

Clarinet®

WAN LAN & ATM

Protocol Analyser, Simulator

and ETS Conformance Tester

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ACACIA

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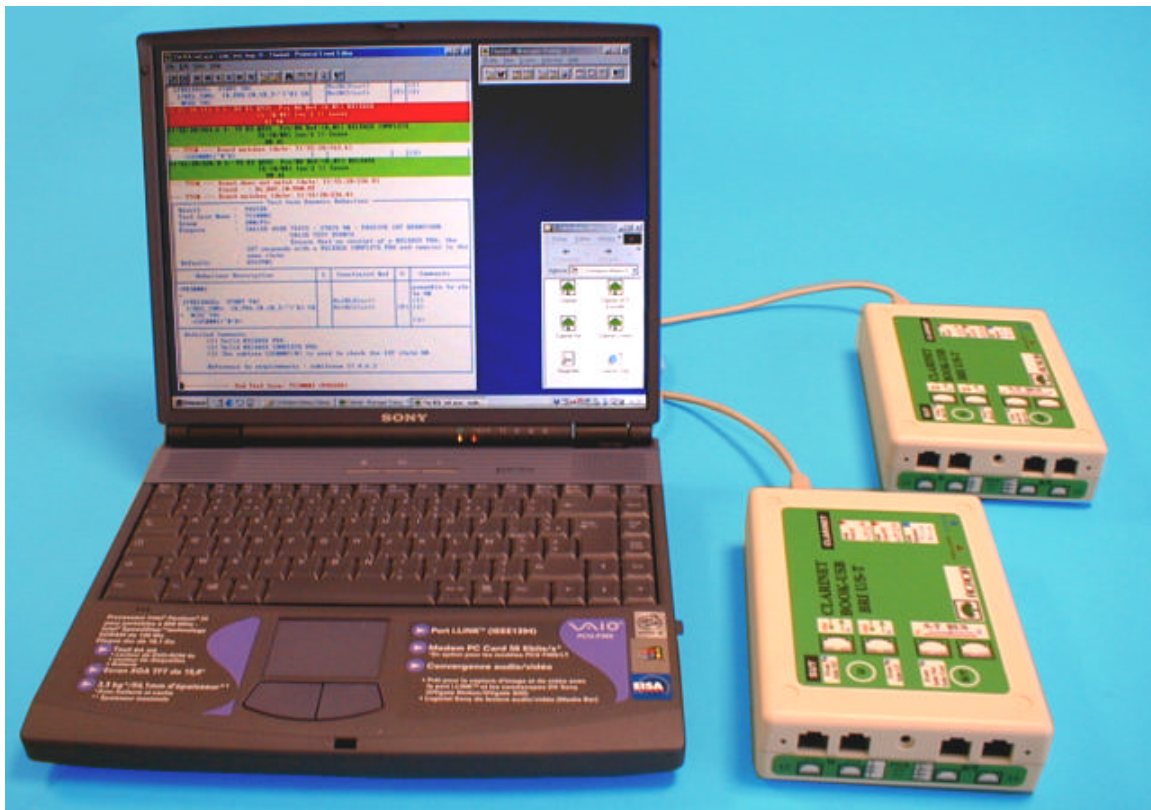
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Introduction

The Acacia Clarinet system comprises a notebook PC host and pods supporting the interfaces required for your application. Up to seven pods can be connected and controlled simultaneously (see pages 5 - 7 for details of pods available). Each pod has its own processors for simulation of the protocol it supports so there is no loss of performance when further pods are added.

The Clarinet Run-Time software licence operates under Windows 98 or 2000 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 (with ISDN for example any Information Element Content may be included inside or outside the SETUP message), the duration, the connected source and how many times the call is repeated.

This versatility allows total testing of protocol support and calls may be generated manually from a real time screen or automatically by the application. The user may also define the response to incoming communications on any port.



The Acacia Clarinet-system is a compact modular protocol analysis, simulation, development and conformance test system for ISDN, V5, QSIG, IP, SS7 and ATM.

