Document Title

EK7159-G1 User Manual

Revision History

Rev. No.	History	Date	Rev. By
1.0	Initial issue.	April. 21, 2016	Achou

Important Notice:

AMICCOM reserves the right to make changes to its products or to discontinue any integrated circuit product or service without notice. AMICCOM integrated circuit products are not designed, intended, authorized, or warranted to be suitable for use in life-support applications, devices or systems or other critical applications. Use of AMICCOM products in such applications is understood to be fully at the risk of the customer.

Table of contents

1. Introduction

This document describes how to use the EK7159-G1 Kit. The evaluation kit enables you to develop and debug firmware and prototype peripheral hardware for wireless applications based on the A7159 RF chip.

2. Hardware Description

2.1. Evaluation board

The Evaluation board provides two main functions. First, the I/O pin function of A7159 can be set and measured on the evaluation board. Another, user can use EK7159-G1 software installed on PC to evaluate the A7159. 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 J10, J15: PA & LNA On/Off. Please see below table 3.6 for detail description.

4. I/O pin connector (J3): Please see below table 3.5 for detail description.

5. Jumper J22: MCU I/O driving voltage select. Select system +3.3V on board or extern power

6. Jumper J7: RF module supply voltage 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 +5V to +7V
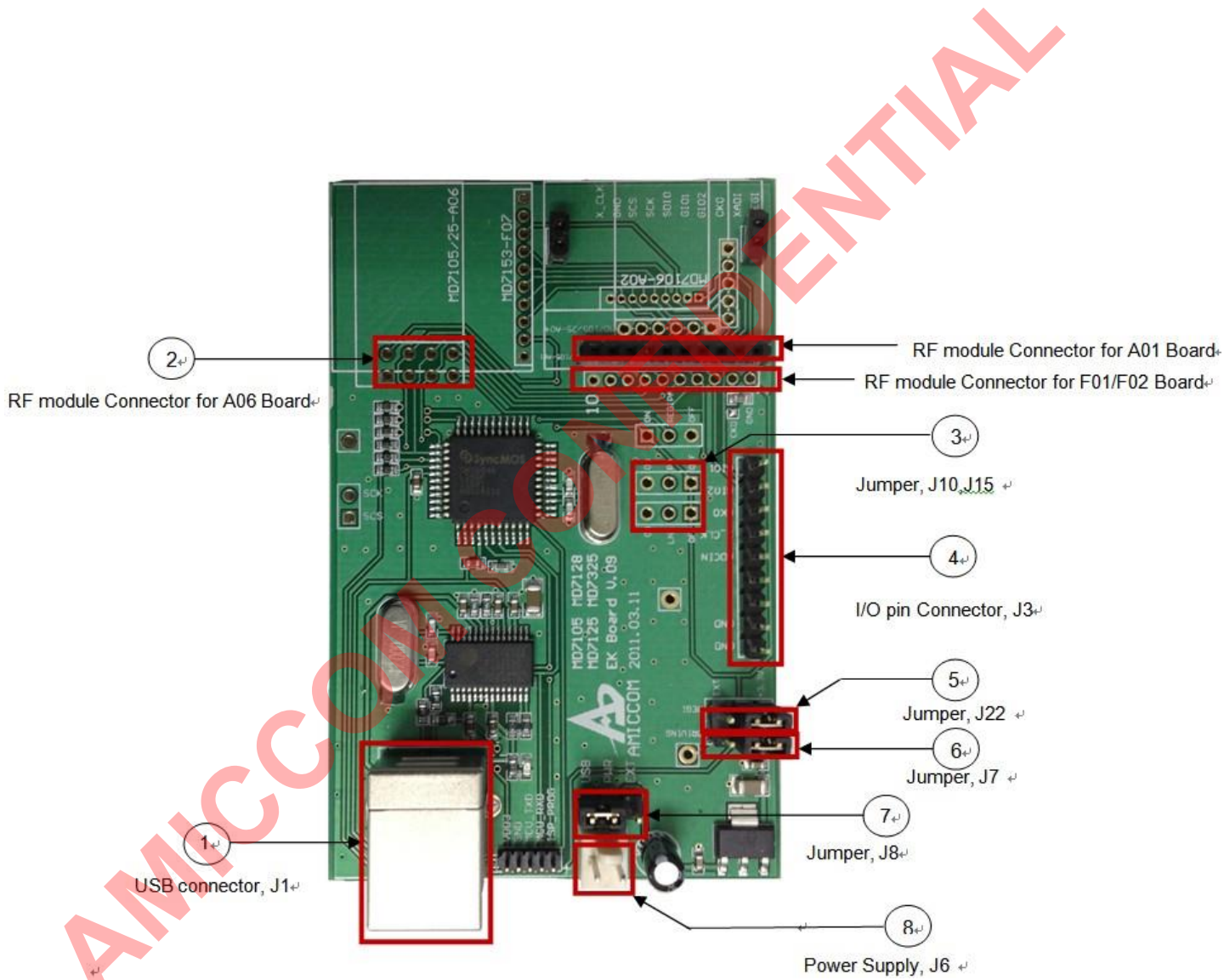
RF module Connector for A06 Board

