HP Internet Advisor WAN

Technical Specifications

The HP Internet Advisor WAN was designed with one goal in mind: to make you more effective when isolating and solving problems on your network the first time you connect. The HP Internet Advisor lets you connect anywhere on the network, capture all the necessary data, and comprehend that information as it reveals problems and suggests solutions.

WAN testing made easy

To install, maintain, or troubleshoot a wide area network, you need to test for many things: physical errors, equipment interoperability, and traffic problems. The HP Internet Advisor WAN offers integrated WAN and LAN over WAN protocol analysis capabilities, along with bit error rate testing, stimulus and response measurements, and statistical analysis capability — everything you need in a powerful, cost-effective test instrument.

No matter what the traffic level, the HP Internet Advisor WAN will capture every frame on your network. It non-intrusively monitors and decodes WAN and LAN over WAN data at full line speed, without missing a bit. In addition, it can simulate either direction of a line under test, and process previously captured data from the buffer or from a file. The analyzer doesn't just capture traffic when the network is working, it gives you information when the network is broken when you need it the most.

Key features

- True multitasking capability, so that monitoring, decoding, statistical analysis, and stimulus/response tests can be executed simultaneously.
- Built-in interfaces and full-featured testing capability for all common WAN technologies, including X.25/HDLC, ISDN, Frame Relay, ATM, SMDS, HDLC, SNA, SDLC, PPP, and more.
- Highly portable, economical package featuring a rugged personal computer with full keyboard, large display, pointing device, and remote test software.
- User friendly full 32 bit Microsoft Windows® user interface.
- Context-sensitive on-line help with measurement and troubleshooting guides, acronym list, index, and glossary.
- HP Software Upgrade Subscription Service to keep you up-to-date on the latest software enhancements.

Unmatched functionality

The HP Internet Advisor WAN provides the following powerful functions:
- decodes for upper and lower layer protocols, including LAN encapsulated in WAN, with displays that can be customized at speeds from 50 bps to 52 Mbps
- statistics, including LAN traffic analysis over WAN, and logging of statistics to disk
- real-time data filtering, including capture and display filtering
- real-time counters and triggers
- line-status monitoring
- comprehensive bit error rate testing

Instrument platform

The HP Internet Advisor WAN combines complete protocol analysis for WAN and LAN testing with a powerful and robust personal computer. Although the analyzer is PC-based, it does not rely on the PC for its data capture performance; Separate acquisition hardware ensures 100 percent full-duplex data capture at all speeds.

All major WAN interfaces, including RS232C/V.24, RS449/422/423, V.10/V.11, and V.35, are already built into the instrument mainframe. Other interfaces, including ISDN BRI and PRI, ATM OC3c, atm 155 mbps UTP, E1, T1/DS1, HSSI, DDS 4-wire, DS3/E3 Cell and Frame are available as slide-in modules. Monitoring of LAN data over WAN and ATM is a standard feature.

Real-time monitoring and decoding

The HP Internet Advisor WAN monitors the network, captures data, and decodes it in real time. Data is fully decoded and displayed in user-configurable summary, detail, or hexadecimal format with 100 ns time-stamp resolution.

X.25/HDLC decodes

The Internet Advisor WAN provides real-time decoding capability for all three layers of the X.25 protocol according to ITU-T X.25-1988. The following fields are decoded and displayed:
- LAPB address, frame type, P/F, N(s), N(r), and FCS
- X.25 GFI, LCN, packet type, P(s), and P(r)
- called and calling addresses
- facility fields
- diagnostic, reset, and restart cause codes and explanations

Frame Relay decodes

The Internet Advisor WAN provides real-time decoding capability for all layers of the Frame Relay protocol according to the following recommendations:
- ITU-T Q.933 Annex A
- ANSI T1.617 Annex D, F and G
- original frame relay consortium

The analyzer decodes and displays the following fields:
- DLCI, DE, FECN, BECN, E/A, C/R, and FCS
- LMI
- RFC 1490

ISDN D-channel decodes

The Internet Advisor WAN provides the following D-channel decodes for ISDN testing:
- Layer 1   Info states (S/T) and activation states (U), also EOC (U)
- Layer 2   Q.921 (DSS1) SAPI 0 signaling SAPI 16 X.25 packets SAPI 63 LAP-D management procedures Extended LAPD

- Layer 3

Q.931, including information elements and diagnostic information and supplementary services.
Q.931 variants:

1TR6	CCITT	QSIG
AT&T4ESS	DMS-100	Siemens
AT&T5ESS	ETSI	SwissNet
AT&TNI-1	JT-Q931	Televerkets
Australia	NI-1	VN3
Bellcore	NI-2	VN4

