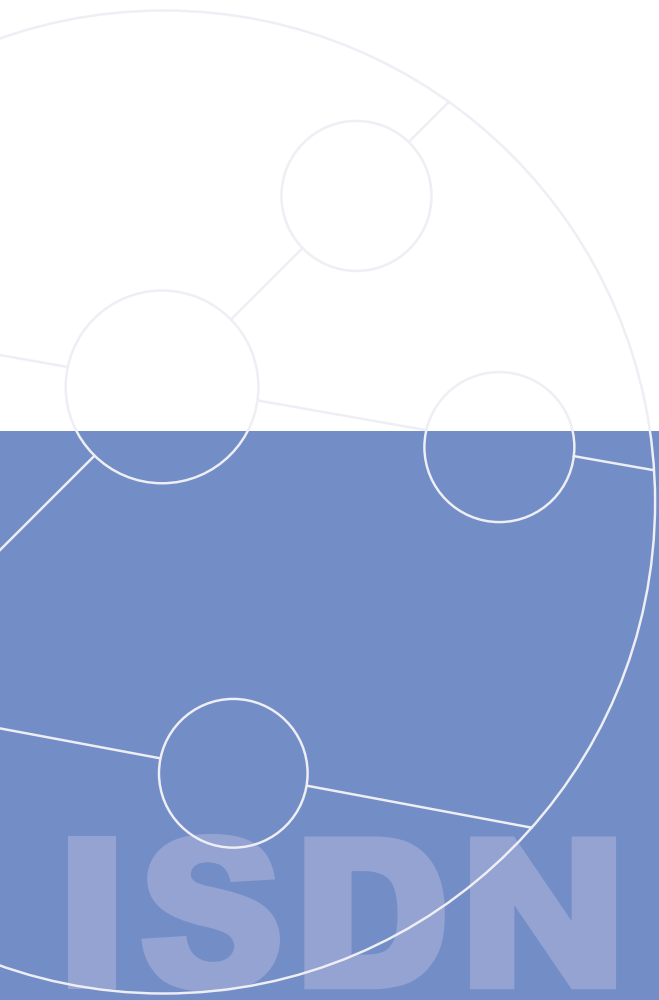


# AuroraTango



Quick Service Qualification



ISDN  
ADSI

*with a single keypress*

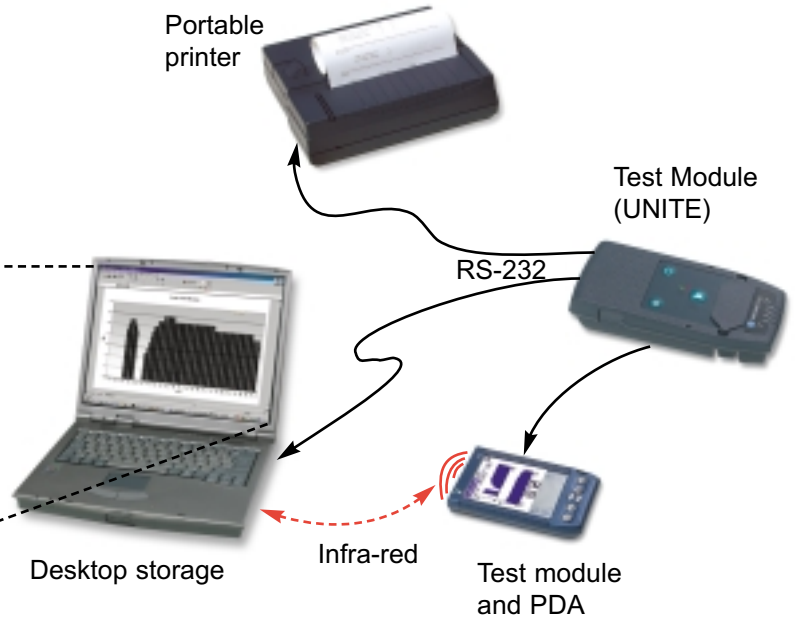


**Trend**Communications

# Verification at a glance

ISDNResults SESS2	
Statistics SESS1	
Upstream Downstream	
Attained BR	960kbs
Fast BR	960kbs
Interleaved BR	0kbs
Noise Margin	6dB
Output Power	3,5dBm
Attenuation	12dB
Rel Capacity	100%

ADSL and ISDN results



Save, print or transfer the test results to the office, to store or to analyse

## Easy operation

To test and validate an ADSL or ISDN service it is no longer necessary to carry a laptop with power adaptor and a bag full of hardware and accessories.

Replace all of these with an Aurora Tango - your hand-held personal test assistant.

Aurora Tango performs a fast and effective test in any environment to provide a definitive PASS/FAIL result.

A comprehensive report containing all of the critical ADSL or ISDN parameters may be printed or exported and saved for future reference.