RF module Connector for A01 Board

RF module Connector for F01/F02 Board

②

① USB connector, J1

③ Jumper, J10,J15

④ I/O pin Connector, J3

⑤ Jumper, J22

⑥ Jumper, J7

⑦ Jumper, J8

⑧ Power Supply, J6

Fig. 1 Topside of evaluation board

2.2. The pin definition of A01

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 F01/F02

Pin No.	Pin name	Comment
1	VREG_IN	Chip's Regulator input
2	GND	GND
3	GIO2	Multi pin IGPIO 2
4	GIO1	Multi pin IGPIO 1
5	SDIO	SPI data input/output
6	SCK	SPI clock
7	SCS	SPI chip select
8	TXSW	PA on/off pin
9	RXSW	LNA on/off pin
10	GND	GND

2.4. The pin definition of A06

Pin No.	Pin name	Comment
1	GND	GND
2	VREG_IN	Chip's Regulator input
3	-	NC
4	SCS	SPI chip select
5	SCK	SPI clock
6	SDIO	SPI data input/output
7	GIO1	Multi pin IGPIO 1
8	GIO2	Multi pin IGPIO 2

2.5. 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	GND	GND
6	-	NC
7	-	NC
8	GND	GND
9	GND	GND

2.6. PA/LNA setting
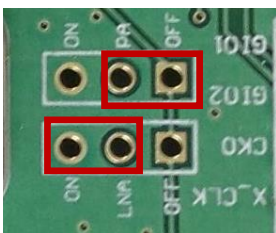
PA On / LNA Off Setting
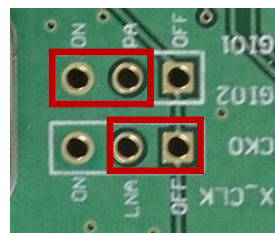
PA Off / LNA On setting

2.7. EV Board Schematic

EK7105 VER_09(USB)

