



# Convergence Test & Measurement Abacus 5000 CTM

## Overview

Spirent provides a single-system solution to test the migration from legacy to converged networks. Abacus 5000 is a fully integrated IP and PSTN Telephony test system in a single platform. Abacus 5000 Convergence Test & Measurement (CTM-5000) adds new ways to test IP Telephony features and protocols. Users can test compliance to IP Telephony standards and obtain real time analysis of VoIP applications and protocols.

## Applications

- SIP UA/Proxy conformance
- H.323 devices conformance
- MG and MGC conformance for MGCP and H.248
- SIGTRAN M3UA and IUA conformance
- SIP-T conformance
- SIP, H.323, RTP/RTCP real time analysis, application flow and troubleshooting
- SIP, H.323, RTP/RTCP, MGCP, Megaco/H.248 protocol analysis

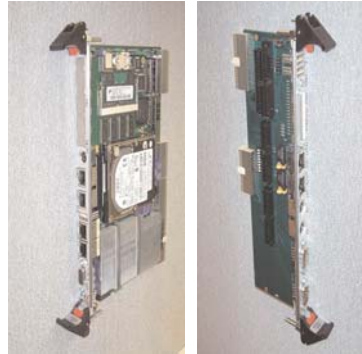
CTM-5000 systems are the ideal complement to achieve network interoperability testing.

## Versatility

The CTM-5000 subsystem for Abacus 5000 chassis is available on a high performance one-slot CompactPCI single board computer.

The multipurpose nature of CTM-5000 makes it easy to run best of breed third-party application such as the Safire Protocol Conformance Testers from Solinet Inc. and the ClearSight Software Analyzer from ClearSight Networks.

The CTM-5000 can be controlled from a remote laptop computer.



CTM-5000 front card

CTM-5000 rear card

## Protocol Conformance Testers

CTM-5000 supports the following Solinet protocol conformance testers:

- SIP Conformance Tester
- H.323 Conformance Tester
- SIGTRAN M3UA Conformance Tester
- SIGTRAN IUA Conformance Tester
- Megaco/H.248 Conformance Tester
- MGCP Conformance Tester System
- SIP-T Conformance Tester

The manufacturer's representative agreement with Solinet Inc. allows Spirent to resell Solinet's test platform, framework and Solinet's Add-on ETSI test suites. Solinet's protocol conformance testers are fully supported by Solinet.

Due to the complexity of conformance testing, Spirent recommends for customers up-front training on the conformance testers. For training and support, contact Solinet:

SOLINET, Inc.  
500 W Cummings Park, Suite 2475  
Woburn, MA 01801, USA  
Tel: +1-781-938-1221 x 102  
Fax: +1 781-933-3178

## IP Telephony Protocol Analyzer System

CTM-5000 offers the IP Telephony Protocol Analyzer System with the CLR-3001 ClearSight Software Analyzer. The ClearSight SW analyzer is a real time network and application analyzer.

CTM-5000 IP Telephony Protocol Analyzer supports VoIP Application Flow and protocol analysis for H.323, SIP, RTP/RTCP. CTM-5000 also supports protocol analysis for MGCP, Megaco/H.248, SIGTRAN and video CODECs. CTM-5000 allows you to troubleshoot IP Telephony applications, networks, server and client problems without decoding.

Spirent's high-level partnership with ClearSight allows Spirent to sell the entire product line of ClearSight Networks.

## SIP Conformance Test Suite

The SIP Conformance Test Suite tests SIP compliance to IETF RFC 3261 and ETSI standard specifications. The test suite also validates User Agent (UA), Proxy or Redirect Server conformance.

