DLS 400J
Japanese ADSL Wireline Simulator

SPIRENT
Communications

SPECIFICATIONS

The Spirent Communications DLS Systems DLS 400J simulates various types, lengths and configurations of twisted pair telephony cable, in order to test ADSL and other wireline technology based products. The DLS 400J works in conjunction with DLS 5102, a separate unit which simulates impairments such as white noise, shaped noise and impulse noise.

Full ITU Compliant
The DLS 400J provides all of the test loops and impairments called for in the ITU Standard for G.992.2 (G.Lite). DLS Systems also provides the DLS 400N, which meets the American standard for testing ADSL and G.Lite, the DLS 400H which meets the American standard for testing HDSL and HDSL2, and the DLS 400E which meets the European Standard for ADSL.

Supports CAP or DMT
The DLS 400J simulates the cable characteristics from DC to 2.0 MHz. This makes the DLS 400J capable of testing devices based on either CAP, DMT, 2B1Q or any other coding technique.

A Modular Approach
Building on the modular wireline approach of the DLS 400 and the DLS 400E, the DLS 400J offers unit modularity, which allows the user to combine units to meet specific testing needs. The attached Unit/Test Loop Matrix shows the coverage offered with various combinations. A complete solution includes all three units.

Accurate & Repeatable
The DLS 400J is the only reference standard in the world for simulating Japanese wirelines. It uses selectable "sections" of passive components (L, R, C) to make up a desired length of cable. This method means that the DLS 400J provides a repeatable and comparable reference standard.

Easy to Use
The DLS 400J is supplied with DLS 1100 Series software, which runs on a Windows™ compatible PC. The connection between the PC and the DLS 400J can be made with a regular RS-232C serial cable or with an IEEE 488 interface. The software allows users to easily select test loops and noise settings.

Noise & Impairments – DLS 5102
The DLS 5102 is a DLS Systems noise generator modified to accommodate Japanese testing applications. Much like the DLS 5101, the DLS 5102 will offer all the shaped narrow and broadband noise, crosstalk and transient impairments outlined in ANSI and ETSI specifications, as well as impairments outlined in the ITU Standard for G.992.2 (G.Lite). Of specific concern to Japanese testing is the need to test ADSL in the presence of TCM-ISDN crosstalk. The DLS 5102 simulates these conditions. In addition to the above mentioned impairments, the DLS 5102 will allow an input

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for external synchronization to a Network Clock Supply, required to produce the TCM – ISDN NEXT and FEXT alternating burst scheme. This synchronization can be achieved with the DLS Systems DLS 5A02.

A Company with Experience
DLS Systems has been a leading pioneer in wireline and impairment simulators since 1980. The company has developed simulators for VF, DDS, BRI ISDN, HDSL and ADSL. The years of experience behind the DLS 400J ensure accuracy and stability.

Specifications

Technology: Cable simulation using networks of discrete R, L & C components.

Cable Simulated: Balanced twisted copper pair.

Cable Impedance: Complex, varies over frequency with length and gauge.

Of Conductors: 2.

Types of Cables: 0.32 mm Polyethylene insulated.   0.4 mm Polyethylene insulated.   0.65 mm Polyethylene insulated.
                   0.9 mm Polyethylene insulated.   0.4 mm Paper insulated.   0.65 mm Paper insulated.

DC Rating: up to 300 VDC, between tip and ring, 100 mA (absolute max 150 mA).

Bandwidth: DC to 1.5 MHz, smooth response to 2 MHz.

