

User's Manual TICS PRO



# **Revision History**

| Revision | Date         | Descriptions/Comments                    |
|----------|--------------|------------------------------------------|
| 1.0      | 8-April-2015 | Initial version                          |
| 2.0      | 19-June-2015 | Updated the Color compliant screen shots |

The TICS PRO User's Manual provides a general overview of the Evaluation Module (EVM) GUI which includes,

- Description of the features of the GUI
- Functions to be considered while using the GUI



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# **Pre-requisites**

- Iron Python 2.7.5
- .Net Framework 4.5



## 1. TICS PRO GUI Overview

The TICS Pro software provides a generic EVM GUI framework for the LMX, LMK and the CDC timing devices.

# **1.1. TICS-PRO GUI Layout**

In this section, the layout of the TICS Pro GUI is explained.

Figure 1: TICS Pro GUI Layout





# A. Title Bar

The TICS Pro GUI provides an option to select the required device. The name of the selected device is displayed in the title bar.

# B. Menu Bar

The menu bar provides the option to perform the various operations on the GUI like selecting the device, communication mode, loading or saving configurations etc.

# C. Tool Bar

The Tool bar provides the options to perform device specific operations that are defined as Iron Python script. The display of the tool bar is optional in the UI and the menu present varies for different devices. It will be loaded only if there is an entry [TOOLBAR] in the device INI and the scripts specified in the section are displayed as the options in the tool bar.

## D. Navigation Pane

The navigation pane lists all the available pages in the GUI. Clicking on an item in the pane will load the corresponding page in the GUI.

## E. Help Pane

When you mouse over the controls on the GUI pages, the help pane displays the information relevant to the controls. It has two tabs – General & Context. The general tab provides information about the selected page. The context tab explains the control-specific information.

## F. Content Pane

When you select any page in the navigation pane, the content pane is loaded with the corresponding page



# G. Status Bar

The status bar displays the status with respect to the different operations being performed on the page.

## H. Communication Info

This pane displays the selected communication protocol and whether the GUI is connected to a device or is being used in simulation mode.



# 2. TICS PRO GUI Menu Options

In this section, we will describe the use of the listed menu options

## 2.1. File Menu

#### 2.1.1. Save

The Save option allows you to save the current configuration of the GUI in a macro file(.mac file). This option can be accessed by traversing through the file menu

| TICS Pro - LMX2492                                                                     | -                 | -                               | and the other diversion of the other diversio | -          | ·         |             | -            |        |      |                     |
|----------------------------------------------------------------------------------------|-------------------|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------|-------------|--------------|--------|------|---------------------|
| File USB communications                                                                | Select Device     | Options Tools                   | Default configuration Help                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |           |             |              |        |      |                     |
| Save                                                                                   |                   |                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |           |             |              |        |      |                     |
| Load                                                                                   |                   | 1                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |           |             |              |        |      |                     |
| Export hex register value                                                              | e<br>e            | Address/Value                   | 2 2 2 2 1 1 1 1 1 1 1<br>3 2 1 0 9 8 7 6 5 4 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1 1<br>2 1 | 100098    | 00007654    | 0000<br>3210 |        |      | Data                |
|                                                                                        |                   | 0x008D00                        | 0000 0000 100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0 1        | 101       | 0000        | 0000         |        | *    | 0x                  |
| Import hex register value                                                              | s                 | 0x008C27                        | 0000 0000 100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0 1        | 100       | 0010        | 0111         |        |      |                     |
|                                                                                        |                   | 0x008B10                        | 0000 0000 100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0 1        | 011       | 0001        | 0000         |        |      | Write Register      |
| LMX2492                                                                                |                   | 0x008A00                        | 0000 0000 100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0 1        | 010       | 0000        | 0000         |        |      |                     |
|                                                                                        |                   | 0x008900                        | 0000 0000 100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0 1        | 001       | 0000        | 0000         |        |      | Read Register       |
| LMK02002                                                                               |                   | 0x008800                        | 0000 0000 100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0 1        | 000       | 0000        | 0000         |        | E    |                     |
| LMK04000B                                                                              |                   | 0x008700                        | 0000 0000 100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0 0        | 111       | 0000        | 0000         |        |      | Read All Registers  |
|                                                                                        |                   | 0x008600                        | 0000 0000 100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0 0        | 110       | 0000        | 0000         |        |      |                     |
| CDCM6208V1                                                                             |                   | 0x008527                        | 0000 0000 100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0 0        | 101       | 0010        | 0111         |        |      | Write All Registers |
| LMK04101                                                                               |                   | 0x008410                        | 0000 0000 100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0 0        | 100       | 0001        | 0000         |        |      |                     |
|                                                                                        |                   | 0x008300                        | 0000 0000 100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0 0        | 011       | 0000        | 0000         |        |      | (                   |
|                                                                                        |                   | 0x008200                        | 0000 0000 100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0 0        | 010       | 0000        | 0000         |        |      | Import Register Map |
| Exit                                                                                   |                   | 0x008100                        | 0000 0000 100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0 0        | 001       | 0000        | 0000         |        |      |                     |
|                                                                                        | 0127              | 0x008000                        | 0000 0000 100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1 1        | 1 1 1     | 0000        | 0000         |        |      | Export Register Map |
|                                                                                        | R127              | 0x007F00                        | 0000 0000 011                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1 1        | 1 1 0     | 0010        | 0 1 1 1      |        |      |                     |
|                                                                                        | P125              | 0x007E27                        | 0000 0000 011                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1 1        | 101       | 0 0 0 1     | 0 0 0 0      |        |      | Desister Field Name |
| Conoral Contaut                                                                        | P124              | 0x007010                        | 0000 0000 011                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1 1        | 100       | 0000        | 0 0 0 0      |        |      | Register/Field Name |
| General Context                                                                        | R123              | 0x007800                        | 0000 0000 011                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1 1        | 011       | 0 0 0 0     | 0 0 0 0      |        |      | Name                |
| Raw Registers                                                                          | R122              | 0x007A00                        | 0000 0000 011                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1 1        | 010       | 0000        | 0000         |        |      |                     |
| This is Pegister man                                                                   | R121              | 0x007900                        | 0000 0000 011                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1 1        | 001       | 0000        | 0000         |        |      | Value               |
| page that holds the                                                                    | R120              | 0x007800                        | 0000 0000 011                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1 1        | 000       | 0000        | 0000         |        |      | Read                |
| values of the                                                                          | R119              | 0x007727                        | 0000 0000 011                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1 0        | 111       | 0010        | 0111         |        |      | Neau                |
| registers                                                                              | R118              | 0x007610                        | 0000 0000 011                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1 0        | 110       | 0001        | 0000         |        |      |                     |
|                                                                                        | R117              | 0x007500                        | 0000 0000 011                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1 0        | 101       | 0000        | 0000         |        |      | Address Bits        |
|                                                                                        | R116              | 0x007400                        | 0000 0000 011                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1 0        | 100       | 0000        | 0000         |        |      |                     |
|                                                                                        | R115              | 0x007300                        | 0000 0000 011                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1 0        | 011       | 0000        | 0000         |        |      |                     |
|                                                                                        | R114              | 0x007200                        | 0000 0000 011                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1 0        | 010       | 0000        | 0000         |        |      |                     |
|                                                                                        | R113              | 0x007100                        | 0000 0000 011                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1 0        | 001       | 0000        | 0000         |        |      |                     |
|                                                                                        | R112              | 0x007027                        | 0000 0000 011                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1 0        | 000       | 0010        | 0111         |        |      |                     |
|                                                                                        | R111              | 0x006F10                        | 0000 0000 011                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0 1        | 111       | 0001        | 0000         |        |      |                     |
|                                                                                        | R110              | 0x006E00                        | 0000 0000 011                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0 1        | 101       | 0000        | 0000         |        |      |                     |
|                                                                                        | R109              | 0x006000                        | 0000 0000 011                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0 1        | 101       | 0000        | 0000         |        |      |                     |
|                                                                                        | R108              | 0x006200                        | 0000 0000 011                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0 1        | 011       | 0000        | 0000         |        |      |                     |
|                                                                                        | R106              | 0x006400                        | 0 0 0 0 0 0 0 0 0 1 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0 1        | 010       | 0000        | 0000         |        |      |                     |
|                                                                                        | R105              | 0x006927                        | 0000 0000 011                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0 1        | 001       | 0010        | 0111         |        |      |                     |
|                                                                                        |                   |                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 10         |           |             |              |        | *    |                     |
| Welcome to TICS Pro. Version<br>Loading Device LMK02002<br>Completed loading Device LM | n -> 0.0.0.17, 23 | 3-Jun-15<br>xn = 2015-05-22, v2 | .0.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |            | Protocol: | SP          | 9            | _      |      |                     |
| Completed loading Device LM<br>Completed loading Device LM                             | X2492. Version    | n = 2015-01-14, ma              | nual update for bitmask                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |            | Connecti  | on Mode: US | B2ANY        | 🤴 Texa | s In | STRUMENTS           |

Figure 2 : File Menu - Save Option



## 2.1.2. Load

This option allows you to load a configuration which was previously saved. It can be accessed in the following by traversing through the File menu and selecting the "Load" option

## **2.1.3.** Recently Loaded Device Info

The five most recently loaded devices are listed under the file menu as shown below in the diagram.

| TICS Pro - LMX2492                                                                                                                             | The second second second                                                                                                | and they bear                                                                                                                               | T I I I MARKED                                                                                                                    |                                                                                                                        |                                                                                                                     |
|------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| File USB communications                                                                                                                        | Select Device Options Tools                                                                                             | Default configuration Help                                                                                                                  |                                                                                                                                   |                                                                                                                        |                                                                                                                     |
| Save                                                                                                                                           |                                                                                                                         |                                                                                                                                             |                                                                                                                                   |                                                                                                                        |                                                                                                                     |
| Load                                                                                                                                           |                                                                                                                         |                                                                                                                                             |                                                                                                                                   |                                                                                                                        |                                                                                                                     |
| Export hex register valu<br>Import hex register valu<br>LMX2492<br>LMK02002<br>LMK04000B<br>CDCM6208V1                                         | es THER<br>es abled •<br>CDER<br>r Modulator •<br>0 ps •                                                                | OSC_DIFFR<br>POWERDOWN<br>Powered Up •<br>SWRST<br>CPM_FLAGL<br>CPM_FLAGH                                                                   | CPM_LIMIT_HIGH                                                                                                                    | 46 <b>*</b><br>4 <b>*</b>                                                                                              | E                                                                                                                   |
| LMK04101                                                                                                                                       |                                                                                                                         | Output Pins                                                                                                                                 |                                                                                                                                   |                                                                                                                        |                                                                                                                     |
| Exit<br>General Context<br>User controls<br>This is User<br>Controls page (High<br>level page with<br>details of the                           | S_CNT<br>32 -<br>DLD_TOL<br>1 ns -<br>DLD_ERR_CNT<br>4 -                                                                | MUXout_MUX<br>Output DLD&CPMON   TRIG1_MUX<br>Input TRIG1  TRIG2_MUX<br>Input TRIG2                                                         | MOD_MUX<br>Input MOD •<br>TRIG1_PIN<br>Tristate •<br>TRIG2_PIN<br>Tristate •                                                      | MOD_PIN<br>Tristate •<br>MUXout_PIN<br>Output - PP •                                                                   |                                                                                                                     |
| register<br>functionalities<br>mapping)                                                                                                        | Others     Speed Up Controls     FL_TOC     O     FL_CSR     Disabled     FL_CPG     Disabled     General Ramp Controls | Ramp Comparators & Limits<br>RAMP_CMP0[30:0]<br>33554432<br>RAMP_CMP0[32:31]<br>0<br>RAMP_CMP0[32:31]<br>0<br>RAMP_CMP1[30:0]<br>2113229216 | RAMP1 Controls<br>RAMP1_INC<br>0 •<br>RAMP1_LEN<br>10000 •<br>RAMP1_DLY<br>RAMP1_FL<br>RAMP1_FL<br>RAMP1_NEXT_TRIG<br>TOC Timeout | RAMP4 Controls<br>RAMP4_INC<br>0 +<br>RAMP4_LEN<br>10000 +<br>RAMP4_DLY<br>RAMP4_DLY<br>RAMP4_NEXT_TRIG<br>TOC Timeout | RAMP7 Controls<br>RAMP7_INC<br>0<br>RAMP7_LEN<br>10000<br>RAMP7_LEY<br>RAMP7_LY<br>RAMP7_FL<br>RAMP7_FL<br>RAMP7_FL |
| Welcome to TICS Pro. Versio<br>Loading Device LMK02002<br>Completed loading Device LM<br>Loading Device LMX2492<br>Completed loading Device LM | un -> 0.0.0.17, 23-Jun-15<br>MK02002. Version = 2015-05-22, v<br>MX2492. Version = 2015-01-14, m                        | 2.0.0<br>anual update for bitmask                                                                                                           | Protocol: S<br>Connection Mode: U                                                                                                 | pi<br>sbzany 🜵 Texa                                                                                                    | as Instruments                                                                                                      |

Figure 3 : File Menu - Recently Loaded Device Info



## 2.1.4. Importing Register Map Data

The "Import Hex Register Values" feature allows you to import the register information or data into the GUI in the following three formats



#### Figure 4 : File Menu - Import Hex Register Values



## 2.1.4.1. Format 1

CASE A (decimal reg#) R0 0x80000100 R0 0x08030400 R1 0x0000101 ... R8 0x10000908 R9 0xa0022a09 R10 0x0082000b

#### 2.1.4.2. Format 2

R13 0x0286c00d

CASE B (hex reg#) R0x0 0x80000100 R0x0 0x08030400 R0x1 0x00000101

.... R0x8 0x10000908

R0x9 0xa0022a09 R0xb 0x0082000b R0xd 0x0286c00d

## 2.4.1.3. Format 3

| CASE C (no reg num) |
|---------------------|
| 0x80000100          |
| 0x08030400          |
| 0x00000101          |
|                     |
| 0x10000908          |
| 0xa0022a09          |
| 0x0082000b          |
| 0x0286c00d          |
|                     |

However when you export the register data using the "Export Hex Register Values" option, It is always exported in Format 1



## 2.2. USB Communications Menu

#### 2.2.1. Interface

The Interface option allows you to select the protocol that is to be used for communication with the devices.

| File | USB communications             | Select Device | Options Tools |
|------|--------------------------------|---------------|---------------|
| Sav  | Interface                      |               |               |
| ⊿ LN | Write All Register             | s Ctrl+L      |               |
|      | User controls<br>Raw Registers | Register Name | Address/Value |
|      | PLL                            | R141          | 0x008D00      |
|      | Ramp Calculator                | R140          | 0x008C00      |
|      | Burst Mode                     | R139          | 0x008B00      |
|      |                                | R138          | 0x008A00      |
|      |                                | R137          | 0x008900      |
|      |                                |               |               |

#### Figure 5 : USB Communications Menu - Interface

When you traverse through the USB Communications menu and click on the Interface option, the pop-up dialog shown below appears on the screen. The Communication setup window lists the Interfaces available for the device loaded. Select the required protocol and click on OK. The rectangular area at the middle of the window display image of the Pin Configuration of the respective interface selected.



| Interface<br>USB2ANY<br>TIHera<br>FTDI<br>Simulation | 54AF0A4720002500     Identify       Simulation | Select a Protocol SPI v |
|------------------------------------------------------|------------------------------------------------|-------------------------|
|                                                      |                                                |                         |
|                                                      |                                                |                         |
|                                                      |                                                |                         |
|                                                      |                                                |                         |







Figure 8 : USB Communications - Interface Selection Dialog – USB2ANY Device Connected

| Communication Setup                                          | April 100 cm                                       | and all all all all all all all all all al |                         |
|--------------------------------------------------------------|----------------------------------------------------|--------------------------------------------|-------------------------|
| Interface<br>© US82ANY<br>© TiHera<br>© FTDI<br>© Simulation | Select USB2ANY<br>54AF0A4720002500   USB Connected | Blinking                                   | Select a Protocol SPI + |
|                                                              |                                                    |                                            |                         |
|                                                              |                                                    |                                            |                         |
|                                                              |                                                    |                                            |                         |
|                                                              |                                                    |                                            | Close                   |



## • Connection Status

The connection status of a device can be identified from the LED where Green denotes one or more devices are connected. On the other hand Red LED denotes that the device is disconnected.

## • List of Devices

The list of connected devices are populated in the listbox for each Interface respectively. Each device is represented as a unique string populated in the list box.

## • Identifying a device

The device connected could be identified by using the "Identify" option. Select one of the listed device and Click the identify option. The "Identify" option will change to "Blinking" state, that will toggle the LED of the selected device in the list.

