



Clarinet

Protocol Analyser, Simulator and Conformance Test System



Now with direct PC NIC/LAN adapter support for VoIP analysis & simulation using new Zumara software.

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System Overview

The Convergence Challenge

As we move along the path of convergence we need to ensure that trusted technologies such as SS#7, Q-SIG and ISDN integrate with LAN technologies. In order to provide the high standard of service demanded between network nodes on the LAN and WAN, test solutions need to measure in an accurate, methodical, reliable and repeatable way. Our modular test & development systems provide an affordable solution, tried and tested by thousands of customers worldwide.

System Format

Customers may choose either of the following software packages to suit their application. Both packages are fully compatible with Clarinet E1/T1 and S/T-U interface pods. The core software analysis/simulation features detailed in this brochure are common across both software packages.

Zumara Software: with direct support for 10/100 & Gigabit Ethernet PC NIC/LAN Adapters for VoIP & VoIP/WAN interoperability applications.

Run-Time Software: traditional Clarinet system software for E1/T1 and S/T-U applications without support for PC NIC/LAN Adapters. Suitable for those customers who do not require Ethernet test capabilities now or in the future.

Zumara & Run-Time software packages operate under Windows 2000, XP or Vista and pre-written profiles are supplied, tested and operational, to meet most applications. Any user may simply edit a profile to generate the type of call or calls required, the content, duration and number of times that the call is repeated. With SS#7, ISDN Q-SIG, SIP, H.323 (including ASN1), all message contents may be edited to create the exact format required.

Clarinet Hardware

Model 2001: E1/T1 interface pod

Model 2002: S/T-U interface pod

Both Zumara & Run-Time software packages are fully compatible with Clarinet E1/T1 & S/T-U USB controlled hardware interface pods. Any combination of up to seven E1/T1, S/T-U or LAN interfaces may be connected & controlled simultaneously.

Options

PESQ Key to produce PESQ & MOS quality scores

G.729 Codec Licence: 2 channels

G.729 Codec Licence: 50 channels

Conformance Test Suites

Key Benefits

Versatility

Controls up to seven independent interface types with one system host for multi-port protocol testing on different network nodes.

Portable

Compact, lightweight format ideal for international travel.

Key Applications

Developers & Manufacturers

- Analysis of delays, errors, lost messages and incompatibilities over the entire network.
- Integration and compatibility testing.
- Full protocol analysis.
- Gathering of performance statistics.
- Analysis of messages arriving and leaving protocol converters or gateways.
- Self declaration (optional).

Network Operators

- Demonstration and test of network features.
- Field analysis and re-creation of protocol errors.
- End to end testing.
- Conformance testing (optional).
- Feature testing.
- Interoperability.

Test Laboratories

- Conformance Testing with TTCN Executable Test Suites for a wide range of protocols (optional).
- Testing for foreign markets.
- LAN - WAN Interoperability testing.

Ensure Terminal or Network Compliance

To test protocol compliance a very wide range of conformance test software in TTCN format is available as an option. Please refer to pages 10 - 14 for a full list of test suites covering SIP, H.225, SS7, Q-SIG, V5.1, V5.2 and ISDN.

Automation

Launch a pre-written test profile using Telnet and at the end of the profile, the next profile/s may be launched automatically. After test execution, it is possible to convert the standard binary event file into a text format and transfer this file back to the Telnet host for investigation.

Enables International Collaboration

Profiles and event files can be e-mailed to colleagues.

Ease of Use

An intuitive GUI allows Manual or Automatic call generation simultaneously over several interfaces.

Proven Established Protocol Test System

The latest TTCN Conformance Test Scripts are available as options.

Event Trace and Protocol Filter

The powerful protocol filter can be opened at any time during test execution or when reviewing a captured file. It allows the user to select display format, colours, protocol stack, detail and message filtering independently for each protocol layer. Up to five timers can be configured to measure the precise duration between two events and display the result with a resolution of 0.1mS. By default, all events are recorded and displayed, however if required the user can select to start and stop recording on receipt of particular events with pre and post trigger information. Figure 1 shows a typical Q-SIG event trace.

Segmented ISDN or Q-SIG events can be fully decoded. Any unrecognised messages are displayed in HEX without stopping the analysis.

Fig 1 - Q-SIG Protocol Trace



Fig 2 - Clarinet E1/T1 interface pod, model 2001.

Monitoring Features

- ☑ Real-time full decode of numerous protocols.
- ☑ Display or suppress messages at each layer.
- ☑ Event time stamping to within 1mS.
- ☑ Filtering of each layer with selectable detail and display colours.
- ☑ View each interface in real time using independent filters for each.
- ☑ Full ASN1 decode.
- ☑ Automatic recording of all or selected events.
- ☑ Analyse unusual protocol combinations.
- ☑ User selectable statistics filters and displays.

Simulation/Emulation Features

- ☑ Manual or automatic simulation of multiple calls with independent content including any ASN1.
- ☑ Simulation of multiple protocols in parallel.
- ☑ Profiles contain all selected call scenarios and can be chained together to run complete test routines.
- ☑ Generation or regeneration of any call plus clearing of calls.
- ☑ Manual generation of Layer 1 events for each protocol such as alarms or activation, deactivation, unblocking...etc.
- ☑ Many high level emulations are provided.
- ☑ Emulation of protocols carried over other protocols such as IP or X.25 over ISDN.

