

UDC SLSM3-11250 Synth. Latch Config. Luis Quintero, Arecibo Observatory

1 Introduction

This document describes how to find out the latch configuration registers to run the LUFF SLSM3 Synthesizer to 11.25GHz frequency output.

2 Analog Devices GUI Config

Read the device ADF4106 config, four config latches, using the Analog Devices GUI. This procedure will setup the SLSM3 to 11.25GHz output frequency, and 10MHz reference[1]:

- Install and run the Analog Devices Integer N_5_0
- Select ADF4106 (LUFF SLSM3-11250) and USB Port, and OK. Ignore the warning message.
- Press on "RF VCO Output Frequency" and enter these values:
 - VCO Output Frequency (MHz): 5625.000000
 - PDF Reference Frequency (kHz): 5000.000000
 - If you press Load Now, you must see these values
 - * $P = 32$
 - * $B = 35$ or 0b100011
 - * $A = 5$ or 0b101
 - * $N = P * B + A = 1125$
 - * See also that $B > A$
- Make sure that REF IN Frequency is 10.000000MHz
- Make sure that RF Prescaler is 32/33
- Make sure that Fastlock is Disabled
- Configure the RF Charge Current Setting 1 and 2:
 - Change R Set to 7500 Ohms
 - Press Load Now
 - Select the Current Setting: 1.9583mA
- Select "CP Gain = 0 Current Setting 1"
- Select "RF PF Polarity Negative"
- Select "Charge Pump Active"
- Select "Counter Reset Disabled"
- Select "LDP=5"
- Press on "Muxout" and select "Digital Lock Detect"
- Make sure that "Anti Backlash Width" is 3.0ns
- Make sure that "Timeout Counter" is 03
- Make sure that in the "Powerdown Settings" the device is in "Normal Operation"

3 Latch Registers

Read the Latches of the previous configuration:

- Make sure that R Register (Reference Counter) shows:


```
Res LDP Res ABP 14bit_R_Count ADDR
000 0 00 00 00000000000010 00
```

- Make sure that N Register (N/A-B Counter) shows:


```
Res CPG 12bit_B_Count 6bit_A_Count ADDR
00 0 0000000100011 000101 01
```
- Make sure that Function (Initialization) Latch shows:


```
Pre PD2 CurS2 CurS1 TCC FML FLE CP3 Po1
10 0 100 100 0000 0 0 0 0
Mux PD1 CR ADDR
001 0 0 11
```

Convert binary values to hex:

- Reference Counter:


```
0000 0000 0000 0000 0000 1000 -> 0x 00 00 08
```
- N (A,B) Counter:


```
0000 0000 0010 0011 0001 0101 -> 0x 00 23 15
```
- Function Latch:


```
1001 0010 0000 0000 0001 0010 -> 0x 92 00 12
```
- Initialization Latch:


```
1001 0010 0000 0000 0001 0011 -> 0x 92 00 13
```

4 UDC Controller Commands

UDC Controller commands (device ID 01).

One by one latch config:

```
>> SYN01L000008
<< syn01ok
>> SYN01L002315
<< syn01ok
>> SYN01L920012
<< syn01ok
>> SYN01L920013
<< syn01ok
```

One command config (equivalent to one by one latch config):

```
>> SYN01S000008002315920012920013
<< syn01ok
```

Verify configuration and save it as default:

```
>> SYN01?
<< syn01s000008002315920012920013
>> SYN01W
<< syn01ok
>> SYN01R
<< syn01s000008002315920012920013i01
```

References

- [1] LUFF Research, *SLSM3-11250 - Additional Application Note*.