

Using Workbench to Create an AUTOTEST Macro

for Testing a DOCSIS 3.0 System Using a DOCSIS 2.0 Modem

Introduction

This document will demonstrate how to create an **AUTOTEST** Macro, with the WorkBench Software for the 860 DSPi.

This test will specifically be able to test the *Primary* channels in a bonded DOCSIS 3.0 system. In this case, *Primary* would mean that a DOCSIS 2.0 modem could range and register on these channels. In channels that are not configured as *Primary*, other non-IP related tests could still be run.

To perform the configuration steps outlined in this document, you must be using WorkBench Version 2.2 and higher.



Background



The **AUTOTEST** Mode of the 860 DSPi performs a sequence of operations specified by a “macro”. You can assemble **AUTOTEST** Macros either manually or load them into the instrument using the WorkBench software.

Each macro is a “script” that the instrument can follow. It may contain most of the functions that the instrument is capable of performing, including channel selection, level setting, measurements, comparisons to limits and data recording. A list of macros can be stored in your instrument and you can select a macro for performing tests and generating reports at any time.

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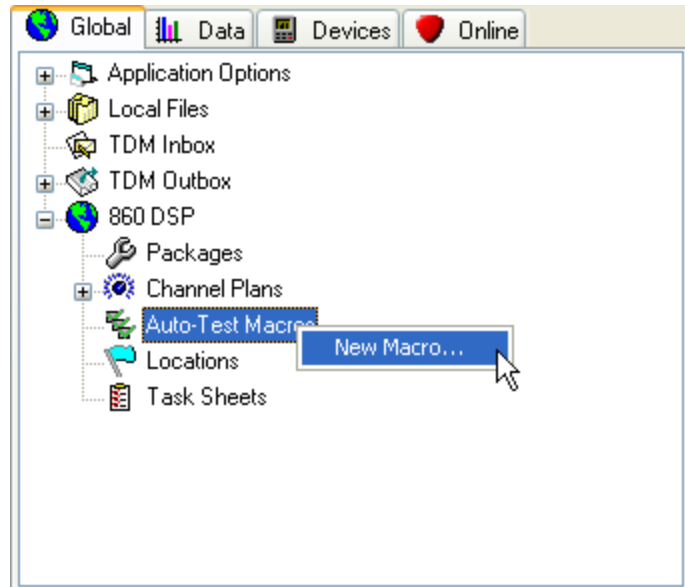
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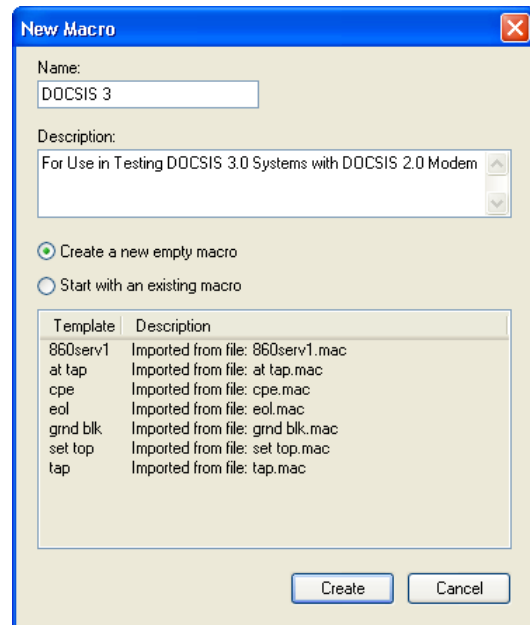
Creating a Macro

From the WorkBench software, perform the following steps to create an AUTOTEST Macro;

1. From the Global Tab of the Navigator Window, select the plus (+) sign next to 860 DSP to expand the option list.
2. Right-click **Auto-Test Macros** and from the pop-up menu, select **New Macro...**



3. The **New Macro** Window will appear.
4. Enter a name for the Macro (*required*) and a description (*not required, but recommended*) into the corresponding fields.
5. Select the **Create a new empty macro** radio button.
6. When you have completed entering your information, select the **Create** Button.



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7. A New blank Macro will appear in the **Data Window**.

