

# Control Bit Generator Software

Used for Digital Step Attenuators and Variable Gain Amplifiers

RFMD Multi-Market Products Group

**REVISION HISTORY**

<b>Version</b>	<b>Date</b>	<b>Description of change(s)</b>	<b>Author(s)</b>
0.1	05-Jul-11	Review andRevision for external posting	Eric Schonthal
0.0	19-Jun-11	Initial Draft	Seung Kyun Heo

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## 1. INTRODUCTION

The Control Bit Generator (CBG) is a program that has the ability to generate control bits that set and/or control the attenuation values of Digital Step Attenuators. The CBG currently handles up to 8 control bits that can be set through the use of a parallel, or USB port. A future version will control up to 16-bits for Dual Variable Gain Amplifier (VGA) products. This software is available to customers as a free download through the RFMD website at:

<https://www.rfmd.com/software/CBGS/bitsgenerator.zip>

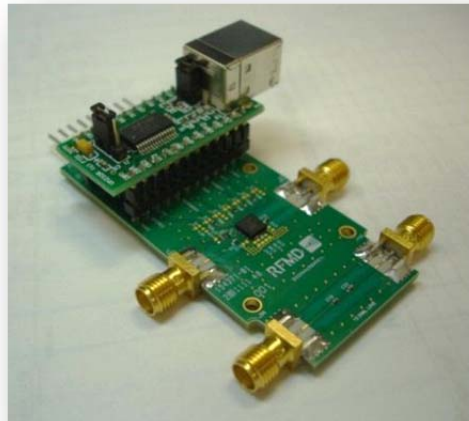


Figure 1. Control Bit Generator

## 2. CONFIGURATION REQUIREMENTS

The minimum requirements for operation of the CBG are below:

- Parallel Port or UM232R USB Device
- Control Cable or USB Cable
- Microsoft Windows Environment

### 3. CONFIGURATION VERIFICATION

To operate the CBG, the parallel port address must be verified and the parallel port pins configured. Then the driver for the USB device must be installed and the device verified.

#### 3.1 PARALLEL PORT ADDRESS VERIFICATION

To check the address of the Parallel Port:

1. Open Device Manager.

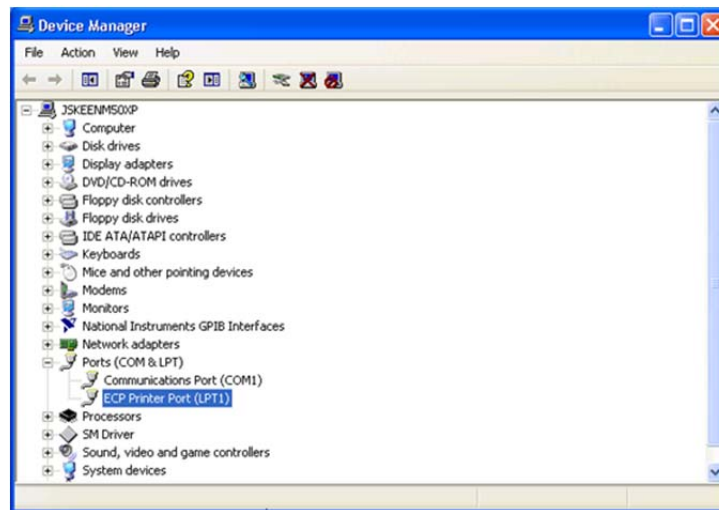


Figure 2. Device Manager

2. Right-click ECP Printer Port (LPT1).
3. Click on Properties to open the ECP Printer Port (LPT1) Properties.

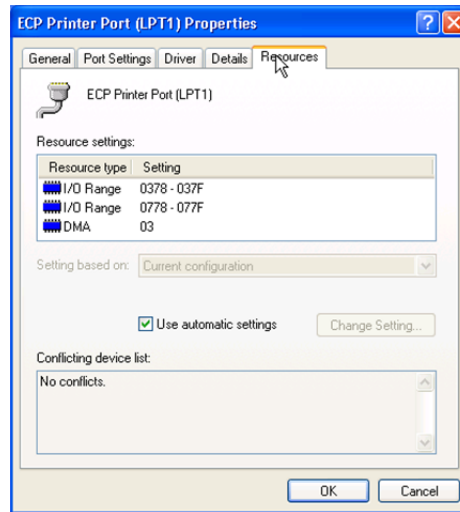


Figure 3. ECP Printer Port (LPT1) Properties

The address can be found in the Resource tab of ECP Printer Port (LPT1) Properties. To avoid future errors, the address of LPT1 should remain set to the default value of 378.