Conformance Test Features (optional)

- ☑ Automatic test case selection based on the configured PICS/PIXIT values.
- ☑ Tests may also be selected individually and by group, purpose or name.
- ☑ PICS/PIXIT parameters and test case selection may be entered without the need to re-compile.
- ☑ All parameters are saved in a profile to simplify re-testing.
- ☑ PICS/PIXIT values and the status of each test are added to the event file for convenience.
- ☑ A full report may be easily generated in MS Word.
- ☑ Protocol events are interleaved with test stages making it very easy to de-debug IUT behaviour.

Statistics

Pre-written statistics filters are provided to count events at different Layers and produce colour bar graphs and tables to display the results. These filters can be created by any user to combine several layers or several protocols, with any scale or automatic scaling and any sample rate. The captured file can be exported to MS Excel for inclusion in a written report. An example of a statistics event file is shown in Figure 3.

Protocol Support

Both Zumara & Run-Time software allow simulation of most protocols which run over the available interfaces. The user simply selects the appropriate interface for the application and is then ready to go! A vast range of protocols for analysis are also included. These can be used to create any required stack for decode.

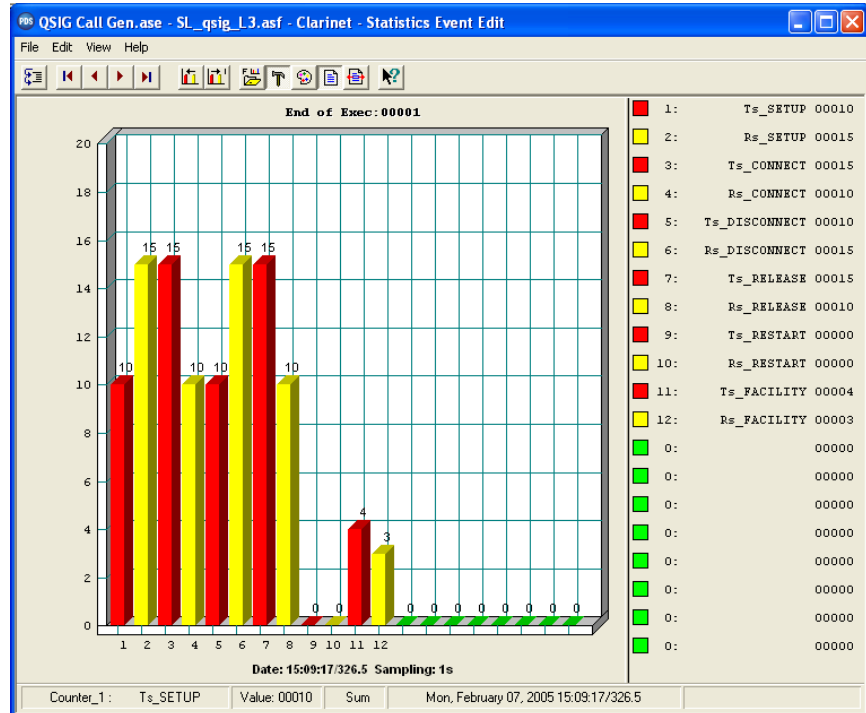


Fig 3 - Q-SIG bulk call generation statistics.

MTP/CCS7	LAN/ETHERNET		TCP/IP		FRAME RELAY	X25
MTP-L2	Analog Measur.	MGCP*	Analog Measur.	OSP*	ANSI T1.617	T62*
MTP-L3 (see note)	ARP/RARP	NOVELL IPX*	ARP/RARP	PAP	ANSI T1.618	T70-L3*
TCAP	BOOTP/DHCP*	NTP*	BOOTP/DHCP*	PPP (syn)	MultiProt. Over FR*	T70-L4*
TCAP/INAP	CHAP	OSP*	CHAP	RTCP	Q922-LAPF	T71-LAPX (8)
TCAP/IS-41*	DNS	PAP	DNS	RTP	Q933	X224 (CI 0)*
TCAP/MAP2*	H225.0 Call Sign	PPPOE	H225.0 Call Sign	SCTP*	Stratacom LMI	X225*
TCAP/MAP2+*	H225.0 RAS	RTCP	H225.0 RAS	SIP		X25-LAPB (0)
	H245	RTP	H245	SIP-T	ISO	X25-Packet
ISDN	H248 Binary*	SCTP*	H248 Binary*	SUA*	ISO 4335 (8)	X75
Analog Measur.	H248 Text*	SIP	H248 Text*	T123-TPKT	ISO 4335E (8)	
Q921-LAPD (128)	ICMP	SIP-T	ICMP	T125	T62	GSM/MOBILE
Q931 (ETSI)	IGMP	SNAP*	IGMP	TCP	T70-L4	GSM A*
QSIG	IP	SUA*	IP	Text	X224 (C10)	GSM A bis*
X.25-Packet	IPCP	T123-TPKT	IPCP	UDP	X225	MTP-L2
	IPv6*	T125	IPv6*	V5UA*	X25-Packet	MTP-L3
DASS2/DPNSS	ISO 8473-CLNP	TCP	IUA*	VJ Compressed*		TCAP
DASS2-L2*	IUA*	Text	LCP	VJ Uncompressed*	V5	
DASS2-L3*	LLC IEEE 802.2	UDP	M2PA*		LAPV5-DL	SMDS
DPNSS-L2*	M2PA*	V5UA*	M2UA*		LAPV5-EF	SMDS DXI*
DPNSS-L3*	M3UA*	VJ Compressed*	M3UA*		Q921-LAPD (128)	SMDS DXI LMI*
	M3UA*	VJ Uncompressed*	MGCP*	IBM	Q931 (ETSI)	
	MAC IEEE 802.3	VLAN*	NTP*	SDLC (8)	V5-L3	

Fig 4 - Standard protocol support. * denotes Analysis only.