## Key Features

- Automated UA/Proxy/Server conformance testing, simulation and verification
- Pass/Fail analysis
- Real-time plain English decode/MSC
- Animated test result action-replay
- Powerful graphical scenario editor
- Batch-test builder allows test groups to be saved and run in sequence
- Can be used with other conformance test systems
- Create, Compile, Run, Validate integrated solution
- Torture tests

Interface - 10/100Base-T Ethernet

Endpoints Tested - Redirect, Proxy, UA

Messages Tested - REGISTER; INVITE; ACK; OPTIONS; BYE; CANCEL; 1xx, 2xx, 3xx, 4xx, 5xx, 6xx Responses

## Sequences Tested

- Valid/Invalid/Inopportune behavior
- Call Establishment and Release
- Registration: Registrant, Registrar
- Message Parsing
- Originating and Terminating Endpoint

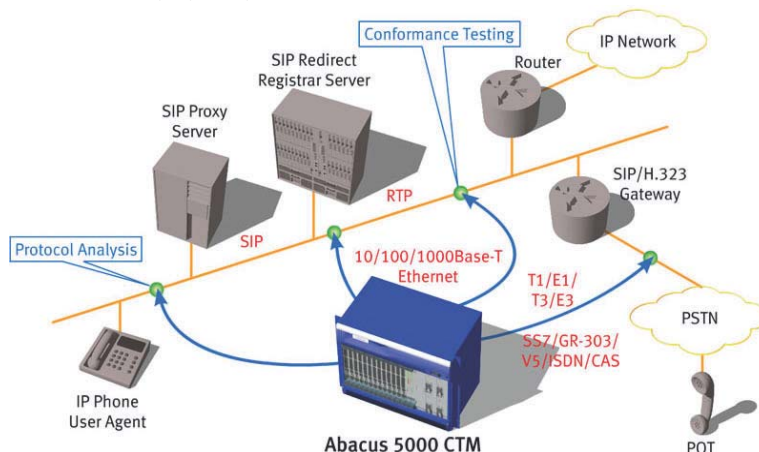
## Automation

- Saving and execution of batched test cases
- Remote trigger over TCP/IP from a test server
- Overnight regression testing

**Spirent Communications**  
26750 Agoura Road  
Calabasas, CA  
91302 USA  
E-mail: productinfo@spirentcom.com

**Sales Contacts:**  
**North America**  
+1 800-927-2660  
**Europe, Middle East, Africa**  
+33-1-6137-2250  
**Asia Pacific**  
+852-2166-8382  
**All Other Regions**  
+1 818-676-2683

www.spirentcom.com



Abacus 5000 CTM

Abacus 5000 Convergence Test & Measurement

Analyze | Assure | Accelerate™



### Supported Standards

- Protocol: IETF RFC 3261, RFC 2543 draft 4 and 9
- Test: TIPHON-06021-1 TS 102 027-1 V2.12 (2003-01) validated by ACATS-forum
- Session Initiation Protocol Torture Test Messages, draft-ietf-sipping-torture-tests-03

### SWF-5101 - SIP Conformance Test Suite

The SWF-5101 - SIP Conformance Test Suite includes Solinet's Safire SIP Conformance Tester:

- 7101/11 Test platform & framework SIP test suite
- 7101/12 Add-on full SIP ETSI test suite

### H.323 Conformance Test System

The H.323 Conformance Test System tests H.323 compliance to ITU-T H.225, Q.931, H.245 and ETSI standard specifications. The H.323 Conformance Test System validates H.323 terminal, gateway and gatekeeper conformance.

#### Key Features

- Automated H.323 conformance testing, simulation and verification
- Pass/Fail analysis
- Real-time plain English decode/MSD
- Animated test result action replay
- Powerful graphical scenario editor
- Batch-test builder allows test groups to be saved and run in sequence
- Can be used with other conformance test suites
- Create, Compile, Run, Validate integrated solution

**Interface** - 10/100Base-T Ethernet

**Endpoints Tested** - Terminal, gateway, gatekeeper

#### Messages Tested

- Q.931: Setup, Call Proceeding, User Information, Alerting, Connect, Release Complete, Progress
- H.225: GRQ, GCF, GRJ, RRQ, RCF, RRJ, URQ, UCF, URJ, ARQ, ACF, CRJ, BRQ, BCF, BRJ, DRQ, DCF, DRJ, LRQ, LCF, LRJ, IRQ, IRR, NSM, XRS, RIP, RAI, RAC, IACK, INAK
- H.245: Request/Response; including MasterSlaveDetermination, TerminalCapabilitySet, OpenLogicalChannel, CloseLogicalChannel

