



GENE2

1 Quick introduction

The Elad RF Generator (GENE2) is a low-cost signal generators that allows you to generate an output level at a certain frequency in the range [52MHz - 6GHz].

There are two outputs:

- OUT 1 : High Power from 150MHz to 450Mhz
- OUT2 : Low Power from 52MHz to 6GHz

GENE2 get power from usb port and for its power supply characteristics needs a USB3 port for High Power (900mA). If only OUT2 is used then a USB2 is enough (500mA). The usb serial port is used also for a serial communication with User Interface software (UI) .

To turn on the device, connect the USB cable and press the button for 3 seconds until the green LED lights up. If the green LED flashes then an alarm condition is signaled (reverse power or maximum swr). To turn off the device, press the button again until the LED turns off.

When switched on, the device re-proposes the last configuration (this setting not depend from the connection with UI software).

There are two possible operating modes that can be set:

- **SINGLE mode** with a single RF frequency output
- **SEQUENCE mode** with a sequence of RF frequencies output in a continuous cycle

2 Table of features

Below is a summary table of the characteristics of the Elad RF generator.

Frequency Range	52MHz to 6GHz	150MHz to 450Mhz
Accuracy	typ. +/- 0.5dB max. +/- 1.0dB (52MHz-1GHz) +/- 1.5dB (1GHz-3GHz) +/- 2.0dB (3GHz-6GHz)	typ. +/- 0.25dB with ALC +/- 1.5dB whitout ALC
Max Level Out	+10dBm 52Mhz-1GHz 0dBm 1Ghz-3Ghz -5dBm 3Ghz-4.5Ghz -10dBm 4.5Ghz-6Ghz	+27dBm 150Mhz-380MHz +30dBm 380Ghz-410MHz +27dBm 410MHz-450MHz
Level Dinamyc Range	typ. uncalibrated 62dB Note (2) Calib. 55dB (52MHz-1GHz) 45dB (1GHz-3GHz) 40dB (3GHz-4.5GHz) 35dB (4.5GHz-6GHz)	typ. 52dB Calib. 42dB
ALC Range	-	+23-30dBm
Max Current Protect.	yes	yes
Max Swr Protect.	no	yes Max swr 3:1 Note(1)



Max Current Drain	400mA	1A
Min Working Voltage	4V	4.7V
External Reference	100Mhz 0dBm	100Mhz 0dBm
Weight	370g	
Size	79.5x41x132mm	

Note 1. At this time protection can in certain condition trigger at 2.5 SWR, next firmware releases will implement a small ramp so will trigger at the specified level on all frequency range.

Note 2. Uncalibrated means the theoretical output level control available. Calibration allow a precise level control output that limit the dinamyc range. Values are the worst case typical values will be defined if needed.

3 Software Interface

The User Interface software (UI) is used to open a serial communication with GENE2 and program GENE2 firmware. When device is connected to the PC a COM is displayed on Device Manager (Image 1).

