**SET LOW UBX**

**Inputs Needed:**

* Target Frequency
* Data Rate
* Integer N Mode
* Device Sub Function
* Destination

**Input Values:**

1. Target Frequency - Integer Value (Eg. 2000000000)

2. Data Rate - Integer Value (Eg. 200000000)

3. Integer N Mode - (True or False flag)

4. Device Sub Function -

* 0 for TX
* 1 for RX/Default

5. Destination -

* Radio\_Perif\_0
* Radio\_Perif\_1
* Global
* Radio\_0\_I2C
* Radio\_1\_I2C
* Global\_I2C
* Radio\_0\_SPI
* Radio\_1\_SPI
* Global\_SPI

6. **Constant Registers are needed in Input --> Not passed as Input but defined in the function.**

**Sub Modules:**

* TuneLO\_UBX

There are 2 seperate calls to the UBX depending on the Band Index.

For TX, Band 0 and for RX Band 0 and 1 calls TuneLO\_UBX with a pre set Target frequency.(For TX 2.1Ghz and for RX 2.38Ghz and 2.44GHz respectively) for Local Oscillator 1. Local Oscillator 2 is called with the difference of the Outcoming frequency of LO1 and the incoming coerced frequency.

For all other bands of TX and RX, TuneLO\_UBX is called with the target frequency that is fed as Input and there is no LO2 call.

The Inputs needed for the sub module remain the same and certain fields just vary based on the LO1 or LO2 call.

**Inputs Needed:**

1. Target frequency - Depending on device sub function and Band Index, the frequency is adjusted and given as Input. (Eg. 2000000000)

2. Data Rate - The Data rate is taken as Input from the SetLO\_UBX module. (Eg. 200000000)

3. Integer N Mode - The Value is True or False flag fed taken from Input of SetLO\_UBX module (Eg. True or False flag)

4. Device Sub Function - The value is taken from the Input of the SetLO\_UBX module. It is 0 for TX and 1 for RX/Default.

5. Destination - The value is taken from the Input of the SetLO\_UBX module.(See first page for more information)

6. LO Number - Calculated and set as "LO1" or "LO2" based on the band index.

7. Selected Band Index - Calculated and set based on the Input Target Frequency Frequencies (For TX - 0,1,2,3,4,5,Default. For RX - 0,1,2,3,4,5,6,7, Default)

* CreateMax2871Packets (Stand alone program for possible reusability)

**Inputs Needed:**

1. Constant Register 5

2. Constant Register 4

3. Constant Register 3

4. Constant Register 2

5. Constant Register 1

6. Constant Register 0

7. Device Sub Function - This value is always TX so 0 for UBX module.

8. Destination

CreateMax2871Packets module also internally calls DestinationEncoding(Stand alone program for possible reusability) module to Encode the Destination Value.

* construct\_radio\_register from FormatRadioCommand module to create the Input Stream for each packet seperately**.**
* Encode\_Process from EncodingStream to create 64 bit format for each packet of the Input Stream.

**Output:**

* LO Frequency
* Coerce Frequency
* Packets for LO1 (7 packets - 1 header packet, 6 constant register packets respectively)
* Packets for LO2 (7 packets - 1 header packet, 6 constant register packets respectively) **- Depending on the Band Index.**
* Each Packet will have 5 packets in the encoded stream(35 packets + 0 or 35 packets)
* Each packet is converted to its 64 bit stream(35 packets + 0 or 35 packets)

**Register data value construction:**

**All Values are in HEX representation**

**Packet 1 Information:**

|  |  |
| --- | --- |
| Sub System ID | Radio config 0 or Radio config 1 |
| Address | 24 |
| Data | If TX = [1 OR 60000000]  If RX = [2 OR 60000000] |

**All data values for the registers are calculated by constructing an array of index 32 and True or False values, these true and false values are converted to their binary equivalent(True = 1 and False = 0) and then converted to its decimal form.**

**Input to the binary form is specified in the tables.**

**Data is arranged in the table from MSB to LSB**

**Packet 2 Information: Register 5**

|  |  |
| --- | --- |
| Sub System ID | Radio config 0 or Radio config 1 |
| Address | 28 |
| Data | |  |  |  | | --- | --- | --- | | Bit# (MSB to LSB) | Register Name | Value | | 1 | C1 Register Value | True or False | | 2 | C2 Register Value | True or False | | 3 | C3 Register Value | True or False | | 4-6 | ADCM Register Value | Last 3 LS bits of the binary representation of the Value | | 7 | ADCS Register Value | True or False | | 8 |  | False | | 9 |  | False | | 10 |  | False | | 11 |  | False | | 12 |  | False | | 13 |  | False | | 14 |  | False | | 15 |  | False | | 16 |  | False | | 17 |  | False | | 18 |  | False | | 19 | MUX Register Value | True or False | | 20 |  | False | | 21 |  | False | | 22 |  | False | | 23-24 | LD Register Value | Last 2 LS bits of the binary representation of the Value | | 25 | F01 Register Value | True or False | | 26 | SDPLL Register Value | True or False | | 27 |  | False | | 28 |  | False | | 29 |  | False | | 30-31 | VAS\_DLY Register Value | Last 2 LS bits of the binary representation of the Value | | 32 |  | False | |

