

DSL Calculator

1. Introduction

The DSL Calculator is a new utility for testing RAD's xDSL modems. It allows you to estimate the operating margin of a RAD modem, given the desired data rate, wire gauge or measured attenuation.

The current version of the DSL Calculator:

- Supports the ASMi-31, ASMi-50, ASMi-51, and ASMi-52 modems
- Calculates line attenuation for the relevant mid-band frequency according to cable gauges and lengths, and selected data rate.
- Uses European units (range in meters, cable diameter in millimeters) or American units (range in feet, cable diameter as per AWG).

Future versions of the program will support additional RAD modems and line/noise models based on site measurements.

Note *In the current version, the DSL Calculator uses only theoretical model for the ASMi-52 margin calculation.*

2. Starting the DSL Calculator

The DSL Calculator is distributed as a Windows executable file named dsl_calcvv.exe, where vv is the version number.

► To start the DSL Calculator:

- Launch the program by running the executable file.

The main dialog box appears (see *Figure 1*).

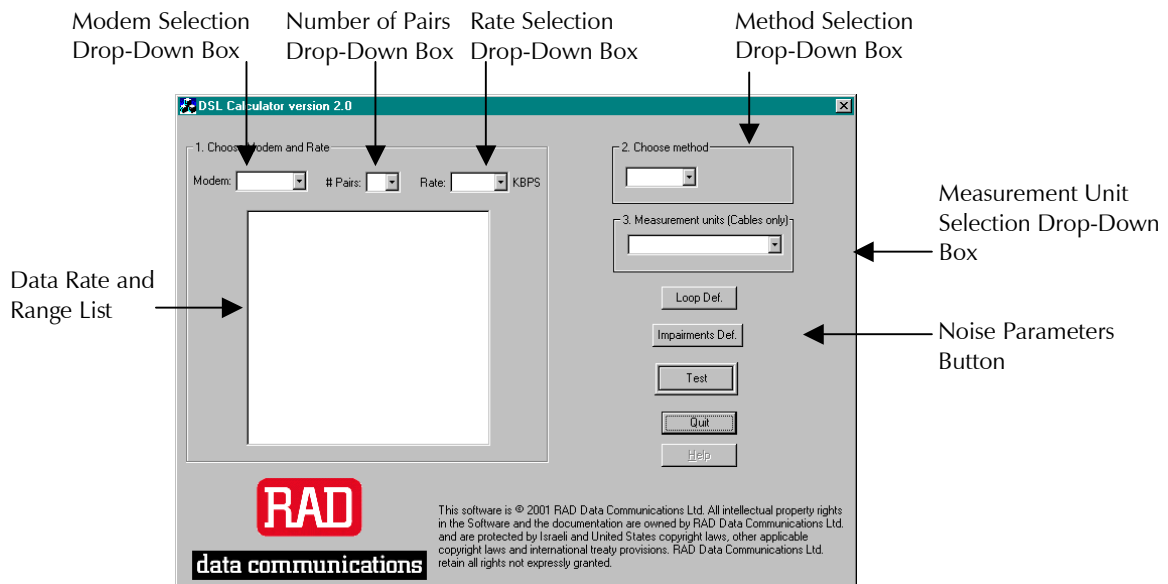


Figure 1. DSL Calculator Main Dialog Box

3. Calculating the Operating Margin

The program calculates the operating margin based on information provided by the user.

► **To calculate the operating margin:**

1. From the Modem Selection drop-down box, select a modem.

Typical ranges for the selected modem over 24 AWG (0.5 mm) or 26 AWG (0.4 mm) wire for various data rates appear as a table in the main dialog box (see Figure 2).

