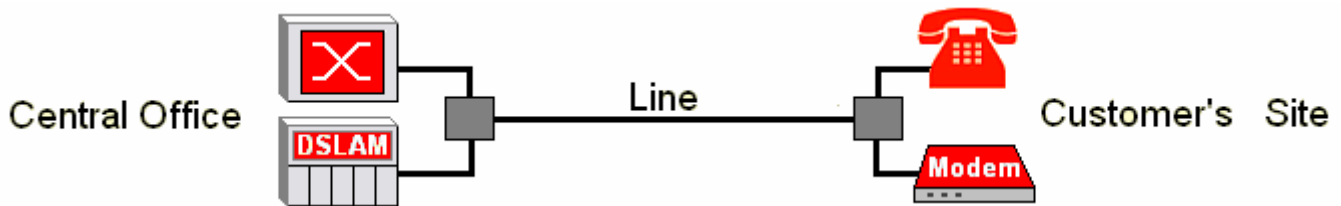## Where is the fault ?

ETET 30 gives the answer !

SIX INSTRUMENTS IN ONE

- **DMM Line Tester**

For the test of the local access line

- **Exchange Simulator**

For the test of the subscriber telephone set

- **Telephone Simulator**

For the test of exchange parameters

- **Golden Modem**

For the test of the xDSL functions

- **Spectrum Analyzer**

For the detection of disturbers on the line

- **High Resolution TDR**

For the location of cable faults.

APPLICATIONS

TELEPHONE & EXCHANGE TESTER ETET 30 is intended to be installed in the central offices for the verification of telephone and xDSL services. In case of service loss it is an excellent tool to find out whether the failure source is within the exchange, the subscriber site or on the line.

MAIN FEATURES

- **DMM Tests**

The DMM tests are aimed to test the line and the exchange when they are separated from each other.

<u>User side DMM test</u>

The user side DMM test consists of DC-AC voltage, insulation resistance and capacitance measurements between the two wires and between each wire and the ground. During these tests the customer's telephone set should be in on-hook state

<u>Exchange side DMM test</u>

The exchange side DMM test consists of loop current measurement and DC-AC voltage measurements between each wire and the ground.

- **Exchange Simulation**

In course of the further investigation, the ETET 30 is operated as an exchange simulator by ringing the subscriber, and with his assistance, can also test the subscriber telephone set. In off-hook state of the customer's telephone set ETET 30 provides loop current, loop resistance, DP and DTMF dialing parameter tests

- **Telephone Simulation**

Assuming that the line and subscriber equipment proved to be faultless, the next step is to test the exchange parameters (such battery voltage, line current), the presence of the dial tone on the line, DC and AC voltages between the two wires and the ground.

The ability of exchange to recognize the arriving dial tones (or pulses) and the ringing voltage sent to the subscriber can be tested by means of a service line.

- **Golden Modem**

The modem of ETET 30 is able to qualify ADSL or VDSL lines installed and connected to the DSLAM. Having synchronized with DSLAM ETET 30 provides useful information about the training process and the state of line:

- Actual bit rate (downstream / upstream)
- Line capacity
- SNR / Hlog / QLN / bit allocation / per tone
- Transmitted power
- Line attenuation
- Line alarms (LOS, LOF, LOP, LOM)
- Line errors (FEC, CRC, HEC)
- Ping test / trace route

Ethernet interface and WiFi-N are provided for PC or other user device connection.

