



## ADSL Trainer (SMT-411)

This ESOLS Engineering product ADSL Trainer (SMT-411) is a widely used digital subscriber line (DSL) technology that enables high-speed data transmission over conventional copper telephone lines. Unlike traditional voice band modems, ADSL offers significantly faster download speeds, making it ideal for broadband internet access. The "asymmetric" nature of ADSL means that download speeds are higher than upload speeds, making it suitable for applications where users consume more data than they send, such as web browsing, video streaming, and online gaming. ADSL operates by utilizing a wider frequency range on telephone lines while allowing simultaneous voice communication without interference.

To study and test ADSL signals effectively, a specialized bench-top apparatus is available, containing all the necessary components for signal analysis. This apparatus supports various functionalities such as modem emulation, ISP login simulation, and multiple protocol compatibility, including PPPoE and PPPoA. It features a digital multimeter (DMM) for copper line testing, a rechargeable Li-ion battery, LED and beep alarms, an LCD display, and data memory functions. The device is compatible with all known DSLAMs and can connect via RJ11 or alligator clips. Additionally, optional simulation software enhances its testing capabilities, making it an essential tool for professionals

## TECHNICAL SPECIFICATIONS

### Specifications:

- Fast Copper tests with DMM (ACV, DCV, Loop and Insulation Resistance, Capacitance, Distance).
- Supports Modem emulation and simulating login to Internet.
- Supports ISP login (username / password) and IP Ping test (WAN PING Test, LAN PING Test).
- Supports all multi-protocol, PPPoE / PPPoA (LLC or VC-MUX).
- Connects to CO via alligator clip or RJ11.
- Rechargeable Li-ion Battery.
- Beep and LEDs alarm indications (Lower Power, PPP, LAN, xDSL).
- Data memory function.
- LCD display, Menu operation.
- Compliant with all known DSLAMs.
- Software management.
- Simulation Software (optional).
- Power 220V 50 Hz AC.



## Technical Data:

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- DSL Physical layer test.
- Modem Emulation (Replace the user Modem completely).
- PPPoE Dialing (RFC1683, RFC2684, RFC2516).
- PPPoA Dialing (RFC2364).
- Telephone Function.
- DMM Test.
- Ping Function (WAN & LAN).
- Data upload to computer and software management.
- Setup system parameter: backlight time, shut off automatically time without operation, press tone.
- Revise PPPoE / PPPoA dial attribute, user name and password; restore factory value and so on.

## Experimental Data:

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- Asymmetric Digital Subscriber Line (ADSL).
- ADSL Basics.
- Signal Generation Analysis.
- ADSL Signal Spectral Analysis.
- Simulation Based analysis:
  - Framing, Synchronization, Error Detection, Forward Error Correction, Data Interleaving, Convolutional Coding in ATU Transmitters, Trellis-Coded Modulation in ATU Transmitters, Viterbi Decoding in ATU Receivers.
- Spread Spectrum analysis.
- Error test.
  - CRC.
  - FEC.
  - HEC.
  - NCD.
  - LOS.
- DMM Test:
  - DC Voltage.
  - AC Voltage.
  - Loop resistance.
  - Capacitance.
  - Insulation resistance.
- ADSL Modem Emulator.