Instructions Guide

Broad Band Accelerator (BBA) 3.0 Calculator Use Guide

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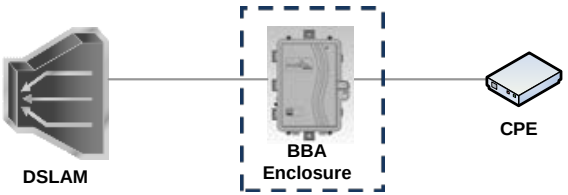
Actelis Networks™

About

This Calculator Instructions Guide describes how to use BBA 3.0 Placement Calculator.

The Actelis Broadband Amplifier (BBA) product line improves ADSL/ADSL2/ADSL2+ and VDSL2 rate and reach performance by using advanced noise filtering and signal amplification. The BBA is easily deployed over legacy copper pairs and is Line Powered from a POTS switch, consuming only minimal power.



The BBA is installed between the DSLAM unit and the CPE unit and is compatible with any standards-compliant ADSL/ADSL2/ADSL2+/VDSL2 DSLAM unit and CPE equipment.

The following table lists the various types of BBAs included as part of the Actelis BBA product line:

Name	Actelis P/N	Applicable for	Comment
ABA 2.0 LP SR	503RG3086	ADSL/ADSL2/ADSL2+	Previously known as BBA LP SR
ABA 2.0 LP ER	503RG3088	ADSL/ADSL2/ADSL2+	Previously known as BBA LP SR
ABA 3.0 LP SR	503RG3110	ADSL/ADSL2/ADSL2+	
VBA 3.0 LP ER	503RG3104	VDSL2	

Single slot, dual slot and multi slot BBA enclosures are available and can be equipped with Actelis BBA cards. Each BBA card can amplify up to two DSL lines.

	510K31000 **Single Slot**	510K31200 **Dual Slot**	510K60055 **Multi Slot**
ABA 2.0 LP SR	Yes	Yes	Yes
ABA 2.0 LP ER	Yes	Yes	Yes
ABA 3.0 LP SR	Yes	Yes	Yes
VBA 3.0 LP ER	No	Yes	Yes

Actelis BBA Flash tool (PN 503RG4080) can be optionally used for diagnosis and troubleshooting of BBA installations.

Preface Material

This Calculator Instructions Guide describes how to use BBA 3.0 Placement Calculator.

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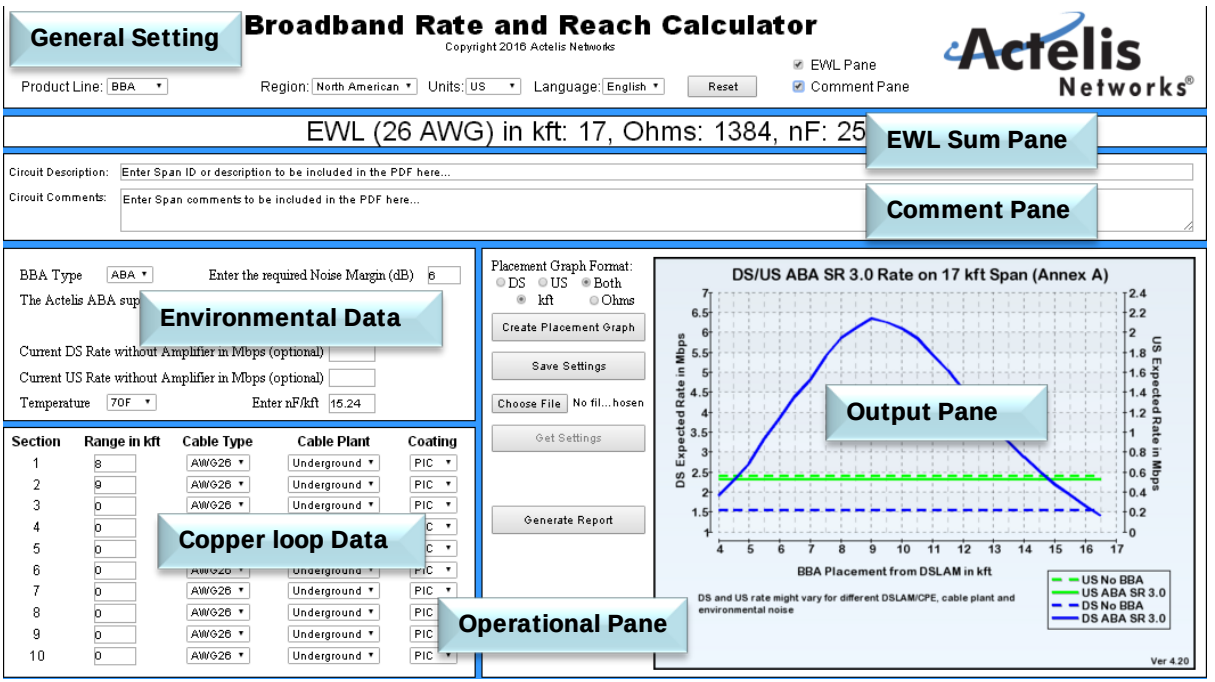
Contents

