

# MAOM-37447 Quad 24G/26G CDR with Integrated EML Driver Evaluation Module User Guide

# User Guide

DC-0014098



## MAOM-37447 Quad 24G/26G CDR with Integrated EML Driver Evaluation Module User Guide

Rev -

### Revision History

Revision	Date	Description
-	January 2017	Initial Release

# 1.0 Preparation and Setup

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## 1.1 Introduction

This EVM is intended for use as a demonstration vehicle for the MAOM-37447 devices.

## 1.2 Unpacking

The contents of the EVM shipping carton are the items listed in [Table 1-1](#).

**Table 1-1. EVM Contents**

Quantity	Part Number	Description
1	MAOM-37447 EVM PCB MH17-D310	EVM containing a MAOM-37447 device
1	MAOM-37447 USB or CD	USB or CD with GUI software and supporting documentation

### 1.3 Recommended Test Equipment

The following test equipment, or equivalent, is recommended for use with this EVM.

1. Power Supplies:

Voltage +1.8 VDC, +/- 5%, Current: 0.7A Current Limit (typical operation mode: CDRs enabled, PRBS Generator and Checker are off)

Voltage +3.3 VDC, +/-5%, Current: 0.5A current limit  
Noise/Ripple: Less than 100mV peak-to-peak

2. Pattern Generator:

Manufacturer: Agilent  
Model: N4903A JBERT or equivalent  
Up to 28Gpbs operation, 800mV<sub>PPD</sub> output signal

3. Digital Communication Analyzer:

Manufacturer: Agilent  
Model: 86100C DCA-J or equivalent

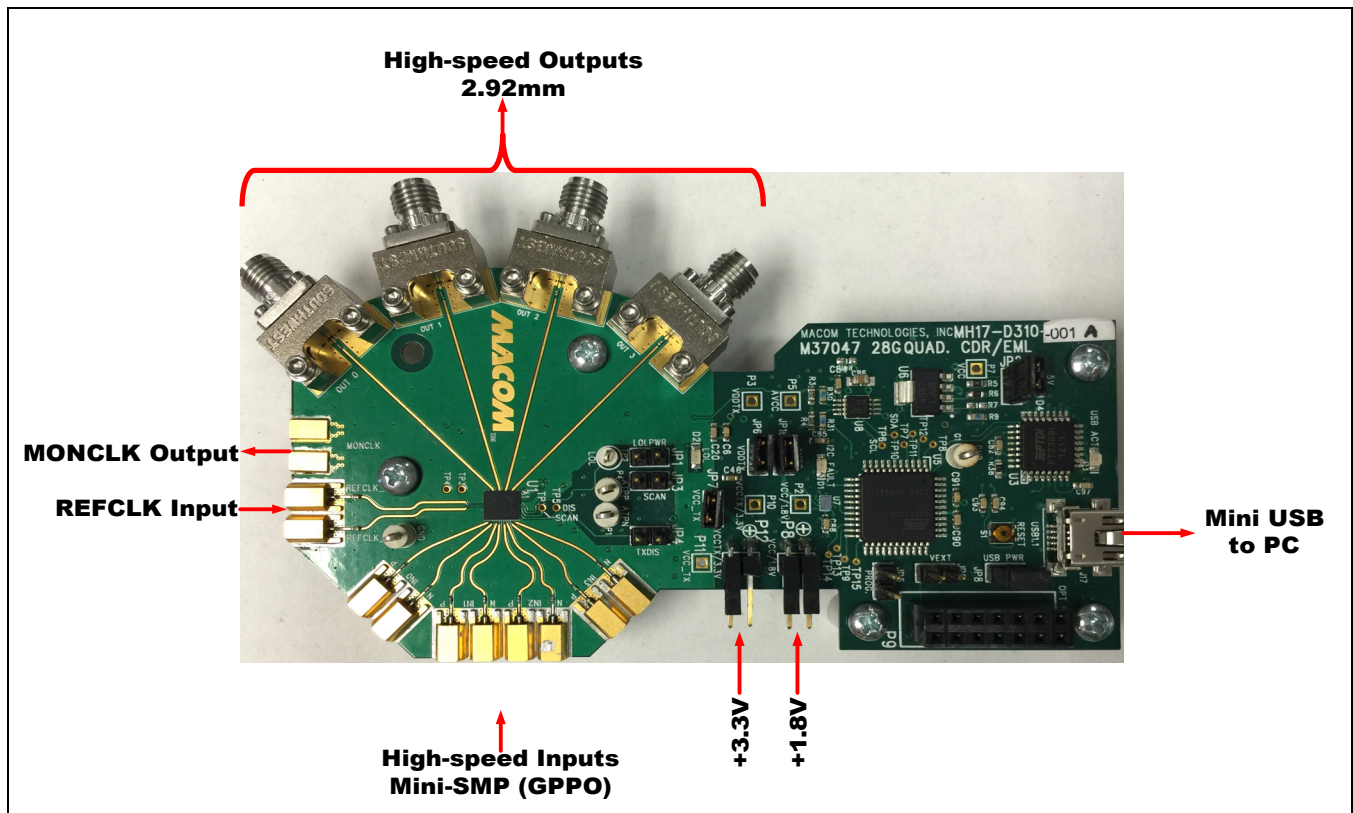
4. Cables:

Matched 12inches 50Ω cables GPPO connectors for input  
0.5meter 50Ω cables 2.92mm connectors for output

## 1.4 Hardware Setup

The EVM is configured for use out of the box. Please refer to [Figure 1-1](#) for locations of various connectors.

Figure 1-1. MAOM-37447 Evaluation Module (with micro-controller)



The following steps outline the initial setup of the EVM.

1. Verify these jumpers are in place: JP2, JP6, JP7, JP8 and JP16
2. Connect P8 header with +1.8V supply and P12 with +3.3V (observe polarity marking).
3. Connect high speed input signal to mini-SMP (GPPO) connectors and output to 2.92mm connectors.
4. Connect provided USB cable from J17 to host PC for software control through graphical user interface (GUI).

Once the necessary hardware connections for the EVM are in place, the next step is to launch the control software for the EVM.

## 2.0 Software Operation

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### 2.1 Software Setup

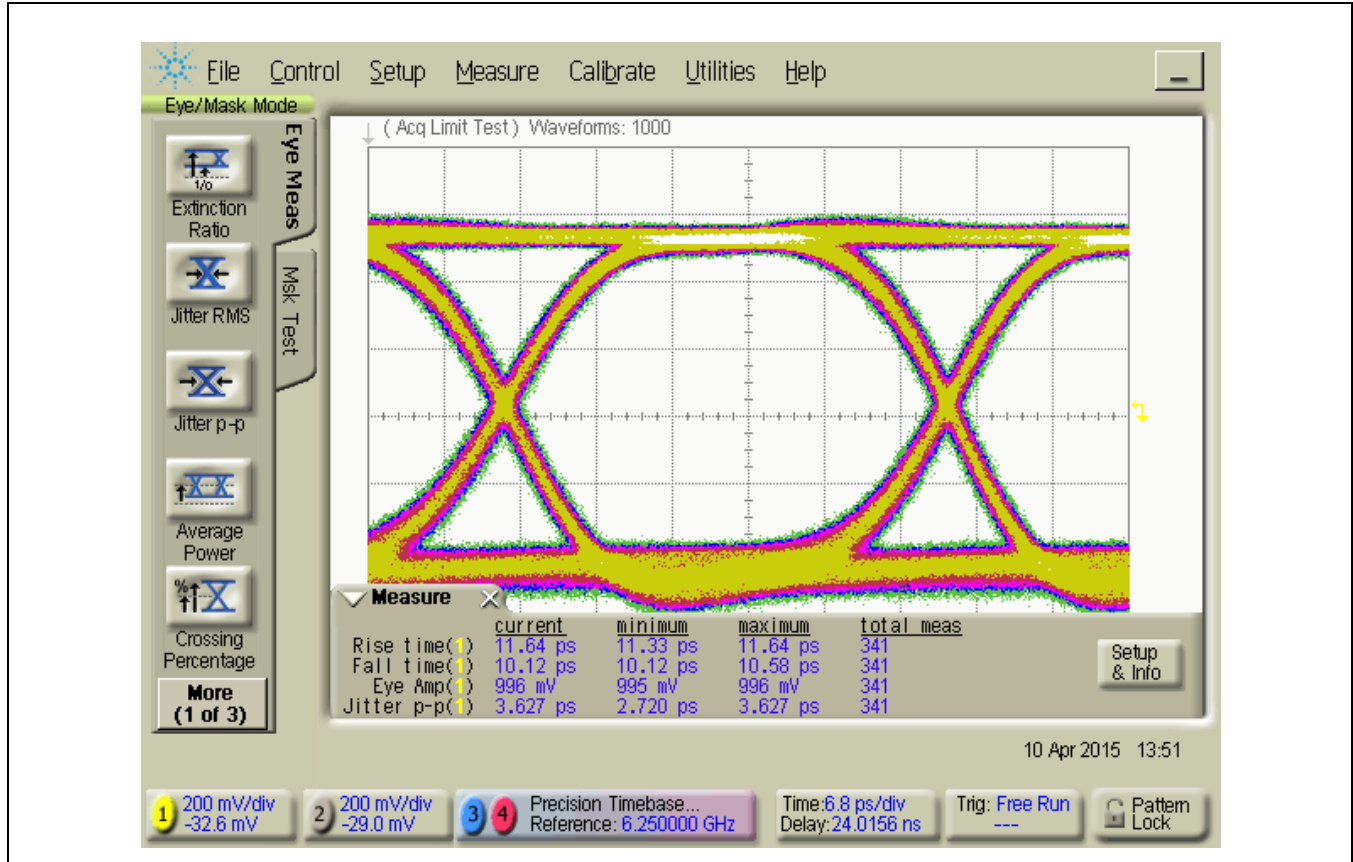
Before using the EVM, install the control software on the host PC from the USB drive or EVM CD that shipped with the EVM kit into the host PC. Copy the software files to the desired location on the host PC, then double click on the setup.exe file to install the control software.

1. Insert the EVM CD or USB flash drive into the computer that will be used as the controller for the EVM. Locate the “\Software\EVM Setup vX.X” folder and launch **Setup.exe** to install the software. Please note that Windows XP Service Pack 2 is the minimum system requirement for this software.
2. Connect a USB cable to the EVM and the PC. When the USB cable is connected, a new hardware found window may pop up and install the USB driver. Allow this process to complete before proceeding.
3. Launch the M37047 EVM User Control software by going to Start > All Programs > MACOM Technology Solutions.
4. Once the software is running, click the “Connect” button in the top-left corner of the screen. Most settings will be auto-detected, but you will be prompted if additional information is required.
5. Once connected, the software will display the current state of all device settings. The user can choose to adjust settings using the “Device Settings” tab, the “Memory Map” tab, or the “Direct Register Access” control.