Why is Acacia migrating Clarinet products to USB?

Acacia chose to adopt USB since USB offers many advantages that benefit customers:

- USB host is available on any new Notebook or Desktop computer
- USB uses reliable and low-cost connectors
- USB offers hot-plug-capable, auto-configuring ease of use.

All without having to restart the host computer, or even go into sleep mode.

USB also provides a fast connection and a large number of ports (by daisy-chaining up to 127 devices).

The Clarinet-Book USB are very lightweight and do not need a power adapter because they can take their power directly from the USB port.

Some notebook PC's have two separate USB ports which allow two pods to be connected without the need of a Hub. If a Hub is used, the Clarinet software can currently control up to seven USB pods. All protocol messages are time stamped with an accuracy of 0.1 μ s for ATM pods, 0.1 ms for others. If several pods are used, time-stamping clocks are synchronised by hardware (1 μ s for ATM pods, 1 ms for others) between pods of the same type (USB or SCSI). In the case combination of SCSI and USB, synchronisation between the different types of pod is done by software (about 10 ms).

Another advantage is that the pod can be connected or disconnected while the PC is powered up, in a true 'plug-and-play' fashion. The software, control and operation is exactly the same as the SCSI pods for ISDN, QSIG, V5, SS7, Frame Relay, IP and LAN detailed in the following pages. The ATM pods are still connected to the PC through the SCSI2 interface.

Clarinet-Book USB E1/T1

Customers who are working with protocols carried exclusively over E1 or T1 interfaces may now choose our new USB controlled pod (model 2001). The 2001 pod has a switchable E1 or T1 interface with both μ law and A law codec selection.

The pod has a built in bit error rate tester, codec, digital port and handset port (handset supplied). Extra features have been added to the E1 and T1 ports such as selectable impedance (75, 100, 120 or HIZ modes) with sensitivity down to -36dB plus support of extra zero code suppression plus coding on the T1 port



The software, control and operation is exactly the same as the SCSI pods for ISDN, QSIG, V5 and SS7 detailed in the following pages.

Clarinet-Book USB BRI U / S-T

Customers who are working with ISDN protocols carried exclusively over Basic Rate U or S-T Bus interfaces may now choose our new USB controlled pod (model 2002). The 2002 pod has a switchable U or S-T interface with both μ law and A law codec selection.

The S-T Bus has two RJ45 identical connectors providing one I430 interface. The U interface has two RJ45 connectors (one dedicated 'TO NT' and one dedicated 'To LE' providing one G961 (2B1Q encoding) interface.



The software, control and operation is exactly the same as the SCSI pods for ISDN detailed in the following pages. The pod has a built in bit error rate tester, codec, digital port and handset port (handset supplied)

Clarinet-Book USB Ethernet 10 / 100

Customers mainly working with IP protocols (TCP and VOIP) carried exclusively over Ethernet interfaces may choose our new USB controlled pod (model 2003).

The 2003 pod has a switchable interface. Each of the AUI, 10 BaseT / 100BaseT interfaces has one connector providing the way to monitor and simulate one interface. The 10Base2 interface is accessible by adding the AUI/10B2 transceiver.

The software, control and operation is exactly the same as the other pods over E1, T1, Vseries and ATM interfaces detailed in the following pages.



Clarinet-Book USB Vseries

Customers mainly working with Asynchronous (PPP...) or HDLC protocols (Frame Relay, X25) carried exclusively over Vseries V24, V35, V36, V11 interfaces may choose our new USB controlled pod (model 2004). The 2004 pod has a switchable interface with clock selection.

Each of the V24, V35, V36, X24 interfaces has two identical connectors providing the way to monitor in 'serial mode' one interface without any specific cable. Simulation use one of the both connectors. The maximum speed rate is 2 Mbits over V35, V36, X24 interfaces.

The software, control and operation is exactly the same as the other pods over E1, T1, LAN and ATM interfaces detailed in the following pages.



