



"Results You Can Count On"

Model 458-LM-E1-30-TP100
Multi-Standard Local Loop Simulator
w/ Optional AWGN Generator

Rev.A
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*Three 458-LM-E1-30-TP100 modules are shown installed
in the 458-3SLB chassis (not included).*



Customer Support

Thank you for your purchase of the Telebyte Model 458-LM-E1-30-TP100 Multi-Standard Local Loop Simulator with Optional AWGN Generator. This one-channel product simulates TP100 as specified in ETSI TS 101 270-1 and G.992.5 Annex M.

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Warranty

Included With Your Purchase

One-year Warranty

- Telebyte will furnish parts and labor for the repair or replacement of products found by Telebyte to be defective in material or workmanship during the warranty period.¹

One-year Calibration (where applicable)

- One N.I.S.T. traceable calibration on the first-year anniversary of the product ship date.²
- Calibration report to ensure traceability.

Extended Customer Care

There are two options available. Our three-year extended warranty extends the original warranty by an additional 36 months and the three-year calibration contract provides 36 additional months of calibration.

Three-Year Extended Warranty

You can extend the original one-year warranty that comes with your product by purchasing the **Three-Year Extended Warranty**.³

Features:

- Telebyte will furnish parts and labor for the repair or replacement of products found by Telebyte to be defective in material or workmanship during the warranty period.¹

Three-Year Calibration Contract (where applicable)

Extended calibration is available through the **Three-Year Calibration Contract**.⁴

Features:

- Yearly N.I.S.T. traceable calibrations, each on the second, third and fourth anniversary of the ship date.²
- Report to ensure traceability.
- Automatic notification when calibration of your product is due.

Disclaimer of Warranties and Other Terms and Conditions

¹ TELEBYTE, INC. warrants its broadband simulation equipment to be free from defects in material and workmanship, under normal and proper use and in its unmodified condition, for 12-months, starting on the date it is delivered for use. TELEBYTE'S sole obligation under this warranty shall be to furnish parts and labor for the repair or replacement of products found by TELEBYTE to be defective in material or workmanship during the warranty period. Warranty repairs will be performed at the point of manufacture. Equipment approved for return for warranty service shall be returned F.O.B. TELEBYTE factory and will be redelivered by TELEBYTE freight prepaid, except for non-continental U.S.A. locations. These deliveries will be sent COD freight and import/export charges.

² The customer is responsible for freight and customs charges when shipping products to and from Telebyte for calibration services.

³ You must purchase the extended warranty at the time of purchase or during the initial warranty period.

⁴ You must purchase the calibration contract at the time of purchase or during the initial warranty period. The above warranty is in lieu of all other warranties, expressed or implied, statutory or otherwise, including any implied warranty of merchantability or fitness for a particular purpose. TELEBYTE shall not be liable for any damages sustained by reseller or any other party arising from or relating to any equipment failure, including but not limited to consequential damages, nor shall TELEBYTE have any liability for delays in replacement or repair of equipment.



Equipment Returns

Out of warranty equipment may be returned, prepaid, to the Hauppauge, N.Y. customer service facility. Return shipping charges will be billed to the customer. The repaired unit will have a 90-day warranty. In those cases where "no trouble" is found, a reduced charge will be billed to cover handling, testing, and packaging. Whether in or out of warranty, a Return Material Authorization number (RMA) is required and may be obtained by going to www.telebytebroadband.com and opening a technical support case.

Please be sure to reference the RMA number on the outside container.



