# AuroraSonata

*ISDN Test Equipment*

ISDN

*Hand-held testing for Primary & Basic Rate*

TrendCommunications

The Trend **Aurora**Sonata represents a significant advance in the capability of ISDN testers. Conceived as an all purpose test tool, it has the functionality to meet and surpass the field technician's growing demands on an ISDN Installation and Maintenance Tester.

The **Aurora**Sonata is hand-held, easy to use, rugged, and above all, has a radical modular design making it suitable for digital communications networks both now and in the foreseeable future.

**Aurora**Sonata and its rugged, butt style weather and scratch resistant construction, is designed to withstand a 2 metre drop.

The **Aurora**Sonata is a key asset in all business activities involving ISDN, its straightforward operation translates into quicker resolution of problems and savings in time and expense. Service providers can make extensive use of the LT emulation and the monitoring functions associated with the 'U' interface. Organisations concerned with the commissioning and installation of ISDN equipment can profit from the NT and TE simulation capability. Companies involved with maintenance and problem solving will find the monitoring and decoding functionality invaluable, especially where NT deregulation has taken place and the aurora's NT 'swap-out' mode can be used. And, of course, the **Aurora**Sonata has protocols for private and proprietary networks enabling engineers to work on any class of ISDN network with the same tool. Even users of ISDN services can use the **Aurora**Sonata to ensure that the services are as expected and as an arbitration tool in the event of dispute between different suppliers in their ISDN environment.

# AuroraSonata

*The evolution of ISDN testing*

The design of the **Aurora**Sonata makes it ideal for all applications and conditions that installation and maintenance engineers in the field can experience. This modular approach means that you can configure today for today's needs, and know the tester will develop for tomorrow's. Its software is field upgradable, and new interfaces can be added locally.

Much thought has gone into the actual operating requirements of the tester. The need to have ease-of use has been a major consideration to make the whole testing process quick and simple. The logically constructed menus for configuration and operation are supplemented by single key selections for commonly needed functions, and the pre-configured test suites for service tests definitely save time. The unit's size and design means that virtually any location where it is possible to install ISDN equipment is accessible to an engineer with an

## Simulation & Monitoring. . .

behaving as, and looking at any part of the local network can identify where a problem exists.

### Simulation

The **Aurora**Sonata can simulate on the Basic Rate 'S/T' or 'U' reference points allowing a full combination of TE, NT and LT modes including EOC loopback commands and on the Primary Rate interface in TE or NT mode, either directly on the exchange or at customer premises.

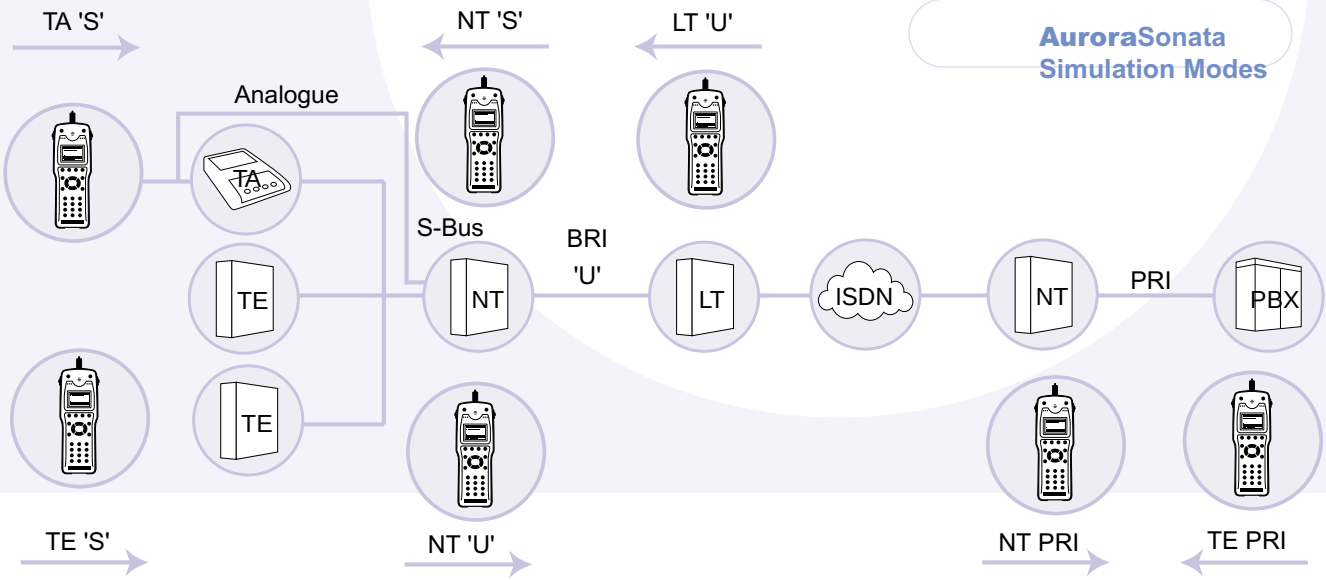
This means the **Aurora**Sonata can test virtually any point on the ISDN. The unique 'One Button Test Suites' can verify B-Channel Provisioning, Line Quality, Teleservice and Supplementary Service availability. Primary Rate simulation offers, in addition, full and outgoing channel tests.

