



LDU 50+™

*Tollgrade's LDU 50+ provides **best-in-class** loop testing and pre-qualification for **triple-play** services*

The LDU 50+ provides best-in-class physical loop testing and pre-qualification for triple-play services served from traditional switched networks, broadband DSLAMs, or IP-based Fiber-To-The-Node (FTTN) networks. It 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 high-frequency enhanced Loop Test Module+ (LTM+) residing in the left hand slot and providing all 4TEL and Celerity physical line test functions, including extended wideband tests. The right hand slot supports an optional ICE™ Services Test Module (STM) for upgrading to full Layer 1-7 broadband services testing or Dialer Board for analog switch interfaces.

LDU 50+ Benefits and Features

Enhanced Performance

Accurate and flexible line test measurements using resistive drive measurement techniques • Wideband test capabilities to support an economical approach for improved DSL line qualification and dispatch segmentation of broadband faults • Enhanced Celerity testing to dynamically adapt the test and analysis for optimum fault detection and dispatch accuracy in the minimum time

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 for Look In/Out • 2/4 wire test bus access via remote terminal test bus

Efficient Installation and Maintenance Facilities

Self-test and alarm reporting to central Test System Controller (TSC) • Front panel LED alarm indications • Full unit/board replacement for quick repair change-out with minimal tools • Industry standard connectors for external interfaces on front panel for quick installation

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, supporting 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 the Celerity measurement frequency out to 17MHz to provide unequalled pre-qualification, provisioning, and service assurance capability to DSL providers. The extended frequency range provides the ability to support VDSL PSD and noise detection, plus high frequency test interactions with field craft testers. LDU 50+ demand and routine testing provides the Celerity analysis engine with measurement data used to determine a loop's capability to support various DSL service levels. Signature analysis can identify load coils, CO splitters, and other DSL inhibitors.

Specifications

PHYSICAL

Size (H x W x D): 44.5 x 444.5 x 267 mm
Weight: <3 kg (with Loop Test Module)
1U Horizontal rack mount, 19"/23/ETSI" bracket options
*Front panel cable connectivity for ETSI 300
019 cabinets installations; required for
wideband features. Rear cable connectivity
option for CO installations*

ENVIRONMENTAL

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

POWER (LTM+ ONLY)

Power: -48VDC (15 watts)
Fusing: 2A

COMMUNICATIONS INTERFACES

Flexible TSC to LDU communications
Options for customer's preferred network type:
10Base-T Ethernet (standard)
V.24/RS-232 (standard)
X.25 over V.24/RS-232 (customer supplied PAD)
ISDN B-Channel (optional adaptor)
Dial-up modem module (optional)
RS-232 Local Craft Port

PRODUCT CERTIFICATION

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

LTM+

DRIVE VOLTAGES

Low range

DC: -10 to 10 VDC, ± 100 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 17 MHz (-10 to 10V peak)
10 Hz to 100 Hz (180 VAC)
Measurement Level: -40 to +13 dBm
Frequency: 10 Hz to 17 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].*

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

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

Celerity Wideband Testing with TAM (for full feature capability):

- » Near end line balance
- » Far end balance
- » Line attenuation measurements
- » FDR for fault location, with short test times
- » PSD and noise measurements up to VDSL frequencies
- » Double-ended handheld testing*
- » 'Golden' DSLAM port to verify line and CPE modem and DSLAM synchronization*

Extended Signature Testing:

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

*Future application - contact Tollgrade for availability

Corporate Headquarters
493 Nixon Road
Cheswick, PA 15024 USA
+1.412.820.1400
www.tollgrade.com

tollgrade
Network Assurance
Simplified.™