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TEMS™ AUTOMATIC 10.1
WHAT'S NEW

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WHY TEMS AUTOMATIC

Challenge

- The growth in data consumption creates more demand for network expansions to improve capacity. As the subscribers stay connected at all times, network problems instantly affect their perception.

 Satisfied subscribers stay and pay, dissatisfied customers take their business elsewhere.

Solution

- TEMS Automatic is about efficiency and customer satisfaction: helping operators to monitor and benchmark network services from end to end to ensure an adequate level of quality – balancing quality investments with subscriber satisfaction.

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TEMS AUTOMATIC 9.2 – WHAT'S NEW

TEMS Automatic powered with the strengths of the Ascom Network Testing TEMS Portfolio

- **Common probe software** – a new Windows 7 probe platform harmonizing device integration and service testing
- **TEMS™ Discovery** – a standardization on TEMS Discovery Enterprise using a new common logfile format *.trp
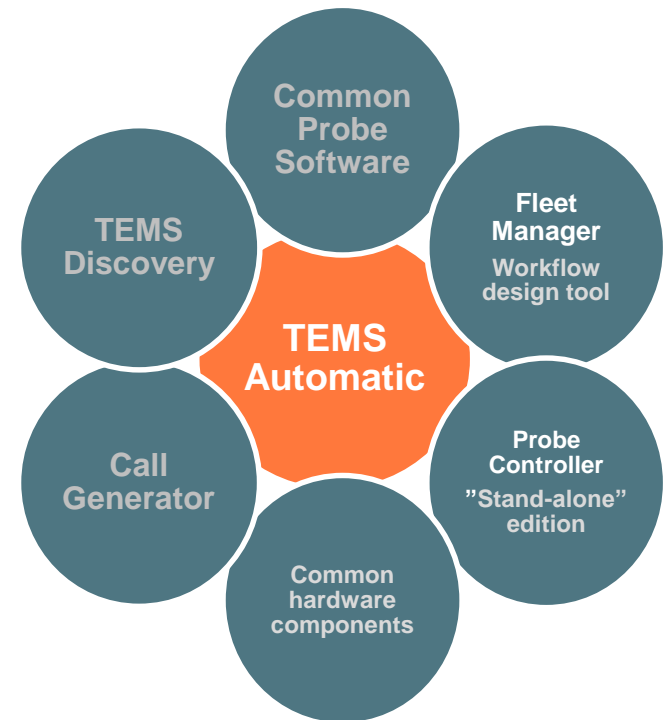- **CallGenerator** – common service testing node, having full functionality for advanced speech quality assessment

Common Probe Software

Fleet Manager
Workflow design tool

TEMS Discovery

TEMS Automatic

Call Generator

Probe Controller
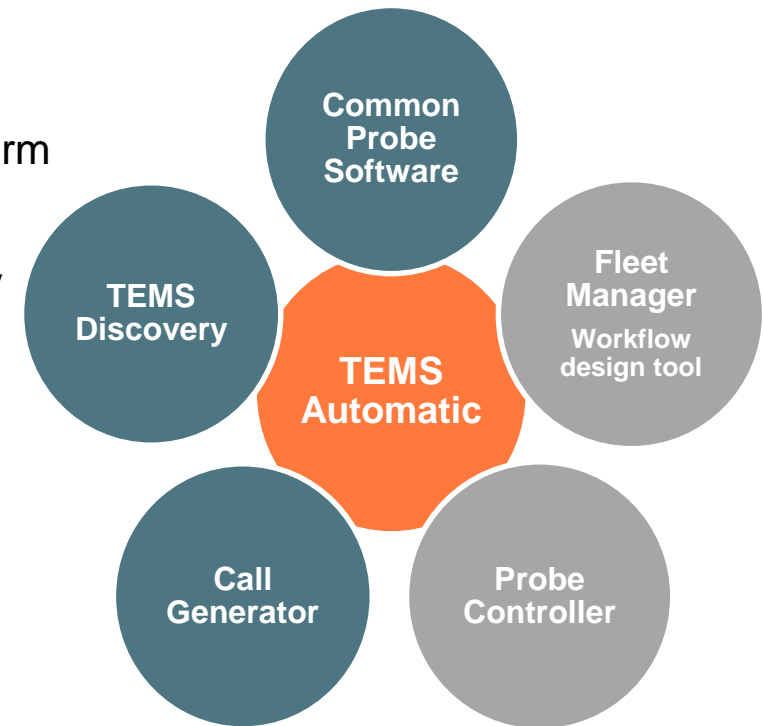
* Requirement candidates for TEMS Automatic 10.x, meanwhile, the current OC/RSI is used.

