Wireless

1900-5 CSA ANSI-136 Digital PCS Radio Test Set

Engineered for maximum performance, the 1900-5 CSA is an all-in-one PCS solution for today's dual-band, dual-mode mobile and base station equipment.

- ANSI-136 conformance test system for TDMA phone certification
- Tri-Band, 400/800 MHz and 1900 MHz cellular and PCS test capable
- Extensive software options library, including analog/digital authentication compliance testing and circuit-switched data testing
- ANSI-136 hyperband hand-off
- Fully automated remote testing ability with RS-232 or IEEE-488 (GPIB) interfaces
- Intuitive test setup screens for easy "Guided" user testing
- VSELP and ACELP vocoder functions
- Full featured 2 GHz service monitor with spectrum analyzer and tracking generator
- Constellation IQ display
- GAIT/GHOST capable

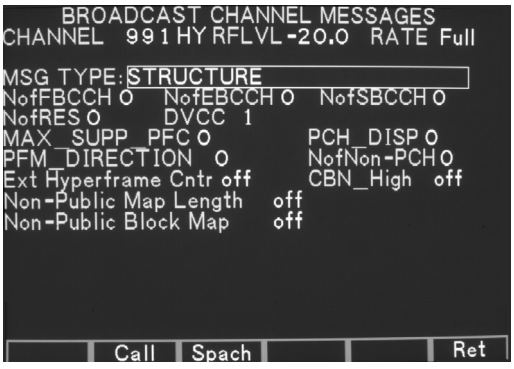
With the power to test and analyze mobile and base station parametrics and protocol performance, the 1900-5 CSA is the leader in ANSI-136 testing technology.

The leader in ANSI-136 protocol test, the 1900-5 CSA is the latest in a generation of high performance dual-band, dual-mode analyzers from IFR for the ANSI-136 digital cellular standard. The 1900-5 CSA is the standard for type certification of TDMA phones for CTIA. With advanced test features such as Circuit Switched Data Radio Link Protocol, Discontinuous Transmission (DTX) testing and multi-slot DCCH capability, the 1900-5 CSA is the foremost standard in testing TDMA phones to the latest ANSI-136 standard. Designed for both dual mode mobiles and base station testing, the 1900-5 CSA provides features no other test system offers. Fully equipped with a 2GHz spectrum analyzer and AM/FM test functions, the 1900-5 CSA is a full features communications service monitor.

The Leader In Protocol Testing

With the AC1136 Consolidated Protocol Test Suite, developers can automate their 1900-5 CSAs to perform full function conformance tests for both PCS and Cellular band ANSI-136 phones.

With its integrated front panel features, the 1900-5 CSA allows easy access and manipulation of both layer 2 and layer 3 message types and information elements. Through constant updates to the ANSI-136 standard, the 1900-5 CSA allows phone and base station designers and verification test engineers the ability to accurately test the latest phones for proper performance against the standard. The 1900-5 CSA's test macro language allows for extended test functions and automated test routines.



Full Base Station Test Features

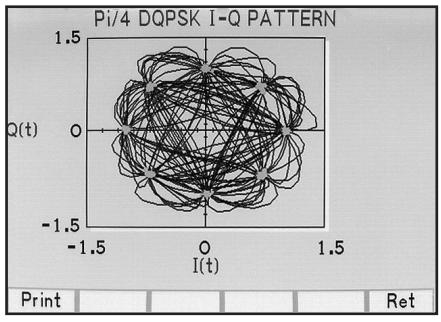
The 1900-5 CSA allows the ability to simulate mobile functions including the ability to generate multiple RACH messages for base station testing. The 1900-5 CSA provides you with the ability to set and select the various mobile messages including the capability of generating a fully functional digital traffic channel including the SACCH and FACCH messaging. Through the use of the available base station test accessories, the 1900-5 CSA can test Lucent, Ericsson and Nortel base stations for conformance to FCC regulations. With extended tests including a full feature spectrum analyzer, Bit Error Rate (BER), Error Vector Magnitude (EVM) and Adjacent Channel Power (ACP) measurement tests, the 1900-5 CSA becomes a true, full featured base station analyzer.

Extended Mobile Test Features

With the ability to generate and define DCCH parameters including F-BCCH, E-BCCH, SPACH and S-BCCH, the 1900-5 CSA provides the most comprehensive test system for ANSI-136 mobile development. In addition to full DCCH functions, the 1900-5 CSA provides true base station emulation capabilities for testing DTX, Circuit Switched Data, SMS messaging and multi-slot DCCH handling functions of the mobile. The 1900-5 CSA provides extensive message type manipulation and information elements on the digital traffic channel including the FACCH and SACCH messaging features. In addition to testing protocol, the 1900-5 CSA also provides the ability to fully test the mobile's parametric performance including EVM, BER, Frequency Error, Adjacent Channel Power and other vital RF performance measurements.

