Broadband Rate and Reach Calculator

<u>Preface Material</u>

Document Identification

Broadband Calculator Introduction
Document No. 702A00011
Revision: A02
Date: Oct 2012
Product Marketing

Copyright

Copyright ©2012 Actelis Networks, Inc.
All rights reserved.
Printed in U.S.A.

This publication is protected by International copyright law. No part of this publication may be copied or distributed, transmitted, transcribed, stored in a retrieval system, or translated into any human or computer language in any form or by any means, electronic, mechanical, magnetic, manual or otherwise, or disclosed to third parties without the express written permission of Actelis Networks, Inc., 6150 Stevenson Blvd., Fremont, CA 94538 USA.

Trademarks Actelis Networks Inc., and the Actelis logo are registered trademarks of Actelis Networks, Inc. MetaASSIST, EFMplus, The 3 R's of EFM, and The Broadband Acceleration Company are trademarks of Actelis Networks, Inc. Actelis reserves the right to change product specifications at any time without notice. Copyright ©2012. All Rights Reserved.

The products described in this document are protected by U.S. Patent No. 6,744,811 and other U.S. patents, foreign patents, and/or pending applications.
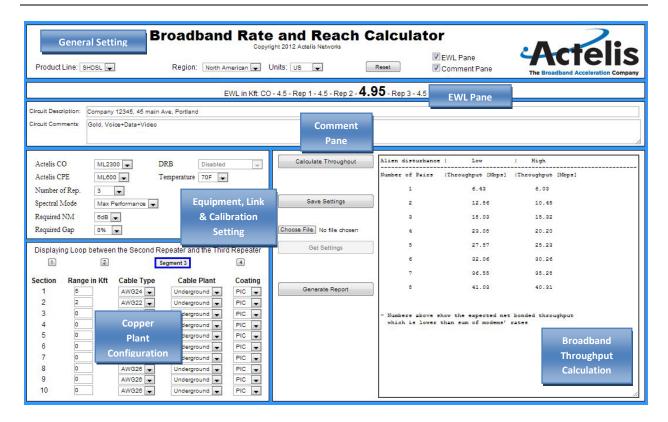
Intended Audience

The intended audience for this document is both technical and non-technical staff within Network Service Provider (NSP) organizations, and it is assumed that the reader has a general understanding of voice and data communications, the xDSL industry and high-speed digital services.

1. HOW TO USE THE DATA

After you have opened the Actelis Performance Calculator, you will be able to operate it to estimate the achievable bonded-copper link performance utilizing Actelis' ML G.shdsl or DMT-based solutions.

2. GENERAL VIEW OF THE BROADBAND CALCULATOR SCREEN

3. INSTRUCTIONS

Step 1: Run the Application
Click "Run Calculator" button below to begin.

Step 2: General Setting
When the calculator main screen is displayed, select the main parameters included as part of the "General Setting" area:
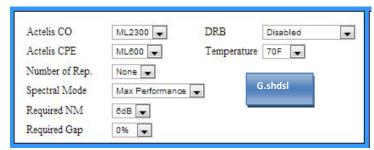
- **Product line**: SHDSL or DMT
- **Region**: North America/CALA, Europe or Asia Pacific
- **Loop length measurements units:** km or Kft

Step 3: Equipment, Link Configuration and Calibration Setting

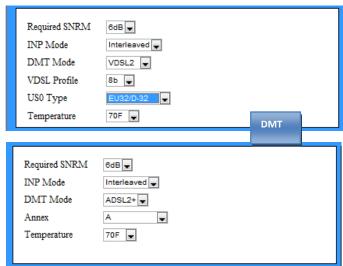<u>If SHDSL line was selected</u>, the following should be specified:

- The equipment at both ends of the link: CO side and CPE/RT side.
- Repeaters, if included and how many.
- Spectral mode and Noise Margin (NM) required.
- DRB level
- High Temperature in the area.
- Loop Influence Gap.

   ** Please note when choosing NA3 spectral mode on a repeater configurations the calculator would provide the expected performance per T1.417 spectral limitations (implementing rDSS)

<u>If DMT line was selected</u>, the following should be specified:

- Noise Margin (NM) required.
- Impulse Noise Protection Level (INP).
- DMT mode (ADSL2 /ADSL 2+/VDSL2).
- DMT Profile – Different option would be presented based on the DMT mode selected:
  - For VDSL - VDSL profiles and US0 configuration
  - For ADSL - ADSL annex A or M
- High Temperature in the area.

Note: The comment pane can be enabled from the global setting area, allowing the user to enter free data associated with the specific link.

Step 4: Cable Plant Configuration
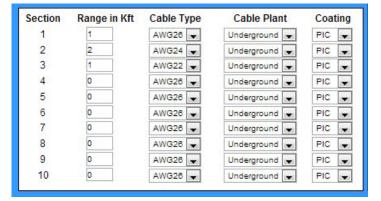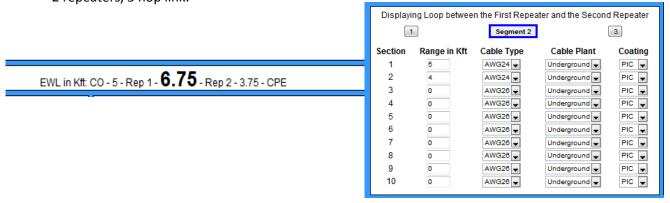
- Up to 10 segments can be set per link section. Cable characteristics, including length, cable type, and coating, should be specified.