Schedule		Parameters
• Timing	Immediate One-Time	
Test Steps		
• Step 1		
• Step 2		
• Step 3		
• Step 4		
• Step 5		
• Step 6		
• Step 7		
• Step 8		
• Step 9		
• Step 10		
• Step 11		
• Step 12		
• Step 13		
• Step 14		
• Step 15		
• Step 16		

Notes to Consider Before Configuring a New Macro

Some important notes to consider when configuring a new macro;

- Each Macro can contain up to 16 steps.
- You can choose from the following non-modem tests; MER, Pre-BER, and Post-BER.
- You can choose from the following modem tests, CMStats, PING and Throughput.
- For best results, run all the tests that are not dependent on the modem first. This will speed up the execution of the macro.
- If you are only measuring DOCSIS 3.0 Primary channels, you may wish to create a separate channel plan with only the DOCSIS 3.0 Primary channels in it.

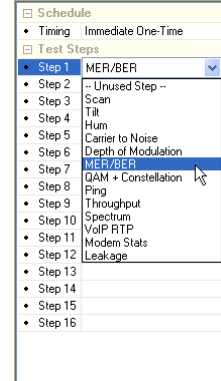
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Configuring Non-Modem Tests

To configure the non-modem tests of the macro, perform the following steps;

1. In the left pane of the Data Window, select the empty field to the right of the Step number. A drop-down box appears; select the **MER/BER** test from the list.



2. In the right pane of the Data Window, adjust the measurements settings and limits to your desired values.

<ul style="list-style-type: none"> ☐ Schedule • Timing Immediate One-Time ☐ Test Steps • Step 1 MER/BER • Step 2 • Step 3 • Step 4 • Step 5 • Step 6 • Step 7 • Step 8 • Step 9 • Step 10 • Step 11 • Step 12 • Step 13 • Step 14 • Step 15 • Step 16 		<ul style="list-style-type: none"> ☐ Step 1 - Check MER/BER • Channel Plan -- Active Channel Plan -- ☐ Limits • Minimum Digital Level -10 dBmV • Maximum Digital Level 10 dBmV • Minimum Digital MER 33 dB • Maximum Digital EVM Don't Test EVM • Maximum Digital Pre BER 9.00E-8 • Maximum Digital Post BER 1.00E-9 	
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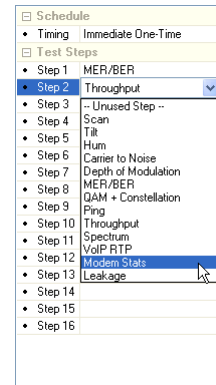
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Configuring Modem Tests

After the initial non-modem tests have been added, you can now add the modem tests. To configure the modem tests, perform the following steps;

1. In the left pane of the Data Window, select the empty field to the right of the Step number. A drop-down box appears; select the **Modem Stats** test from the list.



2. In the right pane of the Data Window, make sure that the parameters are correctly set for the first downstream frequency. Typically, the upstream ID would be left at **Use Setup Menu** and the meter's settings would be "ID Any".

Schedule		Step 2 - Check Modem Stats	
• Timing	Immediate One-Time		
Test Steps		Parameters	
• Step 1	MER/BER	• Modem MAC	MAC #1
• Step 2	Modem Stats	• Downstream Frequency	819.000 MHz
• Step 3		• Modem Mode	DOCSIS 2.0
• Step 4		• Annex Type	Annex B
• Step 5		• Upstream Id	Use Setup Menu
• Step 6		Limits	
• Step 7		• Minimum Launch Level	30 dBmV
• Step 8		• Maximum Launch Level	50 dBmV
• Step 9		• Minimum Receive Level	-10 dBmV
• Step 10		• Maximum Receive Level	40 dBmV
• Step 11			
• Step 12			
• Step 13			
• Step 14			
• Step 15			
• Step 16			

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- Once the Modem Stats connection has been made, the steps immediately following will use this same connection. At this point you can run any other tests associated with this channel including the VoIP RTP and Throughput Tests.

<ul style="list-style-type: none"> Schedule • Timing Immediate One-Time Test Steps • Step 1 MER/BER • Step 2 Modem Stats • Step 3 VoIP RTP • Step 4 Throughput • Step 5 • Step 6 • Step 7 • Step 8 • Step 9 • Step 10 • Step 11 • Step 12 • Step 13 • Step 14 • Step 15 • Step 16 	<ul style="list-style-type: none"> Step 4 - Check Throughput • File Name • IP Address 207.250.51.174 Parameters • File Transfer UDP Downstream Test • Transfer Rate 40000000 Bits/Sec Limits • Minimum Transfer Rate 10000000 Bits/Sec
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- To step to the next Primary channel for testing, add a new Modem Stats step to the macro. Remember to change the setup parameters to match the next Primary channel to be tested.