- Full decode of X.25 packets on the D-channel
- Supplementary Services

PPP decodes

The HP Internet Advisor WAN provides decode capability for synchronous, asynchronous, and multi-link PPP . The maximum speed for asynchronous PPP is 115.2 kbps. The following fields are decoded and displayed:
- HDLC header-address, frame type and FCS
- PPP header-protocol ID and CP code
- LCP
- NCP/NSCP, including IPCP, IPXCP, CCP, NetBios CP
- PAP
- CHAP
- Multi-link PPP dual channel monitor and decodes

SMDS decodes

The HP Internet Advisor WAN provides run-time and post processing display of the following decodes according to Bellcore TR-TSY-00772, 00773 and 00774 specifications:
- Layer 1   PLCP
- Layer 2   PDU
- Layer 3   SMDS header

The following encapsulated protocols are decoded:
   Frame Relay
   X.25
   HDLC
   IP
   SNAP

V5.1/V5.2 monitoring

V5.1 and V5.2 are interface standards defined by the European Telecommunication Standard Institute (ETSI) for interfaces between an Access Network (AN) and the Local Exchange (LE). The HP Internet Advisor WAN provides V5.1/V5.2 monitoring capabilities.

- Layer 2 LAPV
- Layer 3

Filters and counters

The Internet Advisor WAN will capture every frame, no matter what the traffic level, and sometimes that is exactly what you need. But it can take a long time to search through hundreds of captured frames looking for a problem. Also, even on a lightly loaded network, at high speeds it does not take long to fill the data capture.

Data Filters allow you to select specific events to bring into the capture buffer. With data filtering, you can zero in on exactly the frames you need to see. The filters examine each and every frame in real time as it appears on the network, and because the filtering is done in hardware, nothing is missed.

Up to 16 data filters can be enabled simultaneously or individually turned on or off. A flexible and user-friendly menu allows you to define specific filters, counters, and triggers.
- up to 16 data filters
- enabled simultaneously or individualy
- flexible, user friendly menu
- definition for filter counter and trigger
- filter up to 64 bytes into the frame

Display filters let you quickly zoom in on selected criteria, from the traffic passing between specific devices to individual conversations. With post-processing, you can do the following:
- search through the data by record or by time stamp
- search for events or strings
- verify event-to-event timing
- view protocol errors
- print the current display or the entire buffer
- export data to other programs
- analyze statistics from the buffer data

Counters

To get statistical information about the data on your network, the HP Internet Advisor will analyze every frame and count user definable events. A number of counters have been pre-defined for Frame Relay, X.25, HDLC, SNA-SDLC, synchronous and asynchronous PPP, ISDN and SMDS.

The pre-defined counters provide statistics for the specific topology as well as application and network layer LAN protocols. Other counters can be added easily.

Network Vitals

Vitals provide real-time measures of network conditions to present a statistical picture of what is happening on the network links. Working simultaneously with decodes, filters, and other measurements, the Vitals feature interprets data traffic as it occurs. This feature can be used to identify network problems or to assist you in optimizing the configuration of network components and software.

Values in the Vitals display are presented in tabular form and are cumulative from the start of a test. Instantaneous utilization, is displayed in graphical format for a quick look at overall usage of the network.

The following values are provided for both the line (network) side and the equipment (subscriber) side.
- max., min., and avg. utilization (%)
- max., min., inst., and avg. throughput in kbps
- total octets (bytes)
- total frames/packets
- short frames/packets
- abort frames/packets
- FCS errors

Vitals are gathered in intervals of 1 second. Values may also be logged to disk.

Line Vitals
- Quick overview of the network health
- Displays both the CPE and the line statistics
- Utilization in graphical representation

DLCI or LCN statistics
- Specific DLCI or LCN statistical information
- 30 DLCIs or LCNs
- Displays both the CPE and the line statistics
  - Throughput in kbps
  - Frame distribution
  - Byte distribution

Top Talkers
- Determines which IP and IPX users consume the most WAN bandwidth
- 256 Top Talkers
- Sorts the source/destination statistics
  - Throughput in kbps
  - Frame rate and %
  - Utilization

Protocols supported:
   HDLC/SDLC, Frame Relay, X.25, and PPP
Number of talkers identified:
   Top 256 nodes
Sorted by:
   IP and IPX network source and destination address
   Traffic identified as DTE or DCE
Sample periode:
   From 2 seconds to 24 hours. Specify period by hours, minutes and seconds
Measurement update:
   Every 2 seconds

Decode View
- Provides the ability to decode network traffic
  - Summary
  - Detailed
  - Hex
    - ASCII/EBCDIC

- Provides the ability to filter/search network traffic

Filter/Counter Statistics
- Graphical and statistical view of the network based on setup filters /counters
  - Graph type
    - Bar
    - Pie
  - Mode
    - Instantaneous
    - Cumulative
  - Graph
    - % of frames
    - Throughput (frame/s)

The Line Status View
- Displays run-time and historical state of the physical state of the physical T1, CEPT E1, HSSI, DS3, E3 links
  - Current Line Status
  - Line Status History

Stimulus/response tests

Because the HP Internet Advisor is a multitasking instrument, you can execute any of the active stimulus/response tests while the analyzer simultaneously monitors their effect on the network.

