XDP™ GUI Builder User Manual

About this document

Scope and purpose

This document aims to describe the XDP™ GUI Builder software and how it is used.

The XDP™ GUI is a tool which is used to test different configuration parameter values for XDP™ digital power products and, when a satisfactory configuration has been created, to burn the parameters into the chip's ROM. Up to four devices can be configured in parallel.

The XDP™ GUI Builder tool can be used to create a custom graphical user interface configuration for XDP™ GUI, coupled with an ICL8105 parameter configuration file.

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1 Important Safety Instructions and Legal Notes

Please read and understand the user manual and the following safety warnings. The design operates with unprotected high voltages. The direct connection of the open and unprotected board to a power supply poses a severe risk of electric shock. Extra caution must be exercised when handling the exposed conductor, terminals of components or charged capacitors (even after disconnection) as high voltages may present there or at other points across the board.

Therefore, the board may only be handled in a laboratory environment by persons with sufficient electrical engineering training and experience wearing suitable personal protective equipment such as eye protection. The customer assumes all responsibility and liability for its correct handling and/or use of the board and undertakes to indemnify and hold Infineon Technologies harmless from any third party claim in connection with or arising out of the use and/or handling of the board by the customer. The board is a sample to be used by the customer solely for the purpose of evaluation and testing. Due to the purpose of the system, it is not subjected to the same procedures regarding Returned Material Analysis (RMA), Process Change Notification (PCN) and Product Withdraw (PWD) as regular products. European legislation in relation to inter alia the restriction of hazardous substances (RoHS), waste from electrical and electronic equipment (WEEE), electromagnetic compatibility, as well as duties to comply with FCC or UL standards may not apply to the board and the board may not fulfil such requirements. Every prepared setup needs to be evaluated and the results need to be documented by the user before using this setup.

The final setup needs to be tested according to all relevant normative requirements. This means that the following actions are mandatory:

- Every combination of parameter sets/configurations needs to be fully evaluated by a technical expert. Make sure that the combination of parameters used matches your application's needs. It is the customer's responsibility to make sure that the chosen parameters meet all requirements, including safety-related requirements.
- Before using a parameter set, make sure that the system – including any programming/ OTP burning hardware – is fully tested and working as expected.
- Every parameter set is only valid for the dedicated evaluated hardware configuration, including PCB, Layout, used topology and all used electronic components (e.g. MOSFET, Transformer, ...)

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Note: Please ensure that the certification for isolation requirements is only valid for the .dp Interface Gen2 (without application cable and application connector).

Note: The user has to cover the whole application board including the cable and connector with a housing fulfilling isolation Class II requirements.

2 XDP™ GUI Builder Components

The GUI consists of two windows: one containing various customization tools and the mock-up of the final XDP™ GUI.

2.1 Tool Window

The tool window (Figure 1) consists of toolbars, the palette, the hint box, and the final GUI size control.

1. Toolbars
- project and parameter configuration file-opening/saving toolbar
- canvas grid configuration toolbar
- global font settings toolbar
- XDP™ GUI technical disclaimer, icon, name and version toolbar
- color settings toolbar

2. Palette
- image
- frame
- text box
- button
- slider
- combo box
- multi-input box

3. Hints box

4. Final GUI window size control

The window size includes window borders and title bars, measured for the current visual theme; may differ on the end-user system because of this.