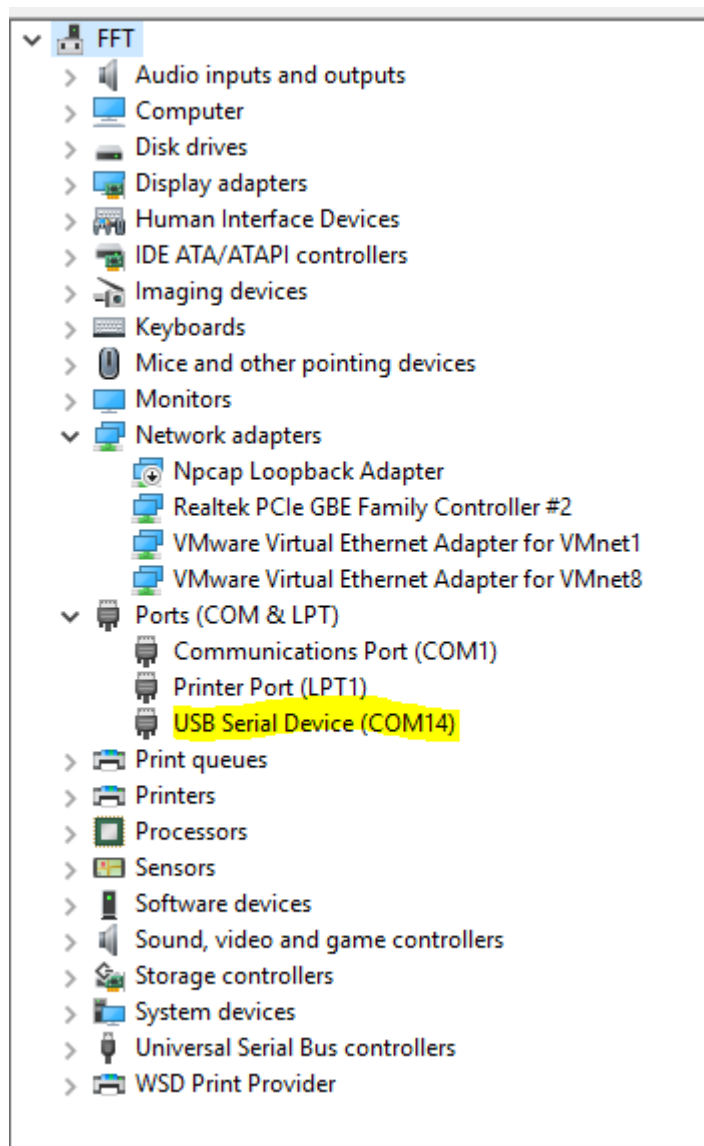




Image 1

The first setting to do for start communication is to set the COM on UI software and then press open button. The UI will start reading all the settings saved inside the firmware and then all information will be showed in the UI software tab (Image 2).

The user interface is divided into two parts vertical, the right side allow to set COM port and open communication, set UI language and display Serial Number/version firmware for the device connected.

The left side is divided into two parts horizontally, the upper part shows some commands sent and the errors during communication with the instrument, the lower part allows to configure the device in Single or Sequence mode.

When switch from Single to Sequence mode RF is put automatically OFF. Is necessary to activate manually when Single or Sequence is programmed.

When serial communication with the instrument is active, a red label on the right side of the UI indicates to wait before sending further commands.