Efficiency – evolve with the Ascom portfolio

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TEMS AUTOMATIC 10.0 – WHAT'S NEW

- **TEMS Automatic FleetManager** enhanced to support TEMS Pocket Remote probes for remote administration tasks

- **RMU – Ruggedized Measurement Unit**, a ruggedized enclosure for smartphone testing. The RMU is designed to work with TEMS Pocket Remote on the Samsung Galaxy S4 i9505 smartphone

- **ProbeController,** a tablet GUI for in-field probe administration that leverages the RTU-5 stand-alone edition

Common Probe Software

TEMS Discovery

Fleet Manager Workflow design tool

TEMS Automatic

Call Generator

Probe Controller "Stand-alone" edition

Common hardware components

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TEMS AUTOMATIC 10.1 – WHAT'S NEW

- **Smartphone measurement device**
  - TEMS Automatic provides the flexibility to support any device type: modems, PCI-e MiniCards, and now also smartphones (Samsung Galaxy S4 i9506)

- **On-Device Measurement (ODM)**
  - Using smartphone clients instead of testing solely on PC-based clients, tests can now alternatively be performed on smartphones. This enables the operator to test and verify the smartphone user's real-world experience.

- **Multiple Device Unit (MDU)**
  - A ruggedized hardware-enclosed smartphone solution provides support for up to four smartphones in a box, configured together with RCU.

- **RTU-5 Control Unit (RCU)**
  - The RCU solution is intended to meet strong requirements on device availability when doing smartphone testing, measurement efficiency, and unattended measurements. It supports common GPS, data upload device, device synchronization and other control activities.

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SMARTPHONE SUPPORT

Samsung's Category 4 (150 Mbit/s) model Galaxy S4
GT-I9506 is now connectable to TEMS Automatic for
on-device testing

- Technologies:
  - GSM 850 / 900 / 1800 / 1900
  - HSDPA 850 / 900 / 1900 / 2100
  - LTE 800 / 850 / 900 / 1800 / 2100 / 2600
- Speed
  - HSDPA, 42.2 Mbps;
  - HSUPA, 5.76 Mbps;
  - LTE, Cat 4, 50 Mbps UL, 150 Mbps DL
- Chipset:
  - Qualcomm MSM8974 Snapdragon 800

Samsung S4 to test and verify CSFB and CAT 4 support

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CSFB SUPPORT

Events	Triggered	Additional IEs/ KPIs
CSFB Call Initiation	This event is generated if the device has previously performed Combined EPS/IMSI Attach, thereby notifying the network that it desires to be able to make CS fallback calls. If no such attach command has been observed, the event is not generated.	
CSFB Call Attempt	A CS fallback call attempt made. Triggered by Layer 3 message NAS Extended Service Request.	Call direction (MO/MT)
CSFB Call Established	A CS fallback call established. Triggered by the Layer 3 message Connect (MO call) or Connect Acknowledge (MT call).	Call direction (MO/MT) Target technology (WCDMA/GSM)
CSFB Call Setup	A CS fallback call set up. Triggered by Layer 3 message Alerting.	Call direction (MO/MT) Target technology (WCDMA/GSM) Call setup time
CSFB Blocked Call	A CS fallback call blocked. This can happen in several ways:	Call direction (MO/MT) Block type
CSFB During IP Call Setup	This event carries performance information on the switch back to LTE after hang-up of a CS fallback call.	
UTRAN Reselection Time After CSFB Call	This event carries performance information on the switch back to LTE after hang-up of a CS fallback call.	Idle to LTE time: Time in seconds from entering idle mode (in UMTS) to reception of System Information Block on LTE. SIB 19 to LTE time: Time in seconds from reception of System Information Block Type 19 (UMTS) to reception of System Information Block on LTE.
PS Data Interruption Time Due To CSFB	This event reports the IP interruption time during RAT change to UTRAN/GERAN due to initiation of a CS fallback call. Always generated in conjunction with the IP Interruption Time event.	Interruption time in ms. Measured from last received IP packet in EUTRAN to first received IP packet in UTRAN/GERAN.

