Acterna Mobile Service Tester 4300

CDMA2000

The Acterna 4300 CDMA Series provides manufacturing, service depots and repair sites with a powerful, cost-effective solution for testing and alignments of mobile phones. Developed by Acterna, the leading vendor of mobile handset test equipment, this series of compact test instruments also enables service providers to determine specific problems with mobile phones and validate the need for repair quickly, efficiently and at minimum cost.

The latest development of the 4300 CDMA Series includes test capability for the new 2.5G CDMA2000 1XRTT wireless technology, as well as legacy IS-95 standards. Using the Acterna 4300 CDMA Series, service and repair organizations can screen mobile phones on arrival, test repairs and realignments, and perform final customer return testing faster and to the highest quality standards.

The Acterna 4300 CDMA Series is available at an extremely competitive price, ensuring customers can benefit from leading-edge test performance for a relatively small investment. The test system is also easy to use, so it simplifies integration into the test environment and minimizes training costs. In addition, the product features a compact, lightweight design that makes it highly suitable for all kinds of testing operations.

The unit is available in two models, 800 MHz US Cellular band (Acterna 4302) or 1900MHz (Acterna 4303) which supports both US and Korean PCS bands. Both units also provide full test capabilities for the Analog AMPS and NAMPS cellular formats. Handoff between all formats is standard, including 800 MHz to 1900 MHz hyper-band handoff.

Features

- **AMPS/Namps, CDMA IS95 and CDMA2000 included**
- **A powerful test solution for AMPS, NAMPS, CDMA IS-95, CDMA2000**
- **Excellent performance at a competitive price**
- **Verify accurate measurements with internal cross point switch**
- **Extensive graphical analysis**
- **Choice of Manual, Quick Test or AutoTest Modes**
- **An easy-to-use, testing instrument that requires minimal training**

ACTERNA™
The Keepers of Communications

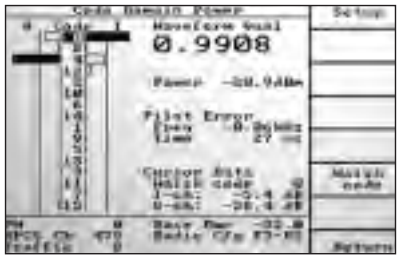
AMPS/NAMPS

Measurements

- Mobile TX power (MAC)
- Receiver sensitivity
- Frequency error
- Audio deviation
- SINAD
- Receiver distortion
- Wide band deviation
- Analog BER
- SAT, ST deviation
- SAT, ST frequency
- ST duration
- DSAT, DST (NAMPS)

CDMA measurements

- FER (mobile reported)
- Audio loopback
- RMS error vector magnitude
- Peak error vector magnitude
- RMS magnitude error
- Peak magnitude
- RMS phase error
- Peak phase error
- Frequency error
- Timing error
- Receiver sensitivity
- Waveform quality
- Carrier feedthrough
- Mobile reported pilot strength
- Average MS power
- Minimum MS power
- Maximum MS power
- Open loop power
- Closed loop power
- Access probe power
- Standby power
- I/Q imbalance
- Code domain measurements



The code domain graph shows the rho measurements (in dB) for each I and Q Walsh Code channel plotted as a bar graph. The current Walsh code selection is displayed in inverse video on the graph. Below the Walsh Code display are the numeric measurements values for the selected code. This screen also displays the composite rho and total power for the mobile signal, as well as time and frequency errors in the pilot signal.

Handoff capability

- AMPS to NAMPS and vice versa
- CDMA to AMPS/NAMPS
- Hyperband from CDMA 800 MHz to CDMA 1900 MHz and vice versa
- Softer handoff

CDMA2000

- Code domain measurements
- Time offset
- Composite rho
- Power
- Frequency error
- RMS phase error
- Carrier feedthrough

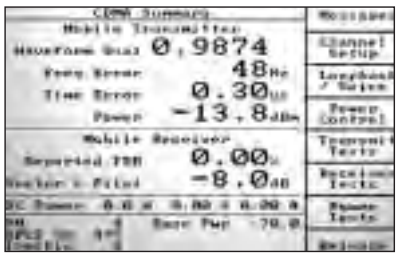
Three powerful test modes

The Acterna 4300 CDMA test instruments can be operated in the Manual, QuickTest, or AutoTest Modes to enable rapid and easy repair or alignment of CDMA devices.

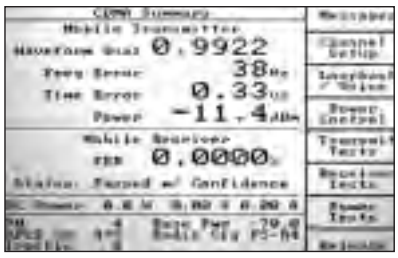
The QuickTest Mode provides a reliable Go/NoGo decision at the press of a single button, while the equally easy-to-use AutoTest Mode provides more intensive testing. In the Manual Operations Mode, users can set all of the important conditions and parameters which occur in a real network and measure and align mobile phones accordingly.

Simplified integration into automatic and production test systems can be achieved over IEEE 488 or serial remote control busses. Test control programs can also be written by a customer using a SCPI command set, or from the Acterna CATS LabWindows™-based test environment.

Together, these features combine to make the Acterna 4300 CDMA Series the most cost effective test solution available for mobile phone repair and realignment operations.