The HP Internet Advisor WAN provides a series of pre-written and pre-configured test routines; others can easily be written by the user. More tests are added with every software release. Test scripts can be customized and saved as a new tests to build a library of powerful test sequences tailored to your individual applications.

- **X.25 test scripts**
  - DCE and DTE network cell
  - DCE and DTE subscriber call
  - Traffic generation

- **Frame Relay test scripts**
  - Auto User LMI
  - PING
  - Traffic generation

- **ISDN test scripts**
  - For BRI
    Simulate TE, NT, or LT
    Partial (LAP-D and partial Q.931 emulation
    Point-to-point, short or extended passive bus
    Terminated or bridged
  - For BRI NT and TE
    Place a voice call and run voice over the selected B channel
    Place a 56 kbps or 64 kbps data call
  - For BRI TE
    Place a call and run an end-to-end BERT over the B1 or B2 channel
    Place a call to yourself and run a BERT over the B1 and B2 channels
    Answer a call and run an end-to-end BERT
  - Answer Voice calls
  - For PRI
    Simulate TE or NT
    Partial LAP-D and partial Q.931 emulation
    Terminated or bridged
    Transmit clock recovered from line or internally generated
    Line codes AMI, B8ZS and HDB3
    Framing ESF or D4
    G.704 with or without CRC-4 n x 56 or 64 kbps
  - For PRI NT and TE
    Place a Voice Call and run voice over the selected B channel
    Place a 56 kbps or 64 kbps data call
  - For PRI TE
    Place a call and run an end-to-end BERT over the selected B-channel
    Answer a call and run an end-to-end BERT
  - Answer voice calls
  - Place multiple calls concurrently to stress test PRI link

Traffic generator

The HP Internet Advisor WAN has powerful and flexible traffic generator capability. Virtually any type of message or frame can be transmitted onto the network.
- Transmit frame once, specified number of times, or continuously.
- Transmit previously captured frames.
- Use Quick Tests for commonly used message types.
- Traffic generation protocols supported HDLC/SDLC, Frame Relay and X.25.
- Emulation supported Frame Relay (Annex D, Original LMI, and Annex A).
- Maximum traffic generation rate 100% of available bandwidth allowed by protocol specifications.
- Line speeds 50 bps to 52 Mbps.
- frame lengths allowed 4 bytes (address, control and FCS) to 9216 bytes per frame.
- Specify traffic rates by:
    1% to 100 % utilization
    interframe flags
    frames per second
    (30,000/sec)
    interframe delay
    (milliseconds)
- Maximum measured line rate 99%.
- Maximum number of different frames allowed 20.
- Define up to 4 different traffic levels and patterns in a single traffic generation test.
- Interfaces supported RS232C/ V.24/V.28, V.35, RS-449/422/423, T1, and E1, HSSI, DS3/E3.
- Clock source DTE/equipment, DCE/Line, internal, or recovered (50 bps to 52 Mbps).

Pre-written simulation/auto configure tests

- PING
  Protocols supported:
    HDLC and Frame Relay
    Select: destination IP address
    source IP address
    Level 2 address or DLCI
    number of ICMP data bytes (range between 1 and 1400)
    number of requests
      (continuous or select between 1 and 9999
      requests), and specify time-out (from 1 msec to 32 seconds).
    Frame Relay PING
      automatically supports Annex D, Original LMI, and Annex A
      emulation.
    Encapsulation Ether type, and RFC 1490 (Frame Relay only)
  Mode:
    Simulate DTE or DCE
- Frame Relay Auto User LMI
  Autodetermine signaling type as Annex D, Annex A or original LMI.
  Select:
    Polling count (1-255), Polling interval (5-25)
- X.25 Call Placement Scripts
  Mode:
    Simulate DTE or DCE
  Select:
    Network call or subscriber call
    logical channel number
    calling and called number
  Emulation:
    Level 2 and partial Level 3
- Autoconfigure T1
  Autodetermine:
    Line Code (AMI or B8ZS)
    Framing (ESF, D4, T1DM or Unframed) and Receiver mode
    (Monitor Bridged, Monitor Terminated, or Monitor Jack).
- Autoconfigure E1
  Autodetermine:
    Line Code (HDB3 or AMI)
    Framing (with CRC-4, without CRC-4, or Unframed
    Receiver mode (Monitor Bridged, Monitor Terminated, or Monitor
    Jack).

