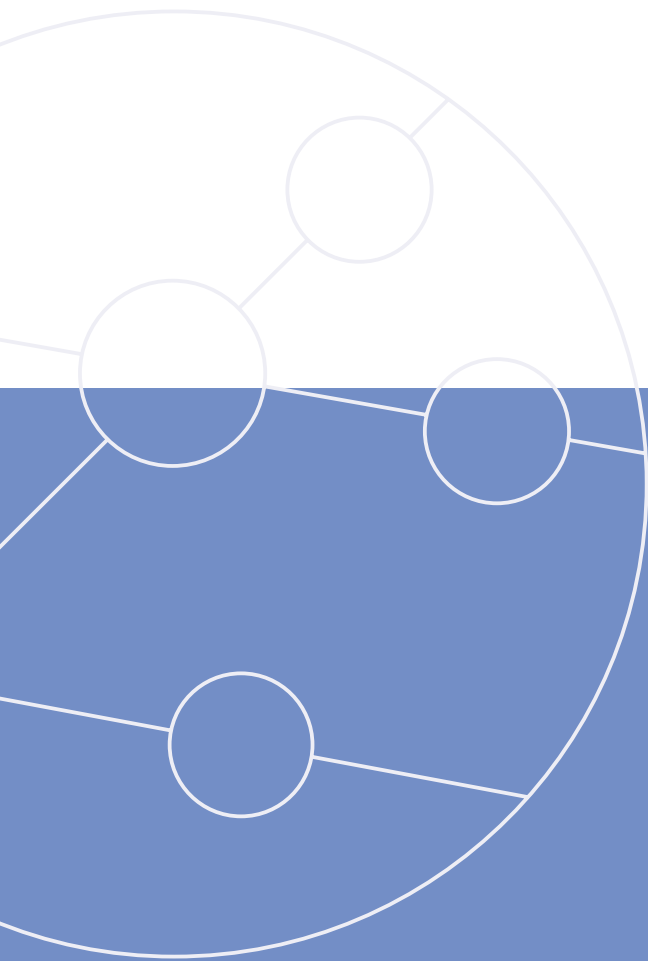


**AuroraPresto**



*A revolution in DSL testing*



**xDSI**

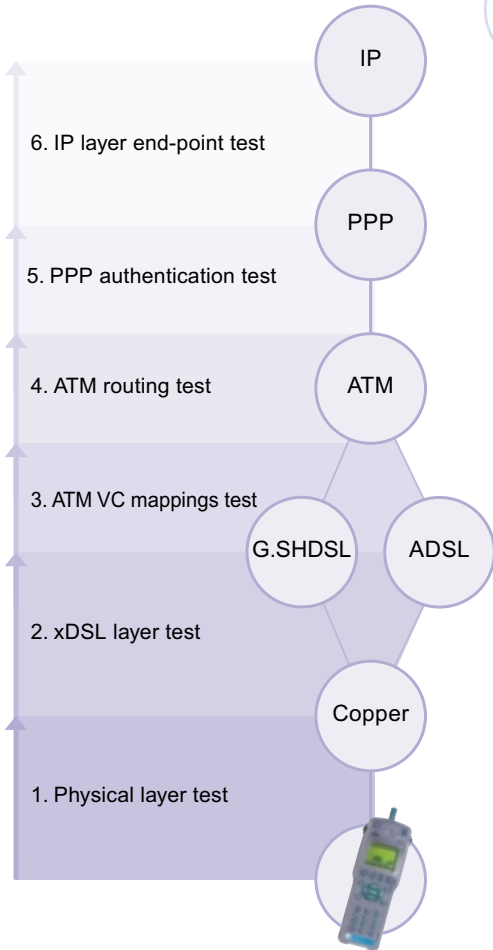
*the complete test tool for DSL technologies*



**Trend**Communications

# xDSL

a multilayer technology



The massive customer demand for new services, with its rapidly increasing demand for greater data transfer, has driven the need to develop Digital Subscriber Line technologies (DSL) to achieve the higher data rates required.