1 HOW TO USE

This "how to use" instructions are for ABA SR 3.0 model placement calculator, allowing to estimate the achievable ABA SR 3.0 performance when placed in different distance between DSLAM and CPE.

For BBA SR /ER 2.0 model Calculator (Excel tool) "how to use" instructions are available in another document available on the Actelis website.

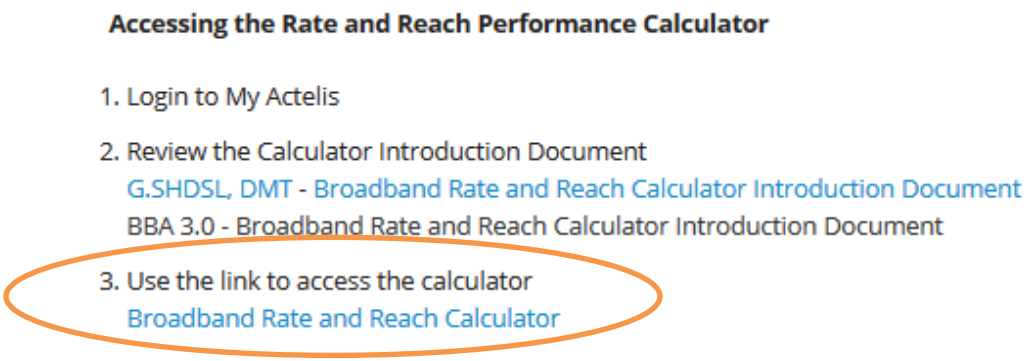
2 GENERAL VIEW



3 INSTRUCTIONS

Step1: Connecting to the Calculator

From Web Browser window, press on the link to access the calculator.

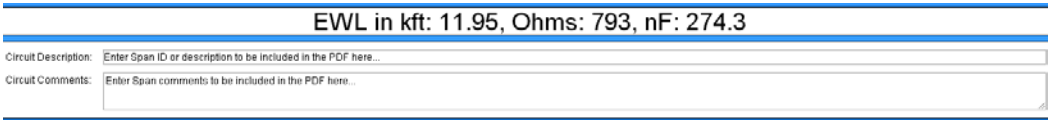


The application is opened as appeared on the general view above.

Step2: Using General Setting area

- **Product Line** : Choose BBA from Product Line drop-box selection (do not select SHDSL or DMT)
- **Region setting**: Localize the region (North American, CALA, European, or Asia Pacific). Selection automatically adjusts input/output data presentation in environmental, EWL and other panes respectively.
- **Units** :Select units (US/metric) for presentation of temperature, distances and other measurements
- Optional **Reset** : Anytime required, use Reset button to clear and start over input data setting
- **Optional EWL pane and Comment panes**, if required can be enabled for additional information and input area (by default these areas are omitted).

