Document Title

EK5133-G1 User Manual

Revision History

Rev. No.	History	Issue Date	Remark
0.0	Preliminary	Dec. 16, 2019	

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1. Introduction

This document describes how to use the EK5133-G1 Series Kit. The evaluation kit enables you to develop and debug firmware and prototype peripheral hardware for wireless applications based on the A5133 RF chip.

2. Hardware Description

2.1 Evaluation board

The Evaluation board provides two main functions. First, the I/O pin function of A5133 can be set and measured on the evaluation board. Another, user can use EK5133-G1 software installed on PC to evaluate the A5133. The RF module is plugged into connector J2 on the evaluation board. The connector J1 should be connected to PC's USB port by USB cable. This evaluation board is shown in the Figure 1.

The following describe the function of key parts on the evaluation board (Figure 1)

1. USB B Type female connector (J1): It should be connected to PC's USB port by USB cable
2. RF Module connector: Plug RF module into RF module connector on the evaluation board.
3. Jumper J21: REGIPA. Please see below table 2.6 for detail description.
4. Jumper J10,J15: PA & LNA On/Off . Please see below table 2.5 for detail description.
5. I/O pin connector (J3): Please see below table 2.4 for detail description.
6. Jumper J7, J22: RF module supply voltage, I/O driving select. Select system +3.3V on board or extern power.
7. Jumper J8: EK Board power supply select. Select USB power supply or J6 Jack power supply.
8. Power supply (J6): Power supply is fed to the evaluation board through J6 and input range is DC +5.5V to +7V