#### Sequences Tested

- Admission/Registration
- Call Setup/Call Release
- Capability Exchange/Master Slave Determination
- Valid/Invalid/Inopportune

#### Automation

- Saving and execution of batched test cases
- Remote trigger over TCP/IP from a test-server
- Overnight regression testing

### Supported Standards

- Protocol: H.323 ITU-T H.323 Vers. 4
- Test: ETSI TS 101 804.2 V2.0.4 (2002-10) validated by ACATS-forum

### SWF-5111 - H.323 Conformance Test Suite

The SWF-5111 - H.323 Conformance Test Suite includes Solinet's Safire H.323 Conformance Tester:

- 7101/21 Test platform and framework H.323 test suite
- 7101/22 Add-on H.323 ETSI Test Suite

### SIGTRAN M3UA Conformance Test Suite

The SIGTRAN M3UA Conformance Test System tests SIGTRAN M3UA compliance to IETF SCTP 3309, M3UA RFC 3332. The SIGTRAN M3UA validates SIGTRAN SG and MGC conformance.

#### Key Features

- Automated SG/MGC conformance testing, simulation and verification
- Pass/Fail analysis
- Real-time plain English decode/MSD
- Animated test result action replay
- Powerful graphical scenario editor
- Batch-test builder allows test groups saved and run in sequence
- Can be used with other conformance test suites
- Create, Compile, Run, Validate integrated solution
- Full decode of the SIGTRAN stack including ISUP/SCCP payload

**Interface** - 10/100Base-T Ethernet

#### Endpoints Tested

- Media Gateway Controller (MGC)
- Signaling Gateway (SG)

#### Messages Tested

- MGMT: ERR, NTFY
- SNN: DUNA, DAVA, DAUD, SCON, DUPO, DRST
- ASPTM: ACTIVE/ACK, INACTIVE/ACK
- M3UA: DATA (ISUP/SCCP)
- SUA: Connectionless CLDT, CLDR

#### Sequences Tested

- Valid/Invalid/Inopportune behavior

#### Automation

- Saving and execution of batched test cases
- Remote trigger over TCP/IP from a test server
- Overnight regression testing

#### Supported Standards

- SCTP: IETF RFC 3309
- M3UA: IETF RFC 3332
- M2UA: IETF RFC 3331
- SUA: IETF Draft 14
- Test: Validated by ACATS-forum

### SWF-5121 - SIGTRAN M3UA Conformance Test Suite

The SWF-5121 - SIGTRAN M3UA Conformance Test Suite includes Solinet's Safire SIGTRAN M3UA Conformance Tester:

- 7101/41 Test platform and framework M3UA test suite

### SIGTRAN IUA Conformance Test Suite

The SIGTRAN IUA Conformance Test Suite tests SIGTRAN Q.921 IUA compliance to IETF SCTP 3309, IUA RFC 3057. The SIGTRAN IUA validates SIGTRAN SG and MGC conformance.

#### Key Features

- Automated SG/MGC conformance testing, simulation and verification
- Pass/Fail analysis
- Real-time plain English decode/MSD
- Animated test result action replay
- Powerful graphical scenario editor
- Batch-test builder allows test groups to be saved and run in sequence
- Can be used with other conformance test suites
- Create, Compile, Run, Validate integrated solution
- Full decode of the SIGTRAN stack including ISUP/SCCP payload

**Interface** - 10/100Base-T Ethernet

#### Endpoints Tested

- Media Gateway Controller (MGC)
- Signaling Gateway (SG)

#### Messages Tested

- QPTM: Data, Unit Data, Establish, Release
- ASPSM: ASP UP/Down, Heartbeat
- ASPTM: ASP Active, ASP Inactive
- MGMT: ERR, NTFY, TEI Status

#### Sequences Tested

- Valid/Invalid/Inopportune behavior

#### Automation

- Saving and execution of batched test cases
- Remote trigger over TCP/IP from a test server
- Overnight regression testing