**Multi-channel simulation:**

- B1, B2, Bx channel selection in Basic Rate modes
- Establish up to 30 simultaneous calls in Primary Rate modes

### Monitoring

The **Aurora**Sonata can monitor B-Channel voice and D-Channel signalling on the PRI 'T' and on Basic Rate 'S/T' and 'U' Reference Points, allowing you to trouble- shoot in-service ISDN lines anywhere on the network. D-Channel decode is displayed on screen in real-time and can be saved in memory or downloaded to the **Aurora**Expert for Windows package for detailed analysis.



**NT 'Swap-out' mode** – used where there is access to an NT1 which may be suspected as being faulty. The **Aurora**Sonata may be substituted for the NT to allow D-Channel signalling to be viewed whilst normal call establishment is allowed to proceed.
As part of its diagnostics, the auroraSonata will also display textual cause code reasons and wherever possible, network location thus making the job of problem solving that much easier.

## Physical layer testing

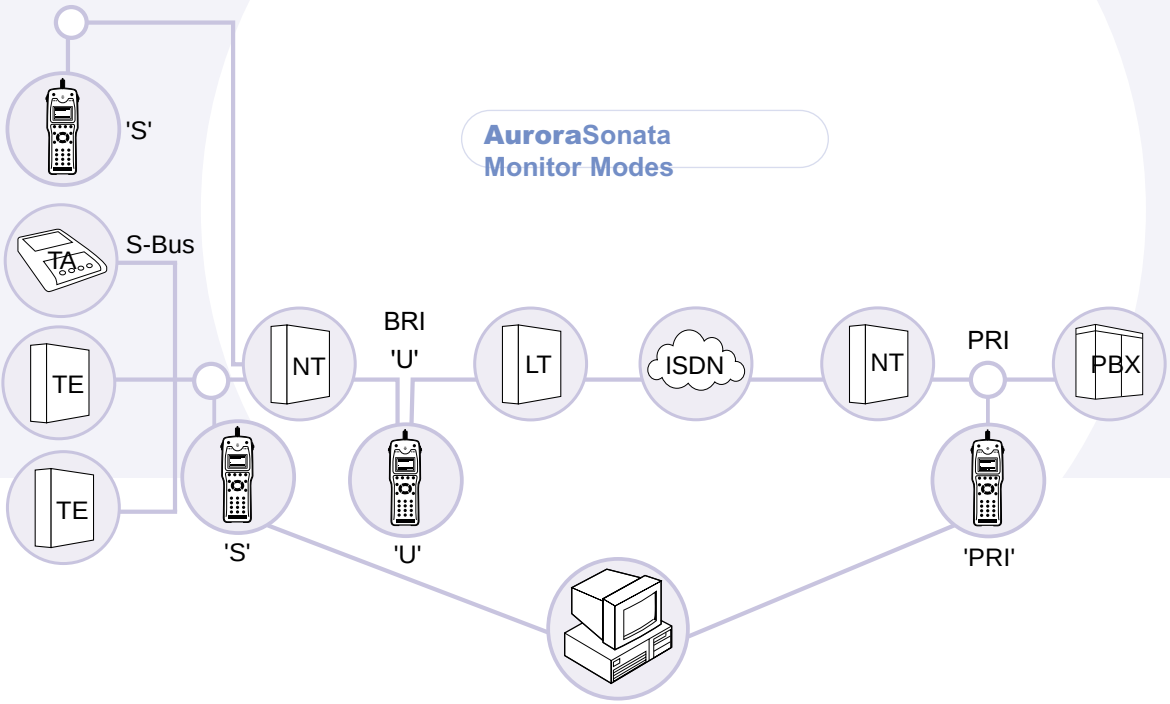
In addition to Context Sensitive LEDs, Layer 1 information is displayed, allowing quick diagnosis of problem circuits. Comprehensive information on current states and number of occurrences of the following layer 1 errors; NOS (No Incoming Signal), AIS (Alarm Indication Signal Received), LOS (Loss of frame Synchronisation), CRC (Cyclic Redundancy Check), E (Number of multi-frames with CRC errors at remote), Slips (Number of frame slips), FAS Error (Number of erroneous FAS words) and HDB3 CV (Number of HDB3 code violations). The content of FAS (Frame Alignment Signal) and NFAS (Non-frame Alignment Signal) words can be viewed. The **Aurora**Sonata has extensive BERT capabilities including simultaneous operation using full bandwidth available.

