

# SPIRENT DLS

## SPIRENT PHYSICAL LAYER SOLUTIONS

### DLS-V2E INTEGRATED SYSTEM

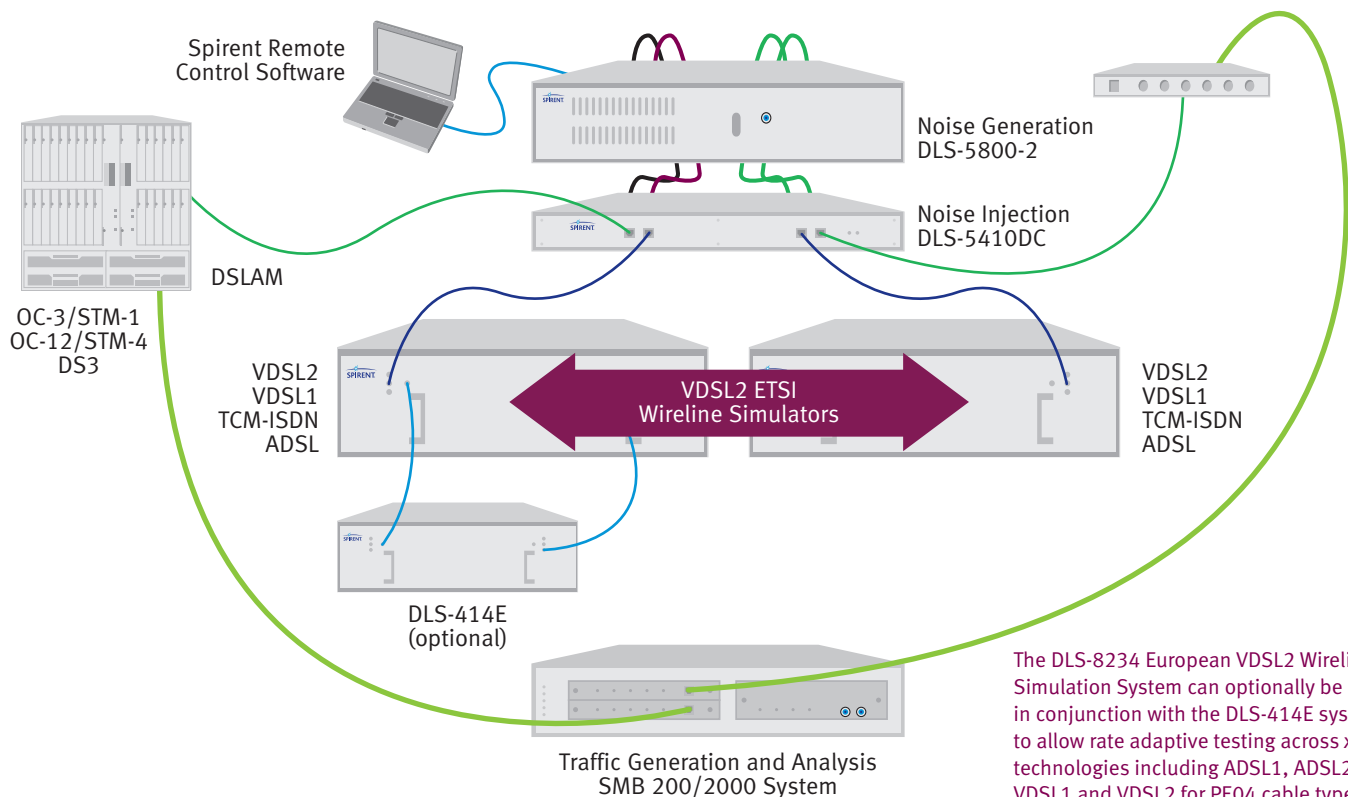
#### European VDSL2 Wireline and Noise Testing Solution

##### OVERVIEW

Increasing demand for high-bandwidth multimedia applications with integrated voice, data and video streams has been driving VDSL deployment. The requirement for high-speed transmission over the traditional copper network has driven the continuous advances in DSL technology. From a standardization viewpoint, this has been reflected in the introduction of the most recent DSL initiative—VDSL2. While VDSL2 is the next generation of VDSL1, it is also designed to ensure compatibility with existing access network solutions such as ADSL, ADSL2 and ADSL2+.

Network equipment manufacturers, chipset designers and service providers seek competitive advantage by being first to deliver reliable products or services to the market. Spirent supports these efforts by providing testing solutions that enable fast results for exacting conformance and performance standards. The DLS-V2E Integrated System, which includes the DLS-8234, DLS-8235 and DLS-5500EV systems, is the most comprehensive and accurate test bed available for VDSL2 applications on copper pair networks. Spirent solution users know that this advantage translates into robust performance, earlier product delivery and greater market share.

