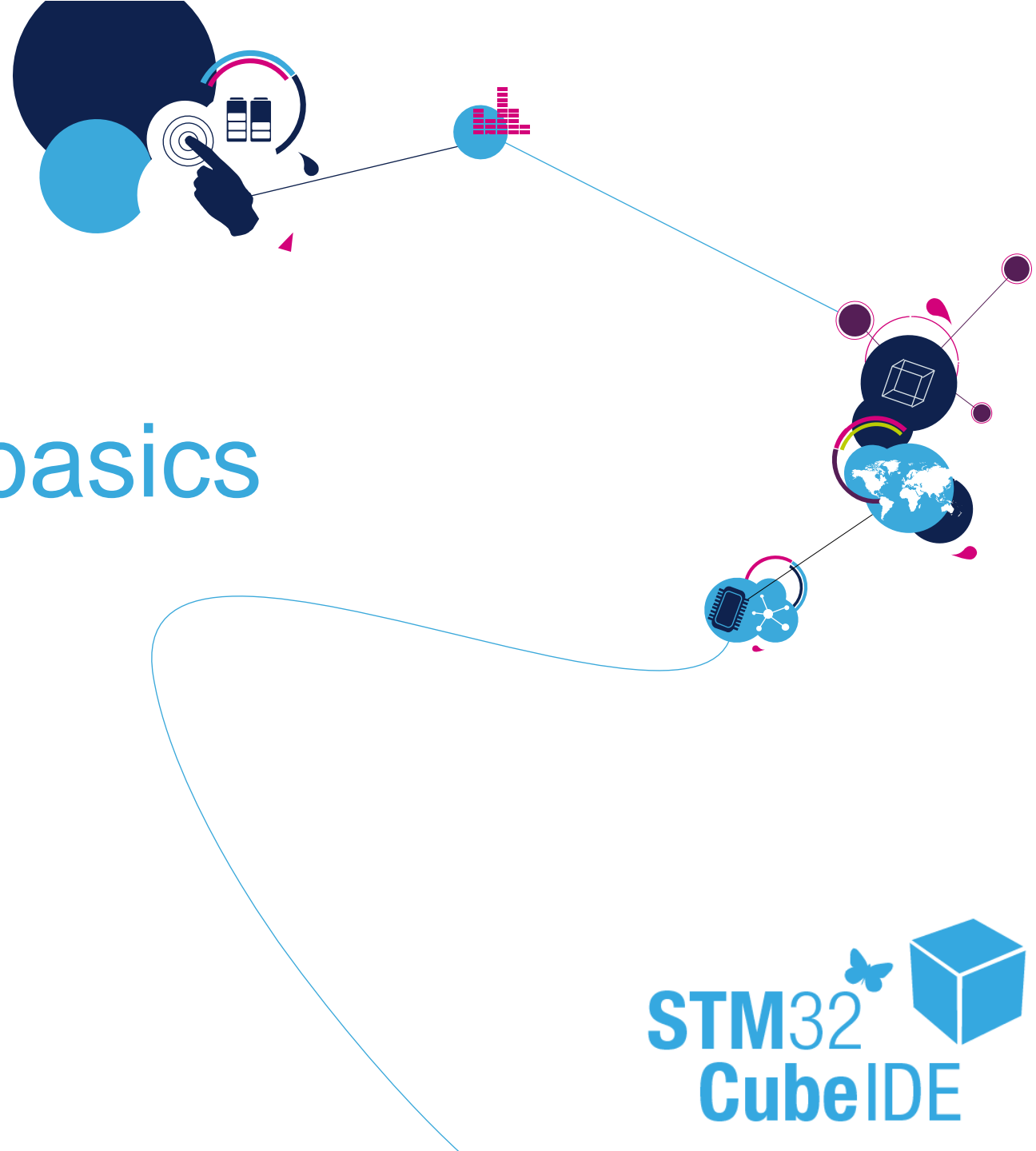
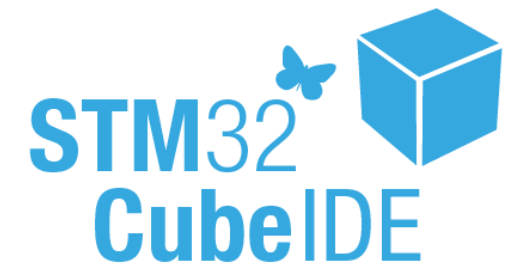
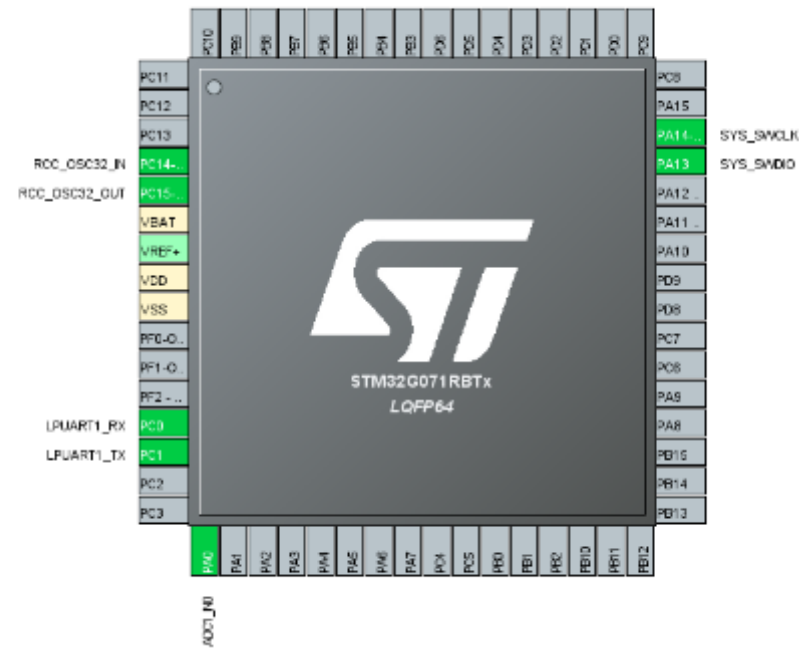