Line statistics

The operation of the physical interface is often critical in determining the cause of network problems. Therefore, the HP Internet Advisor WAN tracks errors at the physical layer. Signal events are recorded on the display for both the line (network) side as well as the equipment (subscriber) side.

Line status is displayed in real time (with 1 second resolution) All the events listed below are saved in the buffer and counted in the line status display. These events may be logged to disk. Critical parameters marked with an asterisk (*) are also displayed in large green or red boxes in the line status display, for easy, at-a-glance viewing.

Available measurements

DS-1/T1 (J2298B and J2299B)
Signal loss (*)
Frame sync loss (*)
PLCP sync loss (*)
AIS (*)
Remote/yellow X-bits (*)
Bi-polar violations
ESF CRC errors
Line code violation (B8ZS)
Frame slips
Frame bits
One's density
Excess zero's

E1 (J2296B, J2293B, J2294C, and J2297B)
Signal loss (*)
Frame sync loss (*)
Cell sync loss (*)
AIS (*)
Remote (*)
Line code violations (HDB3)
CRC-4 errors (if CRC-4 is
    selected)
Frame alignment error

J2 (J2911A)
Signal loss (*)
Frame sync loss (*)
Cell sync loss (*)
AIS (*)
Line code violations (HDB3)
Payload AIS
A-bit error
Spare bit #1 errors
Spare bit #2 errors
Spare bit #3 errors

ATM OC-3c/STM-1 (J2912B)
Signal loss (*)
Frame sync loss (*)
Cell sync loss (*)
Line code violations
Summary BIP error
Line AIS (*)
Path AIS
Line FEBE error
Path FEBE error
STS loss of frame
STS out of frame
STS loss of pointer
Path yellow (*)
Line FERF (Line RDI)
Path FERF (Path-RDI)

ATM 155 UTP (J2913B)
Signal loss (*)
Frame sync loss (*)
Cell sync loss (*)
Line code violations
Summary BIP error
Line AIS (*)
Path AIS
Line FEBE error
Path FEBE error
STS loss of frame
STS out of frame
STS loss of pointer
Path yellow
Line FERF
Path FERF

HSSI (J3762A)
Data: SD
Data: RD
Status DCE ready: TA
Status DCE ready: CA
Loop back:
    A: CA
    B: LB
    C: LC
Test mode: TM
Clocks
    ST: (from DCE)
    RT: (from DCE)
    TT: (from DTE)

DS3/E3 (J3759A)
Signal loss (*)
Frame sync loss (*)
Yellow alarms
AIS
Line code violations
FEBE
Idle
P1/P2 parity error
C-bit parity error
DS3 line
FEAC signal loss
FEAC frame sync loss
FEAC AIS
FEAC idle
FEAC service failure
FEAC no service failure
FEAC common equipment failure
FEAC line loopback activate
FEAC live loopback interactivate

X.25 LCN Statistics

Display:	First 30 LCNs (all data stored to capture buffer)
	Graph of instantaneous throughput
For each individual LCN display:	Number of frames by LCN in pie chart graphic
First 30 DLCIs display:	Total bytes transmitted by each DLCN in a pie chart

For all LCNs monitored display packet length distribution as a percent and total count

Frame Relay Statistics

Display:	First 30 DLCIs (all data stored to capture buffer)
For each individual DLCI display:	Graph of instantaneous throughput
First 30 DLCIs display:	Number of frames by DLCI in piechart graphic
	Total bytes transmitted by each DLCI in a pie chart
Mode:	Monitor and simulation complete vital statistics, and protocol counts.

- Line Vital Signs
- DLCI statistics
- Top Talkers
- Decodes
- Filter counter stats
- Combo view

ISDN Statistics

B-channel tracker:

- B-channel activity monitor tracks voice and data usage on all B-channels.

- Extensive B-channel traffic statistics: Channel State, Call type, Channel Elements, Called Party Number, Calling Party number, Duration of Current Call, Number of Calls Attempted, Number of Call Setup Completed, Start of Latest Successful Call, Disconnect of Last Failed Call, Call Reference, Last Disconnect Cause.

D-channel Protocols:

Level 2: LAPD per ITU-T standard Q.921. SAPI 0 signalling, SAPI 16 X.25 packet and SAPI 63 LAPD management procedures supported.