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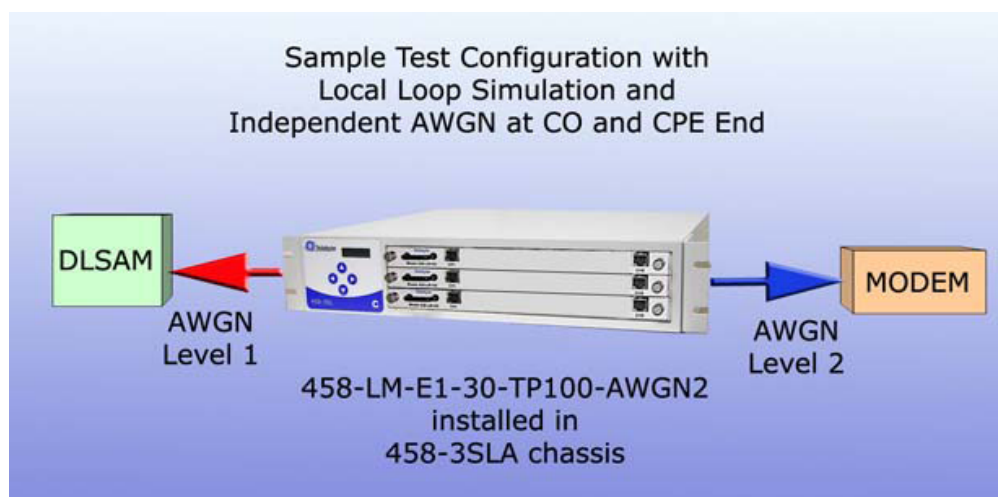
1.0 Introduction

The Model 458-LM-E1-30-TP100 Multi-Standard Local Loop Simulator is the ideal solution for ADSL, ADSL2, ADSL2+, and VDSL2 chip/modem/DSLAM testing out to 9,000 m in very small increments. Optional noise may be ordered that adds in variable AWGN on the CO and/or CPE side, allowing for common or independent noise levels on both sides.

This powerful local loop simulator is plugged into our Model 458-3SLB (3-Slot) or 458-CC-16 (16 Slot) chassis where settings are controlled by a convenient keypad located on the front, RS-232, Ethernet or IEEE-488(GPIB). The modular design of Telebyte's products allows the 458-LM-E1-30-TP100 to be combined with other line modules for a wide variety of test configurations.

Main Features:

- Simulates TP100 as specified in ETSI TS 101 270-1 & G.992.5 Annex M
- Bandwidth DC to 30 MHz
- Ideal for testing ADSL, ADSL2, ADSL2+, VDSL2 chips/modems/DSLAMs
- Loop lengths programmable from 0 to 9,000 m in 10-m increments
- Plugs into our Model 458-CC-16 (16-slot) or 458-3SLB (3-Slot) chassis
- Loop Lengths and AWGN levels controlled manually via front panel of chassis, remotely via RS-232, Ethernet or IEEE-488 (GPIB), or our 458 Universal GUI software
- Optional White Noise (AWGN) Generator (-90 dBm/Hz to -145 dBm/Hz)