# STM32CubeIDE basics

Tools – Power Consumption Calculator

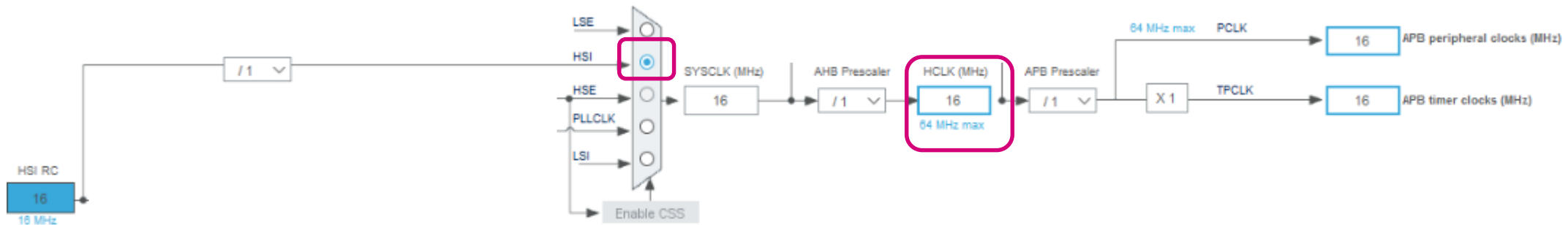
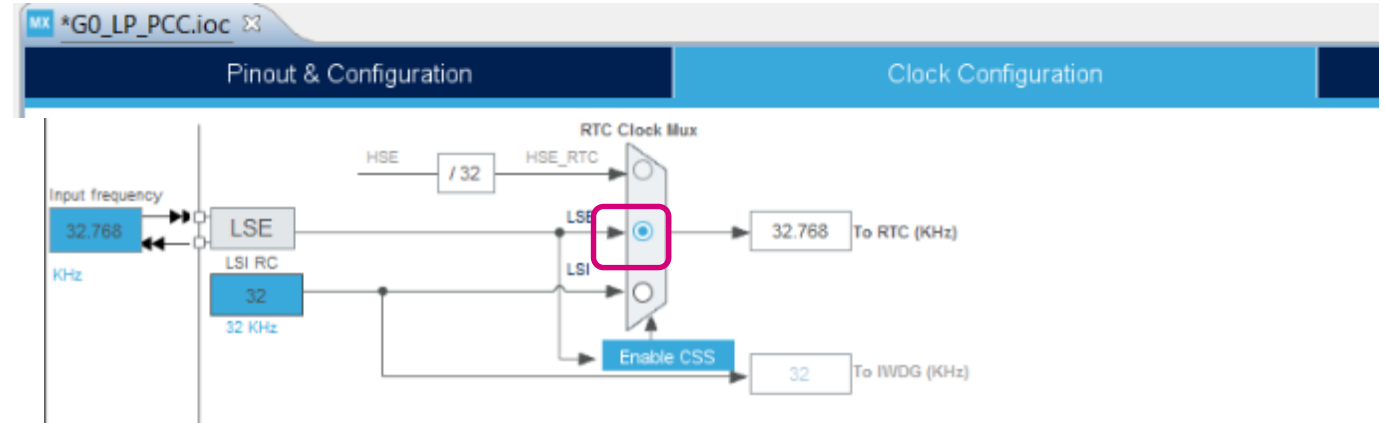


- 

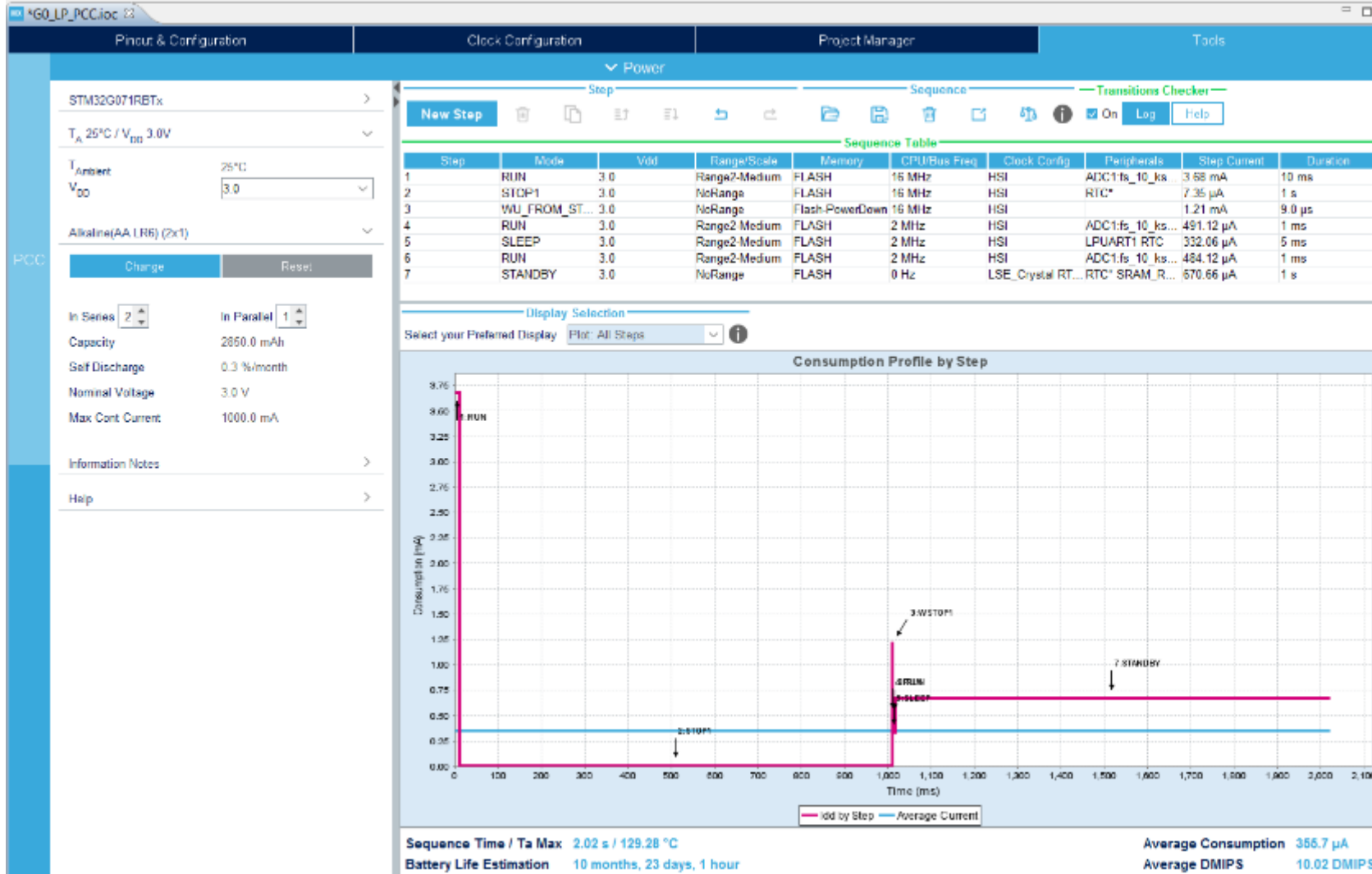


- Within clock configuration:

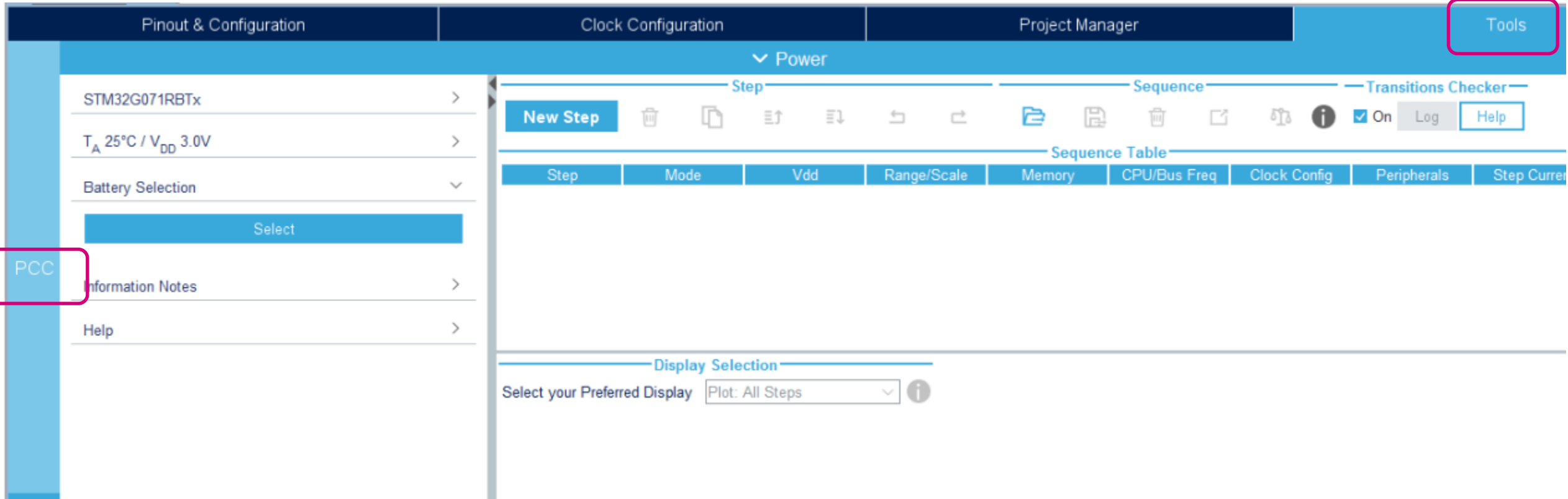
- Select LSE as RTC clock source
- Use HSI 16MHz as system clock
- Select SYSCLK as ADC clock
- Select LSE as LPUART1 clock source



- To run Power Consumption Calculator select Tools tab and then PCC



- To run Power Consumption Calculator select Tools tab and then PCC



The screenshot shows the STM32CubeIDE interface with the following components:

- Top Tabs:** Pinout & Configuration, Clock Configuration, Project Manager, and **Tools** (highlighted with a red box).
- Left Sidebar:** Contains project settings like STM32G071RBTx, T<sub>A</sub> 25°C / V<sub>DD</sub> 3.0V, Battery Selection, a **Select** button, Information Notes, and Help. The **PCC** option is highlighted with a red box.
- Main Area:**
  - Power** dropdown menu is expanded.
  - Step** section includes a **New Step** button and various icons for step management.
  - Sequence** section includes icons for sequence management.
  - Transitions Checker** section includes a checkbox for **On**, **Log**, and **Help** buttons.
  - Sequence Table** section shows a table with columns: Step, Mode, Vdd, Range/Scale, Memory, CPU/Bus Freq, Clock Config, Peripherals, and Step Current.
  - Display Selection** section includes a label "Select your Preferred Display" and a dropdown menu set to "Plot: All Steps".

- We can specify the battery type which would be used to power our application (it is possible to add own battery type, combine battery connections – in series and or in parallel)

### Pinout & Configuration

STM32G071RBTx

$T_A$  25°C /  $V_{DD}$  3.0V

#### Battery Selection

Select

#### Information Notes

#### Help

### STM32CubeMX PCC: Battery Database Management

Add User Battery Edit

#### Batteries Table

Used	Name	Capacity (mAh)	Self Discharge ...	Nominal Voltage...	Max Cont Curr...	Max Pulse Curr...	Databa
	Alkaline(AA LR6)	2850.0	0.3	1.5	1000.0	0.0	Default
	Alkaline(AAA L...	1250.0	0.3	1.5	400.0	0.0	Default
	Alkaline(C LR14)	8350.0	0.3	1.5	3000.0	0.0	Default
	Alkaline(D LR20)	20500.0	0.3	1.5	7500.0	0.0	Default
	Alkaline(9V)	625.0	0.3	9.0	200.0	0.0	Default
	Li-MnO2(CR12...	48.0	0.12	3.0	1.0	5.0	Default
	Li-MnO2(CR16...	125.0	0.12	3.0	1.5	10.0	Default
	Li-MnO2(CR20...	225.0	0.12	3.0	3.0	15.0	Default
	Li-MnO2(CR24...	285.0	0.12	3.0	4.0	20.0	Default
	Li-MnO2(CR24...	850.0	0.12	3.0	2.0	10.0	Default
	Li-SOCL2(AAA...	700.0	0.08	3.6	10.0	30.0	Default
	Li-SOCL2(A3400)	3400.0	0.08	3.6	100.0	200.0	Default
	Li-SOCL2(C9000)	9000.0	0.08	3.6	230.0	400.0	Default
	Li-SOCL2(D190...	19000.0	0.08	3.6	230.0	500.0	Default
	Li-SOCL2(DD3...	36000.0	0.08	3.6	450.0	1000.0	Default
	Ni-Cd(AA1100)	1100.0	20.0	1.2	220.0	0.0	Default
	Ni-Cd(A1700)	1700.0	20.0	1.2	340.0	0.0	Default
	Ni-Cd(C3000)	3000.0	20.0	1.2	600.0	0.0	Default
	Ni-Cd(D4400)	4400.0	20.0	1.2	880.0	0.0	Default
	Ni-Cd(F7000)	7000.0	20.0	1.2	1400.0	0.0	Default

\* The Battery selection is optional

OK Cancel

### G0\_PWM.ioc

#### Pinout & Configuration

STM32G071RBTx

$T_A$  25°C /  $V_{DD}$  3.0V

Alkaline(AA LR6) (2x1)