## 2.2.2. Program All Register

The "Program All Register" option allows you to write all the register values into the device. The status bar at the bottom indicates this. It is similar to the "Write All" operation on the Raw Register Page



| TICS Pro - LMX2492                                         |               | r 7 8 - 1     |             |            |      | -         | -            | Autor.  | Autor Auto | -           |                     |
|------------------------------------------------------------|---------------|---------------|-------------|------------|------|-----------|--------------|---------|------------|-------------|---------------------|
| ile USB communications                                     | Select Device | Options Tools | Default con | figuration | Help |           |              |         |            |             |                     |
| Save Interface                                             |               |               |             |            |      |           |              |         |            |             |                     |
| Write All Register                                         | c Ctrl+l      | 1             |             |            |      |           |              |         |            |             |                     |
|                                                            | S GUIVE       | <u>.</u>      |             |            |      |           |              |         |            |             |                     |
| Raw Registers                                              | Register Name | Address/Value | 2222        | 1111       | 1111 | 1100      | 0000         | 3210    |            |             | Data                |
| PLL                                                        | P141          | 0x008000      | 0000        | 0000       | 1000 | 1101      | 0000         | 0000    |            |             | 0×009600            |
| Ramp Calculator                                            | R140          | 0x008000      | 0 0 0 0     | 0 0 0 0    | 1000 | 1 1 0 0   | 0000         | 0000    |            |             | 0,000000            |
| Burst Mode                                                 | R139          | 0x008800      | 0 0 0 0     | 0000       | 1000 | 1011      | 0000         | 0000    |            |             | Write Register      |
|                                                            | R138          | 0x008A00      | 0000        | 0000       | 1000 | 1010      | 0000         | 0000    |            |             |                     |
|                                                            | R137          | 0x008900      | 0000        | 0000       | 1000 | 1001      | 0000         | 0000    |            |             | Read Register       |
|                                                            | R136          | 0x008800      | 0000        | 0000       | 1000 | 1000      | 0000         | 0000    |            | =           |                     |
|                                                            | R135          | 0x008700      | 0000        | 0000       | 1000 | 0111      | 0000         | 0000    |            |             | Read All Registers  |
|                                                            | R134          | 0x008600      | 0000        | 0000       | 1000 | 0110      | 0000         | 0000    |            |             |                     |
|                                                            | R133          | 0x008500      | 0000        | 0000       | 1000 | 0101      | 0000         | 0000    |            |             | Write All Registers |
|                                                            | R132          | 0x008400      | 0000        | 0000       | 1000 | 0100      | 0000         | 0000    |            |             |                     |
|                                                            | R131          | 0x008300      | 0000        | 0000       | 1000 | 0011      | 0000         | 0000    |            |             |                     |
|                                                            | R130          | 0x008200      | 0000        | 0000       | 1000 | 0010      | 0000         | 0000    |            |             | Import Register Map |
|                                                            | R129          | 0x008100      | 0000        | 0000       | 1000 | 0001      | 0000         | 0000    |            |             |                     |
|                                                            | R128          | 0x008000      | 0000        | 0000       | 1000 | 0000      | 0000         | 0000    |            |             | Export Register Map |
|                                                            | R127          | 0x007F00      | 0000        | 0000       | 0111 | 1111      | 0000         | 0000    |            |             |                     |
|                                                            | R126          | 0x007E00      | 0000        | 0000       | 0111 | 1110      | 0000         | 0000    |            |             |                     |
|                                                            | R125          | 0x007D00      | 0000        | 0000       | 0111 | 1101      | 0000         | 0000    |            |             | Register/Field Name |
| General Context                                            | R124          | 0x007C00      | 0000        | 0000       | 0111 | 1100      | 0000         | 0000    |            |             | Namo                |
|                                                            | R123          | 0x007B00      | 0000        | 0000       | 0111 | 1011      | 0000         | 0000    |            |             | Name                |
|                                                            | R122          | 0x007A00      | 0000        | 0000       | 0111 | 1010      | 0000         | 0000    |            |             | Value               |
| egister Name:                                              | R121          | 0x007900      | 0000        | 0000       | 0111 | 1001      | 0000         | 0000    |            |             |                     |
| egister Name(in                                            | R120          | 0x007800      | 0000        | 0000       | 0111 | 1000      | 0000         | 0000    |            |             | Read                |
| ex): R0x86                                                 | R119          | 0x007700      | 0000        | 0000       | 0111 | 0111      | 0000         | 0000    |            |             |                     |
| ield Name :                                                | R118          | 0x007600      | 0000        | 0000       | 0111 | 0110      | 0000         | 0000    |            |             | _                   |
| AMP6_NEXT_TRIG                                             | R117          | 0x007500      | 0 0 0 0     | 0000       | 0111 | 0101      | 0000         | 0000    |            |             | Address Bits        |
| tart Bit : 3                                               | R116          | 0x007400      | 0000        | 0000       | 0111 | 0100      | 0000         | 0000    |            |             |                     |
| ength : 2                                                  | R115          | 0x007300      | 0000        | 0000       | 0111 | 0011      | 0000         | 0000    |            |             |                     |
| escription:                                                | R114          | 0x007200      | 0000        | 0000       | 0111 | 0010      | 0000         | 0000    |            |             |                     |
| his determines                                             | R113          | 0x007100      | 0000        | 0000       | 0111 | 0001      | 0000         | 0000    |            |             |                     |
| amp is.                                                    | R112          | 0x007000      | 0000        | 0000       | 0111 | 0000      | 0000         | 0000    |            |             |                     |
|                                                            | R111          | 0x006F00      | 0000        | 0000       | 0110 | 1 1 1 1   | 0000         | 0000    |            |             |                     |
| ield Name :                                                | R110          | 0x006E00      | 0000        | 0000       | 0110 | 1101      | 0000         | 0000    |            |             |                     |
| AMP6_NEXT                                                  | R109          | 0x006000      | 0000        | 0000       | 0110 | 1101      | 0000         | 0000    |            |             |                     |
| tart Bit : 5                                               | R108          | 0x006C00      | 0000        | 0000       | 0110 | 1011      | 0000         | 0000    |            |             |                     |
| ength : 3                                                  | R107          | 0x006600      | 0000        | 0000       | 0110 | 1011      | 0000         | 0000    |            |             |                     |
| escription:                                                | P105          | 0x006400      | 0 0 0 0     | 0000       | 0110 | 1001      | 0 0 0 0      | 0000    |            |             |                     |
| his determines                                             | R105          | 0,000900      | 0000        |            |      | 1001      |              |         |            | Ŧ           |                     |
| /rote Register R0x4 as 0x00<br>/rote Register R0x3 as 0x00 | 0400<br>0300  | 1             |             |            |      | * Protoco | : S          | PI      |            |             |                     |
| Irote Register R0x2 as 0x00                                | 0201          |               |             |            |      |           |              |         |            |             |                     |
| rote Register R0x1 as 0x00                                 | 0018          |               |             |            |      | Contract  | ion Made: O  |         | TEVA       | S IN        | STRIMENT            |
|                                                            |               |               |             |            |      | - Connec  | uon mode: Si | mulauon |            | <b>5</b> II | SINUMERI            |



## **2.3. Select Device Menu**

## 2.3.1. Import User Device

This option allows you to load new devices into the GUI. The User Device related files must be grouped together in a ".Zip" File. When the Import User Device option is selected, a dialog pops up to select the zip file. The GUI then unzips all the files and places them into the appropriate folders.

| TICS Pro - LMX2492                                         |                                          | 2 88 X             | A33.0                                 |                       |
|------------------------------------------------------------|------------------------------------------|--------------------|---------------------------------------|-----------------------|
| File USB communications                                    | Select Device Options Tools Default conf | guration Help      |                                       |                       |
| Save Load Read Back                                        | Import User Device                       |                    |                                       |                       |
| ▲ LMX2492                                                  | Delete User Device(s)                    |                    |                                       |                       |
| Raw Registers                                              | User Devices                             | 111                | 1100000000000000000000000000000000000 | Data                  |
| PLL<br>Ramo Calculator                                     | PLI                                      | 000                | 1101 0000 0000                        | 0x008600              |
| Burst Mode                                                 | CDC Devices                              | . 000              | 1011 0000 0000                        | Write Register        |
|                                                            |                                          | 000                | 1010 0000 0000                        | Read Register         |
|                                                            | Open                                     | TH SALL I          |                                       | E Read All Register   |
|                                                            | Libraries > Document                     | •                  | - 4 Search Documents                  | P Redu All Registers  |
|                                                            | Organize 🔻 New folder                    |                    | ÷ - 🗋 🌘                               | Write All Registers   |
|                                                            | 🚖 Favorites 🍎 DOCUM                      | ents library       | Arrange by: Folder 🔻                  | Import Register Map   |
|                                                            | Desktop Includes: .                      | locations          |                                       | Export Register Map   |
|                                                            | Recent Places                            | ackup Source Files |                                       | Â.                    |
|                                                            | 📲 🎉 Debug 📱 火 🚺                          | ile folder         |                                       | E Register/Field Name |
| General Context                                            | Release                                  | DC Devices         |                                       | Name                  |
| Register Name:                                             | CodeLoader 4                             | le folder          |                                       | Value                 |
| Register Name(in<br>Her): POx86                            | 🔒 Golden Samples 👘 📊                     | DCM6208            |                                       | Read                  |
| Field Name :                                               | Mac Files                                | ile folder         |                                       |                       |
| RAMP6_NEXT_TRIG<br>Start Bit : 3                           | Installed Director                       | DCM6208V1          |                                       | Address Bits          |
| Stop Bit : 4<br>Length : 2                                 | 🐊 Installer                              | ile folder         |                                       |                       |
| This determines                                            |                                          | con                |                                       |                       |
| ramp is.                                                   | Libraries -                              | ile folder         |                                       | -                     |
| Field Name :                                               | File name:                               |                    | ✓ User Devices (.zip) (*.zip)         |                       |
| Start Bit : 5                                              |                                          |                    | Open Cancel                           |                       |
| Length : 3<br>Description:                                 |                                          |                    |                                       |                       |
| This determines                                            | R105 0x006900 0 0 0 0 0                  |                    |                                       | *                     |
| Wrote Register R0x4 as 0x00<br>Wrote Register R0x3 as 0x00 | 0400<br>0300                             | *                  | Protocol: SPI                         |                       |
| Wrote Register R0x2 as 0x00<br>Wrote Register R0x1 as 0x00 | 0201<br>0100                             |                    | <b></b>                               | T                     |
| Wrote Register R0x0 as 0x00                                | 0018                                     |                    | Connection Mode: Simulation           | IEXAS INSTRUMENTS     |
| Ľ                                                          |                                          |                    |                                       |                       |

Figure 10 : Select Device - Import User Device



The new user devices would then appear in the Select Device menu as shown in figure below.

| TICS Pro - LMX2492                                         | - 6 6 9       | r 7 8               | H-9-8              |         |         | -          | -            | Autor.     | Authors | Autority 1 |                     |
|------------------------------------------------------------|---------------|---------------------|--------------------|---------|---------|------------|--------------|------------|---------|------------|---------------------|
| File USB communications                                    | Select Device | Options Tool        | s Default config   | uration | Help    |            |              |            |         |            |                     |
| Save Load Read Back                                        | Import Us     | ser Device          |                    |         |         |            |              |            |         |            |                     |
| 4 LMX2492                                                  | Delete Us     | ser Device(s)       |                    |         |         |            |              |            |         |            |                     |
| User controls                                              | Lines Day     |                     |                    |         | 111     | 1100       | 0 0 0 0      | 0000       |         |            |                     |
| Raw Registers                                              | User Dev      | ices                |                    |         | 432     | 1098       | 7654         | 3210       |         |            | Data                |
| PLL                                                        |               |                     |                    |         | 000     | 1101       | 0000         | 0000       |         | *          | 0×008600            |
| Ramp Calculator                                            | PLL           |                     |                    | ,       | 000     | 1100       | 0000         | 0000       |         |            |                     |
| Burst Mode                                                 | CDC Dev       | rices               |                    | ,       | 000     | 1011       | 0000         | 0000       |         |            | Write Register      |
|                                                            | Clock Dis     | tribution with Div  | ider               | ,       | 000     | 1001       | 0000         | 0 0 0 0    |         |            | Read Register       |
|                                                            | PLL + VC      | 0                   |                    |         | 000     | 1000       | 0000         | 0000       |         | E          |                     |
|                                                            | Transak       |                     |                    |         | 000     | 0111       | 0000         | 0000       |         |            | Read All Registers  |
|                                                            | Transcelv     | /er                 |                    |         | 0000    | 0110       | 0000         | 0000       |         |            | Mitte All Desisters |
|                                                            | VCO           |                     |                    | ,       |         | 0101       | 0000         | 0000       |         |            | white All Registers |
|                                                            | Competite     | or Devices          |                    |         | 000     | 0011       | 0000         | 0000       |         |            |                     |
|                                                            | Competiti     | OI Devices          |                    |         | 000     | 0010       | 0000         | 0000       |         |            | Import Register Map |
|                                                            | Engineeri     | ing                 |                    | ,       | 000     | 0001       | 0000         | 0000       |         |            | import register map |
|                                                            | Clock Ge      | nerator/Jitter Cle  | aner (Single Loop) |         | 000     | 0000       | 0000         | 0000       |         |            | Export Register Map |
|                                                            |               |                     |                    |         | 111     | 1111       | 0000         | 0000       |         |            |                     |
|                                                            | Clock Ge      | nerator/Jitter Clea | aner (Dual Loop)   | '       | 1111    | 1110       | 0000         | 0000       |         |            |                     |
|                                                            | R125          | 0x007D00            | 00000              | 000     | 0111    | 1101       | 0000         | 0000       |         |            | Register/Field Name |
| General Context                                            | R124          | 0x007C00            | 00000              | 000     | 0111    | 1100       | 0000         | 0000       |         |            | Name                |
| A                                                          | R123          | 0x007B00            | 00000              | 000     | 0111    | 1011       | 0000         | 0000       |         |            |                     |
| Register Name:                                             | R122          | 0x007400            | 00000              | 000     | 0111    | 1001       | 0000         | 0000       |         |            | Value               |
| R134                                                       | R120          | 0x007800            | 0 0 0 0 0          | 000     | 0111    | 1000       | 0000         | 0000       |         |            | Bead                |
| Hex): R0x86                                                | R119          | 0x007700            | 00000              | 000     | 0111    | 0111       | 0000         | 0000       |         |            | Reau                |
| E                                                          | R118          | 0x007600            | 00000              | 000     | 0111    | 0110       | 0000         | 0000       |         |            |                     |
| RAMP6 NEXT TRIG                                            | R117          | 0x007500            | 0000               | 000     | 0111    | 0101       | 0000         | 0000       |         |            | Address Bits        |
| Start Bit : 3                                              | R116          | 0x007400            | 0000               | 000     | 0111    | 0100       | 0000         | 0000       |         |            |                     |
| Stop Bit : 4                                               | R115          | 0x007300            | 00000              | 000     | 0111    | 0011       | 0000         | 0000       |         |            |                     |
| Description:                                               | R114          | 0x007200            | 0 0 0 0 0          | 000     | 0111    | 0010       | 0000         | 0000       |         |            |                     |
| This determines                                            | R113          | 0x007100            | 00000              | 000     | 0111    | 0001       | 0000         | 0000       |         |            |                     |
| ramp is.                                                   | R112          | 0x007000            | 00000              | 000     | 0111    |            | 0000         | 0000       |         |            |                     |
|                                                            | RIII<br>P110  | 0x006F00            | 00000              | 000     | 0110    | 1111       | 0000         | 0000       |         |            |                     |
| Field Name :                                               | R109          | 0x006000            | 0 0 0 0 0          | 0 0 0   | 0 1 1 0 | 1101       | 0000         | 0000       |         |            |                     |
| RAMP6_NEXT                                                 | R108          | 0x006C00            | 00000              | 000     | 0110    | 1100       | 0000         | 0000       |         |            |                     |
| Stop Bit : 7                                               | R107          | 0x006B00            | 00000              | 000     | 0110    | 1011       | 0000         | 0000       |         |            |                     |
| Length : 3                                                 | R106          | 0x006A00            | 00000              | 000     | 0110    | 1010       | 0000         | 0000       |         |            |                     |
| This determines                                            | R105          | 0x006900            | 00000              | 000     | 0110    | 1001       | 0000         | 0000       |         | -          |                     |
| Wrote Register R0v4 as 0v00                                | 0400          |                     |                    |         |         |            |              | 1          |         |            |                     |
| Wrote Register R0x3 as 0x00                                | 0300          |                     |                    |         |         | Protoco    | ol: S        | PI         |         |            |                     |
| Wrote Register R0x2 as 0x00                                | 0201          |                     |                    |         |         |            |              |            | -       |            |                     |
| Wrote Register R0x1 as 0x00<br>Wrote Register R0x0 as 0x00 | 0100 0018     |                     |                    |         |         | Conner     | tion Mode: S | Simulation | Ti Ti   | EXAS I     | NSTRUMENT           |
|                                                            | -             |                     |                    |         |         | * Contries | aon moue. c  | andiduon   | Y       |            | GIROMENTS           |
| C                                                          |               |                     |                    |         |         |            |              |            |         |            |                     |