### 3.2 PARALLEL PORT PIN CONFIGURATION

During the test setup, the CBG will display the pin configuration of each device under test (DUT). Once pin configuration is verified, use cable to connect the PC parallel port to the DUT control port.

For example, if the DUT has a 7-bit parallel interface, pins D0 to D6 and GND pin of the parallel port should be connected to the control pins of the DUT.

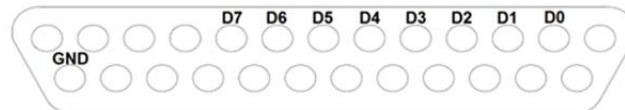


Figure 4. Parallel Port Pin Configuration

### 3.3 UM232R USB DRIVER INSTALL

The UM232R USB driver install should only need to be completed once for each PC. Installation instructions can be found in the driver installation guides listed at the link below:

<http://www.ftdichip.com/Support/Documents/InstallGuides.htm>

The latest driver files can be found at the below link:

<http://www.ftdichip.com/Drivers/VCP.htm>

### 3.4 UM232R USB DEVICE VERIFICATION

For verification:

1. Connect the UM232R USB Device
2. Open the Device Manager
3. Click the Ports (COM & LPT) arrow to see the port connections.

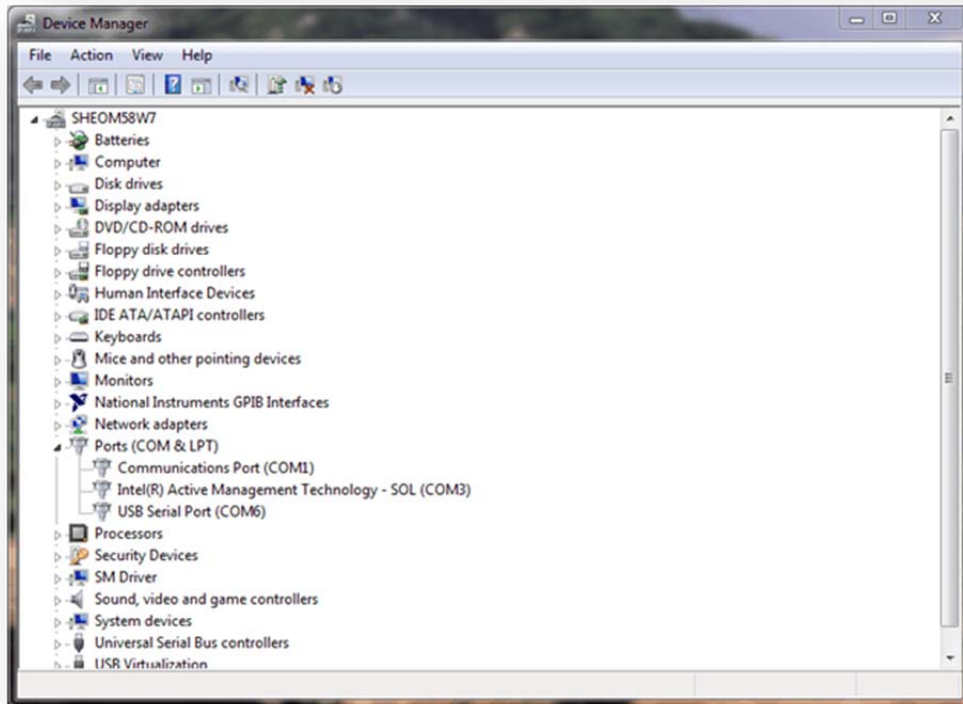


Figure 5. USB Serial Port Correctly Installed

## 4. CBG SOFTWARE INTERFACE

Using the CBG Interface requires installing the software, opening the executable file, and selecting the interface. Follow the procedural sequence specified in section 4.3 to avoid component damage.

### 4.1 SOFTWARE INSTALLATION

To install the CBG software:

1. Download the software zip (Bits\_Generator\_REVx.x.zip) file from the RFMD website <https://www.rfmd.com/software/CBGS/bitsgenerator.zip>
2. Extract the software zip file to any folder.  
**NOTE:** All files should be placed in the same folder.
3. Right-click Bits\_Generator\_REVx.x.exe and select Run as administrator to run the CBG.