Change Reset

In Series 2 In Parallel 1

Capacity 2850.0 mAh

Self Discharge 0.3 %/month

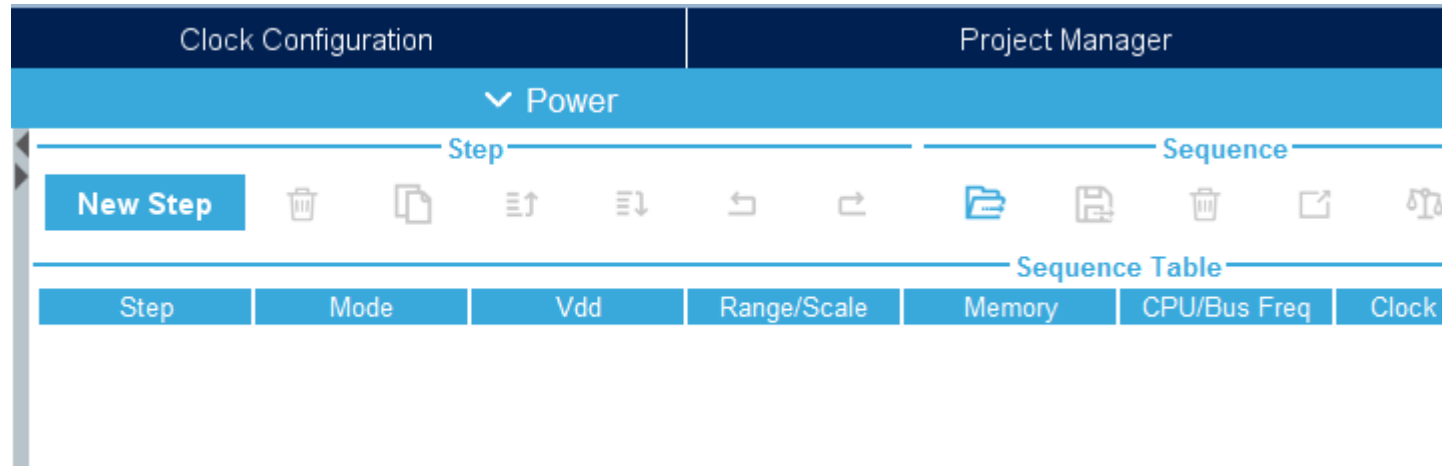
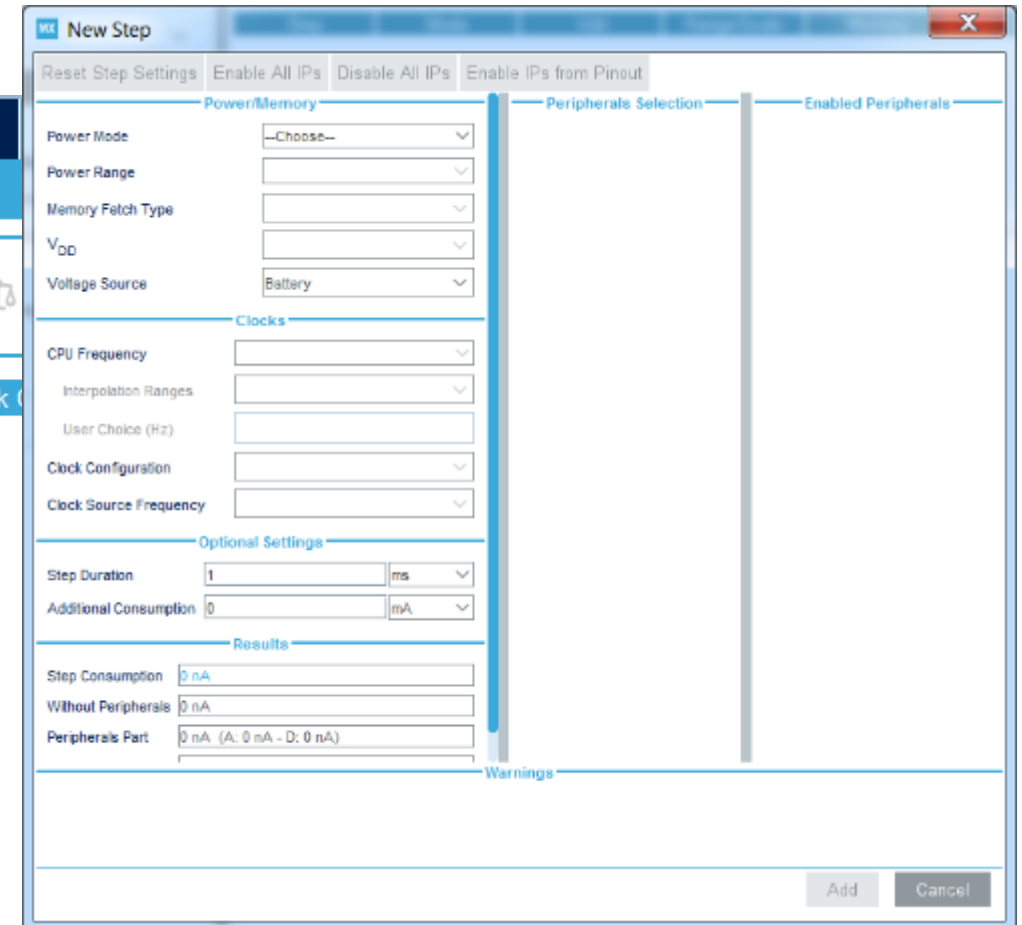
Nominal Voltage 3.0 V

Max Cont Current 1000.0 mA

#### Information Notes

#### Help

- Click on “New Step” to add a new working phase within application work flow. Usually the first one is RUN mode as it is necessary to configure all of the peripherals after power on

The 'New Step' dialog box is shown, allowing configuration of a new step in the application workflow. It includes tabs for 'Reset Step Settings', 'Enable All IPs', 'Disable All IPs', and 'Enable IPs from Pinout'. The 'Power/Memory' section includes fields for Power Mode, Power Range, Memory Fetch Type, V<sub>DD</sub>, and Voltage Source. The 'Clocks' section includes fields for CPU Frequency, Interpolation Ranges, User Choice (Hz), Clock Configuration, and Clock Source Frequency. The 'Optional Settings' section includes fields for Step Duration and Additional Consumption. The 'Results' section shows calculated values for Step Consumption, Without Peripherals, and Peripherals Part. A 'Warnings' section is at the bottom.