Level 3: Q931 variants

1TR6	JT-Q931
AT&T4ESS	NI-1
AT&T5ESS	NI-2
AT&TNI-1	QSIG
Australia	Siemens
Bellcore	SwissNet
CCITT	Televerkets
DMS-100	VN3
ETSI	VN4

B-channel protocols

WAN: LAP-B, X.25 Blue Book 1988, HDLC, SDLC, synchronous, async and multi link PPP and LCP, frame relay (ANSI T1.606, ITU-T I.233, ANSI T1.617 annex D, F & G, RFC 1490, ITU-T Q.933, NTT), SNA, and SNAP. These can encapsulate any of the following LAN decodes.

LAN over WAN: 802.2, 802.3, and 802.5 MAC layer TCP/IP, Novell, DECNet, AppleTalk, 3Com, and IBM.

BERT (Bit error rate testing)

Many times problems on the network can often be attributed to the transmission medium. Although the physical medium may be good for normal data transmission, it may not be able to handle high-speed WAN data. That is why the HP Internet Advisor WAN has a powerful, built-in BERT (bit error rate tester).

BERT specifications

- DS1/T1, E1, PRI T1 and E1, BRI S/T/U
  Transmit and receive framed and unframed bit patterns over single fractional and clear channel for DS1/T1, E1, PRI T1 and PRI E1

  Basic rate channel (S/T/U):
      B1 or B2 at 56 or 64 kbps point-to-point
      B1 + B2 at 112 or 128 kbps point-to-point
      B1 with B2 looped full duplex
      B2 with B1 looped full duplex
  Patterns:
      63, 511, 2047 and 4095 PRBS
      2^{15}, 2^{20}, 2^{23}
      3 in 24, 1 in 8 (1:7), 2 in 8
      all 1's, all 0's, 1010...(1:1)
      DDS1, DDS2, DDS3N, DDS4N, DDS5N, DDS6N,
      DDS3R, DDS5R, DDS/V54LPDN, DDS/V54LPUP
      OCT53, OCT54, OCT55, OCT55V2, OCT72,
      OCT96, OCT120
      QRSS, and user defined patterns up to 996 bytes in hex or text
  Standard pattern exception for E1:
      2^{23} and 2^{15} inverted per CCITT O.151
  Block length:
      511 bits, 1000 bits, 2047 bits
  Duration:
      10^5 through 10^9 bits
      5, 10, 15 min.; 1, 4, 12, 24 hrs.; cont

  Data rate:
      User definable from 50 bps to 2.048 Mbps
  Error insert rate:
      10^2 through 10^7 or single error
  Error insert type:
      Frame, Logic, BPV (Frame and BPV on DS1/T1 interface only)
  BERT results include:
      Bit and block count
      Bit and block errors
      Bit error rate
      Errored second
      Error free seconds
      Percent error free seconds

  Log Results:
      Disk
  G.821 measurements — Reported, both in quantity and in percentage:
      Available time
      Errored seconds
      Degraded minutes
      Severely errored seconds
      Unavailable time

- ASYNC, SYNC and Isoc BERT (V-Series Only)
  Simulate:
      DTE or DCE
  DTE Clock:
      DTE or DCE
  Patterns:
      63, 511, 2047 and 4095 PRBS
      all 1's, all 0's, 1010...(1:1)
      Fox, and user defined patterns up to 1024 bytes in hex or text
  Flow Control:
      None, Leads, Xon/Xoff pacing selectable
  Log Results:
      Off, Disk, Printer
  Data Rates:
      50, 75, 110, 134.5, 150, 200, 300, 600, 1200, 1800, 2000, 2400, 3200, 3600, 4800, 7200, 9600, 19200 14.4K, 38.4K, 48K, 56K, 64K (Selectable)
  Framing:
      None, 5 to 8 bits

- Green Screens
  Simulate:
      DTE or DCE
  DTE Clock:
      DTE or DCE
  Patterns:
      63, 511, 2047 and 4095 PRBS
  BERT results include:
      Bit and block count
      Bit and block errors
      Bit error rate
      Errored second
      Elapsed seconds

Data Rates:
  50, 75, 110, 134.5, 150, 200, 300, 600, 1200, 1800, 2000, 2400, 3200, 3600, 4800, 7200, 9600, 19200, 14.4K, 38.4K, 48K, 56K, 64K (Selectable 50 - 64K (Adjustable — External Clock Source)

Framing:
  None, 5 to 8 bits

- DS3/T3, J2 and E3

  Patterns:
    2^{15}, 2^{20}, 2^{23} all 1's, 1010...(1:1), 1100...
    User defined: one octet (8 bits)

  Duration:
    Continuous or user definable from 1 minute to 1000 hours

  Errors:
    Logic, Code, Frame, P1/P2 bit parity FEBE, FEAC

  Error insert rate:
    Programmable from 10^3 to 10^9

Notes

BERT results can be logged at user-defined intervals and duration with each log entry carrying a real-time stamp with 100 ns resolution.