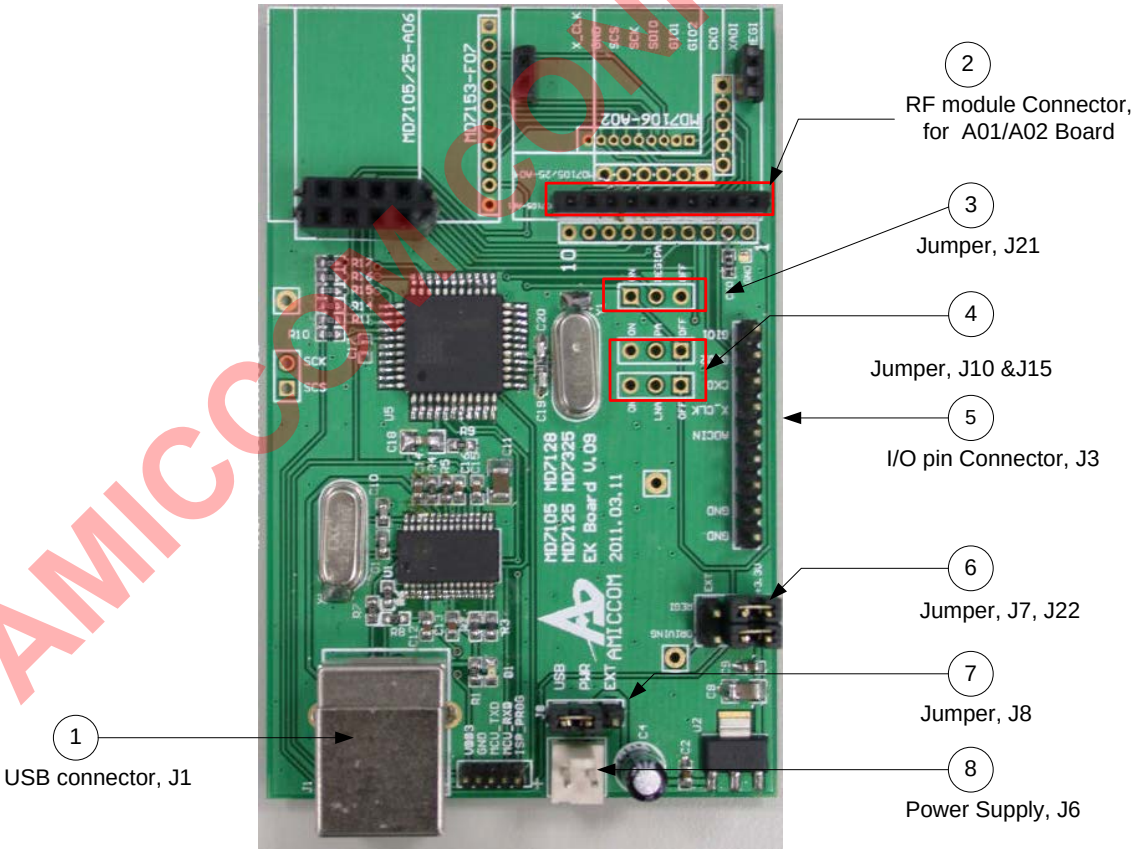


Fig. 1 Topside of evaluation board

2.2 The pin definition of A01/A02

Pin No.	Pin name	Comment
1	VREG_IN	Chip's Regulator input
2	GND	GND
3	CKO	Multi pin CKO
4	GIO2	Multi pin IGPIO 2
5	GIO1	Multi pin IGPIO 1
6	SDIO	SPI data input/output
7	SCK	SPI clock
8	SCS	SPI chip select
9	GND	GND
10	XCLK	External crystal source input

2.3 The pin definition of F07

Pin No.	Pin name	Comment
1	GND	GND
2	REGIPA	Control A7700 Rx gain select
3	CKO	Multi pin clock output
4	GIO2	Multi pin IGPIO 2
5	GIO1	Multi pin IGPIO 1
6	SDIO	SPI data input/output
7	SCK	SPI clock
8	SCS	SPI chip select
9	REGI	Chip's Regulator input
10	GND	GND

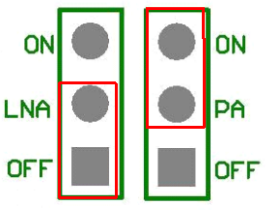
2.4 The pin definition of J3

Pin No.	Pin name	Comment
1	GIO1	Multi pin GPIO1
2	GIO2	Multi pin GPIO2
3	CKO	Multi pin CKO
4	XO	External crystal source input
5	ADC_IN	ADC input for external signal source
6	-	NC
7	-	NC
8	GND	GND
9	GND	GND

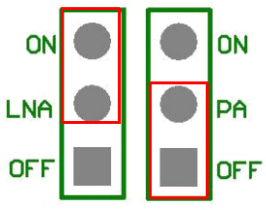
2.5 PA/LNA setting

The PA/LNA pin is control TRX switch select.

a) PA On setting



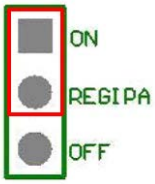
b) LNA On setting



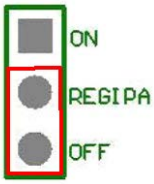
2.6 REGIPA setting

The REGIPA pin is control A7700 RX gain select.