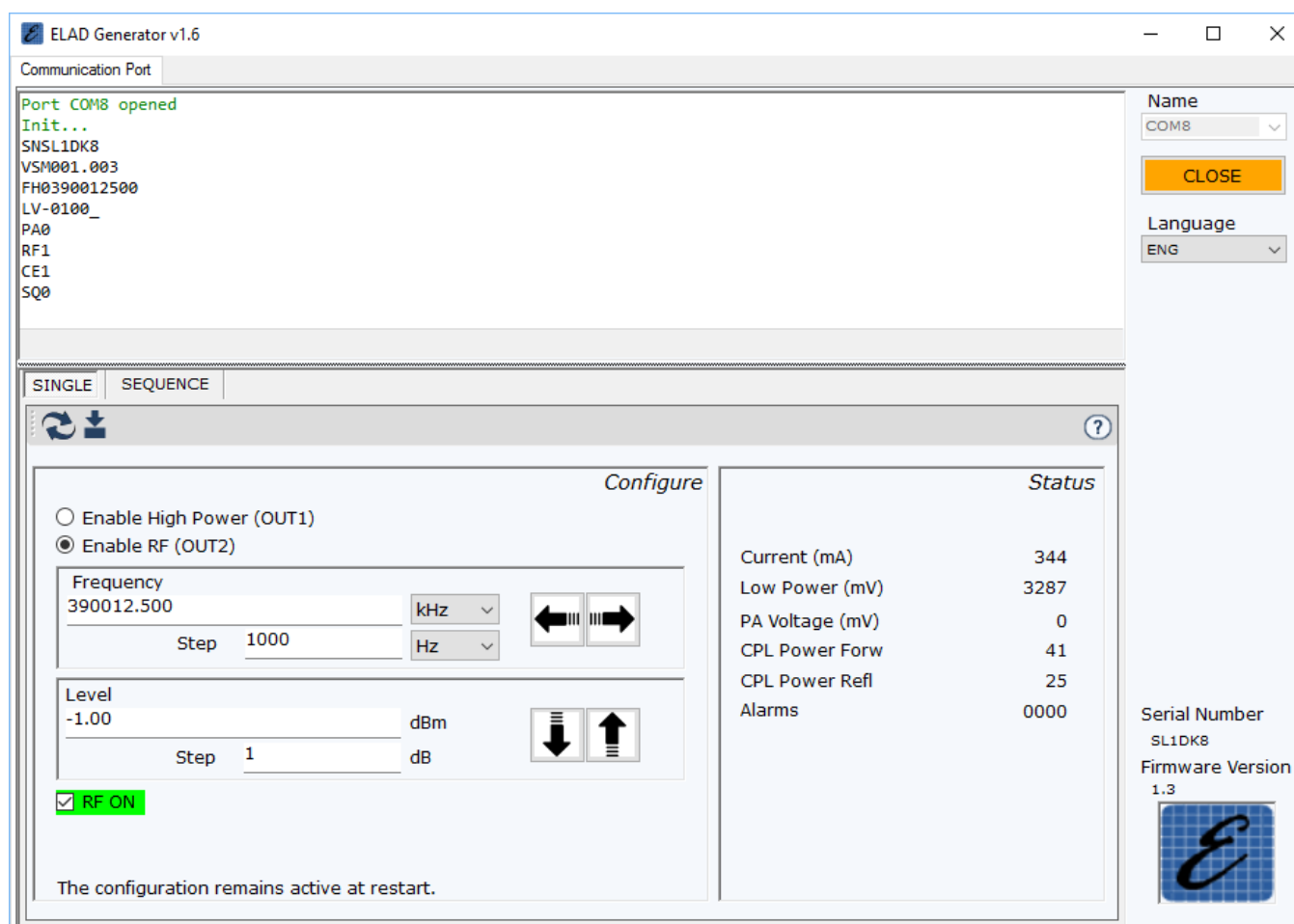


Image 2

Single Mode

Single mode generates a single continuous CW frequency that can be set on frequency, level and output. Important to activate and deactivate the output enable or disable the RF check. If a level is not set correctly the device limits itself.

The Single mode Tab (Image 3) have a command bar at the top with the basic commands : load settings and save settings. Below the command bar on the left side there is the 'Configure' tool for Single mode to set:

- Output (1 or 2)
- Frequency (Hz/kHz/MHz settable)



- Level (dBm)
- RF Activation (on /off)

General informations are displayed on the 'Status' box, on the right side. Here Alarms are displayed in red if present. The values displayed are refreshed every 2sec.

The screenshot shows the GENE2 configuration interface. The 'Configure' panel on the left has two tabs: 'SINGLE' and 'SEQUENCE'. The 'Configure' panel contains the following settings:

- ☒ Enable High Power (OUT1)
- ☐ Enable RF (OUT2)
- Frequency: 390012.500 kHz, Step: 1000 Hz
- Level: 30.00 dBm, Step: 1 dB
- ☒ RF ON

The 'Status' panel on the right displays the following information:

Status	
Current (mA)	292
Low Power (mV)	3290
PA Voltage (mV)	0
CPL Power Forw	13
CPL Power Refl	24
Alarms	0002
Reverse power!	

The configuration remains active at restart.

Image 3

Sequence Mode

Sequence mode allows you to set a sequence of RF outputs with frequency, level, output, transmission time and pause time. The sequence is displayed in a table that can be modified in all its parameters including the possible enabling of the output row. Is possible to set maximum 256 RF frequencies/rows (Image 4).

The screenshot shows the GENE2 configuration interface in 'SEQUENCE' mode. The 'Configure' panel on the left contains the following settings:

- Tot. Sec. 3,401/Loop
- ☐ RF ON
- Max Row: 30
- Set button

The 'Populate Sequence' panel on the right contains the following settings:

- Frequency (kHz): 390012500 Hz
- Step (Hz): 25000 Hz
- Start Idx: 1, Stop Idx: 1
- Level (dB): -10, Update Level: ☒
- Row Enable: ☐
- Enable High Power (OUT1): ☐
- Timer On(sec): 0,001
- Timer Off(sec): 0,001
- Populate button

The 'Sequence Not Uploaded' message is displayed in red. The table below shows the sequence of RF outputs:

ID	Row Enable	Frequency (kHz)	Level	Timer On(sec)	Timer Off(sec)	Enable High Power (OUT1)	Note
1	☒	390012500	-10,00	1,200	0,000	☐	
2	☒	390037500	-10,00	1,200	0,000	☐	
3	☐	390062500	-10,00	1,000	0,001	☐	
4	☐	390087500	-10,00	1,000	0,000	☐	
5	☐	390112500	-10,00	1,000	0,000	☐	
6	☐	390137500	-10,00	1,000	0,000	☐	
7	☐	390162500	-10,00	1,000	0,000	☐	
8	☐	390187500	-10,00	1,000	0,000	☐	
9	☐	390212500	-10,00	1,000	0,000	☐	
10	☐	390237500	-10,00	1,000	0,000	☐	
11	☐	390262500	-10,00	1,000	0,000	☐	



Image 4

The sequence tab have a command bar at the top that allows you to:

- load a table configuration on file
- save a table configuration on file
- load the table
- delete table and set default values
- transfer the table to the device

Between the command bar and the table there is the possibility to make some generic settings.

On the Left there is the RF enable check for the entire sequence, if RF is not active no signal will be activated.

Furthermore there is the possibility to set the maximum number of visible RF frequencies/rows (the undisplayed rows will be automatically disabled at the first data transfer).

On the Right the 'Populate Sequence' box that allows you to act quickly on the table settings without having to type each single row. The 'Populate' option does not transfer the data to the device, saving on GENE2 must still be done via the command bar -> configuration transfer.

The Timer On/Off for every row is displayed in sec.ms, minimum timer suggested is 10 ms. The internal time to set RF row is about 1 ms and all setted timer are approximate to 1 ms.

A red label "Sequence Not Uploaded" on the right show the information that the sequence table is not yet transferred to the device.