**Power/Memory**

- Power Mode: --Choose--
- Power Range:
- Memory Fetch Type:
- V<sub>DD</sub>:
- Voltage Source: Battery

**Clocks**

- CPU Frequency:
- Interpolation Ranges:
- User Choice (Hz):
- Clock Configuration:
- Clock Source Frequency:

**Optional Settings**

- Step Duration: 1 ms
- Additional Consumption: 0 mA

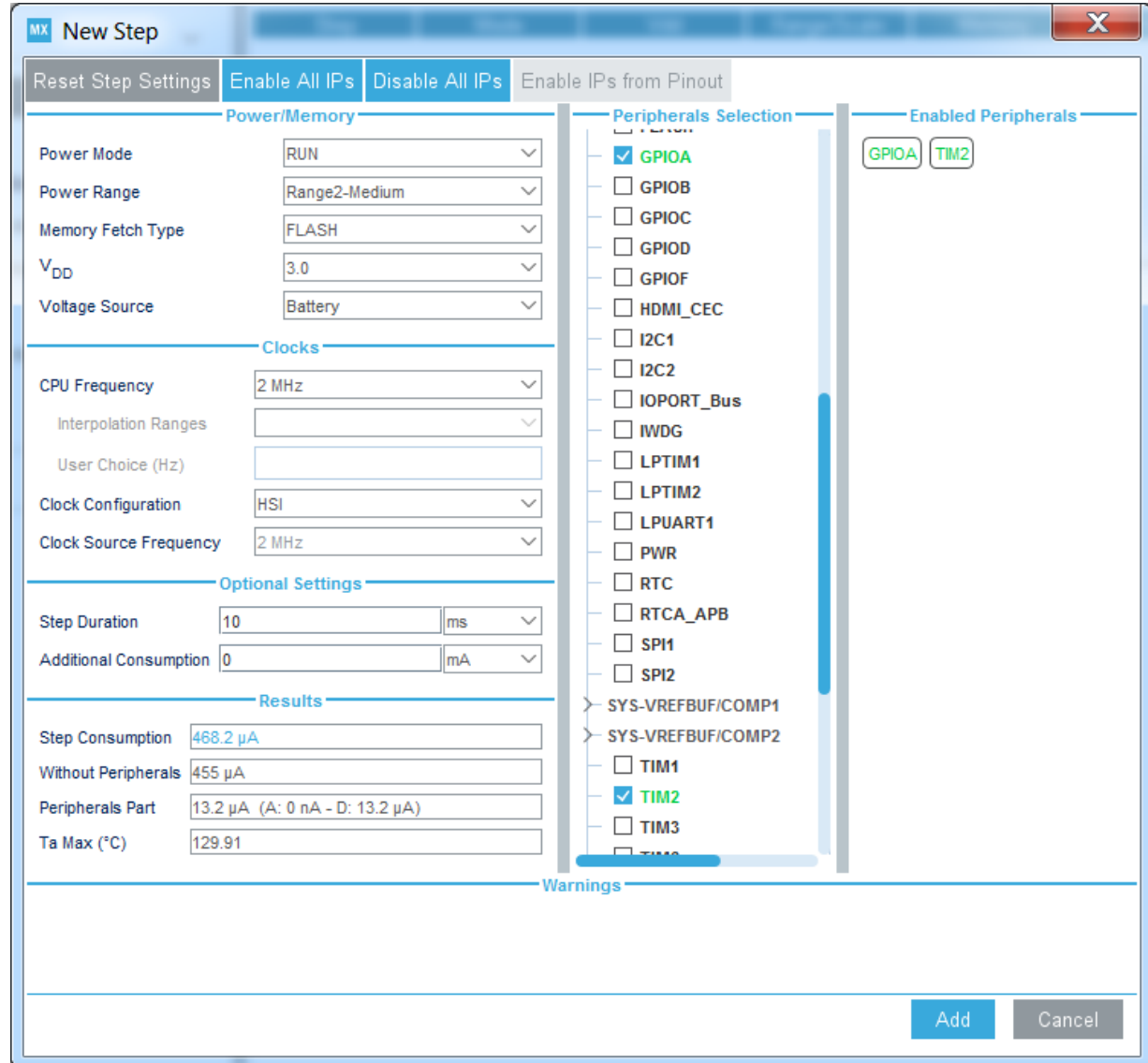
**Results**

- Step Consumption: 0 nA
- Without Peripherals: 0 nA
- Peripherals Part: 0 nA (A: 0 nA - D: 0 nA)