T1 standard loopback commands are generated and processed to simulate a CSU.

Interface specifications

T1

Output:	Two channels 100 ohm balanced
Connectors:	RJ48C, RJ45 or WECO mini-bantams; RJ-11 hand set jack
Interface type:	DSX-transmitter in 5 ft steps Network interface transmitter output
Levels:	ANSI
Clocking:	External or Internal
Clock speed accuracy:	
	Two channels to allow monitor/transmit in both directions simultaneously +/- 32 ppm
Input:	
Connectors:	RJ48C, RJ45, or WECO mini-bantams
Interface type:	DSX-1 and Network Interface
Levels:	DSX-1, +6 to -10 dB Network Interface, +6 to -36 dB
Monitor modes:	Terminated (100 ohm) Bridged (high impedance) Monitor jack
Framing:	Extended Super Frame (ESF) with or without CRC D4 (SF) Ft and Fs, or Fs only Fractional, any multiple of 56 K or 64 K channels Unframed 1.544 Mbps DS0A and DS0B subrates

Line code:
  AMI and B8ZS

ATM cell mapping: PLCP and direct

Alarm detection:
  Loss of signal
  Frame sync loss
  Remote/yellow alarm
  AIS (all 1's)
  Frame loss
  Bipolar violation
  One's density
  Excess zeros

E1

Output:
  Two channels
  75 Ohm unbalanced or 120 Ohm balanced

Connectors:
  BNC , BR-2, DB-9, small Siemens (1.6/5.6 mm)

Levels:
  G.703

Clocking:
  External, any speed up to 2.048 Mbps
  Internal, selectable entry for any rate with four significant digits

Clock speed accuracy:
  +/- 50 ppm

Input:
  Two channels to allow monitor/transmit in both directions simultaneously
  75 ohm unbalanced or 120 ohm balanced

Connectors:
  BNC, BR-2, DB-9, small Siemens (1.6/5.6 mm), RJ-11 hand set jack

Levels:
  G.703

Monitor modes:
  Terminated (75 ohm)
  Bridged (high impedance)
  Monitor jack (-20 dB)

Framing:
> G.704 alternate framing with or without CRC-4 Fractional channel, any multiple 64 K channel Unframed at 2.048 Mbps

Line code:
> AMI and HDB3

ATM cell mapping:
> Direct (HEC)

DS3

Output:
> Two channels
> 75 ohm unbalanced
> BNC connectors

Transmit levels:
> High (+6 dB dsx)

Clocking:
> Recovered and internal

Xmit alarms:
> Remote/yellow (X-bits),
> AIS (1010...)
> Idle (1100)
> Loss of sync (HEC only)
> Simulate sine or equipment
> Simulate C-bit framing

Input:
> Two channels to allow monitor/transmit in both directions simultaneously

Levels:
> Auto gain control for high, X-connect, low, and monitor jack
> (-20dB gain); all unbalanced
> 2.4 V pp to 51 mV pp - 34 dB dynamic range

Monitor modes:
> Terminated (75 ohm)
> Bridged (high impedance)

Alarm detection:
> Remote/yellow (X-bits)
> AIS (1010...)
> Idle (1100)
> Loss of signal
> Loss of sync
> FEAC

ATM

ATM cell mapping:
> PLCP (G.832)
> Direct (G.804)

Line code:
> B3ZS
> Monitor FEAC channel signals
> Alarms conform to ANSI T1M1.3/91-003R2

Framing:
> C-bit

Frame Relay
Framing:
> C-bit and M13 framing

E3

Output:
> Two channels
> 75 ohm unbalanced
> BNC connectors

Levels:
> G.703

Clocking:
> Recovered and internal

Xmit Alarms:
> Remote/yellow (X-bits)
> AIS (1010...)
> Simulate line or equipment

Input:
> Two channels to allow monitor/receive in both directions simultaneously

Levels:
> Auto gain control, incl. monitor jack

Monitor modes:
> Terminated (75 ohm)
> Bridged (high impedance)

Framing:
> G.804/G.834/G.751

ATM cell mapping:
> PLCP (G.751)
> Direct (G.804)