- Automatic Service Tests suites for one key testing
- Check the line configuration
- Validates operation across all channels

## Teleservice & Supplementary Service Testing

Identifies which services are available on the line under test and therefore those which are not.

Keypad support for * and #; Hold/Retrieve; Call Waiting; Forwarding (CFU, CFB, CFNR); Completion; Closed User Group; Terminal Portability; 3 Party and Conference Calls; Malicious Call ID; Origination and display of Calling Line Identity (CLIP), Connected Line Identity (COLP), Charging information; Validates operation of Direct Dialling In (DDI), Multiple Subscriber Numbers (MSN), User to User information, Alpha-numeric sub-addressing.



## Protocol Monitoring, Trace and Analysis

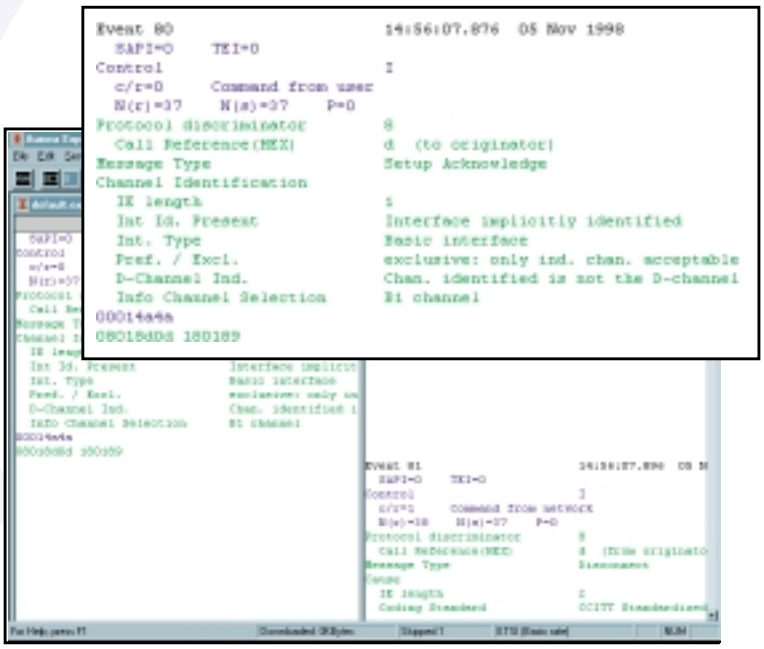
It's not enough to know what is wrong, it's knowing why it's wrong. Capture the awkward, intermittent errors that cause the underlying problems.

