ClockBuilder Pro Overview

JANUARY 2020

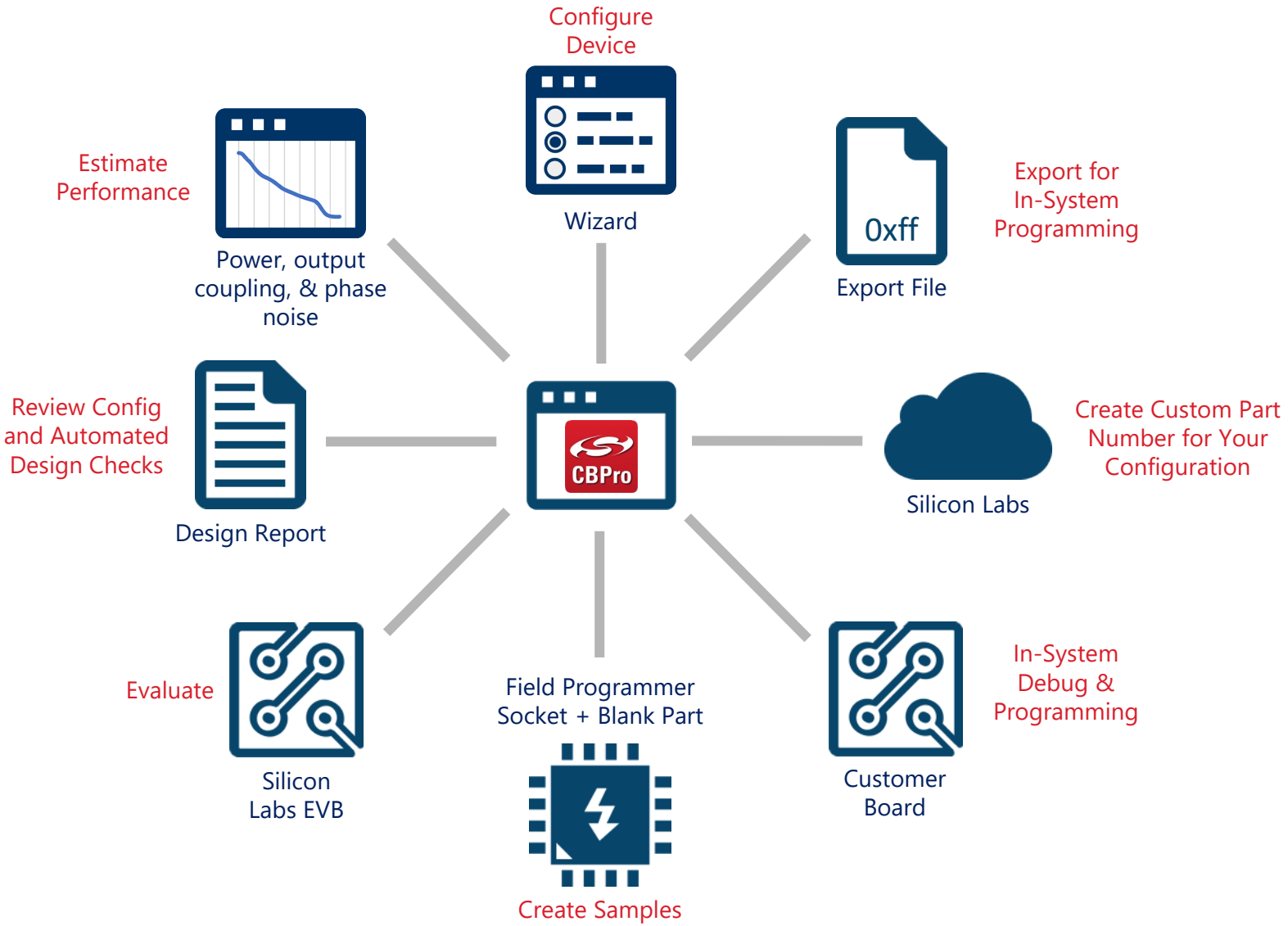
A walk through of the

top 14

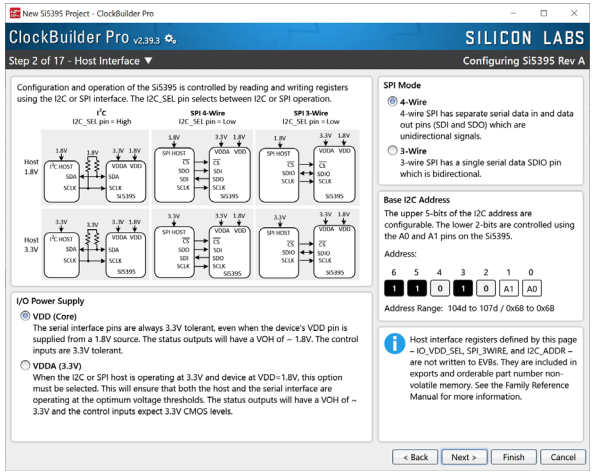
CBPro features that will help you get your design to market **easier** and ***faster***

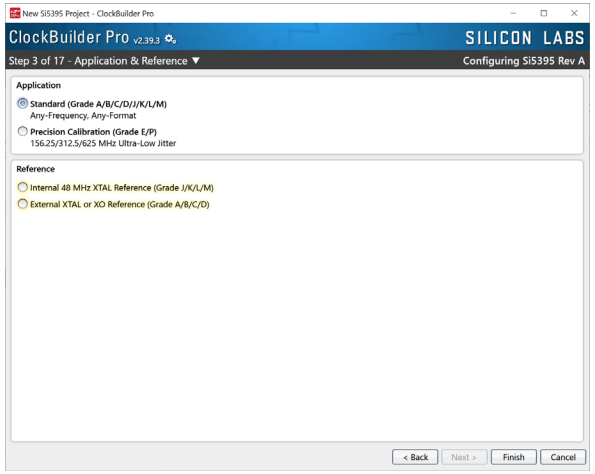
Note: feature availability varies by device

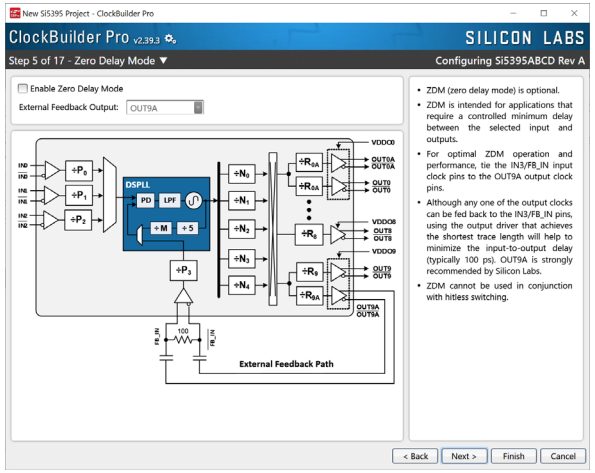
#1 - A Single Tool that Supports All Stages of Your Timing Design