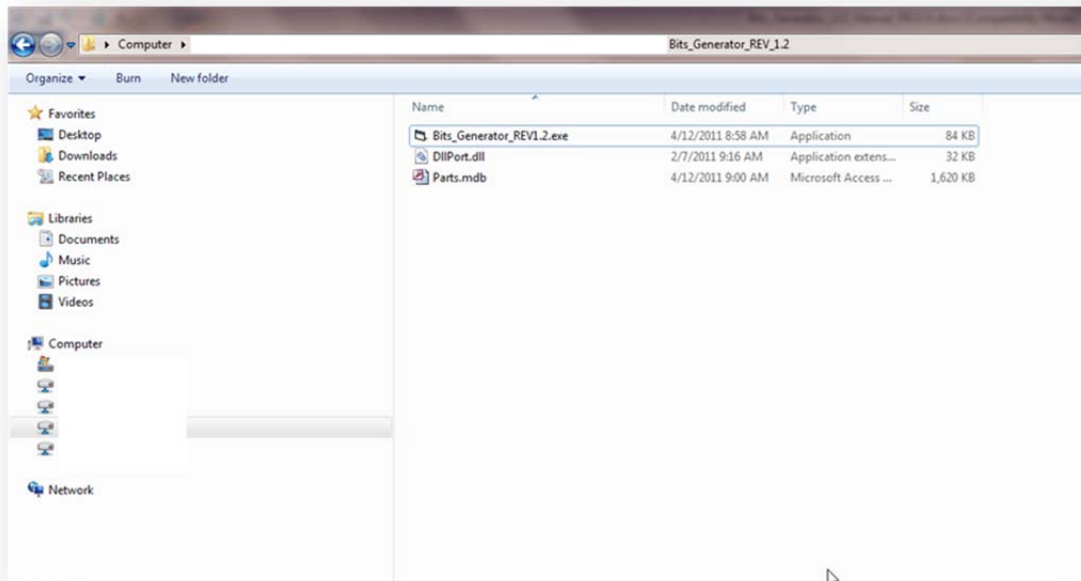


Figure 6. Control Bit Generator Software Installed Folder



## 4.2 CBG USER INTERFACE

After running the executable as an administrator, the user interface will display.