XDP™ GUI Builder Components

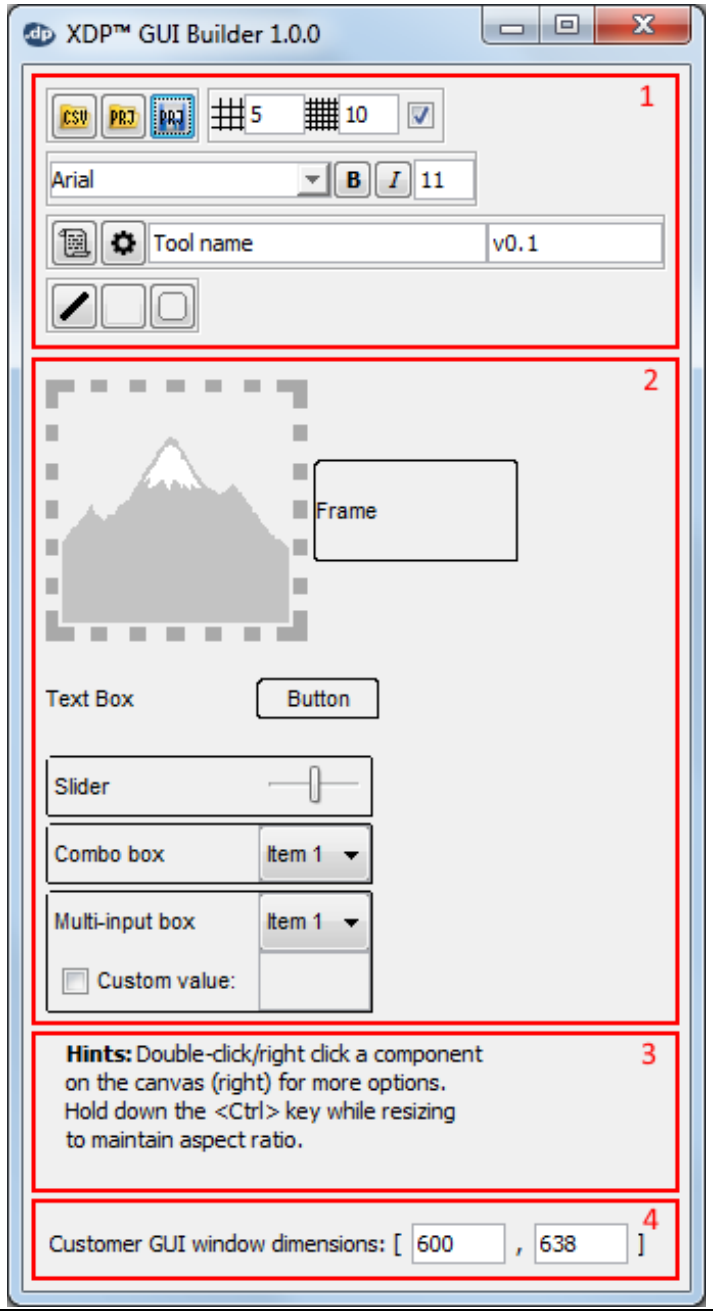

Figure 1 Tool Window

2.2 XDP™ GUI Mock-up Window

The mock-up window (Figure 2) consists of the following:

1. Inactive placeholders for non-customizable XDP™ GUI elements. Shown only for convenience.
2. The canvas onto which the custom GUI elements are dropped. This canvas has a dot grid so GUI elements can be easily aligned. This grid can be modified or removed completely using the grid toolbar in the tool window.

