The evolution of ISDN testing
auroraSonata

The Trend auroraSonata represents a significant advance in the capability of ISDN testers. Conceived as an all purpose test tool, it acknowledges the requirements of a world-wide customer base. It has the functionality to meet and surpass the field technician’s growing demands on an ISDN Installation and Maintenance Tester.

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

designed for the field

◆ Rugged, butt style, weather proof and scratch resistant construction, designed to withstand a 2 metre drop;
◆ Low cost of ownership designed in
  – Flash memory for field upgradable software;
  – Modular construction to make functional expansion quick and simple;
◆ Powered by a rapid recharge battery for maximum usage
◆ Environmentally aware manufacturing – constructed from recyclable materials
◆ Voltage protection from dangerously high line voltages

easy to use

◆ Large, 8 line x 21 character backlit LCD screen with Windowed User Interface for the ultimate in operational simplicity
◆ User definable One Button Test Suites and on-the-fly call set-up parameters for the ultimate in speedy testing
◆ Comprehensive set of LED indicators for on-the-spot analysis of line status
◆ Soft Key function selection allowing rapid access to commonly used functions
◆ Real-time decode window always available for instant verification of signalling status
◆ Context sensitive help giving instant assistance

operational modes

The auroraSonata integrates the simulation and monitoring functionality needed by the technician to provision or trouble-shoot networks in the shortest possible time.

◆ ISDN TE mode to simulate TE and verify ISDN service provided at the customer’s site
◆ ISDN NT mode to simulate and verify operation of the Network Termination
◆ ISDN LT mode to simulate exchange operation
◆ Real-time Decode on ‘S/T’ and ‘U’ reference points for on-the-spot trouble shooting in Simulation or Monitor Modes
◆ Voice and Data calls with BERT capability for verification of line quality
◆ Comprehensive Supplementary Service support available in standard package
◆ Multiple protocols available per unit
Bi-directional high speed RS232 serial port for Decode and test result outputs and upload of software for upgrades

Real-time date and time-stamp feature for BERT results and D Channel Decode

NT ‘Swap-Out’ mode – preparing for the advent of NT liberalisation

Unattended Mode with Call Back option allowing remote testing functions

Cause Code Location display to identify where problems occur in the Network

Displayed line voltage detection and measurement

Compatibility with auroraExpert for Windows for Full analysis of D Channel Signalling and call statistics

**applications**

The auroraSonata is a “Go anywhere” tester. Its rugged construction places it equally at home in the Switch rooms of a Service Provider, the wiring closets of users, or the inhospitable subground and field conditions where cabling and junctions can be installed.

**A tool for the line installer**

- Rapid one-button checks in TE mode for the verification of line configuration, channel availability, service availability and line quality
- NT ‘S’ mode simulation to check the operation of S-Bus connections
- NT ‘U’ mode to check the quality of the U-interface local loop
- Unattended operation enables the technician to position test units strategically to aid identification of non-localised faults – a one-operator function
- LT mode to qualify local loops in absence of Exchange Line Cards

**A tool for the Equipment Provider and Maintainer**

- Use the auroraSonata to validate pre-delivery configuration of Terminal Equipment without attaching to the network avoiding expensive calls to the Network
- Use NT mode to check operation of Terminal Equipment following installation before final connection to the Network
- Use of the Real-time monitor and decode to isolate intermittent protocol problems or non-recognisable errors

**A tool for the ISDN End User**

- Easy and intuitive to use for all IT personnel
- Pre-emptive testing for ISDN backup applications
- Use as an arbitration tool when confronted with operation problems regarding line versus terminal equipment to identify problem source
Test Measurements

**Physical:** Power Source detection and voltage measurement (normal and restricted), Line Activation Status

**Voice:** Up to 18 teleservices on all B Channels. DTMF Tone Generation. A Law and Mu Law encoding.

**Data:** G.821 BERT with Error Injection. Variable duration – 10s, 1 min, 15 min, 1 hr, continuous, user defined. Displays Error Free Seconds, Errored Seconds, Severely Errored Seconds, Bit Error rate, Unavailable Seconds. In addition prints Bit Count, Error Count, Sync Loss Count, Degraded Minutes with timestamps via RS232.

**Protocol:** Realtime Display of D-Channel Decode in Simulation and Monitor. Decode via RS232 for output to Printer, PC or auroraExpert for Windows. Display of CLI, COL, CPN, charging and other supplementary service information.

Physical Specification

- **Weight:** 1.1kg with S interface
- **Dimensions:** 285mm(l) x 100mm(w) x 87mm(d)
- **Screen:** 61mm x 41mm, 8 rows x 21 chars
- **Keypad:** 4 “Soft” Function keys, 10 Alphanumeric keys plus * and #, SCROLL keys plus ENTER, 6 dedicated keys for Power On, Hands Free, Escape, Channel, Select Shift and Window Select
- **LEDs:** ISDN Activation States, Error Detection, D Channel Status, Battery Low, BERT Sync, Active interface
- **Electrical Interfaces:**
  - **RS232:** Bi-directional 8 pin mini DIN socket operating at 2.4, 9.6, 19.2, 38.4, 57.6 or 115.2 Kbps
  - **Power:** DC inlet 14v input from AC/DC charger/adaptor. Normal operational power provided by NiMH battery
- **Operational conditions:**
  - Temperature Operating: -15°C to 55°C
  - Storage: -25°C to 70°C
- **Memory:** 200Kb Flash memory for decode storage, expandable to 2Mb

Standard Equipment

- Trend auroraSonata unit with software including simulation, monitoring, supplementary service support
- Rechargeable battery pack
- Lightweight universal AC/DC power adaptor/charger
- Operating manual
- Carry case
- 2 year warranty

Options

- Luxury Carry Case
- Spare 4Ah Battery
- Auxiliary power box for ‘S’ Bus powered Terminal Equipment
- Auxiliary power box for ‘Up0’ Bus powered Terminal Equipment
- Vehicle charger adapter
- Menu Language
- User upgrade language
- RJ45 T-Piece for monitoring
- auroraExpert for Windows decode package

To arrange a demonstration or to obtain more information on the Trend auroraSonata or any of Trend’s other test equipment, contact your nearest Trend Distributor.