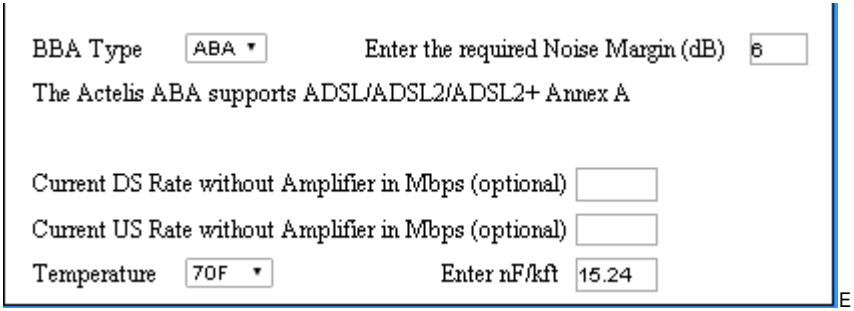
Step3: Using Comment area



- **Circuit Description** is 256 characters limited field to be used for short description. This information will be available in PDF report, if Calculation Results will be exported (by Generate Report operation).
- **Circuit Comment** is an unlimited in size field to provide any additional information required. This information will be available in PDF report, if Calculation Results will be exported (by Generate Report operation).

- **Effective Working Length (EWL) Pane** is automatically updated upon Environmental/Copper loop data setting specified. EWL is representing loop length per 26 AWG cable located underground and at 70^0F. For more details please refer to "Stage 5".

Step 4: Using Environmental data area



- **BBA type**: Select specific BBA type. Currently only ABA 3.0 is supported.
- **Noise Margin (NM) Required**: Provide Noise Margin in dB as required per link.
  - Same Noise margin will be used for both US and DS directions.
  - Default Value is 6dB.
  - Supported range is 0-31dB
- **Current (without Amplifier) performance (Optional)**: You can optionally provide Current DSL link performance for Downstream and Upstream. Using "Current info" the calculator can offer a higher level of accuracy in predicting the performance with the BBA

as it can more effectively mitigate variability between loops due to specific copper characteristics, interference levels as well as DSLAM and CPE equipment used.

- If current rates entered by the user are out of the allowed range (i.e. Too high or too low), the calculator will alert the user and will use accordingly the Max or the Min rate values accepted. Acceptable rate is calculated per scenario in accordance with the entered NM and the entered loop EWL.
- DS rate entered should be higher than the US rate.

- **Temperature** : Select environmental temperature
  - The user can select between 2 values – 70^0 or 120^0 F (20^0 or 50^0 C)
  - Default Values are – 70^0C / 20^0C
- **Kft or Km conversion to nF (Optional)**: Provide the primary line constant C, in nF per distance. Default values used are - 5.24nF/Kft and 50nF/km.

Step 5: Using Copper Loop data area

Section	Range in kft	Cable Type	Cable Plant	Coating
1	15.5	AWG26	Underground	PIC
2	0	AWG26	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

- **Loop**: Up to 10 segments/sections can be set per copper loop.
  Cable characteristics, including length, cable type, and coating, should be specified.
- **Range**: Range can be provided per segment in either kft or km (based on the unit selected at the top of the general settings and applicable for all settings).

The loop **Span**, i.e. the distance between the DSLAM and the DSL modem (CPE) is the sum of the ranges enter per each section.
Min and Max loop span are per ABA 3.0 Specification – See table below.

	ABA 3.0 LP SR		
	Min Loop Span (kft)	**Max Loop Span (kft)**	
26 AWG	5.5	20.0	Represents EWL
24 AWG	7.3	26.7	
22 AWG	9.2	33.3	
19 AWG	13.8	50.0	

- **Cable Type**: Select specific cable type using drop box selector, with available values for AWG26, AWG 24, AWG 22, AWG 19 or diameter (in mm) PE04, PE05, PE06, PE08 depends on Region selected in the general setting pane.
- **Cable Plant**: Indicate if the cable used per segment is Aerial, Buried, or Underground (default)
- **Coating**: Indicate cable coating - Pulp or PIC (default).

Note: The EWL pane can be enabled to present the Effective Working Length of the Span in Kft of 26 AWG. EWL depends on the range/span entered and cable type and coating as well as Environmental Conditions – Temp. For example 12 kft of AWG19 is equal to EWL=4.8kft (of 26 AWG) which is unsupported as can be seen from the table above as this loop is too short.