- **Spectrum Analyzer**

In this mode ETET 30 provides disturbing voltage analysis and the detection of ADSL or VDSL modems at the user end.
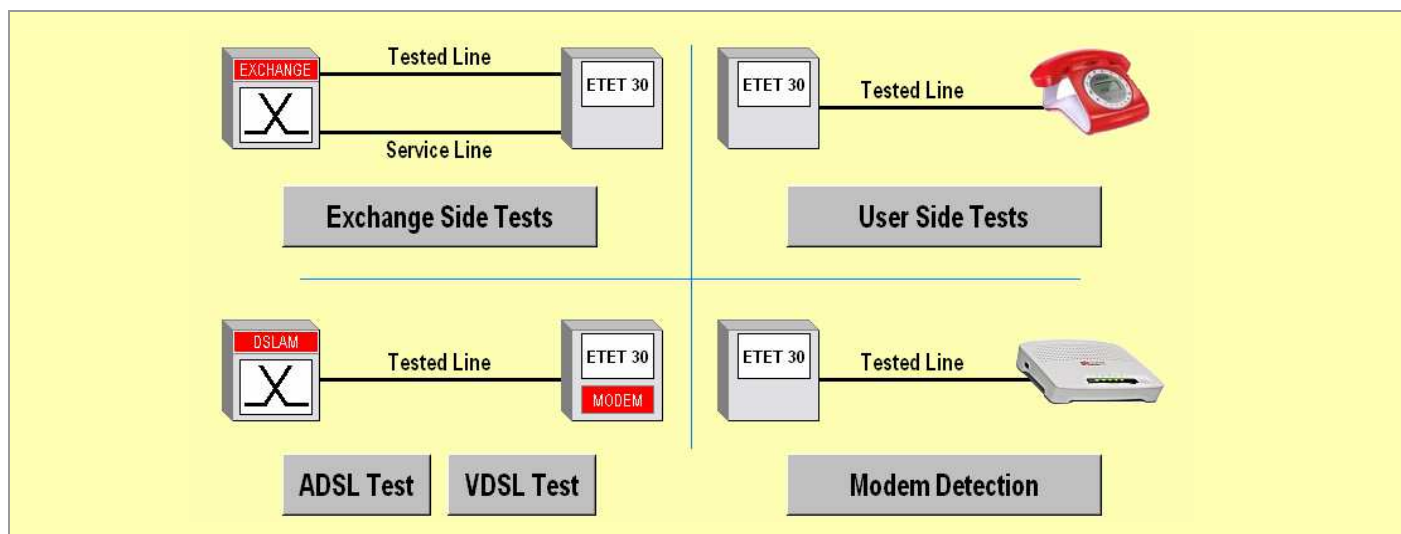
- **TDR**

The TDR of ETET 30 is a powerful tool for trouble shooting providing

- Single line test
- Long time test for locating loose contacts

- **USB Host Port for Data Transfer**

The obtained test results can be transferred to PC for post processing.

TELEPHONE & EXCHANGE TESTER   ETET 30

TEST ARRANGEMENTS

TEST FUNCTIONS

EXCHANGE SIDE TESTS

DMM
- Exchange battery voltage measurement
- Loop current measurement
- Wiring continuity test

TDR
- Cable fault location in the central office

Ringing Test
The purpose of that test is to measure the ringing voltage when the user's number is called.
In this mode ETET 30 sends a test call from the service line to the subscriber's line and indicates the appearance of ringing voltage

Register Test
Sometimes the subscribers complain that they are connected to another subscriber instead of the one they wanted to call. The purpose of that test is to identify the reason of the malfunction
In this mode ETET 30 sends a test call from the subscriber's line to the service line and indicates the appearance of ringing voltage

USER SIDE TESTS

DMM
- AC-DC voltage measurement
- Insulation resistance measurement
- Wiring continuity test
- Capacitance measurement

TDR
- Cable fault location at the access line

Spectrum Analyzer
The purpose of the User Side Spectrum measurement is to get information about the disturbing voltages on the line

Test call
In this mode the subscriber telephone set can be tested in off-hook state with the subscriber's assistance.
The operator should call the subscriber and communicate with him. ETET 30 provides:
- Loudness test with 800 Hz
- Loop current measurement
- Loop resistance measurement
- Dialing parameter test.

ADSL & VDSL TEST

The "Golden" modem of ETET 30 supports the most commonly used connection types

Bridge Mode
The modem provides an ADSL or VDSL link to the DSLAM and connects the LAN segment to the WAN.

Router Mode
In router mode the modem connects to the ISP and makes the authentication if necessary. It acts as a DHCP server on the LAN side and works as a DHCP client on the WAN side. Available connection types: IPoE, PPPoE, IPoA, PPPoA/ADSL only

Test Results
ETET30 shows the main parameters of ADSL or VDSL connection. The detailed line diagnosis helps the experts to verify the problem of a DSL connection.

Ping & Browser Functions
That functions allows ETET30 to check the connection to the ISP on IP level.
The PING utility used to test the reachability of a host on an Internet Protocol (IP) network and to measure the round-trip time of messages
The BROWSER (IE) can be used for retrieving, presenting and traversing information on the World Wide Web

SPECIFICATIONS

USER SIDE LINE TESTS
(With the on hook state of subscriber's phone set)

DMM
Voltage
  DC voltage. ....up to 400 V
  AC voltage .... up to 250 V eff
  Accuracy .... ±3% ±1 V
  Frequency range................................... 15 to 300 Hz
  Input resistance .... 1 or 2 M Ω

Insulation Resistance
  Measuring range...............................10 kΩ to 100 MΩ
  Measuring voltage ....100 V
  Accuracy .... ±3% ±1 kΩ

Capacitance
  Measuring range................................. 10 nF to 10 μF
  Measuring voltage .... 11 Hz, 5 V or 100V DC
  Accuracy ....±3% ±0.3 nF

Test of Continuity
  Resistance threshold ....Selectable
  Indication .... visual and acoustic