#### Supported Standards

- IETF: SCTP 3309
- IUA: RFC 3057
- Test: Validated by ACATS-forum

### SWF-5131 - SIGTRAN IUA Conformance Test Suite

The SWF-5131 - SIGTRAN IUA Conformance Test Suite includes Solinet's Safire SIGTRAN IUA Conformance Tester:

- 7101/51 Test platform and framework IUA test suite

### Megaco/H.248 Conformance Test Suite

The Megaco/H.248 Conformance Test Suite tests Megaco/H.248 compliance to IETF RFC 3015 and ITU-T H.248. The Megaco/H.248 validates MG or MGC conformance.

#### Key Features

- Automated MG/MGC conformance testing, simulation and verification
- Pass/Fail analysis
- Real-time plain English decode/MSD

- Animated test result action replay
- Powerful graphical scenario editor
- Batch-test builder allows test groups to be saved and run in sequence
- Can be used with other conformance test suites
- Create, Compile, Run, Validate integrated solution

**Interface** - 10/100Base-T Ethernet

#### Endpoints Tested

- Media Gateway Controller (MGC)
- Media Gateway (MG)

#### Messages Tested

##### MGC Originated

- Add (AD)
- Modify (MD)
- Subtract (SU)
- Move (MO)
- Audit Value (AV)
- Audit Capabilities (AC)

##### MG Originated

- Notify (NO)
- Service Change (SC)

#### Sequences Tested

- Valid/Invalid/Inopportune behavior

#### Automation

- Saving and execution of batched test cases
- Remote trigger over TCP/IP from a test server
- Overnight regression testing

#### Supported Standards

- Protocol: ITU-T H.248, IETF RFC 3015
- Test: TIPHON ETSI TS 101 889-2 V1.1.1 (2002-08)
- Test: Validated by ACATS-forum

#### SWF-5141 - Megaco/H.248 Conformance Test Suite

The SWF-5141 - Megaco/H.248 Conformance Test Suite includes Solinet's Safire Megaco Conformance Tester:

- 7101/61 Test platform and framework Megaco test suite

#### MGCP Conformance Test Suite

The MGCP Conformance Test Suite tests MGCP compliance to IETF RFC 3435. The MGCP validates MG or MGC conformance.

#### Key Features

- Automated MG/MGC conformance testing, simulation and verification
- Pass/Fail analysis
- Real-time plain English decode/MSD
- Animated test result action replay
- Powerful graphical scenario editor
- Batch-test builder allows test groups saved and run in sequence
- Can be used with other conformance test systems
- Create, Compile, Run, Validate integrated solution

**Interface** - 10/100Base-T Ethernet

#### Endpoints Tested

- Media Gateway Controller (MGC)
- Media Gateway (MG)

#### Messages Tested

##### MGC Originated

- Endpoint Configuration (EPCF)
- Notification Request (RQNT)
- Create Connection (MDCX)
- Delete Connection (DLCX)
- Audit Endpoint (AUPE)
- Audit Connection (AUCX)

##### MG Originated

- Notify (NTFY)
- Restart in progress (RSIP)

**Sequences Tested** - Restart, Connection Creation, Connection Deletion

#### Automation

- Saving and execution of batched test cases
- Remote trigger over TCP/IP from a test server
- Overnight regression testing

#### Supported Standards

- IETF RFC 3435
- Test: Validated by ACATS-forum

#### SWF-5151 - MGCP Conformance Test Suite

The SWF-5151 - MGCP Conformance Test Suite includes Solinet's Safire MGCP Conformance Tester:

- 7101/71 Test platform and framework MGCP test suite

#### SIP-T Conformance Test Suite

The SIP-T Conformance Test Suite tests SIP compliance to IETF RFC 3372 in conjunction with RFC 3261. The SIP-T Conformance Test Suite validates User Agent (UA), Proxy or Redirect Server conformance