#### Figure 11 : Select Device - List of User Devices



## **2.3.2.** Delete User Device

When you select the Delete User Device option, a pop-up displays on the screen. Select the required devices and press the Delete button

| TICS Pro - LMX2492                                         | - K C & T B                    | 0-0 ## L 1                 | -       |                     | Autor Auto | to summer a |                     |
|------------------------------------------------------------|--------------------------------|----------------------------|---------|---------------------|------------|-------------|---------------------|
| File USB communications                                    | Select Device Options Tools    | Default configuration Help |         |                     |            |             |                     |
| Save Load Read Back                                        | Import User Device             |                            |         |                     |            |             |                     |
| 4 LMX2492                                                  | Delete User Device(s)          |                            |         |                     |            |             |                     |
| User controls                                              | Usor Dovisor                   |                            | 1 1 1   |                     | 0000       |             | ·                   |
| Raw Registers                                              | User Devices                   | 4 1                        | 32 10   | 98 7654             | 3210       |             | Data                |
| PLL<br>Ramo Calculator                                     | PLL                            | .01                        | 0 0 1 1 | 01 0000             | 0 0 0 0    | *           | 0×008600            |
| Burst Mode                                                 |                                | 0                          |         |                     | 0 0 0 0    |             | Write Register      |
|                                                            | CDC Devices                    |                            | 0 10    | 10 0000             | 0000       |             |                     |
|                                                            | Clock Distribution with Divi   | der F. o (                 | 0 1 0   | 01 0000             | 0 0 0 0    |             | Read Register       |
|                                                            | PLL + VCO                      |                            | 00 10   | 000000              | 0000       | E           | Dead All Dealstern  |
|                                                            | Transceiver                    | 0                          |         | 10 0000             | 0000       |             | Read All Registers  |
|                                                            | Handeever                      | 0                          | 0 0 1   | 01 0000             | 0 0 0 0    |             | Write All Registers |
|                                                            | VCO                            | •                          | 0 0 1   |                     | 0 0 0 0    |             |                     |
|                                                            | Competitor Devices             |                            | 0 0 0 0 | 011 0000            | 0 0 0 0    |             |                     |
|                                                            | Engineering                    |                            |         |                     | 0000       |             | Import Register Map |
|                                                            | Clock Generator/ litter Clos   |                            |         |                     | 0000       |             | Export Register Man |
|                                                            | CIUCK Generator/Sitter Cied    | 1 :                        | 1 1 1 1 | 11 0000             | 0000       |             | Export register map |
|                                                            | Clock Generator/Jitter Clea    | iner (Dual Loop)           | 1 1 1 1 | 10 0000             | 0000       |             |                     |
|                                                            | R125 0x007D00                  | 0000 0000 01               | 1 1 1 1 | 01 0000             | 0 0 0 0    |             | Register/Field Name |
| General Context                                            | R124 0x00/C00<br>R123 0x007800 | 0000 0000 01               | 1 1 0   |                     | 0000       |             | Name                |
| A                                                          | R122 0x007A00                  | 0000 0000 01               | 1 1 0   | 10 0000             | 0 0 0 0    |             | Value               |
| Register Name:                                             | R121 0x007900                  | 0000 0000 01:              | 1 1 0   | 0 1 0 0 0 0         | 0000       |             | value               |
| Register Name(in                                           | R120 0x007800                  | 0000 0000 01:              | 1 1 0   | 000000              | 0000       |             | Read                |
| Hex): KUX86                                                | R119 0x007700                  | 0000 0000 01               | 1 0 1   |                     | 0000       |             |                     |
| Field Name :                                               | R117 0x007500                  | 0000 0000 01:              | 1 0 1   | 01 0000             | 0 0 0 0    |             | Address Bits        |
| Start Bit : 3                                              | R116 0x007400                  | 0000 0000 01:              | 1 0 1   |                     | 0000       |             |                     |
| Stop Bit : 4<br>Length : 2                                 | R115 0x007300                  | 0000 0000 01:              | 1 0 0   | 011 0000            | 0000       |             |                     |
| Description:                                               | R114 0x007200                  |                            | 1 0 0   |                     | 0000       |             |                     |
| what the next                                              | R112 0x007000                  | 0000 0000 01:              | 1 0 0   |                     | 0000       |             |                     |
| ramp is.                                                   | R111 0x006F00                  | 0000 0000 01:              | 0 1 1   | 11 0000             | 0 0 0 0    |             |                     |
| Field Name 4                                               | R110 0x006E00                  | 0000 0000 01:              | 10 11   | 10 0000             | 0 0 0 0    |             |                     |
| RAMP6_NEXT                                                 | R109 0x006D00                  | 0000 0000 01:              |         | 01 0000             | 0 0 0 0    |             |                     |
| Start Bit : 5                                              | R108 0x006C00                  | 0000 0000 01               |         | 0 1 1 0 0 0 0       | 0000       |             |                     |
| Length : 3                                                 | R106 0x006A00                  | 0000 0000 01               | 0 1 0   | 10 0000             | 0 0 0 0    |             |                     |
| This determines                                            | R105 0x006900                  | 0000 0000 01:              | 10 10   | 001 0000            | 0000       | *           |                     |
| Wrote Register R0x4 as 0x00                                | 0400                           |                            | -       |                     | BI         |             |                     |
| Wrote Register R0x3 as 0x00<br>Wrote Register R0x2 as 0x00 | 0300                           |                            | P       | TOLOCOI: SI         | PI         |             |                     |
| Wrote Register R0x1 as 0x00                                | 0100                           |                            | -       |                     | i          | True        |                     |
| Wrote Register R0x0 as 0x00                                | 0018                           |                            | 0       | Connection Mode: Si | imulation  | IEXAS IN    | STRUMENTS           |
|                                                            |                                |                            |         |                     |            |             |                     |

#### Figure 12 : Select Device - Delete User Device



## 2.3.3. List of Devices under groups

All the devices in the GUI are grouped into relevant categories based on the type of the device. There can be multiple levels of sub-menus based on the device types.

| TICS Pro - LMX2492                                                                                                                                      | - K K M T B -                        | 8-9-98 L                 | A subscript Authorn Authorn Authorn Authorn |                     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|--------------------------|---------------------------------------------|---------------------|
| File USB communications                                                                                                                                 | Select Device Options Tools          | Default configuration He | lp                                          |                     |
| Save Load Boad Back                                                                                                                                     | Import Liser Device                  |                          |                                             |                     |
| Bave Load Read Back                                                                                                                                     | import Oser Device                   |                          |                                             |                     |
| ▲ LMX2492                                                                                                                                               | Delete User Device(s)                |                          |                                             |                     |
| User controls                                                                                                                                           | User Devices                         |                          | 111 1100 0000 0000                          | Data                |
| PLL                                                                                                                                                     |                                      |                          | 432 1098 7654 3210                          |                     |
| Ramp Calculator                                                                                                                                         | PLL                                  | A                        |                                             | × 0x008600          |
| Burst Mode                                                                                                                                              | CDC Devices                          | •                        | 000 1011 0000 0000                          | Write Register      |
|                                                                                                                                                         | Clock Distribution with Divid        | ler 🕨                    |                                             | Read Register       |
|                                                                                                                                                         | BUL + VCO                            |                          | 000 1000 0000 0000                          | E                   |
|                                                                                                                                                         | FLETVOO                              |                          | 000 0111 0000 0000                          | Read All Registers  |
|                                                                                                                                                         | Transceiver                          | •                        | 000 0110 0000 0000                          |                     |
|                                                                                                                                                         | VCO                                  | •                        |                                             | Write All Registers |
|                                                                                                                                                         | Competitor Devices                   |                          | 000 0011 0000 0000                          |                     |
|                                                                                                                                                         | -                                    |                          | 000 0010 0000 0000                          | Import Register Map |
|                                                                                                                                                         | Engineering                          | •                        | 000 0001 0000 0000                          |                     |
|                                                                                                                                                         | Clock Generator/Jitter Clea          | ner (Single Loop)        |                                             | Export Register Map |
|                                                                                                                                                         | Clock Generator/Jitter Clea          | ner (Dual Loop)          | LMK040xx LMK04000B                          |                     |
|                                                                                                                                                         | R125 0x007D00                        | 0000 0000                | LMK041xx LMK04001B                          | Register/Field Name |
| General Context                                                                                                                                         | R124 0x007C00                        | 0000 0000                | 11//0100                                    | Name                |
|                                                                                                                                                         | R123 0x007600                        |                          | LMIK0400X LMIK04002B                        |                     |
| Register Name:                                                                                                                                          | R122 0X007A00                        | 0 0 0 0 0 0 0 0 0 0      | LMK04816B LMK04010B                         | Value               |
| R134<br>Register Name(in                                                                                                                                | R120 0x007800                        | 0000 0000                | LMK0482x + LMK04011B                        | Read                |
| Hex): R0x86                                                                                                                                             | R119 0x007700                        | 0000 0000                | LMK04836B-A0 LMK04031B                      |                     |
| Field Name :                                                                                                                                            | R118 0x007600                        | 0000 0000                |                                             |                     |
| RAMP6_NEXT_TRIG                                                                                                                                         | R117 0x007500                        | 0000 0000                | LMK04906 LMK04033B                          | Address Bits        |
| Stop Bit : 4                                                                                                                                            | R115 0x007300                        | 0000 0000                | 0111 0011 0000 0000                         |                     |
| Description:                                                                                                                                            | R114 0x007200                        | 0000 0000                | 0111 0010 0000 0000                         |                     |
| This determines                                                                                                                                         | R113 0x007100                        | 0000 0000                | 0111 0001 0000 0000                         |                     |
| ramp is.                                                                                                                                                | R112 0x007000                        |                          |                                             |                     |
|                                                                                                                                                         | R110 0x006E00                        | 0000 0000                | 0110 1110 0000 0000                         |                     |
| Field Name :                                                                                                                                            | R109 0x006D00                        | 0000 0000                | 0110 1101 0000 0000                         |                     |
| Start Bit : 5                                                                                                                                           | R108 0x006C00                        | 0000 0000                | 0110 1100 0000 0000                         |                     |
| Stop Bit : 7                                                                                                                                            | R107 0x006B00                        | 0000 0000                |                                             |                     |
| Description:                                                                                                                                            | R105 0x006400                        | 0000 0000                |                                             |                     |
| inis determines                                                                                                                                         |                                      |                          |                                             |                     |
| Wrote Register R0x4 as 0x00<br>Wrote Register R0x3 as 0x00<br>Wrote Register R0x2 as 0x00<br>Wrote Register R0x1 as 0x00<br>Wrote Register R0x0 as 0x00 | 0400<br>0300<br>0201<br>0100<br>0018 |                          |                                             | s Instruments       |
|                                                                                                                                                         |                                      |                          |                                             |                     |





## 2.4. Options Menu

## 2.4.1. AutoUpdate

Whenever a change is made either to the register values or to any controls and the AutoUpdate option is true, the GUI automatically writes the value into the device. If the AutoUpdate option is not selected, any changes made to the UI – registers / controls, are not written to the device unless the Write Register / Write All option is explicitly selected

| TICS Pro - LMX2492                                                                                                   | - 6 6 4                    |               | 8-P         |            |         | -       | -            | Autor.    | Autors Autor | -    |                        |
|----------------------------------------------------------------------------------------------------------------------|----------------------------|---------------|-------------|------------|---------|---------|--------------|-----------|--------------|------|------------------------|
| File USB communications                                                                                              | Select Device              | Options Tools | Default con | figuration | Help    |         |              |           |              |      |                        |
| Save Load Read Back                                                                                                  |                            | ✓ AutoUpdate  |             |            |         |         |              |           |              |      |                        |
| ▲ LMX2492                                                                                                            | Register Map               |               |             |            |         |         |              |           |              | _    |                        |
| Raw Registers                                                                                                        | Register Name              | Address/value | 3210        | 9876       | 5432    | 1098    | 7654         | 3210      |              |      | Data                   |
| PLL                                                                                                                  | R141                       | 0x008D00      | 0000        | 0000       | 1000    | 1101    | 0000         | 0000      |              |      | 0x008600               |
| Ramp Calculator                                                                                                      | R140                       | 0x008C00      | 0000        | 0000       | 1000    | 1100    | 0000         | 0000      |              |      |                        |
| Buist Mode                                                                                                           | R139                       | 0x008B00      | 0000        | 0000       | 1000    | 1011    | 0000         | 0000      |              |      | write Register         |
|                                                                                                                      | R138                       | 0x008A00      | 0000        | 0000       | 1000    | 1010    | 0000         | 0000      |              |      | Dead Dealstee          |
|                                                                                                                      | R137                       | 0x008900      | 0000        | 0000       | 1000    | 1001    | 0000         | 0000      |              |      | Read Register          |
|                                                                                                                      | R136                       | 0x008800      | 0000        | 0000       | 1000    | 1000    | 0000         | 0000      |              | E    |                        |
|                                                                                                                      | R135                       | 0x008700      | 0000        | 0000       | 1000    | 0111    | 0000         | 0000      |              |      | Read All Registers     |
|                                                                                                                      | R134                       | 0x008600      | 0000        | 0000       | 1000    | 0110    | 0000         | 0000      |              |      |                        |
|                                                                                                                      | R133                       | 0x008500      | 0000        | 0000       | 1000    | 0101    | 0000         | 0000      |              |      | Write All Registers    |
|                                                                                                                      | R132                       | 0x008400      | 0000        | 0000       | 1000    | 0100    | 0000         | 0000      |              |      |                        |
|                                                                                                                      | R131                       | 0x008300      | 0000        | 0000       | 1000    | 0011    | 0000         | 0000      |              |      | (Inc. 15. (Inc. 11.))  |
|                                                                                                                      | R130                       | 0x008200      | 0000        | 0000       | 1000    | 0010    | 0000         | 0000      |              |      | Import Register Map    |
|                                                                                                                      | R129                       | 0x008100      | 0000        | 0000       | 1000    | 0001    | 0000         | 0000      |              |      | [ Second Barriel and a |
|                                                                                                                      | R128                       | 0x008000      | 0000        | 0000       | 0111    | 1 1 1 1 | 0000         | 0000      |              |      | Export Register Map    |
|                                                                                                                      | R12/                       | 0x007F00      | 0000        | 0000       | 0111    | 1 1 1 0 | 0000         | 0000      |              |      |                        |
|                                                                                                                      | R120                       | 0x007E00      | 0000        | 0000       | 0111    | 1 1 0 1 | 0000         | 0000      |              |      |                        |
| Contract                                                                                                             | D124                       | 0x007000      | 0 0 0 0     | 0000       | 0111    | 1 1 0 0 | 0 0 0 0      | 0000      |              |      | Register/Field Name    |
| eneral Context                                                                                                       | P123                       | 0x007200      | 0 0 0 0     | 0 0 0 0    | 0111    | 1011    | 0 0 0 0      | 0 0 0 0   |              |      | Name                   |
| A.                                                                                                                   | P122                       | 0x007400      | 0 0 0 0     | 0 0 0 0    | 0 1 1 1 | 1010    | 0 0 0 0      | 0 0 0 0   |              |      |                        |
| egister Name:                                                                                                        | R121                       | 0x007900      | 0 0 0 0     | 0000       | 0111    | 1001    | 0000         | 0000      |              |      | Value                  |
| 134                                                                                                                  | R120                       | 0x007800      | 0 0 0 0     | 0000       | 0111    | 1000    | 0000         | 0000      |              |      | Dead                   |
| egister Name(in                                                                                                      | R119                       | 0x007700      | 0000        | 0000       | 0111    | 0111    | 0000         | 0000      |              |      | Read                   |
| E                                                                                                                    | R118                       | 0x007600      | 0000        | 0000       | 0111    | 0110    | 0000         | 0000      |              |      |                        |
| ield Name :                                                                                                          | R117                       | 0x007500      | 0000        | 0000       | 0111    | 0101    | 0000         | 0000      |              |      | Address Bits           |
| tart Bit : 3                                                                                                         | R116                       | 0x007400      | 0000        | 0000       | 0111    | 0100    | 0000         | 0000      |              |      |                        |
| top Bit : 4                                                                                                          | R115                       | 0x007300      | 0000        | 0000       | 0111    | 0011    | 0000         | 0000      |              |      |                        |
| ength : 2                                                                                                            | R114                       | 0x007200      | 0000        | 0000       | 0111    | 0010    | 0000         | 0000      |              |      |                        |
| his determines                                                                                                       | R113                       | 0x007100      | 0000        | 0000       | 0111    | 0001    | 0000         | 0000      |              |      |                        |
| hat the next                                                                                                         | R112                       | 0x007000      | 0000        | 0000       | 0111    | 0000    | 0000         | 0000      |              |      |                        |
| amp 15.                                                                                                              | R111                       | 0x006F00      | 0000        | 0000       | 0110    | 1111    | 0000         | 0000      |              |      |                        |
|                                                                                                                      | R110                       | 0x006E00      | 0000        | 0000       | 0110    | 1110    | 0000         | 0000      |              |      |                        |
| AMP6 NEXT                                                                                                            | R109                       | 0x006D00      | 0000        | 0000       | 0110    | 1101    | 0000         | 0000      |              |      |                        |
| tart Bit : 5                                                                                                         | R108                       | 0x006C00      | 0000        | 0000       | 0110    | 1100    | 0000         | 0000      |              |      |                        |
| top Bit : 7                                                                                                          | R107                       | 0x006B00      | 0000        | 0000       | 0110    | 1011    | 0000         | 0000      |              |      |                        |
| ength : 3                                                                                                            | R106                       | 0x006A00      | 0000        | 0000       | 0110    | 1010    | 0000         | 0000      |              |      |                        |
| This determines                                                                                                      | R105                       | 0x006900      | 0000        | 0000       | 0110    | 1001    | 0000         | 0000      |              | -    |                        |
| rote Register R0x4 as 0x00<br>rote Register R0x3 as 0x00<br>rote Register R0x2 as 0x00<br>rote Register R0x2 as 0x00 | 0 0400<br>0 0300<br>0 0201 |               |             |            |         | Protoco | l: S         | PI        |              |      |                        |
| /rote Register R0x0 as 0x00                                                                                          | 0018                       |               |             |            | C       | Connec  | tion Mode: S | imulation | 🔑 Texas      | s In | STRUMENT               |