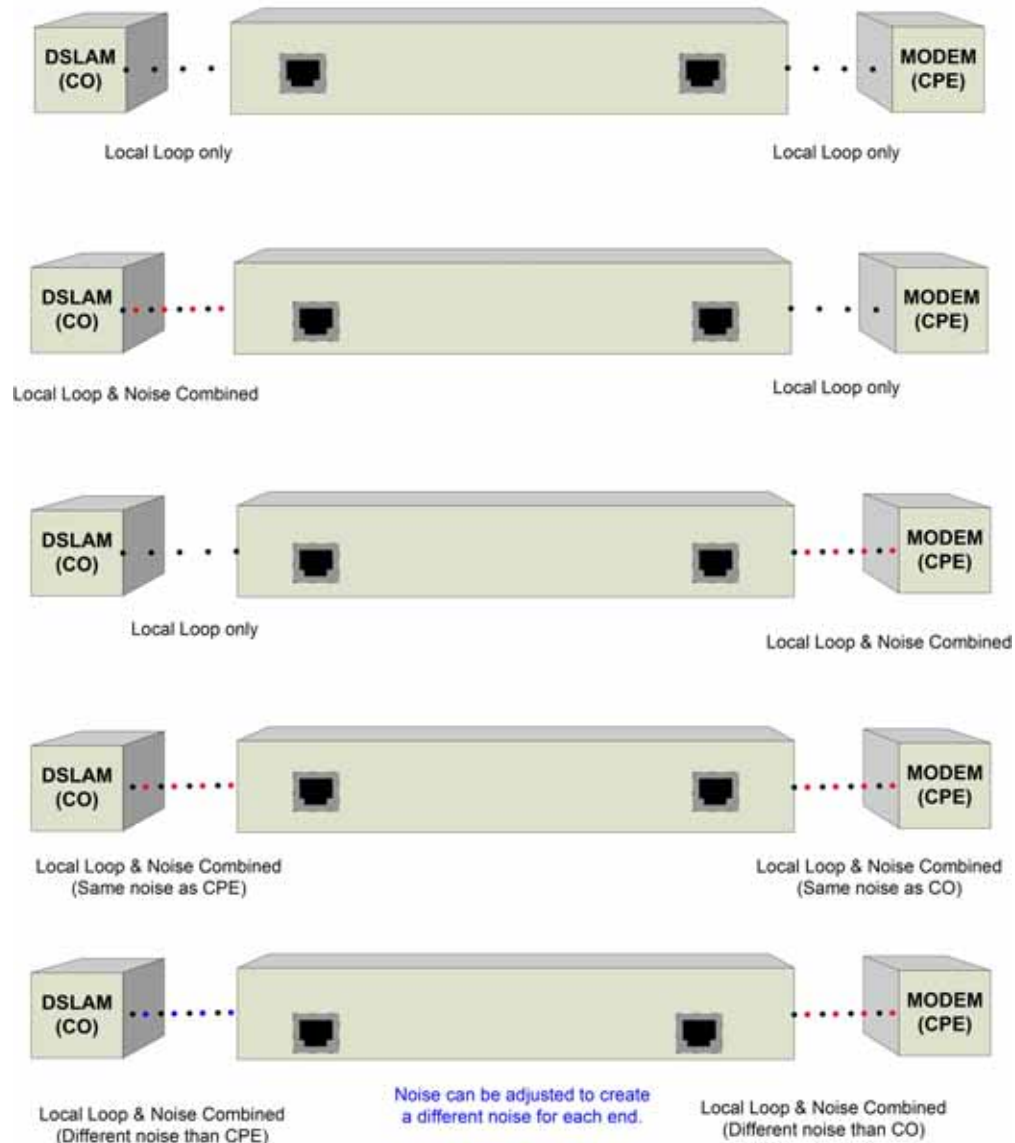


The diagram above shows a sample test configuration where independent AWGN may be added to the near and far end of the loop. Variable noise levels provide uncorrelated, simultaneous injection where desired.



Ordering Options		
458-LM-E1-30-TP100	Multi-Standard Local Loop Simulator	Local Loop without noise
458-LM-E1-30-TP100-AWGN2	Multi-Standard Local Loop Simulator with (2) AWGN Generator Modules	Local Loop with two independent noise sources at the CO and/or CPE end

458-LM-E1-30-TP100
Variety of Configurations





2.0 Specifications

2.1 458-LM-E1-30-TP100

Product Specifications	
Simulation	<ul style="list-style-type: none"> • Accurately simulates attenuation and impedance • Full bidirectional operation at all specified frequencies • TP100 as specified in ETSI TS 101 270-1 & G.992.5 Annex M • Optional White Noise (AWGN) Generator
Bandwidth	DC to 30 MHz
Attenuation Accuracy (when source and load impedances are 100 ohms)	MAE < 1 dB 20 kHz to 30 MHz
Maximum Attenuation	> 90 dB
Impedance Accuracy	Typically +/- 10% 20 kHz to 30 MHz
Maximum Voltage Tip – Ring	200 V
Maximum Current	130 mA
Connectors	2 RJ-45's on front
Optional White Noise (AWGN) Generator (factory-installed sub-module)	-90 dBm/Hz to -145 dBm/Hz in 0.25 dBm increments

2.2 458-3SLB

458-3SLB Product Specifications (3-Slot Chassis and Control Module)	
Controls	Keypad for setting loop lengths and IEEE-488 address, RS-232, or Ethernet communication parameters.
Indicators	Backlit LCD display of line length and set up parameters.
Power	88 to 264 VAC, 50 or 60 Hz
Size	[2U] 19 in W x 22 in D x 3.47 in H (482.6 mm W x 558.8 mm D x 88.1 mm H)
Environmental	Operating: +32 F to +122 F (0 to +50 degrees C) Storage: 0 to 95% relative humidity (non-condensing)
Remote Control Connectors	RS-232: DB9 female (DCE); GPIB:IEEE488 24-pin connector. Ethernet: RJ-45
Plug-In Compatibility	Accepts 1-3 458 plug-in modules



