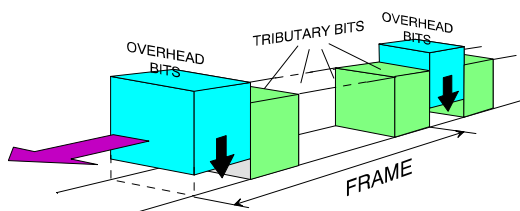


# AT-2048 Datacom / Wander

*the Path to Excellence*

**The AT-2048 is the ultimate tester designed specifically for field engineers that are installing, commissioning and trouble-shooting E1 and Datacom circuits.** The AT-2048 has been designed and manufactured by ALBEDO Telecom in Barcelona and is a brand new platform incorporating the latest available electronics. Consequently you will enjoy top performance, high accuracy and, of course, a very competitive price.

The AT-2048 analyzer is a simple to use, rugged handset, equipped with a full colour GUI specifically designed for field use for the analysis and maintenance of telecom circuits. Its comprehensive performance includes framed and unframed signalling, drop and insert Nx64Kbps, data and jitter into any time slot.



Moreover, the AT-2048 also provides the markets most complete variety of E1 line status, transmission events, performance testing, BERT, monitoring, results, remote control and configurations. In other words, this equipment has been designed to match the performance and budget over five continents.

## Best in town

The AT-2048 is a very powerful and fully featured tester and we have two good reasons to justify this point: (a) our architects have designed more E1 testers than any one else, (b) based on latest technologies available in 2010, you will manage easily to execute any verification, whether it is - channel test, alarm report, quality monitoring, faultfinding or signalling verification

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**“Low Cost, Fully Featured and High Performance in E1, Datacom, and Jitter testing”**

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Friendly and rugged, the AT-2048 is presented in a compact case and equipped with all interfaces to reach every point of the network topology.

Have a look and try this flexible tool, you will love it after discovering how the latest FPGA can overcome previous limitations in accuracy, space or performance. Honestly, nothing else can really be compared with this outstanding update to E1/Datacom/Jitter testing.



# Simply the Best

Designed and manufactured in Barcelona, this instrument is 100% *Made in Europe* and equipped with the latest components in the industry including a long life battery, TFT full colour 480x272 touch screen, SD memory, USB and Ethernet port, Smart serial 26p DTE/DCE ports. Moreover, it has also adopted the state-of-the-art technology in FPGAs, ergonomics, GUI, and testing methodologies. Honestly, nothing compares with the AT-2048.

## Excellence

After such extended experience, we can at least say we understand field technician needs. The AT-2048 is an excellent tester for network operators, contractors and enterprise users that have to manage fixed and mobile networks that are using E1 and Datacom backhaul circuits. Your engineers will require a minimum training for installation and commissioning.

can carry out both framed and unframed tests on a wide range of equipment. The AT-2048 E1 and data tester provides a scalable test solution for E1 and data testing applications, supported by a large range of software options for E1 services and sub rate multiplexing system.

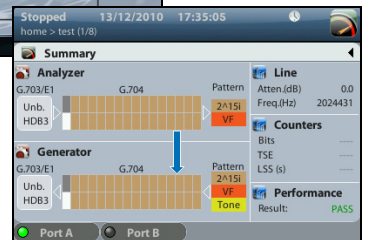
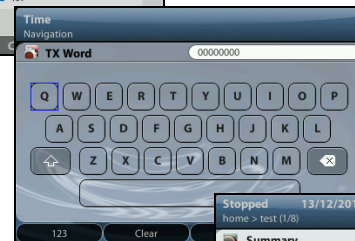
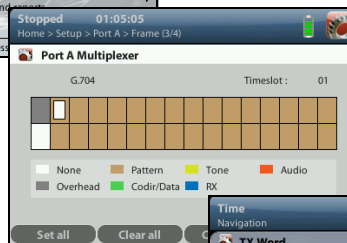
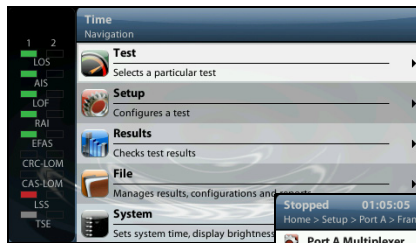
It allows for rapid evaluation of circuits through a user interface with an auto configure feature. For large, clear results the screen employs a full set of physical layer tests for E1 balanced and unbalanced circuits including BERT, VF, round trip delay and signal level. Upgradable software via an integrated USB interface is offered. Some important functions include:



Designed and Manufactured in Europe

## Highlights

The AT-2048 reports and generates all events to verify your circuit performance, including frequency level and other functions to ensure a healthy support of any customer applications. The E1 frame defines a cyclical set of 32 time slots of 8 bits that can be analysed in detail including a list of event reports and graphics such as logs, chronograph and histograms for maintenance. The time slot 0 is devoted to transmission management and time slot 16 for signalling; the rest were assigned originally for voice/data transport. All of them can be tested with PRBS, Fixed Code and 16-bit user word.



- Multi-interface capability: V.24/RS232, V.11/X.24, V.35, V.36/RS449, G.703 (2048/704kbit/s), G.703 co-directional,
- ITU-T G. 821, G. 826, and M. 2100 performance analysis,
- Collection of call records from remote locations,
- CAS signalling generation and monitoring,
- Extensive error and alarm generation,
- VF tone generation and measurement,
- Frequency, clock slip and level measurement,
- Jitter measurement,
- Pulse mask representation.

## Top Featuring

The robust, handheld E1 and data tester is used for installation, commissioning and maintenance of digital networks. It



(C) ALBEDO TELECOM



Internet Access  
 Mobiles  
 IM S  
 Data Links  
 Leased Lines  
 Synchronization

## E1 Applications

E1 is still probably the best and most reliable standard established in telecommunications. It is so widely deployed that it will last for many years to come.

### E1 testing market

This market has plenty of new opportunities including traditional applications such as voice, data, synchronization and leased lines, plus the new challenging architectures that combine E1 circuit with Carrier-Ethernet and IP.

### Voice and Data

E1 systems are perfect for voice transfers. The E1 connection has the capability to handle up to 32 voice conversations at once. The 2 Mbit/s circuit is widely used to connect millions of users attached to a PBX, base stations, satellite and microwaves links, with main exchange supporting voice and signalling of any standard including ISDN, POTS, VoIP and IMS.

### Synchronizacion

Most of the mobile base-stations rely on E1 backhaul connections then synchronization is not an issue.

When transport is migrated to Ethernet/IP packets, then mobile networks use to maintain the E1 circuits to achieve the levels of synchronous timing and frequency needed.

### VoIP over E1

Voice over packets uses compression techniques to maximize available bandwidths that are often transported by E1 lines. For instance, audio codec's like the G729a, very popular in WANs, uses E1 to handle up to 107 simultaneous calls interconnecting the new VoIP solutions by means of TDM circuits.

### TDM emulation

The network convergence has moved Service Providers to carry native E1 TDM traffic transparently across the packet switched network (PSN), using various circuit emulation techniques. The TDM traffic is encapsulated in Ethernet or IP frames to emulate the functionality of a TDM circuit, ensuring that all original feature sets are preserved. The AT-2048 will ensure that the jitter, typical of packet networks, is compliant with ITU-T O.172..



Smart Cisco Data Cables

(C) ALBEDO TELECOM

#### BENEFITS

- Designed in 2011
- Ultra high performance
- Double Port
- Extra rugged but lightweight
- Hand-held 1kg
- Longest battery life
- All in one: E1, Data, Jitter
- High value - low cost
- Very High accuracy

#### KEY FEATURES

- Wander measurement
- Pulse Mask
- Field tester extra rugged
- Cisco Data Cables
- Upgradable
- Battery Operated
- 2xUSB & RJ45Ports
- Multilanguage

#### USERS

- E1 installers
- Mobile business
- Fixed line operators
- E1 Datacom Maintenance
- Laboratories and plant
- Academics and Education
- ISDN service
- Synchronization networks
- Defence links