#### Figure 14 : Options - AutoUpdate



## 2.5. Tools Menu

This menu lists all the tools available for use in the TICS Pro GUI

| TICS Pro - LMX2492                                                                                                                                      | - # 6 4                              |               | - 10 - 10 -   |           |      | -       | -            | Autor aut | they bullet |                     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|---------------|---------------|-----------|------|---------|--------------|-----------|-------------|---------------------|
| File USB communications                                                                                                                                 | Select Device                        | Options Too   | Default cont  | iguration | Help |         |              |           |             |                     |
| Considered Providents                                                                                                                                   |                                      | (TT)          | LOW Orle Jak  |           | 12   |         |              |           |             |                     |
| Save Load Read Back                                                                                                                                     |                                      |               | LCM Calculato | r         |      |         |              |           |             |                     |
| <ul> <li>LMX2492</li> <li>User controls</li> <li>Raw Registers</li> </ul>                                                                               | Register Map<br>Register Name        | Address/Value | 2222          | 1111      | 1111 | 1100    | 0000         | 0000      |             | Data                |
| PLL                                                                                                                                                     | R141                                 | 0x008D00      | 0000          | 0000      | 1000 | 1101    | 0000         | 0000      |             | 0x008600            |
| Ramp Calculator                                                                                                                                         | R140                                 | 0x008C00      | 0000          | 0000      | 1000 | 1100    | 0000         | 0000      |             |                     |
| Burst Mode                                                                                                                                              | R139                                 | 0x008800      | 0000          | 0000      | 1000 | 1011    | 0000         | 0000      |             | Write Register      |
|                                                                                                                                                         | R138                                 | 0x008A00      | 0000          | 0000      | 1000 | 1010    | 0000         | 0000      |             |                     |
|                                                                                                                                                         | R137                                 | 0x008900      | 0000          | 0000      | 1000 | 1001    | 0000         | 0000      |             | Read Register       |
|                                                                                                                                                         | R136                                 | 0x008800      | 0000          | 0000      | 1000 | 1000    | 0000         | 0000      | E           |                     |
|                                                                                                                                                         | R135                                 | 0x008700      | 0000          | 0000      | 1000 | 0111    | 0000         | 0 0 0 0   |             | Read All Registers  |
|                                                                                                                                                         | R134                                 | 0x008600      | 0000          | 0000      | 1000 | 0110    | 0000         | 0000      |             |                     |
|                                                                                                                                                         | R133                                 | 0x008500      | 0000          | 0000      | 1000 | 0101    | 0000         | 0 0 0 0   |             | Write All Registers |
|                                                                                                                                                         | R132                                 | 0x008400      | 0000          | 0000      | 1000 | 0100    | 0000         | 0000      |             |                     |
|                                                                                                                                                         | R131                                 | 0x008300      | 0000          | 0000      | 1000 | 0011    | 0000         | 0000      |             |                     |
|                                                                                                                                                         | R130                                 | 0x008200      | 0000          | 0000      | 1000 | 0010    | 0000         | 0000      |             | Import Register Map |
|                                                                                                                                                         | R129                                 | 0x008100      | 0000          | 0000      | 1000 | 0001    | 0000         | 0000      |             |                     |
|                                                                                                                                                         | R128                                 | 0x008000      | 0000          | 0000      | 1000 | 1111    | 0000         | 0000      |             | Export Register Map |
|                                                                                                                                                         | R12/                                 | 0x007F00      | 0000          | 0000      | 0111 | 1111    | 0000         | 0000      |             |                     |
|                                                                                                                                                         | R120                                 | 0x007E00      | 0000          | 0000      | 0111 | 1101    | 0000         | 0000      |             |                     |
| Opposed Context                                                                                                                                         | R125                                 | 0x007000      | 0000          | 0000      | 0111 | 1100    | 0000         | 0 0 0 0   |             | Register/Field Name |
| General Context                                                                                                                                         | P123                                 | 0x007800      | 0000          | 0 0 0 0   | 0111 | 1011    | 0 0 0 0      | 0 0 0 0   |             | Name                |
| A                                                                                                                                                       | R122                                 | 0x007400      | 0000          | 0 0 0 0   | 0111 | 1010    | 0000         | 0 0 0 0   |             |                     |
| Register Name:                                                                                                                                          | R121                                 | 0x007900      | 0000          | 0000      | 0111 | 1001    | 0000         | 0000      |             | Value               |
| R134                                                                                                                                                    | R120                                 | 0x007800      | 0000          | 0000      | 0111 | 1000    | 0000         | 0000      |             | Read                |
| Hex): R0x86                                                                                                                                             | R119                                 | 0x007700      | 0000          | 0000      | 0111 | 0111    | 0000         | 0000      |             | Reau                |
| E                                                                                                                                                       | R118                                 | 0x007600      | 0000          | 0000      | 0111 | 0110    | 0000         | 0000      |             |                     |
| Field Name :                                                                                                                                            | R117                                 | 0x007500      | 0000          | 0000      | 0111 | 0101    | 0000         | 0000      |             | Address Bits        |
| Start Bit : 3                                                                                                                                           | R116                                 | 0x007400      | 0000          | 0000      | 0111 | 0100    | 0000         | 0000      |             |                     |
| Stop Bit : 4                                                                                                                                            | R115                                 | 0x007300      | 0000          | 0000      | 0111 | 0011    | 0000         | 0000      |             |                     |
| Description:                                                                                                                                            | R114                                 | 0x007200      | 0000          | 0000      | 0111 | 0010    | 0000         | 0000      |             |                     |
| This determines                                                                                                                                         | R113                                 | 0x007100      | 0000          | 0000      | 0111 | 0001    | 0000         | 0000      |             |                     |
| what the next                                                                                                                                           | R112                                 | 0x007000      | 0000          | 0000      | 0111 | 0000    | 0000         | 0 0 0 0   |             |                     |
| 1 400 131                                                                                                                                               | R111                                 | 0x006F00      | 0000          | 0000      | 0110 | 1111    | 0000         | 0000      |             |                     |
| Field Name a                                                                                                                                            | R110                                 | 0x006E00      | 0000          | 0000      | 0110 | 1110    | 0000         | 0000      |             |                     |
| RAMP6 NEXT                                                                                                                                              | R109                                 | 0x006D00      | 0000          | 0000      | 0110 | 1101    | 0000         | 0 0 0 0   |             |                     |
| Start Bit : 5                                                                                                                                           | R108                                 | 0x006C00      | 0000          | 0000      | 0110 | 1100    | 0000         | 0000      |             |                     |
| Stop Bit : 7                                                                                                                                            | R107                                 | 0x006B00      | 0000          | 0000      | 0110 | 1011    | 0000         | 0000      |             |                     |
| Description:                                                                                                                                            | R106                                 | 0x006A00      | 0000          | 0000      | 0110 | 1010    | 0000         | 0000      |             |                     |
| This determines                                                                                                                                         | R105                                 | 0x006900      | 0000          | 0000      | 0110 | 1001    | 0000         | 0000      |             |                     |
| Wrote Register R0x4 as 0x00<br>Wrote Register R0x3 as 0x00<br>Wrote Register R0x2 as 0x00<br>Wrote Register R0x1 as 0x00<br>Wrote Register R0x0 as 0x00 | 0400<br>0300<br>0201<br>0100<br>0018 |               |               |           |      | Protoco | I: SI        |           | TEXAS IN    | ISTRUMENTS          |
|                                                                                                                                                         |                                      |               |               |           |      | *       | aon mode. Of |           |             | SHOMENIS            |

Figure 15 : Tools Menu



# **2.6.** Default Configuration Menu

The GUI maintains a list of default modes. When you click on the Default Configuration menu all the available default modes are listed. You can select one of the modes and the device is automatically reconfigured.

#### Figure 16 : Default Configuration Menu

| TICS Pro - LMX2492              | - 5 5 5       |               | 8-9-        |              |         | -        | -            | Autor to | Mary Mallace o |                     |
|---------------------------------|---------------|---------------|-------------|--------------|---------|----------|--------------|----------|----------------|---------------------|
| File USB communications         | Select Device | Options Tools | Default con | figuration   | Help    |          |              |          |                |                     |
| Cours Land Dood Dook            |               |               | Defen       | h Mada 4 25  | 2044    |          |              |          |                |                     |
| Save Load Read Back             |               |               | Delau       | It Mode 4.25 | .2014   |          |              |          |                |                     |
| ▲ LMX2492                       | Register Man  |               |             |              |         |          |              |          |                |                     |
| User controls                   | Register Name | Address/Value | 2222        | 1111         | 1111    | 1100     | 0000         | 0000     |                |                     |
| Raw Registers                   |               |               | 3210        | 9876         | 5432    | 1098     | 7654         | 3210     |                | Data                |
| PLL                             | R141          | 0x008D00      | 0000        | 0000         | 1000    | 1101     | 0000         | 0000     | 4              | 0x008600            |
| Ramp Calculator                 | R140          | 0x008C00      | 0000        | 0000         | 1000    | 1100     | 0000         | 0000     |                |                     |
| Burst Mode                      | R139          | 0x008800      | 0000        | 0000         | 1000    | 1011     | 0000         | 0000     |                | Write Register      |
|                                 | R138          | 0x008A00      | 0000        | 0000         | 1000    | 1010     | 0000         | 0000     |                |                     |
|                                 | R137          | 0x008900      | 0000        | 0000         | 1000    | 1001     | 0000         | 0000     |                | Read Register       |
|                                 | R136          | 0x008800      | 0000        | 0000         | 1000    | 1000     | 0000         | 0000     | E              |                     |
|                                 | R135          | 0x008700      | 0000        | 0000         | 1000    | 0111     | 0000         | 0000     |                | Read All Registers  |
|                                 | R134          | 0x008600      | 0000        | 0000         | 1000    | 0110     | 0000         | 0000     |                |                     |
|                                 | R133          | 0x008500      | 0000        | 0000         | 1000    | 0101     | 0000         | 0000     |                | Write All Registers |
|                                 | R132          | 0x008400      | 0000        | 0000         | 1000    | 0100     | 0000         | 0000     | C10.           |                     |
|                                 | R131          | 0x008300      | 0000        | 0000         | 1000    | 0011     | 0000         | 0000     |                |                     |
|                                 | R130          | 0x008200      | 0 0 0 0     | 0000         | 1000    | 0010     | 0000         | 0000     |                | Import Register Map |
|                                 | R129          | 0x008100      | 0000        | 0000         | 1000    | 0001     | 0000         | 0000     |                |                     |
|                                 | R128          | 0x008000      | 0000        | 0000         | 1000    | 0000     | 0000         | 0000     |                | Export Register Map |
|                                 | R127          | 0x007F00      | 0000        | 0000         | 0111    | 1111     | 0000         | 0000     |                |                     |
|                                 | R126          | 0x007E00      | 0000        | 0000         | 0111    | 1110     | 0000         | 0000     |                |                     |
|                                 | R125          | 0x007000      | 0000        | 0000         | 0111    | 1101     | 0000         | 0000     |                | Register/Field Name |
| General Context                 | R124          | 0x007C00      | 0000        | 0000         | 0111    | 1 1 0 0  | 0000         | 0000     |                | Name                |
| *                               | R125          | 0x007600      | 0000        | 0000         | 0111    | 1011     | 0000         | 0000     |                |                     |
| Register Name:                  | R122          | 0x007A00      | 0000        | 0000         | 0111    | 1001     | 0000         | 0000     |                | Value               |
| R134                            | P120          | 0x007800      | 0 0 0 0     | 0 0 0 0      | 0111    | 1000     | 0 0 0 0      | 0 0 0 0  |                |                     |
| Register Name(in<br>Hex): ROx86 | P119          | 0x007700      | 0 0 0 0     | 0 0 0 0      | 0 1 1 1 | 0111     | 0 0 0 0      | 0 0 0 0  |                | Read                |
| E                               | R118          | 0x007600      | 0 0 0 0     | 0 0 0 0      | 0111    | 0110     | 0000         | 0 0 0 0  |                |                     |
| Field Name :                    | R117          | 0x007500      | 0000        | 0000         | 0111    | 0101     | 0000         | 0000     |                | Address Rits        |
| Start Bit : 3                   | R116          | 0x007400      | 0000        | 0000         | 0111    | 0100     | 0000         | 0000     |                | Address Bits        |
| Stop Bit : 4                    | R115          | 0x007300      | 0000        | 0000         | 0111    | 0011     | 0000         | 0000     |                |                     |
| Length : 2                      | R114          | 0x007200      | 0000        | 0000         | 0111    | 0010     | 0000         | 0000     |                |                     |
| This determines                 | R113          | 0x007100      | 0000        | 0000         | 0111    | 0001     | 0000         | 0000     |                |                     |
| what the next                   | R112          | 0x007000      | 0000        | 0000         | 0111    | 0000     | 0000         | 0000     |                |                     |
| ramp 1s.                        | R111          | 0x006F00      | 0000        | 0000         | 0110    | 1111     | 0000         | 0000     |                |                     |
|                                 | R110          | 0x006E00      | 0000        | 0000         | 0110    | 1110     | 0000         | 0000     |                |                     |
| Field Name :                    | R109          | 0x006D00      | 0000        | 0000         | 0110    | 1101     | 0000         | 0000     |                |                     |
| Start Bit : 5                   | R108          | 0x006C00      | 0000        | 0000         | 0110    | 1100     | 0000         | 0000     |                |                     |
| Stop Bit : 7                    | R107          | 0x006B00      | 0000        | 0000         | 0110    | 1011     | 0000         | 0000     |                |                     |
| Description:                    | R106          | 0x006A00      | 0000        | 0000         | 0110    | 1010     | 0000         | 0000     |                |                     |
| This determines *               | R105          | 0x006900      | 0000        | 0000         | 0110    | 1001     | 0000         | 0000     | *              |                     |
| Wrote Register R0x4 as 0x00     | 0 0400        |               |             |              |         | •        |              |          |                |                     |
| Wrote Register R0x3 as 0x00     | 0300          |               |             |              |         | Protoco  | I: SI        | PI       |                |                     |
| Wrote Register R0x2 as 0x00     | 0201          |               |             |              |         |          |              |          |                |                     |
| Wrote Register R0x1 as 0x00     | 0018          |               |             |              |         | Concer   | tion Mode: O |          | TEYAS IN       | STRUMENTS           |
| The stage of the second second  |               |               |             |              |         | * Connec | uon mode: SI |          | ILAAS II       | SINUMENTS           |
|                                 |               |               |             |              |         |          |              |          |                |                     |



## 2.7. Help Menu

The Help Menu provides the following information

- Clock and timing on ti.com Connects to the relevant page on the TI website that displays the clock and timing information
- Go to product folder Opens the Installed directory of the software •
- Go to datasheet Opens the datasheet of the currently loaded device
- User's Guide Opens the website link containing the User's Guide
- TICS Pro User Manual Opens the User Manual
- About TICS Pro Displays the about screen for the TICS Pro software •

| TICS Pro - LMX2492                                                                                                   |                                                                                     |                                                                                                                           |                                                                                                   |                                                                                                            |                                                                                                                |
|----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| File USB communications                                                                                              | Select Device Options Tools                                                         | Default configuration Help                                                                                                |                                                                                                   |                                                                                                            |                                                                                                                |
| Save Load Read Back                                                                                                  |                                                                                     | c                                                                                                                         | lock and Timing on ti.com                                                                         |                                                                                                            |                                                                                                                |
| <ul> <li>LMX2492<br/>User controls<br/>Raw Registers<br/>PLL<br/>Ramp Calculator<br/>Burst Mode</li> </ul>           | PLL PLL Controls FRAC_DITHER Disabled FRAC_ORDER 2nd Order Modulator PFD_DLY 860 ps | OSC_DIFFRUU<br>POWERDOWN T<br>Powered UG<br>SWRST<br>CPM_FLAGL<br>CPM_FLAGH                                               | So to product folder<br>So to datasheet<br>Iser's Guide<br>ICS Pro User Manual<br>Jobout TICS Pro |                                                                                                            | E                                                                                                              |
| General Context<br>Field Name:<br>OSC_DIFFR                                                                          | Cock Detect<br>DLD_PASS_CNT<br>32<br>DLD_TOL<br>1 ns<br>DLD_ERR_CNT<br>4            | Output Pins<br>MUXout_MUX<br>Output DLD&CPMON •<br>TRIG1_MUX<br>Input TRIG1 •<br>TRIG2_MUX<br>Input TRIG2 •               | MOD_MUX<br>Input MOD •<br>TRIG1_PIN<br>Tristate •<br>TRIG2_PIN<br>Tristate •                      | MOD_PIN<br>Tristate •<br>MUXout_PIN<br>Output - PP •                                                       |                                                                                                                |
| Register Name: R27<br>Start Bit : 2<br>Stop Bit : 2<br>Length : 1                                                    | Others                                                                              |                                                                                                                           |                                                                                                   |                                                                                                            |                                                                                                                |
| Description:<br>Enables a<br>differential input<br>even R divides and<br>if the higher<br>frequency is<br>necessary. | Speed Up Controls FL_TOC                                                            | Ramp Comparators & Limits<br>RAMP_CMP0[30:0]<br>33554432<br>RAMP_CMP0[32:31]<br>0<br>RAMP_CMP0_EN<br>0<br>RAMP_CMP1[30:0] | RAMP1_Controls<br>RAMP1_INC<br>0 ÷<br>RAMP1_LEN<br>0 RAMP1_DLY<br>RAMP1_FL<br>RAMP1_FL            | RAMP4_Ontrois<br>RAMP4_INC<br>0 -<br>RAMP4_LEN<br>0 RAMP4_DLY<br>CRAMP4_DLY<br>RAMP4_FL<br>RAMP4_NEXT_TRIG | RAMP7 Controls<br>RAMP7_INC<br>0<br>RAMP7_LEN<br>10000<br>RAMP7_LLY<br>RAMP7_PL<br>RAMP7_FL<br>RAMP7_NEXT_TRIG |
| Welcome to TICS Pro. Versio                                                                                          | n -> 0.0.0.17, 22-Jun-15                                                            | 2113929216 🚖                                                                                                              | Protocol: Si                                                                                      | PI                                                                                                         | TOC Timeout 🔹 👻                                                                                                |
| Detected 1 USB2ANY interfai<br>Completed loading Device LN                                                           | ces<br>//X2492. Version = 2015-01-14, ma                                            | inual update for bitmask                                                                                                  | Connection Mode: U                                                                                | sb2any 🐺 TEXA                                                                                              | as Instruments                                                                                                 |

#### Figure 17 : Help Menu



# 3. TICS PRO Page Selection

# **3.1. TICS PRO Pages**

The different pages available in the TICS PRO GUI are as listed below

- User Control Page
- Raw Register Page
- PLL Page
- Flex Page
- Burst mode Page

## **3.2.** User Control Page

The User control Page displays the different controls to work with the device grouped by separate Master Groups

# **3.2.1.** Master Group Display for a Device

The controls are grouped into separate Master Groups as shown in the figures below. User can expand one or multiple master groups to access the controls from the group.