#### Key Features

- Automated UA/Proxy/Server conformance testing, simulation and verification
- Pass/Fail analysis
- Real-time plain English decode/MSD
- Animated test result action-replay
- Powerful graphical scenario editor
- Batch-test builder allows test groups to be saved and run in sequence
- Can be used with other conformance test suites
- Create, Compile, Run, Validate integrated solution

**Interface** - 10/100Base-T Ethernet

#### Endpoints Tested

- Redirect
- Proxy
- UA

#### Messages Tested

- REGISTER
- INVITE
- ACK
- OPTIONS
- BYE
- CANCEL
- 1xx, 2xx, 3xx, 4xx, 5xx, 6xx Responses

#### Sequences Tested

- Valid/Invalid/Inopportune behavior
- Call Establishment and Release
- Registration: Registrant, Registrar
- Message Parsing
- Originating and Terminating Endpoint

#### Automation

- Saving and execution of batched test cases.
- Remote trigger over TCP/IP from a test-server
- Overnight regression testing

**Supported Standards** - Protocol: IETF RFC-3372 with RFC 3261

#### SWF-5171 - SIP-T Conformance Test Suite

The SWF-5171 SIP-T Conformance Test Suite will include Solinet's Safire SIP-T Conformance Tester:

- 7101/31 Test platform framework SIP-T test suite

#### Requirements for the Previous Conformance Testers

The CTM-5000 subsystem supports the conformance test suites. The conformance test suites will be supplied by Solinet Inc on a USB flash memory drive. The conformance test suites can easily be installed on the CTM-5000 subsystem using the USB interface located on the front panel.

If used on a desktop or laptop, the conformance test suites require:

- Industry standard laptop/desktop
- Pentium® III or better, 850 MHz or higher
- Windows® NT or Windows® 2000 Professional, Windows® XP Professional operating systems
- 128 MB RAM (minimum)
- 70 MB of available hard disk
- Available USB port (required for USB HASP security device)

#### IP Telephony Protocol Analyzer System

The CTM-5200 IP Telephony Protocol Analyzer System with the CLR-3001 ClearSight Software Analyzer is a real time network and application analyzer.

The CTM-5200 IP Telephony Protocol Analyzer system features intuitive visual tools to solve IP Telephony network and application problems.

The CTM-5200 IP Telephony Protocol Analyzer system offers the ability to troubleshoot multimedia (VoIP) applications, networks, server and client problems without decoding a packet.

#### Key Features

- Three Layer Interface - Application Network, Physical: Immediately see problem layers and quickly determine overall health in real time
- Application Flow View (Ladder Diagram) - Read VoIP conversations between client and server in the application command language without having to decode packets



- Intuitive Drill-down Methodology - Find the problem without having to parse and build stories; filter on conversations and get to the problem fast
- Automatic capture filters activated through drill down
- Content Flow View - Quickly see (H.261/H.263) or hear (G.711, G.723, MPEG) what the user is experiencing to get to the root of the problem
- Real time monitoring of VoIP Applications - Application and configuration flow views without capturing a packet
- Timing Diagrams with Application Conversations - Poor response times and delays pop right out of the application flow view and identify slow commands, poor service or application performance issues
- SLA - Constantly tests and alerts on application responses (SIP and H.323 Server) that fall below your acceptable standards; emulates partial client function to send call setup to the server
- Full packet decodes, reporting and alerting

**Interface** - 10/100Base-T half-duplex Ethernet

#### Supported VoIP Application Flow

- H.323: H.225, H.245, RAS
- SIP
- SCCP (Skinny)
- RTP/RTCP

#### Supported VoIP Protocols

- H.323: H.225, H.245, RAS
- SIP
- MGCP
- Megaco/H.248
- SCCP (Skinny)
- SIGTRAN
  - IUA: RFC 3057 ISDN UA
  - SUA
  - M2PA
  - M2TP
  - M2UA: RFC 3331, SS7 MTP2 UA
  - M3UA: RFC 3332, SS7 MTP3 UA
- Media Protocol: RTP, RTCP, RTSP

#### Play (decode) Audio Codecs

- G.711 ( $\mu$ -law)
- GSM mono
- G.723 mono
- 4-bit mono DVI 8 kHz, 11.025 kHz, 22.05 kHz
- MPEG layer (I, II, III)