2010.11.18
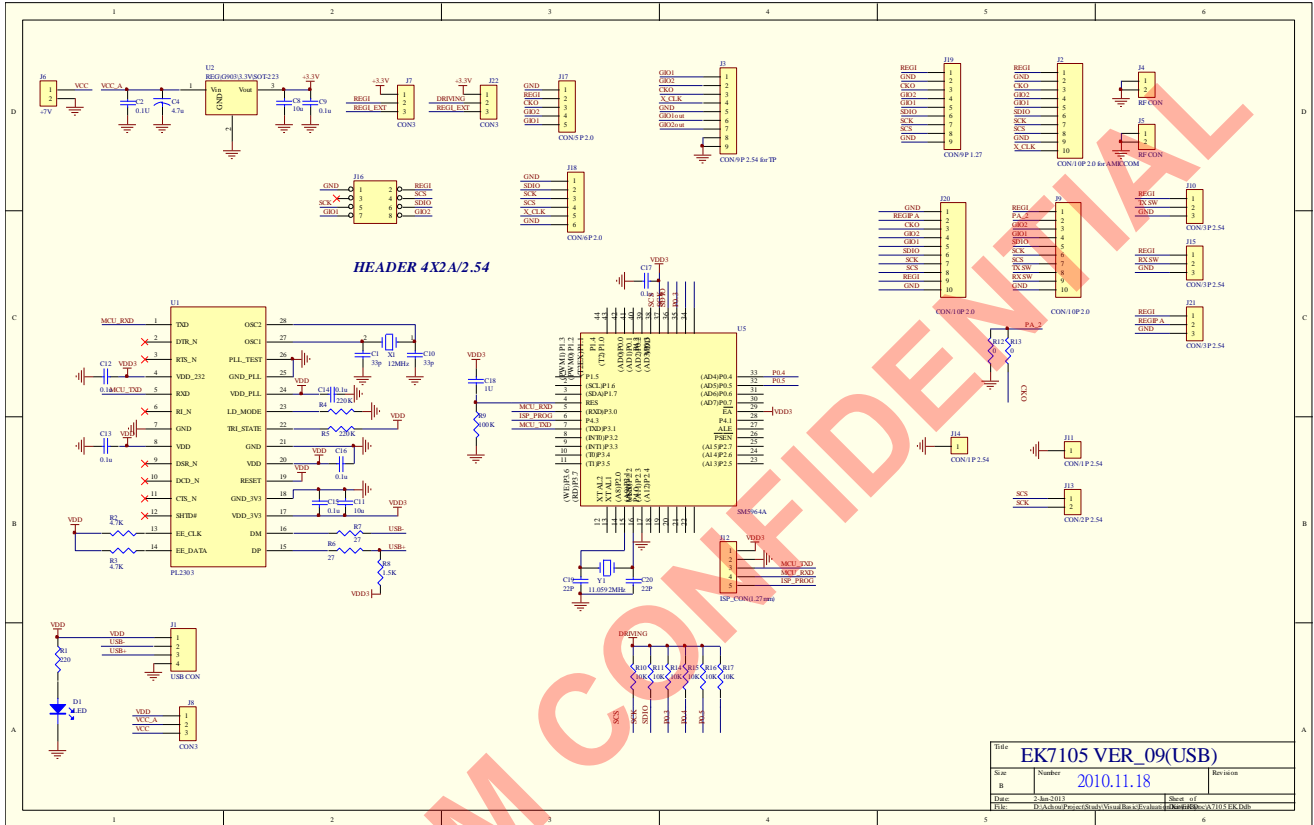
3. Software Introduction

The software is used to program the A7159 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/XP/7/8/10 operating system. There should be a USB port in the target PC for the device control.

To install EK7159-G1 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 EK7159-G1" item to setup program.

Notes: Administrator privilege is required for installing the EK7159-G1 on Windows 2000/XP/7/8/10.

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 EK7159-G1 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 EK7159-G1 from the list of programs that can be automatically removed.