Clarinet-Book SCSI ATM

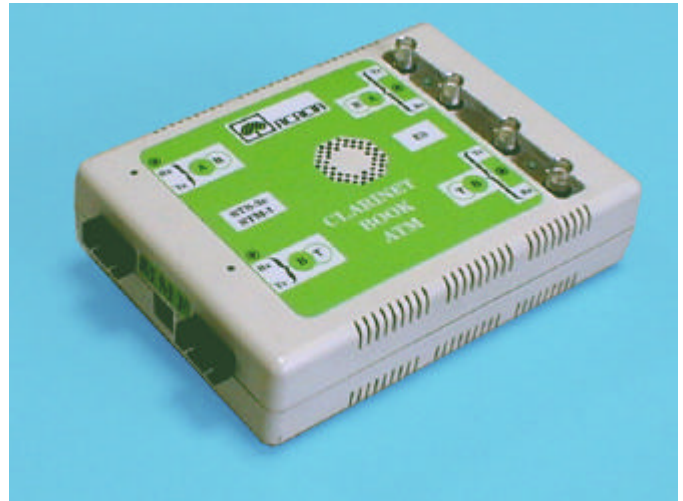
Customers who are working with UNI, PNNI, IP, Frame Relay protocols carried exclusively over ATM interfaces may choose our SCSI controlled pod (model 4010/4011)

Each of the ATM Pod has two STS-3c/STM1 fibre interfaces (Single mode or multi-mode depending on 4010/4011 model) and two E3 BNC interfaces.

Dual ports pods allow to monitor the both directions with a common time-stamping of events. When running simulation, they provides the way to monitor simultaneously the both direction.

Up to 4 ATM interface Pods can be controlled simultaneously by one Clarinet host

The software, control and operation is exactly the same as the SCSI pods for ISDN, QSIG, V5 and SS7 detailed in the following pages.



Clarinet Event Trace and Protocol Features

The powerful Clarinet 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, protocol stack (7 layers), attributes, 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, the Clarinet records and displays all events but the user can select to start and stop recording on receipt of particular events with pre and post trigger information if required. Figure 1.0 shows a typical ISDN event trace.

Pre-written statistics filters are provided with the Clarinet system to count Layer 1, Layer 2 or Layer 3 events and produce colour bar graphs and tables showing 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 Excel for inclusion in a written report. An example of a statistics event file is shown in Figure 1.1.

The Clarinet standard Run-Time software allows simulation of most European ISDN variants, US ISDN variants, V5.1, V5.2, ATM, Frame Relay, X25 and X75. The user simply selects the appropriate Clarinet interface pod/s for the application and is ready to go! A vast range of protocols for analysis are also included with the system which can be used to create any required decode. The standard list of protocols supported for analysis is shown in Figure 1.2.