- If unsupported range is specified, EWL area value will be marked in red.
  Calculation results will be provided with the error, as shown on the example below:

EWL (26 AWG) in kft: **4.8**, Ohms: 193, nF: 182.9

An Error message would be presented

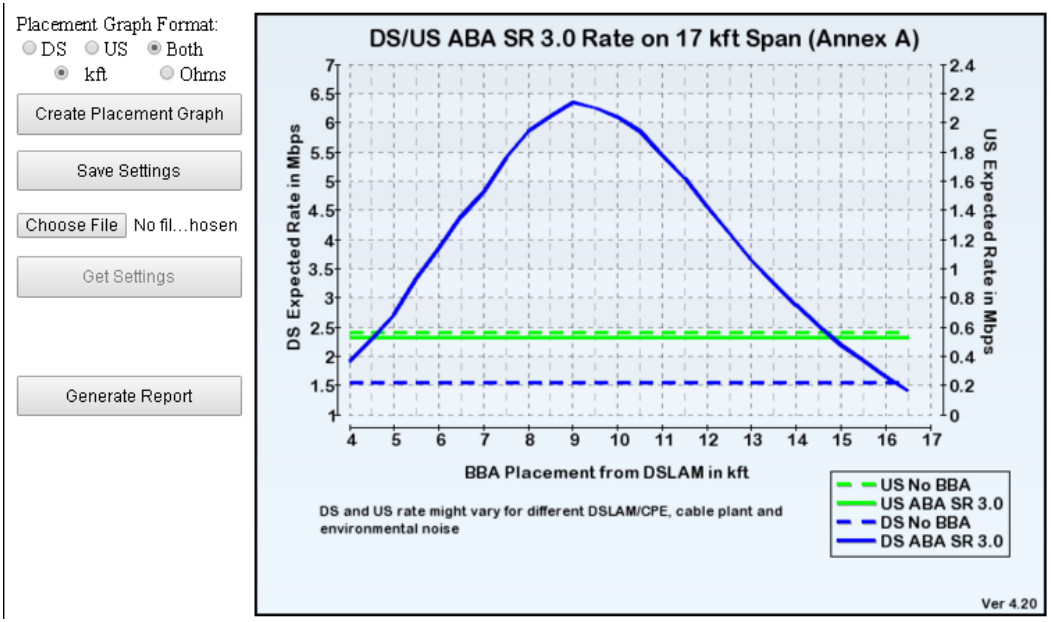
```
The entered EWL (26 AWG) is too short.
This loop is not suitable for an Actelis amplifier.
The acceptable input EWL is between 5.5 kft to 20 kft.
```

Or

EWL (26 AWG) in kft: **24**, Ohms: 1954, nF: 365.8

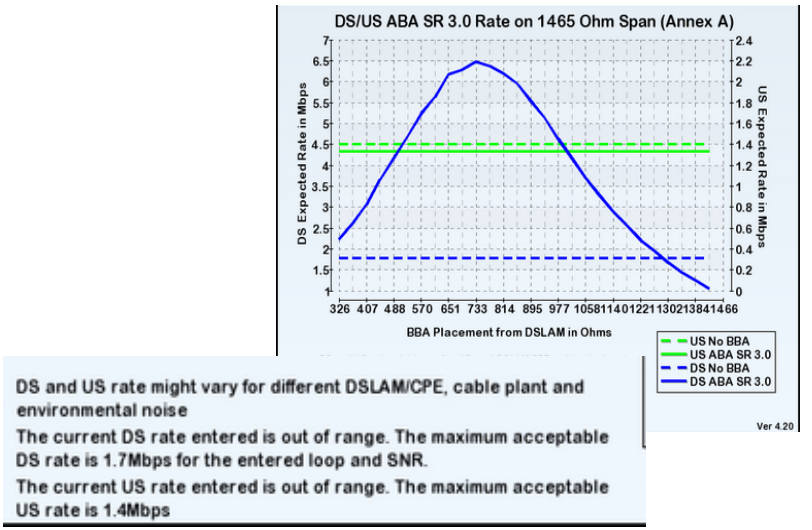
```
The entered EWL (26 AWG) is too long.
This loop is not suitable for an Actelis amplifier.
The acceptable input EWL is between 5.5 kft to 20 kft.
```