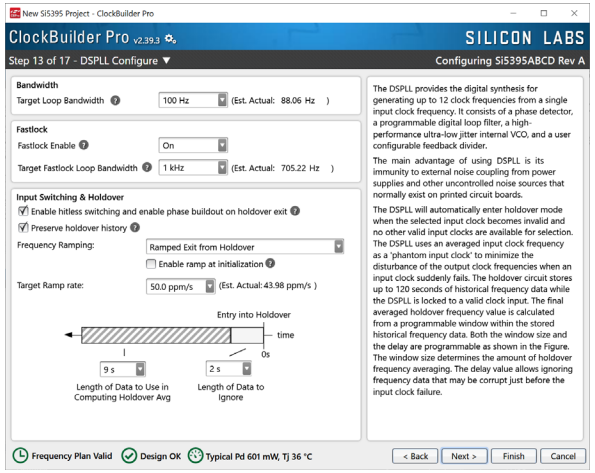


#2 - Device Configuration Wizard



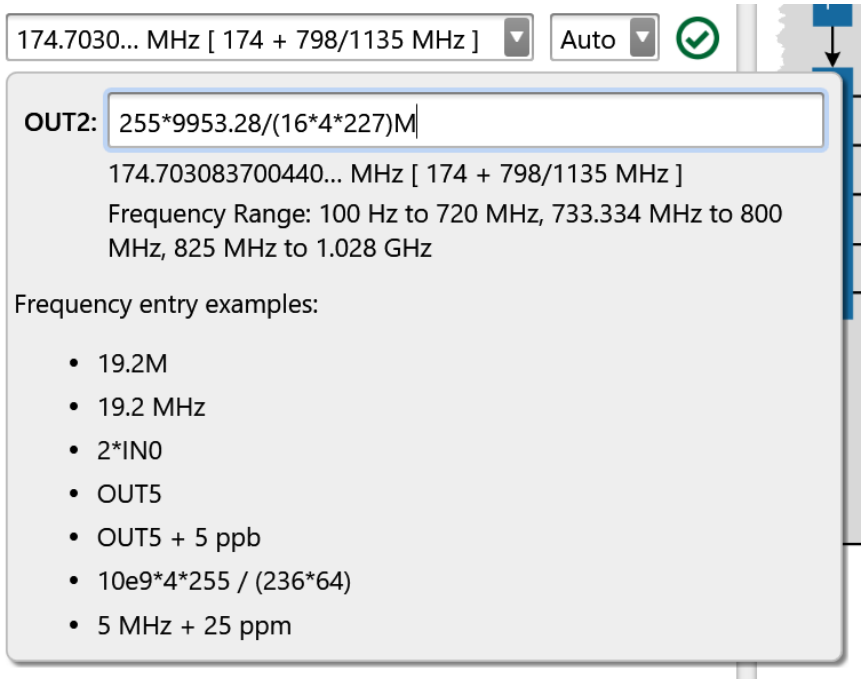






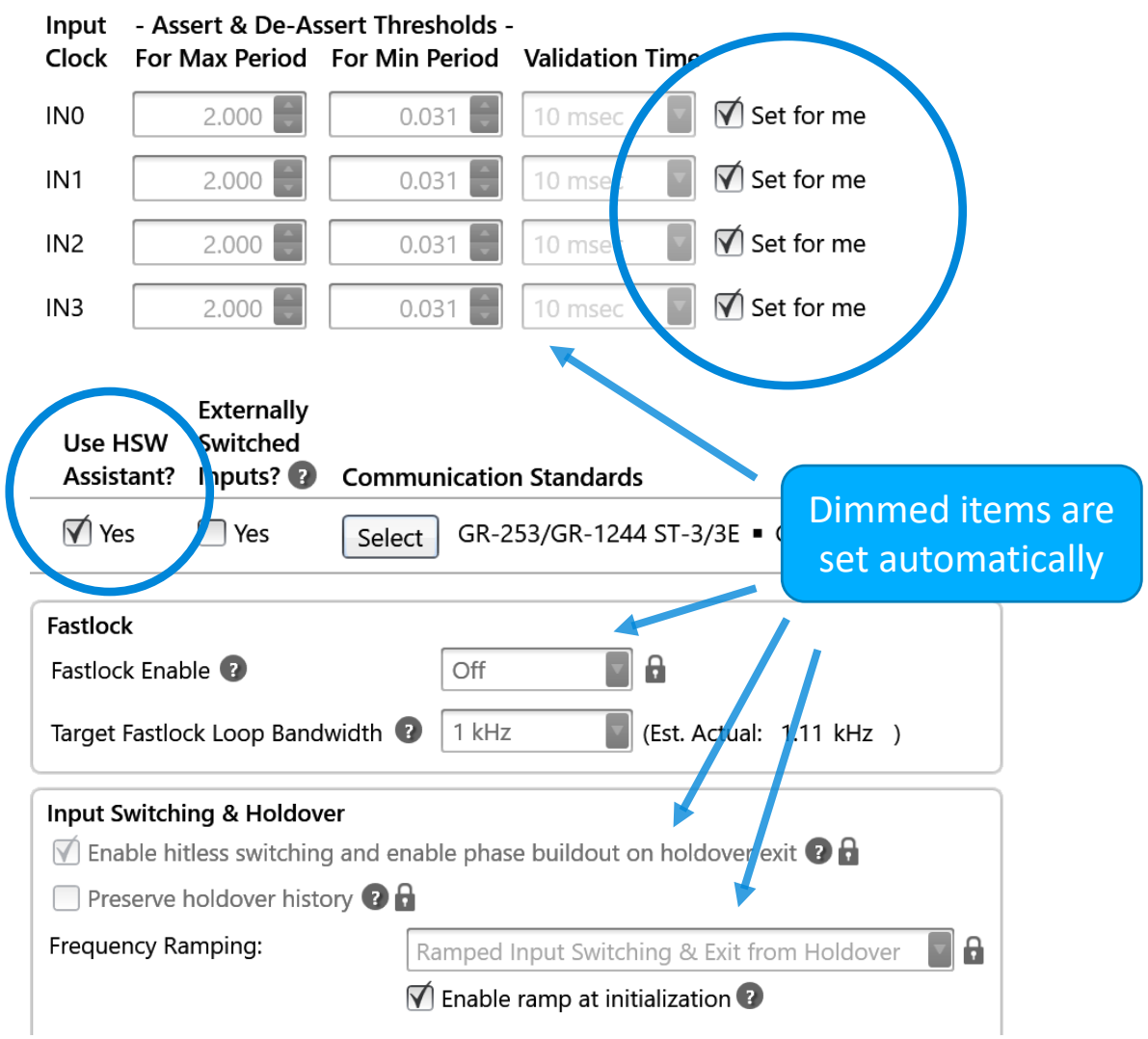
- The CBPro wizard breaks configuration into related and manageable chunks
- Ensures configuration is done in logical order
- Hides features not applicable based on earlier selections

