FaradaySemi Graphical User Interface (GUI): User's Manual

Easily program & test the FS1412/FS1409

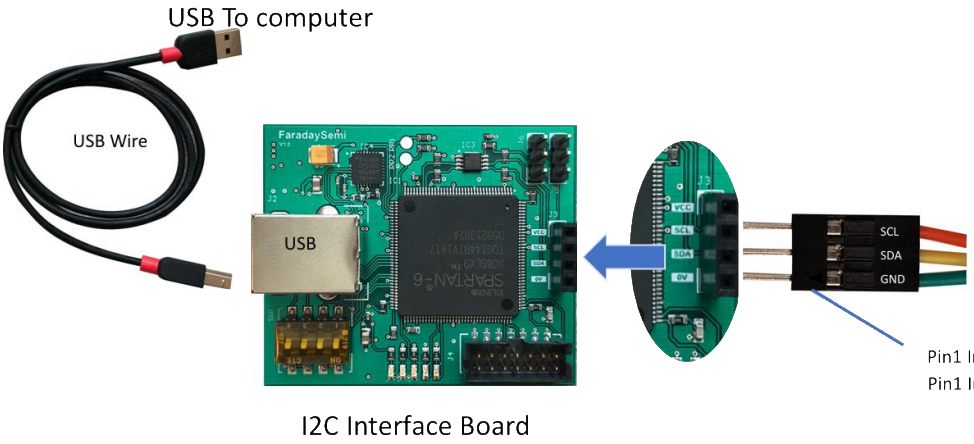
- This user's manual provides instructions on using the *CondUIt software* to program and communicate with the FS1409/FS1412 chip through the FaradaySemi I2C InterfaceBoard.
- The software and complementary hardware read and write directly to the circuit's registers using I2C.

System Requirements

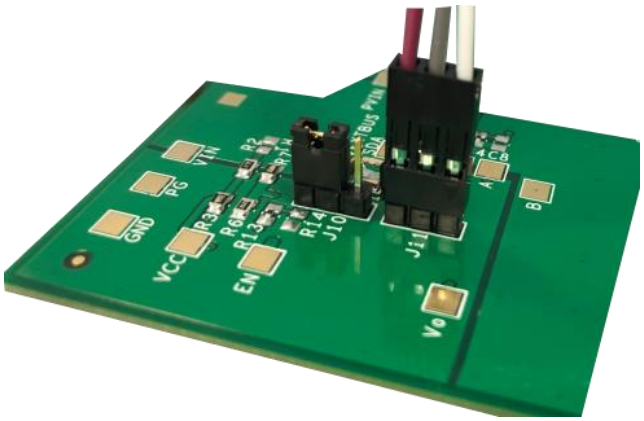
Computer installed with Windows 7 or higher
2GB Of RAM
USB Port Access
FaradaySemi I2C interface board kit

Software and Hardware Setup

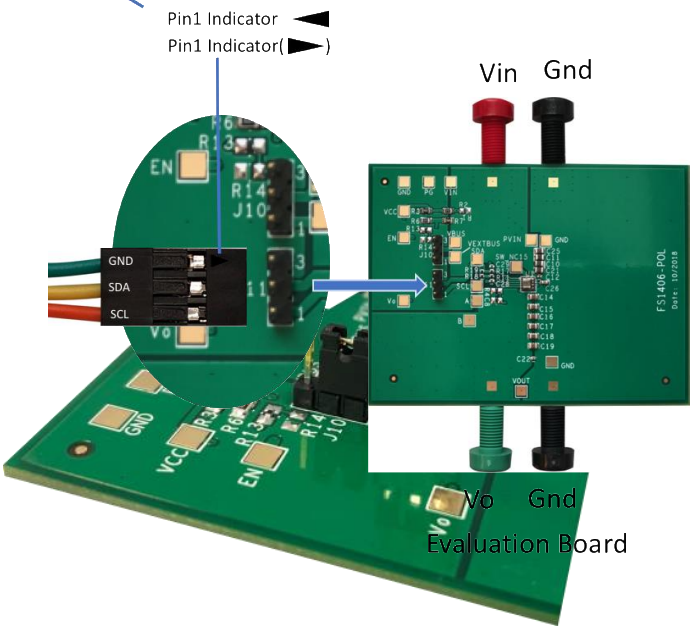
1. Before installing the GUI, download and install Silicon Labs CP210x USB to UART Bridge VCP Driver.
2. Extract the given GUI zip file – CondUIt_27_04_2021.zip then run CondUIt_27_04_2021.msi to install GUI.
3. Connect the I2C interface board to the evaluation board by using jumper cables as shown in Fig 1.
4. Connect I2C interface board to computer using USB Cable as shown in Fig 1.
5. Bus Voltage
    a. The default setup uses **VCC as bus voltage**, jumper shorts pins 1 and 2 of J10 as shown in Fig 2.a.
    b. If using **external bus voltage**, place shorting jumper across pins 2 and 3 of J10 and attach external Bus Voltage to test point "VEXTBUS." Show in in Fig 2.b.



(Fig 1.) I2C interface board connections



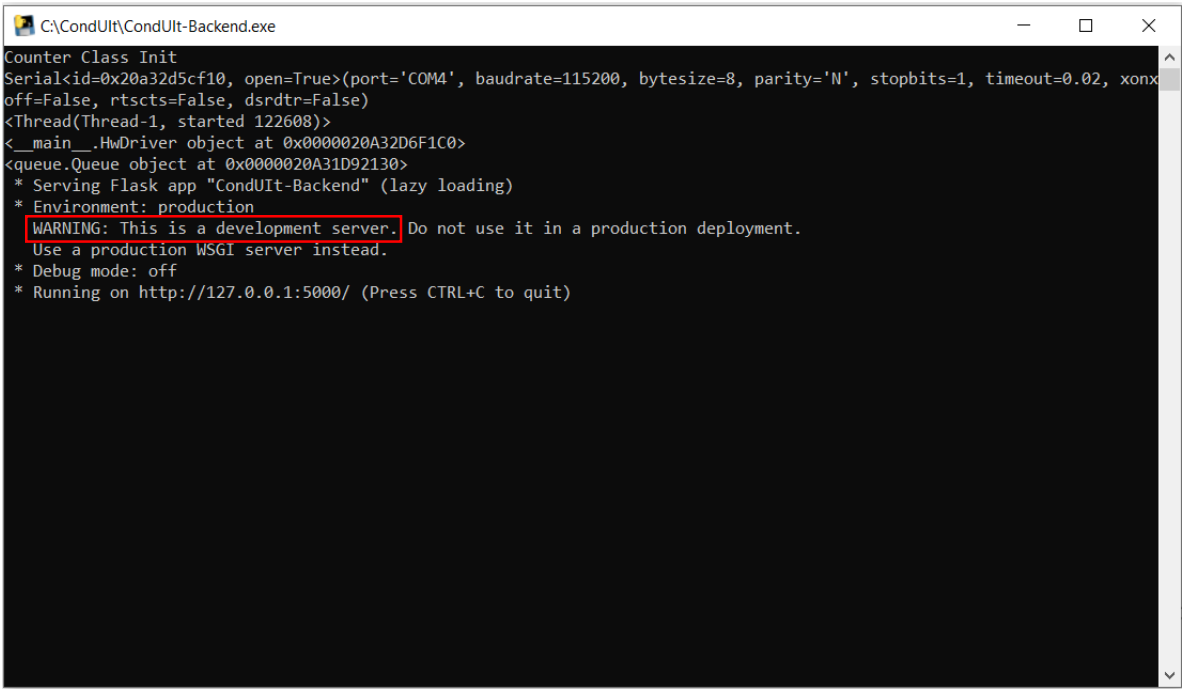
(Fig 2.a) Jumper across Pins 3 and 1of J10. Uses VCC voltage as Bus Voltage.