### ADSL facilities:

- ADSL statistics: Bit Rate, Noise Margin, Power, Attenuation, Relative Capacity
- Up/Downstream counts: FEC, HEC, CRC, BER
- Carrier load: bits per tone
- Noise per carrier: dBm per tone
- Event trace: timestamp, command/response, event

ISDN Test Service Report 27/09c/01	
<b>ADSL Test Service Report 27/09c/01</b>	
Customer:	Mike Smith / 01494 548932 33 Shelburne Road 1287 267 High Woodbe, UK
Operator:	Robert Don Patrice
Modem:	G.DMT
**** PASS ****	
ADSL Statistics: Up Down	
- Bit rate (kbit/s)	956 0564
- Fast BR (kbit/s)	0 0
- Noise Margin (dB)	6.0 14.0
- Attenuation (dBm)	4.6 12.8
- Relative Capacity(%)	100 80
Counts: Up Down	
- FEC	3 5
- HEC	3 5
- CRC	3 5
Bit Errors:	
- Fast bit error	3
- Fast seconds	1
- Interleaved	3
Carrier Load	
001:001 002:001 003:002 004:002	
.....256:007 256:001	
Noise per carrier	
001:000.04 002:110.57 003:115.42	
.....256:109.00	
Trace Direction Event	
52:09:19 Command:Req Noise Test Request	
52:14:15 Response:OK Noise Test Passed	
52:16:16 Command:Req Open Request	
52:17:18 Response:Can Seeking ATU	
Service Level Agreement	
Appendix 1	

## Powerful solution

Any test performed with Aurora Tango can be interpreted at two levels:

- 1) PASS/FAIL result where a LED indicates if the test has been passed according to defined thresholds
- 2) Report analysis, once the test has been completed, on PDA screen, printed or transferred to a PC

Aurora Tango test report is key to the Service Level Agreement

### ISDN facilities:

- BRI with "U" and "S/T" interface
- Automatic Configuration and testing (B-channel usage, service availability,..)
- ISDN and X.25 call handling
- Q.931, X.25, LAPD trace
- Supplementary Services test (MSN, DDI, CLIP/CLIR, COLP/COLR, AOC, CFU/CFNR/CFB, SUB, UUS1...)
- BERT analysis

## Results downloads

A formatted report may be printed, saved in a File, or sent to the office with the PDA.

The Customer Service Dept. will get the report in a compatible format that allows further processing on a PC.

# Modularity

*a concept taken to the edge*

The modular architecture of Aurora Tango covers the requirements in today's extensive test environments. It provides for technological evolution without a large financial outlay.

## A PDA as the user interface?

Aurora Tango gives you the choice of three different user interfaces:

- a) a colour PDA
- b) a monochrome PDA
- c) simple one-button operation using the internal keypad.

Using a PDA allows you to integrate test processes with company applications. Carry your testing schedule on the tester.



Modular architecture keeps you abreast of state-of-the-art testing



## Universal Test Engine

The UNiversal Test Engine (UNITE) is the 'heart' of Aurora Tango.

UNITE provides one-button operation using the keypad with Test and Print buttons. The Test report together with the status LEDs and the Pass/Fail indication provides enough information to produce detailed report.

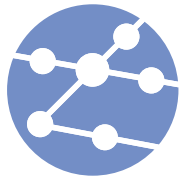
## Test modules

The growth of access technologies requires the handling of different test applications and therefore calls for different test equipment for most of the installers and service engineers.

The Test modules can be swapped to give the user full flexibility in using the Aurora Tango as a multi-service test tool.

Secure your future investment by simply upgrading the Aurora Tango with a suitable test module.

- Modularity is the guarantee for your investment
- The PDA provides an advanced touch-screen interface
- UNITE supplies the test performance
- Test modules keep abreast of the latest in test technology



# Aurora Tango ISDN

*All you need for rapid ISDN maintenance*



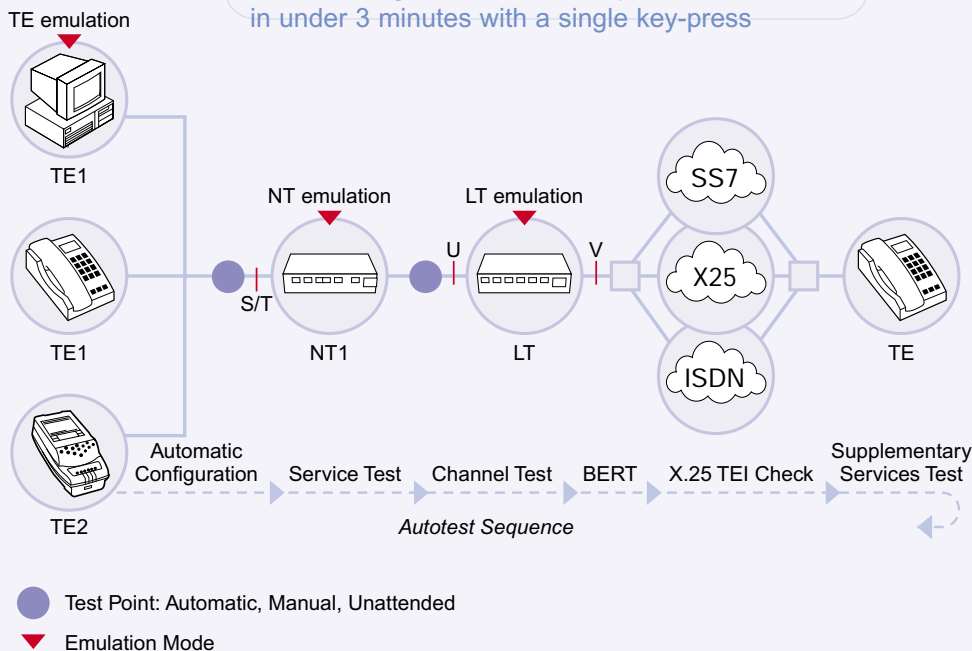
ISDN is a well-established circuit-switched technology that provides subscribers with a range of bearer services for voice and data. One of reasons ISDN is so successful is its ability to handle different types of traffic - voice, fax, internet and so on. There is a large installed base of ISDN lines, and even with the emergence of newer technologies ISDN is still in demand, often as an additional service to ADSL.