**Warnings**

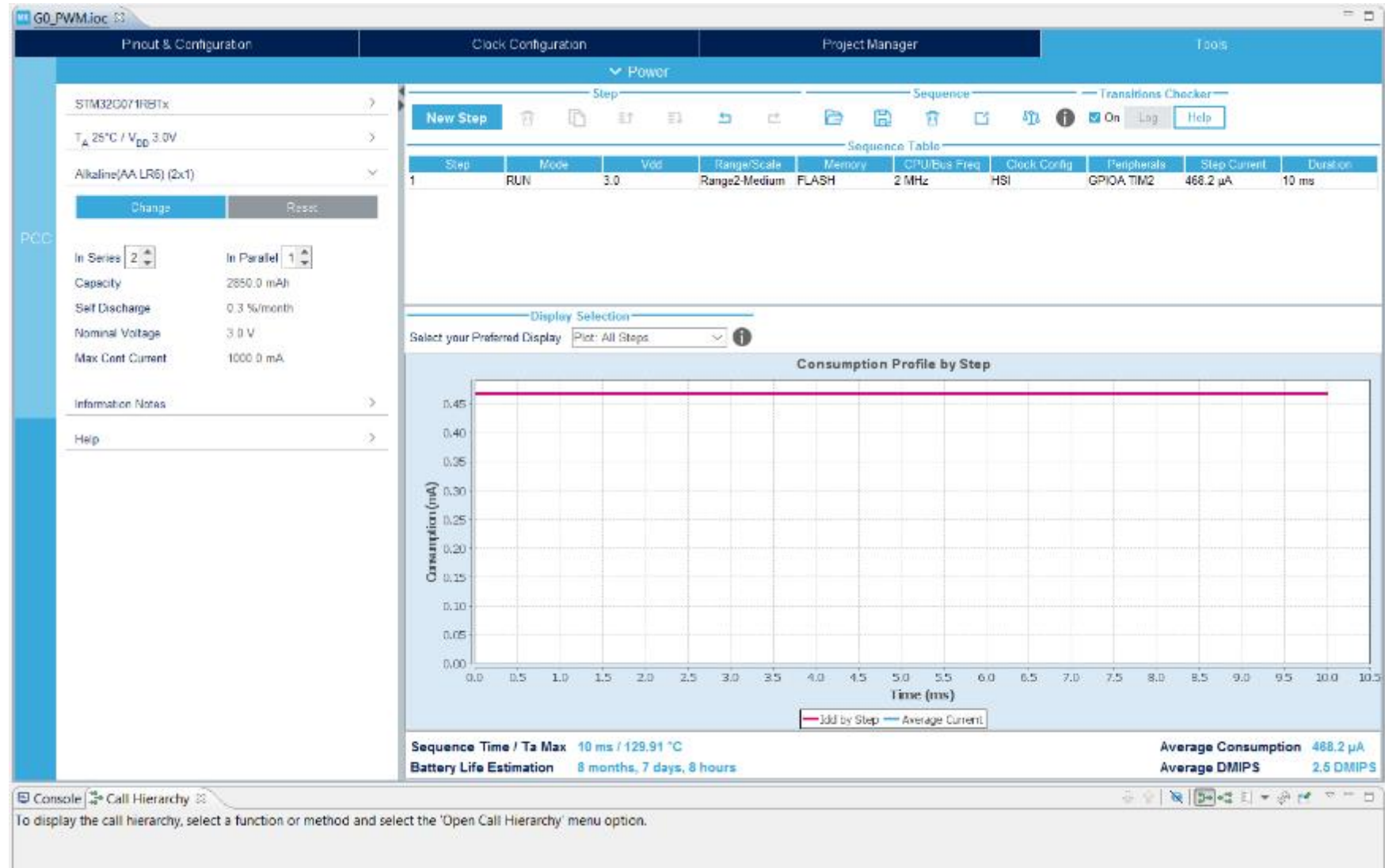
Buttons: Add, Cancel

- Within selected mode it is necessary to specify:
  - power and clock options
  - active peripherals (we can enable/disable all or do a selection based on already done configuration within pinout tab)
  - An additional current consumption (outside MCU – if any)
  - Step duration

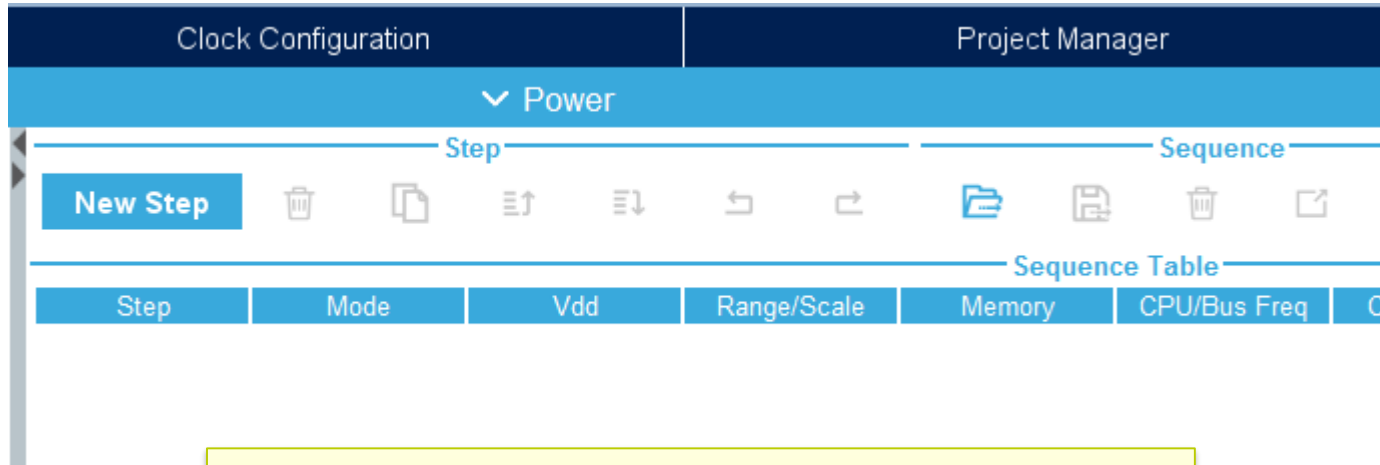




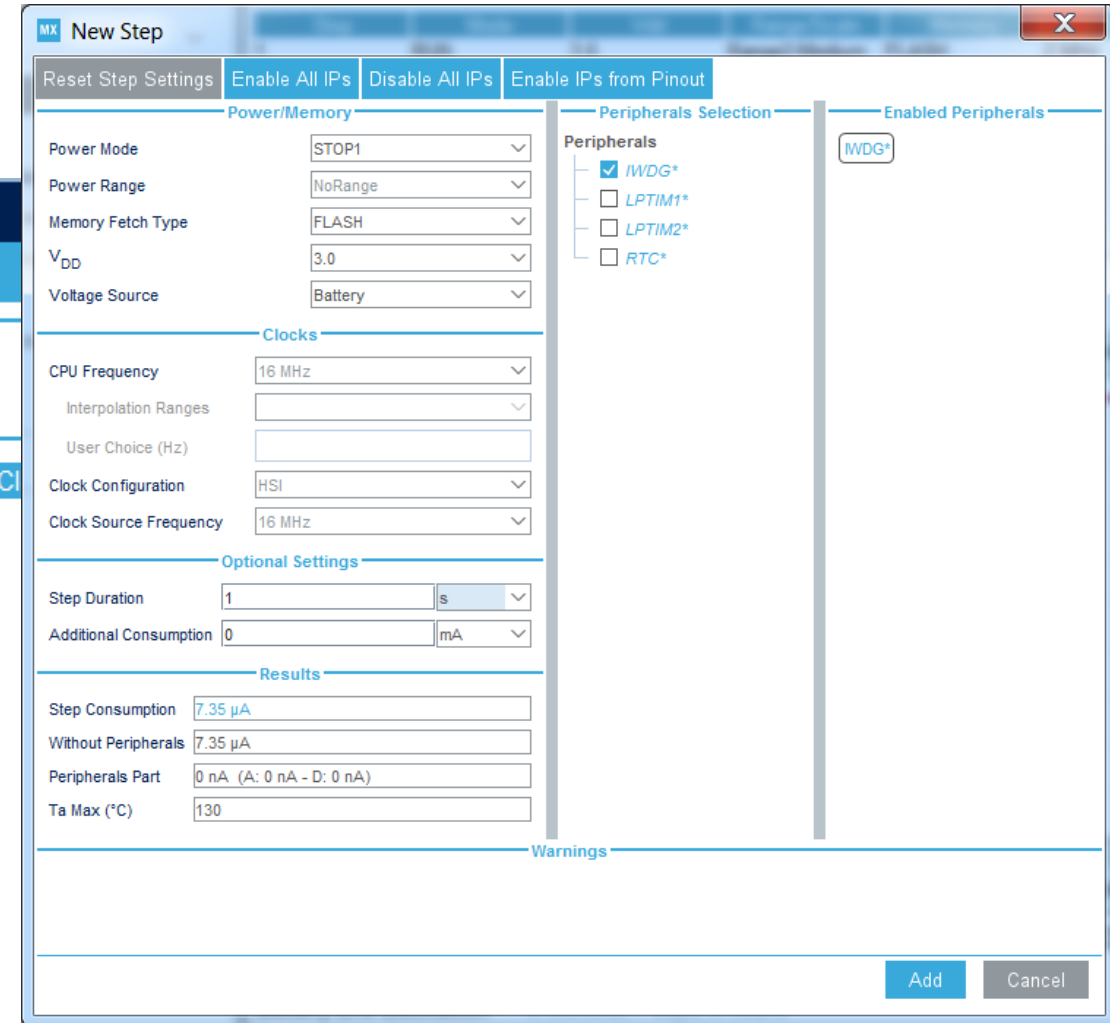
- After adding a new step, there is an automatic update of the consumption profile with: graphical view by step and total, sequence time, battery life estimation, average and step current consumption
- Now we can add a new step