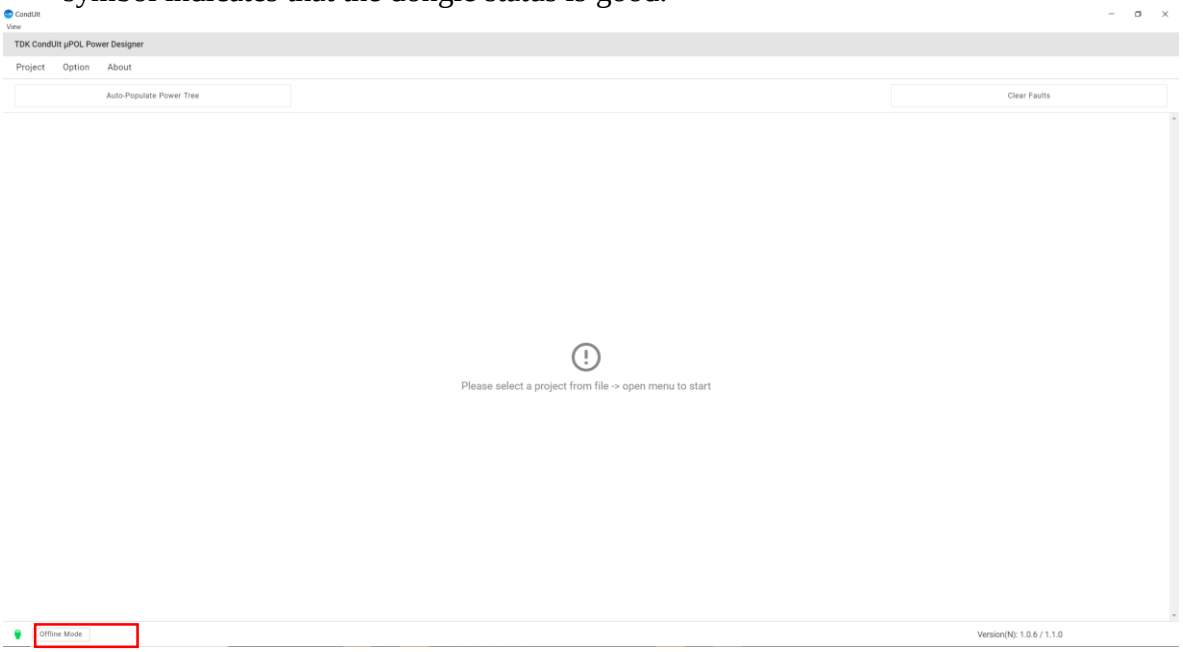
(Fig 2.b) Jumper across Pins 2 and 1 of J10. Uses VEXTBUS as Bus Voltage.

Launching the GUI

1. Go to C:\Conduit (the default installation folder) and double-click CondUIt-Backend.exe to launch the backend. Wait until the backend is ready as indicated by the highlighted line below.

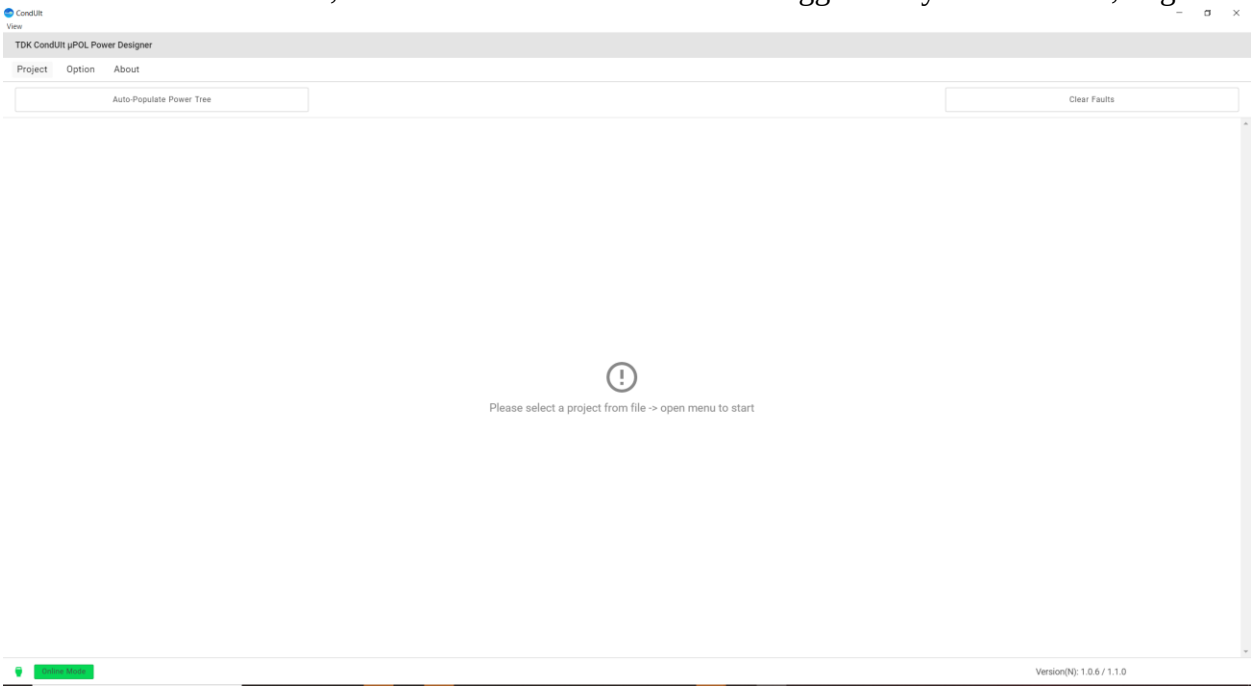


2. From C:\Conduit, double click the CondUIt application to launch the GUI. The GUI will launch in "offline" mode as shown in the highlighted area below, which means that it can be used without connecting the dongle to a FS1412 device/demoboard. The green symbol indicates that the dongle status is good.



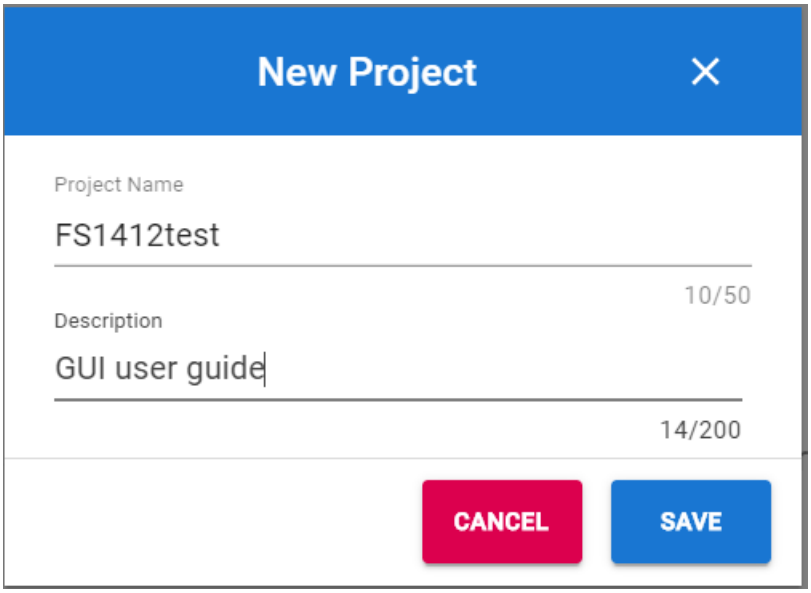
NOTE: A future release of CondUIT will allow launching the backend as well as front-end with a single click

At this stage the user can choose to build up a project in “offline” mode, but in this guide document the focus will be on the online mode, or operation when a demo board is connected to the dongle and powered up. The steps for offline mode are virtually identical. To switch to online mode, click on Offline mode and it will toggle to say Online mode, in green.