Aurora Tango is a cost-effective, easy-to-use, hand-held tester designed for use by technicians installing and maintaining the ISDN network. Aurora Tango connects to the Basic Rate Interface, and can emulate both terminal equipment and the network.

## ISDN service qualification

- Create scripts to run a customised collection of tests by pressing a single button
- Choose your test mode - performs automatic tests or allows you to connect calls and perform tests manually
- Configuration Profiles allow you to set up, save and use common configurations
- Automatically detects the line configuration - no manual configuration needed
- Unattended mode - leave Aurora Tango connected on site and use it as a Remote Loop box
- Tracer - capture, save, and view detailed protocol information
- PDA provides an optional user interface with test software linked to standard PDA functions
- Without PDA - provides simple one-button testing
- Field upgradable hardware/software

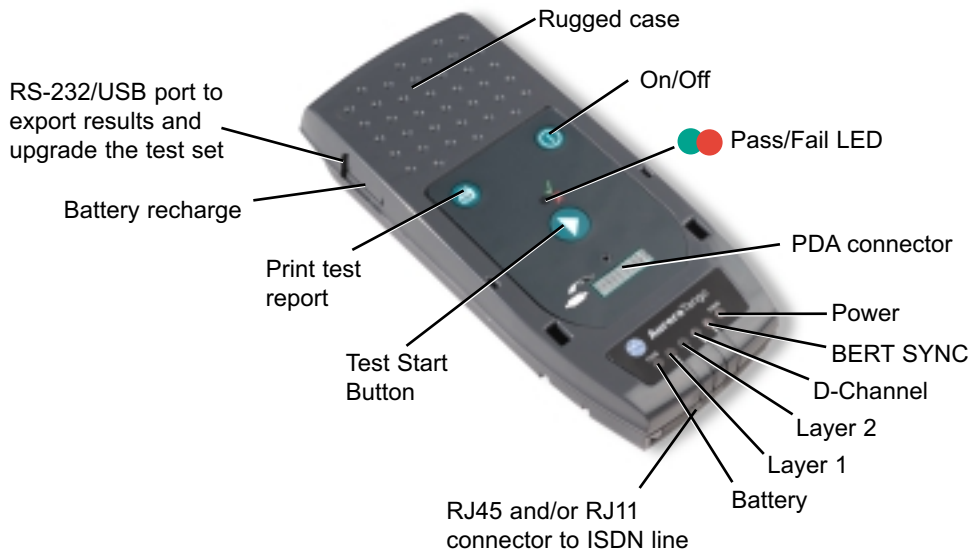
**Aurora Tango verifies the complete ISDN service in under 3 minutes with a single key-press**



# ISDN quick installation

and Service Verification

**Aurora Tango ISDN**  
UNiversal Test Engine



## ISDN service qualification

Aurora Tango is easy to use, it is ideal for a user with no specialist skills. The Autoconfig feature means that the user does not have to configure the instrument to match the line. On the other hand it can execute a number of test sequences in order to verify any ISDN installation. This means that operation is simple plug and test. Technicians can also develop alternative test scripts enabling Aurora Tango to execute additional test sequences.

Aurora Tango provides you with an affordable multi-service platform for testing and installing both ISDN and ADSL. Aurora Tango gives you flexibility of having one tester that can be used for various technologies and the ability to upgrade to a new technology at a later date. The PDA gives you the facility of managing your daily work schedule.

## Plug and test

Aurora Tango enables you to test both ISDN network and Terminal Equipment, and emulates a full range of ISDN calls.

The test strategy enables you to run pre-configured tests. Three steps are needed to test the ISDN service:

1. Connect Aurora Tango, to the network,
2. Press the Test Start button,
3. View the result.

If you are using the test set with a PDA, the results can be viewed directly on the screen of the PDA. In one-button mode a "Test Complete" indication is given by LED and a detailed report can be printed.

- Specific test for any ISDN installation
- No TE, NT, laptop, or plug socket needed for a full ISDN emulation and analysis
- Test from the customer premises through local exchange to remote end
- Autotest, easy indication and interpretation of results
- Diagnostic information enabling a systematic location of faults
- Test report available within seconds for on site or further analysis
- Indoor and outdoor operation

## Easy to set up

Configuration Profiles allow you to set up and save all the settings needed to connect to ISDN. Aurora Tango is supplied with pre-defined Configuration profiles and you can add your own profiles for specific uses, for example for testing fixed links. The Configuration profiles mean that the line configurations you often use are never more than a click away - just choose them from a list.