#### Physical Layer Test Setup for European VDSL2 Reach Testing including Wireline Simulation, Noise Generation, Traffic Generation and Analysis



The DLS-8234 European VDSL2 Wireline Simulation System can optionally be used in conjunction with the DLS-414E system to allow rate adaptive testing across xDSL technologies including ADSL1, ADSL2, ADSL2+ VDSL1 and VDSL2 for PE04 cable types

The DLS-V2E Integrated System is designed for conformance/performance testing in accordance with ITU-T Recommendation G.993.2. This ensures complete testing coverage that addresses the testing of next-generation multi-functional xDSL chipsets that provide rate-adaptive capabilities across all variations of ADSL and VDSL technologies, including ADSL1, ADSL2, ADSL2+, VDSL1 and VDSL2. The figure below displays the DLS-414E ADSL2+ wireline simulator that, when connected to the front panel input ports of the VDSL2 wireline solution, allows users the option of simulating ITU-T G.992.5 and TR-067 and WTR-100 European test loops. The V2E product set features seamless loop configurations across these various standards while also providing extensive capabilities for testing many other high bandwidth applications such as Ethernet in the First Mile (EFM) Copper, and TR-114 VDSL2 Interop Standard.

## **INTEGRATED VDSL2 EUROPEAN WIRELINE SIMULATOR AND NOISE GENERATOR SYSTEM**

### **Supports VDSL2 Test Loops and Noise Models**

Permits simulation of all loops and noise impairments specified by the ITU-T and DSL Forum. Using this test setup enables the user to be certain that the device under test (DUT) has been designed to achieve peak performance while performing to the specifications of the governing standards bodies. Being able to test to exacting standards and in their own lab enables network equipment manufacturers to develop their product faster and more cost-effectively and, as a result, differentiate themselves from their competition.

### **High Degree of Accuracy**

The DLS-V2E system enables simulation of real-world environments. This provides the user with a high level of confidence that the behavior of the equipment in the field is well understood.

### **Repeatability**

Unlike in-house test setups, Spirent's wireline simulators enable the user to obtain consistent and repeatable results—allowing for the comparison of results regardless of time, location or test environment. The DLS-V2E system is the ideal regression test bed.

### **Control Interface**

The DLS-8234, DLS-8235 and DLS-5800 Control Software provides an easy-to-use Windows-based GUI making testing easier and more efficient in today's complex testing environments.

### **Designed for Precision Testing**

As stated in ITU-T xDSL specifications, testing with a noise crest factor of less than 5 does not represent real world conditions, hence your modem and DSLAM test results may be inaccurate. The DLS-5500EV is able to generate VDSL2 impairments with a crest factor of 5 or greater. Using it as part of a Spirent test solution ensures that tested modems and DSLAMs work where it counts—in the field.

### **Integrated System**

The product can easily be integrated into an automated test environment allowing for control of the system in a customer's own scripting environment or by using Spirent Communications' ScriptCenter.

### **Uses the Spirent DLS-5800 xDSL 30MHz Custom Noise Generator**

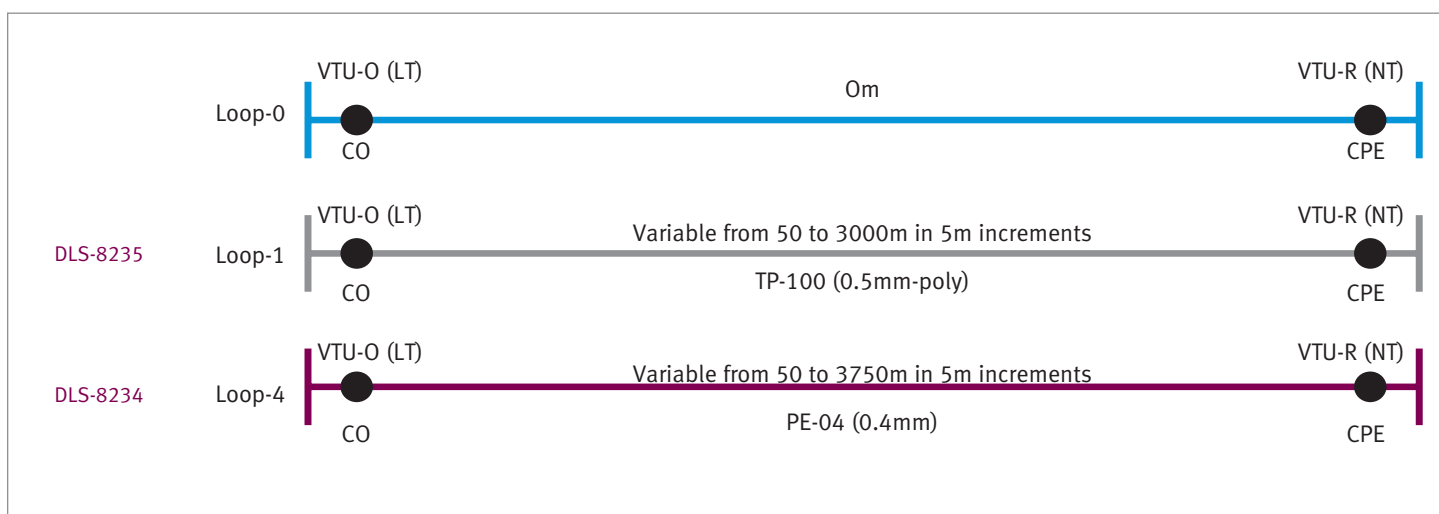
Provides the efficiency of having independent xDSL 30MHz noise generators in a single system. This means that noise impairments—whether crosstalk, white noise, RFI tones or impulse noise—can be independently generated and applied simultaneously to both ends of a loop. When used with the DLS-5410DC noise injector users can now inject noise in both Common and Differential mode simultaneously on the line.