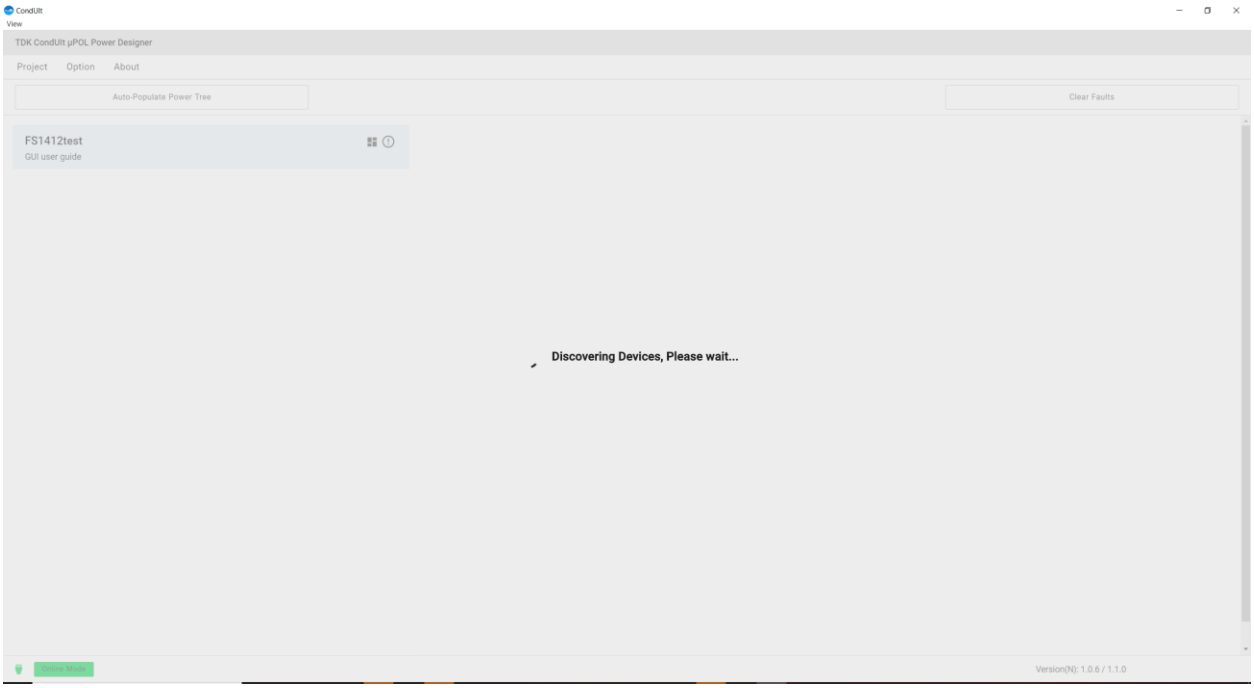


Creating and working with a project

1. Create the project, by clicking on the Project>Create, and then filling out the name and description in the New Project window as below. Then click the SAVE button

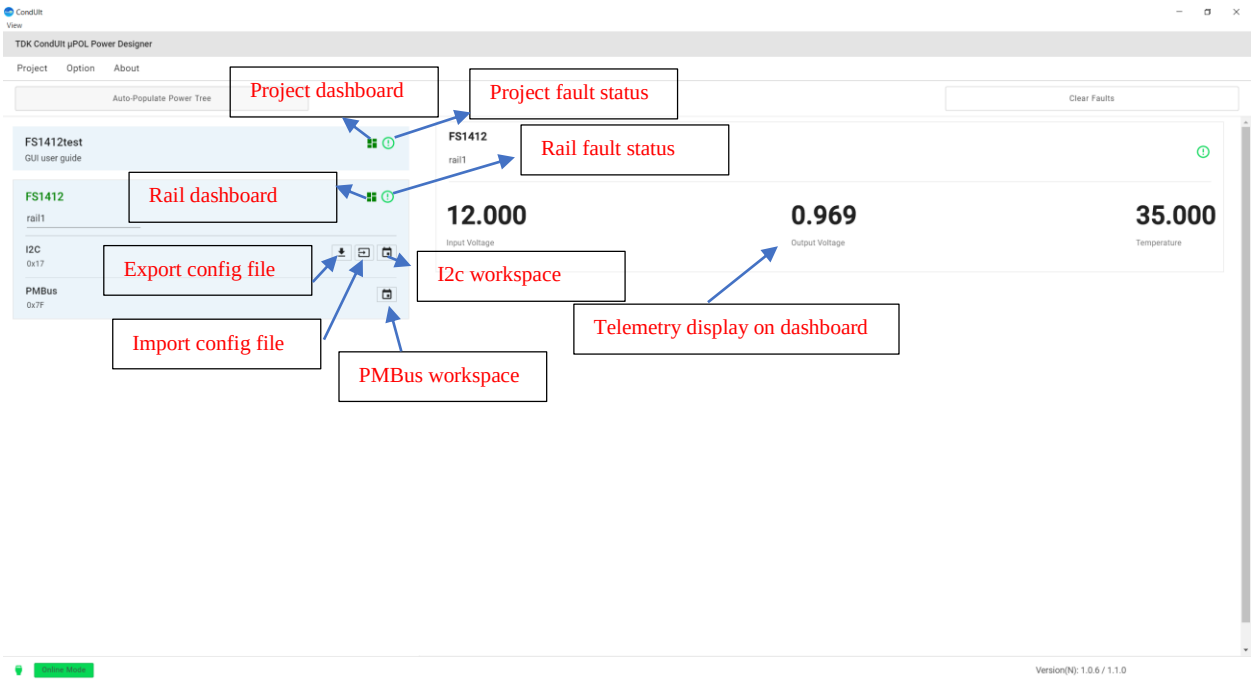


2. Click on the Auto-populate Power Tree button to scan the bus for all i2c/PMBus devices. When a device is found, it will automatically populate in the project power tree. Device discovery scans for nearly 127 addresses with some wait states, so this can take up to 2-3 minutes, so please be patient during this process.