Using existing copper, which shares a bundle with many diverse services, provides serious quality-of-service problems to the network operator, service provider and end users.

Aurora Presto has been developed to provide all the functionality necessary for the installation, maintenance and troubleshooting of Asymmetrical Digital Subscriber Line (ADSL) and Symmetrical High Speed Digital Subscriber Line (G.SHDSL) services in both laboratory and field environments.



*Aurora Presto allows testing at all layers of the xDSL service, enabling diagnosis of faults at any point between the PC and the Internet*



## AuroraPresto

*Multilayer test solution for xDSL rollout, maintenance and troubleshooting*

With the growth of 'self install', where the customer obtains the DSL modem and a splitter box from an electronics retailer as a move to cut costs, DSL service, installation and commissioning problems are set to grow.

A typical xDSL service from customer modem to ISP consists of several different layered technologies. Aurora Presto, the market leader in xDSL testing, quickly and correctly locates and identifies fault conditions on the DSL, ATM, AAL5, PPP, IP and Application layers.



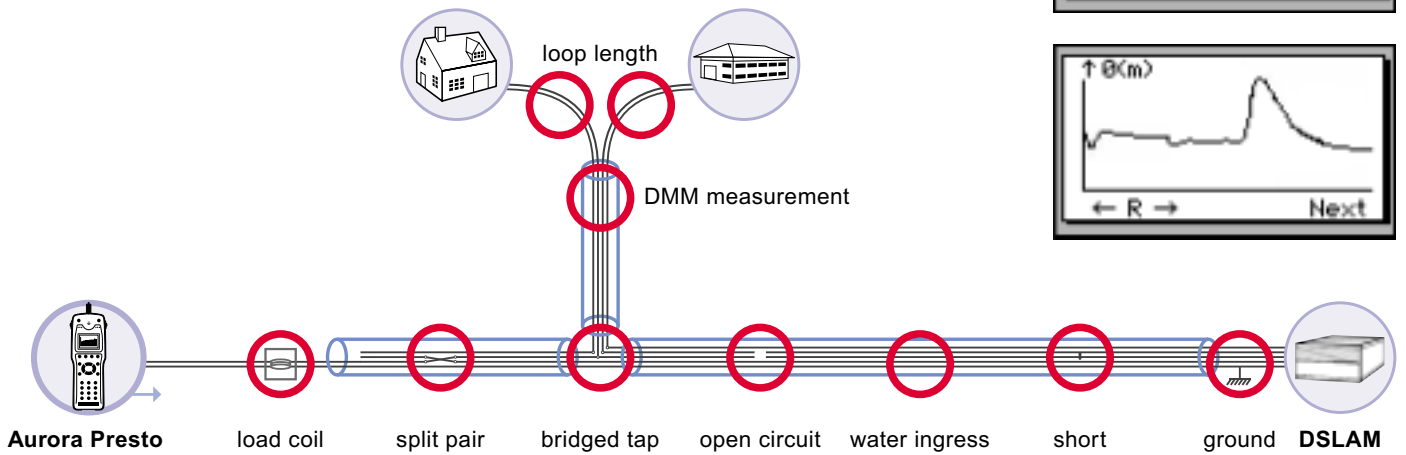
- Multiple Modem/Data Cards:
  - TDR and DMM
  - ADSL ATU-R/ATU-C
  - G.SHDSL STU-R/STU-C
  - ATMF 25.6
- ADSL over POTS and ADSL over ISDN
- G.SHDSL Annex A and B
- Fully automated 'one-button testing' mode
- Manual 'expert diagnostics' mode
- Analogue line testing with TDR and DMM tools
- ADSL and G.SHDSL layer testing
- ATM layer testing (full ATM cell-stream handling capability)
- IP layer testing (with Bridged and Routed Ping facility)
- PPP testing (PPPoE and PPPoA)
- Built-in 10BaseT Ethernet port
- Storage/export of test results

# Physical Layer

test with TDR and DMM

DSL technologies are robust and highly suited for use over existing poor-quality copper. However, degradation of the local loop can lead to physical layer problems which cannot be found using conventional service test measurements.