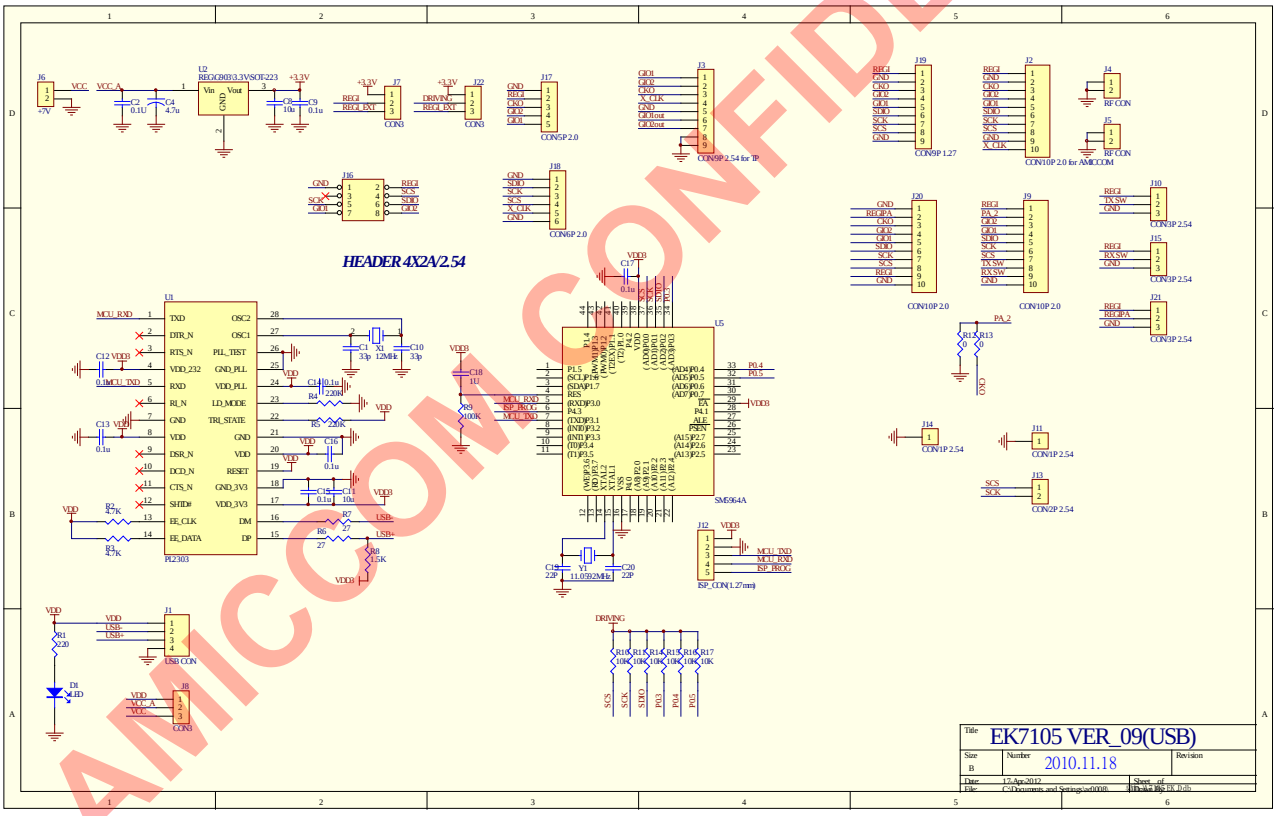
b) High gain mode setting



b) Low gain mode setting



2.7 EV Board Schematic



3. Software Introduction

The software is used to program the A5133 device on the evaluation board. By using this software the designer of the radio system can easily evaluate the performance of RF IC in the early stage of the design process. It is further a useful tool during the generation of the configuration data and for finding optimized external component values.

3.1 Software Install/Uninstall

The software is written to run under Windows 2000 or Windows XP operating system. There should be a USB port in the target PC for the device control.

To install EK5133-G1 Series program:

1) Start Windows, if you have not already done so.
2) Place the CD-ROM disk into the CD-ROM drive.
3) Select “Install EK5133-G1” item to setup program.

Notes: Administrator privilege is required for installing the EK5133-G1 Series on Windows 2000/XP. If the user doesn't have the administrative right, this program may be not work while controlling the device with the USB port.

To uninstall EK5133-G1 Series program:

1 Click the [Start] button under Windows.
2 Select “Control Panel” in Setup.
3 Double-click Add/Remove Programs.
4 Click Install/Uninstall. Then select EK5133-G1 from the list of programs that can be automatically removed.
5 Click the [Remove...] button to uninstall EK5133-G1 Series.

3.2. Driver Install

This software should be install PL2303 USB to Bridge (HX) installshield driver. The Wizard will guide you to complete the installation.

3.3. Using the EK5133-G1 Series software

The EK5133-G1 program Main Screen appears whenever you execute the program. The screen is shown below. Refer to the A5133 datasheet for detailed information on the register settings.