  Note: The EWL pane can be enabled to present the Effective Working Length in Kft (26AWG) or km.

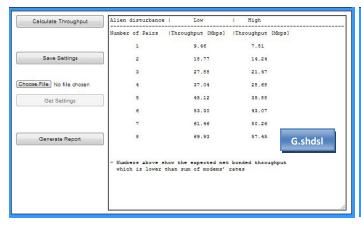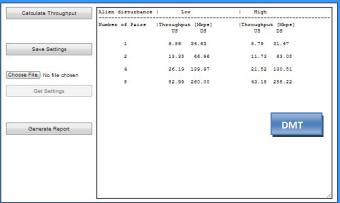| Section	Range in Kft	Cable Type	Cable Plant	Coating
1	1	AWG26	Underground	PIC
2	2	AWG24	Underground	PIC
3	1	AWG22	Underground	PIC
4	0	AWG26	Underground	PIC
5	0	AWG26	Underground	PIC
6	0	AWG26	Underground	PIC
7	0	AWG26	Underground	PIC
8	0	AWG26	Underground	PIC
9	0	AWG26	Underground	PIC
10	0	AWG26	Underground	PIC

- For a repeatered link, the user will be required to define each "Segment" of the link (hop) and its sections. The EWL pane will present the whole link, as can be seen by the example below - 2 repeaters, 3 hop link.

Displaying Loop between the First Repeater and the Second Repeater

[1]   Segment 2   [3]

Section	Range in Kft	Cable Type	Cable Plant	Coating
1	5	AWG24	Underground	PIC
2	4	AWG24	Underground	PIC
3	0	AWG26	Underground	PIC
4	0	AWG26	Underground	PIC
5	0	AWG26	Underground	PIC
6	0	AWG26	Underground	PIC
7	0	AWG26	Underground	PIC
8	0	AWG26	Underground	PIC
9	0	AWG26	Underground	PIC
10	0	AWG26	Underground	PIC

EWL in Kft: CO - 5 - Rep 1 - **6.75** - Rep 2 - 3.75 - CPE
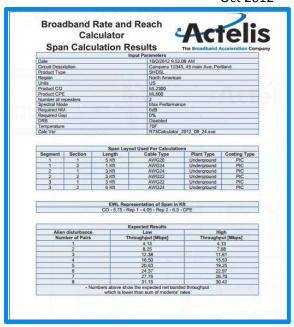
Step 5: Calculate Throughput – Link Performance

- Click "Calculate Throughput" to run the calculator.
- The Actelis link performance will be presented as per the input parameters entered on the left-hand side.
  - Actelis G.shdsl link throughput will be presented for 1 to 8 bonded copper pairs when ML600 is selected as CPE or up to 32 pairs when ML230 is selected as CPE.
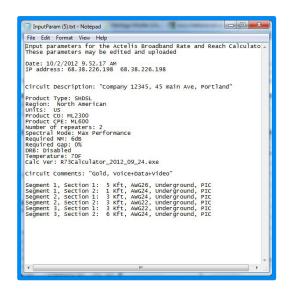 - Actelis DMT solution performance will be presented for 1 to 8 bonded copper pairs.

G.shdsl

```
Alien disturbance |     Low     |    High
---------------------------------------------------
Number of Pairs   |Throughput [Mbps]  |Throughput [Mbps]

       1              9.46              7.81
       2             18.77             14.24
       3             27.88             21.47
       4             37.04             28.68
       5             45.12             35.86
       6             53.30             43.07
       7             61.46             50.26
       8             69.93             57.45

- Numbers above show the expected net bonded throughput
  which is lower than sum of modems' rates
```

DMT

```
Alien disturbance |       Low        |       High
---------------------------------------------------------
Number of Pairs   |Throughput [Mbps]  |Throughput [Mbps]
                       US     DS          US     DS

       1             6.59    34.63       5.79    31.47
       2            13.35    66.96      11.73    63.08
       4            26.19   139.97      21.52   130.51
       8            52.99   260.00      43.18   258.22
```

- Click "Generate Report" to print the link configuration (all entered information) including calculated throughput to a PDF file.

Other

Save Link Input Parameters – "Save Settings" (Optional)

- Link input parameter (left-hand side) can be saved to be used in the future to represent changes in the link and then recalculate the expected performance with no need to re-enter all parameters.
- The data should be saved as a "txt" file.
- After saving the data, the input file can be opened, viewed or modified and then uploaded back to the system.

Load Input File - "Get Settings" (Optional)

- Using the "Choose File" button and then "Get Settings", the user can upload a "txt" file representing a link configuration (left-hand side).
- After "Get Settings" is clicked, the user can update the data, if required, and calculate the throughput.

For detailed information about system configuration and functionality please refer to Actelis' ML specific user manual and release notes

4. HOW TO CONTACT ACTELIS

Corporate Office	**Customer Service**
6150 Stevenson Blvd.	t. +1 510-545-1045
Fremont, CA 94538	t. +1 866-638-2544
t. +1 510-545-1045 or +1-866-ACTELIS	e. techsupport@actelis.com
f. +1 510-545-1075	
e. efmales@actelis.com	

Document Feedback

We welcome your comments and suggestions about this document. Please send them to Technical Publications, Actelis, 6150 Stevenson Blvd., Fremont, CA 94538 USA, or email us at **userdoc@actelis.com**. Please include the document number, revision number and title of this document in your correspondence. Also include your name and phone number, if you are willing to provide additional clarification.