The TDR tester quickly locates faults on the copper pair, the DMM tester tests electrical properties of the copper pair



- TDR (Time Domain Reflectometer)
- DMM (Digital Multimeter) ACV, DCV, Capacitance, Resistance, DC Current
- Detects up to 4 load coils
- Noise analysis test with graphical display

A typical test scenario would be where a customer's modem is unable to achieve synchronisation on a previously live circuit. A service engineer would probably use a DMM to confirm that there is the correct voltage on the copper pair and to test the connection to the DSLAM. Should this test fail, the engineer would typically then locate the type and location of the fault on the pair using a TDR.

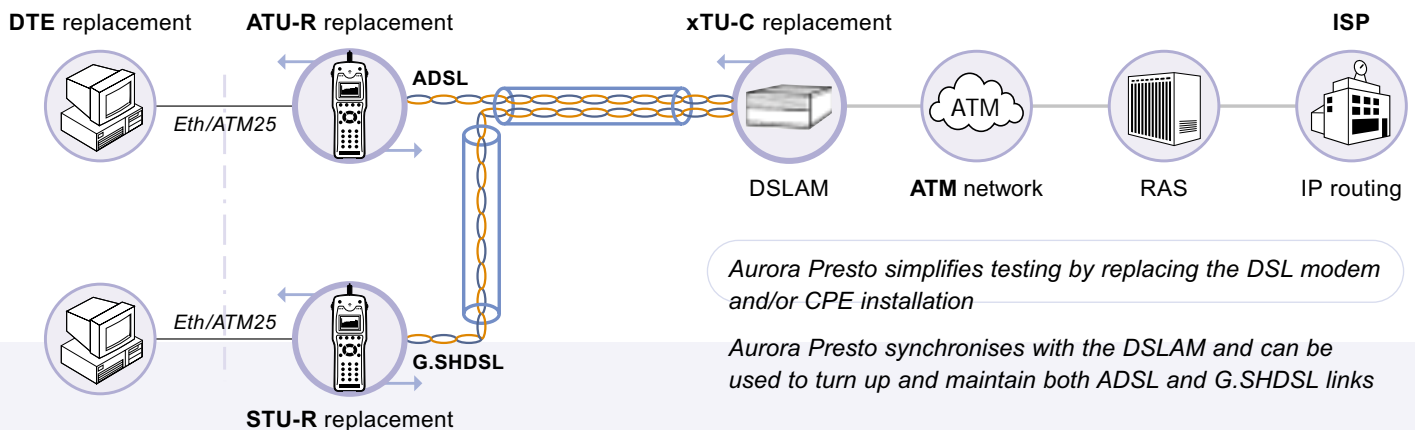
Aurora Presto provides both TDR and DMM functionality to allow effective fault finding at the physical layer on the local loop.



## ADSL test

Reliable results from DSL layer testing are fundamentally important for link turn-up and maintenance operations. Aurora Presto provides comprehensive statistical reporting of the ADSL link performance, including a full display of the allocation of bits per tone. All major DSLAM and chipset vendors are supported for both ADSL over POTS and ADSL over ISDN bandplans. Selection of any of the three DSL modems or data cards is via the graphical user interface - one of the many reasons why the Aurora Presto is regarded as the most flexible xDSL test solution on the market today.

- ATU-C and ATU-R operation
- Up to 3 modems simultaneously
- Full ADSL 'Golden Modem' replacement mode
- Full ADSL 'Golden Router' replacement mode



- STU-C and STU-R operation
- G.SHDSL tracer with EOC messaging and G.994.1 trace
- Loopback invocation/response
- Sealing current termination
- Full G.SHDSL 'Golden Modem' replacement mode
- Full G.SHDSL 'Golden Router' replacement mode

## G.SHDSL test

G.SHDSL offers flexible broadband provision based on robust standards (G.991.2), with significant reach and performance improvements over its non-standardised predecessor, SDSL. Aurora Presto provides full STU-R and STU-C modem replacement functionality and offers all the same testing features (ATM, PPP and IP) available on the ADSL line cards.