Notes

MTP3 Includes: SNMM, SNTM, SCCP, TUP, ISUP UK, ISUP ANSI, ISUP ITU, ISUP Spirou, MTP, TCAP.

H248: commonly known as Megaco.

VoIP Applications

Our new Zumara software can simulate multiple SIP or H.323 endpoints via the PC host NIC or a combination of NIC and LAN adapters (10/100 & Gigabit). This transforms a standard PC host into a powerful VoIP simulation, analysis, traffic generation and quality measurement tool.

For interoperability testing, Zumara supports our popular Clarinet hardware interface pods for E1/T1 and S/T-U. These pod(s) connect to your PC host via USB and synchronise with LAN interfaces. Any combination of up to seven LAN, E1/T1 & S/T-U interfaces may be connected and controlled simultaneously.

For example, an ISDN call may be generated and answered as an H.323 call or a SIP call may be generated and answered as SS#7, with all events decoded and time stamped in one Window using one very accurate reference clock.

The LAN RTP payload and the WAN user channel may be turned in to WAV files for audible comparison using the PC host sound card.

Up to eight LAN protocol layers may be defined for simulation or sixteen for analysis. The user may first check the exchange of 802.3 frames or perform a ping during simulation to check the physical layer. While simulating, the user may build and save any H.323 or SIP message content required for test purposes, either valid or invalid.

MOS Score Using PESQ (Option)

PESQ (perceptual evaluation of speech quality) is ITU-T recommendation P.862, which replaces PSQM (P.861) for end-to-end voice quality measurement in real network conditions using VoIP, POTS, ISDN, Q-SIG, SS#7 or GSM. The measurement provides a PESQ score in the range of 1 to 5 where 1 is unacceptable and 5 is excellent. A typical range for VoIP is 3.5 to 4.2. An optional USB security key is available which allows PESQ measurement to be calculated after transmitting a reference WAV file in both directions. Measure PESQ from LAN to LAN or from LAN to WAN through a Gateway. Several PESQ measurements may be made during one long duration call, to test speech quality over time as network demands fluctuate. MOS score, noise score & speech score are also provided.

G.729 (Option)

With this option installed, Zumara software will automatically connect a G.729 codec if specified in an incoming 'INVITE' message for SIP or the H.245 content of an incoming 'SETUP' message for H.323. It is also possible for the user to select G.729 when running the optional PESQ (perceptual evaluation of speech quality) measurements. A license for 2 or 50 channels is available as an option.

H.323 Features

- Define the stack of emulators from the IP layer to the H.323 layer.
- Generate 50 independent communications to any IP address.
- Optional 2 channel or 50 channel g.729 support.
- User-User IE using PER ASN 1 may be coded easily via an editor which simultaneously displays the HEX value and the ASN 1 notation.
- Templates of ASN 1 encoded User-User messages are provided.
- Define responses to incoming communications including any ASN 1 content.
- Real time protocol analysis provides an invaluable decode of H.225/H.245 messages & sequencing. A trace of primitives used between the different layers clearly shows the 'commands' and 'indications' exchanged.
- Simulate ISDN or SS#7 calls (E1/T1 pod) on one Gateway port while responding to, and simulating H.323 calls on another Gateway port (LAN interface).
- Perform PESQ (optional) measurements or audibly compare WAV files generated from the RTP payload.
- H.225 TTCN Conformance Test suite available, see page 12.

SIP Features

- Generate 50 similar or independent outgoing calls at a user defined rate for a user defined duration.
- Each message transmitted during outgoing or incoming calls may be configured by the user and checked or launched without checking if invalid responses are required for test purposes.
- Optional 2 channel or 50 channel g.729 support.
- The IP profile allows the user to build a list of aliases used with each IP address and create incoming call filters to respond according to the received alias.
- When generating or responding to a call the user may select to include the RTP content or no content.
- Clarinet interface pods are available for E1/T1 and ISDN S/T-U allowing users to send and receive calls on both sides of a Gateway.
- If using multiple Clarinet pods with one PC host it is possible to measure LAN/WAN delays, run PESQ (optional) measurements or audibly compare ISDN, SS#7 or Q-SIG channel content with the LAN RTP payload.
- SIP TTCN conformance test suite available, see page 12.

**Request a trial of Zumara today at:
www.pds-test.co.uk/trial.html**

ISDN Applications

A basic rate S-T/U interface pod (model 2002) and a primary rate E1/T1 interface pod (model 2001) are available as options for ISDN. Template profiles are provided as standard allowing easy configuration to act as either a Network (NT), a Terminal (TE) or a passive monitor. Simulation profiles have been pre-configured to generate thirty two outgoing ISDN calls using the most common information element content. It is easy to copy and paste content between the calls, to select starting delay, duration, inter-call delay, number of calls, connected device, clearing cause value and all information element content.

The information element editor (see figure 6) provides drop-down boxes for simple selection of the required content. If invalid contents are required, HEX coding may be used. Event filters allow full configuration of the detail on the user display. B channel contents may be recorded and converted to WAV files for comparison or optional quality measurement.