Dynamic IQ Constellation Display Simplifies Analysis

The 1900-5 CSA provides you with a dynamic, high speed constellation display for precise RF modulation analysis of DQPSK digitally modulated waveforms from 10 MHz to 2010 MHz. This unique feature yields near-real time display, which dramatically enhances the instrument's ability to test and troubleshoot digital radios.



IQ Constellation display allows for comprehensive digital modulation testing

Digital Control Channel Capture Capability

With the optional AC1070 DCCH Capture Option, the 1900-5 CSA provides a unique solution for capturing a digital control channel F-BCCH and E-BCCH parameter, storing them, and then replaying them at a later date for system troubleshooting and phone interoperability testing. This unique capability provides the field service engineer and phone design engineer with the ability to quickly isolate tough to find problems that previously would take weeks to solve with extensive on-site testing and expensive travel to problem locations. The captured file can be downloaded from the 1900-5 and e-mailed to a different location for analysis.

New Features for GAIT Testing

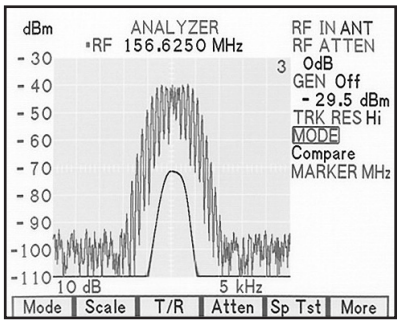
With the addition of the 2935 GSM Test Head, the 1900-5 CSA now provides the ability to test the new GAIT mobiles phones. The new GSM/ANSI-136 mobiles require new interoperability test functions including the ability to test GSM Hosted SMS Teleservice (GHOST) and the new Network Selection Database (NSDB) algorithms. With the optional GAIT test suite, the AC108x, developers and verification and validation test engineers can define their own GSM SMS PDU, and have the 1900-5 CSA handle the Higher Layer Protocol settings to handle GHOST SMS messaging.

Service Monitor Functions to 2 GHz

With its impressive list of digital test features, the 1900-5 CSA doesn't leave you short in providing all the standard RF testing you expect in a radio test set. Full frequency domain analysis to 2 GHz, with a built-in spectrum analyzer and tracking generator are just the beginning. The 1900-5 CSA also includes a full scan digitized oscilloscope to 1 MHz, DVM, SINAD functions, frequency and channel tables, selectable IF filters and a wide variety of displays and meters.

In addition to its 2 GHz RF generator, the 1900-5 CSA feature list also includes fully configurable audio/data generator capabilities, as well as measurement facilities and precision power meter features.

Analog paging encoding/decoding, DTMF, tone coded squelch, digital squelch, AM modulation/demodulation with 2 separate AF generators and a cross band duplex feature give you added test versatility in a variety of public and private wireless systems.



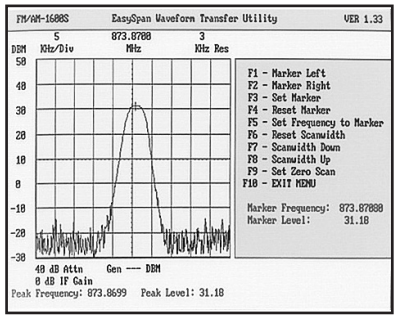
The Aeroflex-1900-5 CSA gives you full featured service monitor functions

Complex Functionality Made Easy

Even with its elaborate capabilities, the 1900-5 CSA performs complex and repeatable test routines no matter what your level of expertise. Our focus on ease-of-use means you can spend more time testing rather than training. For example, our man-machine interface relies on easy to navigate menus driven by soft keys. A color VGA delivers vivid screen clarity. The 1900-5 CSA's extensive use of softkeys reduces complex cellular and PCS parametric and protocol tests to fast, simple and manageable routines. Its powerful scripting language (TMAC) can be easily configured to perform complex automatic tests on base stations and terminals (including single and multi-mode as well as single and multi-band radios) and baseband equipment. This allows you to create and save simple "one button" test routines.

Software Options Make Complex Testing Simple

With the fast pace of wireless technology, having the latest hardware just isn't enough. That's why the 1900-5 CSA comes with an impressive array of software products. From custom applications engineering support, to off-the-shelf utilities and applications, our comprehensive portfolio of application software options are designed to simplify data acquisition and manipulation, automate complex tests and expand the functionality of your instrument.