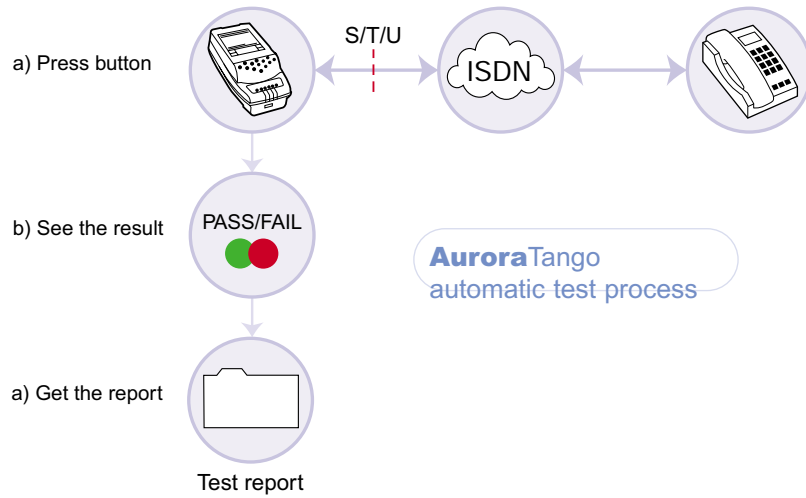
# Maintenance

and troubleshooting

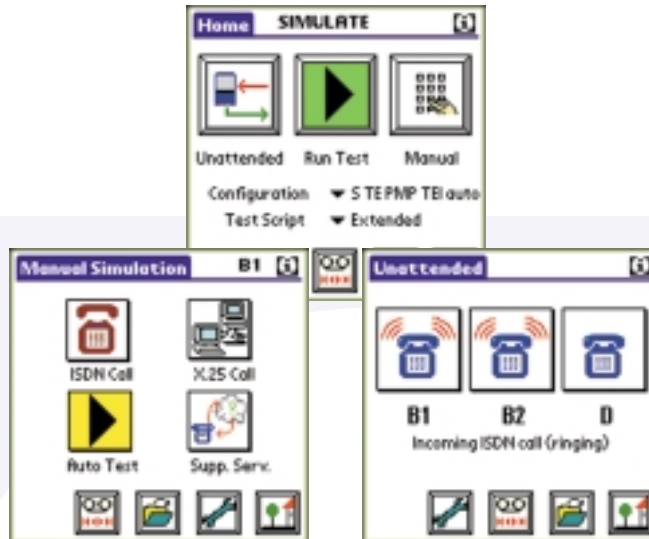
## Full Range of Tests

At the local exchange the test can be customised to define specific qualification criteria. A full range of tests designed for installing or maintaining an ISDN line are provided to verify and approve the ISDN service.

Aurora Tango enables you to use pre-defined test scenarios or choose your own set. The test scripts enable you to set up different types of test and include them in a sequence. This can then be selected from a list and run by pressing the test start button. The following tests can be combined in a test script.



- Auto-Configuration to match the line
- Bearer service test to identify which bearer services are available on the line
- BERT analysis to test the line quality
- B-Channel availability test
- Supplementary Services test (Optional)
- X.25 TEI Testing (Optional)



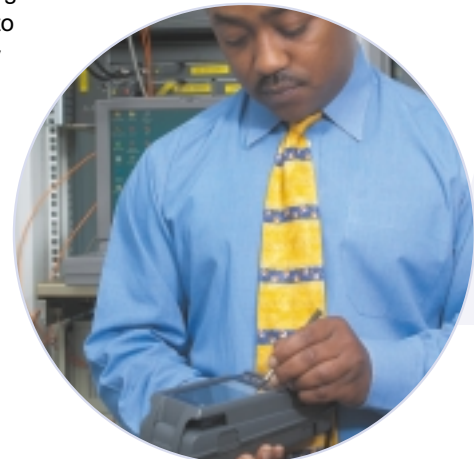
## Manual Tests

Manual tests are sometimes what is needed - when you know the test you want to run or if you have run a range of tests and want to re-run a particular test for detailed analysis. Aurora Tango enables you run all the automatic tests as manual tests. It also enables you to connect ISDN calls and X.25 calls.

## Traces

Aurora Tango's tracer runs in the background whenever Aurora Tango is being used. This enables you to save and later view traces of any calls or tests.

The traces generated by Aurora Tango can be transferred to a PC in different formats for further analysis. They are also compatible with the PC decode software, Aurora Expert.