5 Click the [Remove...] button to uninstall EK7159-G1.

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 EK7159-G1 software

The EK7159-G1 program Main Screen appears whenever you execute the program. The screen is shown below. Refer to the A7159 datasheet for detailed information on the register settings.
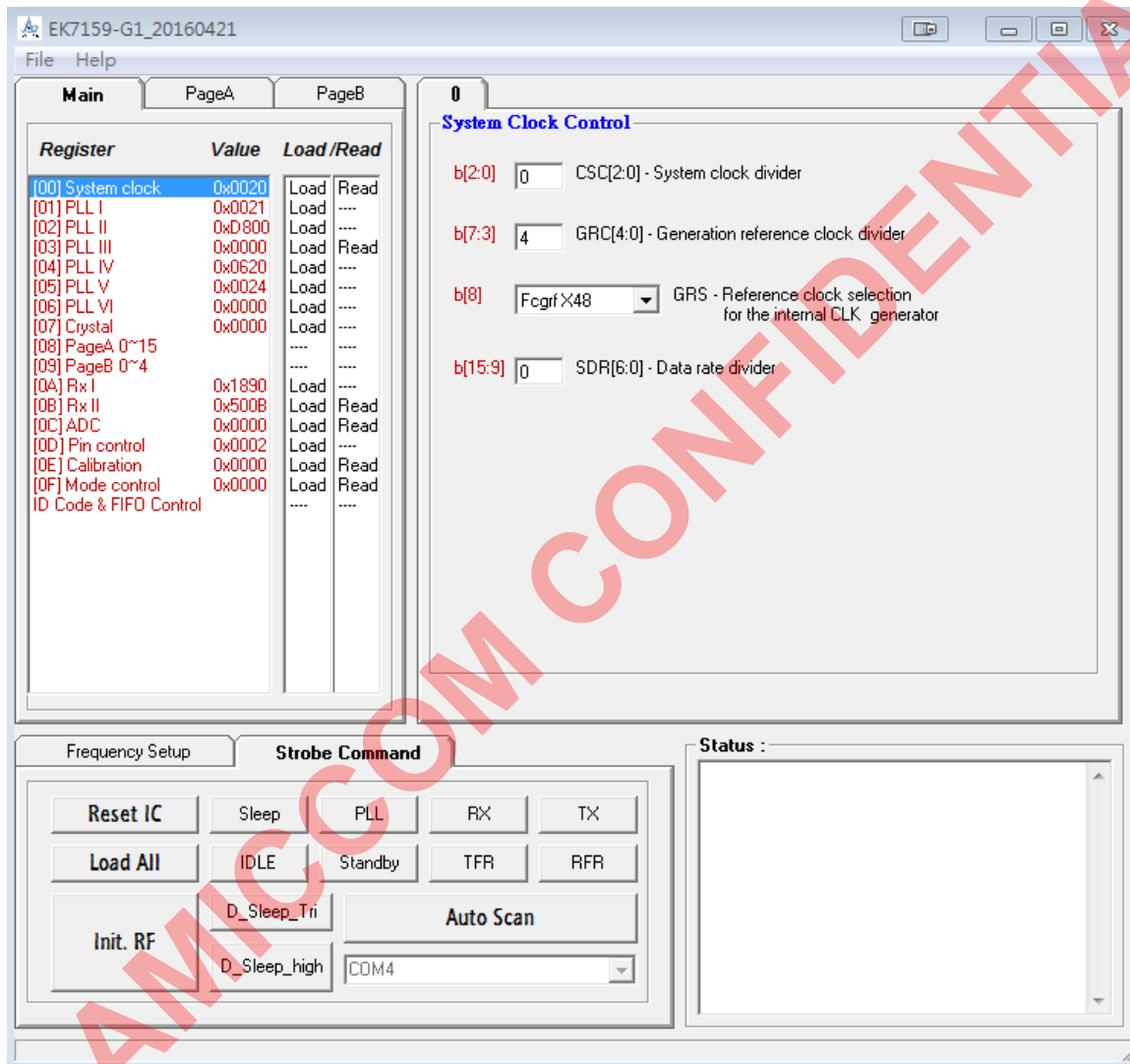

Fig. 2 EK7159-G1 program main screen

9

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.

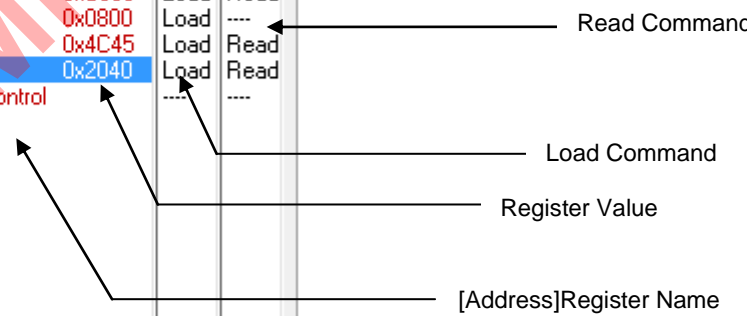**Exit:** Exits A7159 Configuration Utility program