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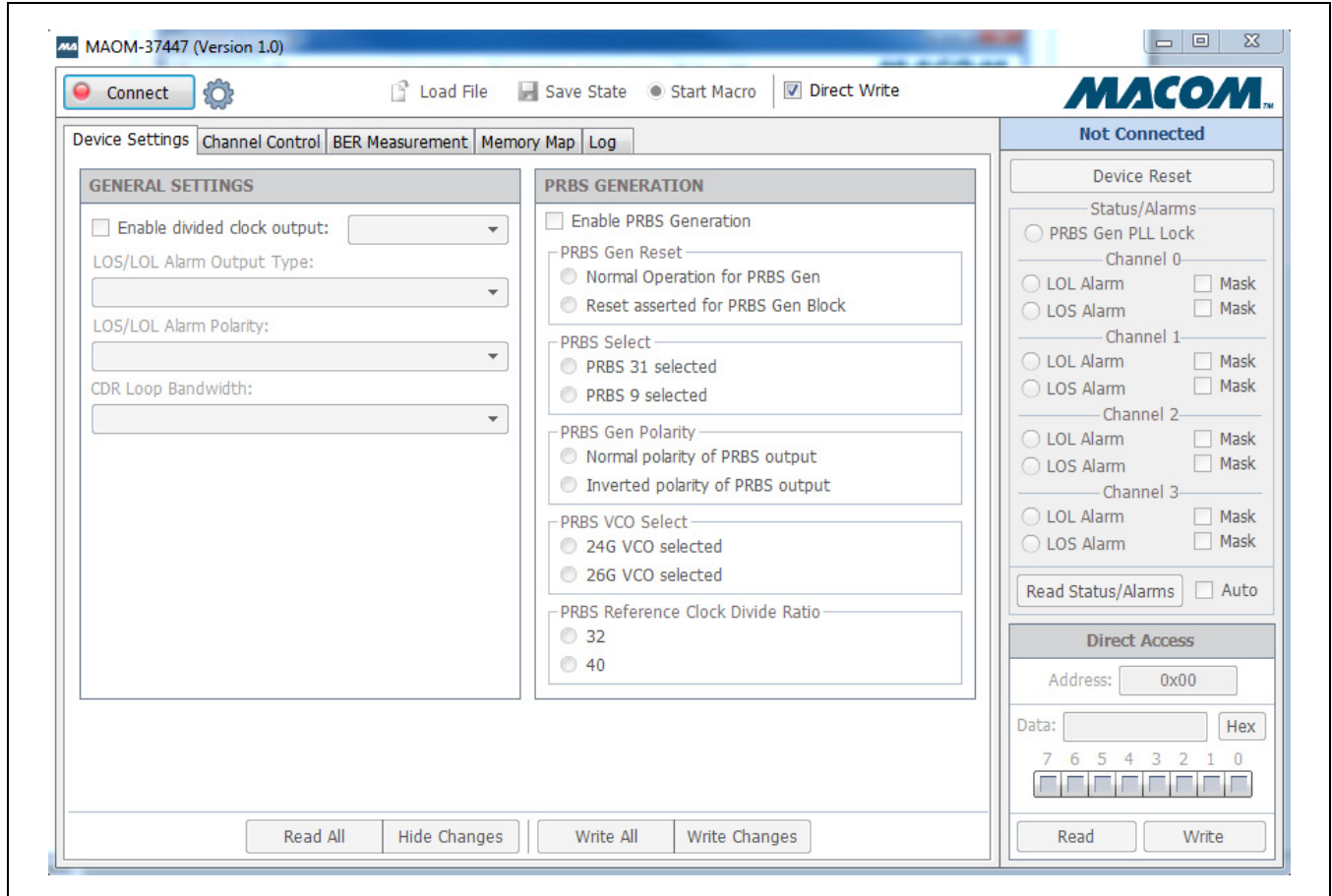
Figure 2-1. MAOM-37447 Typical Output Eye Diagram at 25.8Gbs, 1V Output Swing, Retime Mode



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Figure 2-2. MACOM EVM GUI Software (before connection)