Figure 1 – Japanese Test Loops for Testing the Performance of ADSL/G.992.2 (G.lite) Systems in an Environment Co-existing with TCM-ISDN DSL
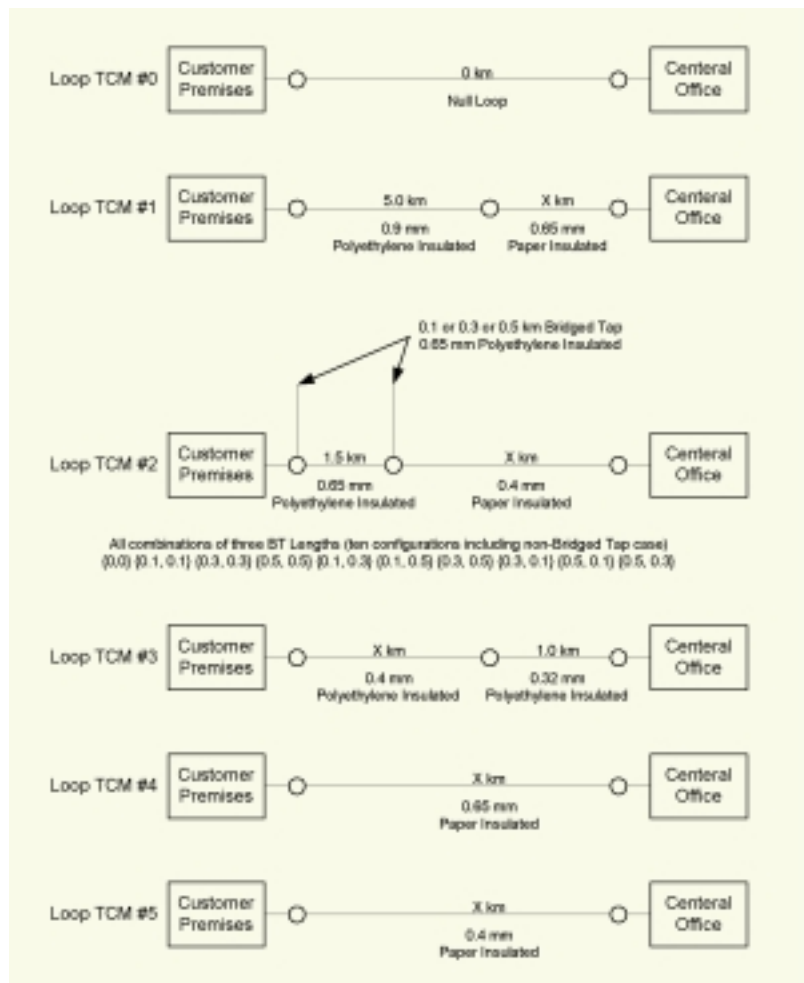
Loop Insertion Loss and Nominal Lengths (As per G.992.2 (G.Lite) and G.996.1 (G.Test) Specifications)

Loop Insertion Loss (160 kHz)	Loop TCM#	Nominal Value of X, km	Loop Insertion Loss (300 kHz),dB	DC Loop Resistance, ohms
26.0 dB (60% coverage)	1	0.42	36.1	314
	2	1.32	34.6	518
	3	0.78	31.9	642
	4	3.62	37.0	376
	5	2.07	34.0	567
37.0 dB (90% coverage)	1	1.95	51.8	474
	2	2.19	49.0	758
	3	1.75	45.6	910
	4	5.15	52.7	536
	5	2.94	48.3	807
50.0 dB (99% coverage)	1	3.76	70.3	662
	2	3.23	66.0	1041
	3	2.91	61.7	1227
	4	6.97	71.2	724
	5	3.97	65.3	1090
65.0 dB (99.9% coverage)	1	5.85	91.7	879
	2	4.42	85.6	1368
	3	-	-	-
	4	9.06	92.6	941
	5	5.16	84.9	1417

Ordering Information

To achieve all TCM loops to 99.9% coverage the 3-unit solution is required. This includes:

DLS 400J1:
DLS 400 chassis with the following wireline module:

2 x 0.32 mm polyethylene insulated.   8 x 0.4 mm paper insulated.

6 x 0.4 mm polyethylene insulated.   5 x 0.65 mm polyethylene insulated.

1 x 0.65 mm paper insulated.

DLS 400J2:
DLS 400 chassis with the following wireline modules:

13 x 0.65 mm paper insulated.   10 x 0.9 mm polyethylene insulated.

DLS 400J3:
DLS 400 chassis with the following wireline modules:

6 x 0.65 mm paper insulated.   3 x 0.4 mm paper insulated.

All Units:
Bantam Jacks, CF Connectors, and RJ-45 Adapters.

Unit/Test Loop Matrix

Loop Insertion Loss	Loop TCM #	Unit Type					
		J1	J2	J1 & J2	J1 & J3	J2 & J3	J1 + J2 + J3
26.0 dB	1		X	X		X	X
(60% coverage)	2	X		X	X		X
	3	X		X	X		X
	4		X	X		X	X
	5	X		X	X		X
37.0 dB	1		X	X		X	X
(90% coverage)	2	X		X	X		X
	3	X		X	X		X
	4		X	X		X	X
	5	X		X	X		X
50.0 dB	1		X	X		X	X
99% coverage	2	X		X	X		X
	3	X		X	X		X
	4			X		X	X
	5	X		X	X		X
65.0 dB	1		X	X		X	X
99.9% coverage	2				X		X
G.992.2	3	-	-	-	-	-	-
(G.Lite) only	4					X	X
	5				X		X

X = Capable
Note: TCM#3: for 99.9% coverage is removed from the list because the DC loop resistance is greater than 1500 Ohms.

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