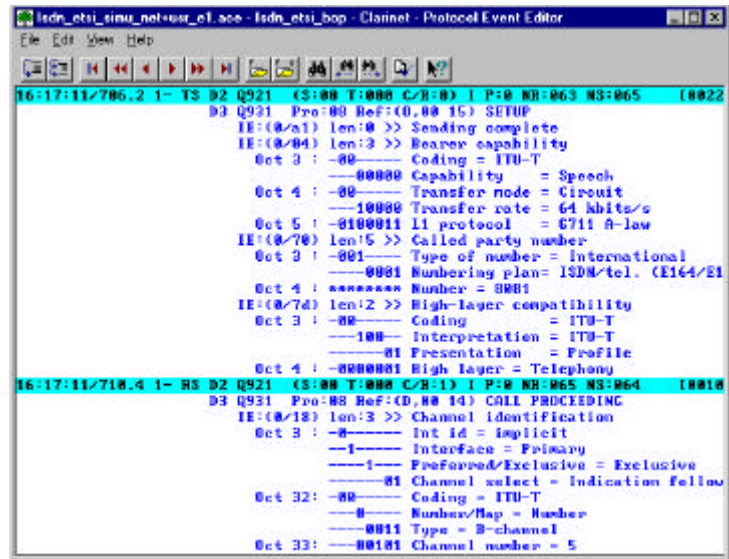


Figure 1.0

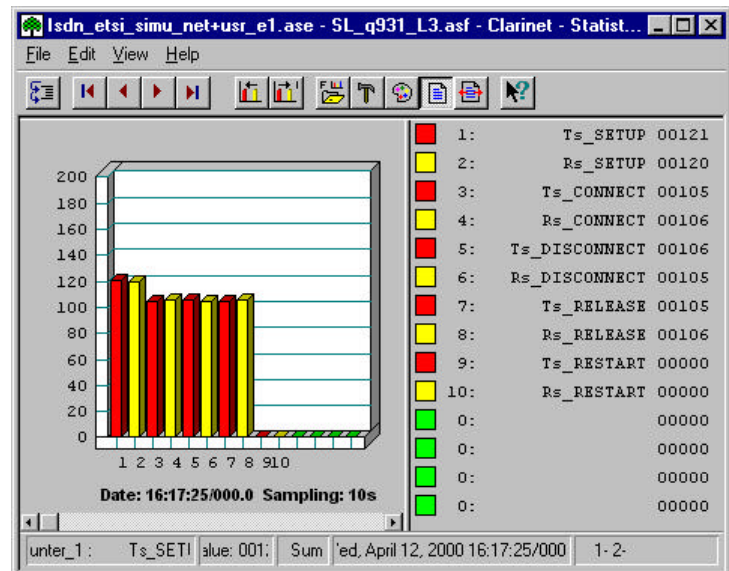


Figure 1.1

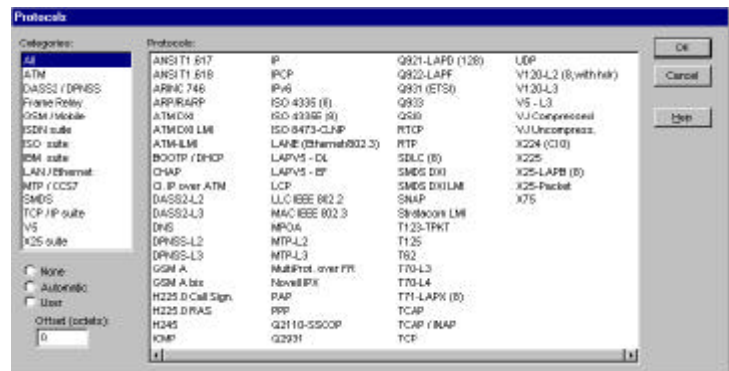


Figure 1.2

ISDN Features

- BRI & PRI User or Network Simulation and passive monitor functions
- Full analysis of Layer 1, 2 and 3 including X.25 or Frame Relay in the signalling channel and a wide range of bearer channel protocols (see list of standard protocol support on page 12)
- User selectable display detail, format and attributes
- User selectable statistics filters and displays
- Event time stamping to within 100uS.
- Fully Automatic or Manual call generation
- Up to 32 simultaneous or staggered Q931 outgoing calls per pod repeated up to 1 million times with zero seconds delay and duration
- Handling of up to 30 simultaneous Q931 incoming calls per pod
- Full Information Element Editor
- Miscellaneous message editor (suspend, resume, facility, hold, retrieve, etc)
- Q921 and Q931 parameters editor: timers, values and national variants
- Wide range of sources available for connection including loop, handset, DTMF, G821 BERT, digital port, Byte-TS file, User data, X.25 or Frame Relay data. (TCP/IP data available soon)
- Support of European and USA protocol variants
- TTCN Network, User and Supplementary Service test scripts available (see list on page 13)
- On line context sensitive HELP
- Templates of profiles and filters selected by Wizard

ISDN Interfaces Available

Model	Description
2001	USB controlled Pod with one switchable E1/T1 port (see page 4)
2002	USB controlled Pod with one BRI S/T port and one BRI 2B1Q U (see page 5)
4002	SCSI controlled Pod with one BRI S/T port and one 120W PRI E1 port
4003	SCSI controlled Pod with one BRI S/T port and one PRI T1 port
4007	SCSI controlled Pod with one BRI 2B1Q U port and one 120W PRI E1 port
4008	SCSI controlled Pod with one BRI 2B1Q U port and one PRI T1 port