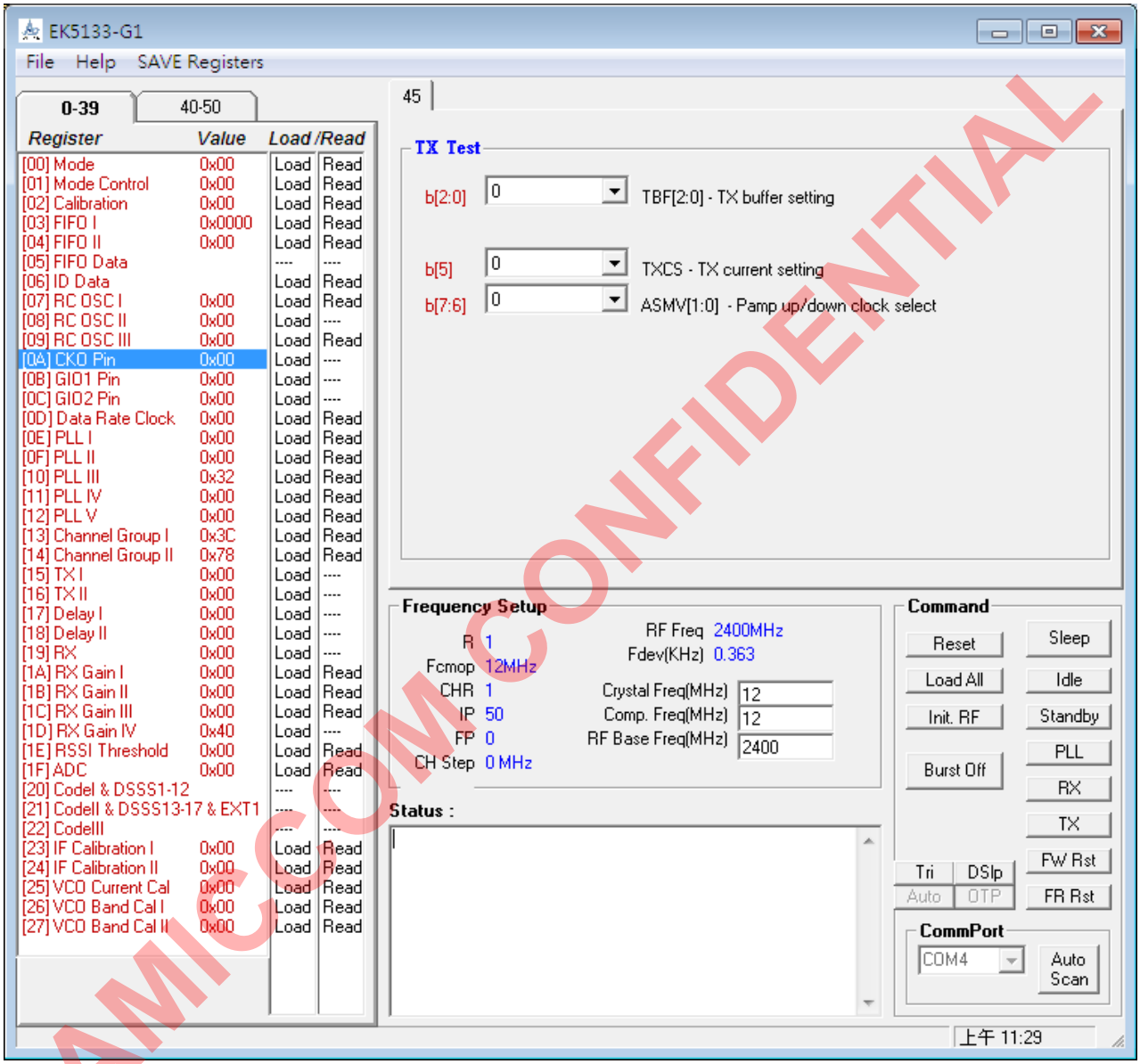
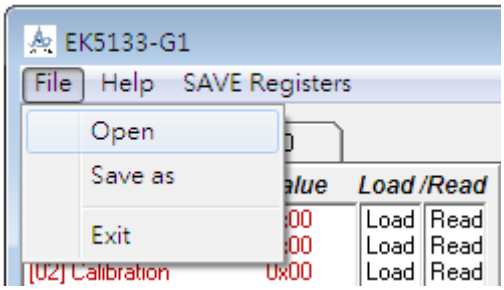