2.3 458-CC-16/458-CM

Product Specifications 458-CC-16 (16-Slot Chassis) & 458-CM (sold separately)	
Controls	Keypad for setting loop lengths and IEEE-488 address, RS-232, or Ethernet communication parameters.
Indicators	Backlit LCD display of line length and set up parameters.
Power	100 - 240 VAC, 50 or 60 Hz
Size	[7U] 19 in W x 22 in D x 12.22 in H (482.6 mm W x 558.8 mm D x 310.4 mm H)
Environmental	Operating: +32 F to +122 F (0 to +50 degrees C) Storage: 0 to 95% relative humidity (non-condensing)
Remote Control Connectors	RS-232: DB9 female (DCE); GPIB:IEEE488 24-pin connector. Ethernet: RJ-45
Plug-In Compatibility	Accepts 1-16 458 Line Modules

Specifications are subject to change without notice. Made in USA.

- Detailed information about the operation of the 458-3SLB and 458-CC-16/458-CM can be found in the reference manuals for those products. Only information specific to the 458-LM-E1-30-TP100 is provided in this manual.



3.0 Control

The Model 458-LM-E1-30-TP100 can be controlled three ways: via RS-232 and IEEE488 Remote Commands, our 458 Universal Graphical User Interface or the LCD display and buttons on the front panel of our 458-3SLB or 458-CM.

3.1 Remote Commands

Please refer to the manuals for the 458-3SLB or 458-CC-16/458-CM for remote commands common to many line modules, including the 458-LM-E1-30-TP100. This manual contains commands unique to this module.

3.1.1 RS-232 (Serial Port) Remote Commands

Set Noise Mode

Set Noise Mode/Level Command Values: SL:M:NOISE:CPE:V or SL:M:NOISE:CO:V

Where,

SL = set length

M = module (slot) number 01 – 16 (458-CM) or 01-03 (458-3SLB)

NOISE = noise mode

CPE or CO = set noise for CPE or CO side of loop

V = AWGN values allowed – OFF or -90.00 to -145.00 (in 0.25 dBm/Hz steps)

Examples :

SL:02:NOISE:CPE:-123.75	=	Set CPE noise source -123.75 dBm/Hz
SL:02:NOISE:CO:-95.00	=	Set CO noise source to -95.00 dBm/Hz
SL:02:NOISE:CPE:OFF	=	Set CPE noise source to off
SL:02:NOISE:CO:OFF	=	Set CO noise source to off

Note: Upper or lower case text may be used



3.1.2 IEEE 488 (GPIB) Remote Commands

Set Noise Mode/Level Command Values:

:SETCARD:LENGTH:M:NOISE:CO:V1,2

Or

:SETCARD:LENGTH:M:NOISE:CPE:V1,2

Where,

M = Module (slot) number 01 – 16 (458-CM), 01-03 (458-3SLB)

V1,2 = OFF or -90.00 to -145.00 level in 0.25 dBm/Hz steps.

Examples:

:SETCARD:LENGTH:02:NOISE:CPE:-123.75

= Set CPE noise source to -123.75 dBm/Hz.

:SETCARD:LENGTH:02:NOISE:CO:-95.00

= Set CO noise source to -95.00 dBm/Hz.

:SETCARD:LENGTH:02:NOISE:CPE:OFF

= Set CPE noise source to off.

:SETCARD:LENGTH:02:NOISE:CO:OFF

= Set CO noise source to off.

Note: Upper and lower case text can be used.



Read Noise Mode/Level Command Values:

READCARD:LENGTH:M:NOISE:CO

Or

READCARD:LENGTH:M:NOISE:CPE

Where,

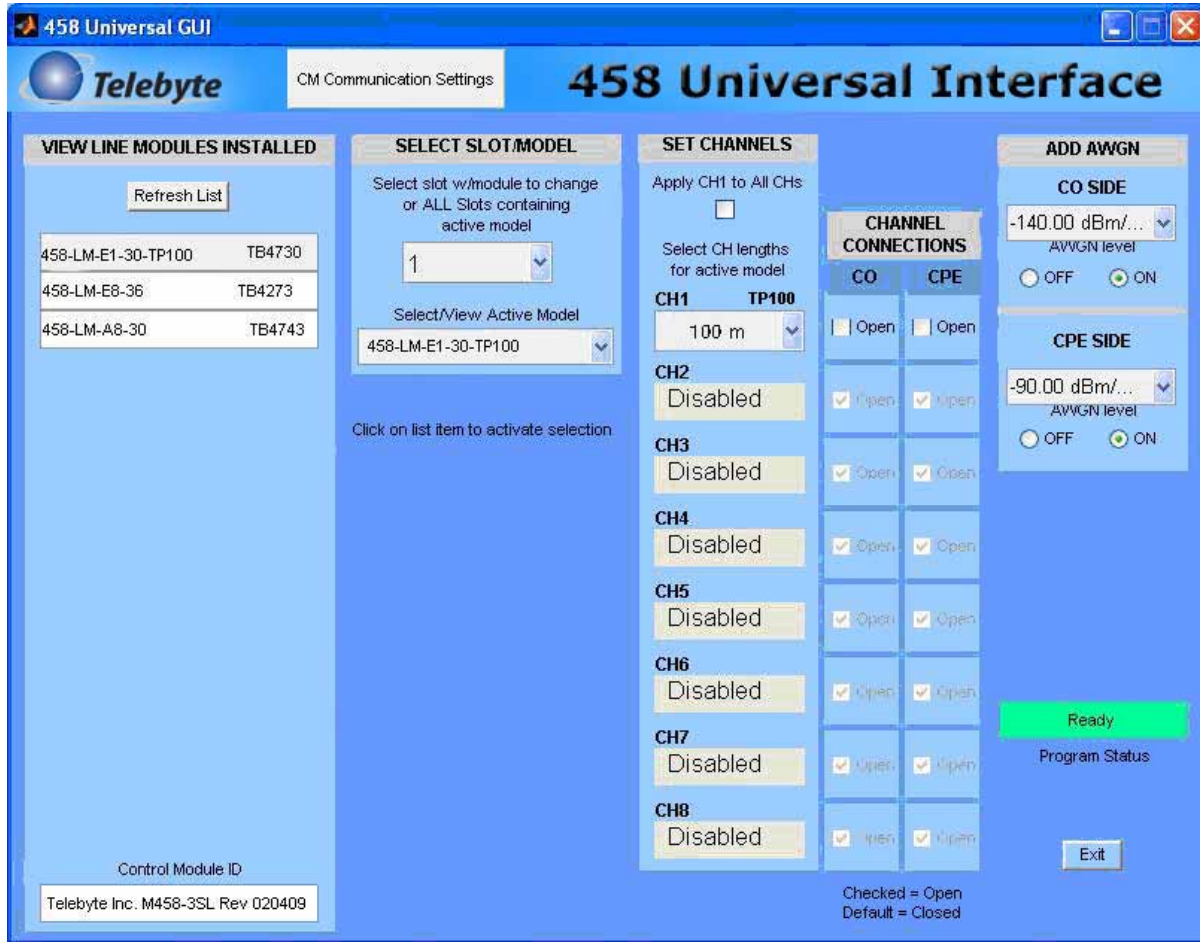
M = Module (slot) number 01 – 16 (458-CM), 01-03 (458-3SLB)

Example:

READCARD:LENGTH:02:NOISE:CO = Read CO noise level of module in slot 2



3.2 Graphical User Interface



➤ Refer to the 458 Universal GUI Reference Manual for more information.



3.3 LCD Display/Front Panel

Basic Operation

Make selections by pushing the UP, DOWN, LEFT and RIGHT arrow buttons on the front panel. The LCD Display shows the choices made. Refer to the chassis manual for additional details.

Step One – Select Slot

- Navigate to the desired slot in the 458-3SLx (3-Slot) Chassis or 458-CC16/458-CM (16-Slot) Chassis using the UP or DOWN arrows.

Step Two – Select Increment

- Step through the allowable lengths for the current slot using the LEFT or RIGHT arrow buttons. The length will increment in 10-m steps.

Step Three – Select Noise Levels

- Use the UP arrow button to select the CO or CPE noise.
- Adjust the noise level using the LEFT and RIGHT arrow buttons.