Step 6: Getting calculated results

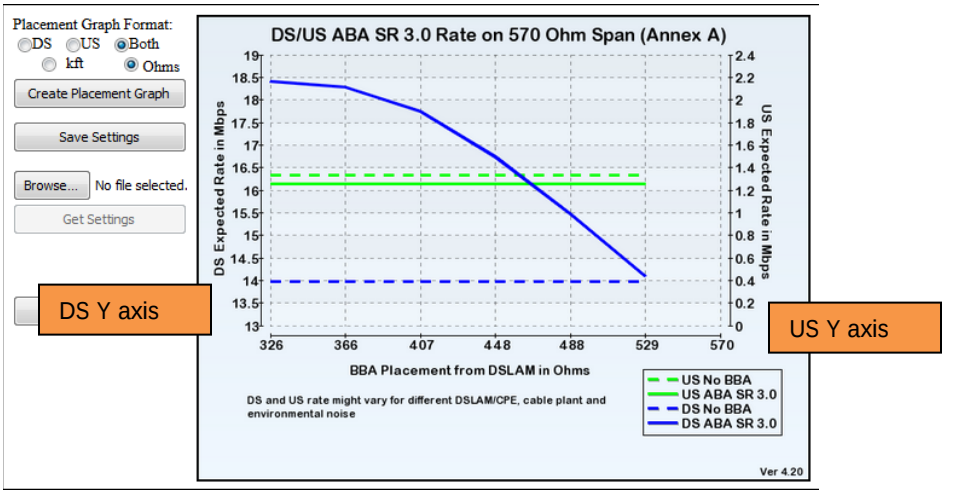


- Choose format of Placement Graph by radio-buttons as below
  - Select DS (Downstream only), US (Upstream only) or both (DS and US)
  - Select Kft or Ohm
- Each time format selections are changed, use “Create Placement Graph” button to run the calculator
- Calculation results appear according with selected format (in example above, in kft for both DS/US).
- The Placement graph shows the performance of the DSL line with and without amplification and per various placements (distance from the DSLAM) along the loop length as specified by the user.
- Blue color is used for DS presentation, Green color for US presentation
- The Full line represents the estimated performance with the Actelis amplifier;
- The Dotted line represents the performance without the Actelis amplifier.
  - If no current performance information was provided by the user the “No BBA” performance line would be estimated by the calculator.
  - If the user entered ‘current performance’ rates (and it is within the expected range) the current performance as entered by the user would be presented.

- If the user entered 'current performance' rates and it is outside the expected range, a note would appear below the graph and the "No BBA" performance line would be estimated by the calculator.
- Example - If the entered performance was higher and outside the acceptable range the



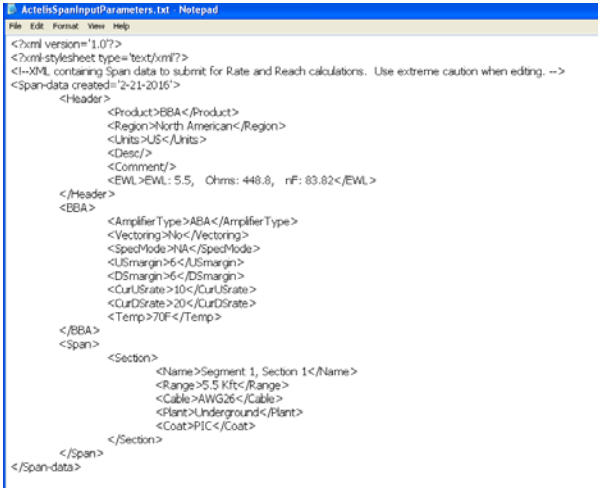
- In case 'both' (DS and US) option is selected, a 2 Y-axis chart is provided to accommodate the variance in scale between the DS and the US.
  The Left Y-axis represents the DS rate and the Right Y-axis represents the US rate.



Additional Options:

Save Link Input Parameters (Optional) – BBA 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.

To enable – Click "**Save Setting**" The data would be saved as a "txt" file. After saving the data, the input file can be opened, viewed or modified. The File can be uploaded back to the system using "Get Setting" see below).



Load Input File - "Get Settings" (Optional) - After "Get Settings" is clicked, all input data appears on the left side and the user can update the data, if required, and re-calculate the throughput

Generate Report button to save HTML report in PDF format

4 Contacts

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