E1 testing	
Standard	<ul style="list-style-type: none"> <li>ITU-T G.703 compliant (pulse)</li> <li>ITU-T G.823 compliant (jitter)</li> </ul>
	<ul style="list-style-type: none"> <li>Port A: Coaxial Pair Impedance: 75 Ohm BNC unbalanced and 120 Ohm RJ-45 balanced</li> <li>Port B: Symmetrical Pair Impedance 120 Ohm RJ-45 balanced</li> <li>Analogue voice frequency audio port.</li> <li>Coaxial Pair Impedance: 75 Ohm BNC unbalanced</li> <li>Return Loss: compliant 0.162</li> <li>Receive Sensitivity: 0 dB to -43 dB</li> <li>Receive Timing Range: 2.048MHz, data or clock, nominal and PMP -20dB</li> <li>Additional balanced secondary E1 port 0 to -6dB, nominal and PMP -20dB</li> </ul>
Input Modes	<ul style="list-style-type: none"> <li>Operation: Terminal, Through and Monitor</li> <li>Impedance: &gt;1000 Ohm</li> </ul>
Line	<ul style="list-style-type: none"> <li>Bit Rate: 2048 Kbit/s <math>\pm</math> 3ppm</li> <li>Codes: HDB3 / AMI</li> </ul>
	<ul style="list-style-type: none"> <li>Unframed</li> <li>PCM31: FAS / FAS+CRC4</li> <li>PCM30: FAS+CAS / FAS+CRC</li> </ul>
	<ul style="list-style-type: none"> <li>Internal Timing: 2.048 MHz <math>\pm</math> 25000 ppm</li> <li>External Timing</li> <li>Recovery from RX Timing (Loop Timing)</li> </ul>
	<ul style="list-style-type: none"> <li>Multiple standard, non-standard PRBS, and user defined patterns</li> <li>Transmit Error Rate</li> <li>Force Single Error: Bit, Frame, CRC, and BPV (Bipolar Violation)</li> </ul>
	<ul style="list-style-type: none"> <li>G.826, G.821, and M.2100</li> </ul>
	<ul style="list-style-type: none"> <li>RTD and VF tone generation</li> </ul>
	<ul style="list-style-type: none"> <li>Alarms and errors count, and generation</li> </ul>

Datacom	
Interfaces	<ul style="list-style-type: none"> <li>Smart Serial 26p DTE / DCE ports</li> <li>V.11/X.24, V.24/V.28, V.24/V.35, V.24/V.11 (V.36/RS449), EIA530 and EIA-530A</li> <li>Codirectional according G.703</li> <li>Rate: 50, 60 bit/s, 1.2, 2.4, 4.8, 8, 9.6, 16, 19.2, 32, 48, 72, 128, 144, 192, 1544 kbit/s</li> <li>N x 56 kbit/s (N=1 to 27); N x 64 kbit/s (N=1 to 32), up to 10 Mbit/s</li> </ul>
	<ul style="list-style-type: none"> <li>DTE, DCE emulation and monitor</li> </ul>

Jitter & Wander	
Standard	<ul style="list-style-type: none"> <li>Overpass 0.172</li> </ul>
Features	<ul style="list-style-type: none"> <li>Jitter level, tolerance, transfer</li> <li>Event detection</li> <li>100% digital based generation and analyzer</li> <li>Wander Generation and Measurements (TIE, MTIE, TDEV)</li> <li>Wander results from 20 to 100 000s</li> </ul>

Pulse Mask	
Pulse characteristics	<ul style="list-style-type: none"> <li>Meets ITU G.703</li> <li>PASS / FAIL function</li> <li>Graphic display scope</li> </ul>
	<ul style="list-style-type: none"> <li>Nominal 2.37V for Coaxial Pair 75 Ohm</li> <li>Nominal 3.00V for Symmetrical Pair 120 Ohm</li> </ul>

Ergonomics	
Ergonomics	<ul style="list-style-type: none"> <li>Instant-On (the equipment measures immediately after power on)</li> <li>Display 480 x 272 TFT full color screen</li> <li>3xUSB, 3xEthernet ports,</li> <li>Fast Recharging time of Batteries that provide continuous working for 16 hours (two packs) or 8 hours (one pack)</li> <li>AC Power Adapter Input: 100 ~ 240 V AC, 50/60 Hz,</li> <li>Operating Temperature 0°C ~ 50° C, Storage Temperature -20°C ~ 70°C, Humidity 5% ~ 95%</li> <li>Soft LEDs: all events at a glance</li> </ul>