Fig. 2 EK5133-G1 Series program main screen

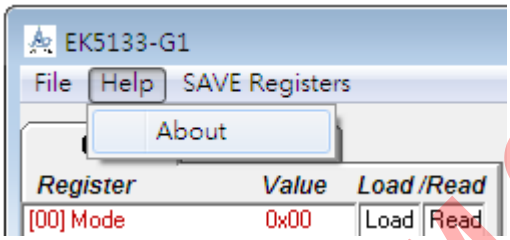
3.3.1 Pull-down menu

3.3.1.1 File menu options



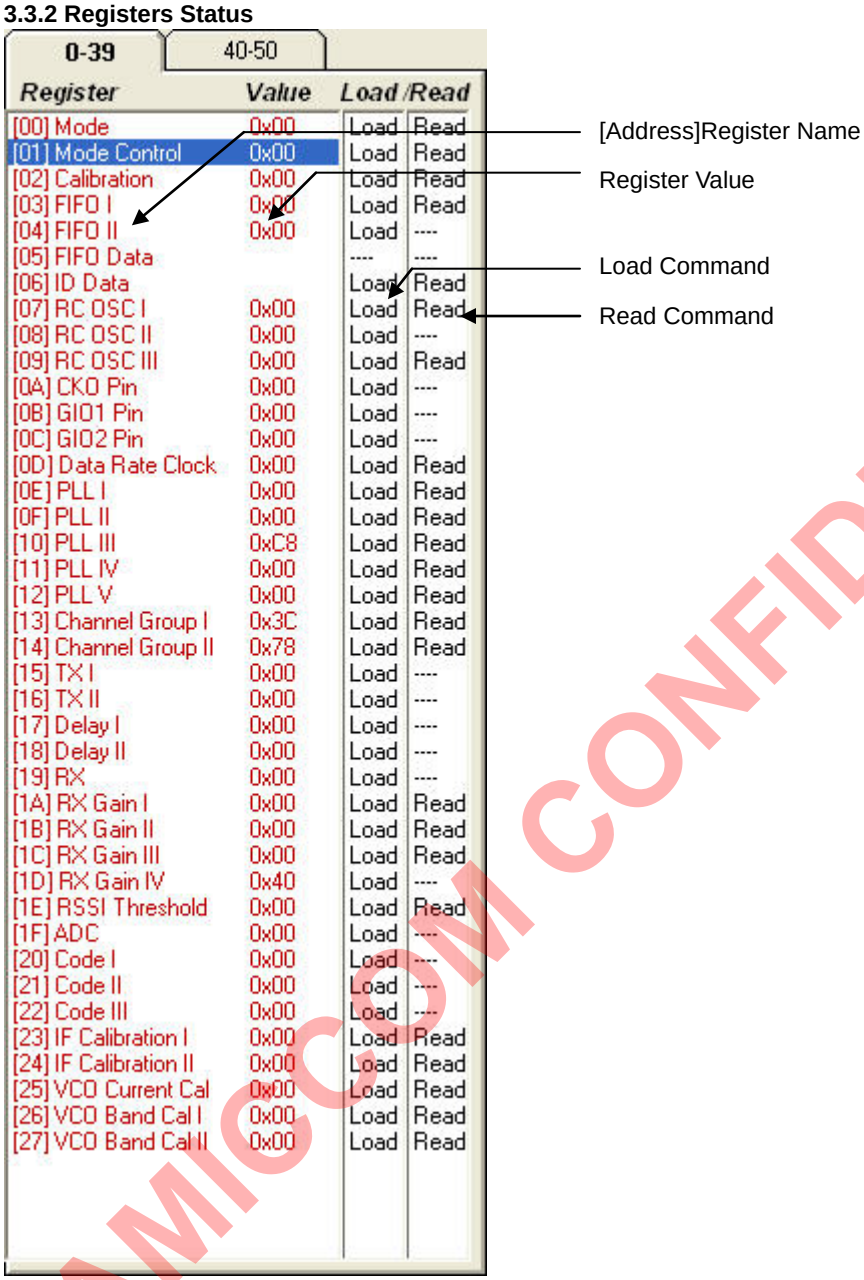
The File menu offers the following commands:
Open Opens an existing CFG file.
Save As Displays a file selection dialog box that asks you for the name of a CFG-file in which to save the entered system parameters.
Exit Exits A5133 Configuration Utility program

3.3.1.2 Help menu options



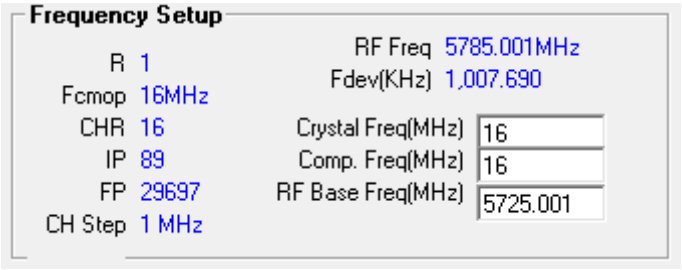
The help menu provides access to useful information about the product.
About brings up a message box with the software revision and copyright information.