### **DLS Products Are The Worldwide Standard For Physical Layer Equipment Used In Conformance, Performance And Interoperability Testing**

With extensive market and technology expertise leveraged from Spirent's active participation at all major standards meetings including ETSI, ANSI, ITU-T, IEEE 802.3, and DSL Forum, Spirent DLS equipment provides the industry's most accurate and repeatable results—ensuring your equipment is designed for peak performance.

DLS-8234/DLS-8235 SYSTEM SPECIFICATIONS	
Technology	Wireline simulation using passive circuits
Type of Wire	DLS-8234: PE 0.4mm as defined in ETSI TS 101 388 DLS-8235: TP100 As defined in ETSI TS 101 270-1 V1.4.1, Annex A-TP-100
Number of Conductors	Two (Twisted Pair)
Standard	ITU-T Recommendation G.993.2 DSL Forum WT-114
Simulated Loops	Proposed VDSL2 test loops
Bandwidth	DC to 30MHz continuous frequency response
Attenuation (Insertion Loss)	MAE < 0.5 dB
Impedance	Complex, varies over frequency with length; Accuracy: Typically better than +/- 5%
Delay	Typically better than +/- 5%
Noise Floor	< -150 dBm/Hz within the VDSL2 range
DC Resistance	Typically better than +/- 10%
DC Rating (steady state)	±200 V between tip and ring, tip ground, ring ground and 125mA
Power Supply	100~240 VAC (50~60 Hz) adapter
<b>Environmental</b>	
Operating Temperature	+10° C to +40° C (50° F to 104° F)
Storage Temperature	-4° F to 158° F (-20° C to +70° C)
Humidity	90% (non-condensing) max.
<b>Mechanical (Unit comes complete with rack mount brackets)</b>	
Weight Per Chassis	28 kg maximum
Dimensions Per Chassis	194 mm x 452 mm x 494 mm (7.5" x 18" x 20") (H x W x D)
Fuses Type	Type T 2A/250V slow blow (2 required, 5 mm x 20 mm)

## DLS-V2E-EUROPEAN LOOPS



**INCLUDED WITH DLS-V2E SYSTEM**

Your DLS-V2E European VDSL2 Wireline Simulator comes complete with the following:

**Simulators:**

- DLS-8234 chassis (PE04 straight-loop simulator)
- DLS-8235 chassis (TP-100 straight-loop simulator)
- 2 x AC power cord
- DLS-8234 Control Software
- DLS-8235 Control Software
- DLS-8234/8235 operating manual
- RS-232 and IEEE 488 cables
- Integrated compensation software

**Noise:**

The recommended noise impairment solution to accompany the V2E Wireline Simulator products is the DLS-5500EV.

- DLS-5800 30MHz custom noise generator (includes 2 noise cards)
- DLS-5410DC VDSL2 Differential and Common Mode Noise Injector
- AC power cord
- DLS-5800 Control Software
- DLS-5800-OM operating manual
- DLS-5B36 RFI tone generator
- DLS-5C60 xDSL custom noise file toolDLS-5B43 European VDSL2 Noise Files
- DLS-5C80 custom Impulse Noise Creation Tool
- DLS-5B44 DSL Forum WT-114 Noise Files

Optionally, the DLS-414E System can be used in conjunction with the DLS-8234 to allow for rate-adaptive testing across xDSL technologies including ADSL1, ADSL2, ADSL2+, VDSL1, VDSL2, etc. Please contact your Spirent representative for further information.

**ORDERING INFORMATION**

DLS-8234, DLS-8235, and DLS-5500EV Integrated System (P/N DLS-V2E)

European PE04 VDSL2 Wireline Simulator (P/N DLS-8234)

European TP-100 VDSL2 Wireline Simulator (P/N DLS-8235)

European VDSL2 Noise Generation Package (P/N DLS-5500EV)

**SPIRENT GLOBAL SERVICES**

Spirent Global Services provides a variety of professional services, support services and education services—all focused on helping customers meet their complex testing and service assurance requirements. For more information, visit the Global Services Web site at [www.spirentcom.com/gs](http://www.spirentcom.com/gs) or contact your Spirent sales representative.

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