



**"Results You Can Count On"**

## **Model 458-AWGN2**

**Dual Output AWGN Generator Line Module**

Rev. -  
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*Two Noise Sources in a Convenient Line Module Format!*





## Customer Support

Thank you for your purchase of the Telebyte Model 458-AWGN2 Dual Output AWGN Generator Line Module. This product is designed to inject Additive White Gaussian Noise (AWGN) on the CO and/or CPE side of a loop simulator installed in one of Telebyte's chassis or onto real cable.

### Contact Information:

#### Telephone

General: 631-423-3232  
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#### E-mail/Internet

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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.<sup>1</sup>

#### **One-year Calibration (where applicable)**

- One N.I.S.T. traceable calibration on the first-year anniversary of the product ship date.<sup>2</sup>
- 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**.<sup>3</sup>

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.<sup>1</sup>

#### **Three-Year Calibration Contract (where applicable)**

Extended calibration is available through the **Three-Year Calibration Contract**.<sup>4</sup>

Features:

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

### Disclaimer of Warranties and Other Terms and Conditions

<sup>1</sup> 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.

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

<sup>3</sup> You must purchase the extended warranty at the time of purchase or during the initial warranty period.

<sup>4</sup> 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](http://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-AWGN2 is the ideal solution for injecting Additive White Gaussian Noise (AWGN) for ADSL, ADSL2, ADSL2+, and VDSL2 chip/modem/DSLAM testing applications. The user may add AWGN on the CO and/or CPE side, depending on their application. The 458-AWGN2 allows for common or independent noise levels on both sides. This line module produces a flat Power Spectral Density (PSD) over bandwidths from 20 kHz to 30 MHz.

This module 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-AWGN2 to be combined with other line modules for a wide variety of test configurations. This module can also be used to inject AWGN onto real cable.

### Features:

- Bandwidth 20 kHz to 30 MHz
- Inject AWGN onto real cable or local loop simulator
- Solution for injecting AWGN for ADSL, ADSL2, ADSL2+, & VDSL2 chip/modem/DSLAM testing
- Plugs into our Model 458-CC-16 (16-slot) or 458-3SLB (3-Slot) chassis
- AWGN levels can be controlled manually via front panel of chassis, or remotely via RS-232, Ethernet or IEEE-488 (GPIB)
- 458 Universal GUI software for control from a remote PC
- White Noise (AWGN) Generator (-90 dBm/Hz to -145 dBm/Hz)



## 2.0 Specifications

### 2.1 458-AWGN2

Product Specifications	
Simulation	Additive White Gaussian Noise (AWGN)
Bandwidth	Flat Power Spectral Density (PSD) over bandwidths from 20 kHz to 30 MHz
AWGN Crest Factor	$\geq 5$
Output Impedance	4k $\Omega$ Minimum (20 kHz to 30 MHz)
White Noise (AWGN) Generator	-90 dBm/Hz to -145 dBm/Hz in 0.25-dBm increments
Maximum Voltage Tip – Ring	200 V
Output Mode	Differential, balanced
Connectors	4 RJ-45's on front (2 for CO side, 2 for CPE side of loop)

### 2.2 458-3SLB

Product Specifications (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 one, two or three 458 Line Modules or one 458-RT



## 2.3 458-CC-16/458-CM

<b>Product Specifications 458-CC-16 (16-Slot Chassis) &amp; 458-CM (sold separately)</b>	
<b>Controls</b>	Keypad for setting loop lengths and IEEE-488 address, RS-232, or Ethernet communication parameters.
<b>Indicators</b>	Backlit LCD display of line length and set up parameters.
<b>Power</b>	100 - 240 VAC, 50 or 60 Hz
<b>Size</b>	[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)
<b>Environmental</b>	Operating: +32 F to +122 F (0 to +50 degrees C) Storage: 0 to 95% relative humidity (non-condensing)
<b>Remote Control Connectors</b>	RS-232: DB9 female (DCE); GPIB:IEEE488 24-pin connector. Ethernet: RJ-45
<b>Plug-In Compatibility</b>	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.





## 3.0 Control

The Model 458-AWGN2 can be controlled three ways: via RS-232 and IEEE488 Remote Commands, our GUI interface or the LCD display on the front panel of our 458-3SLB or 458-CM.

- Only information specific to the 458-AWGN2 is provided in this section. Refer to the 458-3SLB or 458-CC-16/458-CM manuals for additional control information.

### 3.1 Remote Commands

#### 3.1.1 RS-232 (Serial Port) Remote Commands

##### 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 GPIB (488) 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 Graphical User Interface Reference Manual for more information.

## 3.3 LCD Display

### Step One

- Select the slot in the 458-3SLx (3-Slot) Chassis or 458-CC16/458-CM (16-Slot) Chassis using the UP or DOWN arrows on the LCD display (e.g., when using our 3-slot chassis: slot 1 top, slot 2 middle, slot 3 bottom).

### Step Two

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