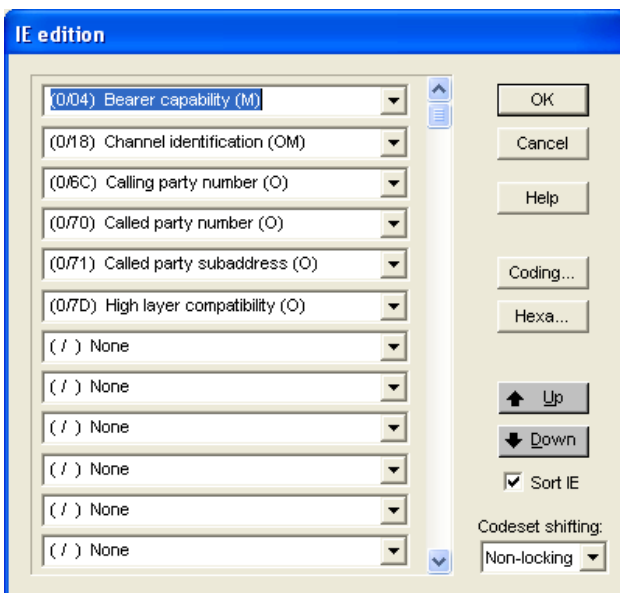


Fig 6 - Information Element Editor for ISDN

Q-SIG Applications

For Q-SIG applications using model 2001 E1/T1 Clarinet units, it is possible to edit each call generated with full access to the selection and content of each information element. A powerful ASN1 decoder allows comprehensive analysis of all messages with user selectable attributes and detail.

As well as basic call content, any Q-SIG GFP (generic functional protocol) supplementary service messages will also be decoded. DTMF tones, a handset, a bit error rate test or an external data port may be selected for connection

ISDN Features

- Up to 32 outgoing calls per pod each repeatable up to 1 million times with user selectable duration and inter-call delay.
- Automatic response to all incoming calls.
- Simulation of Network (NT) or Terminal (TE) plus passive monitor capability.
- Fully automatic or manual call generation with user selectable information element content and clearing cause value.
- Wide range of data sources available to connect including loop, handset, DTMF, digital port, BERT plus X.25, FR or H.323/SIP call generator.
- Support of European and US ISDN national variants.
- Access to Q.921/Q.931 timer values.
- Optional TTCN conformance test suites available for L2, L3 NT, L3 TE and supplementary service protocol verification. (See pages 12 & 13 for more information).

Q-SIG Features

- Up to 32 outgoing calls per pod each repeatable up to 1 million times with user selectable duration and inter-call delay.
- Automatic response to all incoming calls.
- Simulation of PNX User or Network with A or B side selection plus passive monitor capability.
- Fully automatic or manual call generation with user selectable information element content and clearing cause value.
- Wide range of data sources available to connect including loop, handset, DTMF, digital port, BERT plus X.25, FR or H.323/SIP call generator.
- Full decode of Q-SIG basic call and GFP message content including ASN1.
- Access to Q.921/Q-SIG timer values.
- Optional TTCN conformance test packages available for L2, L3 Q-SIG basic call and L3 GFP protocol verification. (See page 13 for more information).

to each incoming or outgoing call. The user may easily edit template profiles provided for PNX User or Network with A or B side to meet the application, then save this profile for quick selection in the field or laboratory.

V5 Applications

Up to four Clarinet model 2001 E1/T1 interface pods may be connected to a single PC host running Zumara or Run-Time software for simulation of the V5.1 or V5.2 protocol. If simulating V5.2, this allows simulation of protection control (PC), bearer channel control (BCC) and link control (LC) using a maximum of four links. Up to 32 ISDN calls per interface may be generated automatically or manually with any required information element content. It is also possible to generate up to 100 analogue (PSTN) calls.

The V5 protocol specification is open to interpretation regarding the start-up procedure, therefore our template profiles allow the user to configure start-up as required to communicate with the device under test. Access to all important timer values at layer 2 and layer 3, plus message content at layer 3 is provided for test and development purposes.

SS#7 Applications

Simulation and analysis are supported on two time slots per E1/T1 link. If only one signalling channel is required, this first channel may be selected in the range of 1 to 31 (default = 16). The other time slot may be used to carry speech, DTMF tones or a bit error rate test. Alternatively, two signalling channels may be specified and the second channel may also be selected in the range of 1 to 31 (default = 1). Each SS#7 template profile is pre-configured with a 'typical' content but allows the user to edit and independently configure the message content for up to 50 communications.

Calls may be launched manually or automatically and repeated up to one million times with a user selected duration and inter-call delay. Access to important timer values is provided together with the ability to specify any required call release message.

The user may passively monitor or act as one or two signalling points. Miscellaneous SS#7 messages may be launched manually during simulation.

V5 Features

- Full support of the V5.1 and V5.2 protocols (Edition 1 & 2)
- Protection control, bearer channel control and link control supported for V5.2.
- Up to four E1/T1 Clarinet units may be connected to simulate four V5.2 links.
- AN or LE simulation is possible plus passive monitor.
- V5 start-up editor simplifies interoperability with the unit under test.
- Layer 2 and Layer 3 parameter editor is provided for timers and values.
- Analogue and ISDN call parameter editors.
- Optional TTCN conformance test suites are available for V5.1 and V5.2.edition 1 and 2. (See page 14 for more information).

SS#7 Features

- Up to 50 calls may be launched and repeated up to one million times.
- May be configured for passive analysis or signalling link simulation (maximum 2 signalling channels per link).
- Full analysis of the SS#7 protocol stack with user defined detail and attributes.
- Real-time user menu provided for blocking and unblocking circuits, plus generation and release of calls.
- May be configured with one signalling channel and one timeslot for a range of speech or data sources.
- ITU and ISUP SS#7 is supported plus some National Variants.
- Optional TTCN conformance test suites are available for INAP, ISUP (V2 & V3), MTP2, SIPP and TCAP. (See page 13 for more information).