... CSFB testing with Samsung S4 i9506

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ON DEVICE SUPPORT

On-device measurements using smartphone's
own clients:

- HTTP Web kit (browsing)

- HTTP Get/Post

- Streaming HTTP (YouTube)

- Ping

PS Data
PDP Context Activation Failure Ratio, PI520c [%]
PDP Context Activation Time, PI521b [s]
PDP Context Cut-off Ratio, PI522a [%]
DNS Resolution Failure Ratio, KPI630 [%]
DNS Hostname Resolution time, KPI631 [s]
HTTP
HTTP IP-Service Access Failure Ratio, PI520d [%]
IP-Service Access Time, PI521c [s]
HTTP Data Transfer Cut-off Ratio, KPI522 [%]
HTTP Mean User Data Rate, KPI523 [kbit/s]
HTTP Data Transfer Time PI523a[s]
HTTP Session Failure Ratio, KPI524 [%]
HTTP Session Time, KPI525 [s]
HTTP Roundtrip Time other (3-way handshake of HTTP data socket), KPI511_OTHER [ms]
HTTP Download/Upload FDTT
HTTP IP-Service Access Failure Ratio, PI520d [%]
IP-Service Access Time, PI521c [s]
FDTT-QoS HTTP {Download} Mean Data Rate [kbit/s]
FDTT-QoS HTTP {Upload} Mean Data Rate [kbit/s]
Ping
ICMP PING Duration, KPI511 [ms]
Youtube
B1 : YouTube Service Access Success Ratio [%] (access/Buffer phase, out of all attempts)
B2 : YouTube Reproduction without interruptions [%] (access&playout phase, out of all attempts)

Test and verify the user's real-world experience

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MESAUREMENT PLATFORMS

Measurement devices can be configured in a number of ways in TEMS Automatic

- RTU – Remote Test Unit
- RCU – RTU Control Unit
- MDU – Multiple Device Unit
- RMU – Ruggedized Measurement Unit

1x External scanner using one of the USB ports

Remote Test Unit (RTU):
- Upto 4 Minicards, embeeded for measurements and data upload
- Inbulit GPS
- SIM switch
- 2x external USB ports

1x MDU with upto 4x Smartphones

Remote Control Unit (RCU)
- Data upload device
- Inbulit GPS
- 4x external USB ports

Upto 4x Smartphones handlheld
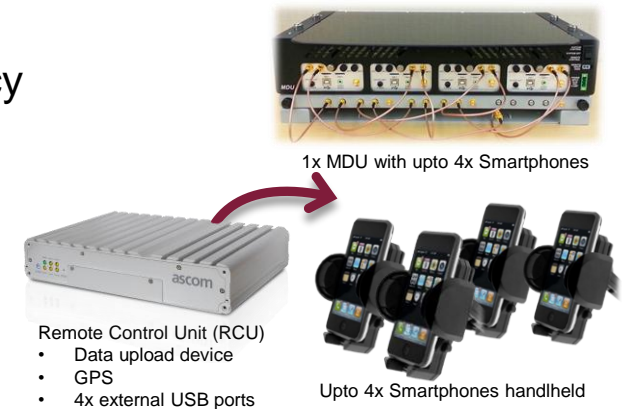
Ruggedized Measurement Unit (RMU))
- 1x Smartphone TEMS Pocket Remote configured
- Inbuilt GPS
- External SIM