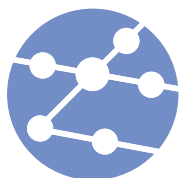


## AuroraTango ISDN

<b>Relevant Standards</b>	Euro-ISDN (ETSI), VN*, X.25* D-channel
<b>Interfaces</b>	S/T interface: RJ45/FCC68 4-8 U interface (2B1Q, 4B3T): FCC68 4-6
<b>Functionalities</b>	TE, NT* and LT* three layers emulation Autoconfiguration function to match line parameters
<b>Operating modes</b>	“One-Button-mode” of the selected test script with Test Complete indication and test report generation Up to 5 programmable test scripts PDA mode provides access to customise the test scripts, detailed test results and improved file system
<b>Test modes</b>	Auto-test mode: executing the selected test script Manual mode: test a line with a defined test set Unattended mode: auto-answer to incoming calls with tone generation, loop back function on the B channels and call back function
<b>Protocol analysis</b>	Euro-ISDN (ETSI), VN and X.25 protocol three layer trace
<b>Error injection</b>	Off, 1 in 10 <sup>2</sup> , 1 in 10 <sup>3</sup> , 1 in 10 <sup>4</sup> , 1 in 10 <sup>5</sup> , 1 in 10 <sup>6</sup>
<b>Line test</b>	BER test (0s, 1s, 1:1, 511pr, 2047pr, user-defined for 8 and 16bits) G821 performance (BER, EFS, ES, SES, US, DM, Sync Loss, Elapsed Time)
<b>Bearer Services test</b>	Speech call, 3.1kHz audio, Data 64kbit/s, Fax Gr2/3, Fax Gr4, 3.1kHz telephony, 7kHz audio, 7kHz telephony, Teletext, Videotext 64, Videophone on the selected B-Channel
<b>Voice test</b>	ISDN voice calls on user selected B-Channel. With manual or automatic answer (Suitable for the local and remote BRI installations)
<b>Channel Services test</b>	Speech, Data or both in B1 and B2 channels. (Suitable for the local and remote BRI installations)
<b>Sup. Services test*</b>	AOC-D, AOC-E, CLIP, CLIR, COLP, COLR, SUB, UUS1, CFU, CFB, CFNR
<b>Protocol Analysis</b>	Decode and Analysis at Layer 1, Layer 2 and Layer 3 including: Euro-ISDN (ETSI), VN or X.25 D-channel Call progress and textual explanation of clear/fail causes Export facilities of the three layers trace for external software analysis like Trend's Aurora Expert
<b>Results Storage</b>	5 test reports in “One-button-mode” With PDA more than 60 test reports Call history (10 calls)
<b>Service Reports</b>	Printing and transfer of results onto a PC. Includes customer and result details of all selected tests
<b>Languages Interface</b>	language can be chosen from English, French, German, Italian, Spanish
<b>Safety and Environmental</b>	Storage ETS 300 019-1-1, Transportation: ETS 300 019-2-2, Operating ETS 300 019-1-7 EMC: Radiated and Conducted Emission EN55022, Immunity: EN55024 Electrical Safety: EN60950 Temperature: Operating 0°C to +45°C, Storage -25°C to +70°C
<b>LEDs</b>	Charge, Layer 1 status, Layer 2 status, D-channel activity, BERT synchronisation, Power, Test Completed/Not Completed
<b>PDA</b>	Handspring Visor™ Prism: 16-bit colour, active matrix LCD, 8MB memory, rechargeable Handspring Visor™ Solo: monochrome, active matrix backlit LCD, 2MB memory, rechargeable
<b>Ergonomic</b>	PDA: 120x75x20mm, 0.2kg ADSL test module: 210x90x27mm, 0.3kg Universal Test Engine: 210x90x52mm, 0.5kg Power supply: NiMH rechargeable battery pack, or 12V DC from mains conversion

\* = optional





# Aurora Tango ADSL

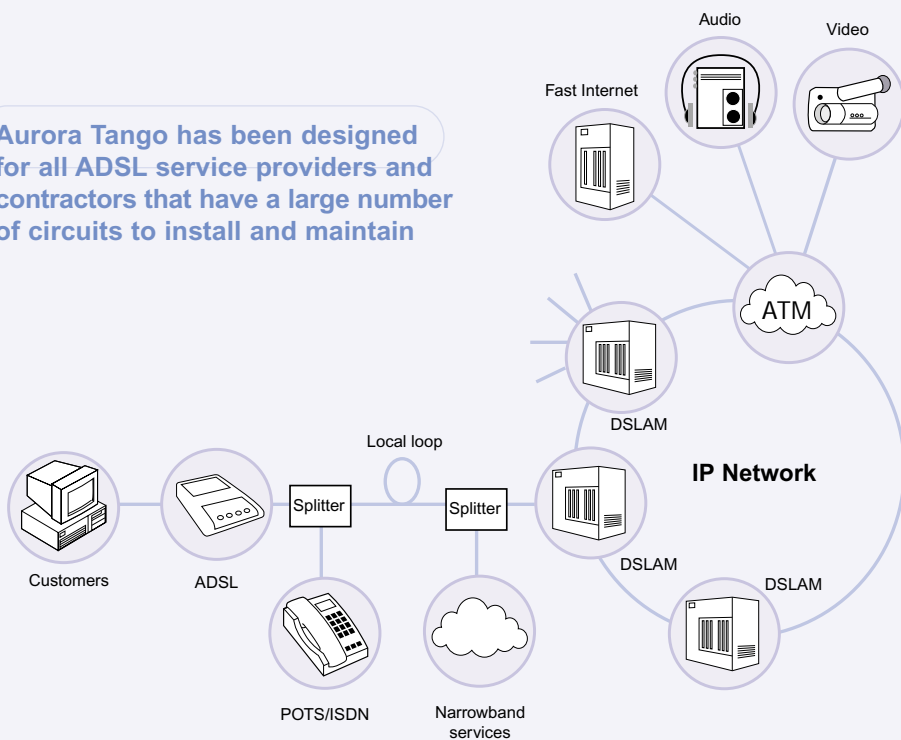
*All you need for a rapid ADSL roll-out*



ADSL is the most cost-effective system to connect residential users and medium sized business using the existing copper wires. ADSL maintains the existing narrow-band services while opening the new broadband market.