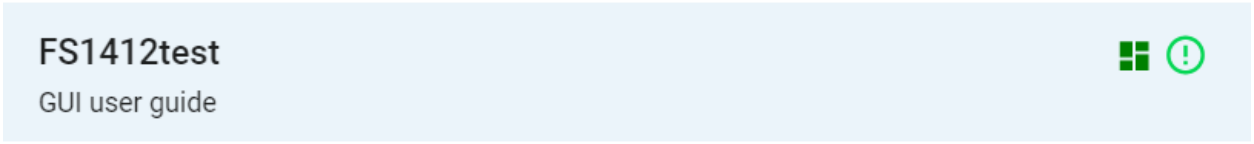


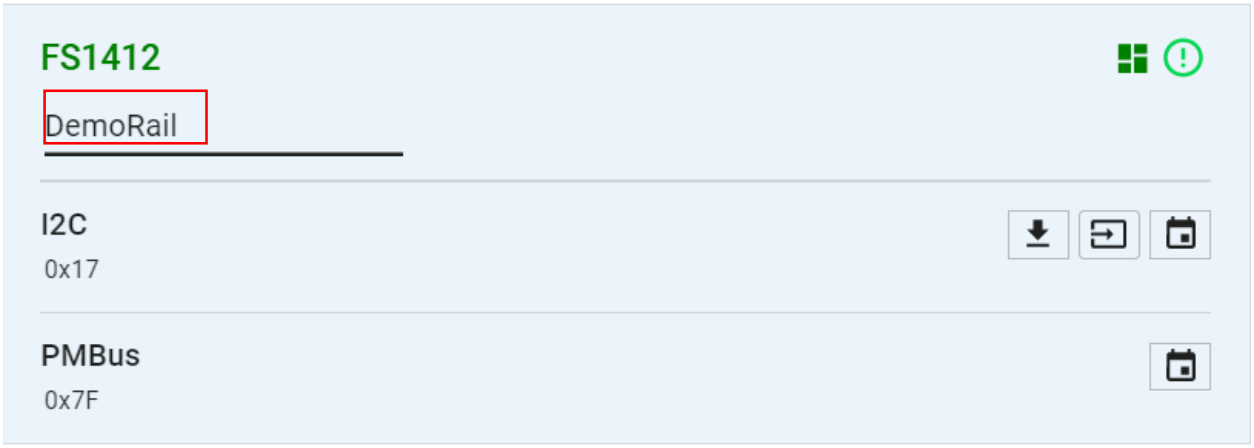
After the auto populate process is complete, the display will show the power tree enumerated with all the devices that responded to the scan, including their i2c and PMBus addresses.

3. Anatomy of the CondUIt display when the project or rail dashboard is clicked. (Clicking on Project dashboard will show the telemetry displays of all the rails)

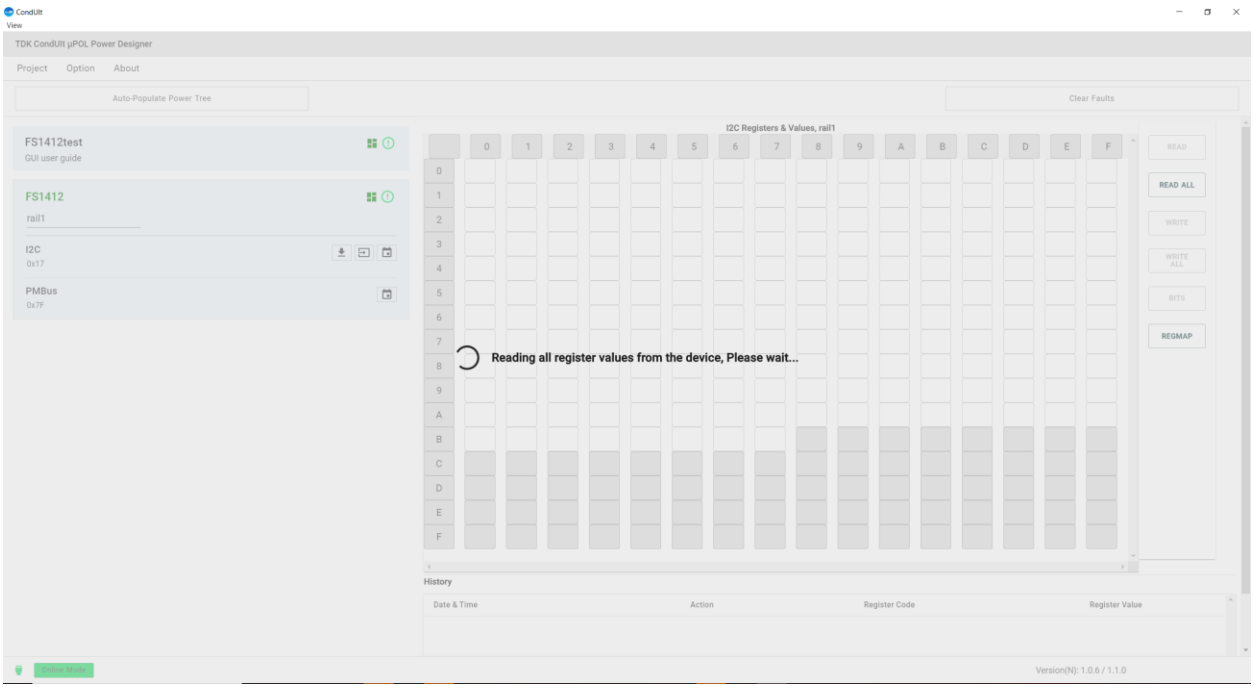


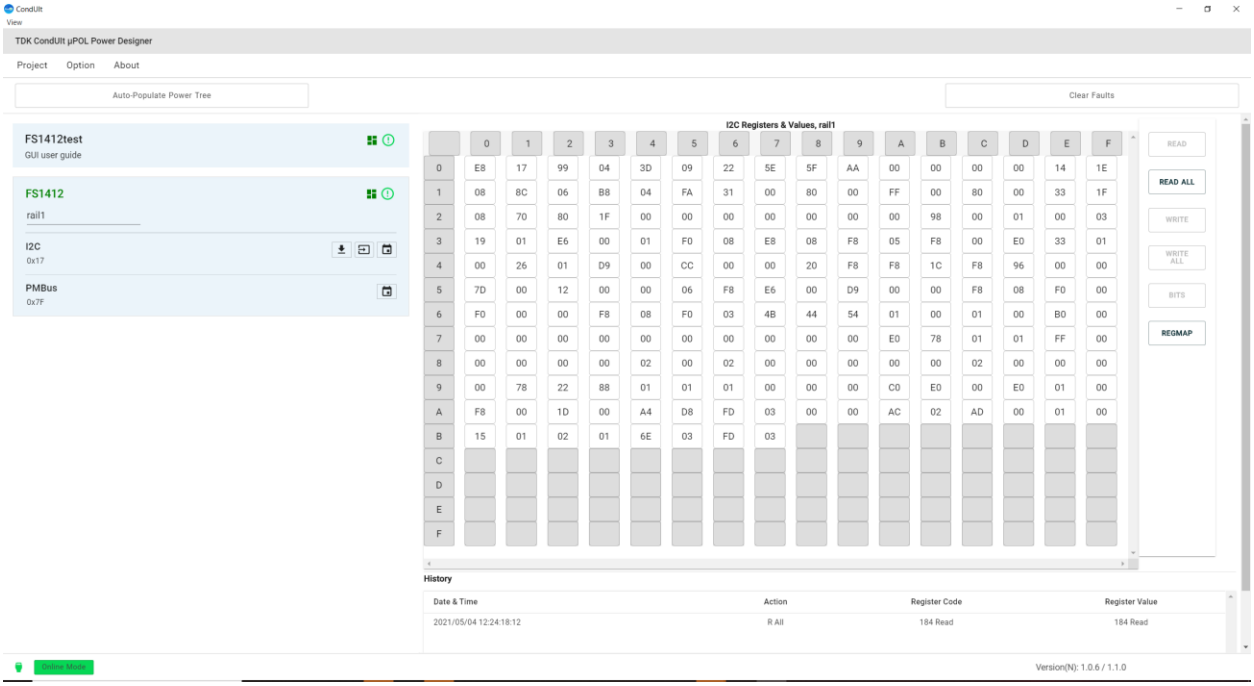
4. At this stage it is recommended but not required to provide meaningful names to the rail (s). This is particularly useful for a multi-rail project, and is done by simply by clicking and typing over the default Rail name.