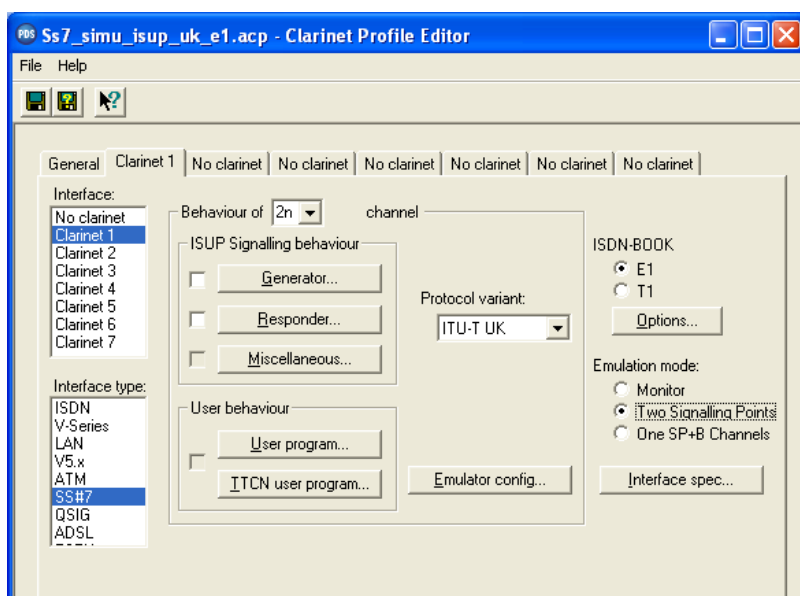


Fig 7 - The main profile editor panel for SS#7.

Clarinet Interface Pods

E1 / T1 Interface Pod - Model 2001

The Clarinet 2001 USB controlled E1/T1 pod supports simulation and analysis of many protocols carried over these interfaces including: V5.1, V5.2, Q-SIG, ISDN & SS#7.

The pod has a built-in Bit Error Rate tester, codec (μ Law or A Law selectable), digital port and handset port (handset supplied). Input impedance is selectable (75, 100, 120 ohms or high impedance) and high sensitivity allows monitoring of signals down to -36dB. Zero code suppression and coding may also be selected for the T1 port. Power for the pod is taken from the USB port therefore external power adapters are not required.



ISDN S-T/U Interface Pod - Model 2002

For applications involving the development and testing of ISDN basic rate terminal equipment or network ports, the 2002 USB S-T/U pod is the ideal choice.

The S-T Bus has two bridged RJ45 connectors providing one I.430 interface. The U interface has two RJ45 connectors (one dedicated 'to NT' and one dedicated 'to LT') providing one G.961 (2B1Q encoding) interface.

The pod has a built-in Bit Error Rate tester, codec (m Law or A Law selectable), digital port and handset port (handset supplied). Power for the pod is taken from the USB port therefore external power adapters are not required.



LAN 10/100 & Gigabit Ethernet - Zumara Software

New Zumara software provides direct support for the PC host NIC or external LAN adapter, for VoIP protocol analysis and simulation.

One or more PC NIC cards or external LAN adapters may be used to support multiple endpoints, monitor multiple links and to support OEM software such as an H.323 gatekeeper or SIP proxy.

A combination of Zumara controlled LAN interfaces plus USB or SCSI controlled Clarinet hardware interfaces may be used simultaneously with synchronisation maintained for accurate inter-node testing.

G.729 licensed channels are available as an option in quantities of 2 or 50.

Request a free trial of Zumara software at:
www.pds-test.co.uk/trial.html

TTCN Conformance Test Scripts

The standard simulation capabilities of both Zumara and Run-Time software make these tools a perfect platform for conformance test applications.

A TTCN compiler has been developed together with event editor screens, which clearly show test case numbers, test purpose, group numbers and TTCN test stages interleaved with protocol messages. This information combined with a header trace showing all PICS/PIXIT parameters used, a summary trace showing all test cases executed and the verdict, provide a very clear indication for test and development purposes. Our TTCN test scripts are widely used by many test laboratories but are also ideal for self declaration.

Since laboratory time can be expensive, these scripts provide a rapid return on investment and the complementary simulation capabilities will prove invaluable for debug purposes.

Conformance Test Profiles

The ETS software is provided with user friendly test profiles one of which is pre-configured with 'typical' values making it easy to see what is required.

Individual test cases can be selected or de-selected manually or automatically using the reference number, part of the purpose or the group. It is also possible to automatically de-select tests that are not applicable due to the PICS values entered (selective expression).

PICS/PIXIT Editor

The Protocol Implementation Conformance Statement (PICS) and Protocol Implementation eXtra Information for Testing (PIXIT) parameters can also be accessed through the profile embedded database manager.

The PICS are a statement of what is supported on the system under test such as: "does support broadcast data link" etc. The PIXIT are parameters needed to carry out the testing including the information element contents required.

It is very easy to modify and save these parameters using the powerful Windows based database manager. The PICS/PIXIT parameters used during execution are automatically inserted as a header in the event trace.

Key ETS Benefits

- Test suites available for SIP, H.225, ISDN, V5.1, V5.2, Q-SIG, SS#7 and Frame Relay.
- Reduce time to market - Executable Test Suites available off the shelf.
- Easy to Use - no need for complex programming.
- Confidence - ensure compliance to industry standards using an established, widely adopted test system.
- Cost effective - provides unrivalled value for money.
- Automatic selection of tests according to entered PICS and PIXIT parameters. TTCN test stages are interleaved with protocol messages in order to verify and debug behaviour.
- Portable - compact and lightweight for international travel.