#3 - Expression-Based Frequency Entry



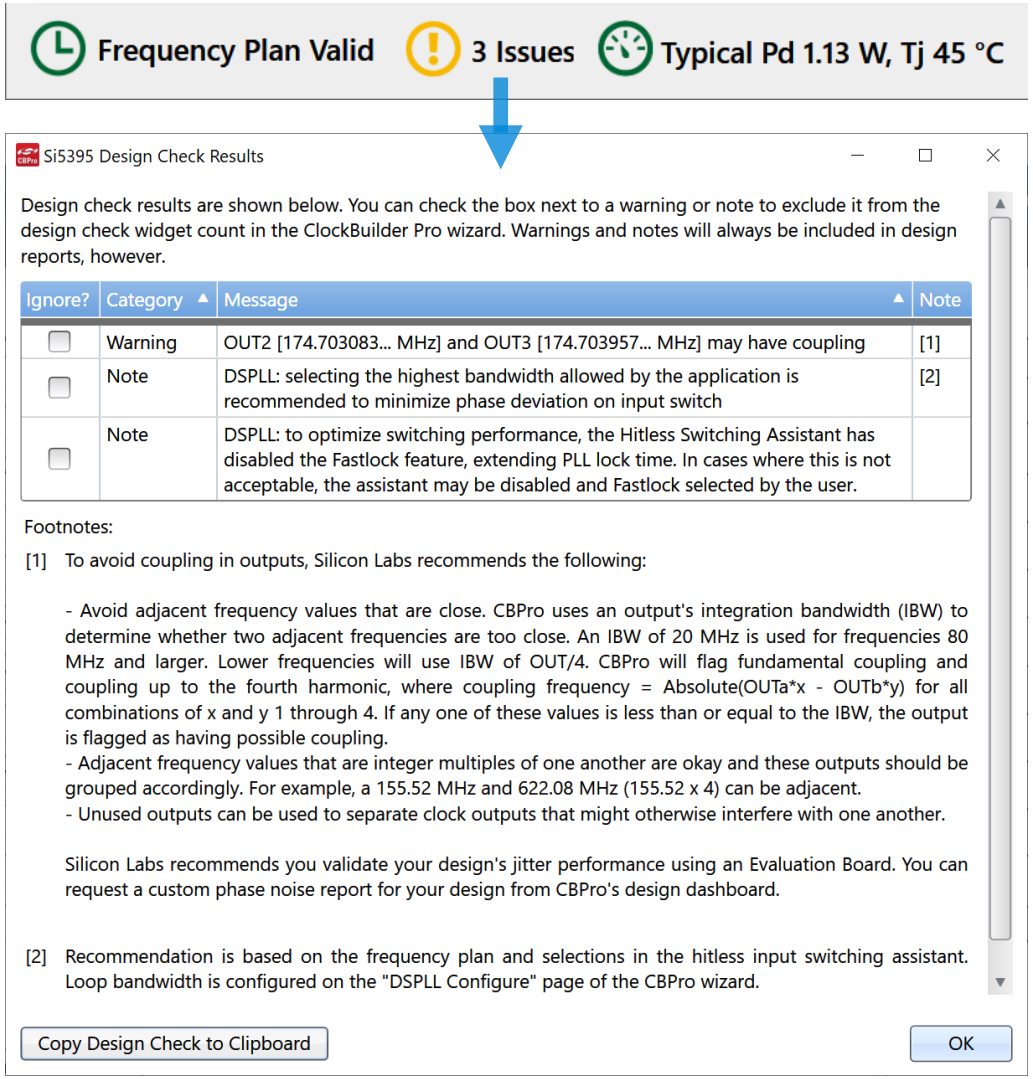
- Frequencies can be entered using human readable expressions like "10e9*4*255 / (236*64)" and "OUT5 + 5 ppb"
- Leads to quick, error free data entry and precise frequency output

#4 - Automatic Optimal Device Configuration



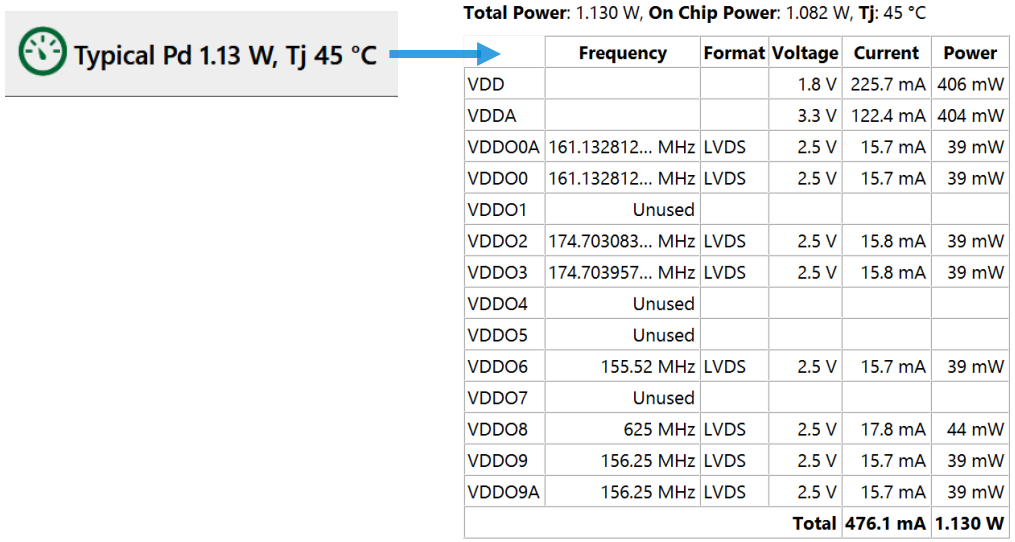
- Many features have "set for me" options to auto select configuration options based on overall design and other user input
- Frequency planner automatically selects dividers that yield best performance

#5 - Design Rule Checks (DRCs)