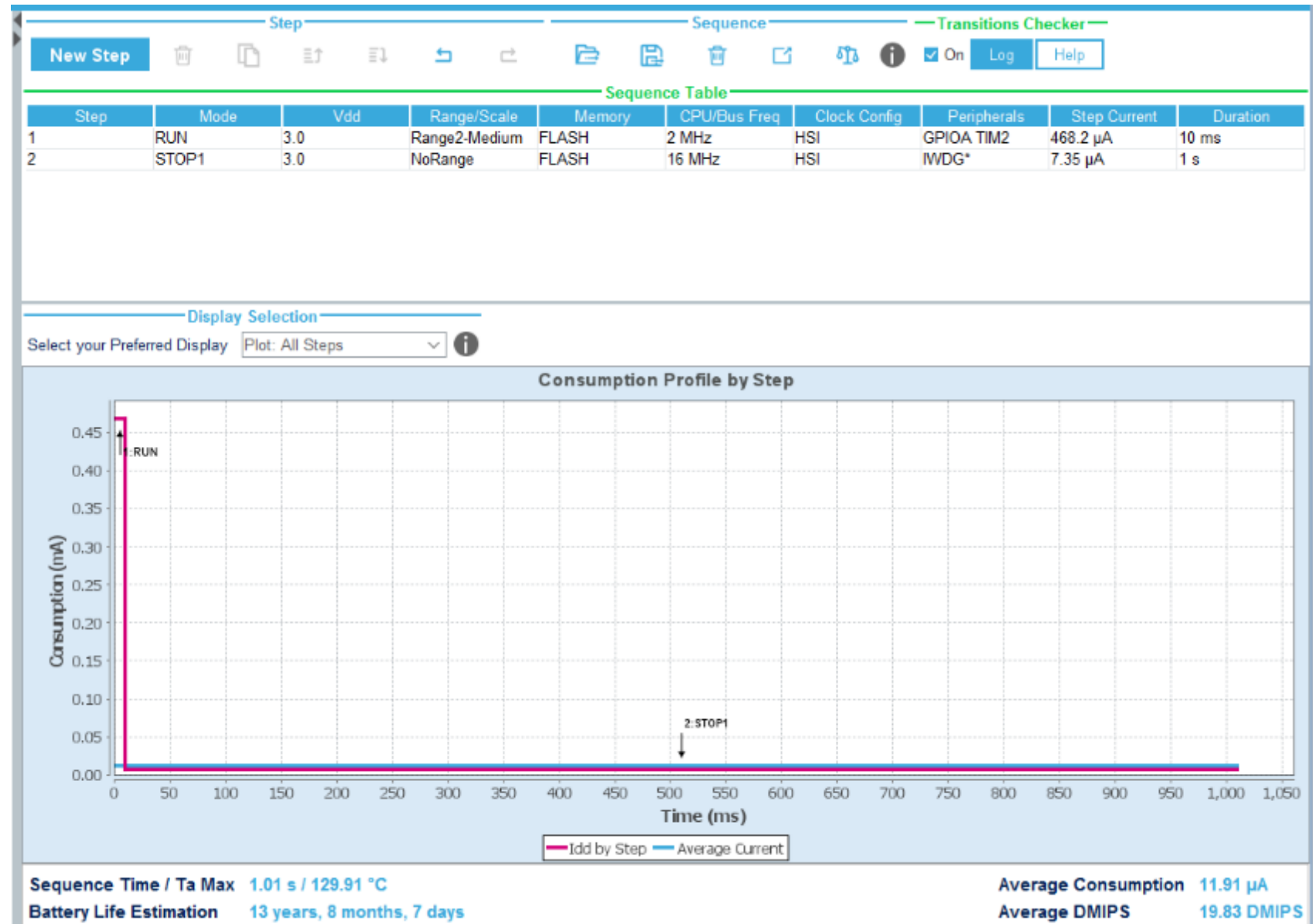
- Click on “New Step” to add a new working step. This time it would be low power mode (STOP1)