RTU – a flexible measurement platform

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RCU – RTU CONTROL UNIT

A solution for smartphone testing that meets high availability requirements

- Each RCU unit can handle up to 4 external smartphone devices (2x voice and 2x ODM data)

- External scanner can be connected, by using one of four external USB ports

- Dedicated data upload device, offloading measurement devices and freeing up more time for measurement

- Advanced device control functionality with quick recovery handling, minimizing device downtime and increasing measurement efficiency

- Time based test synchronization for benchmarking

- Remote Software Upgrade via FleetManager

- In-built external GPS, shared across all measurement devices

- Local GUI – Remote Status Indicator support for in-field probe administration

1x MDU with upto 4x Smartphones

Remote Control Unit (RCU)
- Data upload device
- GPS
- 4x external USB ports

Upto 4x Smartphones handlheld

..to support strong requirements on device availability

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MDU – MULTIPLE DEVICE UNIT

A ruggedized solution for unattended deployments of smartphones, managed and controlled by the RCU.

Four smartphones in a box solution with support for

- External RF Antenna with diversity
- External SIM slot

Rear view

Inside the MDU, there are up to four Device Modules (DMs), including the cradle holding the smartphone
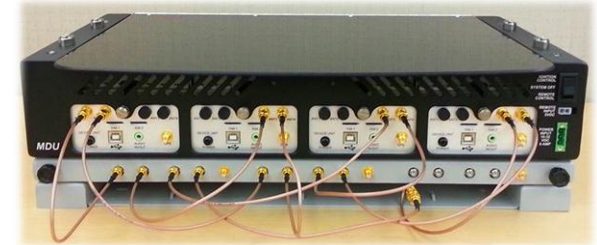
* MDU box ,mounted on a bottom plate equipped with a combiner platform configured with RF combiners. .

…connected together with RTU Control Unit

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TEMS POCKET REMOTE SOLUTIONS

Smartphone testing for end user experience testing

- Turn your smartphone into a remotely controlled test probe for user experience testing

- Deploy a smartphone fleet of probes for network monitoring or benchmarking

  - Handheld solutions, including car holder solutions

  - Backpack solution for indoor and pedestrian testing

  - Unattended solution for mobile and fixed location

* For details about TEMS Pocket Remote, refer to its product information.

Remotely controlled from TEMS Automatic

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SMARTPHONE TESTING WITH RMU

RMU – a ruggedized platform for stand-alone
smartphone deployments configured with
TEMS Pocket Remote.