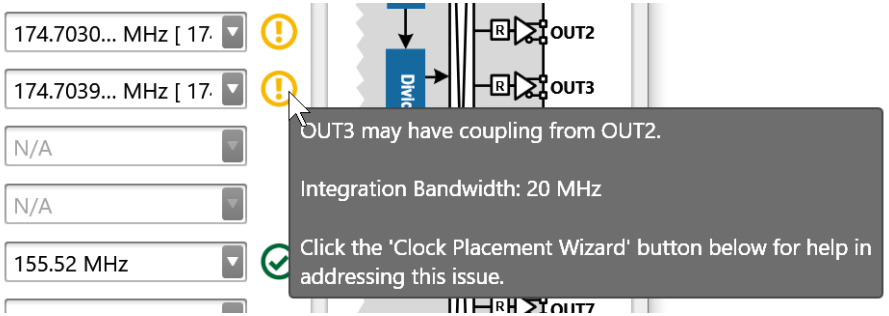
- CBPro checks your configuration for errors and potential issues (warnings) in real-time
- Always visible DRC widget provides centralized clearing house for errors and warnings, making it easy to track whether your design is issue free
- Also included in design report
- You must review and approve if custom part number is created

#6 - Configuration Performance Analysis



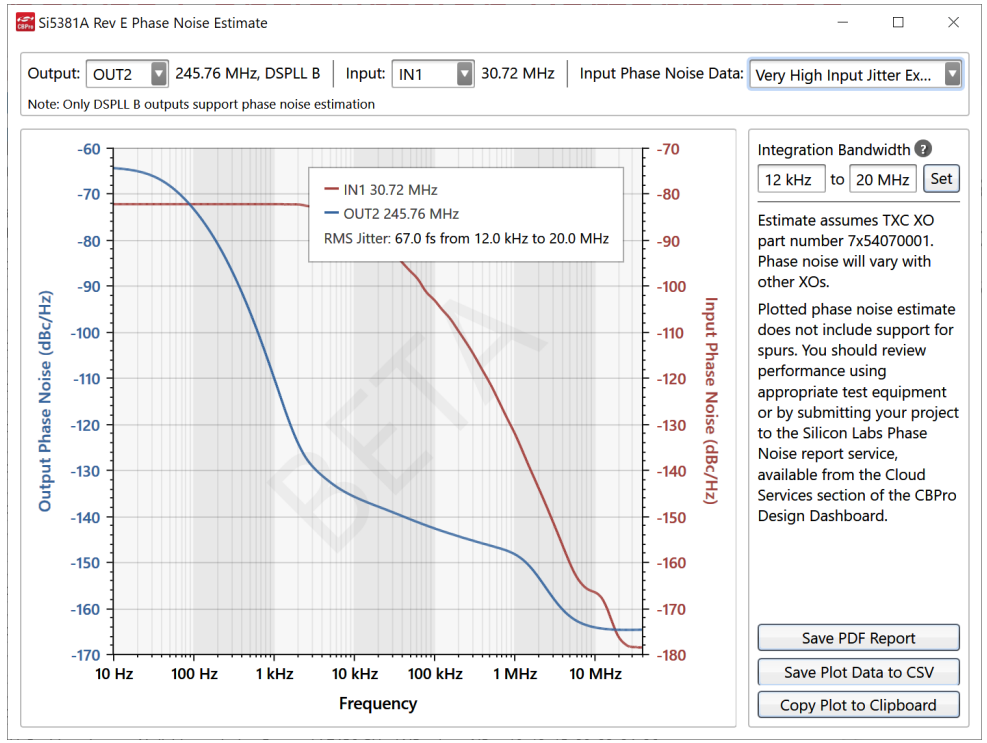
	Frequency	Format	Voltage	Current	Power
VDD			1.8 V	225.7 mA	406 mW
VDDA			3.3 V	122.4 mA	404 mW
VDDO0A	161.132812... MHz	LVDS	2.5 V	15.7 mA	39 mW
VDDO0	161.132812... MHz	LVDS	2.5 V	15.7 mA	39 mW
VDDO1	Unused				
VDDO2	174.703083... MHz	LVDS	2.5 V	15.8 mA	39 mW
VDDO3	174.703957... MHz	LVDS	2.5 V	15.8 mA	39 mW
VDDO4	Unused				
VDDO5	Unused				
VDDO6	155.52 MHz	LVDS	2.5 V	15.7 mA	39 mW
VDDO7	Unused				
VDDO8	625 MHz	LVDS	2.5 V	17.8 mA	44 mW
VDDO9	156.25 MHz	LVDS	2.5 V	15.7 mA	39 mW
VDDO9A	156.25 MHz	LVDS	2.5 V	15.7 mA	39 mW
			Total	**476.1 mA**	**1.130 W**

- Review estimated power and junction temperature
- Si5332, Si534x/7x/8x/9x, Si5121x



- Check for potential output coupling issues, with option to auto place frequencies for optimum performance
- Si534x/7x/8x/9x, Si535x (warnings only)

