

TEMS[™] Scanner WCDMA

For use with TEMS Investigation WCDMA



High-precision scanning of WCDMA networks

TEMS[™] Scanner WCDMA is a high-precision DSP-based scanner that supports a comprehensive set of WCDMA radio network measurements. It works as an integrated part of TEMS Investigation WCDMA, and further enhances the troubleshooting and optimization capabilities in that tool. Together they form the optimal way to monitor WCDMA networks, combining radio environment measurements with air interface signaling information.

Multiple application areas

Site acquisition – TEMS Scanner is capable of performing continuous wave (CW) measurements. In conjunction with a test transmitter, this task can also be supported.

Tuning of coverage predictions – The result of CW measurements can also be used in tools such as TEMS CellPlanner to tune coverage prediction models.

Coverage verification – When the network is not limited by capacity, for example at the time of initial network deployment, it is important to verify the coverage. TEMS Scanner WCDMA can perform Scrambling Code measurements. Together with the display properties in TEMS Investigation, for instance the real-time map, coverage verification is easy to perform.

Optimization of neighbor relations – The normal measurements received from user equipment (UE) depend on the network configuration. TEMS Scanner gives the flexibility to measure on a wider range of radio parameters. Since TEMS Scanner is an integrated part of TEMS Investigation, information on network neighbors and monitored cell configuration can be compared with TEMS Scanner radio measurements, facilitating optimization of neighbor relations.

Improvement of cell search performance – TEMS Scanner can also measure time delay on the synchronization channels. The relative timing information for the synchronization channels can be used to improve cell search performance.

Common Pilot Channel scrambling code measurements

TEMS Scanner WCDMA measures the scrambling codes transmitted on the Common Pilot Channels (CPICH). Three different operational modes for the scrambling code measurements are possible: Top N, user-selected list, and all (512) scrambling codes (SCs).

Top N scans all 512 SCs and returns the "N" strongest scrambling codes received, in descending E_C/I_O order. "N" is user-definable, with a valid range from 1 to 32. User-selected list makes it possible to manually select scrambling codes, or a user-defined group of scrambling codes to measure on.

Scrambling Code Peak Power, E_c , E_c/I_o , and E_b/I_o values – Measures and reports the strongest peak of the correlation for each scrambling code.

Scrambling Code Aggregated Power, E_c , E_c/I_o , and E_b/I_o values – Computes, for a given scrambling code, the sum of all peaks above a user-definable E_c/I_o threshold.

Delay Spread – Time in chips from the first to the last E_C/I_O peak that is above the PN threshold.

Time offset – time offset of P-SCH synchronization in chips.

Continuous Wave measurements

Continuous wave (CW) channel power measurements are performed on a user-definable set of frequencies (UARFCNs). Up to 255 UARFCNs can be scanned simultaneously.



Synchronization Channel code word measurements

The Synchronization Channel (SCH) code word measurements follow the same operational modes as the CPICH scrambling code measurements.

The measurements are performed on the code words transmitted on the primary and secondary synchronization channels.

Code Word Peak Power, E_c and E_c/I_o values – Measures and reports the peak power for each synchronization channel. E_c and E_c/I_o values for both the primary and secondary SCH are reported.

Timeslot Measurements, E_c values – Measures, in a 2560 chip timeslot, the power for each chip in the primary SCH 256-chip spreading sequence. In addition, the time difference between the different SCH peak values is also reported.

Spectrum analysis

Spectrum analysis can measure the whole or part of the spectrum in a resolution that goes from 10 kHz up to 80 kHz. The start and stop frequencies are defined in MHz and are user-selectable. The user can also define the number of samples per reported value, in the range from 1–16.

GPS

TEMS Scanner has a built-in GPS for positioning of the network measurements.

Technical specifications for TEMS[™] Scanner WCDMA

| | Frequencies: | The IMT-2000 Band (2,110–2,170 MHz) |
|----|---|--|
| | CPICH_ E_C/I_O Accuracy ($I_O = -50$ dBm): | |
| | Variation | Condition |
| | ±1 dB | $CPICH_E_C/I_O \ge -15 \text{ dB}$ |
| | ±1.5 dB | $CPICH_E_C/I_O = -17 \text{ dB}$ |
| | Measurement RF input power range: | |
| | 3.84 MHz filter | -95 – -20 dBm |
| | 0.2 MHz (CW) filter | -105 dBm – -20 dBm |
| | Extended Measurement RF input power rate | nge: |
| | 3.84 MHz filter | -98 dBm – -95.01 dBm |
| | 0.2 MHz (CW) filter | -108 dBm – -105.01 dBm |
| | Min. discernable signal: | -21 dB (-90 < I_0 < -20 dBm, with highest correlator length) |
| | Wide bandwidth: | 3.84 MHz |
| | Narrow bandwidth (CW mode): | 200 kHz |
| | CPICH measurement time: | |
| | CPICH pilot scan time for 512 pilots | 5 sec. typical |
| | All top N | 1 sec. typical |
| | Input power: | +8 – +16V DC (negative ground), 1A max. @ 12V DC |
| | Communications interface: | RS-232C, 115,200 baud, 8 data bits, no parity |
| | Dimension (H x W x D): | 133 x 165 x 35 mm (51/4 x 61/2 x 12/5 in.) |
| | Weight: | not to exceed 1,4 kg (3 lbs.) |
| | Temperature range, operating: | ±0°C – +50°C (+32°F – +122°F) |
| | Temperature range, storage: | -40°C – +85°C (-40°F – +185°F) |
| | Connectors: | |
| | RF Input (Scanner) | SMA female (50 Ω) |
| | RF Input (GPS) | SMB female (50 Ω) |
| | Data and Power | 9-pin female DB-9S connector wired as DCE device |
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