can be connected simultaneously.

Please note that using multiple R&S TSME6 devices requires sufficient capacity of the used network link and computer running TEMS Investigation. A single R&S TSME6 can fully utilize a gigabit Ethernet connection and if the network link reaches its maximum capacity, the measurement system decreases the network throughput to avoid network overload. The result is a reduced performance of the R&S TSME6.

When using multiple R&S TSME6 devices for load balancing applications, a network link can be shared by several TSM6 devices. In these cases, it is strongly recommended to use several network ports on your PC, or to use R&S supplied USB to LAN adapter for connection to TSME6. This applies also for the measurement of multiple technologies on the used R&S TSME6 device.

3.4.21 Rohde & Schwarz TSME6 LTE Signal Scan

Added new parameter for R&S LTE Signal Scan to configure scan with threshold for minimum RSRP and minimum CINR level.

3.4.22 New Information Elements and Events

New information elements:

- LTE Serving Cell Barring Factor Presence
- LTE UE Supported Band Combinations
- LTE UE Supported Bands
- MR-DC UE Supported Band Combinations

- NR DRX Active Rate
- NR DRX On Duration Timer
- NR Serving Cell Barring Factor Presence
- NR Serving Cell RSRP Rx1-Rx4
- NR Serving Cell RSRQ Rx1-Rx4
- NR Serving Cell RSSI Rx1-Rx4
- NR Serving Cell SINR Rx1-Rx4
- NR UE Supported Band Combinations
- NR UE Supported Bands
- Remote Meeting Success Ratio (%)
- Remote Meeting Total Reconnecting Duration

New events:

- 5G Service Lost
- Data Radio Bearer (Session Usage)
- EPS Cell Barring Factor Configured
- EPS Cell Barring Factor Removed
- First TWAMP Packet Downlink
- First TWAMP Packet Uplink
- HS-SCCH Decode Success Rate (Session Statistics)
- HSPA BLER UL Residual (Session Statistics)
- HSPA Carrier Count (Session Usage)
- HSPA CQI (Session Statistics)
- HSPA DSCH BLER Residual (Session Statistics)
- HSPA DSCH DTX Rate (Session Statistics)
- HSPA DSCH HARQ Process Count (Session Statistics)
- HSPA DSCH NACK Rate (Session Statistics)
- HSPA DSCH Retransmission Rate (Session Statistics)
- HSPA DSCH Throughput Per Carrier (Session Statistics)
- HSPA DSCH Throughput Total (Session Statistics)
- HSPA PDSCH Code Count (Session Usage)
- HSPA PDSCH Modulation (Session Usage)
- HSPA UL DTX Rate (Session Statistics)
- HSPA UL E-DCH TTI (Session Usage)
- HSPA UL Happy Rate (Session Statistics)
- HSPA UL HICH NACK Rate (Session Statistics)
- HSPA UL Retransmission Rate (Session Statistics)
- HSPA UL Serving Grant (Session Statistics)
- EPS CQI (Session Statistics)
- EPS CQI CW 0 Average (Session Statistics)
- EPS CQI CW 1 Average (Session Statistics)
- EPS PDCP DL Total Throughput (Session Statistics)
- EPS PDSCH BLER (Session Statistics)
- EPS PDSCH Current Transmission Distribution (Session Usage)
- EPS PDSCH Modulation (Session Usage)
- EPS PDSCH MCS (Session Statistics)

- EPS PDSCH Physical Throughput Per Carrier (Session Statistics)
- EPS PDSCH Resource Blocks (Session Statistics)
- EPS PDSCH Resource Blocks (%) (Session Statistics)
- EPS PDSCH Physical Total Throughput (Session Statistics)
- EPS PUSCH Current Transmission Distribution (Session Usage)
- EPS PUSCH MCS (Session Statistics)
- EPS PUSCH Physical Throughput (Session Statistics)
- EPS PUSCH Physical Throughput Per Carrier (Session Statistics)
- EPS PUSCH Resource Blocks (Session Statistics)
- EPS PUSCH Resource Blocks (%) (Session Statistics)
- EPS PUSCH BLER (Session Statistics)
- EPS RACH Current Transmit Power (Session Statistics)
- EPS RACH Number of Transmits Count (Session Statistics)
- EPS Rank Indication (Session Statistics)
- EPS Serving Cell DL Bandwidth (Session Usage)
- EPS Serving Cell RRC Cell ID (Session Usage)
- EPS Serving Cell RS CINR (Session Statistics)
- EPS Serving Cell RSRP (Session Statistics)
- EPS Serving Cell RSRQ (Session Statistics)
- EPS Serving Cell RSSI (Session Statistics)
- EPS SRS Transmit Power (Session Statistics)
- EPS Timing Advance (Session Statistics)
- EPS UE Average Transmit Power (Session Statistics)
- EPS UE PUCCH Transmit Power (Session Statistics)
- EPS UE PUSCH Transmit Power (Session Statistics)
- EUTRAN Inter-frequency Handover Count (Session Statistics)
- EUTRAN Intra-frequency Handover Count (Session Statistics)
- EUTRAN Handover Count (Session Statistics)
- Last TWAMP Packet Downlink
- Last TWAMP Packet Uplink
- Last TWAMP Packet Downlink Before Failure
- Last TWAMP Packet Uplink Before Failure
- NR Cell Barring Factor Configured
- NR Cell Barring Factor Removed
- NR Handover Details
- Remote Meeting Attempt
- Remote Meeting Configuration Phase Complete
- Remote Meeting Done
- Remote Meeting Duration
- Remote Meeting End
- Remote Meeting Error
- Remote Meeting Established
- Remote Meeting Established Success Rate
- Remote Meeting Joined
- Remote Meeting Reconnect Attempt
- Remote Meeting Reconnect Complete
- Remote Meeting Setup Success Rate

