

# **TEMS<sup>™</sup> Investigation WCDMA**

The industry-leading air interface test tool



## Identify your network problems

**TEMS<sup>™</sup> Investigation WCDMA** is an air interface test tool for troubleshooting, verification, optimization, and maintenance of WCDMA networks.

TEMS Investigation measures parameters, automatically detects WCDMA network problems, and decodes air interface messages. Using a TEMS Scanner WCDMA and User Equipment (UE) enhanced by Ericsson's TEMS product unit, TEMS Investigation performs tests from a user's perspective. Data is presented in realtime or is saved as logfiles for post-processing purposes. This power and flexibility enables operators to verify and optimize the performance of new data services available in 3G networks.

## **Key features**

- Support for TEMS Scanner and UE enhanced by Ericsson's TEMS product unit
- · Presentation of transport channel utilization
- Displays on maps for identifying problem areas
- · Linked views for getting detailed information
- User-defined monitors and line charts to filter out important data
- Signal monitoring (Layer 3 messages)
- Site connection to improve handover analysis and to verify handover behavior
- · Events for notification/search
- Wide range of quality parameters
- Data session handling

The wealth of details on air interface parameters and signaling collected by TEMS Investigation helps analysts tackle difficult network problems. There are also ample capabilities for setting up test scenarios for efficient detection of network errors.

## Speech Quality Index (SQI)

SQI assesses the speech quality as perceived by the user, and is computed by an algorithm that mimics the preferences of participants in standardized listening tests. The SQI values are based on measured quality parameters, events, and the speech codec mode.

## Scanning

If a TEMS Scanner is used, four different scanning features are available:

- Primary Common Pilot Channel (P-CPICH) scrambling code power measurements
- Primary and Secondary Synchronization Channel power and timeslot measurements
- Continuous Wave (CW) measurements
- Spectrum analysis

The P-CPICH scrambling code measurements can be used for coverage verification, which is important when the WCDMA network is not limited by capacity (for example during initial network roll-out and in rural areas). Indication of CPICH (Pilot) pollution is supported as well, to help identify problem areas. These measurements are also integrated with UE measurements and/or imported site data, and will then provide features like Missing Neighbor Detection. This makes it easier to optimize neighbor relations. CW measurements can be used for propagation model tuning (for example in TEMS CellPlanner), and site acquisition (in conjunction with a test transmitter). Synchronization Channel measurements can be used to improve cell search performance.

## **Application areas**

### Field trials

During field trials, the drive tests are an important part of the system performance tests. The verification/validation of Node-B, clusters, and networks is accomplished during these field trials based on the radio-related measurements.

• Commissioning

Putting new cell sites into operation entails careful checking of the added equipment. The predicted cell coverage and achievable capacity must be verified, and soft handovers must be checked. In addition, accessibility must be verified. Most importantly, multi-service accessibility and quality must be satisfactory. All these tasks can be performed with TEMS Investigation.



## **User interface**

The well-designed and mature user interface can be freely configured, and users can build their own presentation windows. The collected data is presented in completely user-definable maps, tables, and status windows. This allows the user to filter out important network data and makes it possible to focus on relevant data measured. TEMS Investigation WCDMA also supports parallel coordinates, where it is possible to represent data in more then three dimensions. This is an extremely valuable feature when testing WCDMA networks, since dependencies between parameters in a WCDMA radio network is more prominent than in a 2G network.

#### Network optimization and tuning

Tuning and optimizing the network typically boils down to tilting site antennas, and adjusting cell and location area boundaries. TEMS Investigation makes it easy to try out various tweaks and adjustments and monitor their effect in realtime, or log the data for later scrutiny in the office.

#### Troubleshooting

Resolving tricky network problems calls for a dynamic analysis tool which gives the user great freedom to configure presentations and events. TEMS Investigation provides this, as well as giving the analyst the ability to obtain a detailed overview of the course of events.

### Events

Collecting event information allows operators to correctly assess the quality of the network, and identify possible problems. Events can be viewed on maps, which identify the geographical position where the event occurred, as well as in monitor windows and line charts. The events are also synchronized with the measurement data so that after an event has been detected, more detailed information is readily available for further analysis.

A number of common events are predefined. Users can also define their own events by composing logical expressions, giving users the ability to focus on specific events that are important in their own networks

#### Import of cell site data

TEMS Investigation can present the geographical location of cell sites in the measurement area. The site data can

be used to quickly get information regarding the site configuration, but will also provide support for more advanced handover analysis and traffic control verification.



#### Logfiles

All collected data can be recorded in logfiles for later analysis in TEMS Investigation. For more detailed logfile analysis TEMS DeskCat, a powerful post-processing tool, is recommended.

TEMS Investigation also supports a report generator that will give a quick verification of network changes and will locate and identify network problems. The data can also be exported to text files for customized analysis.

## **Product package**

- TEMS Investigation software application
- UE enhanced by Ericsson's TEMS product unit
- Cable kit for connection to PC
- User manual

Options include:

- Additional TEMS-developed User Equipment
- TEMS Scanner (including Slim case)
- Slim case

## Minimum hardware and software requirements

For one TEMS-developed UE and a GPS receiver:

- PC: Pentium II 266 MHz, 128 Mb RAM (faster processor and more memory required for use with more external units)
- OS: Windows 2000 or Windows XP
- GPS protocol: NMEA 0183 General, TAIP, TSIP, or NAV200