Spectrum Analyzer
  Frequency ranges............................. 15 Hz to 600 kHz

Modem detection
  Measuring mode .... Spectrum measurement

USER SIDE TEST CALL
(With the assistance of subscriber)

Loop Test
Loop Current
  Measuring range. .... 1 mA to 0,1A
  Accuracy .... ±3% ±1 mA

Loop Resistance
  Measuring range.................................100 Ω to 1 kΩ
  Accuracy ....±3% ±5 Ω

Loudness Test
  Test tone...800 Hz

Dialing parameter test
  Tone dialing .... The level of tones
                              The frequency of tones
                              List of dialed numbers
                              Duration of key pressings
  Tone dialing ....Brake time
                              Make time
                              List of dialed numbers

DSLAM TESTS

VDSL Compliance
• ITU.T G.993.1 VDSL1
• ITU.T G.993.2 VDSL2 (Profile 8a, 8b, 8c, 8d, 12a, 12b and 17a support)
• Supports VDSL band plan, 997, 998, over POTS
• Downstream up to 100 Mbps
• Upstream up to 45 Mbps
• Rate adoptions
• SRA (Seamless Rate Adoptions)
• UPBO (Upstream Power Back-Off)
• Dual latency support in VDSL mode
• INP values up to 16
• Trellis coding
• PhyR PHY level retransmission technology
• PTM mode
• PPPoE (RFC2516)

ADSL Compliance
• G.992.1 (G.dmt), Annex A compliant
• G.992.2 (G.lite), Annex A compliant
• G.992.3 (ADSL2), Annex A, L and M compliant
• G.992.5 (ADSL2+), Annex A and M compliant
• Reach-Extended ADSL (RE ADSL)
• SRA (Seamless Rate Adaptation)
• Rate adaptation
• ADSL physical connection ATM AAL5 (ATM Adaptation Layer type 5)
• Support multi-protocol over AAL5 (RFC2684/1483)
• PPP over ATM AAL5 (RFC2364)
• PPPoE (RFC 2516)
• MAC encapsulation routing
• Support VC-based and LLC-based multiplexing
• Support up to 8 PVCs
• I.610 F4/F5 OAM

Measurements and displayed information
• Actual bit rate (downstream/upstream)
• Line capacity
• Visualization of SNR /Hlog /QLN /bits /per tone
• Transmitted power
• Line attenuation
• Line alarms (LOS, LOF, LOP, LOM)
• Line errors (FEC, CRC, HEC)
• Ping test / trace route

IP Ping
• Set-up of the remote IP: In URL, IP address format
• Number of PING requests to be sent 1 to cont.
• Size of PING packets   84 to65,535 bytes
• Average response time in msec

EXCHANGE SIDE TESTS

DMM Measurements

Voltage
  DC voltage. ....up to 400 V
  AC voltage .... up to 250 V eff
  Accuracy .... ±3% ±1 V
  Frequency range.................................... 15 to 300 Hz
  Input resistance ....1 or 2 M Ω

Loop Current
  Measuring range. .... 1 mA to 0,1A
  Accuracy. .... ±3% ±0.1 mA

TDR

Measuring Modes
  Single pair short time...L1
  Single pair long time...L1LT

Test Parameters
  Impedance.. 120 Ohm
  Measuring ranges................................16m to 32 km
  Zoom .... 1 to 5
  Gain range...0 to 90 dB
  Pulse Amplitude .... ~3 V
  Pulse width .... 10 ns to 6 µs
  Propagation velocity
  V ....90 to 299m/µs
  V/2 .... 45 to 150 m/µs
  PVF...0.3 to 0.999
  Accuracy..±0.5% ±1m

GENERAL SPECIFICATIONS

Power supply

Voltage ....48 V DC (36 to 72)
Consumption .... app. 36 VA

Display.....................10.4" 800 x 600 color TFT-LCD
with touch screen and backlight

Degree of protection ....IP 40

Over voltage protection

Between a and b or ground.......140V DC+ 140Vpp AC

Connectors and measuring cable

Mouse and pen drive.....................2 pieces of USB 2.0
Ethernet.. 10/100 BaseT
Handset ....RJ 11
Service Line ....RJ 11
Measuring cable........................... 4 pole CAT.III 600V
Power supply................................ PHONIX PC4/3-ST

Mechanical data

Dimensions (W x H x D)................. 380 x 400 x 75 mm
Weight .... app 6 kg

Ambient temperature ranges

Reference...23±5°C
                        Rel. humidity 45% to 75%
Normal operation.......................................0 to +45°C
                Rel. humidity 5% to 95% *(<25g/m^3)
Storage and transport ....–40 to +70°C
                Rel. humidity 95% at +45°C *(<35g/m^3)

* without condensation