3.3.2 Registers Status



The registers tab shows the value that the EK5133-G1 is sending to the device. The names part of the data registers is displayed. You can change the different parameter value in you need configure register, the specified register in register Tab will change automatically. When the Load command is used, the selected data register is sent. After this step is done once, it is necessary to do it again whenever data register is to be changed. When the Read command is used, you can readout the register value which display in status message box

3.3.3 Frequency Setup



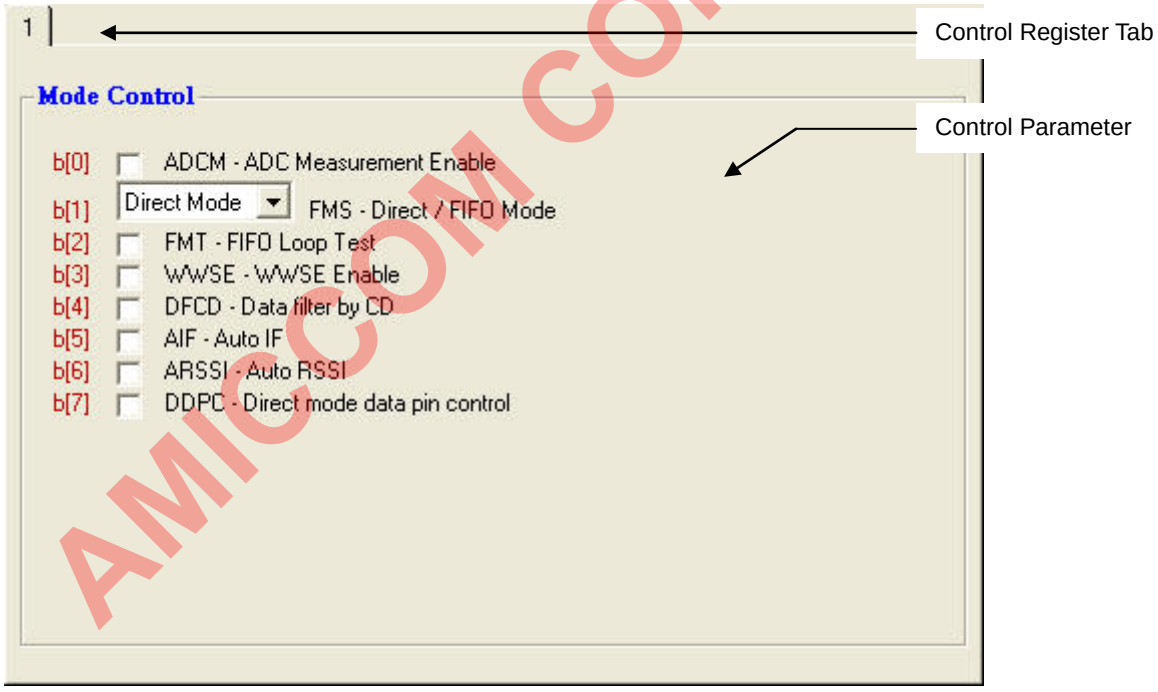
The user needs to enter the crystal frequency, the RF frequency, and the compare frequency. When you have changed the values, IP, FP and RRC counter value are calculated and PLL II, PLL III, PLL IV, PLL V register will change automatically.

The crystal frequency The crystal frequency of your module board is 16 MHz.
Do not change the crystal frequency parameter when using this module unless the crystal is being replaced.