- TEMS Pocket Remote with Samsung Galaxy S4
  LTE GT-i9505
- External GPS
- External RF antennas, w/ diversity support
- External SIM slot
- Watchdog for periodic recovery of UE device
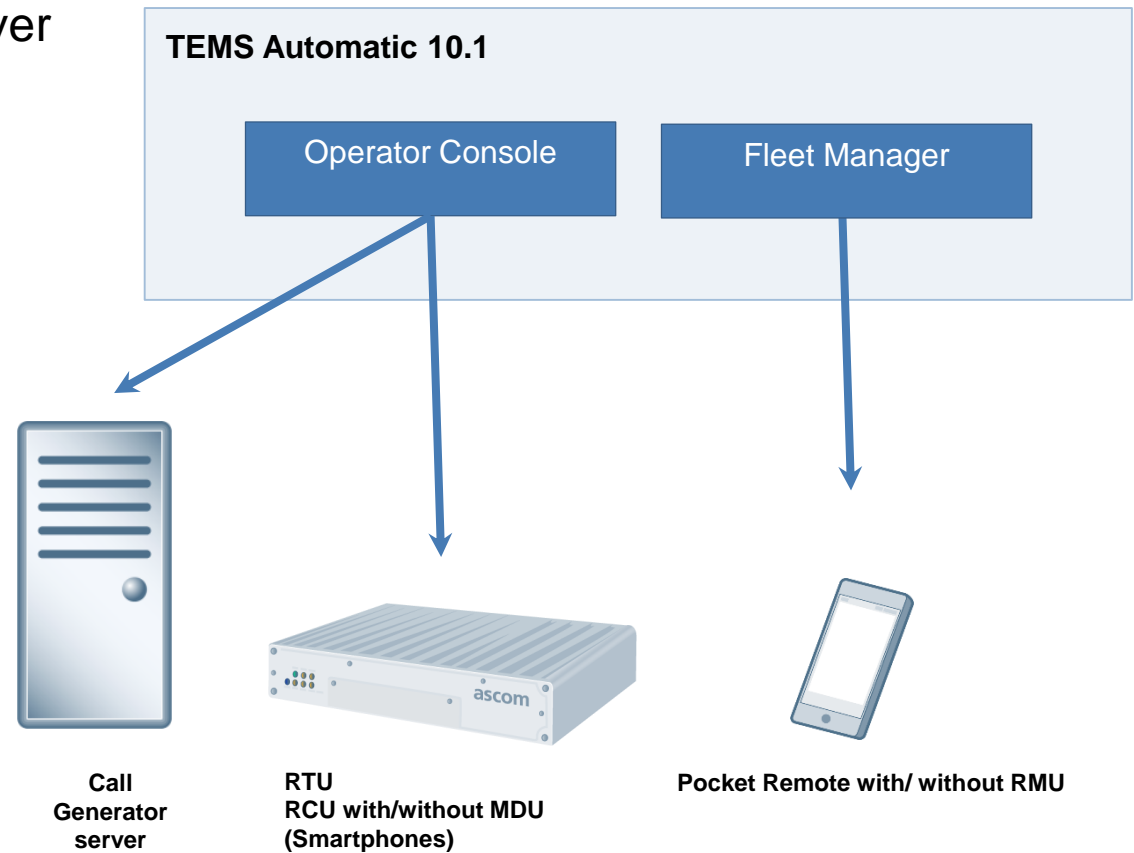- Stackable RMU – same form factor as RTU-5

Front view

Rear view

* SIM switch not supported.
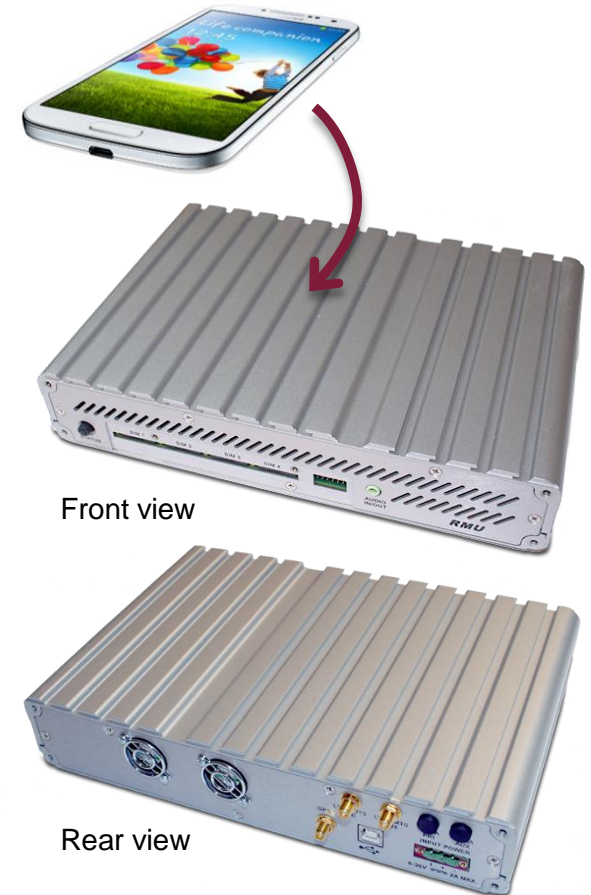
RMU stand-alone edition for smartphone testing

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SYSTEM SETUP

TEMS Automatic using common server and common database for Operator Console and Fleet Manager

TEMS Automatic 10.1

Operator Console   Fleet Manager

Call Generator server

RTU RCU with/without MDU (Smartphones)

Pocket Remote with/ without RMU

* For details about constraints and limitations, refer to speaker notes.

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THANK YOU!