Trend Communications reserves the right to change this specification without prior notice.

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auroraSonata - Basic Rate Specification

The auroraSonata with the Basic Rate Options provides the ISDN technician with the capability to identify any problem associated with the Basic Rate Integrated Services Digital Network.

This rugged unit has been designed to be used within any environment experienced by the field technician from line installation to pre delivery configuration and intermittent fault investigation on Terminal Equipment.

Basic Rate Configurations

The auroraSonata is modularly designed so it can be made available in a wide variety of configurations to meet your Basic Rate test requirements. A full range of configurations and operation modes are offered:

- **‘S’ only** for NT/TE Simulation and Monitoring on the ‘S/T’ reference point
- **‘S+U’** for ‘NT Swap-Out’ Mode, NT/TE Simulation and Monitoring on the ‘S’ reference point, NT/LT Simulation on the ‘U’ reference point
- **‘Dual U’ interfaces** for NT/LT Simulation and Monitoring on the ‘U’ reference point
- **‘U’ only** for NT/LT emulation on the U reference point

Operating Modes

*Simulation*

The aurora can Simulate on the ‘S/T’ or ‘U’ reference points allowing a full combination of TE, NT and LT modes. This means the auroraSonata 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.

- **TE Mode.** Simulates the TE towards the NT and ISDN on the S/T Reference Point and can verify ISDN service provisioning and availability.
- **NT ‘S’ Mode.** Simulates the NT on the ‘S/T’ Reference Point and verifies operation of TE without making expensive calls into the ISDN.
- **NT ‘U’ Mode.** Simulates the NT towards the exchange on the ‘U’ Reference Point and verifies operation over the twisted pair ‘local loop’.
- **LT Mode.** Simulates the LT on the ‘U’ Reference Point in absence of an Exchange Line Card. EOC commands loop the NT to perform local loop tests.

*Monitoring*

The auroraSonata can monitor voice and D Channel Signalling on the ‘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 auroraExpert for Windows package for detailed analysis.

- **‘S/T’ Monitoring.** Connects passively to the ‘S/T’ Reference Point for trouble shooting between the TE and the NT.
- **‘U’ Monitoring.** Connects actively to the ‘U’ reference point as a ‘U-Interface Repeater’ for trouble shooting between the NT and the Exchange.

*NT ‘Swap Out’ Mode*

‘NT Swap Out’ Mode allows you to troubleshoot faulty NT1s. By Replacing a suspected faulty NT1 it is possible to view the D-Channel Signalling on the screen in real-time, whilst normal call establishment is allowed to proceed over the Network.
Protocols

Up to 7 protocols may be held in the aurora\textsuperscript{Sonata} at a time making the aurora\textsuperscript{Sonata} truly versatile for use around the World.

- ETSI with SwissNet, BTNR and EDSS1 variations
- ITR6
- VN4
- TN1R6-T & TN1R6-N
- CorNet-T & CorNet-N

Supplementary Services

- Comprehensive Supplementary Service Support (Protocol Specific): Multiple Subscriber Numbering, Direct Dial In, CLIP, COLP, Subaddressing, Call Hold, 3 Party Call, Conference Call, Call Forwarding, Call Deflection, Explicit Call Transfer, Call Completion Busy Subscriber, Call Waiting, Malicious Call Id, CLIP(R), COLP (R), Terminal Portability, Closed User Groups, Keypad Stimulus Protocol, Advice of Charge, User to User Signalling.

Additional Basic Rate Features

- One Button Tests including X.25 TEI, Supplementary Services, 18 Teleservices, Channel Availability and Configuration, Line Quality (BERT)
- X.25 Packet test capability for B and D channel X.25 with throughput test capability
- 2 simultaneous Voice/Data Calls with \textbf{128k BERT} – Prove line quality using BERT even with lines only configured to use speech teleservices
- Context Sensitive LEDs
  - Activation state of the BRI ISDN
  - D Channel Activity indication
  - NEBE/FEBE error detection and indication on 2B1Q
- On Screen Layer 2 and \textbf{3 status indication} and incoming call B channel indicator
- \textbf{Line Voltage Measurement} and Display for Power Source 1 and 2
- Call Screening on CLI and CPN ensuring correct TE identity
- Number Type and Plan
- \textbf{10 number store} for CPN Recall
- External NT \textbf{Clock Input} on ‘S’ interface
- 40Khz Tone generation for TIMS test
- ‘S’ & ‘U’ interface \textbf{Power Feed option} – Test devices which normally depend on line power

BERT patterns

- Binary 0, binary 1, 1:1, 1:3, 3:1, 63 pr, 511 pr, 2047 pr

Physical Connections

- ‘S’ Interface – 8 Pin RJ45
- Clock Input Connector on ‘S’ interface – 4 Pin FCC68 4-4
- ‘U’ Interface – 4 Pin FCC68 4-4

Interfaces

- ‘S/T’ Interface to CTR 3
- 2B1Q ‘U’ Interface to ANSI T1.601, ETSI ETR 080
- 4B3T ‘U’ Interface to ETSI ETR 080

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