<ul style="list-style-type: none"> Schedule • Timing Immediate One-Time Test Steps • Step 1 MER/BER • Step 2 Modem Stats • Step 3 VoIP RTP • Step 4 Throughput • Step 5 Modem Stats • Step 6 • Step 7 • Step 8 • Step 9 • Step 10 • Step 11 • Step 12 • Step 13 • Step 14 • Step 15 • Step 16 	<ul style="list-style-type: none"> Step 5 - Check Modem Stats Parameters • Modem MAC MAC #1 • Downstream Frequency 816.000 MHz • Modem Mode DOCSIS 2.0 • Annex Type Annex B • Upstream Id Use Setup Menu Limits • Minimum Launch Level 30 dBmV • Maximum Launch Level 50 dBmV • Minimum Receive Level -10 dBmV • Maximum Receive Level 40 dBmV
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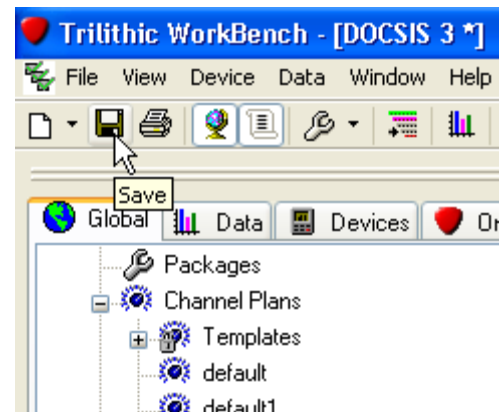
- Select the desired tests for this connection (if any) or continue running the Modem Stats test for all primary channels.

<ul style="list-style-type: none"> ☐ Schedule • Timing Immediate One-Time ☐ Test Steps • Step 1 MER/BER • Step 2 Modem Stats • Step 3 VoIP RTP • Step 4 Throughput • Step 5 Modem Stats • Step 6 Modem Stats • Step 7 Modem Stats • Step 8 • Step 9 • Step 10 • Step 11 • Step 12 • Step 13 • Step 14 • Step 15 • Step 16 	<ul style="list-style-type: none"> ☐ Step 7 - Check Modem Stats ☐ Parameters • Modem MAC MAC #1 • Downstream Frequency 821.000 MHz • Modem Mode DOCSIS 2.0 • Annex Type Annex B • Upstream Id Use Setup Menu ☐ Limits • Minimum Launch Level 30 dBmV • Maximum Launch Level 50 dBmV • Minimum Receive Level -10 dBmV • Maximum Receive Level 40 dBmV
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Saving and Uploading Macros

Perform the following steps to save the macro and upload it to an 860 DSPi;

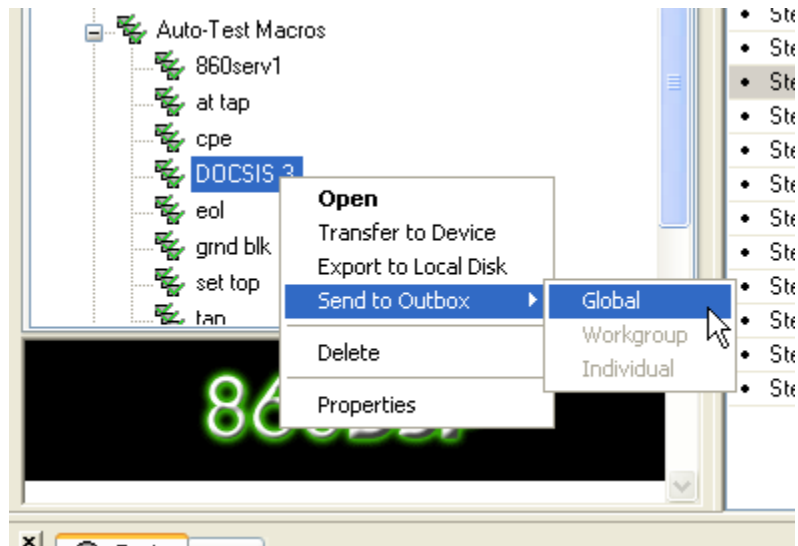
- After you have finished making changes to the macro, select the save menu from the WorkBench Toolbar at the top of the screen.



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2. From the Global Tab, find the new macro that you created and right-click on its name. From the pop-up menu, select Transfer to Device (specific device) or Send to Outbox (TDM users).



Conclusion

The steps performed in the previous sections will provide you with a starting point in creating an AUTOTEST Macro to test DOCSIS 3.0 systems using a DOCSIS 2.0 Modem in the 860 DSPi.

A note of caution; the AUTOTEST Macro shown in this Application Note is provided as an example only. The desired tests and parameters will need changed to meet the needs of your system.

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