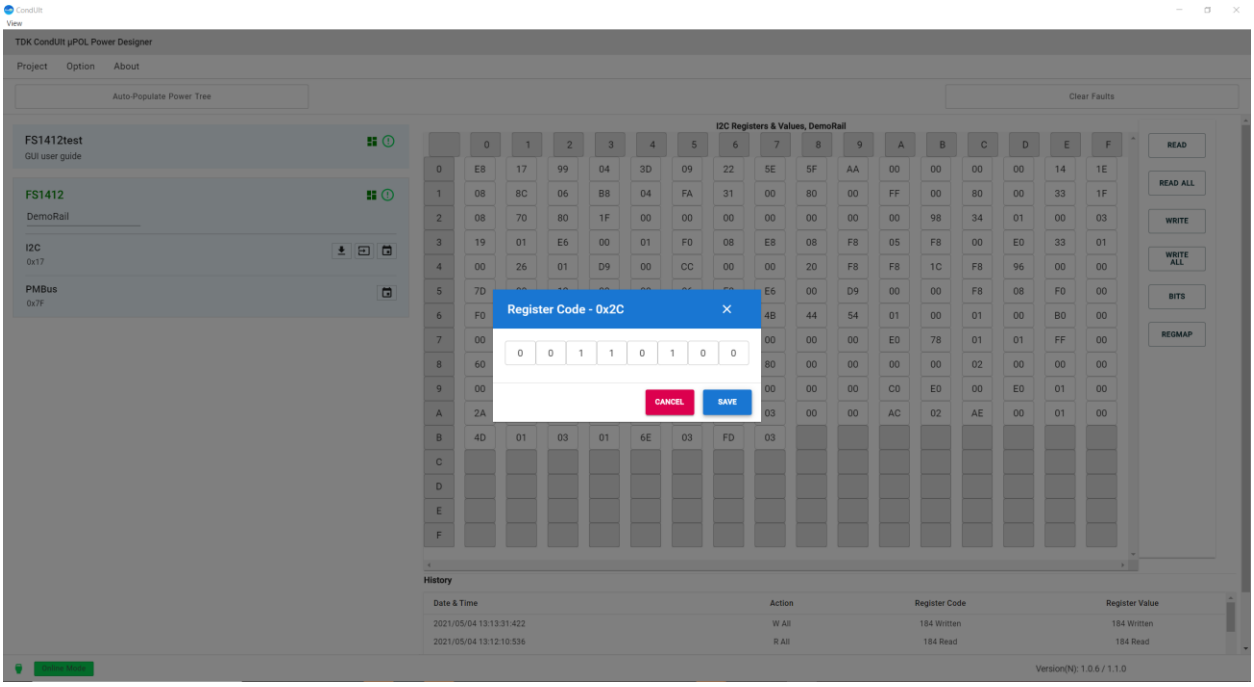
5. At this stage, the user can read all the i2c registers using the Read All Registers button.

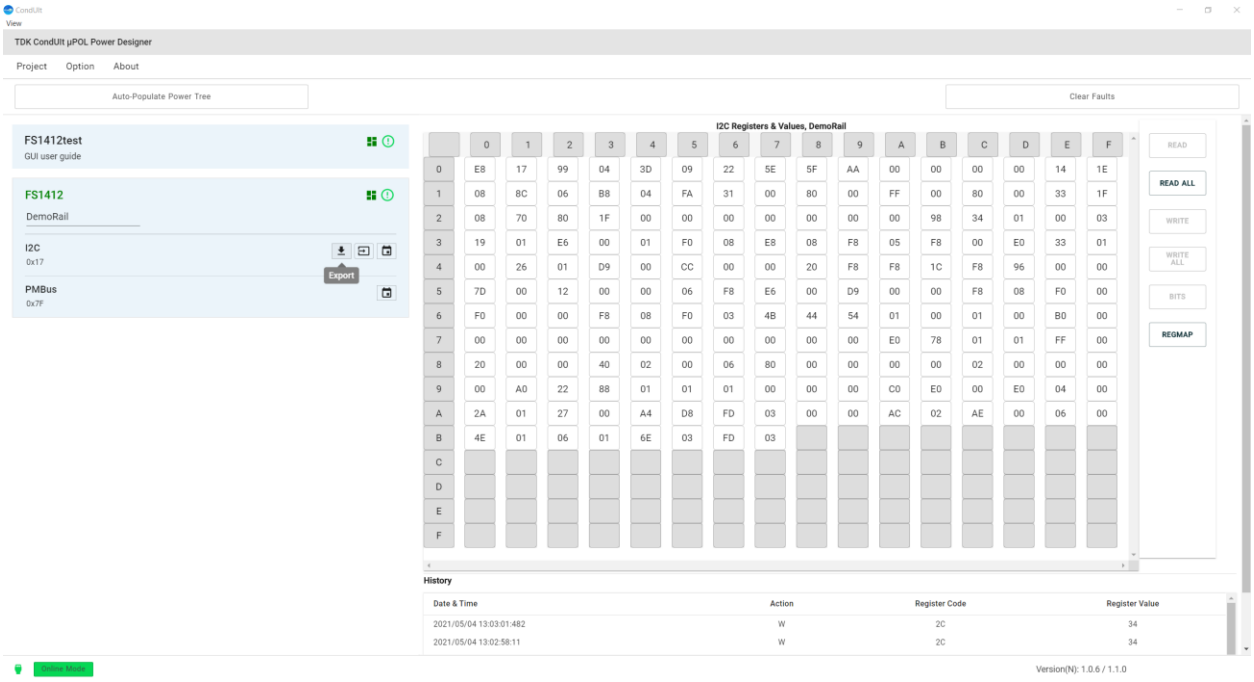




6. Exporting a configuration file:

This step illustrates the export/save of a register configuration file in text format once any changes have been made to any of the registers. In this illustration, to keep it simple, only registers 2C and 2D are written using the WRITE ALL button. Reg 0x2D is written with a value of 0x01 and Reg 0x2C is written with a value of 0x34. Note that single registers may be written using the WRITE button. Also a note about the BITS button: The BITs button is useful to change individual bit values within a register when different bits or groups of bits in a given 8 bit register serve different functions.