#### Play (decode) Video Codecs

- H.261
- H.263 (Mode A)
- JPEG (411, 422, 111)

#### Other Applications

- HTTP, FTP, DNS, Telnet
- POP3, SMTP, Exchange
- MS-SQL, Oracle

#### System Requirements

The CTM-5200 - IP Telephony Protocol Analyzer system includes:

- Pre-installed CLR-3001 - ClearSight Analyzer SW
- CTM-5000 Convergence Test & Measurement subsystem for Abacus 5000

The CLR-3001 - ClearSight Analyzer SW if used on a desktop or laptop requires:

- Industry standard laptop/desktop
- Pentium III or better, 1 GHz or higher
- 1024x768, 16-color minimum
- Windows 2000 Professional, Windows XP Professional
- 500 MB installation
- Up to 512 MB capture buffer (memory)
- Capture file based on hard disk capacity

#### CTM-5000 Convergence Test & Measurement Subsystem

The CTM-5000 subsystem is a high performance one-slot CompactPCI single board computer for Abacus 5000 chassis. CTM-5000 supports Abacus 5000 CTM including protocol conformance test systems and IP Telephony protocol analyzer systems.

#### Specifications

- PC compatible one-slot CompactPCI single board
- Pentium III 1 GHz processor
- Windows XP Professional
- High-res AGP graphics interfaces
- 512 MB RAM
- EIDE hard disk
- Two 10/100Base-T Ethernet ports on front panel

#### Physical Connections

- CTM-5000F front card fits into one Abacus 5000 slot
- CTM-5000R rear card provides real panel Ethernet RJ-45 connections

#### Peripheral Interfaces

- Keyboard and mouse interfaces via single PS/2 TM connector on front panel
- 2 USB interfaces and one parallel port on back panel (required for USB HASP security key) and 1 USB interface on front panel (required for Solinet's SW installation)
- Monitor interface

#### Electrical

- Power draw: Approx. 31 W per board

#### Ordering

##### CTM Subsystem

CTM-5000 - Convergence Test & Measurement subsystem for Abacus 5000

##### CTM-5200 Systems available

- CTM-5200 - IP Telephony Protocol Analyzer System

##### CTM-51xx - SW suites available

- SWF-5101 - SIP Conformance Test Suite
- SWF-5111 - H.323 Conformance Test Suite
- SWF-5121 - SIGTRAN M3UA Conformance Test Suite
- SWF-5131 - SIGTRAN IUA Conformance Test Suite
- SWF-5141 - Megaco/H.248 Conformance Test Suite
- SWF-5151 - MGCP Conformance Test Suite
- CLR-3001 - ClearSight Analyzer SW Will follow
- SWF-5171 SIP-T Conformance Test Suite

##### Spirent Service and Support

Abacus 5000 comes with comprehensive warranty, maintenance, and support packages, as well as Spirent Communications' full commitment to helping you get the most from our innovative technology.

##### Solinet Service and Support

The SWF-51xx SW suites are fully supported by SOLINET USA. The support e-mail address is:

<Support@SOLINETinc.com>

Call 1-800-293-0823 ext 3 for support, 9am-5pm EST.

##### ClearSight Service and Support

Spirent provides first tier support for ClearSight products. Customers should call 1-800-SPIRENT as they do for all technical support issues. ClearSight will be brought in for second tier support.

##### For More Information

Access Abacus 5000 information at <www.spirentcom.com/voice>. Learn more about Spirent IP Telephony test systems and services, download product literature, white papers and test methodologies. Or contact your local sales representative for additional details.

**Spirent Communications**  
26750 Agoura Road  
Calabasas, CA  
91302 USA  
E-mail: productinfo@spirentcom.com

**Sales Contacts:**  
**North America**  
+1 800-927-2660  
**Europe,**  
**Middle East, Africa**  
+33-1-6137-2250  
**Asia Pacific**  
+852-2166-8382  
**All Other Regions**  
+1 818-676-2683

www.spirentcom.com