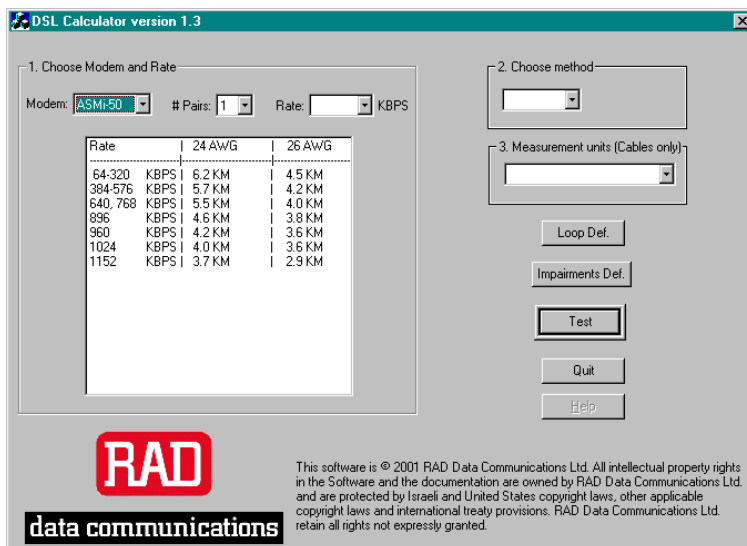


Figure 2. Data Rate and Typical Range List

2. From the # Pairs drop-down box, select the number of wires: 2-wire (one pair) or 4-wire (two pairs).
3. From the Rate Selection drop-down box, select the desired data rate.
4. From the Method Selection drop-down box, select the estimation method. In the current version of the program, only the “Cables” option is available.

Optional The default noise model for ASMi-31, ASMi-50 and ASMi-51 assumes a thermal noise level of -140 dBm/Hz and 10 self-interferers. For ASMi-52, the default is noise model C (according to the G.991.2 Annex B). Advanced users may change the relevant impairment parameters by clicking the Impairments Def. button and entering the desired values in the corresponding text boxes (see Figure 3). For details on the ASMi-52 noise impairments, refer to the ASMi-52 Noise Impairments section below.

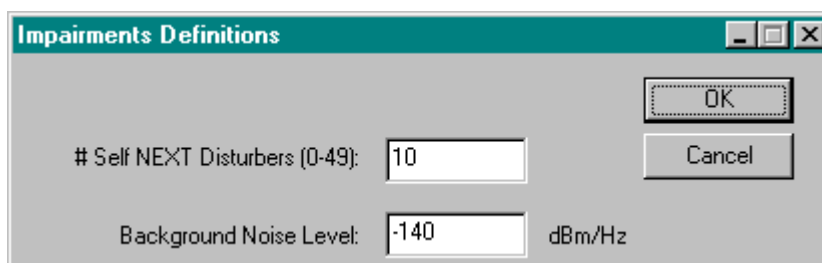


Figure 3. Impairments Def. Dialog Box

- From the Measurement Units drop-down box, select the measurement unit type: European (meters/millimeters) or American (feet/AWG).

The Cables Data dialog box appears (Figure 4).

Figure 4. Cables Data Dialog Box

- In the Cables Data dialog box, enter distance values and the cable gauges for all segments between the modems. You can enter data for up to 15 cable segments for all cable types, except for CAT-3 and CAT-5TP wires, which support only a single-segment input.

Note Bridged taps are not taken into account.

- Click OK button.

The Main dialog box appears.

- From the Main dialog box, click the Test button.

If the resulting operating margin is positive, the DSL Calculator displays the 'GO' message along with the margin and insertion loss (see Figure 5).

Note Although the modem will be able to operate at adequate BER level with any positive margin value, it is advisable to allow for a spare margin to account for changing line and noise conditions. The recommended spare margin for the modem in question appears on the Results screen.

If the resulting operating margin is negative, the DSL Calculator displays the 'NO GO' message (Figure 6).