TDK CondUit µPOL Power Designer
Project
Option
About
Auto-Populate Power Tree
Clear Faults
FS1412test
GUI user guide
FS1412
DemoRail
I2C
0x17
PMBus
0x7F
I2C Registers & Values, DemoRail
READ
READ ALL
WRITE
WRITE ALL
BITS
REGMAP
Register Code - 0x2C
0 0 1 1 0 1 0 0
CANCEL
SAVE
History
Date & Time
Action
Register Code
Register Value
2021/05/04 13:13:31:422
W All
184 Written
184 Written
2021/05/04 13:12:10:536
R All
184 Read
184 Read
Online Mode
Version(N): 1.0.6 / 1.1.0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REGMAP
History
Date & Time
Action
Register Code
Register Value
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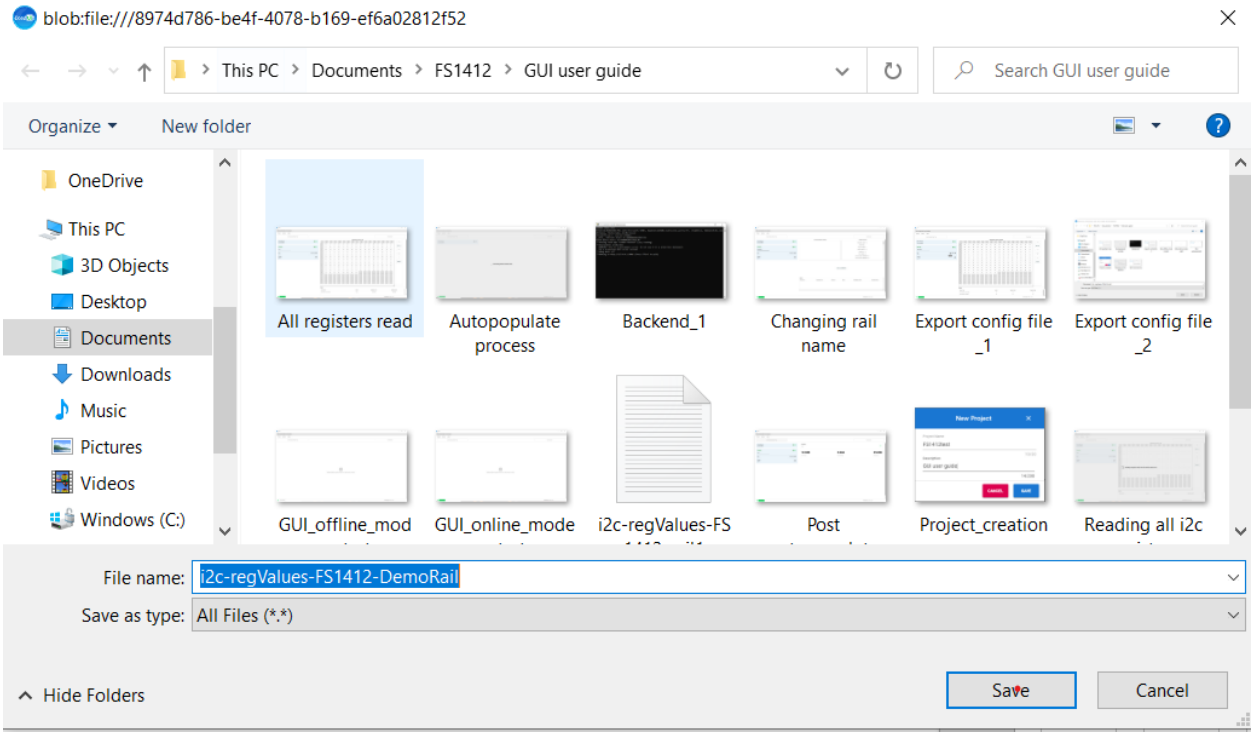
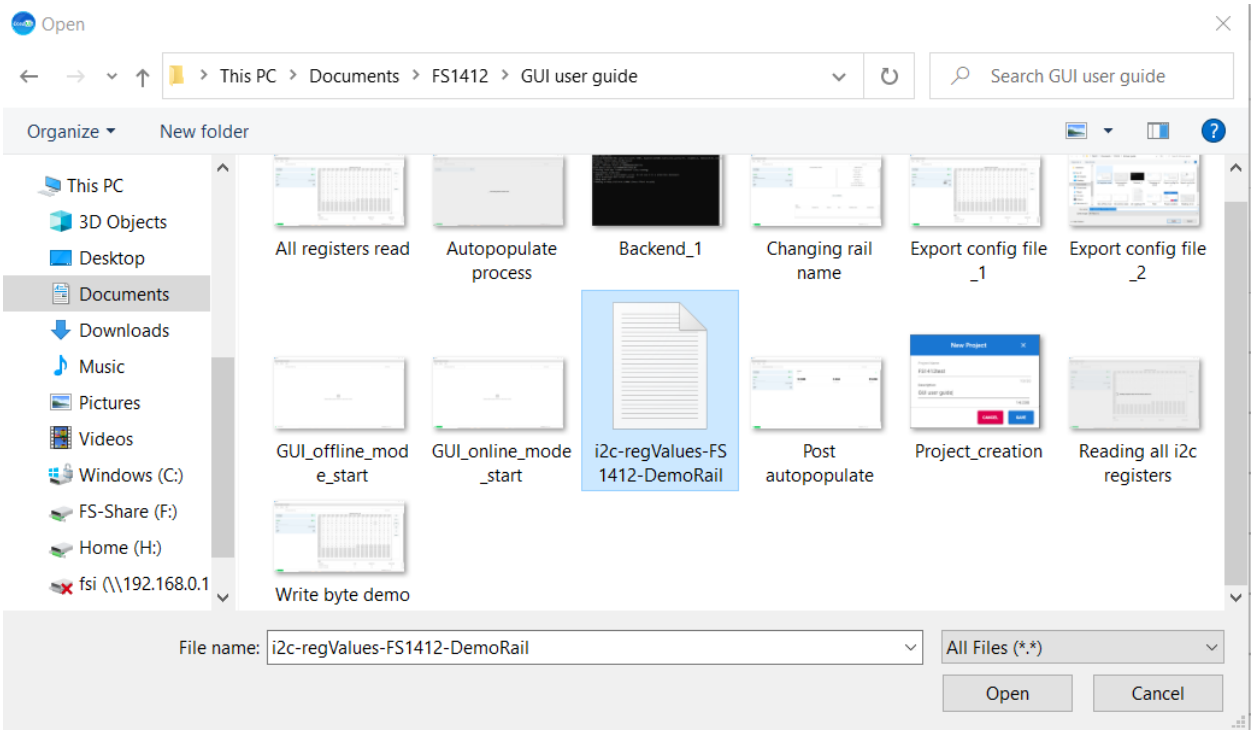
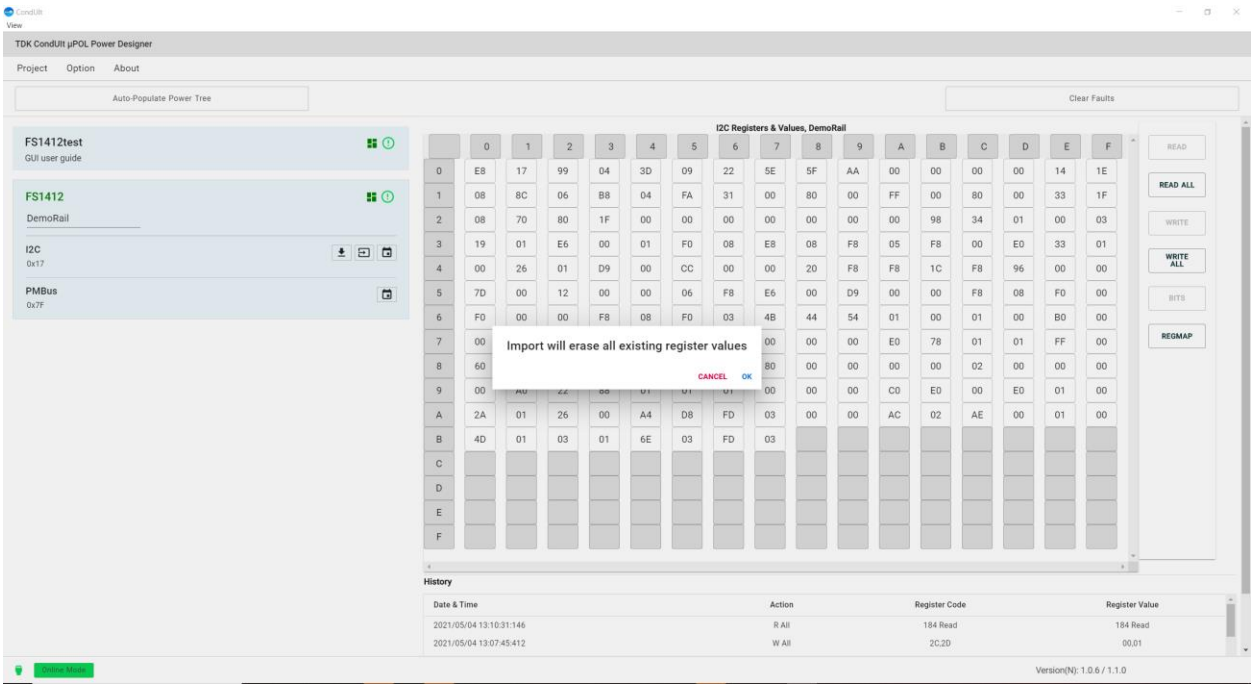
Online Mode
Version(N): 1.0.6 / 1.1.0