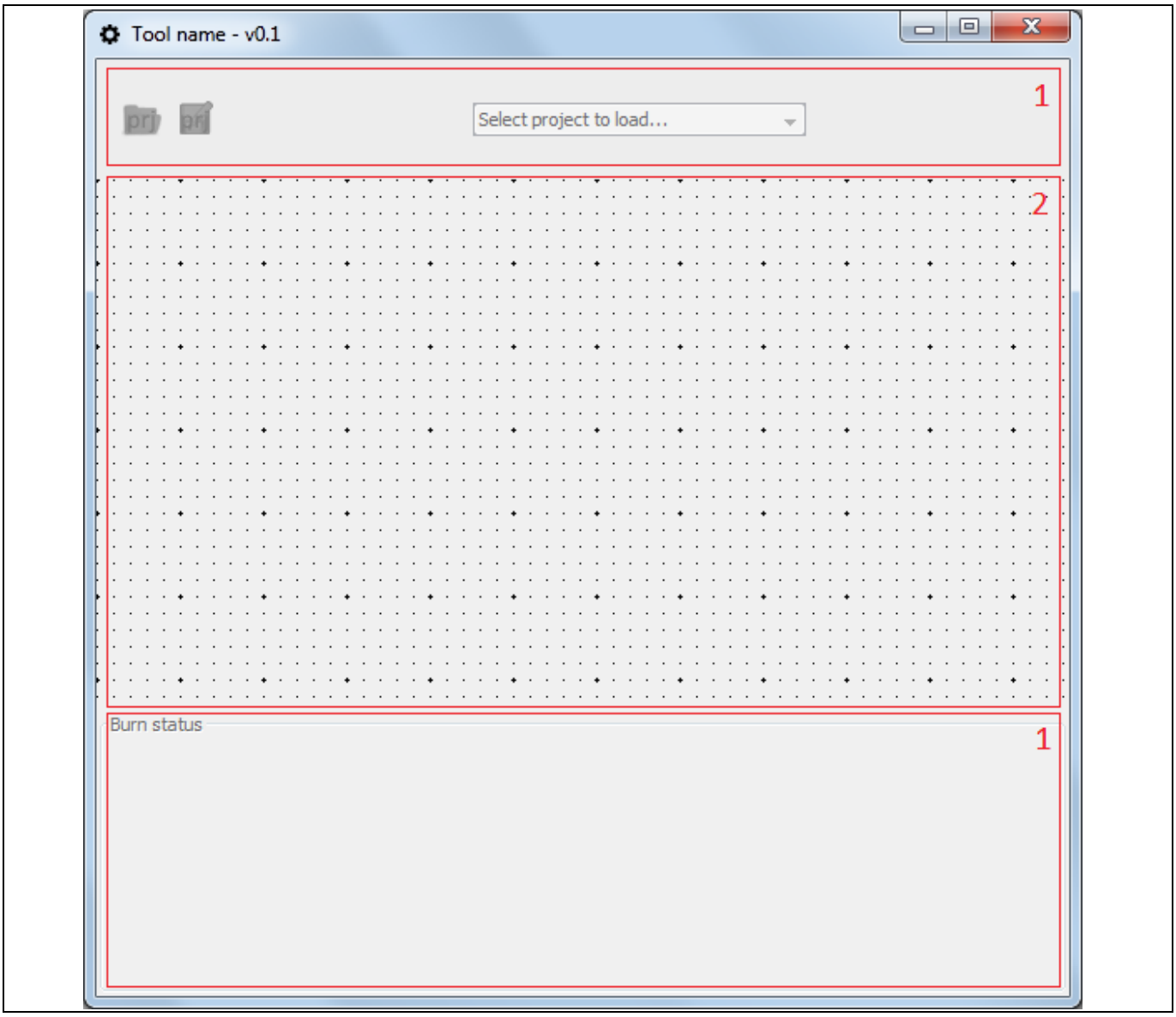

Figure 2 XDP™ GUI Mock-up Window

3 Getting Started Guide for XDP™ GUI Builder and XDP™ GUI Applications

3.1 XDP™ GUI Builder

Here is the typical usage scenario for XDP™ GUI Builder:

1. Double-click on XDP_GUI_Builder.exe.
2. The first step is to read the License Agreement and check the “I agree…” checkbox, then either click the “Accept” or the “Accept and do not show again” button.
3. Two windows show up next to each other.
4. Before we can place the elements from the left-side window (XDP™ GUI Builder) to the right-side window (Tool name) we must first either:
    - Open an existing project by clicking on the yellow PRJ icon and selecting a project file.
    - Start a new project by clicking on the yellow CSV icon and selecting a csv configuration file.
5. Drag and drop the required GUI elements from the palette on the left onto the canvas (right).
6. Arrange and resize the elements.
7. Associate parameters to the Slider, Combo Box and Multi-input Box elements by double-clicking on them and selecting the appropriate parameter name from the box labeled “Parameters:”.
8. For Sliders and Multi-input Boxes, you can also modify the range and resolution of the allowed values in the configuration window, opened by double-clicking the element.
9. Make sure you add at least one Button with “Burn configuration” selected as its action and that no input elements are left without an associated parameter.
10. Save the project file by clicking on the blue save icon.
11. At this point, you can close the Builder window and test the project with XDP™ GUI application.