Aurora Tango is a modular hand-held tester designed to assist in the volume deployment of ADSL to residential and business customers. Aurora Tango emulates an ADSL modem in ATU-R operation towards the DSLAM. Aurora Tango confirms the promised ADSL service, identifies its performance and analyses its quality.

**Aurora Tango has been designed for all ADSL service providers and contractors that have a large number of circuits to install and maintain**



- Fast validation of the committed ADSL/POTS or ADSL/ISDN service
- One-button PASS/FAIL test from pre-configured parameters
- Determine the QoS with a concise report of bit rates, bit errors and physical performance
- Check the complete circuit from customer premises through the DSLAM up to the ISP
- PDA provides an optional user interface with test software linked to standard PDA functions
- Training and synchronisation including time-stamped protocol, alarm trace and user selectable time-out.
- ADSL installation, verification and confirmation of customer Service Level Agreement
- Field upgradable hardware/software

# Quick ADSL

*Installation and Service Verification*

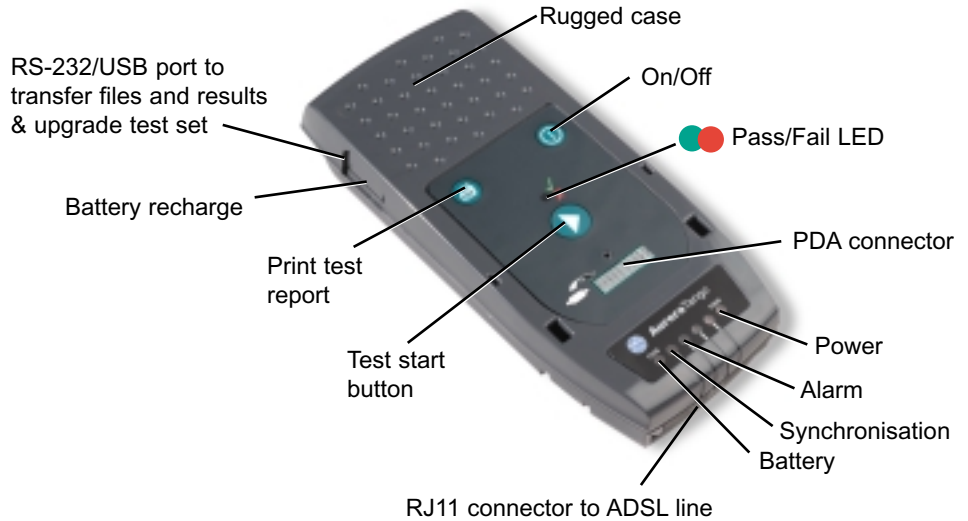
**Aurora Tango**  
UNiversal Test Engine

## ADSL qualification: plug and test

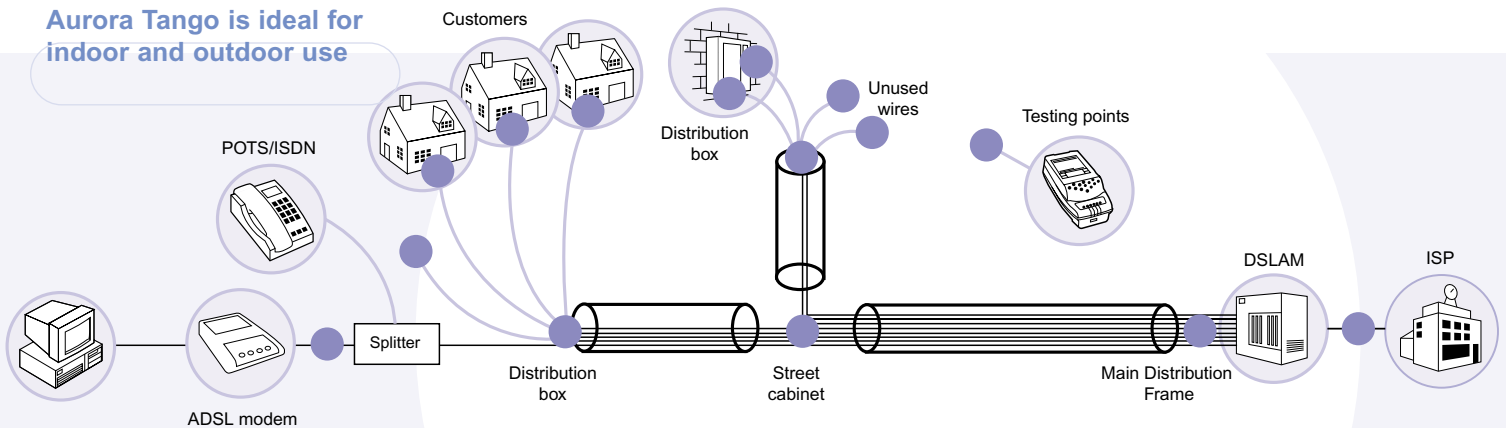
Most ADSL lines are pre-qualified using modelling that assumes the line properties without testing the physical and electrical parameters.