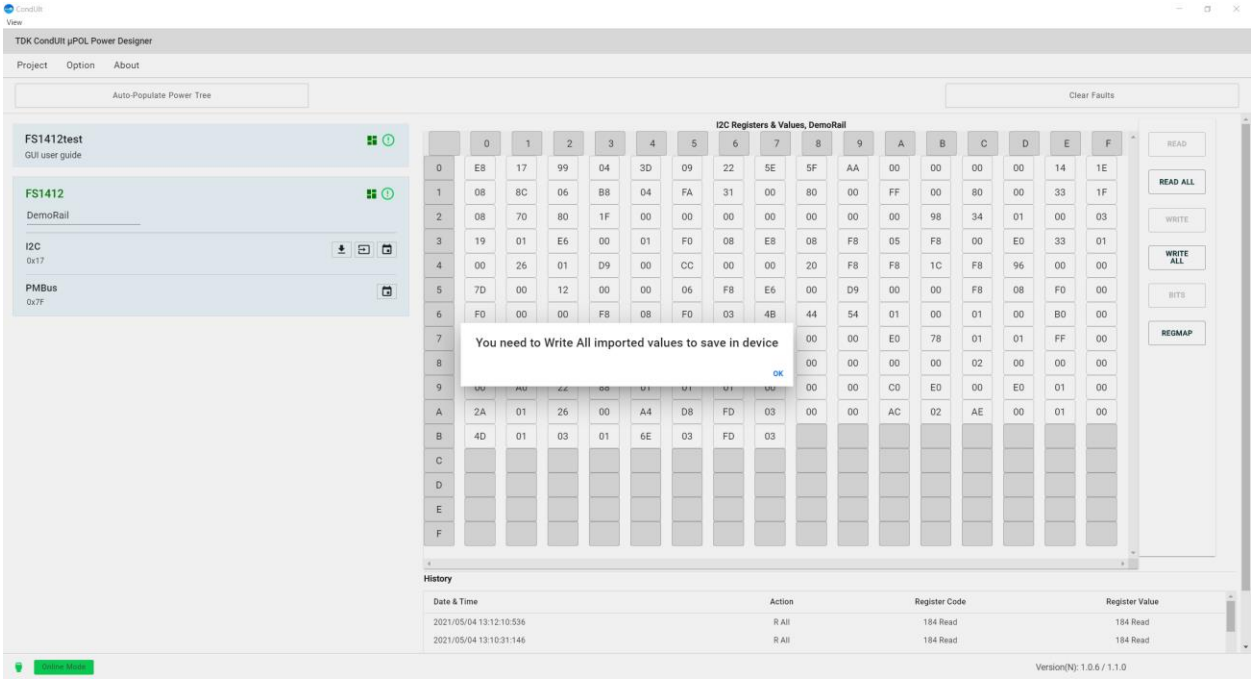


7. Importing a text configuration file into the registers:
   By clicking the import button, the user can browse and select the configuration file they wish to import in to the design/project.