**NOTE:** To use the USB interface, the UM232R USB device must be connected to PC before running this software.

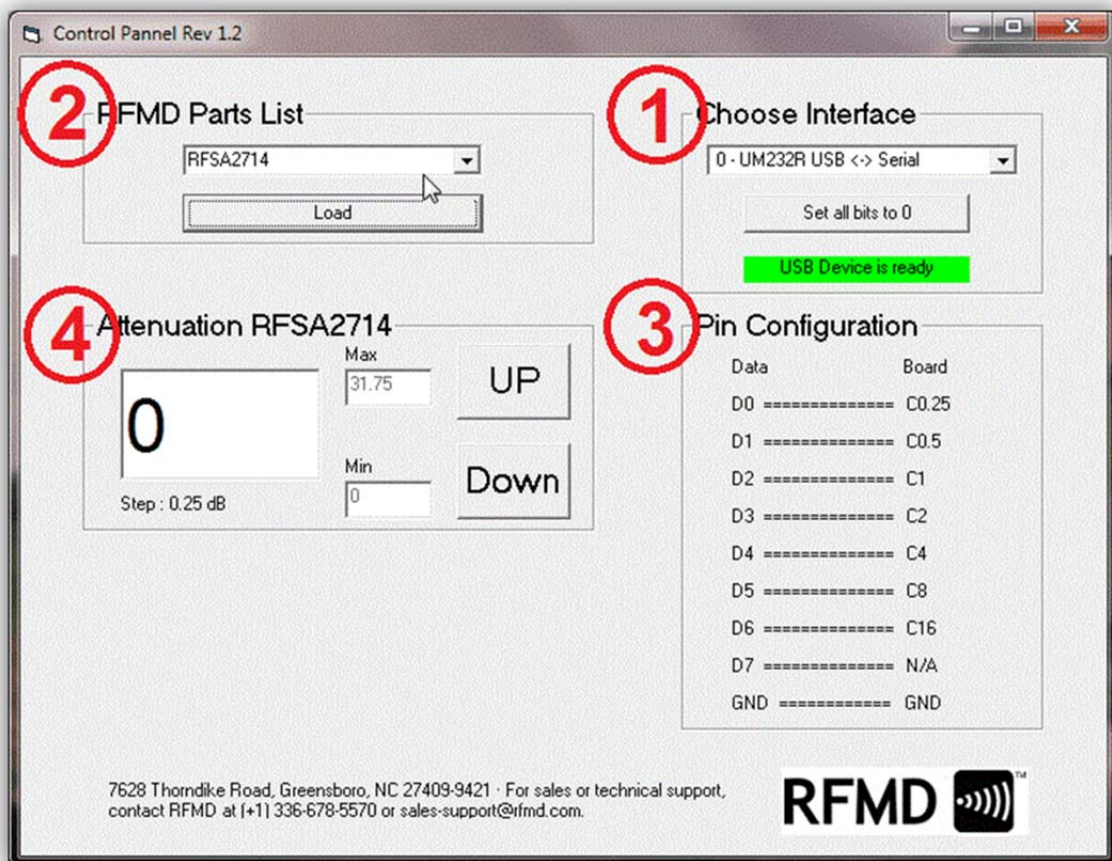


Figure 7. Control Bit Generator Software Interface

### 4.2.1 Choose Interface

CBG supports two data interfaces: USB and Parallel Port. Use the Choose Interface drop down menu (Number 1 in Figure 7) to choose the data interface.

**NOTE:** If the USB device is not available, only the parallel port will be shown in the drop down menu.

#### 4.2.2 RFMD Parts List

To load the interface configuration, update the Pin Configuration section of the CBG interface, and enable and update the Attenuation section:

1. Type or select the RFMD part number to be tested from the drop down menu.
2. Click the Load button.

#### 4.2.3 Pin Configuration

Refer to the Pin Configuration section (Number 3 in Figure 7) if a custom parallel port connection cable or pin connection verification is needed after step two in the previous section.

#### 4.2.4 Attenuation

Set the desired attenuation in the Attenuation section (Number 4 in Figure 7). The maximum, minimum, and step values of attenuation default to the specifications of the selected RFMD part.

Attenuation values can be adjusted, either by typing values and clicking Enter, or by using the Up or Down buttons to change the value.

### 4.3 PROCEDURAL SEQUENCE TO AVOID COMPONENT DAMAGE

To avoid component damage:

1. Plug the UM232R USB device into the PC and install the driver (once for each PC).
2. Run the CBG to set data pin to 0V.
3. Connect the UM232R USB device to an evaluation board.
4. Apply the supply voltage.
5. Load the part configuration.
6. Set the attenuation value.
7. Take the measurement.

## 5. INTERFACE OUTPUT CONTROL VOLTAGE

The output control voltage ratings of the each interface:

1. Parallel Port

High: 2.4V to 5V  
Low: 0V to 0.8V

2. UM232R UBS Device

IO output level can be set to 3.3V or 5V. Output level characteristics are:

5V  
High: 3.2V to 4.9V  
Low: 0.3V to 0.6V

To use IO output level 5V connect jumper J1 pins 2 and 3 together.

3.3V  
High: 2.2 V to 3.2V  
Low: 0.3 V to 0.5V

To use IO output level 3.3V, connect jumper J1 pins 1 and 2 together.

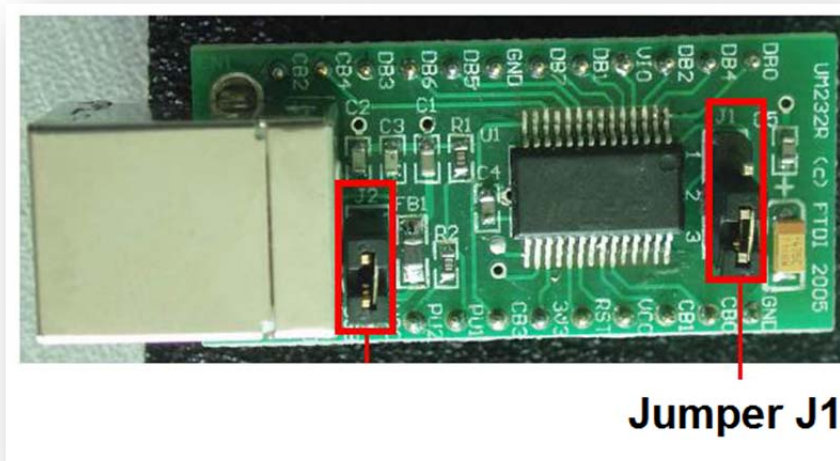


Figure 8. UM232R USB Device

## 6. REFERENCES

1. RFMD company web site (<http://www.rfmd.com>)
2. UM232R Data Sheet  
([http://www.ftdichip.com/Support/Documents/DataSheets/Modules/DS\\_UM232R.pdf](http://www.ftdichip.com/Support/Documents/DataSheets/Modules/DS_UM232R.pdf))