3.2 XDP™ GUI

1. Double-click on XDP_GUI.exe.
2. Open a project by clicking on the yellow PRJ icon and selecting a project file.
3. Adjust the parameter values using Slider, Combo Box and Multi-input Box elements. (Note that only parameter values can be modified using XDP™ GUI)
4. Make sure that at least one .dpIfGen2 interface board is connected to the PC.
5. Click the Burn button.
6. Note the gray status buttons in the status area in the lower part of the UI have turned yellow.
7. The status buttons will turn green when burning is successfully finished and red otherwise.

4 Element-specific Options

4.1 Image

When the image element is double-clicked, a file chooser dialog is displayed and a custom image file can be selected. The Image will automatically be scaled to fit the working area. Take note that once an element is resized from its original aspect ratio, it can only be restored manually or by recreating the element. This is particularly important for the image elements.

4.2 Frame and Text Box

The frame and text box elements are much more complex. Double-clicking either opens a configuration window (see Figure 3) which allows adding multiline text to the element whose font can be customized. This text can be dynamic in the sense that parts of text may reflect the state of different parameters in the final GUI. In order to add a dynamic parameter reference, click the combo box in the “Add parameter reference:” section and select a parameter to include, either by typing a part of the parameters name or by scrolling. After the parameter is selected, you need to select the aspect of the parameter you want to show (value, min or max). Text will be added in the form of ${parameter_name}.value to the box and, in XDP™ GUI, these parameter references will be replaced by corresponding data (Figure 4).