EasySpan Software

- OPT3 - Circuit Switched Data option for enabling Radio Link Protocol1 (RLP 1) interface for testing ANSI-136.310 circuit switched data services.
- OPT4 - AutoCell 882/884 is an auto-test program for performing acceptance tests on Ericsson 882/884/882D/882M/882DM base stations.
- OPT5 - Nortel Base Station Test Software.
- OPT5A - Upgrade to the above.
- OPT7 - DCCH Capture utility for capturing the E-BCCH and F-BCCH Parameters of a TDMA Digital Control Channel.
- OPT9-Auto-Cell Series II is a comprehensive program for FCC compliance testing of Lucent Series II cell sites.
- AC1009W - EasySpan is a Windows-based software utility which extracts spectrum analyzer and tracking generator traces from the Aeroflex 1900-5 CSA to a PC for further off-line analysis.
- AC1019 - EasySweep™ is a swept measurement utility designed to test antennas and transmission lines.
- AC1021 - CellScan™ cellular utility software simplifies combiner alignment, monitoring RF levels and base stations on TDMA and PCS cellular channels.
- AC1064 - ANSI-136 Dynamic Battery Test Suite analyzes battery life using dynamic "real world" conditions for checking talk time and standby time.
- AC1073 - "Pro Suite" TMAC Programming Windows Software Suite speeds up custom programming requirements for automated testing and special test features of the 1900-5 CSA.
- AC1079CD - "ANSI-136 PhoneTest" is a Windows based software suite that automates the 1900-5 for easy ANSI-136 performance testing.
- AC1080CD - "GAIT Test Suite" automates the 1900-5 and the 2935 GSM test head for testing GSM/ANSI-136 mobile phones.
- AC1136 - Consolidated Protocol Test Suite is a conformance test suite for verification of TDMA Cellular and PCS handsets for CTIA approval.

SPECIFICATION

RF SIGNAL GENERATOR

(T/R) and Duplex Connector

Frequency Range

10 MHz to 2010 MHz

Resolution

100 Hz

Accuracy

Same as Master Oscillator

Range

-127 dBm to -10 dBm into 50 Ω

(T/R Connector: -30 dBm maximum with reverse power present)

Resolution

0.1 dB

Accuracy

± 1.5 dB (≥-110 dBm)

Duplex Connector Input Protection

Alarm sounds when level exceeds +15 dBm, ±6 dB

MODULATION

Level Range

-30 dBm to +25 dBm into 50 Ω

Residual FM

<50 Hz RMS

SSB Phase Noise

<-90 dBc/Hz (20 kHz Offset) @ <1 GHz (1000 MHz)

Residual AM

<0.1% RMS (50 Hz to 15 kHz BW) ≤1.01 GHz (1010 MHz)

Non-Harmonics

<-50 dBc

Internal FM

Range

Off and ±100 Hz to ±100 kHz Dev

Accuracy

± 5% (1 kHz to 20 kHz Dev, 1 kHz rate)

± 10% (1 kHz Dev and >20 kHz Dev, 1 kHz rate)

Resolution

100 Hz

Modulation Rate

1 kHz to 10 kHz - 5% accuracy

Waveforms

Sine, Square, Triangle

Internal Phase/Quadrature (IQ)

RF Ranges

10 MHz to 2010 MHz

IQ Error Vector Magnitude

4% from ideal DQPSK waveform	*Base Simulation*
6%	*Mobile Simulation*

IQ Origin Offset

<-28 dBc

AF SIGNAL GENERATORS

AF Generators #1 and #2

Range

10 Hz to 40 kHz

Resolution

0.1 Hz ≤ 2 kHz

1 Hz >2 kHz

Accuracy

±0.1%

Waveshapes

Sinewave, Square, Triangle, Ramp, Pulse

Level - 1 m to 3 v RMS

AUDIO FREQUENCY COUNTER

Frequency Range

10 Hz to 200 kHz (in 4 decade ranges)

Accuracy

Same as Master Oscillator ± LSD

Resolution

0.1 Hz (10 Hz to 2 kHz)

1 Hz (>2 kHz to 20 kHz)

10 Hz (>20 kHz)

Input Level

0.5 VRMS to 30 VRMS (SINAD/BER input)

0.1 VRMS to 3.5 VRMS (EXT MOD input)

RECEIVER

Frequency Range

10 MHz to 2010 MHz

Sensitivity

<-80 for 10 dB SINAD

(1 kHz rate, 6 kHz Dev, FM 2, ANT Input Port)