CDMA test summary (voice)



CDMA test summary (loopback)

Functions, features, measurements and specifications

CDMA channels
- Sector A
  - F-Pilot - Walsh code 0
  - F-Sync - Walsh code 32
  - F-Paging - Walsh code 1
  - F-QPCH - Walsh code 80
  - F-FCH - selectable Walsh codes (2-64)
  - F-OCNS - fixed to upper three Walsh codes
- Sector B (utilized in softer handoff)
  - F-Pilot - Walsh code 0
  - F-FCH - selectable Walsh codes (2-63)
  - F-OCNS - fixed to Walsh Code 64

Protocols supported
- IS95A
- IS98D
- IS2000 P_REV6
- JSTD-008
- TSB74

CDMA2000 transmitter measurements
- Average power
- Access probe power
- Maximum power
- Minimum power
- Closed loop power
- Gated output power
- Composite (multicode) waveform quality (rho)
- Waveform quality (rho)
- Code domain power (graphical and data)
- Code domain time and phase offsets (data only)
- Open loop power accuracy
- Time response of open loop power control
- Channel frequency error

CDMA2000 receiver measurements
- Frame error rate (FER)
- Receiver sensitivity
- Receiver dynamic range
- Demodulation with AWGN
- Mobile reported FER
- Mobile reported pilot strength

CDMA base station emulation functions (protocol)

Base station parameters
- NID, SID, MCC, MNC, F-QPCH state, F_PCH relative level and reverse link traffic pilot gain

Access parameters
- Nominal power, initial power, power step, probe steps, response sequences, request sequences, preamble length, timeout

Registration support
- Timer based, power up, power down, zone, distance, ordered, implicit (origination), parameter change

Reverse link close loop power control modes
- Active
- Alternating
- All up
- All down

CDMA2000 call processing functions
- Registration
- Base station origination
- Base station release
- Mobile origination
- Mobile release
- Other: authentication, message waiting, caller ID
- Intraband hard handoff
- Interband hard handoff
- Handoff to AMPS/NAMPS
- Sector (softer) handoff
- Speech encoding: loopback, canned speech, silent, normal
- Audio tones, audio chirp

CDMA service options
- Support for RC 1-5
  - SO1-9.6 kbps voice echo
  - SO2-9.6 kbps data loopback
  - SO3-9.6 kbps EVRC voice
  - SO9-14.4 kbps data loopback
  - SO17-14.4 kbps voice echo
  - SO55-RC 3, 4 and 5 data loopback
  - SO32-test data service option
  - SO32768-14.4 kbps voice echo

CDMA signal generator
- Frequency
  - Cellular: 864-894 MHz (MMS4302,4303)
  - US PCS: 1930-1990 MHz (MMS4303)
  - Korean PCS: 1805-1870 MHz (MMS4303)
  - Resolution: 10 kHz
  - Accuracy: Same as OCXO Timebase

Amplitude
- Level: -23 dBm to -125 dBm
- Resolution: 0.1 dB
- Accuracy: ±0.75 dB ±0.003 dB/dB below -30 dBm at 25ºC, from -30 to -120 dBm ±2.0 dB +0.003 dB/dB below -30 dBm, from 10ºC to 40ºC, from -30 to -120 dBm

AWGN
- Range: +5 to -10 dB relative to CDMA Channel power
- Resolution: 0.1 dB
- Accuracy: ±1 dB

CDMA modulation
- Type: QPSK
- Residual rho: > 0.97
- Carrier feedthrough: < -30 dBc

CDMA analyzer
- Frequency
  - Cellular: 824-849 MHz (MMS4302,4303)
  - US PCS: 1850-1910 MHz (MMS4303)
  - Korean PCS: 1715-1780 MHz (MMS4303)
  - Resolution: 10 kHz
  - Accuracy: ±10 Hz relative to OCXO timebase

Power range
- Max input: +40 dBm
- Measurement range: -60 dBm to +40 dBm
- Accuracy: ±0.65 dB +0.003 dB/dB at 25ºC, ±1.2 dB 10ºC to 40ºC

Waveform quality rho
- Range: 0.90 to 1.0
- Accuracy: 0.003
- Timing measurement accuracy: 60 ns

External CDMA signals interface
- Inputs: 10 MHz reference, even second clock
- Outputs: even second clock chip x 16, chip x 8, chip x 4, chip, PN clock, 20 ms, 80 ms, 1.25 ms

Physical specifications
- Height x width x depth: 7.25"x 17.75"x 20.50" / 184.2mm x 450.9mm x 520.7mm
- Weight: 39 lbs. (min) / 49 lbs. (max)

Environmental specifications
- Temperature range
  - Operating: 10 to 40°C
  - Storage: -20 to 70°C
- Storage humidity: 10-90% RH, non-condensing
- Operating humidity: 10-75% RH, non-condensing

Power requirements
- Voltage: 85 to 264 VAC (no switching required)
- Current: 5A maximum
- Frequency: 47 to 440 Hz

Peripheral ports
- GPIB (IEEE 488)
- Parallel printer
- Serial RS-232

Ordering information
- Acterna MMS 4302 CDMA2000/AMPS I-4302 Cellular 800 MHz only
- Acterna MMS 4303 CDMA2000/AMPS I-4303 US and Korean PCS 800 MHz, 1900 MHz

Upgrades available for 2G test systems of the 4300 Series
- Acterna 4301/2/3/4/5: I-CDMA-OPT
- Acterna 4301/2/4 upgrade to PCS: I-FEX-OPT

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