#### Figure 18 : User Control Page

| TICS Pro - LMX2492                                         |               |               |                       |      | -         | summer A       | and the  | Marca Radiance |            |
|------------------------------------------------------------|---------------|---------------|-----------------------|------|-----------|----------------|----------|----------------|------------|
| File USB communications                                    | Select Device | Options Tools | Default configuration | Help |           |                |          |                |            |
| Save Load Read Back                                        |               |               |                       |      |           |                |          |                |            |
| ▲ LMX2492<br>User controls                                 | PLL           |               |                       |      |           |                |          |                |            |
| Raw Registers<br>PLL                                       | Vco           |               |                       |      |           |                |          |                |            |
| Burst Mode                                                 | Others        |               |                       |      |           |                |          |                |            |
|                                                            | Pins          |               |                       |      |           |                |          |                |            |
|                                                            |               |               |                       |      |           |                |          |                |            |
|                                                            |               |               |                       |      |           |                |          |                |            |
|                                                            |               |               |                       |      |           |                |          |                |            |
|                                                            |               |               |                       |      |           |                |          |                |            |
|                                                            |               |               |                       |      |           |                |          |                |            |
|                                                            |               |               |                       |      |           |                |          |                |            |
| General Context                                            |               |               |                       |      |           |                |          |                |            |
| Field Name:                                                |               |               |                       |      |           |                |          |                |            |
| Register Name: R18                                         |               |               |                       |      |           |                |          |                |            |
| Start Bit : 2<br>Stop Bit : 3<br>Length : 2                |               |               |                       |      |           |                |          |                |            |
| Description:<br>Enables dithering in                       |               |               |                       |      |           |                |          |                |            |
| the fractional engine.                                     |               |               |                       |      |           |                |          |                |            |
|                                                            |               |               |                       |      |           |                |          |                |            |
|                                                            |               |               |                       |      |           |                |          |                |            |
|                                                            |               |               |                       |      |           |                |          |                |            |
|                                                            |               |               |                       |      |           |                |          |                |            |
| Wrote Register R0x4 as 0x00                                | 0400          |               |                       |      |           |                |          |                |            |
| Wrote Register R0x3 as 0x00<br>Wrote Register R0x2 as 0x00 | 0300<br>0201  |               |                       |      | Protocol: | SPI            |          |                |            |
| Wrote Register R0x1 as 0x00<br>Wrote Register R0x0 as 0x00 | 0100<br>0018  |               |                       |      | Connecti  | on Mode: USB2A | NY 📲     | TEXAS I        | NSTRUMENTS |
|                                                            |               |               |                       |      | *         |                | <b>V</b> |                |            |





| TICS Pro - LMX2492                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                              |                                                                                                                                                                                                   | · · · · · · · · · · · · · · · · · · ·                                                                                                                                              | Addie Autors in                                                                                                                                                         |                                                                                                                                                                                   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| File USB communications                                                                                                                                                                                                                                                                        | Select Device Options Tools                                                                                                                                                                                                                                  | Default configuration Help                                                                                                                                                                        |                                                                                                                                                                                    |                                                                                                                                                                         |                                                                                                                                                                                   |
| Save Load Read Back                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                              |                                                                                                                                                                                                   |                                                                                                                                                                                    |                                                                                                                                                                         |                                                                                                                                                                                   |
| <ul> <li>LMX2492</li> <li>User controls</li> <li>Raw Registers</li> <li>PLL</li> <li>Ramp Calculator</li> <li>Burst Mode</li> </ul>                                                                                                                                                            | FRAC_ORDER<br>2nd Order Modulator<br>PFD_DLY<br>860 ps                                                                                                                                                                                                       | Powered Up   SWRST  CPM_FLAGL  CPM_FLAGH                                                                                                                                                          | CPM_LIMIT_LOW                                                                                                                                                                      | 4 🔹                                                                                                                                                                     | *                                                                                                                                                                                 |
|                                                                                                                                                                                                                                                                                                | ▶ VCO       Lock Detect       DLD_PASS_CNT       32 ◆       DLD_TOL       1 ns ◆       DLD_ERR_CNT       4 ◆                                                                                                                                                 | Output Pins<br>MUXout_MUX<br>GND •<br>TRIG1_MUX<br>Input TRIG1 •<br>TRIG2_MUX<br>Input TRIG2 •                                                                                                    | MOD_MUX<br>Input MOD                                                                                                                                                               | MOD_PIN<br>Tristate •<br>MUXout_PIN<br>Tristate •                                                                                                                       | E                                                                                                                                                                                 |
| General Context<br>Field Name:<br>RAMP_CMPO[32:31]<br>Script Name:<br>RAMP_CMPO[32:31]<br>Register Name:<br>R63<br>Start Bit: 7<br>Length: 1<br>Register Name:<br>R70<br>Start Bit: 0<br>Length: 1<br>Description:<br>This is the last<br>2 bits of ramp<br>comparator 0.<br>Realized that the | Others           Speed Up Controls           FL_TOC           0 ↓           FL_CSR           Disabled ↓           FL_CPG           Disabled ↓           General Ramp Controls           RAMP_CLK           RAMP_EN           RAMP_TRIGA           Disabled ↓ | Ramp Comparators & Limits<br>RAMP_CMP0[30:0]<br>701287628 •<br>RAMP_CMP0[32:31]<br>3 •<br>RAMP_CMP0_EN<br>0 •<br>RAMP_CMP1[30:0]<br>694576742 •<br>RAMP_CMP1[32:31]<br>2 •<br>RAMP_CMP1_EN<br>0 • | RAMP1 Controls<br>RAMP1_INC<br>0<br>RAMP1_LEN<br>50000<br>RAMP1_LLY<br>RAMP1_FL<br>RAMP1_FL<br>RAMP1_RXT_TRIG<br>TOC Timeout<br>RAMP1_RST<br>RAMP1_RST<br>RAMP1_RST<br>RAMP1_EL AG | RAMP4 Controls<br>RAMP4_INC<br>0<br>RAMP4_LEN<br>50000<br>RAMP4_DLY<br>RAMP4_PL<br>RAMP4_FL<br>RAMP4_NEXT<br>TOC Timeout<br>RAMP4_NEXT<br>5<br>RAMP4_RST<br>RAMP4_FL AG | RAMP7 Controls<br>RAMP7_INC<br>0<br>RAMP7_LEN<br>50000<br>RAMP7_DLY<br>RAMP7_DLY<br>RAMP7_FL<br>RAMP7_NEXT_TRIG<br>TOC Timeout<br>RAMP7_NEXT<br>0<br>RAMP7_RST<br>RAMP7_FLAG<br>T |
| Wrote Register R0x4 as 0x00<br>Wrote Register R0x3 as 0x00<br>Wrote Register R0x2 as 0x00<br>Wrote Register R0x1 as 0x00<br>Wrote Register R0x0 as 0x00                                                                                                                                        | 0400<br>0300<br>0201<br>0100<br>0018                                                                                                                                                                                                                         |                                                                                                                                                                                                   | Protocol: SI                                                                                                                                                                       | pi<br>sb2any 🦊 TeXA                                                                                                                                                     | as Instruments                                                                                                                                                                    |



# 3.2.2. PINS Master group

The PINS Master Group is a common group that appears for all devices irrespective of the device type selected.

#### Figure 20 : User Control Page - PINS Master Group

| TICS Pro - LMX2492                                         |                                                        |
|------------------------------------------------------------|--------------------------------------------------------|
| File USB communications                                    | Select Device Options Tools Default configuration Help |
| Save Load Read Back                                        |                                                        |
| ▲ LMX2492<br>User controls                                 | IL                                                     |
| Raw Registers                                              |                                                        |
| Ramp Calculator                                            |                                                        |
| Burst Mode                                                 | ♥ Others                                               |
|                                                            | Program Pins                                           |
|                                                            |                                                        |
|                                                            |                                                        |
|                                                            |                                                        |
|                                                            | □ CE                                                   |
|                                                            | MUXout                                                 |
|                                                            |                                                        |
| General Context                                            |                                                        |
| Field Name:<br>FRAC_DITHER                                 |                                                        |
| Register Name: R18<br>Start Bit : 2                        |                                                        |
| Stop Bit : 3<br>Length : 2                                 |                                                        |
| Description:<br>Enables dithering in<br>the fractional     |                                                        |
| engine.                                                    |                                                        |
|                                                            |                                                        |
|                                                            |                                                        |
|                                                            |                                                        |
|                                                            |                                                        |
| Wrote Register R0x4 as 0x00<br>Wrote Register R0x3 as 0x00 | 0400                                                   |
| Wrote Register R0x2 as 0x00<br>Wrote Register R0x1 as 0x00 |                                                        |
| Wrote Register R0x0 as 0x00                                | Connection Mode: USB2ANY                               |



# 3.3. Raw Register Page

The Raw Register Page displays the register map for the selected device.

| Figure 21 | : Raw | Register | Page – | Register | Мар |
|-----------|-------|----------|--------|----------|-----|
|-----------|-------|----------|--------|----------|-----|

| TICS Pro - LMX2492                                    |                   |                   |                 |          |         | -           | -               | Autor.  | Autors   | Sugar La Constantino | X                   |
|-------------------------------------------------------|-------------------|-------------------|-----------------|----------|---------|-------------|-----------------|---------|----------|----------------------|---------------------|
| File USB communications                               | Select Device     | Options Tools     | Default config  | guration | Help    |             |                 |         |          |                      |                     |
| Save Load Read Back                                   |                   |                   |                 |          |         |             |                 |         |          |                      |                     |
|                                                       |                   |                   |                 |          |         |             |                 |         |          |                      |                     |
| LMX2492     User controls                             | Register Map      | A                 | 0.0.0.0         |          |         | 4 4 0 0     |                 | 0.0.0   |          |                      |                     |
| Raw Registers                                         | Register Name     | Address/value     | 2222            | 9876     | 1111    | 1100        | 7654            | 3210    |          |                      | Data                |
| PLL                                                   | R141              | 0x008D00          | 0000            | 0000     | 1000    | 1101        | 0000            | 0000    |          | *                    | Ox                  |
| Ramp Calculator                                       | R140              | 0x008C27          | 0000            | 0 0 0 0  | 1000    | 1100        | 0010            | 0111    |          |                      |                     |
| Burst Mode                                            | R139              | 0x008B10          | 0000            | 0 0 0 0  | 1000    | 1011        | 0001            | 0000    |          |                      | Write Register      |
|                                                       | R138              | 0x008A00          | 0000            | 0000     | 1000    | 1010        | 0000            | 0000    |          |                      |                     |
|                                                       | R137              | 0x008900          | 0000            | 0 0 0 0  | 1000    | 1001        | 0000            | 0000    |          |                      | Read Register       |
|                                                       | R136              | 0x008800          | 0000            | 0 0 0 0  | 1000    | 1000        | 0000            | 0000    |          | =                    |                     |
|                                                       | R135              | 0x008700          | 0000            | 0000     | 1000    | 0111        | 0000            | 0000    |          |                      | Read All Registers  |
|                                                       | R134              | 0x008600          | 0000            | 0000     | 1000    | 0110        | 0000            | 0000    |          |                      | Molto All Devictors |
|                                                       | R133              | 0x008527          | 0000            | 0000     | 1000    | 0101        | 0010            | 0 1 1 1 |          |                      | write All Registers |
|                                                       | P1 31             | 0x008410          | 0000            | 0 0 0 0  | 1000    | 0 0 1 1     | 0001            | 0000    |          |                      |                     |
|                                                       | R131              | 0x008200          | 0000            | 0 0 0 0  | 1000    | 0010        | 0 0 0 0         | 0000    |          |                      | Import Register Man |
|                                                       | R129              | 0x008100          | 0000            | 0 0 0 0  | 1000    | 0 0 0 1     | 0000            | 0 0 0 0 |          |                      | import register map |
|                                                       | R128              | 0x008000          | 0 0 0 0         | 0 0 0 0  | 1000    | 0 0 0 0     | 0 0 0 0         | 0 0 0 0 |          |                      | Export Register Map |
|                                                       | R127              | 0x007F00          | 0000            | 0 0 0 0  | 0111    | 1111        | 0000            | 0000    |          |                      | Expert register map |
|                                                       | R126              | 0x007E27          | 0000            | 0 0 0 0  | 0111    | 1110        | 0010            | 0111    |          |                      |                     |
|                                                       | R125              | 0x007D10          | 0000            | 0000     | 0 1 1 1 | 1 1 0 1     | $0 \ 0 \ 0 \ 1$ | 0000    |          |                      | Register/Field Name |
| General Context                                       | R124              | 0x007C00          | 0000            | 0 0 0 0  | 0111    | 1 1 0 0     | 0000            | 0000    |          |                      | Namo                |
| Raw Registers                                         | R123              | 0x007B00          | 0 0 0 0         | 0 0 0 0  | 0111    | 1011        | 0000            | 0 0 0 0 |          |                      | Inditio             |
| Kaw Registers                                         | R122              | 0x007A00          | 0000            | 0000     | 0111    | 1010        | 0000            | 0000    |          |                      | Value               |
| This is Register map                                  | R121              | 0x007900          | 0000            | 0000     | 0111    | 1001        | 0000            | 0000    |          |                      |                     |
| values of the                                         | R120              | 0x007800          | 0000            | 0000     | 0111    | 1000        | 0000            | 0 1 1 1 |          |                      | Read                |
| registers                                             | P118              | 0x007727          | 0000            | 0 0 0 0  | 0111    | 0 1 1 0     | 0 0 0 1         | 0 0 0 0 |          |                      |                     |
|                                                       | P117              | 0x007500          | 0 0 0 0         | 0 0 0 0  | 0111    | 0 1 0 1     | 0 0 0 0         | 0 0 0 0 |          |                      | Address Dite        |
|                                                       | R116              | 0x007400          | 0000            | 0 0 0 0  | 0111    | 0100        | 0000            | 0 0 0 0 |          |                      | Address Bits        |
|                                                       | R115              | 0x007300          | 0000            | 0 0 0 0  | 0111    | 0011        | 0000            | 0000    |          |                      |                     |
|                                                       | R114              | 0x007200          | 0000            | 0 0 0 0  | 0111    | 0010        | 0000            | 0000    |          |                      |                     |
|                                                       | R113              | 0x007100          | 0000            | 0 0 0 0  | 0 1 1 1 | 0001        | 0000            | 0000    |          |                      |                     |
|                                                       | R112              | 0x007027          | 0000            | 0 0 0 0  | 0111    | 0000        | 0010            | 0111    |          |                      |                     |
|                                                       | R111              | 0x006F10          | 0000            | 0 0 0 0  | 0110    | 1111        | 0001            | 0000    |          |                      |                     |
|                                                       | R110              | 0x006E00          | 0000            | 0000     | 0110    | 1110        | 0000            | 0000    |          |                      |                     |
|                                                       | R109              | 0x006D00          | 0000            | 0000     | 0110    | 1101        | 0000            | 0000    |          |                      |                     |
|                                                       | R108              | 0x006E00          | 0000            | 0 0 0 0  | 0110    | 1011        | 0000            | 0000    |          |                      |                     |
|                                                       | R106              | 0x006600          | 0000            | 0 0 0 0  | 0110    | 1010        | 0 0 0 0         | 0000    |          |                      |                     |
|                                                       | R105              | 0x006927          | 0000            | 0 0 0 0  | 0110    | 1001        | 0010            | 0111    |          |                      |                     |
|                                                       |                   |                   |                 |          |         |             |                 |         |          | Ŧ                    |                     |
| Welcome to TICS Pro. Versio                           | n -> 0.0.0.17, 22 | -Jun-15           |                 |          |         | A Destroyed |                 |         |          |                      |                     |
| Loading Device LMX2492<br>Detected 1 USB2ANV interfer | 000               |                   |                 |          | C       | Protocol    | . S             |         |          |                      |                     |
| Completed loading Device LN                           | AX2492. Version   | = 2015-01-14, mar | nual update for | bitmask  |         |             |                 |         |          | -                    |                     |
| Wrote Register R0x8D as 0x0                           | 00 8D00           |                   |                 |          |         | Connect     | tion Mode: U    | SB2ANY  | // Tey   | KAS IN               | ISTRUMENTS          |
| Wrote Register R0x8C as 0x0                           | 00 8C27           |                   |                 |          |         | •           |                 |         | <b>T</b> |                      |                     |



## 3.3.1. Operations

The following operations can be performed on the Raw Register Page.