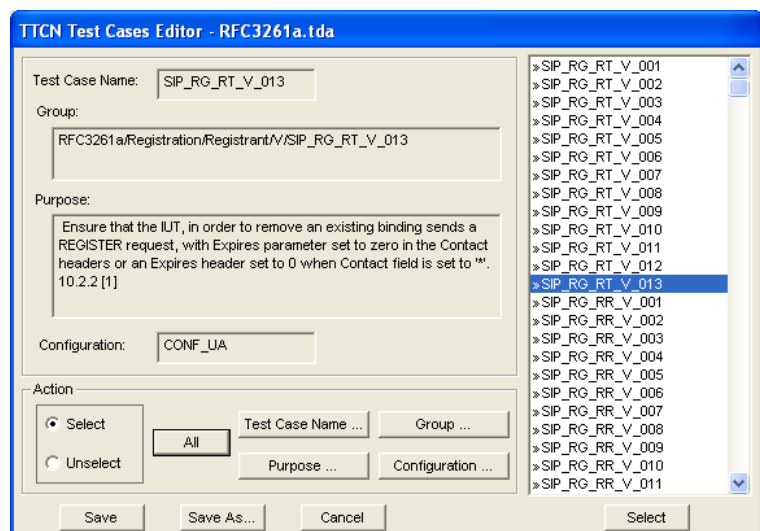


Fig 8 - The Test Case Editor window.

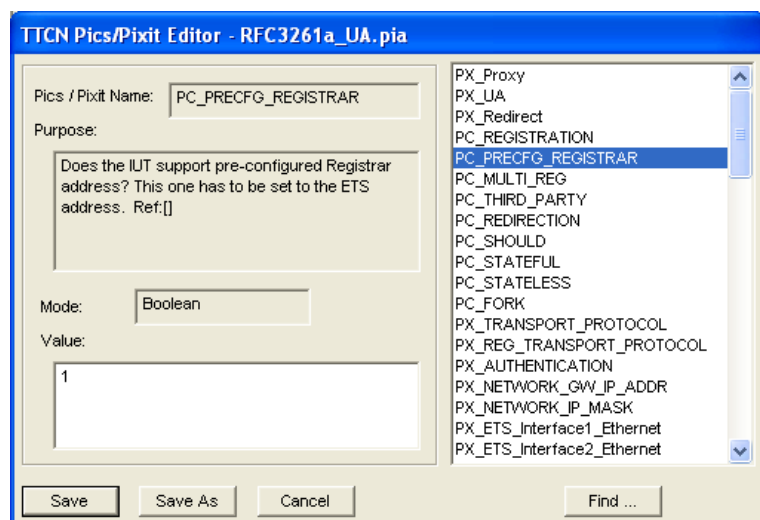


Fig 9 - The PICS/PIXIT Editor window.

Test Results

The sample trace (below) shows the TTCN test stages, verdict and comments for the test case executed. This information together with a list of the PICS/PIXIT parameters and a summary are interleaved with the protocol messages in the event trace. It is very easy to see at what point a verdict was reached and the guidelines used to arrive at the verdict, which is ideal for de-bug purposes.

TTCN Test Report

A tool is also included which uses the event file resulting from running a test, and automatically generates a test report in MS Word format.

Test Case Dynamic Behaviour

Result : PASSED
 Test Case Name : SIP_CC_OE_CE_V_002
 Group : RFC3261a/CallControl/OriginatingEndpoint/CallEstablishment/
 Purpose : Ensure that the IUT, to establish a call sends an INVITE request with a Request-URI set to the same URI value of the To header.
 ref 8.1.1 [1]
 Configuration : CONF_UA
 Defaults : DEF_UA_CC

Behaviour Description	L	Constraint Ref	V	Comments
+INIT_DIALOG_IN +CALLER_REGISTRATION +ASK_FOR_INVITE +RECEIVES_UA_INVITE +CHECK_URI_S(TCV_to.addr_spec,TCV_RequestUri) → +SENDS_UA_486_BUSY_HERE +END_CONF_UA				(1) (2)

Detailed Comments :
 (1) Check that URI are equivalent
 (2) ETS answers with a 486 Busy Here

```

15:08:27/811.3 1- S2 MAC UNIT-DATA-INDICATION
15:08:27/811.3 1- S3 IP UNIT-DATA-INDICATION
15:08:27/811.3 1- S4 UDP UNIT-DATA-INDICATION
15:08:27/811.3 1- D4 D4 DATA UNIT [00316]
    Protocol: UDP from IP
    S:172.16.1.10 D:172.16.1.41
D4 UDP (S:05062 D:05060) Len:00282 Chk:cd6d [0274]
D5 SIP [0274]
  ACK sip:mtc10172.16.1.41:5060 SIP/2.0
  Via: SIP/2.0/UDP 172.16.1.10:5060;branch=z9hG4bK397553
  From: <sip:clarinet@172.16.1.10:5060>;tag=1410903760
  To: <sip:mtc10172.16.1.41:5060>;tag=1215778257
  Call-ID: 3332780730172.16.1.10
  CSeq: 10 ACK
  Content-Length: 0
  
```

Ready...

Fig 10 - SIP conformance test RFC3261a.