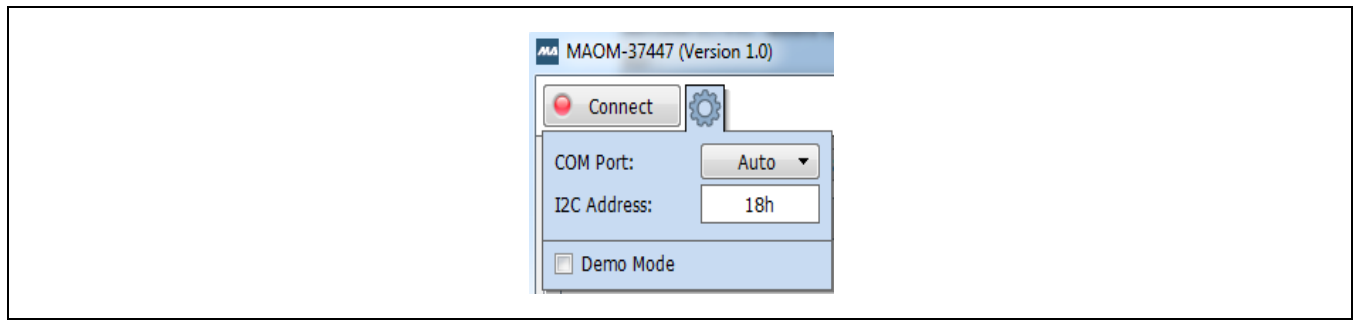
## 2.2 Software Operation

### 2.2.1 Connection Settings

In most cases, simply clicking the “Connect” button will auto-detect all settings necessary to connect to the device. However, if changes to the connection settings need to be made, click the settings icon next to the Connect button and adjust the settings in the drop-down panel that appears.

The software may also be operated without a device plugged in by turning “Simulate Connection” on. This is useful primarily for getting familiarized with the interface or reviewing the available device settings.

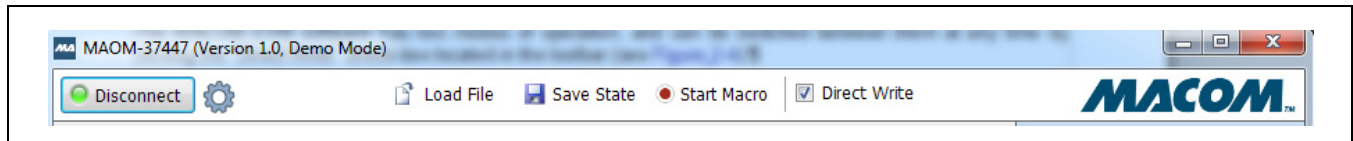
Figure 2-3. Connection Settings Panel



### 2.2.2 Direct/Indirect Write Mode

The MACOM EVM software has two modes of operation, and can be switched between them at any time by clicking the “Direct Write” check-box located in the toolbar (see [Figure 2-4](#)).

**Figure 2-4. MACOM GUI Toolbar**



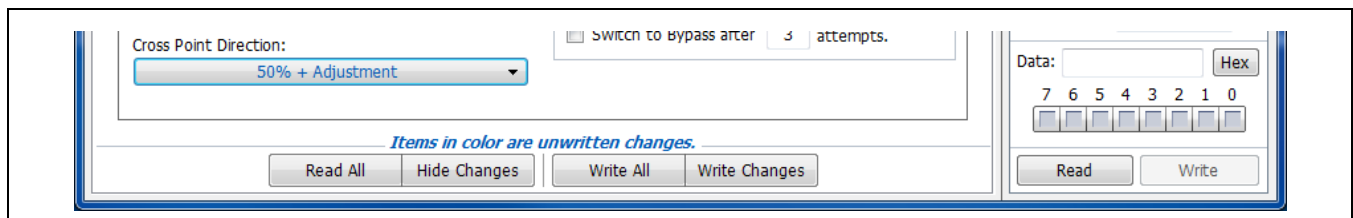
#### Direct Write Mode

In this mode any changes made in the software are immediately written to the device without any further actions necessary. When a direct-write occurs, the field will momentarily flash to indicate that the write is taking place. This applies throughout the interface, except for the “Direct Register Access” control (see [Section 2.2.4](#)), which still requires that the “Write” button be clicked in order to commit a change.

#### Indirect Write Mode (Direct Write disabled)

In this mode, changes made in the software are not written to the device until “Write Changes” or “Write All” is clicked. Any items that have been modified will appear in **color** to make it clear that these items have not been written. This color may be altered by going to the “Log” tab and clicking on the color wheel at the bottom.