## a) Write Register

Select the required register, enter the data to be written and press the Write Register button to write the data into the register

| TICS Pro - LMX2492                      |                   |                  |                                         |             | Automation in which the | -            | Autor, au | Maria Autoria |                     |
|-----------------------------------------|-------------------|------------------|-----------------------------------------|-------------|-------------------------|--------------|-----------|---------------|---------------------|
| File USB communications                 | Select Device     | Options Tools    | Default configurati                     | ion Help    |                         |              |           |               |                     |
| Save Load Read Back                     |                   |                  |                                         |             |                         |              |           |               |                     |
| Cure Loud House                         |                   |                  |                                         |             |                         |              |           |               |                     |
| ▲ LMX2492                               | Register Map      |                  |                                         |             |                         |              |           |               |                     |
| Diser controls                          | Register Name     | Address/Value    | 2222 11                                 | 11 1111     | 1100                    | 0000         | 0000      |               | Data                |
| PLI                                     |                   |                  | 3210 98                                 | 16 5432     | 1098                    | 1654         | 3210      |               | Data                |
| Ramp Calculator                         | R141              | 0x008D00         | 0000 00                                 | 00 1000     | 1101                    | 0000         | 0000      | *             | 0×008700            |
| Burst Mode                              | R140              | 0x008C27         | 0000000                                 | 00 1000     | 1011                    | 0010         | 0 0 0 0   |               | Write Register      |
|                                         | P138              | 0x008610         | 0000 00                                 | 0 0 1 0 0 0 | 1010                    | 0 0 0 0      | 0000      |               |                     |
| 1                                       | R137              | 0x008900         | 0 0 0 0 0 0 0                           | 0 0 1 0 0 0 | 1001                    | 0 0 0 0      | 0 0 0 0   |               | Read Register       |
| 1                                       | R136              | 0x008800         | 0000 00                                 | 00 1000     | 1000                    | 0000         | 0 0 0 0   | =             |                     |
|                                         | R135              | 0x008700         | 000000                                  | 00 1000     | 0111                    | 0000         | 0000      | 1             | Read All Registers  |
| 1                                       | R134              | 0x008600         | 0000000                                 | 001000      | 0110                    | 0000         | 0000      |               |                     |
|                                         | R133              | 0x008527         | 0 0 0 0 0 0 0                           | 00 1000     | 0101                    | 0010         | 0111      |               | Write All Registers |
|                                         | R132              | 0x008410         | 000000                                  | 00 1000     | 0100                    | 0001         | 0 0 0 0   |               |                     |
|                                         | R131              | 0x008300         | 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | 00 1000     | 0011                    | 0000         | 0000      |               |                     |
|                                         | R130              | 0x008200         | 0000000                                 | 00 1000     | 0010                    | 0000         | 0000      |               | Import Register Map |
|                                         | R129              | 0x008100         | 0000 00                                 | 0 0 1 0 0 0 | 0001                    | 0000         | 0000      |               | Event Desister Max  |
|                                         | R120              | 0x007E00         | 0 0 0 0 0 0 0                           | 0 0 0 1 1 1 | 1111                    | 0 0 0 0      | 0 0 0 0   |               | Export Register Map |
|                                         | R126              | 0x007E27         | 0000 00                                 | 0 0 0 1 1 1 | 1110                    | 0010         | 0111      |               |                     |
|                                         | R125              | 0x007D10         | 0000 00                                 | 00 0111     | 1101                    | 0001         | 0 0 0 0   |               | Register/Field Name |
| General Context                         | R124              | 0x007C00         | 0000 00                                 | 00 0111     | 1100                    | 0000         | 0000      |               | News                |
|                                         | R123              | 0x007B00         | 000000                                  | 00 0111     | 1011                    | 0000         | 0 0 0 0   |               | Name                |
| Desident New Datas                      | R122              | 0x007A00         | 0000 00                                 | 00 0111     | 1010                    | 0000         | 0 0 0 0   |               | Value               |
| Register Name: K135<br>Register Name(in | R121              | 0x007900         | 0000 00                                 | 00 0111     | 1001                    | 0000         | 0000      |               |                     |
| Hex): R0x87                             | R120              | 0x007800         | 0000 00                                 | 0 0 0 1 1 1 | 1000                    | 0000         | 0000      |               | Read                |
| Field Name :                            | R119              | 0x007727         | 0000 00                                 | 0 0 0 1 1 1 | 0 1 1 0                 | 0010         | 0 0 0 0   |               |                     |
| RAMP7_INC                               | R110              | 0x007500         | 0 0 0 0 0 0 0                           | 0 0 0 1 1 1 | 0101                    | 0 0 0 0      | 0000      |               | Address Dite        |
| Stop Bit : 7                            | R116              | 0x007400         | 0 0 0 0 0 0 0                           | 0 0 0 1 1 1 | 0100                    | 0 0 0 0      | 0 0 0 0   |               | Address Bits        |
| Length : 8                              | R115              | 0x007300         | 0000 00                                 | 0 0 0 1 1 1 | 0011                    | 0000         | 0 0 0 0   |               |                     |
| Description:<br>This is the 2's         | R114              | 0x007200         | 000000                                  | 00 0111     | 0010                    | 0000         | 0000      |               |                     |
| complement of the                       | R113              | 0x007100         | 000000                                  | 00 0111     | 0001                    | 0000         | 0 0 0 0   |               |                     |
| desired ramp                            | R112              | 0x007027         | 0000 00                                 | 00 0111     | 0000                    | 0010         | 0111      |               |                     |
| The chere                               | R111              | 0x006F10         | 0 0 0 0 0 0                             | 00 0110     | 1111                    | 0001         | 0 0 0 0   |               |                     |
|                                         | R110              | 0x006E00         | 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | 0 0 0 1 1 0 | 1110                    | 0000         | 0 0 0 0   |               |                     |
|                                         | R109              | 0x006D00         | 0000 00                                 | 0 0 0 1 1 0 | 1101                    | 0000         | 0000      |               |                     |
| 1                                       | R108              | 0x006C00         | 0000 00                                 | 0 0 0 1 1 0 | 1011                    | 0000         | 0000      |               |                     |
| 1                                       | R105              | 0x006400         | 0 0 0 0 0 0 0                           | 0 0 0 1 1 0 | 1010                    | 0 0 0 0      | 0 0 0 0   |               |                     |
|                                         | R105              | 0x006927         | 0000 00                                 | 00 0110     | 1001                    | 0010         | 0111      |               |                     |
|                                         |                   |                  |                                         |             |                         |              |           | ٣             |                     |
| Welcome to TICS Pro. Versio             | n -> 0.0.0.17, 22 | -Jun-15          |                                         |             | -                       |              |           |               |                     |
| Loading Device LMX2492                  |                   |                  |                                         | C           | Protocol                | : SF         | 1         |               |                     |
| Completed loading Device L              | X2492, Version    | = 2015-01-14 mar | ual update for bitma                    | ask         |                         |              |           | -             |                     |
| Wrote Register R0x8D as 0x0             | 00 8D00           |                  | and the second second                   |             | Connect                 | ion Mode: US | BEANY     | EXAS          | NSTRUMENTS          |
| Wrote Register R0x8C as 0x0             | 00 8C27           |                  |                                         |             | *                       |              |           |               |                     |

| Figure  | 22 | Raw    | Register | Page - | Operations |
|---------|----|--------|----------|--------|------------|
| 1 Baile |    | 110100 | Register | I UBC  | operations |

# b) Read Register

Select the required register and press the Read Register button to read the data at the selected register in the device.



## c) Read All

Pressing the Read All button, reads the data from all the registers in the device and updates the UI

#### d) Write All

Pressing the Write All button, writes all the data into the registers in the device

#### e) Import Register Map

This option allows you to load a register map into the GUI

#### f) Export Register Map

This option allows you to export or save the current register map into a file

#### g) Read

The Read option at the bottom of the page allows you to read the value of a particular register or a field in the device. This option does not cause any updates to the UI. The read data is only displayed in the box shown

| USB communications       | Select Device | Options Tools | Default con  | figuration | Help         |          |          |                    |   |                     |
|--------------------------|---------------|---------------|--------------|------------|--------------|----------|----------|--------------------|---|---------------------|
| we Load Read Back        |               |               |              |            |              |          |          |                    |   |                     |
| LMX2492                  | Register Map  |               |              |            |              |          |          |                    |   | ~                   |
| Raw Registers            | Register Name | Address/Value | 2222<br>3210 | 1111 9876  | 1111<br>5432 | 1100     | 00007654 | 0 0 0 0<br>3 2 1 0 |   | Data                |
| PLL<br>Parent Calendates | R141          | 0x008D00      | 0000         | 0000       | 1000         | 1101     | 0000     | 0000               |   | 0x008700            |
| Ramp Calculator          | R140          | 0x008C27      | 0000         | 0000       | 1000         | 1100     | 0010     | 0111               | 1 |                     |
| Burst Mode               | R139          | 0x008B10      | 0000         | 0000       | 1000         | 1011     | 0001     | 0000               |   | Write Register      |
|                          | R138          | 0x008A00      | 0000         | 0000       | 1000         | 1010     | 0000     | 0000               |   |                     |
|                          | R137          | 0x008900      | 0000         | 0000       | 1000         | 1001     | 0000     | 0000               |   | Read Register       |
|                          | R136          | 0x008800      | 0000         | 0000       | 1000         | 1000     | 0000     | 0000               | 8 |                     |
|                          | R135          | 0x008700      | 0000         | 0000       | 1000         | 0111     | 0000     | 0000               |   | Read All Registers  |
|                          | R134          | 0x008600      | 0000         | 0000       | 1000         | 0110     | 0000     | 0000               |   |                     |
|                          | R133          | 0x008527      | 0000         | 0000       | 1000         | 0101     | 0010     | 0111               |   | Write All Registers |
|                          | R132          | 0x008410      | 0000         | 0000       | 1000         | 0100     | 0001     | 0000               |   |                     |
|                          | R131          | 0x008300      | 0000         | 0000       | 1000         | 0011     | 0000     | 0000               |   |                     |
|                          | R130          | 0x008200      | 0000         | 0000       | 1000         | 0010     | 0000     | 0000               |   | Import Register Map |
|                          | R129          | 0x008100      | 0000         | 0000       | 1000         | 0001     | 0000     | 0000               |   |                     |
| RJ<br>RJ<br>RJ           | R128          | 0x008000      | 0000         | 0000       | 1000         | 0000     | 0000     | 0000               |   | Export Register Mar |
|                          | R127          | 0x007E00      | 0000         | 0000       | 0111         | 1111     | 0000     | 0000               |   | Export register map |
|                          | R126          | 0x007E27      | 0000         | 0000       | 0111         | 1110     | 0010     | 0111               |   |                     |
|                          | R125          | 0x007D10      | 0000         | 0000       | 0111         | 1101     | 0001     | 0 0 0 0            |   | Pagistor/Field Name |
| neral Context            | R124          | 0x007C00      | 0000         | 0000       | 0111         | 1100     | 0000     | 0 0 0 0            |   | Register/Field Name |
| neral Context            | R123          | 0x007800      | 0000         | 0000       | 0111         | 1011     | 0 0 0 0  | 0 0 0 0            |   | R141                |
|                          | P122          | 0x007400      | 0 0 0 0      | 0 0 0 0    | 0111         | 1010     | 0 0 0 0  | 0 0 0 0            |   |                     |
| aister Name: R135        | 0121          | 0×007000      | 0 0 0 0      | 0 0 0 0    | 0 1 1 1      | 1001     | 0 0 0 0  | 0 0 0 0            |   | 0×008D00            |
| gister Name(in           | P120          | 0×007800      | 0000         | 0000       | 0111         | 1000     | 0 0 0 0  | 0 0 0 0            |   |                     |
| <pre>x): R0x87</pre>     | R120          | 0x007800      | 0000         | 0000       | 0111         | 0111     | 0010     | 0111               |   | Read                |
| ald Name :               | RIIS          | 0x007727      | 0000         | 0000       | 0111         | 0111     | 0010     | 0 0 0 0            |   | N.                  |
| IP7_INC                  | RIIS          | 0007610       | 0000         | 0000       | 0111         | 0110     | 0001     | 0000               |   |                     |
| art Bit : 0              | R11/          | 0x007500      | 0000         | 0000       | 0111         | 0101     | 0000     | 0000               |   | Address Bits        |
| op Bit : /               | K116          | 0x007400      | 0000         | 0000       | 0111         | 0100     | 0000     | 0000               |   |                     |
| scription:               | R115          | 0x007300      | 0000         | 0000       | 0111         | 0011     | 0000     | 0000               |   |                     |
| is is the 2's            | R114          | 0x007200      | 0000         | 0000       | 0111         | 0010     | 0000     | 0000               |   |                     |
| aplement of the          | R113          | 0x007100      | 0000         | 0000       | 0111         | 0001     | 0000     | 0000               |   |                     |
| rement                   | R112          | 0x007027      | 0000         | 0000       | 0111         | 0000     | 0010     | 0111               |   |                     |
|                          | R111          | 0x006F10      | 0000         | 0000       | 0110         | 1111     | 0001     | 0000               |   |                     |
|                          | R110          | 0x006E00      | 0000         | 0000       | 0110         | 1110     | 0000     | 0000               |   |                     |
|                          | R109          | 0x006D00      | 0000         | 0000       | 0110         | 1101     | 0000     | 0000               |   |                     |
|                          | R108          | 0x006C00      | 0000         | 0000       | 0110         | 1100     | 0000     | 0000               |   |                     |
|                          | R107          | 0x006B00      | 0000         | 0000       | 0110         | 1011     | 0000     | 0000               |   |                     |
|                          | R106          | 0x006A00      | 0000         | 0000       | 0110         | 1010     | 0000     | 0000               |   |                     |
|                          | R105          | 0x006927      | 0000         | 0000       | 0110         | 1001     | 0010     | 0111               |   | r                   |
| te Register R0x0 as 0x0  | 0 0018        |               |              |            |              | -        |          |                    |   |                     |
| te Register R0x27 as 0x  | 00 2738       |               |              |            |              | Protocol | : S      | PI                 |   |                     |
| to Desister D0v22 as 0v  | 00 2200       |               |              |            |              |          |          |                    |   |                     |