- Remote Meeting Start
- Remote Meeting State Changed
- Remote Meeting Success
- Remote Meeting Test Phase Complete
- TWAMP Accept Session
- TWAMP Chunk Interactivity Score
- TWAMP Chunk Jitter
- TWAMP Chunk Packet Delay Variation
- TWAMP Chunk Packet Loss
- TWAMP Chunk Round Trip Time
- TWAMP Request Session
- TWAMP Start Sessions ACK
- TWAMP Start Sessions
- TWAMP Stop Session
- WCDMA DL UARFCN (Session Usage)
- WCDMA Serving Cell CPICH Ec/No (Session Statistics)
- WCDMA Serving Cell CPICH RSCP (Session Statistics)
- WCDMA Soft Handover (Session Usage)
- WCDMA Spreading Factor UL (Session Usage)
- WCDMA UE TX Power (Session Statistics)

3.4.23 Layer 3 Decoding Updates

The following specifications are now based on the latest 3GPP release 17 versions:

- 38.331 (NR-RRC)

3.5 Corrected bugs

- 00497387 Missing Streaming KPI
- 00498092 Unexpected NR CA
- 00500581 Modem Control on commercial phones
- 00501096 IEs not presented in a correct way in the map window
- 00501203 Band N41 in scripts
- 00501117 Information Elements settings not shown on map
- 00502141 Wrong Calculation of Call Setup Time for OTT
- 00498375 UE Restart & Disconnection Issue Android 13

3.6 Deprecated Features

The following features are deprecated and will be removed with TEMS Investigation 26.0

- CDMA and Ev-Do mobile system, data collection and post processing of logfiles
- Intel based phones, data collection and post processing of logfiles
- PCTEL MX, data collection and post processing of logfiles
- RAS Network Connect

3.7   Removed Features

- LoRa mobile system, data collection and replay of logfiles
- TEMS Basic Radio mobile system, replay of logfiles.
- PCTEL LX, PCT, CX and EX post processing of logfiles
- Weibo service control activity for PC based data testing

4   Known Bugs and Limitations

4.1   Device Related

- When running Samsung Exynos based devices with Samsung's TCP/IP logbank enabled, PDCP DL and PDSCH PHY Throughput values can be delayed and may arrive after the actual service is finished.
- If using the Huawei Mate 20 X 5G EVR-AN00 in GSM or WCDMA networks, voice calls may not be executed correctly.
- LTE Signal Scan settings for Rohde & Schwarz do not support Automatic Bandwidth detection.

4.1.1   TEMS Investigation Professional Related

4.1.1.1   Installation and Start-up

- If TEMS™ Investigation takes a long time to start up (more than about 45 seconds), the delay may be caused by the OS trying unsuccessfully to check the application's Verisign certificate. If a network has been detected, the OS will try to contact Verisign to verify that the certificate is not on the Certificate Revocation List (CRL). TEMS™ Investigation will not continue until this procedure times out.

    There are two ways to remedy this:

    1. Open your proxy to enable access to the Certificate Revocation List. The details of how to accomplish this may vary between countries.
    2. Turn off the certificate revocation check in Internet Explorer:

        - Open Internet Explorer, and from the Tools menu select Internet Options.
        - On the Advanced tab, under Security, uncheck the option "Check for publisher's certificate revocation" and click Apply.

        (This procedure can be automated by the use of Group Policies.)

- When installing TEMS™ Investigation under Chinese or Japanese Windows, TEMS™ Investigation will not recognize file paths such as C:\User\<user name>\..., where <user name> contains Chinese or Japanese characters. This will prevent proper use of the application. (Similar problems may occur with other non-ASCII characters.)

4.1.1.2   Application Use

- When many devices are used for data collection, the number of windows in the workspace should be kept to a minimum to lower the CPU load. It is also advisable to start a new logfile recording at least once every hour to reduce RAM consumption.
- During logfile recording as well as during logfile replay, temporary files are created by the application to enable the user to browse the history of the logfile. These files can become very large (3–4 times the logfile size), the exact size depending on the number of devices activated in the application at recording time. The

temporary files are named according to the format "temsn" and created in the Windows temp directory (default: C:\path\tmp, where the path is defined by the environment variable TMP). Make sure there is plenty of space on the disk where the temporary directory resides. The temporary files are removed when you exit the application; however, if the application terminates abnormally, this might not happen. The files must then be removed manually.

- Network Connect over RAS fails under Windows 10 and above (the IP sniffer does not start).
- Service Control Designer: If multiple Service Control Designers are open simultaneously, a script run from one of them could fail.
- Service Control Designer: Problems may arise during script execution if a participating device is detached from Windows, whether due to user interaction or to device instability. One thing that may occur in this situation is duplicate recording of data in multiple logfiles.
- Service Control Designer: The Wait For activity cannot be triggered by an activity that is inside a different while loop.
- WCDMA SCH timeslot scans are not scriptable.
- The information element "Frequent AQM Score Downlink" is not populated when loading a logfile where uplink PESQ data has been merged in.
- When doing WhatsApp voice calls, both MT and MO side must run from a TEMS™ Investigation script. Otherwise, the call will fail.
- Serving Cell SSB SNR/Serving Cell SS SNR IE's will be reported as "Not valid" from Qualcomm devices.

5 Contact Information

Please visit our website at www.infovista.com for contact and support information.