**Figure 2-5. Writing Changes**



Note that the buttons at the bottom of the tab page only affect items on that tab page.

#### Read All

Discards changes by re-reading the registers from the device.

#### Hide Changes

Temporarily reveals what the settings were before they were changed.

#### Write All

Re-writes every register on the current tab page, even those that haven't changed.

#### Write Changes

Writes only those items that have changed (items in **color**).

### 2.2.3 Memory Map

Register values can be set directly using the memory map. Click the “Read All” button to load the current values into the interface. To change a value, click on a particular cell in the table and type a new value. Changes will either take effect immediately or after “Write Changes” is clicked, depending on the current Direct Write/Indirect Write setting (see [Section 2.2.2](#)).

Figure 2-6. Memory Map

The screenshot shows a software interface with a tabbed menu at the top containing "Device Settings", "Channel Control", "BER Measurement", "Memory Map", and "Log". The "Memory Map" tab is active. Below the tabs, a text label reads "All values are in hexadecimal." Below this is a table with 16 columns labeled 0 through F and 16 rows labeled 00-0F through F0-FF. The table contains hexadecimal values for each cell. At the bottom of the interface are four buttons: "Read All", "Hide Changes", "Write All", and "Write Changes".

Address	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00-0F	98	01	00	00	10	00	00	00	00	00	00	00	00	00	00	00
10-1F	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
20-2F	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
30-3F	00	00	04	10	1C	00	08	00	00	00	00	00	00	00	00	00
40-4F	00	00	04	50	1C	00	08	00	00	00	00	00	00	00	00	00
50-5F	00	00	04	50	1C	00	08	00	00	00	00	00	00	00	00	00
60-6F	00	00	04	50	1C	00	08	00	00	00	00	00	00	00	00	00
70-7F	00	00	04	50	1C	00	08	00	00	00	00	00	00	00	00	00
80-8F	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
90-9F	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
A0-AF	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
B0-BF	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
C0-CF	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
D0-DF	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
E0-EF	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
F0-FF	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00

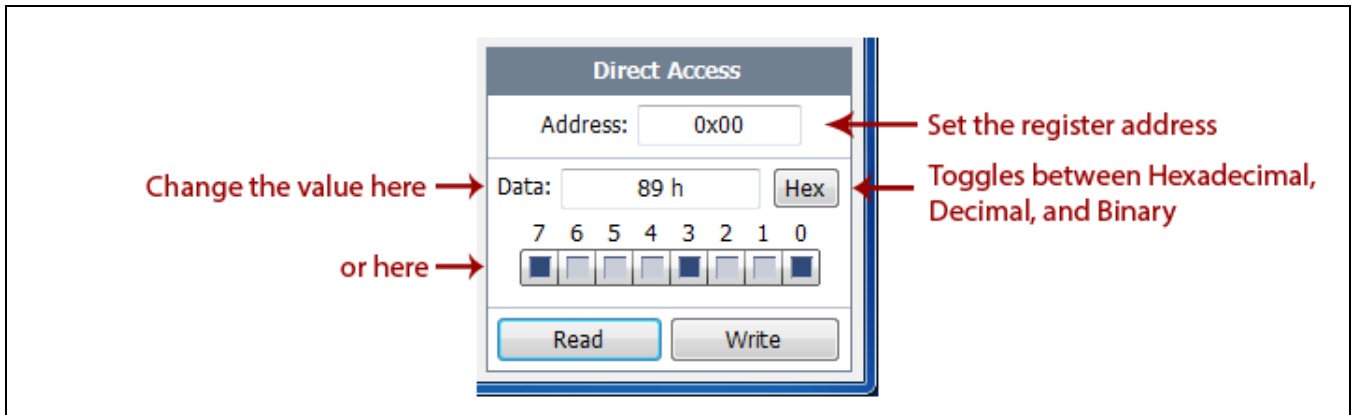
### 2.2.4 Direct Register Access

The Direct Register Access control is located in the bottom-right corner of the interface, and can be used to read and write register values directly (by address). To view a register value, type the address into the “Address” text box, then click the “Read” button. To write a new value, make sure the “Address” box is set to the proper address, enter the new value into the “Data” box and click “Write.”