- On-screen Real time decode and trace of D-Channel activity provides instant identification of errors. Freeze display whilst continuing to capture data
- Expand mode to view all protocol events
- Onboard storage of data for subsequent analysis with **Aurora**Expert , enables less experienced technicians to collect traces from network
- Filters allow specific protocols to be selected with frame timestamps for accuracy of transmission recording
- Many filter criteria including layer, call reference, SAPI, TEI, and many more to define exactly the required data

## International, National and Private protocols

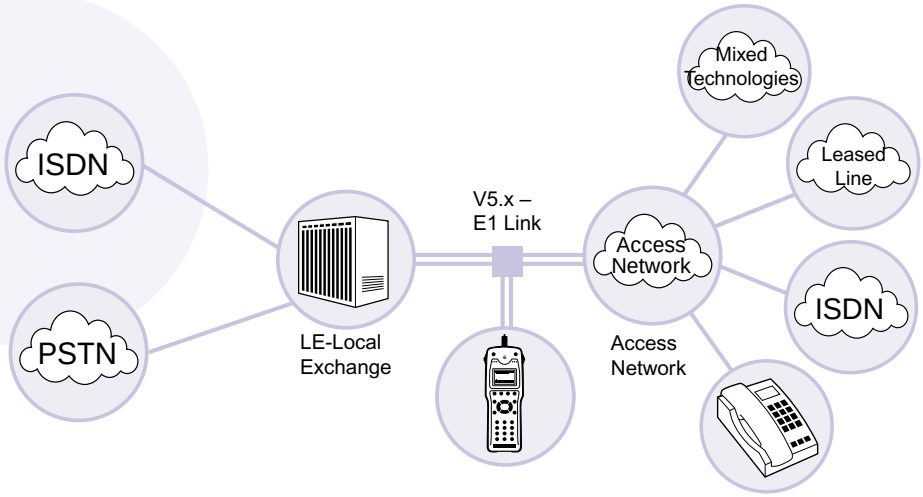
International, National and Private protocols – enables engineers to work on a variety of equipment and mixed protocol networks without using a different tester.

- ETSI, EDDS1-VN, 1TR6, Cornet-T, Cornet-N, Cornet-TS, TN1R6-T, TN1R6-N DASS2, DPNSS, X25



## V5 Protocol monitor

With access networks providing the means to accommodate mixed technologies across multiple E1 spans, monitoring and decoding the traffic over these interfaces is crucial in determining where cross protocol errors may occur.




- Fully decode all V5.1 and V5.2 protocols
- PSTN Protocol, Control Protocol, Link Control Protocol, Bearer Channel Control Protocol, Protection Protocol and the Encapsulated LAPD Protocol (ISDN + X25)
- Decode encapsulated ISDN and X.25 signalling (user signalling)

## HDSL System Testing

With the development of HDSL lines as a medium of transporting Primary Rate ISDN access, the auroraSonata is able to simulate the various components in the system.

- LT, NT and TE simulation
- 1 or 2 pair testing
- Physical testing, such as Attenuation and SNR
- Test functions and features of Primary rate payload
- NT Swap-out

## Advanced POTS facilities

The **Aurora**Sonata enables the engineer to test and monitor POTS circuits. The functionality provided here is not simply to identify POTS circuits but to actively test their operation, in many cases relieving the need to carry additional test equipment.

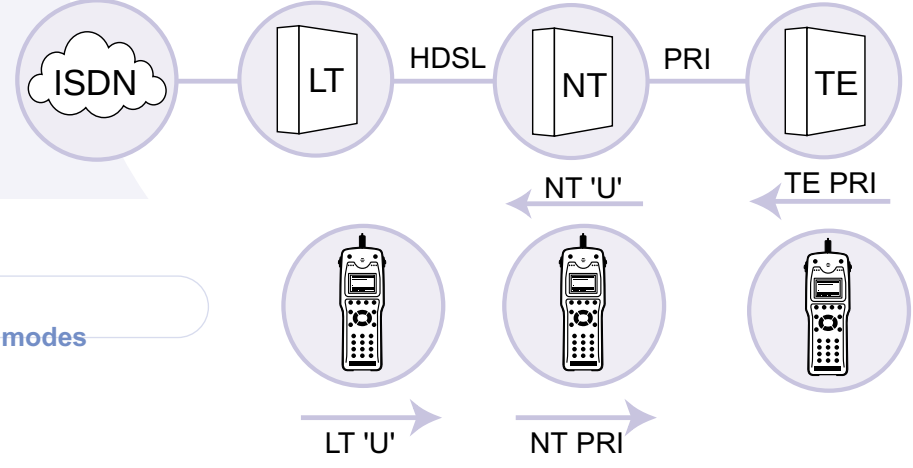
The **Aurora**Sonata will simulate POTS terminal equipment onto the network, providing incoming and outgoing call facilities, capturing the call detail and providing review/decode of those captured details.