VoIP Conformance Test Suites

Ref	Standard	1 Int**	TC	Package Name	Description
8501	VoIP H.225 based on TS101 804-2 and TS101 804-3 re-written by Acacia	374	374	Clarinet ETS H225a	H225a
8504	VoIP SIP	530	530	Clarinet ETS VOIP-RFC3261a	SIPa

ISDN User Side ETSI Conformance Test Suites

Ref	Standard	1 Int*	TC	Package Name	Description
8540	ETSI	25	25	Clarinet ETS 300 188-4	ISDN 3PTY User side
8542	ETSI	100	100	Clarinet ETS 300 359-4	ISDN CCBS User Side
8774	ETSI	154	154	Clarinet ETS 300 182-4	ISDN AOC User side
8770	ETSI	689	689	Clarinet ETS 300 403-5	ISDN Basic Call User side
8775	ETSI	266	266	Clarinet ETS 300 207-4	ISDN CDIV User side
8536	ETSI	2	2	Clarinet ETS 300 092-4b	ISDN CLIP User side
8536	ETSI	2	2	Clarinet ETS 300 092-4p	ISDN CLIP User side
8537	ETSI	2	2	Clarinet ETS 300 093-4b	ISDN CLIR User side
8537	ETSI	2	2	Clarinet ETS 300 093-4p	ISDN CLIR User side
8538	ETSI	2	2	Clarinet ETS 300 097-4bm	ISDN COLP User side
8538	ETSI	2	2	Clarinet ETS 300 097-4pm	ISDN COLP User side
8539	ETSI	2	2	Clarinet ETS 300 098-4b	ISDN COLR User side
8539	ETSI	2	2	Clarinet ETS 300 098-4p	ISDN COLR User side
8776	ETSI	74	74	Clarinet ETS 300 185-4	ISDN CONF User side
8541	ETSI	11	11	Clarinet ETS 300 138-4b	ISDN CUG User side
8541	ETSI	11	11	Clarinet ETS 300 138-4p	ISDN CUG User side
8532	ETSI	14	14	Clarinet ETS 300 058-4b	ISDN CW User side
8532	ETSI	14	14	Clarinet ETS 300 058-4p	ISDN CW User side
8691	ETSI	565	565	Clarinet ETS 300 402-7	ISDN Data Link Layer
8533	ETSI	17	17	Clarinet ETS 300 064-4b	ISDN DDI User side
8533	ETSI	17	17	Clarinet ETS 300 064-4p	ISDN DDI User side
8777	ETSI	107	107	Clarinet ETS 300 369-4	ISDN ECT User side
8545	ETSI	66	66	Clarinet ETS 300 141-4	ISDN Hold User side
8534	ETSI	12	12	Clarinet ETS 300 130-4	ISDN MCID User side
8531	ETSI	16	16	Clarinet ETS 300 052-4b	ISDN MSN User side
8531	ETSI	16	16	Clarinet ETS 300 052-4p	ISDN MSN User side
8778	ETSI	70	70	Clarinet ETS 300 745-4	ISDN MWI User side
8535	ETSI	8	8	Clarinet ETS 300 061-4b	ISDN SUB User
8535	ETSI	8	8	Clarinet ETS 300 061-4p	ISDN SUB User
8543	ETSI	156	156	Clarinet ETS 300 286-4	ISDN UUS User Side

ISDN User Side ETSI TBR Conformance Test Suites

Ref	Standard	1 Int*	TC	Package Name	Description
8782	ETSI	34	34	Clarinet ETS TBR3 L2	ISDN TBR003 - Layer 2
8781	ETSI**	71	71	Clarinet ETS TBR3 L3	ISDN TBR003 - Layer 3
8784	ETSI	38	38	Clarinet ETS TBR4 L2	ISDN TBR004 - Layer 2
8783	ETSI**	61	61	Clarinet ETS TBR4 L3	ISDN TBR004 - Layer 3
8779	ETSI	9	9	Clarinet ETS TBR8	ISDN TBR008
8788	ETSI	36	36	Clarinet ETS TBR33 L2	ISDN TBR033 - Layer 2
8787	ETSI**	56	56	Clarinet ETS TBR33 L3	ISDN TBR033 - Layer 3
8790	ETSI	32	32	Clarinet ETS TBR34 L2	ISDN TBR034 - Layer 2
8789	ETSI**	55	55	Clarinet ETS TBR34 L3	ISDN TBR034 - Layer 3

Key

TC = Number of test cases within the suite.

* Denotes the number of Clarinet interface pods required for the specified number of test cases.

** Denotes the number of LAN interfaces required for the specified number of test cases.

** TTCN-GR published by ITU. TTCN-MP generated by Acacia.

ISDN User-Side National ISDN User Forum Conformance Test Suites

Ref	Standard	1 Int*	TC	Package Name	Description
8786	NIUF	228	228	Clarinet ETS NIUF 413-92	ISDN Layer 3 BRI User side
8785	NIUF	239	239	Clarinet ETS NIUF 421-93	ISDN Layer 3 PRI User side

ISDN Network Side NI2-PRI Conformance Test Suites

Ref	Standard	1 Int*	2 Int*	TC	Package Name	Description
8544	NI-A	33	288	321	Clarinet ETS NI 1268	ISDN Layer 3 PRI Network side