Aurora Tango allows the verification of the copper loop by means of the key digital and analog parameters that govern ADSL service.

Just connect to the line at the customer premises and within seconds you will know its capability to provide the level of service required. If necessary, every circuit in a bundle can be tested in this way until the loop has been fully qualified.



**Aurora Tango is ideal for indoor and outdoor use**



## Service Level Agreement

ADSL providers may offer different levels of service depending on the customer requirements or their commercial strategy.

Aurora Tango can generate a service test report which can be identified with a specific customer showing the details of the promised ADSL service.

The test report can be used as the basis of the Service Level Agreement document, once signed by both customer and the ADSL service provider.

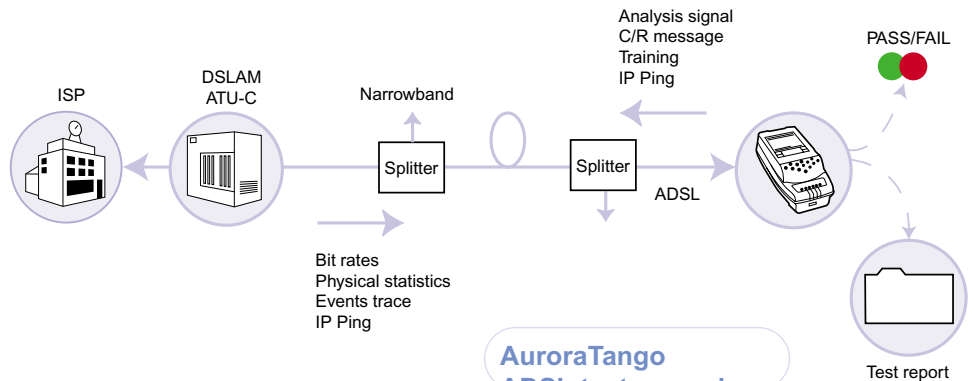
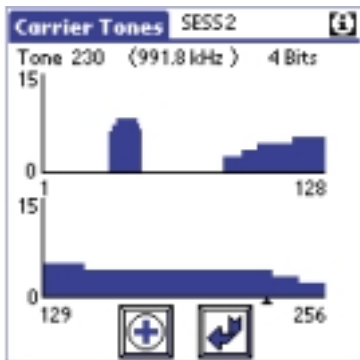
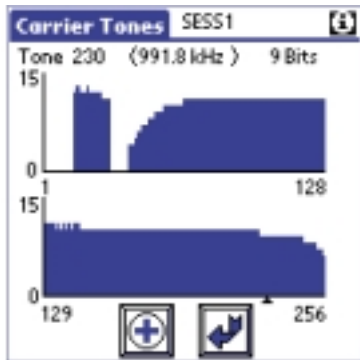
- Indoor and outdoor operation
- No modem, laptop, or electrical socket needed for a full ATU-R emulation and analysis
- Test from the customer premises beyond the DSLAM to the ISP
- Autotest, easy indication and interpretation of results
- Diagnostic information enabling a systematic location of faults
- Test report available within seconds for on-site or further analysis
- Set up tests for any specific ADSL installation

## Test selection

Aurora Tango can store and execute a number of test profiles in order to verify any ADSL installations.

At the local exchange the test can be customised to define specific qualification criteria.

# Maintenance and troubleshooting



## AuroraTango ADSL test procedure

## Physical Layer testing

Aurora Tango analyses the ADSL Physical layer performance, identifying the causes of reduced bit rates.

Aurora Tango analyses the complete 256 ADSL DMT tones to provide reports of load, and with Alcatel systems, noise as well.

The tone analysis provides a powerful troubleshooting tool that allows immediate identification of the fault.

## IP Ping & Trace Route

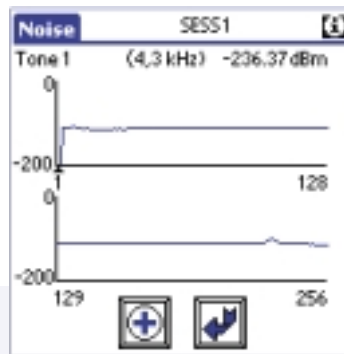
Aurora Tango is able to send Ping messages using either IP address or DNS Client address and to check the way through the network with Trace Route functionality. It supports PPPoE and PPPoA for service authentication.

## DSLAM synchronisation

Attach Aurora Tango to the circuit, press Start, and it will contact the ATU-C modem. It then starts the training phase when synchronised with the DSLAM.