- Called party Number facility provides for both on and off-line editing
- Call Information: CPN
  CLI (where available)
  Charging
  Line Voltage
  Ringing Voltage
- Tracer Support for local decode, **Aurora**Expert and Debug

The engineer will be able to monitor audio on POTS circuits through the inbuilt speaker.

## Multiple Interface capability

Needed for combined BRI/PRI operation, POTS, and 'U' interface monitoring. Selected physical interface is indicated by LED at the base of the unit.




**AuroraSonata**
**HDSL Simulation modes**

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Distributor

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



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# AuroraSonata

| | | |
|---|---|---|
| **Physical Measurement** | Voltage measurement across common mode pairs | Display G.703/G.704 statistics and FAS/NFAS word |
| **Voice** | 3.1KHz and ISDN voice calls on user selected B-Channel. With manual or automatic answer. | |
| **Data** | Automatic answer. Wide range of Teleservices. Auto/Manual Bit Error inject. Loop of Receive to Transmit data. | |
| **Test Length** | 10 secs, 1 min, 15 mins, 1 hr, continuous User defined. | |
| **Test Pattern** | 8 selectable & user defined | |
| **Results: (Displayed as per G.821)** | Bits received, Bit Errors, Bit error ratio, Errored seconds, Error Free seconds, Severely Errored Seconds, Unavailable Seconds, Degraded Minutes, Elapsed time, Sync losses | |
| **Protocol** | Display of call progress and textual explanation of clear/fail causes. Monitor and Tracer facility giving time stamped three layer decode to screen or printer port. | |
| **Interfaces** | S/T: 192Kbps to ITU 1.430 | ITU G.703 2.048Mbps |
| **Connectors** | RJ45 connector | 75ohm unbalanced/120ohm balanced RJ45 |
| | FCC 68 4-4 for external clock | |
| | RJ11 for audio input/output | |
| **Clocking** | Recovered from line. Internally generated. Generated from external source. | Transmit clock recovered from received data. Internally generated 2.048Mbps ± 10 ppm. Supplied from external source Coding HDB3, CRC4 on/off. |
| **U Interface (Individual hardware required for each different interface)** | 2B1Q, 4B3T, Up0 | |
| **Indicators** | Line Activation Status<br>Battery Charge/Low Level<br>BERT Sync<br>HDB3 Status<br>CRC4 Status | |
| **POTS I/F** | DTMF identifying the most recently received tones<br>CLASS identifying the last received V23 encoded CLI or call waiting CLASS service<br>CHARGE counting the number of charge pulses received<br>Line Voltage<br>DATA (absent or present) showing data outside the normal audio frequency range for voice has been detected on the line | |
| **Display** | Backlit display 21 characters by 8 lines | |
| **RS232** | Asynchronous selectable to 115.2Kbps | |
| **Ethernet** | 285mm(l) x 100mm(w) x 87mm(d) | |
| **Size** | 1.1kg with single interface | |
| **Weight** | -15oC to 55oC | |
| **Operating temperature** | -25oC – 70oC (ETSI 300 019 – 1-1 class 1.2) | |
| **Storage temperature** | IP22 - water ingress Drop test - 2m | |
| **Humidity** | Rechargeable NiMH battery. Supplied with 220/240 VAC to DC adaptor. | |
| **Case design** | Large Carry Case | |
| **Options** | Phantom Power Feed boxes | |