#6 - Configuration Performance Analysis

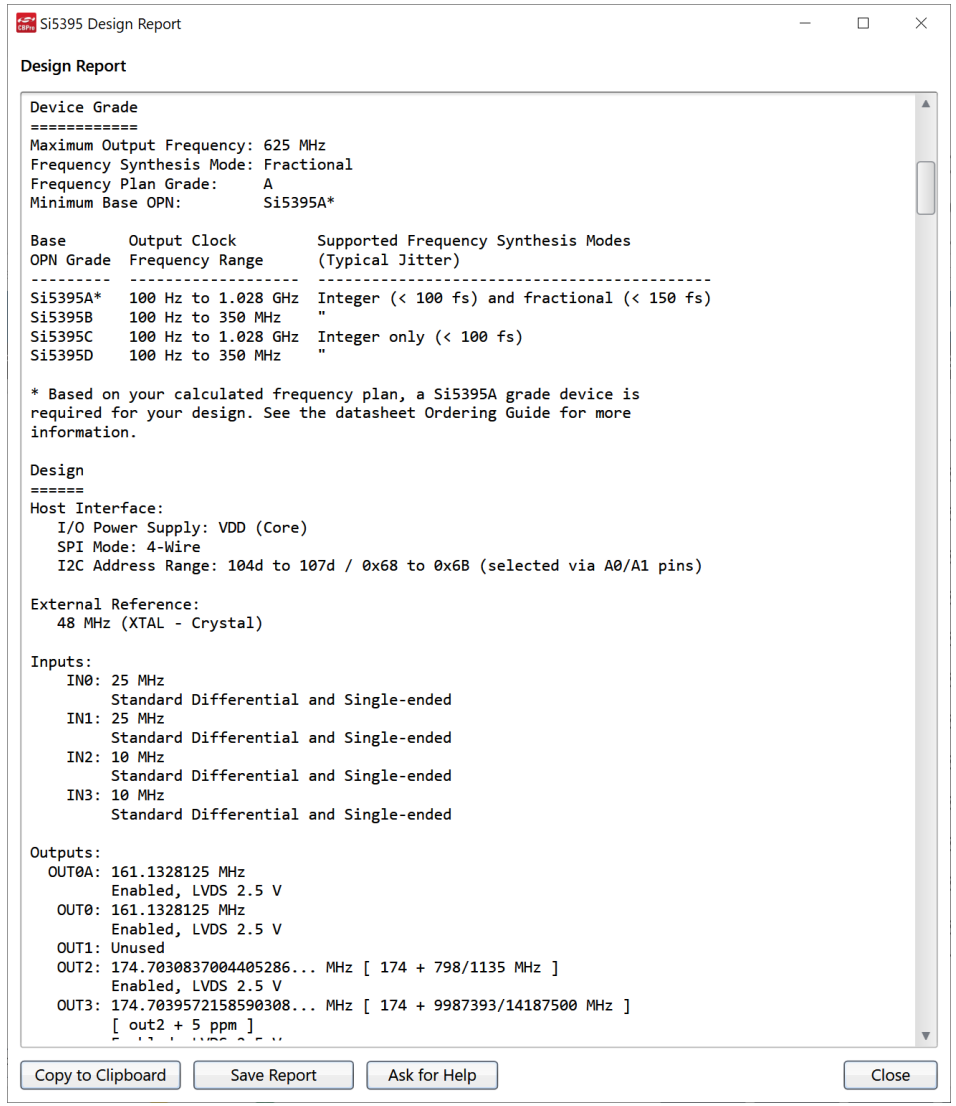


Silicon Labs Cloud Services

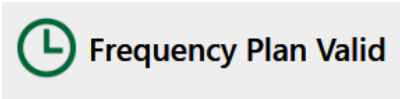
You can create a custom part number for your design, which can be used to order factory pre-programmed devices. Or request a phase noise report for this design.

- Si5380/1/2/6: estimate phase noise for wireless PLL
- All devices: request phase noise plots from Silicon Labs with a few clicks

#7 - Design Report

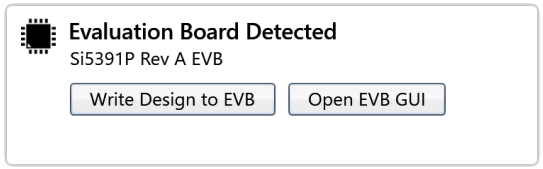


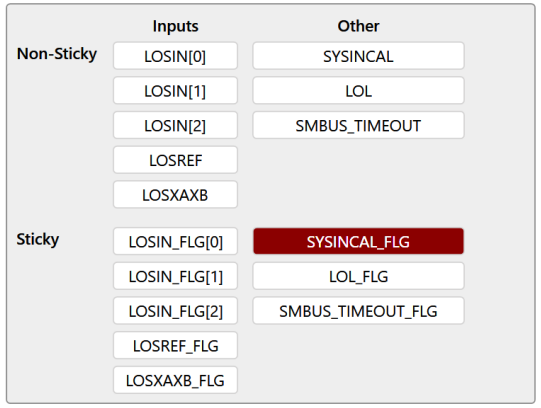
- CBPro's design report summarizes key design inputs and resulting frequency plan, design rule check results, estimated power consumption, and register breakdown/values
- Provides detailed record/snapshot of CBPro project
- Available from widget area:

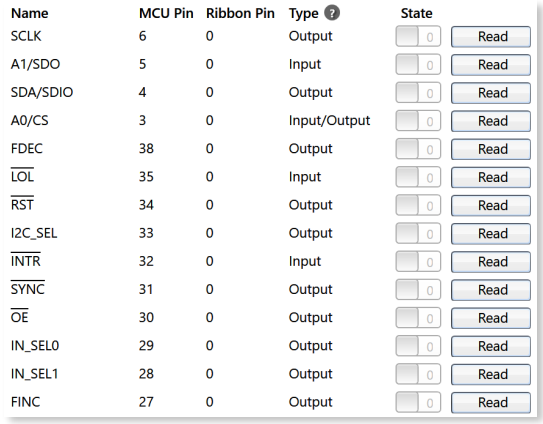


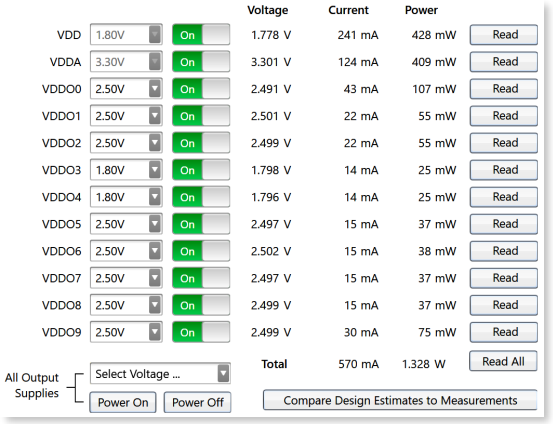
- Or dashboard:

#8 – Evaluation Support



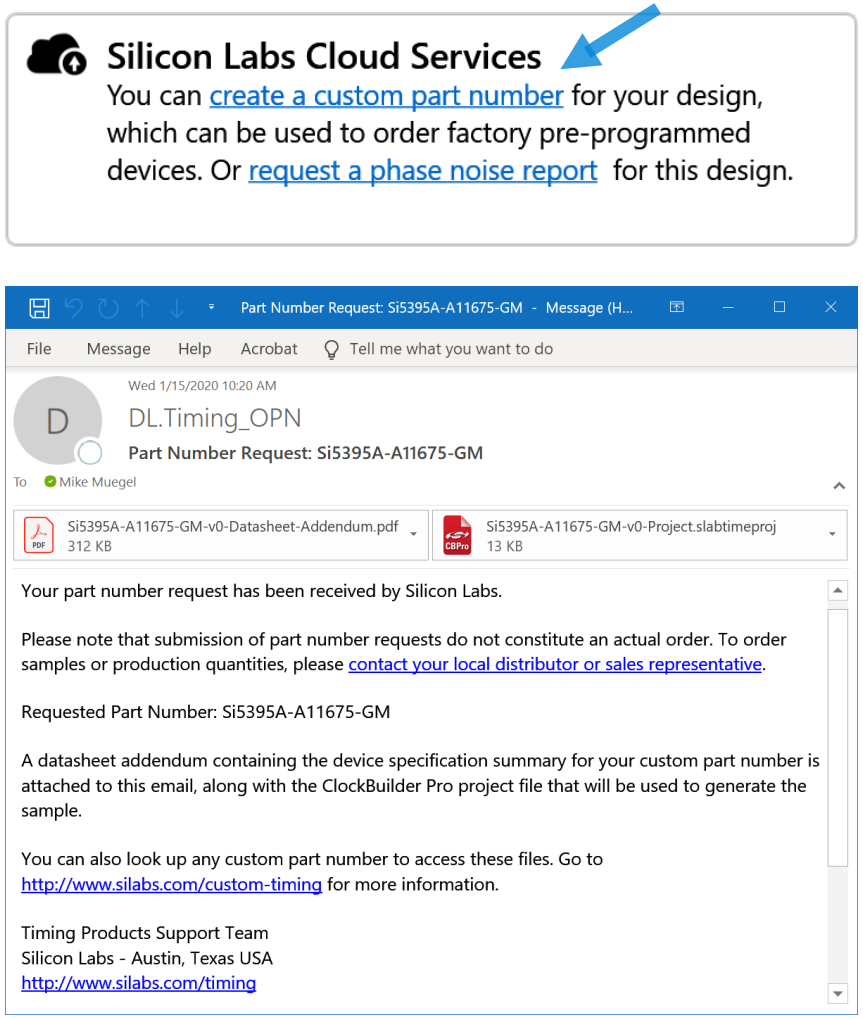






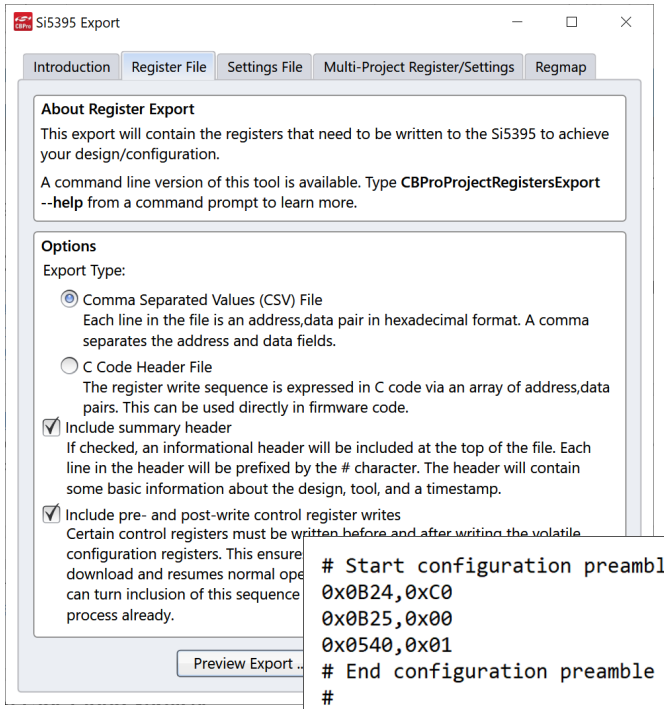
- Your configuration can be written to EVB with a single button press
- EVBs support most configurable features
- Telemetry such as status registers can be read from the device and inspected via GUI or CLI
- Measure power draw and compare to estimate

#9 - Custom Part Number Generation



- With a few clicks, create part number such as Si5395A-A11675-GM that will have CBPro configuration burned into the part
- Saves cost and effort to program in-house or using third party
- You will receive an e-mail acknowledgement containing the part number, project file, and PDF datasheet addendum that includes the project's design report
- Option still available to program in-system should configuration need to be changed once device has been soldered down

#10 - In-system Programming Assistance




```
# Start configuration preamble
0x0B24,0xC0
0x0B25,0x00
0x0540,0x01
# End configuration preamble
#
# Delay 300 msec
#    Delay is worst case time for device to complete any calibration
#    that is running due to device state change previous to this script
#    being processed.
#
# Start configuration registers
0x0006,0x00
0x0007,0x00
0x0008,0x00
0x000B,0x68
0x0016,0x02
0x0017,0xDC
0x001[illegible],0x00
```

- Export tools support creating simple "script" files that can be written to device by micro-controller to fully **reconfigure** a device
- End-customer software engineer needs to know very little about Silicon Labs device other than how to read/write a register via serial interface: the script handles all programming setup and finalization tasks

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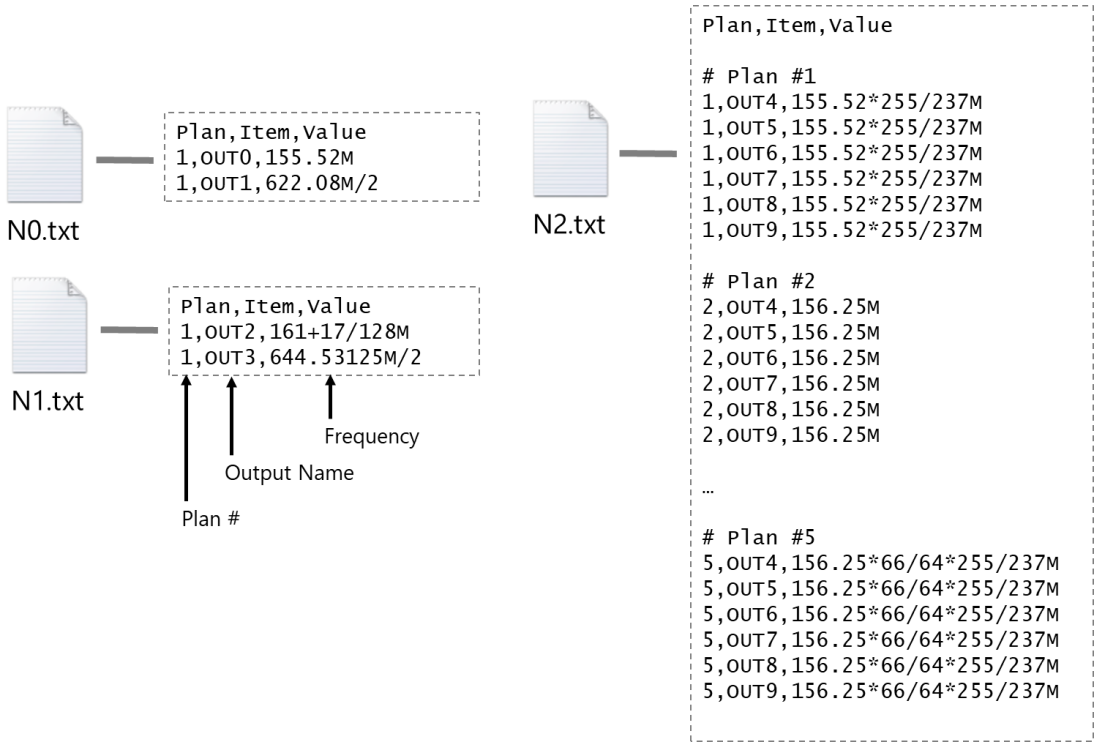
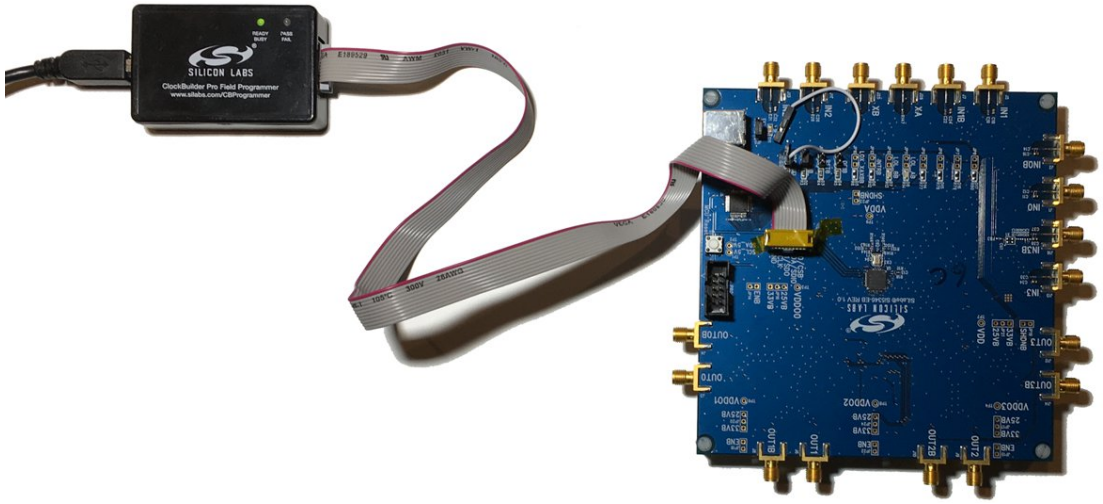