Line code:
> HDB3

ATM at J2

Output:
> Two channels
> 75 ohm unbalanced

Transmit levels:
> High (+6 dB dsx)

Clocking:
> Recovered and internal

Xmit alarms:
> Remote/yellow (X-bits),
> AIS (1010...)
> Idle (1100)
> Loss of sync
> Simulate line or equipment

Input:
 Two channels to allow monitor/receive in both directions
Levels:
 Auto gain control for high, X-connect, low, and monitor jack (-20dB gain); all unbalanced
Monitor modes:
 Terminated (75 ohm)
 Bridged (high impedance)
Alarm detection:
 Remote/yellow (X-bits)
 AIS (1010...)
 Idle (1100)
 Loss of signal
 Loss of sync
 FEAC
Framing:
 C-bit and M13
ATM cell mapping:
 PLCP and direct
Line code:
 B3ZS

HSSI

Modes:
 Simulate DCE, Simulate DTE, Monitor, Monitor and Repeat
Connectors:
 2 connectors (1 to DTE, 1 to DCE)
 50 pin SCSI
Type:
 Latch Blocks without rails
Clocking:
 Recovered or Internal
Internal:
 Selectable rate from 1.544 - 52 Mbps

Control Signal Control:
 DCE: CA, TM
 DTE: TA
Loop Control:
 DTE: None, Local DTE, Local Line, Remote Line
 DCE: LC

Electrical Specifications:
 EIA - 612
 FIA - 613

Control and Data Signals
Monitored:
 Signal: DTE: SD
 Signal: DCE: RD
 Clock: From DCE: ST
 Clock: From DTE: RT
 Clock: From DTE: TT
 Status: DCE Ready: TA
 Status: DTE Ready: CA
 LoopBack
 A: LA
 B: LB
TestMode:
 TM

DDS 4-wire
DDS (Digital Data System) subrate demultiplexing is available with the DDS 4-wire slide-in interface module. This module enables the HP Internet Advisor WAN to connect to T1 DDS circuits and allows monitoring and decoding of data traffic of individual DDS subrate users. It is only available in the U.S.

Interface:
 Time slots 1-24 on T1 lines using D4 or ESF framing
 Time slots 1-23 on DDS lines using T1 DM framing Speeds
DSOA, single user:
 2.4, 4.8, 9.6, 19.2, 38.4, and 56 kbps
 (error corrected 19.2 kbps not supported)
DSOB:
 2.4, 4.8 and 9.6 kbps in 20, 10 and 5 user positions respectively 19.2, 28.8 and 38.4 multiplexed intermediate rates in any adjacent combination of the five 9.6 kbps channels.

Meets the following standards:

    ANSI T1.107 1988, DigitalHierarchy Synchronous Digital
     Data Format
    ANSI T1.107b 1991 Supplement to ANSI T1.107
    AT&T TR 54075 Subrate Data Multiplexing for Digital
     Data Systems
    CB-INC-101 Compatibility Bulletin, Integrated Network
     Corporation, 38.4 kbps DDS Equipment, June '88

Physical interface specifications and status information for ISDN
testing

ISDN
BRI S/T/U

Standards used:
    ITU-T Standard I.430
    ETS 300 012
    ANSI T1.605

Standards used:
    ITU-T Standard G960/961
    ETR 80
    ANSI T1.601-1992

Connectors:
    RJ-45
    RJ-11 for handset

Voice coding:
    a-law
    mu-law

Data rates:
    D-channel, 16 kbps
    B1 or B2, 56 or 64 kbps
    B1 + B2, 112 or 128 kbps

BRI S/T

Front Panel LED indicators:
    Info states 0 thru 4
    PS1 present (normal and reverse)
    PS2 present
    D data
    B1/B2 activity

Info states 0 thru 4 are stored as events in the buffer.

BRI - U

Front Panel LED indicators:
    Loss
    frame sync activation sealing current D data
    B1/B2 activity
    CRC
    FEBE
    A1B

Activation states and EOC messages are stored as events in the
buffer.