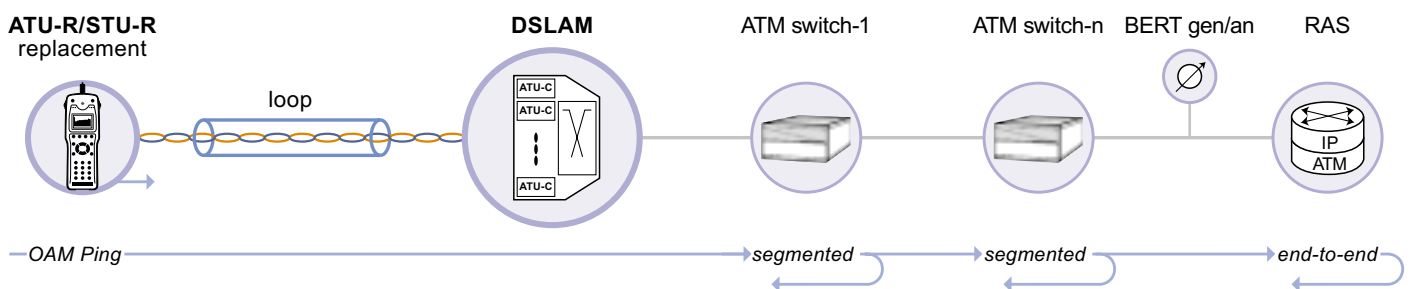
# ATM layer

test functions

- ATMF 25.6 interface including BER test capability
- AAL-5 global, mapped VC and unmapped VC statistics and errors
- ATM layer BER test, using fixed, pseudo-random or user-defined bit sequences
- ATM cell-stream throughput test
- F5 OAM loopback statistics
- F5 OAM support including OAM Ping functionality

With ATM providing the main transport technology for ADSL networks, Aurora Presto is several steps ahead of similar testers, with its full ATM layer cell stream handling.

Aurora Presto's ATM layer tests provide actual usable data throughput a function not available with 'DSL layer only' testers, or testers which implement the marginal ATM functionality available via the DSL chipsets.



## BERT testing

Bit Error Rate Testing (BERT) is the universally accepted method of performing fixed line quality testing. Aurora Presto enables BER testing over DSL by means of user-defined, fixed or pseudo-random (PRBS) patterns and provides full statistical analysis of the BER test. ATMF 25.6 BER testing is available with the optional ATM-25 interface.

## F5 OAM troubleshooting

OAM loopback cells can be used to verify the end-to-end connectivity on the ATM layer and to test if there is a continuous ATM 'pipe' from the modem all the way to the RAS (Remote Access Server). Aurora Presto's OAM Ping test takes less than 30s. to confirm end-to-end connectivity at the ATM layer.

If the OAM Ping fails, this indicates that there is a problem at the ATM layer. Aurora Presto can perform further tests using segmented OAM Ping flows to find the location and nature of the fault on the ATM layer. If the OAM Ping passes, the IP layer can be tested using the higher layer IP and PPP diagnostic features of Aurora Presto.

*Aurora Presto's ATM functionalities can be used for verification of ATM connectivity in new installations, and for fault finding ATM problems*