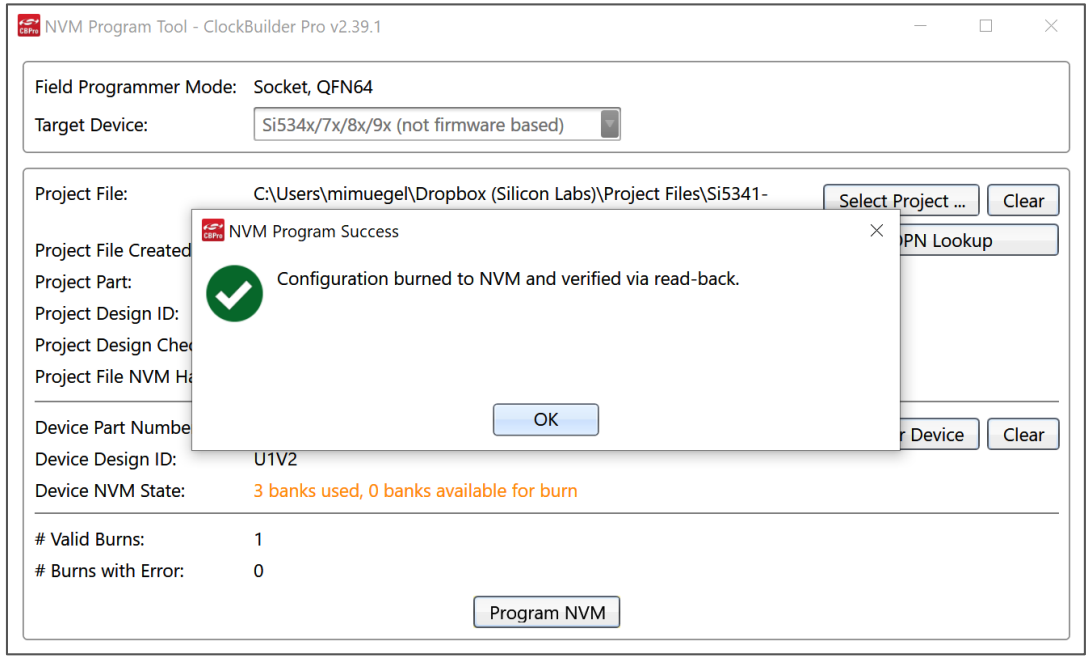
- On select Si534x/7x/8x/9x devices, supports **frequency-on-the-fly** scenarios where subset of outputs is modified, leaving other outputs undisturbed
- Simple text files define alternate per-MultiSynth or per-PLL plans
- FOTF tool creates optimized scripts to switch between plans
- Advanced scenarios such as discrete PLL reconfiguration also supported

#11 - In System Bring-up and Debug Support



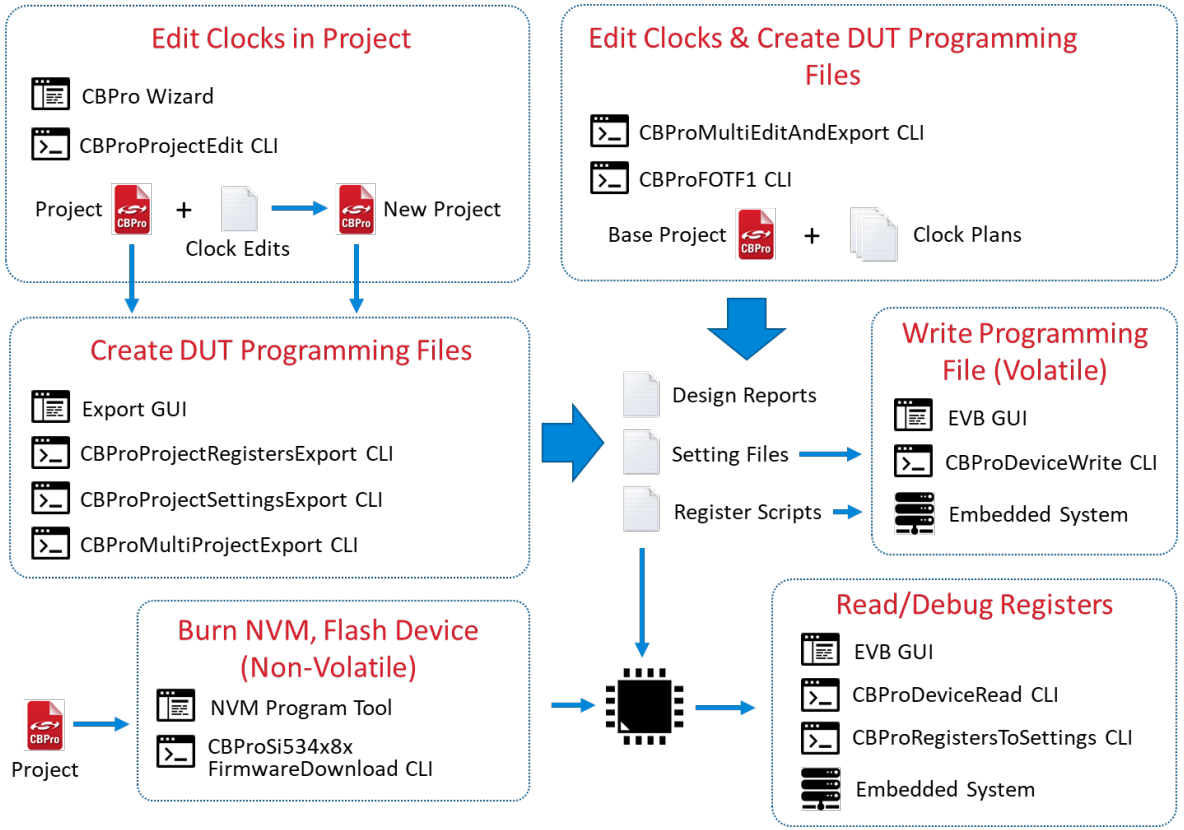
- Using the ClockBuilder Pro Field Programmer, CBPro can communicate with customer board using I2C or SPI and:
  - Read/write settings and registers
  - Write a CBPro project file
  - Flash firmware and configuration
- GUI and Command Line interfaces