QSIG Features

- PNX User or Network Simulation and passive monitor functions
- Full analysis of Layer 1, 2 and 3 including any ASN1 decoding
- User selectable display detail, format and attributes
- User selectable statistics filters and displays
- Event time stamping to within 100uS
- Fully Automatic or Manual call generation
- Up to 32 simultaneous or staggered QSIG outgoing calls per pod repeated up to 1 million times with zero seconds delay and duration
- Handling of up to 30 simultaneous incoming calls per pod
- Basic call specification: Q931 messages with full Information Element Editor
- Miscellaneous message editor (restart, status enquiry, facility...etc)
- Q921 and QSIG parameters editor: timers and values
- Wide range of sources available for connection including loop, handset, DTMF, G821 BERT, digital port, Byte file, User data, X.25 or Frame Relay data. (TCP/IP data available soon)
- QSIG Basic Call and GFP TTCN Test Scripts available (see list on page 13)
- On line context sensitive HELP
- Templates of profiles and filters selected by Wizard

QSIG Interfaces Available

Model	Description
2001	USB controlled Pod with switchable E1/T1 port (see page 4)
4002	SCSI controlled Pod with one BRI S/T port and one 120W PRI E1 port
4003	SCSI controlled Pod with one BRI S/T port and one PRI T1 port
4007	SCSI controlled Pod with one BRI 2B1Q U port and one 120W PRI E1 port
4008	SCSI controlled Pod with one BRI 2B1Q U port and one PRI T1 port

SS7 Features

- Signalling Point Simulation and passive monitor functions
- Full analysis of SS7 stack: MTP2, MTP3, ISUP, TUP, TCAP, SCCP, INAP including any ASN1 decoding
- User selectable display detail, format and attributes
- User selectable statistics filters and displays
- Event time stamping to within 100uS.
- Fully Automatic or Manual call generation
- Up to 50 simultaneous or staggered ISUP outgoing calls per pod repeated up to 1 million times with zero seconds delay and duration
- Handling of up to 50 simultaneous incoming calls per pod
- Basic ISUP Call Specification Messages configuration with
- Full Mandatory/Variable Part Editor
- Miscellaneous message editor (suspend, resume)
- MTP2, MTP3 and ISUP parameters editor: timers, values
- Wide range of sources available for connection including loop, handset, DTMF, G821 BERT, digital port, Byte file, User data, X.25 or Frame Relay data. (TCP/IP data available soon)
- Support of ITU & ANSI ISUP and national variants (UK, SPIROU)
- TTCN Signalling Point Test Scripts available (see list on page 13)
- On line context sensitive HELP
- Templates of profiles and filters selected by Wizard

SS7 Interfaces Available

Model	Description
2001	USB controlled Pod with switchable E1/T1 port (see page 4)
4002	SCSI controlled Pod with one BRI S/T port and one 120W PRI E1 port
4003	SCSI controlled Pod with one BRI S/T port and one PRI T1 port
4007	SCSI controlled Pod with one BRI 2B1Q U port and one 120W PRI E1 port
4008	SCSI controlled Pod with one BRI 2B1Q U port and one PRI T1 port

V5 Features

- AN simulation, LE simulation and passive monitor configuration
- Full support of the V5.1 and V5.2 protocols (Edition 1 and Edition 2)
- Protocol Control, BCC and Link Control additional protocols supported for V5.2
- Up to four V5.2 links supported (four E1 ports)
- User selectable display detail, format and attributes
- User selectable statistics filters and displays
- Event time stamping to within 100uS
- Fully automatic or manual V5.1/V5.2 simulator supporting 100 PSTN ports and 1 ISDN BRI/PRI port.
- V5 start up editor simplifies Interoperability
- Up to 100 analogue calls may be generated automatically or manually
- User selectable response to incoming Communications
- Up to 32 ISDN calls per pod may be generated automatically or manually
- Full ISDN Information Element editor
- V5 and ISDN miscellaneous message real-time simulator/editor
- Layer 2 and Layer 3 parameters editor: timers, values and options
- Analogue and ISDN call parameter editor
- Manual real time screen for call simulation and clearing
- V5.1 and V5.2 TTCN conformance test scripts available (see list on page 13)
- On line context sensitive help menus
- Templates of profiles and filters selected by Wizard

