



LDU 50™

*Tollgrade's LDU 50 provides **best value** loop testing and pre-qualification for **triple-play** services.*

Tollgrade's LDU 50 provides best value physical loop testing for triple-play services served from traditional switched networks, broadband DSLAMs, or IP-based Fiber-To-The-Node (FTTN) networks. The LDU 50 supports full 4TEL® and Celerity® physical loop test functions, enabling network operators to reduce the cost of provisioning and maintaining voice, broadband Internet and video services over copper.

The LDU 50 is designed as a two module enclosure with the Loop Test Module (LTM) residing in the left hand slot, providing all the 4TEL and Celerity physical line test functions. The right hand slot supports an optional dialer board for analog switch interfaces.

LDU 50 Benefits and Features

Improved accuracy of line test measurements using resistive drive measurement techniques.

Non-intrusive software updates

Application upgrades can be downloaded to provide feature enhancements without site visits, enabling uninterrupted testing.

Flexible test access

Two 2/4 wire test buses for simultaneous connection to a Test Access Matrix (TAM) and switch test access • 4 wire test bus access via TAM (Look In/Out) • 2/4 wire test bus access via remote terminal test bus

Reduced installation time

Industry standard connectors for all external interfaces • Front panel connections • Optional rear panel connections (same connections as RMU 745 and LDU 100 to support quick replacement)

Improved maintenance facilities

Self-test and alarm reporting to central TSC • Front panel LED alarm indications • Full unit replacement/board replacement for quick repair change-out with minimal tools

Extended product life-cycle

Designed-in hardware expansion for future upgrades • Remote, in-service software download of application code updates



4TEL and Celerity Loop Testing

The LDU 50 provides comprehensive voice and DSL service assurance loop test capabilities. The LDU 50 supports both on-demand and routine tests for reactive and proactive maintenance of the copper plant. On-demand tests provide summarized test results and fault segmentation—exchange, network, and customer—enabling efficient dispatch of field staff for prompt service restoration.

The LDU 50 extends Celerity measurement frequency out to 5MHz to provide unequalled pre-qualification, provisioning, and service assurance capability to DSL providers. LDU 50 demand and routine testing provides the Celerity analysis engine with measurement data used to determine a loop's capability to support various service levels. Signature analysis can identify load coils, CO splitters, and other DSL inhibitors.

4TEL Test Features

POTS/ISDN Demand Testing:

- » Fault isolation to dispatch segment
- » Cable length and balances
- » Termination detection
- » Hazardous voltage detection
- » Electronic monitoring
- » Busy detection

Extended Tests:

- » Pull and Break Dial Tone tests
- » Pair ID

Routine Test Sequences:

- » DN/EN parametric batch testing
- » DN/EN parametric routine testing

Enhanced Voice Testing Features:

- » Electronic Ringer Detection
- » Enhanced Receiver Off-Hook Detection
- » Integrated routine testing

Specifications

PHYSICAL DIMENSIONS

Size (H x W x D): 44.5 x 444.5 x 267 mm
Weight: <3 kg (with Loop Test Module only)
Horizontal rack mount, 19"/23"/ETSI bracket options

ENVIRONMENTAL SPECIFICATION

Operating temperature: -40°C to +70°C ambient
Storage temperature: -40°C to +85°C ambient
Humidity: 5 to 95% relative, non-condensing

POWER REQUIREMENTS:

Operating Supply: -48 VDC Nominal (15 watts)
Fusing: 2A

COMMUNICATIONS OPTIONS

Flexible TSC to LDU communications options for customer's preferred network type

- IP over Ethernet (standard)
- V.24/RS-232 (standard)
- X.25 over V.24/RS-232 (customer supplied PAD)
- ISDN B-Channel (optional adaptor)
- Dial-up via dial-up modem module (optional)

HARDWARE SPECIFICATIONS

IP management comms: 10Base-T Ethernet
RS-232 I/O Ports:

- (1) Digital Switch Access/Matrix Interface
- (1) TSC Communications Interface
- (1) Local Maintenance Port
- External alarm relay contacts
- Single or dual test bus options

Front panel cable connectivity for ETSI 300 019 cabinets
Rear cable connectivity option for CO or DLC cabinets

PRODUCT CERTIFICATION

UL 60950-1, EN 60950-1, EN 55022 (CISPR22), EN 300 386
FCC Part 15, NEBS compliant, ETSI 300-019-1-3 Class 3.4 compliant

LTM

DRIVE VOLTAGES

Low range

DC: -10 to +10 VDC, ± 0.1 mV
AC: 0 to 7 Vrms, ± 100 mV
10 Hz – 100 kHz

High range

DC: 0 V to ± 180 VDC, ± 2 V
AC: 0 V to ± 180 VAC, ± 2 V, 0 – 100 Hz
Source Impedance: 100 Ω , 600 Ω , 10 k Ω

TRANSMISSION MEASUREMENTS

Transmit Level: -40 to +10 dBm, 1 dBm steps
Frequency: 10 Hz to 5 MHz (-10 to 10V peak)
10 Hz to 100 Hz (180 VAC)
Measurement Level: -40 to +13 dBm
Frequency: 10 Hz to 5 MHz
Detects frequency, amplitude, phase and cadence
Loop Termination Impedance: 100 Ω /200 Ω
600 Ω /1200 Ω , 10K Ω /20K Ω

MEASUREMENT ACCURACY

Range	Accuracy
DC Voltage	
0 to 10 V	$\pm 1\%$
10 to 100 V	$\pm 1\%$
100 to 622 V	$\pm 5\%$
AC Voltage (RMS)	
0 to 7 V	$\pm 2\%$
7 to 70 V	$\pm 2\%$
70 to 440 V	$\pm 5\%$

Resistance

100 to 1 kohm	$\pm 5\%$
1 k to 10 kohm	$\pm 2\%$
10 k to 100 kohm	$\pm 2\%$
100 k to 1 Mohm	$\pm 5\%$
1 M to 2 Mohm	$\pm 10\%$

Capacitance

10 nF to 1 μ F	$\pm 3\%$
1 μ F to 100 μ F	$\pm 3\%$

Above line test measurements returned for A-B [Tip-Ring], B-A [Ring-Tip], A/B-Earth [Tip/Ring-Ground], A/B-Battery [Tip/Ring-Battery].

Celerity Test Features

Service Qualification Testing:

- » Bulk qualification testing
- » 'Speed binned' qualification results for ADSL, ADSL2, VDSL, IPTV and VOIP

Service Performance Testing:

- » DSL fault isolation to dispatch segment
- » Real time broadband performance qualification
- » Transmission capability analysis, including elements such as signal loss and noise susceptibility
- » PSD measurements, ATU-C/R detection*

Extended Signature Testing:

- » Signaturized and non-signaturized CO splitter detection
- » Load coil identification

*Future application - contact Tollgrade for availability

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