#12 - Program Non-Volatile Memory of Loose or Soldered Down Parts



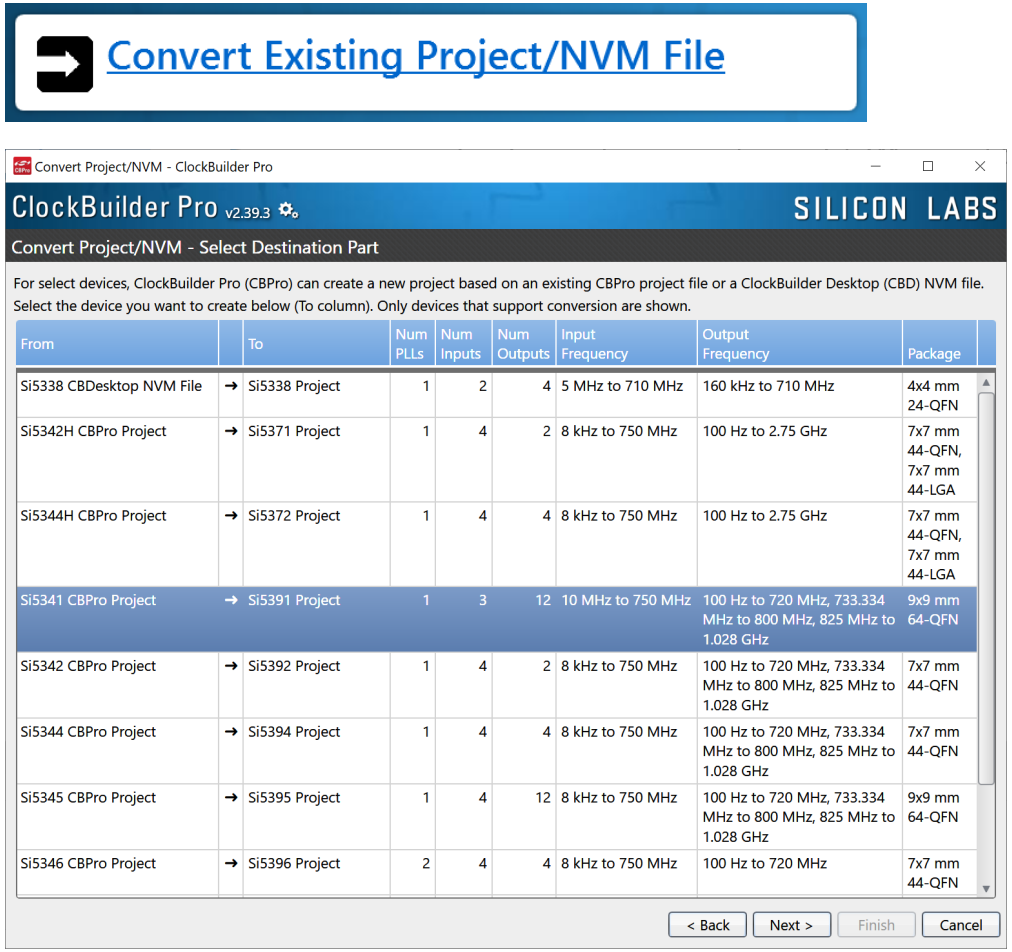
- Using the ClockBuilder Pro Field Programmer, device NVM can be written based on CBPro project file:
  - Wired to system board via serial interface, program NVM of soldered part
  - Using appropriate field programmer socket, program NVM of loose sample
- Supports rapid prototyping where in-system programming µc support is not available and custom part number (OPN) turn around would be too long
- Sockets for Si5332, Si534x, Si537x, Si538x, and Si539x

#13 - Automate Common Activities



- There are command line interfaces (CLI) to all CBPro export and device read/write activities.
- These can be used to automate and streamline:
  - In-system programming file generation
  - EVB and system board programming and test

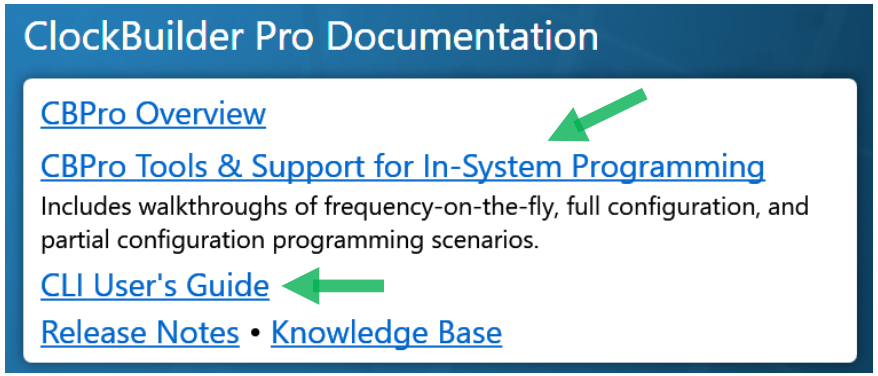
#14 - Convert a Design Between Part Families



- Support conversion between select product families, such as converting an Si5341 project to Si5391
- Convert Si5338 CBDesktop NVM file to CBPro project

Learn More

- *CBPro Tools & Support for In-System Programming*
- *CLI User's Guide*
- Both are bundled with CBPro and available from the welcome screen or links above



- ClockBuilder Pro Field Programmer product page

Thank you!

silabs.com