RF COUNTER

Frequency Range

100 MHz to 2010 MHz

Accuracy

Same as Master Oscillator ± LSD

Resolution

10 Hz

Minimum Level

-60 dBm (ANT connector)

RF FREQUENCY ERROR METER

Frequency Range

100 MHz to 2010 MHz

Frequency Digital Meter Range

0 Hz to ±150 kHz

Bar Graph Meter Range

0 to ±100 kHz (in 4 decade ranges)

Accuracy

Same as Master Oscillator ± LSD

Resolution

1 Hz (±1 Hz to ±10 kHz)

10 Hz (>±10 kHz to ±150 kHz)

Minimum Level

-60 dBm (ANT Input Port)

RF POWER METER

Frequency Range

100 MHz to 2010 MHz

Input Level

0.05 mW to 50 W RMS (≤900 MHz, 1–2–5 sequence, 4 decade)

Resolution

1 % minimum

Accuracy

±6% (>5 W and <50 W, at Typical Operational Ambient Temperature)

POWER METER

Frequency Range

100 MHz to 2010 MHz

Input level

-40 dBm to -10 dBm

Accuracy

12% typical

FM DEVIATION METER

Frequency Range

100 MHz to 2010 MHz

Deviation Range

±100 Hz to ±100 kHz

Resolution

100 Hz (<20 kHz ranges)

1 kHz (>20 kHz ranges)

Accuracy

±5 % ±2 counts

PM DEVIATION METER

Frequency Range

100 MHz to 2010 MHz

Deviation Range

0 Rad to 10 Rad (Peak)

Resolution

0.01 Rad (deviation ≤5 Rad)

0.1 Rad (deviation >5 Rad)

AM MODULATION METER

Frequency Range

100 MHz to 2010 MHz

Modulation Range

1 % to 90 %

Resolution

1 %

Accuracy

±5 % of full scale ±1 count

DISTORTION METER

Distortion Range

0 % to 20 %

Resolution

0.1 %

Accuracy

±0.5 % distortion ±1 count (1 % to 10 %)

±2 % distortion ±1 count (>10 %)

ERROR VECTOR MAGNITUDE (EVM) METER

Frequency Range

100 MHz to 2000 MHz

Minimum Carrier Level

-40 dBm (ANT connector)

EVM Range

0 to 100 %

EVM Resolution

0.01 %

Meter Residual EVM

<2 % indication

Accuracy

± 3.0% indication, ± 1 LSD + meter residual EVM

SINAD METER

Range

3 dB to 40 dB

Resolution

0.1 dB

Accuracy

±2 dB ±1 count

DIGITAL MULTIMETER

Voltmeter (DC/AC)

Ranges

200 mV to 200 V

Maximum Input

1000 VDC, 500 VAC

Resolution

3.5 digit (maximum resolution 0.1 mV on 200 mV range)

Accuracy

±5% of full scale ± 1 count (AC, where ACV*kHz < 140)

±1% of full scale ± 1 count (DC)

Frequency

DC, 50 Hz to 20 kHz

Ohmmeter

Ranges

200 Ω to 20 MΩ (full scale, decade sequence)

Resolution

3.5 digit

Accuracy

±5% or 0.1 (±1 count)

Current Meter (DC/AC)

Ranges

20 mA to 2 A (full scale, decade sequence, 20 A maximum when using external shunt)

Resolution

3.5 digit (maximum resolution 0.01 mA on 20 mA range)

Accuracy

±5 % or 0.1 mA ±1 count

OSCILLOSCOPE

Vertical BW

1 MHz (-3 dB)

Input Ranges

1 mV / Div to 50 V / Div (1-2-5 sequence, 8 divisions)

Max Input Vertical

30 V RMS

Accuracy Vertical

±5% of full scale

±10% of full scale (1 mV and 2 mV ranges)

Coupling Vertical

AC, DC, GND

Horizontal Sweep Rate

1 µSec / Div to 100 msec / Div (1-2-5 sequence, 10 divisions)

Accuracy Horizontal

±1 % of Full Scale

SPECTRUM ANALYZER

Range

50 MHz to 2010 MHz

Frequency Span Range

1 kHz/Div to 200 MHz/Div plus Zero Scan
(10 divisions in a 1-2-5 sequence)

Accuracy

±5% of Span Width

Reference Accuracy

See Master Oscillator

Display

Log, 10 dB/Div and 2 dB/Div

Displayed Range (Dynamic)

60 dB (0 dB Attenuation, Span <1 MHz/Div)