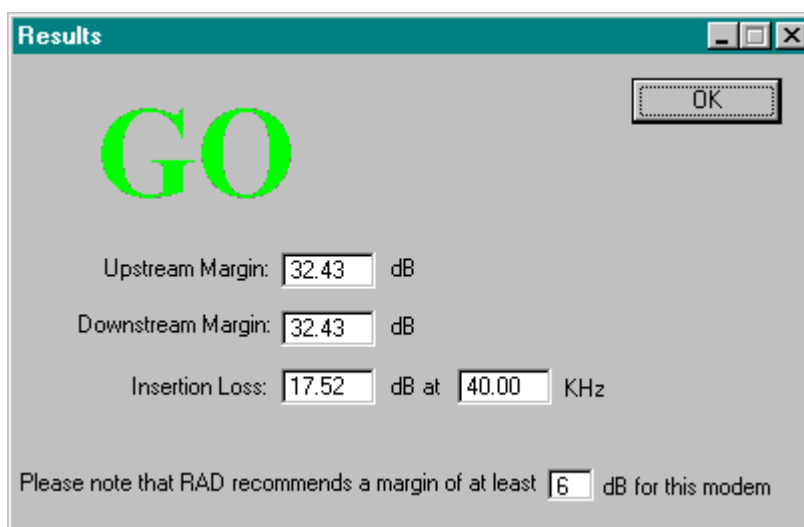


Figure 5. Resulting Screen with Positive Signal-to-Noise Value

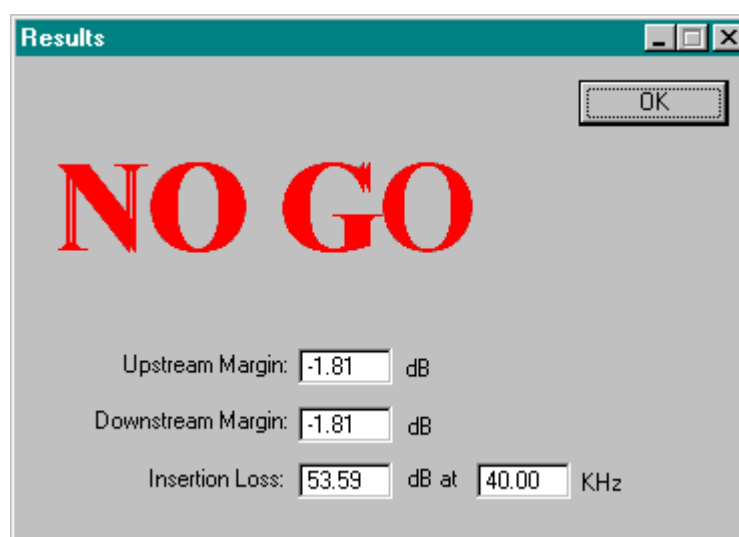


Figure 6. Resulting Screen with Negative Signal-to-Noise Value

ASMi-52 Noise Impairments

For the ASMi-52 modem, you can also specify the following parameters (see Figure 7):

- Noise Model Type (A, B, C, D, or Zero Xtalk), as per G.991.2 Annex B requirements.
- Power Backoff Level (level of power transmitted on the SHDSL line).
- Theoretic to 'Real World' implementation gap (estimated difference between the signal-to-noise ratios achieved via calculations for the theoretical model and real-life modem).

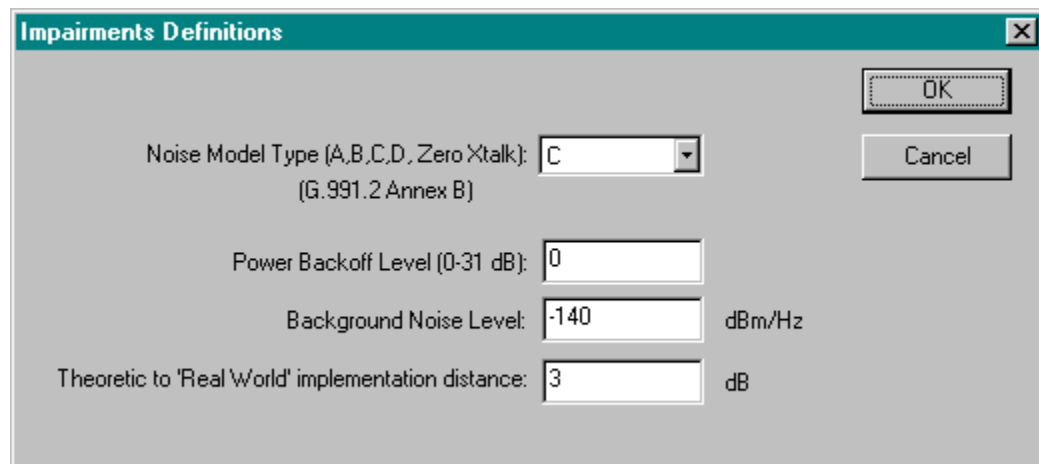


Figure 7. Noise Impairments of the ASMi-52 Modem

4. Exiting the DSL Calculator

Once done, you can exit the program.

► **To exit the DSL Calculator:**

- From the Main dialog box, click 'Quit'.
Alternatively, you can exit the program by pressing <Esc>.