V5 Interfaces Available

Model	Description
2001	USB controlled Pod with switchable E1/T1 port (see page 4)
4002	SCSI controlled Pod with one BRI S/T port and one 120W PRI E1 port
4007	SCSI controlled Pod with one BRI 2B1Q U port and one 120W PRI E1 port

LAN Features

- LAN station Simulation and passive monitor functions
- Full analysis of IP, TCP and H323 decoding including any ASN1 decoding
- User selectable display detail, format and attributes
- User selectable statistics filters and displays
- Event time stamping to within 100uS.
- IP and TCP simulation over LAN interface
- On line context sensitive HELP
- Templates of profiles and filters selected by Wizard

LAN Interfaces Available

Model	Description
2003	USB controlled Pod with one switchable Ethernet 10/100 port
4006	SCSI controlled Pod with switchable Ethernet AUI / 10B2 / 10BT2 port

ATM Features

- User selectable display detail, format and attributes
- Event time stamping to within 100nS and User selectable statistics filters and displays
- Cell acquisition mode generating one event with time stamp per cell
- PDU acquisition mode with automatic reassembly function
- Cell filtering is available for ATM cells or idle cells
- SVC and PVC automatic simulation
- User selection of NNI or UNI interface type for cell layer simulation
- User selection of AAL 1, AAL 3/4 or AAL 5 automatic segmentation/reassembly function for ATM layer simulation
- 7 layer protocol stack available for analysis
- requirements including Frame Relay over ATM and SSCOP
- Independent Frame Relay call simulators may be run in two independent virtual channel connections
- TTCN conformance test scripts are available for ATM-forum or ETSI
- On line context sensitive HELP
- Templates of profiles and filters selected by Wizard

ATM Interfaces Available

Model	Description
4010	SCSI Controlled Pod with two STS-3c/STM1 multi-mode fibre ports and two E3 BNC ports
4011	SCSI Controlled Pod with two STS-3c/STM1 single-mode fibre ports and two E3 BNC ports

Vseries Features

- One pod includes V.11, V.24, V.35 and V.36 interfaces
- Physical interface clock selection with V.24 - 114/115, V.24 - 113/115, X.24-S and X.24 - X/S
- Td and Rd clock specification from 50 bps to 2Mbps
- User selectable display detail, format, attributes and statistics filters
- A seven layer protocol stack may be defined in the event filter
- Event time stamping to within 100uS
- User selectable transmitted pattern
- Fully Automatic or Manual communications simulator (Hayes or V25 signalling)
- V Series circuit / state definition panel (command/data state)
- Independent Frame Relay or X25 call simulators may be run in the data state connection
- On line context sensitive HELP
- Templates of profiles and filters selected by Context sensitive help menus on-line

Vseries Interfaces Available

Model	Description
2004	Clarinet USB controlled Pod with switchable V.24, V.11, V.36 and V.35 - 2Mbps
4000	Clarinet SCSI controlled pod with V.24, V.11, V.36 and V.35 (International) 2Mbps
4001	Clarinet SCSI controlled pod with V.24, V.11, V.36 and V.35 (France) 2Mbps

Frame Relay Specific Features

- Monitoring of Q922/Q933 protocol
- Frame Relay simulator supports SVC and PVC
- Switched virtual call setup information element editor
- Call responder edit panel
- Layer 2 emulator editor including timer values
- Layer 3 emulator editor including timer values
- Q933, X.36, FRF.4, X.76 and FRF.10 implementation supported
- Restart and Status Enquiry miscellaneous message editor