Overall Accuracy

± 4 dB (10 MHz to 400 MHz) (normalized)

± 5 dB (>400 MHz to 2010 MHz) (normalized)

BIT ERROR METER (BER)

Range

$1x10^{-1}$ to $1x10^{-5}$

Data Rates

75, 150, 300, 600, 1200, 2400, 4800 bps & 16 kbps

Data Pattern Size

100 to 100,000 bits

Data Pattern Type

Random, Fixed and User Defined

INPUT/OUTPUT (I/O)

IEEE 488.1-1987 Internally Assigned GPIB Addresses

System Control Processor (GPIB Address=4)
TDMA Control Processor (GPIB Address=5)

RS-232C

Host Port System Control Processor
Optional Port Special Test Control Processor

Baud Rates

300 to 115200

External Video Port Operation Mode

VGA Compliant

Frequency Reference Ports

BNC Input for External 10 MHz Sync

BNC Output of Internal 10 MHz Sync

Dedicated Printer Port

25-Pin D-Sub, Centronics Compatible

IQ Output Interface

BNC Connector

TDMA Timeslot Sync

BNC Connector

MASTER OSCILLATOR

Frequency Standard

10 MHz (Nominal)

Temp Stability

±0.1 ppm (0 to 50°C)

GENERAL CHARACTERISTICS

Dimensions

188 mm H, 478 mm W, 635 mm D (with bail handle and front panel cover in place)

7.4 in.H, 18.8 in. W, 25 in. D (with bail handle and front panel cover in place)

Weight

Less than 21.8 kg (48 lbs.)

Operating Temperature Range

5° to 40°C

POWER REQUIREMENTS

Line

110 - 120 to 220 - 240 VAC

50 to 60 Hz @ 20 W Maximum

DISPLAY

Type

Color, Active Matrix LCD

Size

96 mm wide, 86 mm high

3.8 in. wide, 3.4 in. high

Resolution

640 pixel x 480 pixels

VERSIONS AND ACCESSORIES

When ordering please quote the full ordering number information.

Ordering Numbers

Versions

1900-5	1900-5 CSA Communications Service Monitor
1900-5-C	1900-5 CSA Communications Service Monitor, Certification of Calibrations
1900-5 Upgrade	1900-4 to 1900-5 Upgrade

Options

OPT2	-40 dB Low Power Meter Calibration
OPT3	Circuit Switched Data Option. (USA Only)
OPT4	Autocell-882/884 (Ericsson)
OPT5	Nortel Base Station Test Software
OPT5A	Upgrade to the above
OPT7	DCCH Capture For F-BCCH, E-BCCH
OPT8	Firmware Ver. 4.4 for SBCCH
OPT9	Autocell-Series II (Lucent Series II)

Accessories

AC1009W	Easyspan For Windows (Waveform Transfer)
AC1019	Easysweep (Swept Antenna Measurements)
AC1021	CellScan (Base Site Utility)
AC1048	SSD Update and Authentication Test Suite
AC1060	Ericsson 884 Autocell Cable Kit
AC1061	Nortel Autocell Cable Kit
AC1062	Lucent Autocell Cable Kit
AC1064	ANSI-136 Dynamic Battery Test Suite
AC1073CD	Aeroflex 1900 Pro Suite Demo (21 Day Demo Disk)
AC1073SKEM	Aeroflex 1900 Pro Suite Site Key (Permanent Enable)
AC1079CD	ANSI-136 PhoneTest - Windows based software suite
AC1080CD	GAIT Test Suite for testing GSM/ANSI-136 mobile phones.
AC1201	Telescoping Antenna
AC2571	1900-5 Extended Warranty - P1
AC2572	1900-5 Extended Warranty - P2
AC2573	1900-5 Extended Warranty - P3
AC2574	1900-5 Extended Warranty - P4

AC4103	Return Loss Bridge Kit (5 MHz - 2 GHz) (Includes AC1019)
AC7854	Heavy Duty Ship Case With Tag-Along Combo
AC8645	Microphone
AC9153	Soft Padded Carrying Case

Notes

P1 - Uninterrupted new product Limited Warranty through year three from original purchase date.

P2 - Two certified NIST traceable calibrations - one during each of years two and three and new product Limited Warranty through year three.

P3 - Uninterrupted new product Limited Warranty through year five from original purchase date.

P4 - Four certified NIST traceable calibrations - one during each of years two through five and new product Limited Warranty through year five.

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AEROFLEX
A passion for performance.

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Our passion for performance is defined by three attributes represented by these three icons: solution-minded, performance-driven and customer-focused.

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