A timestamped trace is generated of the Command/ Response sequence and other events to track the training process.

A list of error codes are provided to interpret the failure causes.



## Bit Error Count

Aurora Tango generates dummy cells to calculate the line bit-error count between the ADSL transceivers ATU-C and ATU-R.

The Bit Error analysis operates on both Fast and Interleaved channels, providing a count of Errored Seconds during the test period.

- IP Ping over ADSL plus support for PPPoA and PPPoE
- Bit rates, Relative Capacity, Noise Margin, Attenuation, Output power
- Command/Response and Events trace
- Training sequence against the ATU-C
- Up/downstream counts FEC, HEC, CRC
- Carrier tone analysis: load [bits/tone] and noise<sup>(1)</sup> [dBm/tone]
- Time-stamped protocol and events trace for easy tracking and fault identification

<sup>(1)</sup> Only Alcatel chipset



Time	Dir.	Event
01:02:03	R>C	Open Request
01:02:03	R<C	Open
01:02:03	R>C	Close Request
01:02:03	R<C	Close
01:02:03	R>C	Idle
01:02:03	R<C	Connect. Closed
01:02:03	R>C	Connect. Opened
01:02:03	R<C	Seeking RTU

## AuroraTango

<b>Chip Set</b>	Alcatel DynaMiTe™ and ADI for ADSL/POTS and ADSL/ISDN	
<b>Relevant Standards</b>	ANSI T1.143 ITU-T G.992.1 (G.DMT) Annex A and Annex B ITU-T G.992.2 (G.Lite)	
<b>Connectors</b>	ADSL Line: RJ11 - FCC68 4-6 Serial Port: RS232/USB -mini Din (8pin)	
<b>Operating Mode</b>	Single-button mode with Pass/Fail indication (one-button test) PDA mode provides access to customise the thresholds, detailed test results and improved file system Auto-test mode executing auto-configuration function to line parameters Expert mode: test a line with a defined test set identified by a test profile	
<b>ADSL threshold PASS/FAIL criteria (up/downstream)</b>	User definition of PASS criteria based on one from a combination of these parameters - Attained bit rate [kbit/s] - Relative capacity [%] - Fast bit rate [kbit/s] - Interleaved bit rate [kbit/s] - Noise margin [dB] - Attenuation [dB] - Output power [dBm]	
<b>ADSL , cellstream and bit error statistics (up/downstream)</b>	Forward Error Correction (FEC) Header Error Checksum (HEC) Cyclic Redundancy Check (CRC) Fast bit error Interleaved bit error Fast errored seconds Interleaved errored seconds	
<b>ADSL Physical Analysis</b>	Noise Margin [dB] Output Power [dBm] Attenuation [dB] Carrier Load: upstream and downstream capacity per tone 256 x [tone:bits] Carrier Noise (Alcatel Chip Set only): upstream and downstream noise per tone 256 x [tone:dBm]	
<b>Synchronisation with the ATU-C</b>	Trace primitives:	Open, Close, Connection Opened, Open rejected, Open fails, Close rejected, Signal lost, Open request
	Events:	Loss of Signal, Loss of Frame, Loss of Power, Loss of Cell Delineation Fast, Loss of Cell Delineation Interleaved, Loss of Margin User-selectable time-out for for seeking and training phase [1m up to 5m]
<b>IP Ping &amp; Trace Route</b>	PPPoE and PPPoA support DNS client support Fixed and network IP address resolution User authentication	
<b>Safety and Environmental</b>	Storage: ETS 300 019-2-1, Transportation: ETS 300 019-2-2, Operating: ETS 300 019-2-7 Safety: EN60950 Temperature: Operating 0°C to +45°C, Storage -25°C to +70°C CE Mark: Directive 1999/05/EC	
<b>PDA</b>	Handspring Visor™ Prism: 16-bit colour, active matrix, backlit LCD, 8MB memory, rechargeable Handspring Visor™ Solo: monochrome, active matrix backlit LCD, 2MB memory, rechargeable	
<b>Ergonomic</b>	PDA: 120x75x20mm, 0.2kg ADSL test module: 210x90x27mm, 0.3kg Universal Test Engine: 210x90x52mm, 0.5kg 6 LED indicators: Power, Charging, ADSL Synchronization, Alarms 1 Pass/Fail Test LED when using without PDA Power supply: NiMH rechargeable battery pack, or 12V DC from mains conversion	



Trend Communications Ltd  
Knaves Beech Estate  
Loudwater, High Wycombe  
Buckinghamshire  
HP10 9QZ, United Kingdom

## TrendCommunications

International: +44 (0)1628 524977  
United Kingdom: 01628 524977  
France: 01 69 35 54 70  
Deutschland: 089 32 30 09 11  
España: 93 300 3313  
India: 022 859 7463  
US: 256 461 0790  
Email: [infoline@trendcomms.com](mailto:infoline@trendcomms.com)  
Web: [www.trendcomms.com](http://www.trendcomms.com)

A Member of the Telemetrix plc Group



Distributor

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

Trend **Aurora** is a registered trade mark of Trend Communications Ltd.

All other Trade Marks are acknowledged as the property of their respective owners.