The data value can also be modified by clicking the individual bits on or off in the bit-strip located just below the data box.

The button to the right of the data box can be clicked to toggle between Hexadecimal, Decimal, and Binary views.

Figure 2-7. Direct Register Access



### 2.2.5 Saving/Loading State and Macro Files

The three buttons located along the center of the toolbar allow you to load and save preset values into the device.

Figure 2-8. Load/Save Buttons



#### Load File

Loads the settings from a file into the device. In some cases MACOM will provide pre-created files which may be included on the EVM CD or USB Drive. Your application resource will provide these files along with instructions for their use if necessary.

#### Save State

Takes a snapshot of the current state of all user-level registers on the device and creates a script file that can be loaded back in later (via the Load File command). This is very useful for creating a baseline configuration that will need to be returned to many times.

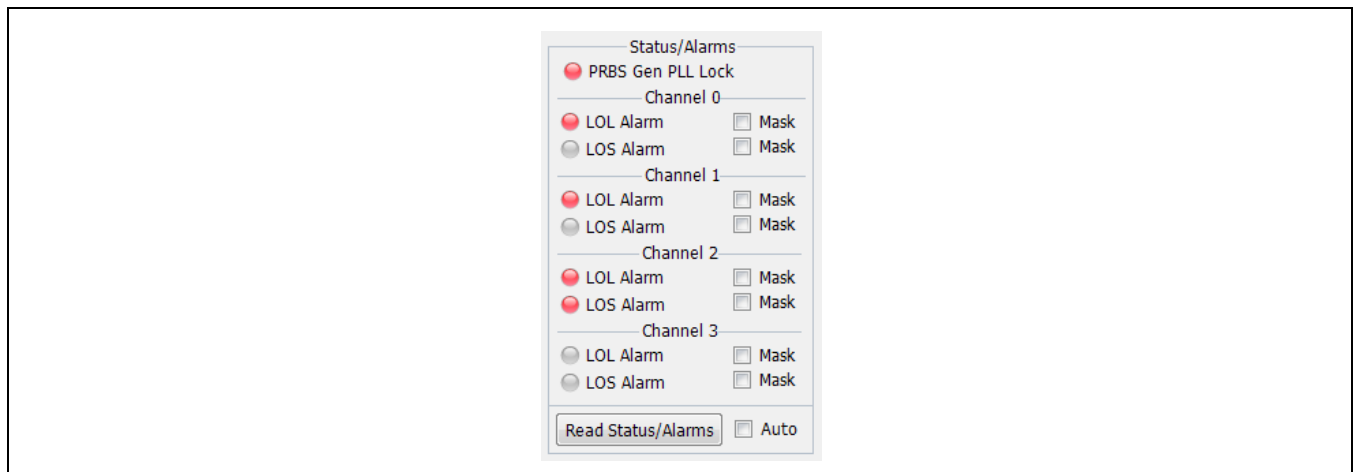
### Start Macro

This function begins recording any register changes from the time that the button is clicked until it is clicked again (once started the button will read “End Macro”). The results will be saved in a file which can be loaded back in later (via the Load File command). When using this feature, consider enabling “Direct Write Mode” (see [Section 2.2.2](#)). In this mode, each change will be recorded to the script file in the order that it was executed. This is useful when the order of the register writes is particularly important.

## 2.2.6 Alarm Auto-Read

The alarm panel on the right side of the interface is normally only updated when the “Read Status/Alarms” button is clicked. However, checking the “Auto” check box next to the “Read Status/Alarms” button will cause the alarm registers to be re-read at regular intervals (about twice per second).

**Figure 2-9. Alarm Panel**



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