Click OK

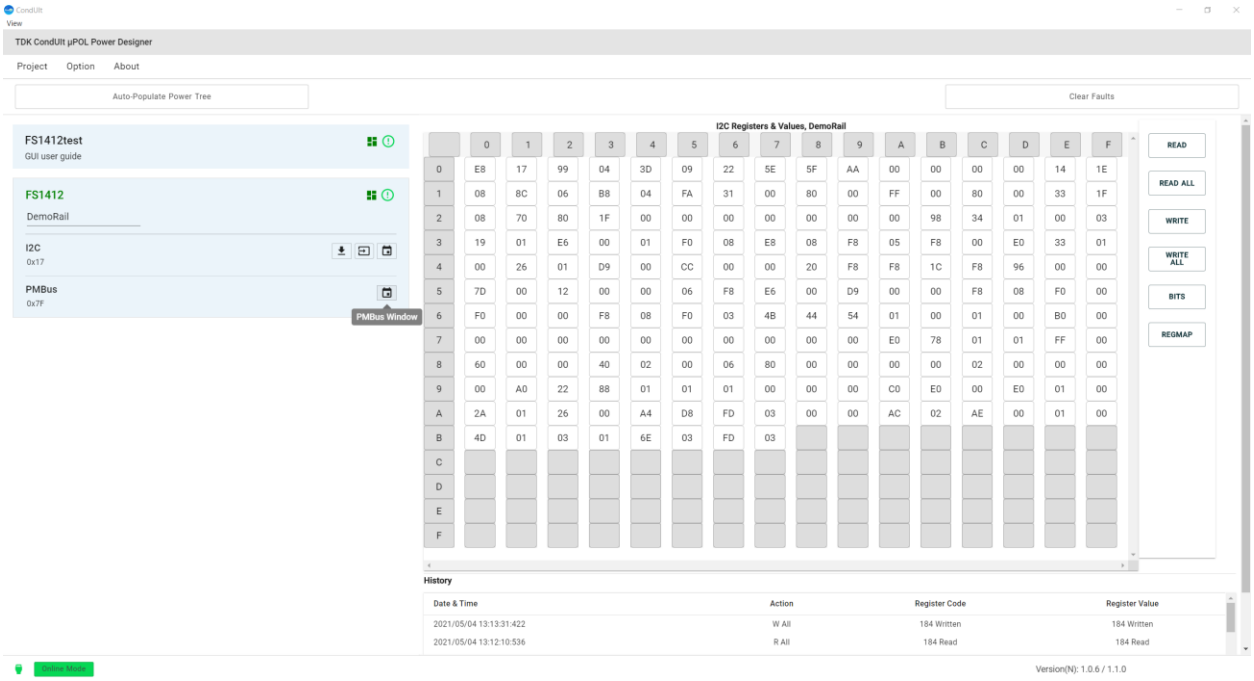


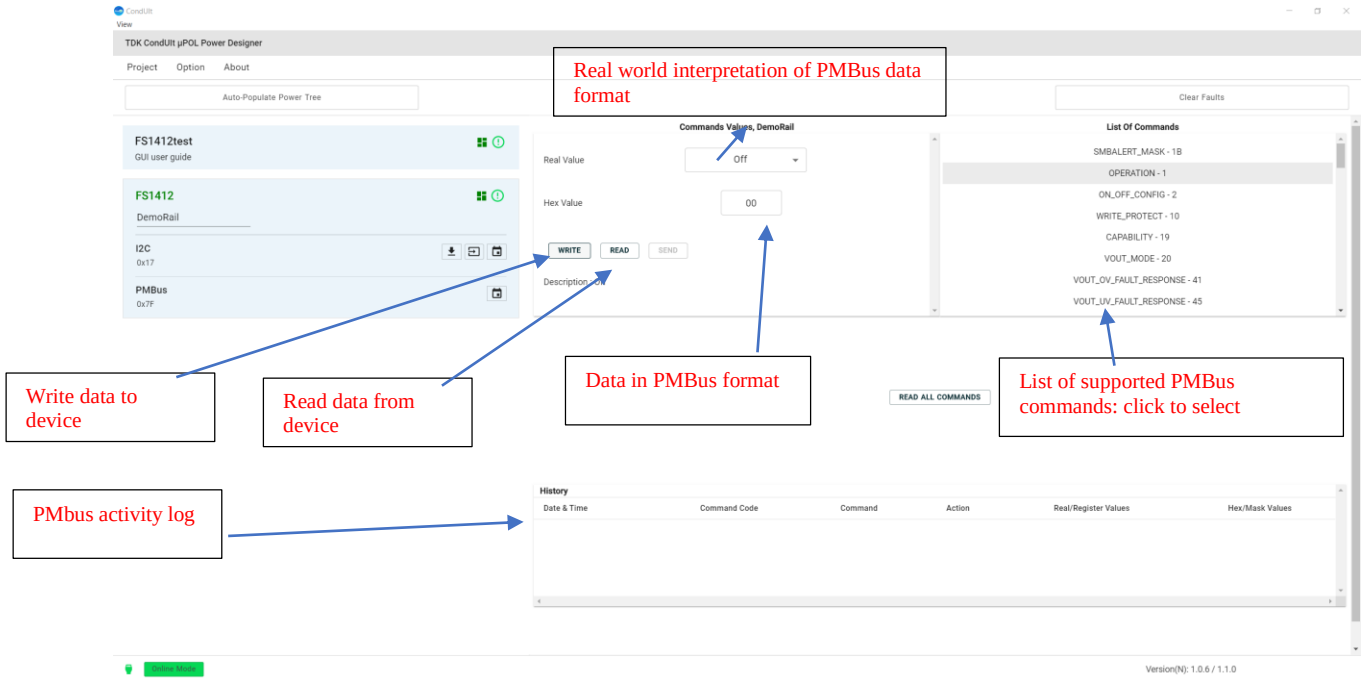
Click OK. Note that at this point the configuration values are part of the project but have not yet been written to the device registers. To do so, click WRITE ALL.

NOTE:

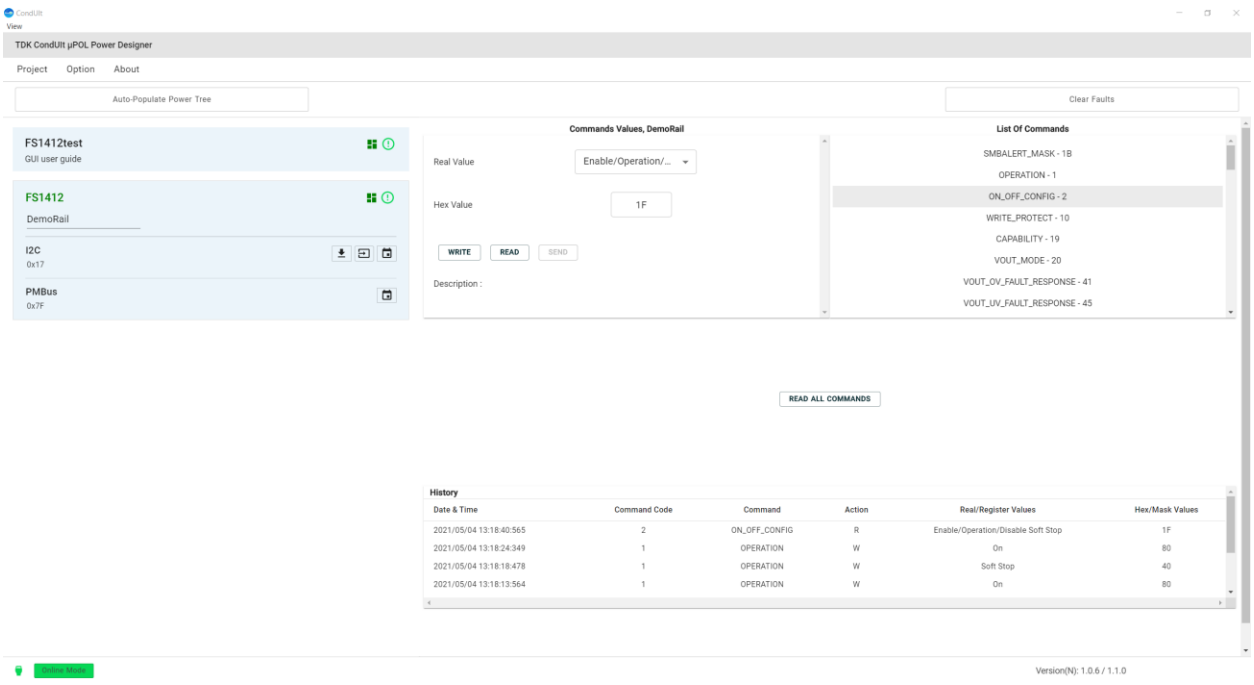
Note that any changes so far are still volatile and the device will revert to its defayult values if Vin/Vcc are cycled. To permanently store the values to the 8 times programmable OTP memory, please follow the steps in the appendix. In a future release of CondUIt this process will be made simpler by addition of a single Burn OTP button.

8. PMBus work area: Click the PMBus workspace button to bring up the PMBus work area.





See an illustration of command history below:



APPENDIX:

INSTRUCTIONS to burn OTP for FS1412/FS1409

1) Once all registers are written to desired values, read all the values into a configuration file as (register, data) pairs

2) Read Reg 0x92 to check number of available user banks

Reg 0x92[7:4]	Number of writes left
0001	9
0010	8
0011	7
0100	6
0101	5
0110	4
0111	3
1000	2
1001	1
1010	0

3) Apply 7.5V+/-0.25V to Vin pin

4) If number of writes left > 0, write 0x02 to reg 0x89

5) Read reg 0x93. If bit [1] is 1, the write to OTP succeeded. If this bit is 0, the write failed.

6) If successful, cycle Vin.

7) Verify step:

   Read all regs, compare with the values in configuration file, and verify that they Match

8) If fail steps 5,6,7, retry steps 1 to 4.

9) If fail step 5,6,7 again, debug.