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.
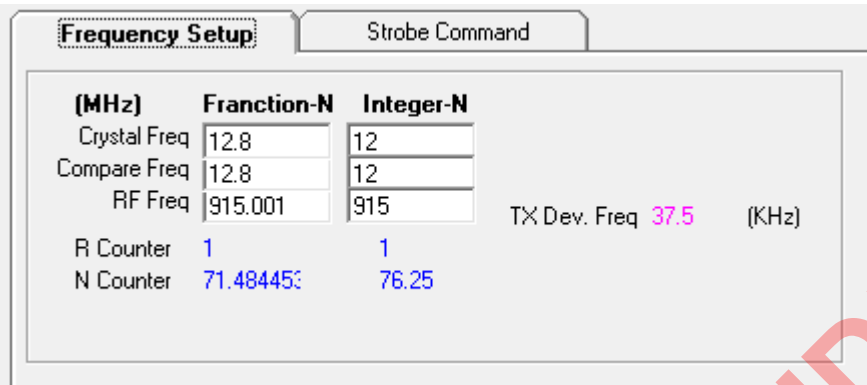
3.3.2. Registers Status

Read Command

Load Command

Register Value

[Address]Register Name

The registers tab shows the value that the EK7159-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 12.8 MHz.

Do not change the crystal frequency parameter when using this module unless the crystal is being replaced.

The RF frequency: The A7159 can operate in the 315/433/868/915 ISM band. Enter the desired RF frequency

The compare frequency: The compare frequency is depending on you need setting. Please refer A7159 datasheet to enter value.