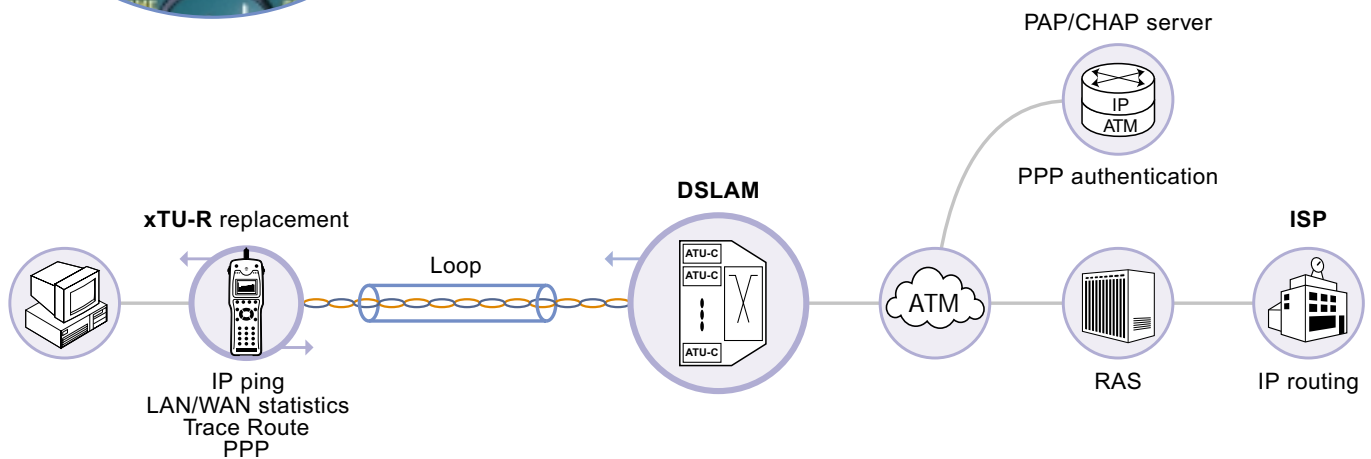
# IP/PPP layer test functions



## IP Ping

Comprehensive IP test facilities are provided on Aurora Presto, including full IP Ping testing and Trace Route functionalities, available over the standard Ethernet (10BT) or DSL connection. Comprehensive IP statistics include separate LAN and WAN statistics when Router Replacement Mode is selected.

Asymmetric IP load testing is provided as a complement to the F5 OAM test capability. Whereas the F5 OAM Ping allows verification of the ATM connectivity, IP load testing allows bandwidth testing of the asymmetric transmission both upstream and downstream.

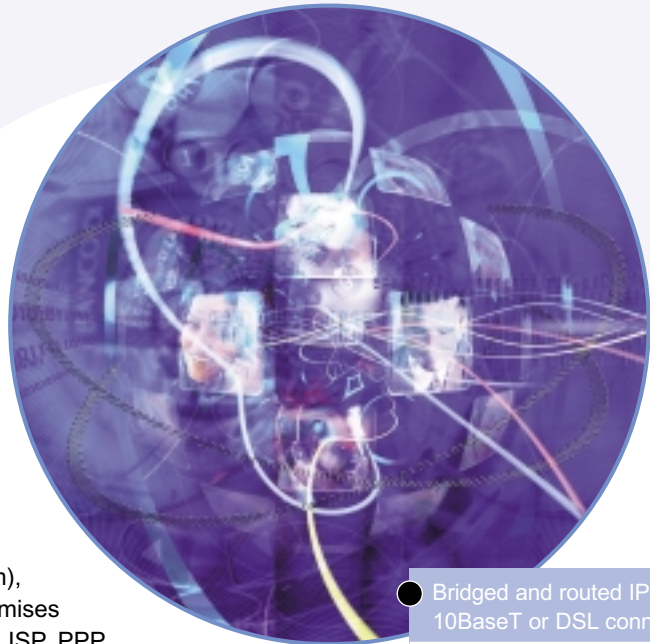


Multiple IP/PPP test facilities are available for a complete verification of the upper layers

## PPP testing

DSL connections typically use PPP as the data link to encapsulate IP and provide point-to-point connectivity to the RAS (Remote Access Server). PPPoE (PPP over Ethernet) and PPPoA (PPP over ATM) are popular configurations that are used worldwide. Aurora Presto allows the user to login to the RAS using either PPPoE or PPPoA. For fault finding, a PPP trace function is provided, allowing the point of failure to be quickly and easily identified.