**Packet 3 Information: Register 4**

|  |  |
| --- | --- |
| Sub System ID | Radio config 0 or Radio config 1 |
| Address | 28 |
| Data | |  |  |  | | --- | --- | --- | | Bit# (MSB to LSB) | Register Name | Value | | 1 | C1 Register Value | True or False | | 2 | C2 Register Value | True or False | | 3 | C3 Register Value | True or False | | 4-5 | APWR Register Value | Last 2 LS bits of the binary representation of the Value | | 6 | RFA\_EN Register Value | True or False | | 7-8 | BPWR Register Value | Last 2 LS bits of the binary representation of the Value | | 9 | RFB\_EN Register | True or False | | 10 | BDIV Register Value | True or False | | 11 | MTLD Register Value | True or False | | 12 | SDVCO Register Value | True or False | | 13-20 | BS Register Value | Last 8 LS bits of the binary representation of the Value | | 21-23 | BS Register Value | Last 3 LS bits of the binary representation of the Value | | 24 | FB Register Value | True or False | | 25-26 | BS Register Value | LS Bit 9 and LS Bit 10's binary representation of the value | | 27 | SDREF Register Value | True or False | | 28 | SDDIV Register Value | True or False | | 29 | SDLDO Register Value | True or False | | 30 |  | True | | 31 |  | True | | 32 |  | False | |

**Packet 4 Information: Register 3**

|  |  |
| --- | --- |
| Sub System ID | Radio config 0 or Radio config 1 |
| Address | 28 |
| Data | |  |  |  | | --- | --- | --- | | Bit# (MSB to LSB) | Register Name | Value | | 1 | C1 Register Value | True or False | | 2 | C2 Register Value | True or False | | 3 | C3 Register Value | True or False | | 4-15 | CDIV Register Value | Last 12 LS bits of the binary representation of the Value | | 16-17 | CDM Register Value | Last 2 LS bits of the binary representation of the Value | | 18 | MUTEDEL Register Value | True or False | | 19 | CSM Register Value | True or False | | 20 |  | False | | 21 |  | False | | 22 |  | False | | 23 |  | False | | 24 |  | False | | 25 | VAS\_TEMP Register Value | True or False | | 26 | VAS\_SHDN Register Value | True or False | | 27-32 | VCO Register Value | Last 6 LS bits of the binary representation of the Value | |

**Packet 5 Information: Register 2**

|  |  |
| --- | --- |
| Sub System ID | Radio config 0 or Radio config 1 |
| Address | 28 |
| Data | |  |  |  | | --- | --- | --- | | Bit# (MSB to LSB) | Register Name | Value | | 1 | C1 Register Value | True or False | | 2 | C2 Register Value | True or False | | 3 | C3 Register Value | True or False | | 4 | RST Register Value | True or False | | 5 | TRI Register Value | True or False | | 6 | SHDN Register Value | True or False | | 7 | PDP Register Value | True or False | | 8 | LDP Register Value | True or False | | 9 | LDF Register Value | True or False | | 10-13 | CP Register Value | Last 4 LS bits of the binary representation of the Value | | 14 | REG4DB Register Value | True or False | | 15-24 | R Register Value | Last 10 LS bits of the binary representation of the Value | | 25 | RDIV2 Register Value | True or False | | 26 | DBR Register Value | True or False | | 27-29 | MUX Register Value | Last 3 LS bits of the binary representation of the Value | | 30-31 | SDN Register Value | Last 2 LS bits of the binary representation of the Value | | 32 | LDS Register Value | True or False | |

**Packet 6 Information: Register 1**

|  |  |
| --- | --- |
| Sub System ID | Radio config 0 or Radio config 1 |
| Address | 28 |
| Data | |  |  |  | | --- | --- | --- | | Bit# (MSB to LSB) | Register Name | Value | | 1 | C1 Register Value | True or False | | 2 | C2 Register Value | True or False | | 3 | C3 Register Value | True or False | | 4-15 | MOD Register Value | Last 12 LS bits of the binary representation of the Value | | 16-27 | PHASE Register Value | Last 12 LS bits of the binary representation of the Value | | 28-29 | CPT Register Value | Last 2 LS bits of the binary representation of the Value | | 30-31 | CPL Register Value | Last 2 LS bits of the binary representation of the Value | | 32 | CPOC Register Value | True or False | |

**Packet 7 Information: Register 0**

|  |  |
| --- | --- |
| Sub System ID | Radio config 0 or Radio config 1 |
| Address | 28 |
| Data | |  |  |  | | --- | --- | --- | | Bit# (MSB to LSB) | Register Name | Value | | 1 | C1 Register Value | True or False | | 2 | C2 Register Value | True or False | | 3 | C3 Register Value | True or False | | 4-15 | FRAC Register Value | Last 12 LS bits of the binary representation of the Value | | 16-31 | INT Register Value | Last 16 LS bits of the binary representation of the Value | | 32 | INT MODE Register Value | True or False | |