3.3.4. Control Register Tab

Control Register Tab
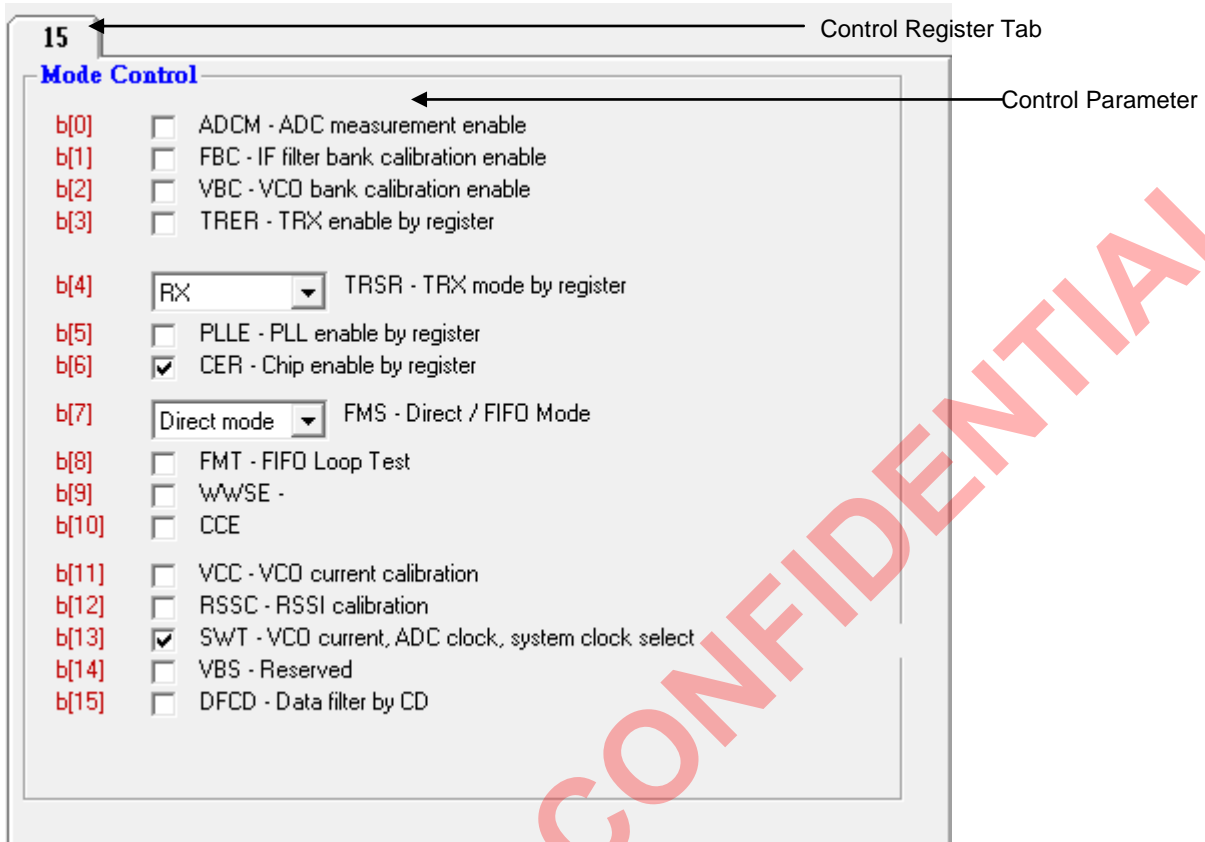
Control Parameter

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

Strobe Command Button

Reset IC Button

Load All Button

Init. RF Button

Comm Port Control
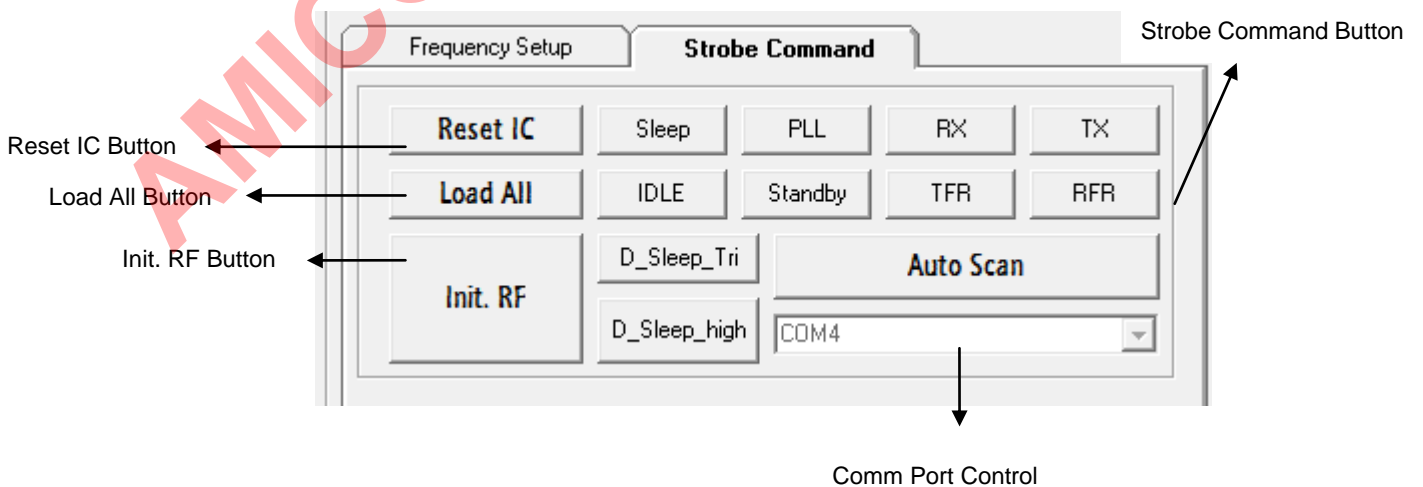
Pressing "Reset IC" button, the program can send out reset command.

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, Deep sleep.

Pressing "Init. RF" button, the program will do calibration procedure automatically.

3.3.6. Status Message Box
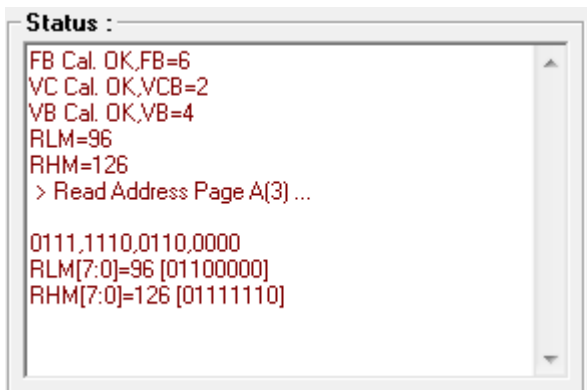
This is Info about Read back / write to register value information.

4. Plug in Configuration File

Installation procedures

Step 1: Connect USB cable between PC and EK7159 Board. Plug A7159 RF module on EK7159's socket.

Step 2: Enable A7159-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 A7159 datasheet for detailed information on the register settings.

AMICCOM Electronics Corporation