#### Figure 23 : Raw Register Page – Read Register Value



| Figure 24   | : R | law | Register | Page - | Read | Field  | Value |
|-------------|-----|-----|----------|--------|------|--------|-------|
| I Igui C 24 | • D | avv | Register | rage – | Neau | I ICIU | value |

| File USB communications        | Select Device     | Options Tools     | Default con | figuration | Help |            |      |      |   |                     |
|--------------------------------|-------------------|-------------------|-------------|------------|------|------------|------|------|---|---------------------|
| Save Load Read Back            |                   |                   |             |            |      |            |      |      |   |                     |
| LMX2492<br>User controls       | Register Map      | A data an A /ali  |             |            |      |            |      |      |   | ć                   |
| Raw Registers                  | Register Name     | Address/value     | 3210        | 9876       | 5432 | 1098       | 7654 | 3210 |   | Data                |
| PLL<br>Dama Calculates         | R75               | 0x004B00          | 0000        | 0000       | 0100 | 1011       | 0000 | 0000 | - | 0x00300F            |
| Ramp Calculator                | R74               | 0x004A00          | 0000        | 0000       | 0100 | 1010       | 0000 | 0000 |   |                     |
| Burst Mode                     | R73               | 0x004900          | 0000        | 0000       | 0100 | 1001       | 0000 | 0000 |   | write Register      |
|                                | R72               | 0x004800          | 0000        | 0000       | 0100 | 1000       | 0000 | 0000 |   | C Devel Development |
|                                | R71               | 0x004700          | 0000        | 0000       | 0100 | 0111       | 0000 | 0000 |   | Read Register       |
|                                | R70               | 0x00460A          | 0000        | 0000       | 0100 | 0110       | 0000 | 1010 |   |                     |
|                                | R69               | 0x004500          | 0000        | 0000       | 0100 | 0101       | 0000 | 0000 |   | Read All Registers  |
|                                | R68               | 0x00447E          | 0000        | 0000       | 0100 | 0100       | 0111 | 1110 |   |                     |
|                                | R67               | 0x004300          | 0000        | 0000       | 0100 | 0011       | 0000 | 0000 |   | Write All Registers |
|                                | R66               | 0x004200          | 0000        | 0000       | 0100 | 0010       | 0000 | 0000 |   |                     |
|                                | R65               | 0x004100          | 0000        | 0000       | 0100 | 0001       | 0000 | 0000 |   |                     |
|                                | R64               | 0x004000          | 0000        | 0000       | 0100 | 0000       | 0000 | 0000 |   | Import Register Map |
|                                | R63               | 0x003F02          | 0000        | 0000       | 0011 | 1111       | 0000 | 0010 |   |                     |
|                                | R62               | 0x003E00          | 0000        | 0000       | 0011 | 1110       | 0000 | 0000 |   | Export Register Map |
|                                | R61               | 0x003D00          | 0000        | 0000       | 0011 | 1101       | 0000 | 0000 |   |                     |
|                                | R60               | 0x003C00          | 0000        | 0000       | 0011 | 1100       | 0000 | 0000 |   |                     |
|                                | R59               | 0x003B00          | 0000        | 0000       | 0011 | 1011       | 0000 | 0000 | 1 | Register/Field Name |
| General Context                | R58               | 0x003A00          | 0000        | 0000       | 0011 | 1010       | 0000 | 0000 |   | DLD PASS CNT        |
|                                | R57               | 0x003900          | 0000        | 0000       | 0011 | 1001       | 0000 | 0000 |   |                     |
| Penister Name: PAS             | R56               | 0x00380F          | 0000        | 0000       | 0011 | 1000       | 0000 | 1111 |   | 0                   |
| Register Name(in               | R55               | 0x00376F          | 0000        | 0000       | 0011 | 0111       | 0110 | 1111 |   |                     |
| Hex): R0x30                    | R54               | 0x00366F          | 0000        | 0000       | 0011 | 0110       | 0110 | 1111 | E | Read                |
|                                | R5 3              | 0x00350F          | 0000        | 0000       | 0011 | 0101       | 0000 | 1111 |   |                     |
|                                | R52               | 0x00348F          | 0000        | 0000       | 0011 | 0100       | 1000 | 1111 |   |                     |
|                                | R51               | 0x00330F          | 0000        | 0000       | 0011 | 0011       | 0000 | 1111 |   | Address Bits        |
|                                | RSO               | 0x00320F          | 0000        | 0000       | 0011 | 0010       | 0000 | 1111 |   |                     |
|                                | R49               | 0x0031AF          | 0000        | 0000       | 0011 | 0001       | 1010 | 1111 |   |                     |
|                                | R48               | 0x00300F          | 0000        | 0000       | 0011 | 0000       | 0000 | 1111 |   |                     |
|                                | R47               | 0x002F4F          | 0000        | 0000       | 0010 | 1111       | 0100 | 1111 |   |                     |
|                                | R46               | 0x002E30          | 0000        | 0000       | 0010 | 1110       | 0011 | 0000 |   |                     |
|                                | R45               | 0x002D00          | 0000        | 0000       | 0010 | 1101       | 0000 | 0000 |   |                     |
|                                | R44               | 0x002C00          | 0000        | 0000       | 0010 | 1100       | 0000 | 0000 |   |                     |
|                                | R43               | 0x002B00          | 0000        | 0000       | 0010 | 1011       | 0000 | 0000 |   |                     |
|                                | R42               | 0x002A00          | 0000        | 0000       | 0010 | 1010       | 0000 | 0000 |   |                     |
|                                | R41               | 0x002900          | 0000        | 0000       | 0010 | 1001       | 0000 | 0000 |   |                     |
|                                | R40               | 0x002800          | 0000        | 0000       | 0010 | 1000       | 0000 | 0000 |   |                     |
|                                | R39               | 0x002700          | 0000        | 0000       | 0010 | 0111       | 0000 | 0000 | Ŧ |                     |
| Vrote Register R0x23 as 0x     | 00 2300           |                   |             |            |      | * Protocol |      | PI   |   |                     |
| lead back Register R0x27 as 0x | as value 0x00 en/ | 0 No difference   |             |            |      | 1 1010000  |      |      |   |                     |
| www.www.incyibici.inuxou.      | AN ARIVE DAUD ODI | vo. no uncicille. |             |            |      |            |      |      |   |                     |



# **3.3.2.** Using the AutoUpdate feature

When the AutoUpdate Option is not selected and changes are made to any control in the GUI, the Raw Register Map displays the new data in red color indicating that these changes have not been written to the device.

| le USB communications                     | Select Device Options Tools Default configuration Help                                            |                                                                                                                                        |
|-------------------------------------------|---------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Save Load Read Back                       |                                                                                                   |                                                                                                                                        |
| LMX2492<br>User controls<br>Raw Registers | Update All For effect, must enable FlexScript before  <br>If not enabled, click Options -> Enable | Controls on grey background/box<br>Flex Scripts.                                                                                       |
| PLL<br>Ramp Calculator<br>Burst Mode      | VCO Output Limit<br>High 9601 MHz                                                                 | Sign         Decimal Value         [32:31]         RAMP_LIMIT_x[30:0]           High         0         167772         0         167864 |
|                                           | Low 9000 MHz Valid In Ramps<br>0 1 2 3 4 5 6 7                                                    | Low 1 100663296 3 2046820352                                                                                                           |
|                                           | CMP0 9800 MHz                                                                                     | Sign         Decimal Value         [32:31]         RAMP_CMPx[30:0]           CMP0         33554432         0         33554432          |
|                                           | CMP1 9400 MHz                                                                                     | смрт 1 33554432 2 2113929216                                                                                                           |
|                                           | OSCin 1000 MHz Must enter to match PLL                                                            | Fpd 100 MHz PLL_R 1 0 PLL_NUM                                                                                                          |
|                                           | VCO Start<br>Frequency 9600 MHz Accumulator Start 1610612736                                      | PLL_N 96 16777216 PLL_DEN                                                                                                              |
|                                           | Ramps Ramp Enable 0                                                                               |                                                                                                                                        |
| eneral Context                            | Actual Start Desired End Actual End Frequency Frequency (MHz) (MHz) (MHz) (us) D                  | Next Start next<br>ly Ramp ramp after RST FL Flags Length Increment (dec)                                                              |
| O_START_FREQ                              | 0 9600 10500 10499.9705314 100                                                                    | 0 • TOC Timeout • Disabled • 10000 15099                                                                                               |
|                                           | 1 -1 10500 -1 100                                                                                 | 0 • TOC Timeout • Disabled • 10000 0                                                                                                   |
|                                           | 2 -1 10500 -1 100                                                                                 | □ • TOC Timeout • □ □ Disabled • 10000 0                                                                                               |
|                                           | 3 -1 10500 -1 100                                                                                 | 0 V TOC Timeout V Disabled V 10000 0                                                                                                   |
|                                           | 4 -1 10500 -1 100                                                                                 | 0 V TOC Timeout V Disabled V 10000 0                                                                                                   |
|                                           | 5 -1 10500 -1 100                                                                                 | 0 V TOC Timeout V Disabled V 10000 0                                                                                                   |
|                                           | 6 -1 10500 -1 100 L                                                                               | 0 V TOC Timeout V Disabled V 10000 0                                                                                                   |
|                                           |                                                                                                   |                                                                                                                                        |
|                                           |                                                                                                   |                                                                                                                                        |
|                                           | Ramp Count 0 Ramp Auto RAMP_AUTO Ramp In                                                          | Source Ramp Transition   Increment (2s complement) Programmed Register 0 15099 4 0                                                     |
|                                           |                                                                                                   |                                                                                                                                        |

#### Figure 25 : AutoUpdate OFF - Changes made to Control



For example, in the above page we have made changes to the "OSCin Frequency" as shown in the above figures and the AutoUpdate option is OFF. In the Raw Register Page, we will notice that for a couple of registers the data is updated in red color indicating that this has not been written to the device. An explicit write operation must be performed to write the data into the device.

| File USB communications                                                                  | Select Device                          | Options Tools      | Default con  | figuration | Help               |         |          |                    |     |                      |
|------------------------------------------------------------------------------------------|----------------------------------------|--------------------|--------------|------------|--------------------|---------|----------|--------------------|-----|----------------------|
| Save Load Read Back                                                                      |                                        |                    |              |            |                    |         |          |                    |     |                      |
| 4 LMX2492                                                                                | Register Map                           |                    |              |            |                    |         |          |                    |     |                      |
| User controls<br>Raw Registers                                                           | Register Name                          | Address/Value      | 2222<br>3210 | 1111 9876  | 1 1 1 1<br>5 4 3 2 | 1100    | 00007654 | 0 0 0 0<br>3 2 1 0 |     | Data                 |
| PLL                                                                                      | R102                                   | 0x006600           | 0000         | 0000       | 0110               | 0110    | 0000     | 0000               |     | 0x004366             |
| Ramp Calculator                                                                          | R101                                   | 0x006500           | 0000         | 0000       | 0110               | 0101    | 0000     | 0000               |     |                      |
| Burst Mode                                                                               | R100                                   | 0x006400           | 0000         | 0000       | 0110               | 0100    | 0000     | _0.0.0.0_          |     | Write Register       |
|                                                                                          | R99                                    | 0x006340           | 0000         | 0000       | 0110               | 0011    | 0100     | 0000               |     |                      |
|                                                                                          | R98                                    | 0x0062C3           | 0000         | 0000       | 0110               | 0010    | 1100     | 0011               |     | Read Register        |
|                                                                                          | R97                                    | 0x006150           | 0000         | 0000       | 0110               | 0001    | 0101     | 0000               |     |                      |
|                                                                                          | R96                                    | 0x006000           | 0000         | 0000       | 0110               | 0000    | 0000     | 0000               |     | Read All Registers   |
|                                                                                          | R95                                    | 0x005F00           | 0000         | 0000       | 0101               | 1111    | 0000     | 0000               |     |                      |
|                                                                                          | R94                                    | 0x005E00           | 0000         | 0000       | 0101               | 1110    | 0000     | 0000               |     | Write All Registers  |
|                                                                                          | R93                                    | 0x005D00           | 0000         | 0000       | 0101               | 1101    | 0000     | 0000               |     |                      |
|                                                                                          | R92                                    | 0x005C20           | 0000         | 0000       | 0101               | 1100    | 0010     | 0000               | - C |                      |
|                                                                                          | R91                                    | 0x005BC3           | 0000         | 0000       | 0101               | 1011    | 1100     | 0011               |     | Import Register Map  |
|                                                                                          | R90                                    | 0x005A50           | 0000         | 0000       | 0101               | 1010    | 0101     | 0000               |     |                      |
|                                                                                          | R89                                    | 0x00593F           | 0000         | 0000       | 0101               | 1001    | 0011     | 1111               |     | Export Register Map  |
|                                                                                          | R88                                    | 0x0058FF           | 0000         | 0000       | 0101               | 1000    | 1111     | 1111               |     | Export register map  |
|                                                                                          | R87                                    | 0x0057C7           | 0000         | 0000       | 0101               | 0111    | 1100     | 0111               | E   |                      |
|                                                                                          | R86                                    | 0x0056F7           | 0000         | 0000       | 0101               | 0110    | 1111     | 0111               |     | Register/Field Name  |
| General Context                                                                          | R85                                    | 0x005500           | 0000         | 0000       | 0101               | 0101    | 0000     | 0000               |     | Registenciela Marile |
| General Context                                                                          | R84                                    | 0x005400           | 0000         | 0000       | 0101               | 0100    | 0000     | 0000               |     | DLD_PASS_CNT         |
| Raw Registers                                                                            | R83                                    | 0x005300           | 0 0 0 0      | 0 0 0 0    | 0101               | 0011    | 0000     | 0000               |     | -                    |
| This is Pasistan man                                                                     | R82                                    | 0x0052A9           | 0000         | 0000       | 0101               | 0010    | 1010     | 1001               |     | 0                    |
| page that holds the                                                                      | R81                                    | 0x005199           | 0000         | 0000       | 0101               | 0001    | 1001     | 1001               |     | Dead                 |
| values of the                                                                            | R80                                    | 0x0050DB           | 0000         | 0 0 0 0    | 0101               | 0000    | 1101     | 1011               |     | Read                 |
| registers                                                                                | R79                                    | 0x004E22           | 0000         | 0 0 0 0    | 0100               | 1 1 1 1 | 0010     | 0010               |     |                      |
|                                                                                          | R78                                    | 0x004F49           | 0 0 0 0      | 0 0 0 0    | 0 1 0 0            | 1 1 1 0 | 1010     | 1001               |     | Address Dite         |
|                                                                                          | P77                                    | 0x004000           | 0 0 0 0      | 0 0 0 0    | 0100               | 1101    | 0000     | 0000               |     | Address bits         |
|                                                                                          | P76                                    | 0×004000           | 0 0 0 0      | 0 0 0 0    | 0100               | 1 1 0 0 | 0000     | -0.0.0.0           |     |                      |
|                                                                                          | P75                                    | 0x004800           | 0 0 0 0      | 0 0 0 0    | 0100               | 1011    | 0 0 0 0  | 0 0 0 0            |     |                      |
|                                                                                          | P74                                    | 0x004400           | 0 0 0 0      | 0 0 0 0    | 0100               | 1010    | 0 0 0 0  | 0 0 0 0            |     |                      |
|                                                                                          | P73                                    | 0×004900           | 0 0 0 0      | 0 0 0 0    | 0100               | 1001    | 0 0 0 0  | 0 0 0 0            |     |                      |
|                                                                                          | 875                                    | 0x004900           | 0000         | 0000       | 0100               | 1001    | 0000     | 0000               |     |                      |
|                                                                                          | D71                                    | 0×004700           | 0 0 0 0      | 0 0 0 0    | 0100               | 0111    | 0000     | 0 0 0 0            |     |                      |
|                                                                                          | P70                                    | 0x004618           | 0 0 0 0      | 0 0 0 0    | 0100               | 0110    | 0 0 0 1  | 1011               |     |                      |
|                                                                                          | P69                                    | 0×004500           | 0 0 0 0      | 0 0 0 0    | 0100               | 0101    | 0 0 0 0  | 0 0 0 0            |     |                      |
|                                                                                          | 069                                    | 0×0044300          | 0 0 0 0      | 0 0 0 0    | 0100               | 0100    | 0 0 1 0  | 1001               |     |                      |
|                                                                                          | 067                                    | 0x004429           | 0 0 0 0      | 0000       | 0100               | 0 0 1 1 | 0110     | 0110               |     |                      |
|                                                                                          | P66                                    | 0×004366           | 0 0 0 0      | 0 0 0 0    | 0100               | 0 0 1 0 | 0110     | 0 1 1 0            |     |                      |
|                                                                                          | KOO                                    | 0X004200           | 0000         | 0000       | 0100               | 0010    | 0110     | 0110               | *   |                      |
| Wrote Register R0x23 as 0x0<br>Wrote Register R0x27 as 0x0<br>Read back Register R0x8D a | 00 2300<br>00 273A<br>Is value 0x00 8D | 00. No difference. |              |            |                    | Protoco | ol: S    |                    | *   |                      |





# 3.4. PLL Page

For a particular device, there can be one or more PLL pages and based on the device selected the required controls will be enabled on each of the PLL page.

| TICS Pro - LMX2492                                                                                                       |                              |                   |                      |                                                       | -             | ter Aut                                                           | 10 A.M | the sufficiency |     | • ×  |
|--------------------------------------------------------------------------------------------------------------------------|------------------------------|-------------------|----------------------|-------------------------------------------------------|---------------|-------------------------------------------------------------------|--------|-----------------|-----|------|
| File USB communications                                                                                                  | Select Device                | Options Tools     | Default configuratio | n Help                                                |               | _                                                                 |        |                 |     |      |
| Save Load Read Back                                                                                                      |                              |                   |                      |                                                       |               |                                                                   |        |                 |     |      |
| Context     General Context                                                                                              | Reference<br>Oscillator      | e<br>OSCin<br>Tin |                      | Multiplier<br>IX<br>N Divider<br>96<br>Prescaler<br>4 | R Divider     | Phase De<br>& Charge<br>Polarity<br>+<br>-<br>1000<br>Gain<br>31X | MHz CF | Loop Filter     |     |      |
| Wrote Register R0x4 as 0x00<br>Wrote Register R0x3 as 0x00<br>Wrote Register R0x2 as 0x00<br>Wrote Register R0x1 as 0x00 | 0400<br>0300<br>0201<br>0100 |                   |                      |                                                       | Protocol:     | SPI                                                               | in     | TEVAC           |     |      |
| wrote Register Roxu as 0x00                                                                                              | 0018                         |                   |                      |                                                       | Connection Mo | de: USB2ANY                                                       |        | IEAAS I         | NON | ENIS |

### Figure 27 : PLL Page



# 3.5. Flex Page

The Flex Pages in the TICS Pro GUI, provide the option to create dynamic pages and have complete control over the design and functionality of the page. A sample flex page is shown below.