X25 Specific Features

- Monitoring of LAP-B/X25 protocol with full facilities decoding
- X.25-LAPB editor including timer values
- X.25 Packet emulator editor including timeouts
- Interrupt Packet editor
- X.25 and X.75 protocol support
- Data may be sent continuously or just once for a pre defined period
- During the call establishment phase, required user facilities may be selected independently for each call
- User data can be entered in ASCII, HEX or X.29

IP/TCP Specific Features

- Monitoring of IP/TCP over the LCP, PPP, CI-IP links protocol
- IP simulator in User-Program mode supports Datagrams transmission
- TCP simulator in User-Program mode supports PDUs transmission

Clarinet TTCN Conformance Test Scripts

The standard simulation capabilities of the Clarinet system make it the perfect platform for conformance test applications. A TTCN compiler has been developed together with new 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.

The Clarinet system is now used by the most important test laboratories but is also ideal as a 'home' tester for software verification prior to seeking approval.

Since laboratory time can be expensive the Clarinet provides a rapid return on investment and the complementary simulation capabilities will prove invaluable for debug purposes.

*PICS = Protocol Information Conformance Statement

*PIXIT = Protocol Information eXtra In Testing

Conformance Test Suites Available from Clarinet

Shown below is a brief summary of test scripts available in Executable form on CD-ROM

ISDN User

TBR3/TBR4 and TBR33/TBR34 Layer 2/Layer3 (ETSI and ITAAB version), ETSI Basic Call and supplementary services

ISDN Network

ETSI Basic Call Layer 2/Layer3 and supplementary services

National ISDN-2 (North America)

NI-2 Layer 3 BRI/PRI (User)

NI-2 Layer 3 PRI (Network)

QSIG

Basic Call and Supplementary services

V5.1/V5.2

V5.1 AN and LE Link and Network Layer

V5.2 AN and LE Link and Network Layer

ETSI Edition 1 and Edition 2 available

SS7

MTP2, MTP3, ISUP(V2), SCCP, TCAP, INAP-CS1

ATM

SSCOP, ATM-Forum UNI, AF041

Frame Relay

PVC and SVC,

X25

ISO layer 2 and Layer 3

The screenshot displays the Clarinet Protocol Event Editor interface. The main window shows a test trace for TBR3. The trace includes protocol messages such as STATUS, CAU_E4_CU2, and YTIMEOUT_TN00C. Below the trace, there is a table with columns for Result, Test Case Name, Group, Purpose, and Defaults. The table shows a 'PASSED' result for test case 'TC11986' in group 'U15/PS'. Below the table, there are detailed comments and a reference to requirements.

Result	Test Case Name	Group	Purpose	Defaults
PASSED	TC11986	U15/PS	RELEASE REQUEST STATE TESTS - STATE U19 - PASSIVE IUT BEHAVIOUR	DF69901

Behaviour Description

Behaviour Description	I	Constraint Ref	V	Comments
+PR31981				preparable to state U19 (1)
+ !STATUS< CB_PDU.CST.CST.CVU.CST_CS + U2::'00000'B,B_PDU.CAU.CAU_E4_CU. + CAU_E4_CU2::'1101111'B> START TH0A + C		Re(ST2(ce))		
YTIMEOUT TN00C			(P)	no response
-CS50001('0'B)				(2)

Detailed Comments :

- (1) Valid STATUS PDU.
- (2) The subtree CS50001(0) is used to check the IUT state UB.

Reference to requirements : subclause 11.4.6.8(c)

Figure 2.0 - Clarinet TBR3 Conformance Test trace

Conformance test Brochure

If you would like to receive more information including reference numbers, number of TestCases contained, please request our Conformance Test Brochure.

Summary

The Clarinet is a fully featured compact and competitive system designed to evolve with new interfaces and new protocols as they are released.

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

Weighing less than 5Kg in its padded carrying case, the Clarinet packaged system is very portable for travel by road or air.

The familiar Windows 98 or Windows 2000 based operating system makes it a pleasure to use and all HELP menus are stored as on-line context sensitive files eliminating the requirement for user manuals.

Contact Acacia and its distributors to discuss your application in detail and see how the Clarinet system will benefit you.