The following events are
monitored:
    Signal loss
    Frame sync
    Activation achieved
    Sealing current
    Data on the D-channel
    Data on the B1 or B2
     channel
    CRC error
    Far end block error
     (FEBE)
    Alarm indication bit
     (AIB)

PRI-T1

Standards used:
    ANSI T1.403
Connectors:
    Mini-Bantam
    RJ-11 for handset
Voice coding:
    mu-law
Framing:
    D4 (Super Frame) ESF
Line coding:
    AMI
    B8ZS
Data rates:
    D-channel, 56 or 64
    kbps or
    D-channel 16 kbps
    subrate
    B1 thru B23, n x 56 or
    n x 64 kbps

The following events are
monitored:
    Signal loss
    Frame sync
    B8ZS detect
    Bi-polar violation
    (BPV)
    ESF CRC errors

    Framing bit errors
    Frame slips
    Pulse density violation
    Yellow/remote alarm
    AIS/all ones

PRI-E1

Standards used:
    G.703/704
Connectors:
    75 ohm BNC unbalanced
    120 ohm RJ-45 balanced
    RJ-11 for handset
Voice coding:
    a-law

Framing:
    G.704 alternate framing with or without CRC
Line coding:
    AMI
    HDB3
Data rates:
    D-channel, 64 kbps
    B1-B30, n x 64 kbps
Bus configurations:
    Point-to-point, short
    passive bus or extended
    passive bus

The following events are monitored:
    Signal loss
    Frame sync
    Line code (HDB3) violation
    Bi-polar violation (BPV)
    CRC-4 bit errors
    Frame alignment signal
    Far end block error (FEBE)
    Yellow/remote alarm
    AIS/all ones

OC-3c/STM-1
Output:
    Two channels
    1300 nm Class 1 single mode laser
    Connector scheme with SC-PC
Output levels:
    Min. -12dBm
    Max. -5dBm
    Typ. -10dBm
Clocking:
    Recovered and internal
Input:
    Two channels
Sensitivity:
    Min. -34dBm
    Max. -3dBm
Loss of signal detect level:
    -40dBm
Framing:
    SONET, SDH
Scrambling:
    SONET (ANSI T1.105)
    STM-1 (ITU-T Rec.G.708)

LAN protocols supported

Encapsulated LAN data is automatically extracted and decoded by the HP Internet Advisor WAN including complex encapsulated protocols. For unique encapsulation schemes, the user may specify the off-set as well.

Includes a comprehensive set of protocol decodes including all of today's popular protocol suites:

- TCP/IP Protocol Stack
- AppleTalk Protocol Stack
- Banyan/Vines Protocol Stack
- DECnet Protocol Stack
- IBM/SNA Protocol Stack
- Novell Protocol Stack
- ISO Protocol Stack
- SUN Protocol Stack
- XNS Protocol Stack
- CISCO Protocol Stack
- 3 Com Protocol Stack
- Microsoft LAN Manager
- Protocol Stack
- H.323 Protocol Stack
- CDPD Protocol Stack

Physical specifications

Size: 30 x 10 x 31 cm (12 x 4 x 12 in)

Weight: 6 kg (14 lb); 7.2 kg (16.5 lb) with the optional
undercradle

Power requirements

External: 100 to 240 VAC (continuous or autoranging)
50 to 60 Hz, 110 watts max.

Temperature

Operating: 5° to 40° C
Non-operating: -25° to 60° C

Humidity

Operating: 20% to 80%
Non-operating: 10% to 90%

Condensation   Not allowed

Altitude   Operating to 15,000 ft

Regulatory compliances

EMC: European Union EMC Directive
IEC801-2, ESD Susceptibility
IEC801-3, Radiated Immunity
IEC801-4, Electrical Fast Transient Immunity
CISPR11, Radiated and Conducted Emissions
IEC 1000 -3 -2 Harmonics
IEC 1000 -3 -3 Flicker
CE marked

Safety: CSA 22.2 No. 1010-1
UL 3111
IEC 1010-1
CE marked
CSA marked

Data capture performance

Bit rates:
                   Sync or Sync NRZI, 50 bps to 2.048 Mbps
                   Async, 50 bps to 256 kbps

Capture rate:
                   100% data capture up to 155 Mbps

Analysis rate:
                   100% data filtering and triggering up to 155 Mbps

Capture buffer:
                   30 MB for data, timing, lead status and line events

Lead status stored:
                   RTS, CTS, DTR, DSR and CD (RS232/V.24 andV.35)
                   CS, RS, RR, TR and DM (RS449/422/423 and V10/110)

Control line pulse width:
                   Min. 100 ms for detection (V-series)

Statistics logging:
                   Min. 1 sec. intervals

Time stamp resolution:
                   100 ns

Ordering Information

HP J2300C

Related Literature

HP Internet Advisor WAN — ISDN	Technical Specifications	5967-5560E
HP Internet Advisor WAN	Product Overview	5967-5566E
HP Internet Advisor WAN — DS3/E3 Cells and Frames Module	Technical Specifications	5967-5559E
HP Internet Advisor	Brochure	5965-8049E

Services

HP J2899A Software Upgrade and Subscription Service	Product Overview	5965-5815E

Warranty

For hardware - three year warranty
For software - warranty 90 day replacement only

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