# The procedure to create a flex page is available as a separate document

| TICS Pro - LMX2492                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| File USB communications                                                                   | Select Device Options Tools Default configuration Help                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Save Load Read Back                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <ul> <li>LMX2492</li> <li>User controls</li> <li>Raw Registers</li> </ul>                 | Update All For effect, must enable FlexScript before pressing update all button.<br>If not enabled, click Options> Enable Flex Scripts.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| PLL<br>Ramp Calculator<br>Burst Mode                                                      | VCO Output Limit         2s complement (programmed register)           High         9601         MHz         High         1         1449534685         3         697948962           Low         9000         MHz         Valid In Ramps         Low         1         1459617792         3         687865856                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                                                           | O         1         2         3         4         5         6         7           CMP0         9800         MHz         Image: Component of the state of |
|                                                                                           | CMP1 9400 MHz CMP1 1 1452906905 2 694576742                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                                                                                           | OSCIn 1000 MHz Must enter to match PLL Fpd 1000 MHz PLL_R 1 0 PLL_NUM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                                           | VCO Start         96000         MHz         Accumulator Start 1610612736         PLL_N         96         16777216         PLL_DEN                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                                                                           | Ramps Ramp Enable 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| General Context<br>Ramp Calculator                                                        | Actual Start         Desired End<br>Frequency         Actual End<br>Frequency         Duration         Next         Start next           Number         (MHz)         (MHz)         (us)         Dly Ramp         ramp after         RST         FL         Flags         Length         Increment (dec)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| This is a Flex page                                                                       | 0 96000 10500 10497.1370697 100 1 • TOC Timeout • Disabled • 115536 -14345                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                                                                                           | 1 10497.1370697 10500 10497.1370697 100 2 • TOC Timeout • Disabled • 115536 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                                                           | 2 10497.1370697 10500 10497.1370697 100 3 • TOC Timeout • Disabled • 115536 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                                                           | 3 10497.1370697 10500 10497.1370697 100 4 • TOC Timeout • Disabled • 115536 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                                                           | 4 10497.1370697 10500 10497.1370697 100 5 V TOC Timeout V Disabled V 115536 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                                                           | 5 10497.1370697 10500 10497.1370697 100 0 6 V TOC Timeout V 0 Disabled V 115030 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                                                                                           | 6 10497.1370097 10500 10497.1370097 100 17 ▼ 100 11meout ▼ 1 Uisabled ▼ 115536 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                                                                           | Ramp Count       Ramp Auto       RAMP_AUTO       Ramp In Source       Ramp Transition       Increment (2s complement) Programmed Register         0       1073727479       4       0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Wrote Register R0x4 as 0x00<br>Wrote Register R0x3 as 0x00<br>Wrote Register R0x2 as 0x00 | 00 0400<br>00 0300<br>00 0201<br>00 0201                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Wrote Register R0x1 as 0x00<br>Wrote Register R0x0 as 0x00                                | DO 0018 Connection Mode: USB2ANY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

#### Figure 28 : Flex Page



# 3.6. Burst Page

The Burst Page allows user to write simple routines and execute them or save them for later use

# a) Delay

You can configure the delay in sec(s) using the text control as shown below. Pressing the Delay button will add a line corresponding to Delay in your routine

| TICS Pro - LMX2492                                                                                        | -                          | -             | And a state of the |                        |                                                                                                  |          | _        |            |
|-----------------------------------------------------------------------------------------------------------|----------------------------|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------------------------------------------------------------------------------------------|----------|----------|------------|
| File USB communications                                                                                   | Select Device              | Options Tools | Default configuration Help                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                        |                                                                                                  |          |          |            |
| Save Load Read Back                                                                                       |                            |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                        |                                                                                                  |          |          |            |
| Save Load Read Back User controls Raw Registers PLL Ramp Calculator Burst Mode General Context Burst Mode | Load                       | Save          | Add delay to the Routine                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Configure —<br>Pattern | Operations<br>Delay<br>1<br>Load Registe<br>Set Pin<br>Edit Options<br>Delete<br>Delete<br>Loop? | Sec<br>r |          |            |
| Wrote Register R0x4 as 0x0<br>Wrote Register R0x3 as 0x0                                                  | 0 0400<br>0 0300           |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | * Protocol:            | SPI                                                                                              |          |          |            |
| Wrote Register R0x2 as 0x0<br>Wrote Register R0x1 as 0x0<br>Wrote Register R0x0 as 0x0                    | 0 0201<br>0 0100<br>0 0018 |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Connection             | Mode: USB2ANY                                                                                    | -        | Texas In | ISTRUMENTS |

Figure 29 : Burst Page - Delay

# b) Load Register

This option allows you to select the required register and add the lines corresponding to the "Write Register" and the "Set Pins" operation to the routine



#### Figure 30 : Burst Page - Load Register

| TICS Pro - LMX2492                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| File USB communications                                                                                              | Select Device Options Tools Default configuration Help                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Save Load Read Back                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| LUXX2492     User controls     Raw Registers     PLL     Ram Pcalculator     Burst Mode   General Context Burst Mode | time.sizer/11<br>WriteRawData(0x0000C3);<br>SetPinstTRIG1,TRIG2,MOD,TRIGGER,CE,MUXout","False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,False,F |
| Wrote Register R0x4 as 0x00<br>Wrote Register R0x3 as 0x00<br>Wrote Register R0x2 as 0x00                            | 1 0400<br>0 0300<br>0 0201<br>* Protocol: SPI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Wrote Register R0x1 as 0x00<br>Wrote Register R0x0 as 0x00                                                           | 2 0018 Connection Mode: USB2ANY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

## c) Load

The Load options allows you to load a pre-saved routine and execute it

## d) Save

Save allows you to save the routine that you have created

## e) Run

The Run option executes the routine that you have created / loaded in the pane.

# f) Stop

This option stops the execution of the routine which is currently executing



# g) Overwrite?

Selecting this option allows you to overwrite the steps in the routine

# h) Loop?

When this option is set to true, the routine is continuously executed until the stop button is pressed

# i) Pattern

When you click on the pattern button, the data in the routine is saved into the individual line status file format for the active communication protocol as shown below

| Figure | 31 | Burst | Mode | - Pattern | File |
|--------|----|-------|------|-----------|------|
|        |    |       |      |           |      |

| 📝 C:\l       | Use          | rs\x02053      | 54\Desk      | top\Test.mac  | - Notepad        | ++                |                       |       |                     |              |              | x    |
|--------------|--------------|----------------|--------------|---------------|------------------|-------------------|-----------------------|-------|---------------------|--------------|--------------|------|
| <u>F</u> ile | <u>E</u> dit | <u>S</u> earch | <u>V</u> iew | Encoding      | <u>L</u> anguage | Se <u>t</u> tings | Macro                 | Run   | Plugins             | <u>W</u> ind | low <u>?</u> | Х    |
| 🕞 (          | Ð            |                | 6            | ۵ 🍐 🗅         | D 🏳 🤁            | C ä               | <b>b</b> ∰ ( <b>€</b> | 3     | <u>a</u> - <u>a</u> | ≣⊋ ¶         | [ 🗐 🐷        | >>   |
| 📄 Tes        | st.ma        | ic 🗵           |              |               |                  |                   |                       |       |                     |              |              |      |
| 1            | c            | 1k0001         | 010101       | 101010101     | 01010101         | .0101010          | 101010                | 10101 | 010101              | .000         |              |      |
| 2            | d            | at0000         | 000000       | 000000000     | 11000000         | 1100000           | 000000                | 00000 | 000000              | 000          |              |      |
| 3            | 1            | e 0000         | 000000       | 000000000     | 00000000         | 0000000           | 000000                | 00000 | 000000              | 011          |              |      |
| 4            |              |                |              |               |                  |                   |                       |       |                     |              |              |      |
|              |              |                |              |               |                  |                   |                       |       |                     |              |              |      |
|              |              |                |              |               |                  |                   |                       |       |                     |              |              |      |
|              |              |                |              |               |                  |                   |                       |       |                     |              |              |      |
|              |              |                |              |               |                  |                   |                       |       |                     |              |              |      |
|              |              |                |              |               |                  |                   |                       |       |                     |              |              |      |
| length       | : 17         | Ln:1 C         | ol:1 S       | Sel : 172   3 |                  | Do                | s\Windov              | vs    | ANSI as             | UTF-8        | IN           | IS H |



## 4. Automation Function

The automation functions help provide a means to access / modify the behavior of the control. Some of the automation functions that are available are listed below.

## 4.1. SetText

## Boolean SetText(string controlName, string value)

- This function helps set the value, including setting a float or integer TextCtrl with a nonnumeric String or setting a floating value for an integer TextCtrl.
- Note that a combo box is an 'integer' type for the index, but could have float values in the drop down which could match as a string.
- If function returns false it means no changes were made. True indicates that the operation was successful.

#### **Explanation for Parameters**

| Parameter_Name | Description                                                                                                                                                                                                |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| controlName    | <ul> <li>Name of the control as described in the INI file.</li> </ul>                                                                                                                                      |
| Value          | <ul> <li>Use a text string to set the index of a control with items.<br/>(ComboBox, ListBox, SmartComboBox).</li> <li>Or, set Text of a simple StaticText, TextCtrl,<br/>MultiTextCtrl, Button.</li> </ul> |

## 4.2. GetText

## string GetText(string controlName)

- Returns the current text string of a control with the items.(ComboBox, ListBox, SmartComboBox)
- Or gets the Text of a simple StaticText, TextCtrl, MultiTextCtrl.

| Parameter_Name | Description                                                           |
|----------------|-----------------------------------------------------------------------|
| controlName    | <ul> <li>Name of the control as described in the INI file.</li> </ul> |



## 4.3. SetIndex

#### Boolean SetIndex(string controlName,int value)

• Sets the index directly of a control with items type control in Flex: ComboBox, ListBox, SmartComboBox, CheckBox, RadioButton

#### **Explanation for Parameters**

| Parameter_Name | Description                                                                  |
|----------------|------------------------------------------------------------------------------|
| controlName    | <ul> <li>Name of the control as described in the INI file.</li> </ul>        |
| Value          | <ul> <li>Index value of the item to be set in the control's list.</li> </ul> |

## 4.4. GetIndex

#### long GetIndex(string controlName)

• Gets the index of a control directly with items type control in Flex for the controls of type : ComboBox, ListBox, SmartComboBox, CheckBox, RadioButton.

#### **Explanation for Parameters**

| Parameter_Name | Description                                       |
|----------------|---------------------------------------------------|
| controlName    | Name of the control as described in the INI file. |

#### 4.5. SetFieldValue

#### Boolean SetFieldValue(string controlName,long value)

• Sets the field value of the specified field in the register map for ComboBox, ListBox, SmartComboBox, CheckBox, TextCtrl, StaticText.Note, that a control which has linked bits will be set all together

| Parameter_Name | Description                                                             |
|----------------|-------------------------------------------------------------------------|
| controlName    | <ul> <li>Name of the control as described in the INI file.</li> </ul>   |
| Value          | <ul> <li>The unsigned integral value of the field to be set.</li> </ul> |



## 4.6. GetFieldValue

## ulong GetFieldValue (string controlName)

• Gets the field value of the specified field in the register map for Combo Box, ListBox, SmartComboBox, CheckBox, TextCtrl, StaticText. Note that a control which has linked bits will be set all together

#### **Explanation for Parameters**

| Parameter_Name | Description                                                           |
|----------------|-----------------------------------------------------------------------|
| controlName    | <ul> <li>Name of the control as described in the INI file.</li> </ul> |

## 4.7. PressButton

#### Boolean PressButton(string controlName)

• Triggers the press button event and returns "False" if not valid and "True" if valid.

#### **Explanation for Parameters**

| Parameter_Name | Description                                                           |
|----------------|-----------------------------------------------------------------------|
| controlName    | <ul> <li>Name of the control as described in the INI file.</li> </ul> |

## 4.8. PressSpinButton

#### Boolean PressSpinButton(string controlName, int direction)

• Triggers the press button event and returns "False" if not valid and "True" if valid.

| Parameter_Name | Description                                                             |
|----------------|-------------------------------------------------------------------------|
| controlName    | Name of the control as described in the INI file.                       |
| direction      | Up if direction >0 by the value.<br>Down if direction < 0 by the value. |



## 4.9. WriteRawData

## Boolean WriteRawData(long IValue)

• Parses the input value into address and data and writes the data of the register to corresponding address of the device

#### **Explanation for Parameters**

| Parameter_Name | Description                                                                                                                        |
|----------------|------------------------------------------------------------------------------------------------------------------------------------|
| IValue         | The raw value of the register that is a combination of address and data. The length of this value is equal to the register length. |

## 4.10. WriteAddressData

## Boolean WriteAddressData(long IAddress,long IValue)

• Writes the input value to the device at the corresponding input address passed

#### **Explanation for Parameters**

| Parameter_Name | Description                                              |
|----------------|----------------------------------------------------------|
| IAddress       | The address of the register to be written to the device. |
| IValue         | The data of the register to be written to the device.    |

#### 4.11. WriteRegisterByIndex

#### Boolean WriteRegisterByIndex(int Index)

• Writes the current value of the register that is located at the index passed in the register map

| Parameter_Name | Description                                                                                    |
|----------------|------------------------------------------------------------------------------------------------|
| Index          | The index of the register in the register map for which the value to be written to the device. |



## 4.12. WriteRegister

#### Boolean WriteRegister(string registerName)

• Writes the value of the register having the input register Name to the device.

#### **Explanation for Parameters**

| Parameter_Name | Description                                           |
|----------------|-------------------------------------------------------|
| registerName   | The name of the register to be written to the device. |

#### 4.13. WriteAllRegisters

#### Boolean WriteAllRegisters()

• Writes the value of all registers to the device.

## 4.14. GetDevice

#### Boolean GetDevice(out string deviceName, out string deviceType)

• Retrieves the name and type of the current device loaded and assigns them to the variables deviceName and deviceType

| Parameter_Name | Description                                                            |
|----------------|------------------------------------------------------------------------|
|                |                                                                        |
| deviceName     | The name of the device currently loaded.                               |
| deviceType     | The type of the currently loaded that could be either of the following |
|                | • BuiltinDevice                                                        |
|                | • UserDevice                                                           |
|                | • Tools                                                                |



## 4.15. SelectDevice

#### Boolean SelectDevice(string deviceName)

• Loads the input built in device to the GUI.

#### **Explanation for Parameters**

| Parameter_Name | Description                                   |
|----------------|-----------------------------------------------|
| deviceName     | The name of the built in device to be loaded. |

#### 4.16. SelectUserDevice

#### Boolean SelectUserDevice(string userDeviceName)

• Loads the input user device to the GUI.

#### **Explanation for Parameters**

| Parameter_Name | Description                               |
|----------------|-------------------------------------------|
| userDeviceName | The name of the user device to be loaded. |

#### 4.17. SaveSetup

#### Boolean SaveSetup(string filePath)

• Saves the current configuration (values of all the registers, non-field controls and pin values) into a .mac file into the file path passed.

| Parameter_Name | Description                                                                         |
|----------------|-------------------------------------------------------------------------------------|
| filePath       | The complete file path to which the current configuration to be saved as .mac file. |



## 4.18. RestoreSetup

## Boolean RestoreSetup(string filePath)

• Restores the configuration from a .mac file passed that contains the values of all the registers, non-field controls and pin values to the currently loaded device

#### **Explanation for Parameters**

| Parameter_Name | Description                                                                                 |
|----------------|---------------------------------------------------------------------------------------------|
| filePath       | The complete path of the file from which the field and non-<br>field values to be restored. |

## 4.19. RunScript

## Int RunScript(string filePath,string[] scriptVariables)

- Sets the array of variables passed to the scope of the Python engine and Runs the Iron Python script located at the passed file path.
- Returns 0 if the script execution is completely successful, else returns -1.

| Parameter_Name  | Description                                                                                                           |
|-----------------|-----------------------------------------------------------------------------------------------------------------------|
| filePath        | The path to the file that contains the python script to be run.                                                       |
| scriptVariables | The array of variables to be added to the Python engine scope, that might be used in the Iron Python script executed. |



## 4.20. CheckModeText

#### Boolean CheckModeText(string modeName)

• Checks whether the mode name passed is available in the default configuration menu and returns true if one exists.

#### **Explanation for Parameters**

| Parameter_Name | Description                                                                  |
|----------------|------------------------------------------------------------------------------|
| modeName       | The name of the mode which to check for existence in default configuration . |

## 4.21. SetMode

#### Boolean SetMode(int Index)

• Loads the mode at the index passed in the default configuration menu.

## **Explanation for Parameters**

| Parameter_Name | Description                                                           |
|----------------|-----------------------------------------------------------------------|
| Index          | The index of the mode to be loaded in the default configuration menu. |

#### 4.22. SetMode

#### Boolean SetModeText(string modeName)

• Loads the mode in default configuration menu that is matching with the mode Name passed.

| Parameter_Name | Description                                                                    |
|----------------|--------------------------------------------------------------------------------|
| modeName       | The name of the mode that is to be loaded from the default configuration menu. |



## 4.23. SetPin

# Boolean SetPin(string pinName,Boolean setFlag)

• Sets/ Clears the pin with passed pin name based on the setFlag.

# **Explanation for Parameters**

| Parameter_Name | Description                                                      |
|----------------|------------------------------------------------------------------|
| pinName        | The name of the pin to be set / cleared.                         |
| setFlag        | The flag that specifies whether the pin to be set or cleared. If |
|                | it is true, the pin is set else cleared.                         |

## 4.24. GetPin

# int GetPin(string pinName)

• Returns 1 if the pin passed is set, else returns 0.

| Parameter_Name | Description                                    |
|----------------|------------------------------------------------|
| pinName        | The name of the pin which flag to be returned. |