ISDN Network Side ETSI Conformance Test Suites

Ref	Standard	1 Int*	2 Int*	3 Int*	4 Int*	TC	Package Name	Description
8757	ETSI			44	1	45	Clarinet ETS 300 188-6	ISDN 3PTY Network side
8693	ETSI		87			87	Clarinet ETS 300 182-6	ISDN AOC Network side
8692	ETSI	77	564	11		652	Clarinet ETS 300 403-7	ISDN Basic Call Network side
8764	ETSI		120			120	Clarinet ETS 300 359-6	ISDN CCBS Network side
8763	ETSI		71			71	Clarinet ETS 300 065-6	ISDN CCNR Network side
8759	ETSI	172		158	6	336	Clarinet ETS 300 207-6	ISDN CDIV Network side
8751	ETSI		26			26	Clarinet ETS 300 092-6	ISDN CLIP Network side
8752	ETSI		5			5	Clarinet ETS 300 093-6	ISDN CLIR Network side
8754	ETSI		24			24	Clarinet ETS 300 097-6	ISDN COLP Network side
8755	ETSI		5			5	Clarinet ETS 300 098-6	ISDN COLR Network side
8760	ETSI	6	14	44		64	Clarinet ETS 300 185-6	ISDN CONF Network side
8756	ETSI		95			95	Clarinet ETS 300 138-6	ISDN CUG Network side
8696	ETSI		1	17		18	Clarinet ETS 300 058-6	ISDN CW Network side
8698	ETSI		4			4	Clarinet ETS 300 064-6	ISDN DDI Network side
8761	ETSI			158	37	195	Clarinet ETS 300 369-6	ISDN ECT Network side
8694	ETSI		43			43	Clarinet ETS 300 141-6	ISDN Hold Network side
8753	ETSI		20			20	Clarinet ETS 300 130-6	ISDN MCID Network side
8695	ETSI		3			3	Clarinet ETS 300 052-6	ISDN MSN Network side
8762	ETSI	44	28			72	Clarinet ETS 300 745-6	ISDN MWI Network side
8697	ETSI		4			4	Clarinet ETS 300 061-6	ISDN SUB Network side
8691	ETSI	564				564	Clarinet ETS 300 402-7	ISDN Data Link Layer
8758	ETSI		252			252	Clarinet ETS 300 286-6	ISDN UUS Network side
8745	ETSI	561				561	Clarinet ETS 1_060_6	VPN Basic Call Network side

SS#7 ETSI and ITU Conformance Test Suites

Ref	Standard	1 Int*	2 Int*	3 Int*	TC	Package Name	Description
8733	ETSI	See note below			333	Clarinet ETS 300 356-33	SS7 ISUP-V3-Basic Call
8734	ETSI	See note below			491	Clarinet ETS 300 356-36	SS7 ISUP-V3-Supp. Services
8741	ETSI	357			357	Clarinet ETS 300 374-4	SS7 INAP-CS1
8742	ETSI		267		267	Clarinet ETS 300 356-33	SS7 ISUP-V2-Basic Call
8743	ETSI	243	227		470	Clarinet ETS 300 356-36	SS7 ISUP-V2-Supp. Services
8746	ETSI	153	81		234	Clarinet ETS 300 009-3	SS7 SCPP
8747	ITU**	146			146	Clarinet ETS Q781a	SS7 MTP2
8748	ETSI	179			179	Clarinet ETS 300 287	SS7 TCAP
8750	ANSI	146			146	Clarinet ETS Q781A ANSI	SS7 MTP2 ANSI

8733 - ETS 300 356-33: The number of interfaces required depends on the stimulus method used to run the ETS. ISUP stimulus = 2 Clarinet interfaces. DSS1 stimulus = 1 Clarinet interface.

8734 - ETS 300 356-36: 1 or 2 interfaces are required depending on role/configuration associated with the test-case; 1 interface if TransitCfg or lworkCfg, 2 interfaces if LocalCfg or MixedCfg, 3 interfaces if MultMixedCfg.

Q-SIG ETSI Conformance Test Suites

Ref	Standard	1 Int*	2 Int*	TC	Package Name	Description
8521	ETSI	307	102	409	Clarinet ETS 300 805-2	QSIG Basic Call
8522	ETSI	88	160	248	Clarinet ETS 300 806-2	QSIG GFP

Key

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** TTCN-GR published by ITU. TTCN-MP generated by Acacia.

Frame Relay Conformance Test Suites

Ref	Standard	1 Int*	TC	Package Name	Description
8731	NIUF	90	90	Clarinet ETS 424-93	Frame-Relay PVC
8732	FR Forum	130	130	Clarinet ETS FR_SVC	Frame-Relay SVC

V5.1 and V5.2 ETSI Conformance Test Suites

Ref	Standard	1 Int*	2 Int*	TC	Package Name	Description
8791	ETSI	146		146	Clarinet ETS 300 324-8	V5.1 Data Link Layer
8793	ETSI	176		176	Clarinet ETS 300 324-4	V5.1 Network AN-side
8792	ETSI	202		202	Clarinet ETS 300 324-6	V5.1 Network LE-side
8593	ETSI	181		181	Clarinet ETS 300 324e2-4	V5.1Ed2 Network AN-side
8592	ETSI	205		205	Clarinet ETS 300 324e2-6	V5.1Ed2 Network LE-side
8794	ETSI	146		146	Clarinet ETS 300 347-8	V5.2 Data Link Layer
8796	ETSI	272	37	309	Clarinet ETS 300 347-4	V5.2 Network AN-side
8795	ETSI	333	29	362	Clarinet ETS 300 347-6	V5.2 Network LE-side
8798	ETSI	285	38	323	Clarinet ETS 300 347e2-4	V5.2Ed2 Network AN-Side
8797	ETSI	309	62	371	Clarinet ETS 300 347e2-6	V5.2Ed2 Network LE-side

Key

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* Denotes the number of Clarinet interface pods required for the specified number of test cases.

The Clarinet Advantage

The Clarinet hardware interface pods together with our traditional Run-Time software is a very well respected and established test solution for a wide range of protocol analysis, simulation and development applications. It's modular format allows it to evolve with new interfaces and new protocols as they are released. Our new Zumara software makes the system even more powerful & affordable for a wide range of VoIP applications, with it's direct support of PC NIC and external LAN adapters.

Over 2500 Clarinet systems are in use around the world with Switch Manufacturers, PTO's, Field Support Groups, Developers and Conformance Test Laboratories.

The familiar Windows 2000, XP and Vista based operating system plus 'hot connection' of external E1/T1 or S/T-U interface pods via USB make the system a pleasure to use.

Contact us today to discuss your application in detail or request a free, no obligation trial of Zumara software at: www.pds-test.co.uk/trial.html

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