The RF frequency The A5133 can operate in the 5725~5825MHz band. Enter the desired RF frequency

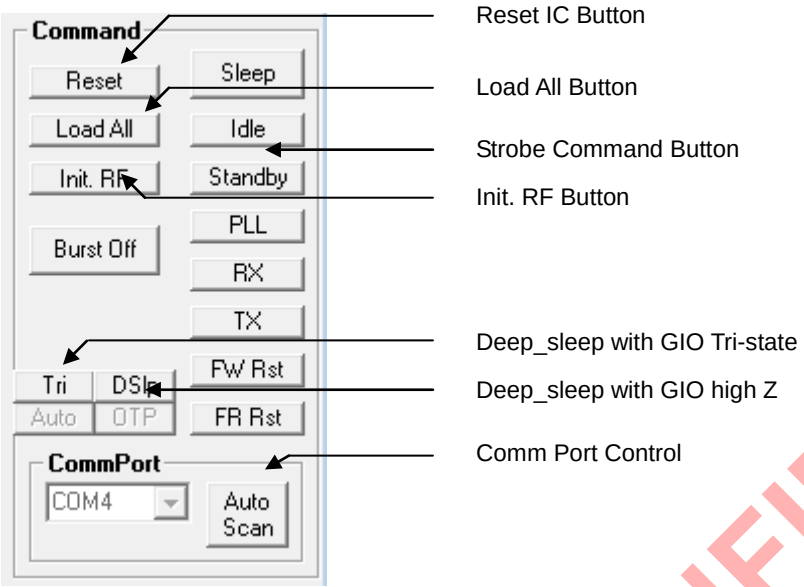
The compare frequency The compare frequency is depending on you need setting. Please refer A5133 datasheet to enter value.

3.3.4 Control Register Tab



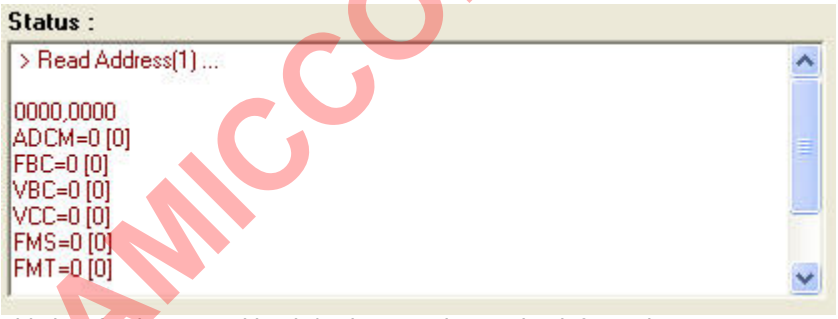
The control register tab can choose by pressing the register list field user you want control.
In control register tab includes available control Item. User can choose parameter value for control Item.

3.3.5 Command Tab



Pressing “Reset” button, the program can send out reset command.
Pressing “Load All” button, the program can send out the register values one by one.
Pressing “Auto Scan” button, the program can scan available comm.
Pressing Strobe Command button, the program can send out strobe command. It includes Sleep, Idle, Standby, PLL, Rx, Tx, FIFO Read Reset, FIFO Write Reset.
Pressing “Init. RF” button, the program will do calibration procedure automatically.
Pressing “D_Sleep-GIO Tri” button, the program can send out deep sleep command with GIO pin Tri-state.
Pressing “D_Sleep-GIO high” button, the program can send out deep sleep command with GIO pin high Z.

3.3.6 Status Message Box



This is Info about Read back / write to register value information.

4. Plug in Configuration File

Installation procedures

Step 1: Connect USB cable between PC and EK5133 Board. Plug A5133 series RF module on EK5133's socket.
Step 2: Enable A5133-G1 program.
Step 3: Pressing "Auto Scan" button to scan available Comm. Port.
Step 4: Select file > open to import a config. File (*.cfg file).
Step 5: Press "Init. RF" button to do calibration procedure.

Setup TX:
Step 1: Press "TX" button to enter TX state.
Step 2: To quit "TX" state, Press "PLL" or "Standby" to exit TX state

Setup RX:
Step 1: Press "RX" button to enter RX state.
Step 2: If user quit "RX" state, Press "PLL" or "Standby" to exit RX state.

5. References

[1] Refer to the A5133 datasheet for detailed information on the register settings.