For testing customer premises equipment (PC and modem), PPP Server modes allow verification of the customer premises equipment independent of the DSLAM, core network and ISP. PPP is an important protocol used extensively in many DSL applications. Aurora Presto supports both PPPoA and PPPoE. DSL installations can be verified by testing right up to the application layer and, for when problems arise, a PPP status window is provided for fault finding.



- Bridged and routed IP Ping via 10BaseT or DSL connection
- Full router replacement
- DHCP and IPCP address allocation
- NAT/PAT address translation
- Trace Route
- PPPoE and PPPoA statistics
- PPP Client and Server modes
- PAP or CHAP authentication

# Technical data

## AuroraPresto

<b>Relevant Standards</b>	ANSI T1.413, ITU-T G.992.1 (G.DMT Annex A and B), G.992.2 (G.Lite), multi-protocol over AAL-5, RFC2364 (PPPoA), RFC2516 (PPPoE), G.994.1 (G.hs), G.991.2 (Annex A and B).
<b>Physical</b>	TDR (Location of faults in graphical format) Load coil test (Location and number of Load coils) DMM (DC Voltage), (AC Voltage), (Resistance), (Capacitance), (DC Current).
<b>ADSL</b>	Synchronisation Results ADSL Tracer (G.994.1) ADSL Statistics (Upstream and Downstream Counts) DMT Carrier Load [bits:tone] in graphical format Noise Analysis [dBm:tone] in graphical format ADSL Bit Errors
<b>G.SHDSL</b>	Synchronisation Results G.SHDSL Tracer (G.994.1) Near End Statistics, Near End Alarms, Far End Statistics, Far End Errors, Far End Alarms, Segment Status
<b>ATM</b>	AAL-0 Global Statistics ATM VC Statistics Unmapped VC List DSL ATM BERT F5 OAM Ping (End-to-End, Segmented), F5 OAM Statistics ATM25 BERT, ATM25 Statistics
<b>PPP</b>	PPP over Ethernet and PPP over ATM PPP Tracer PAP/CHAP Authentication, Dynamic IP address allocation
<b>IP</b>	WAN Global Statistics, LAN Global and Connection Statistics LAN/WAN IP Ping Trace Route DHCP Server NAT/PAT Address Translation
<b>Test modes</b>	DSL Termination Modes (xTU-R, xTU-C) Golden Modem/Router (modem and router replacement mode) In Service (any testing point) DTE/DCE replacement mode
<b>Auto Test mode</b>	Hot Key Test Profiles One-Button testing Automatic printing
<b>Hot Keys</b>	Up to 20 user-defined, exportable test profiles
<b>LEDs</b>	xDSL Link Status, xDSL Alarms, xDSL activity, Datalink activity, BERT sync/error, Battery status
<b>Interface Cards</b>	ADSL over POTS (Annex A) ADSL over ISDN (Annex B) G.SHDSL: STU-R, STU-C (Annex A and B) Ethernet 10BaseT, ATMF- 25.6 TDR/DMM
<b>Connectors</b>	ADSL Line: RJ11 Ethernet 10BaseT: RJ45 socket ATMF 25.6F: RJ45 socket RS232: Mini DIN (8pin)socket G.SHDSL: RJ45 (line), RJ11 (Clock)
<b>Safety and Environmental</b>	Storage ETS 300 019-2-1, Transportation: ETS 300 019-2-2, Operating ETS 300 019-2-7 Temperature: Operating 0 °C to +45 °C, Storage -25 °C to +70 °C EMC Emission EN55022, EN61000-3-2 and EN61000-3-3, Immunity: EN55024 Rugged insulated case, EN60950 IP22 water resistant
<b>Connectivity</b>	Serial Port: RS232 mini Din Ethernet 10BaseT Results Export in Text and CSV Direct results Print (connect to printer)
<b>Ergonomics</b>	285x100x87mm, 1.1kg Backlit graphical display Power supply: NiMH rechargeable battery pack, field replacement or 12V DC from mains conversion, cigar lighter connector





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Distributor

To arrange a demonstration or to obtain the latest information on the Trend **Aurora**Presto or any of Trend's other test equipment, contact your nearest Trend Distributor.

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