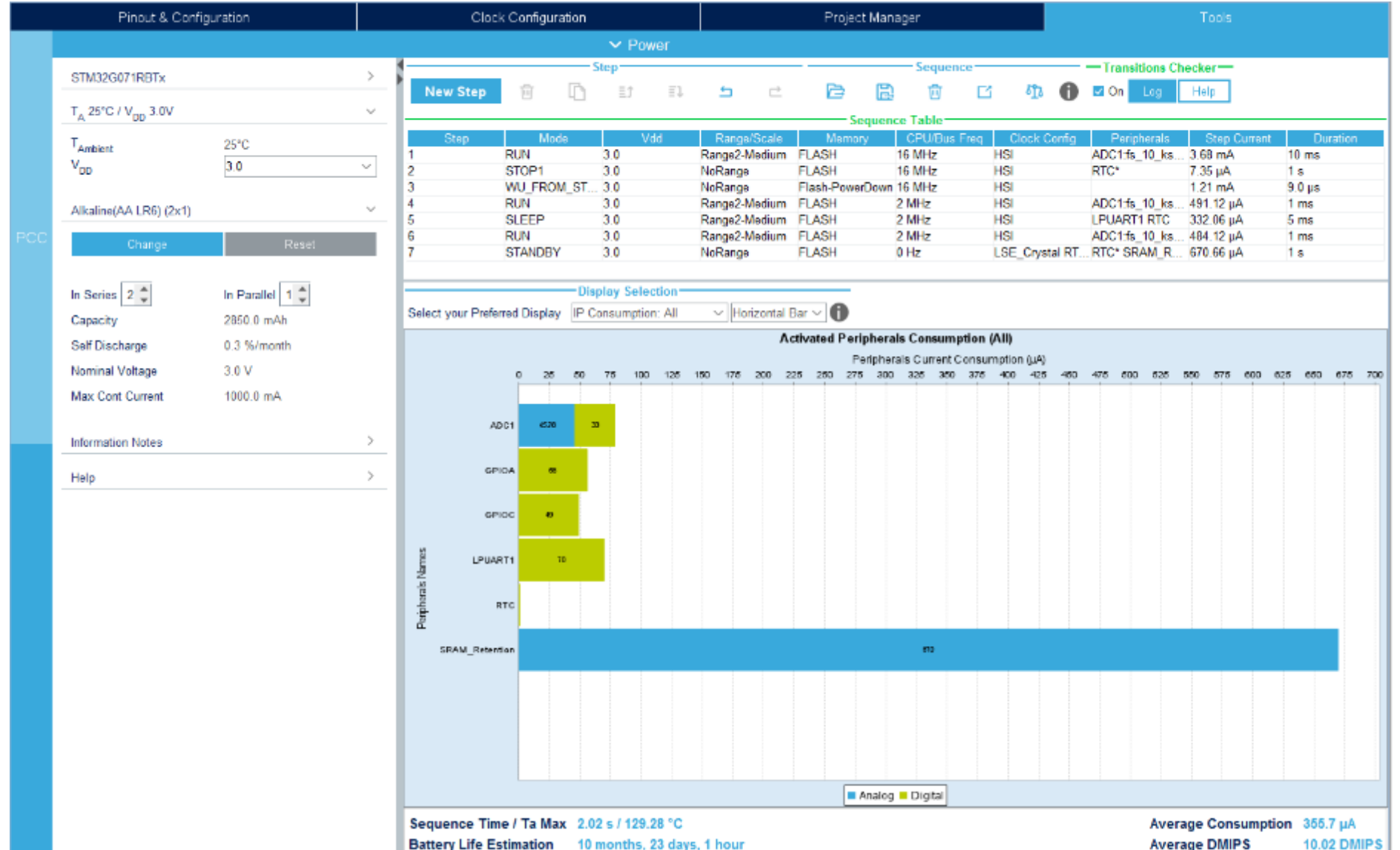
TIP: When selecting new mode, application is displaying only valid modes and in case of low power->RUN sequence a wakeup phase is added



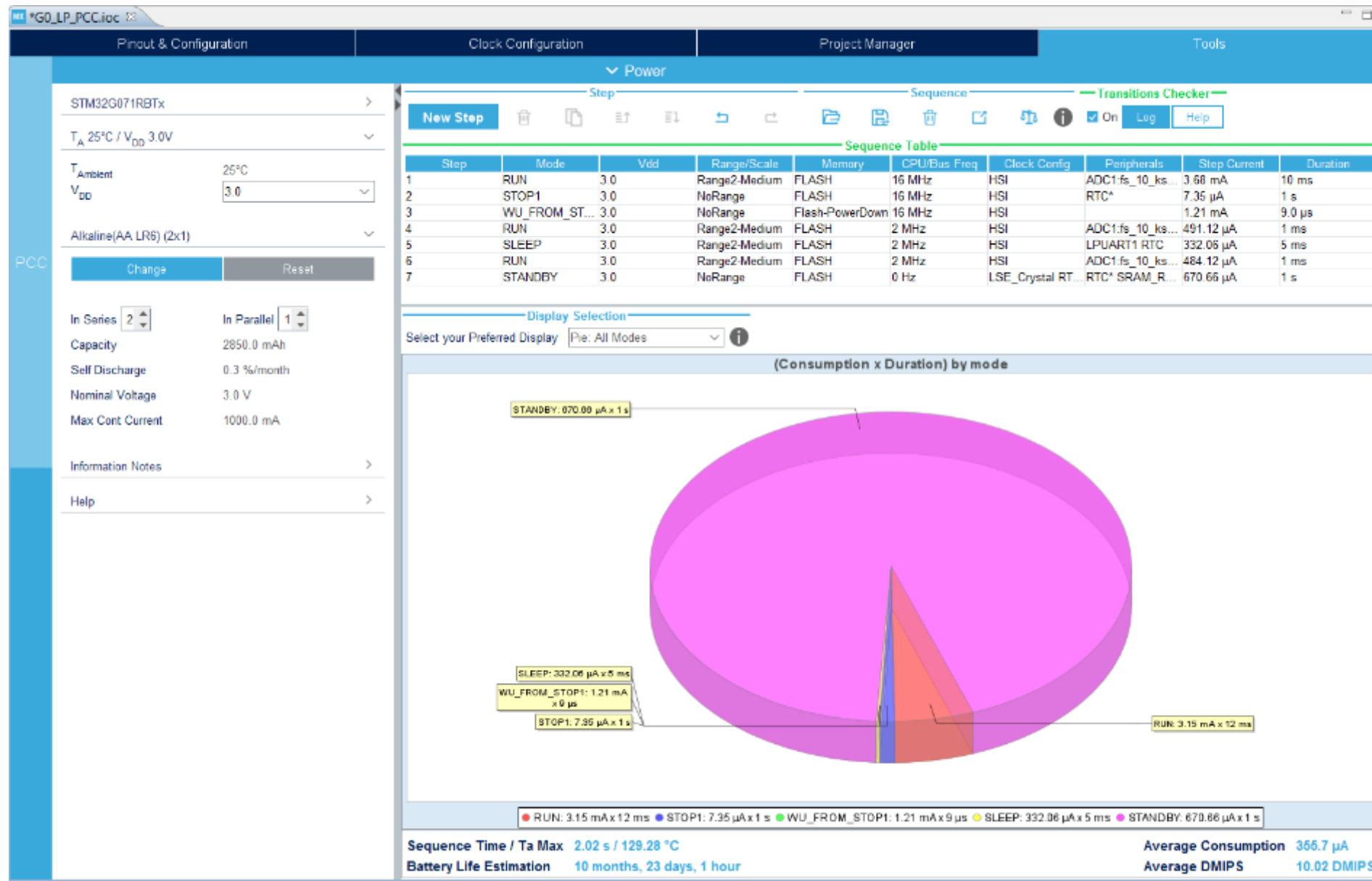
- After adding a new step a consumption profile is updated and we can either add a new step, change steps order, change display view



- More complex scheme with different current consumption view (split on analog and digital parts)



- Another view of current consumption profile



# Thank you



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