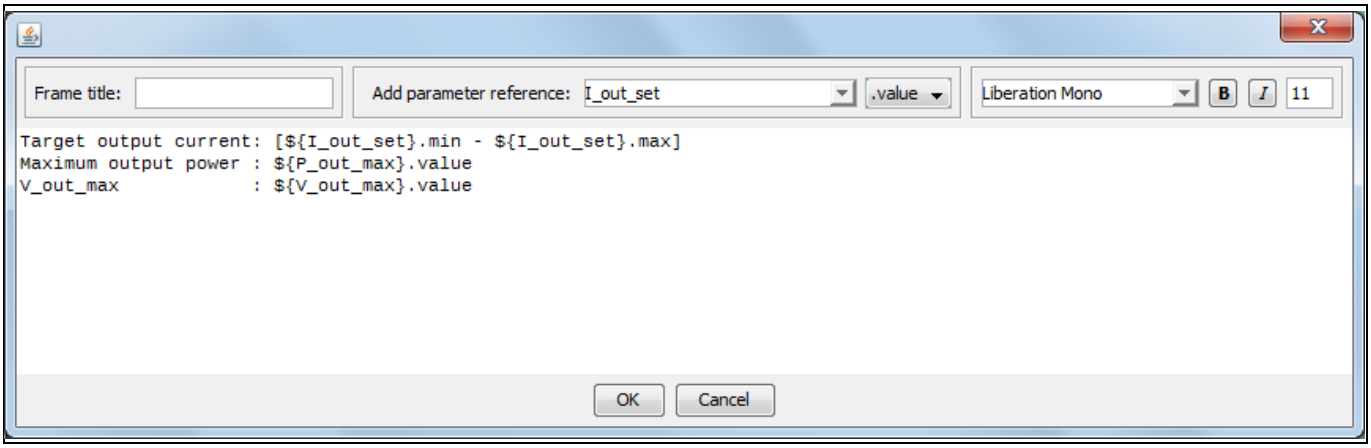

Figure 3 Frame Configuration Window

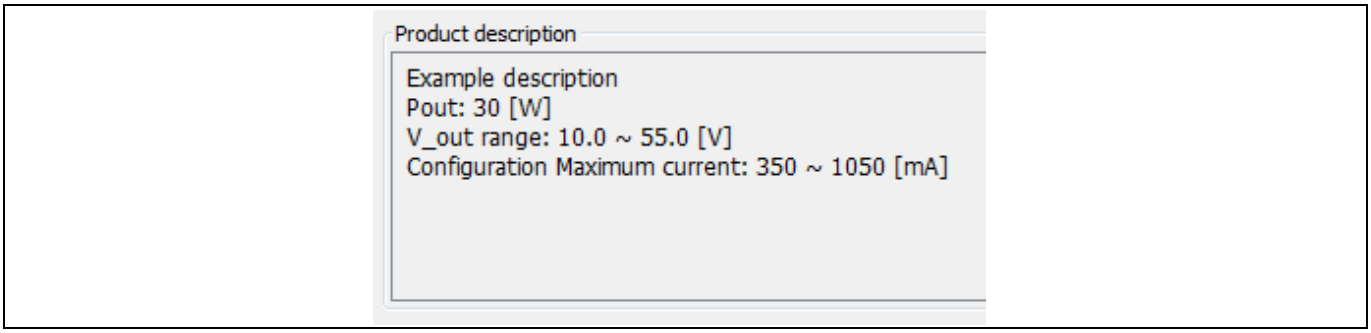

Figure 4 Product Description

The only differences between a frame and a text box element are that a frame element has a border and can have a title, as opposed to the text box element, which has no border and no title.

4.3 Button

Two types of buttons can be added to the GUI. One is a “Burn” button, which is used to program parameter values into the device’s ROM, and the other one is a “Test” button, which only downloads the values into RAM, for configuration testing purposes.

In addition to the button’s action, the text on the button can be changed (see Figure 5).

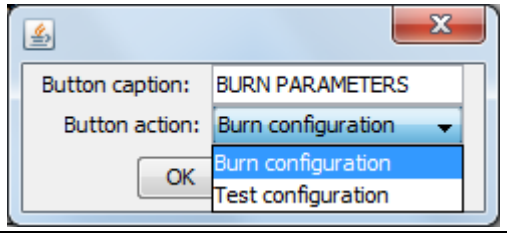

Figure 5 Button Configuration Window

4.4 Slider and Multi-input Box

Sliders and multi-input boxes are used exclusively with numeric parameters. The configuration windows for these elements are the same (see Figure 6).

Here it is advised to first select the parameter to be associated with the element. This is because the other options’ valid values vary between parameters. The name (alias) of the parameter can be changed to a more suitable one if needed. The absolute minimum and maximum limits for the parameters are shown on the right-hand side of the window. These are dictated by the parameter configuration file and cannot be violated. The “low limit”, “high limit” and “increment” values can be modified to further constrain the final GUI parameter value options so as to fit the project requirements. The format label on the bottom of the window hints at the precision allowed by the parameter configuration file and cannot be modified.

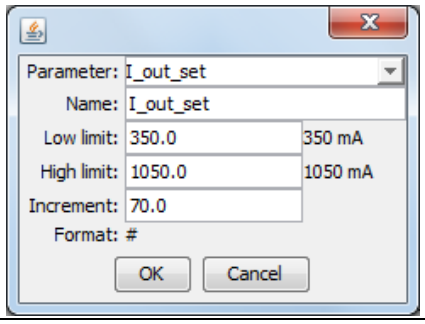

Figure 6 Slider and Multi-input Box Configuration Window

4.5 Combo Box

The combo box element is used for textual parameters only. The configuration window (see Figure 7) offers a parameter selection box and a name (alias) text field.

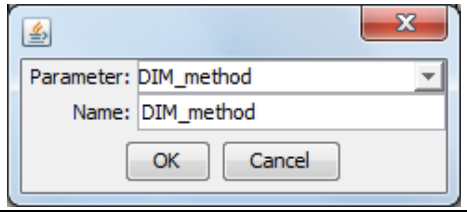

Figure 7 Combo Box Configuration Window

5 Example Project

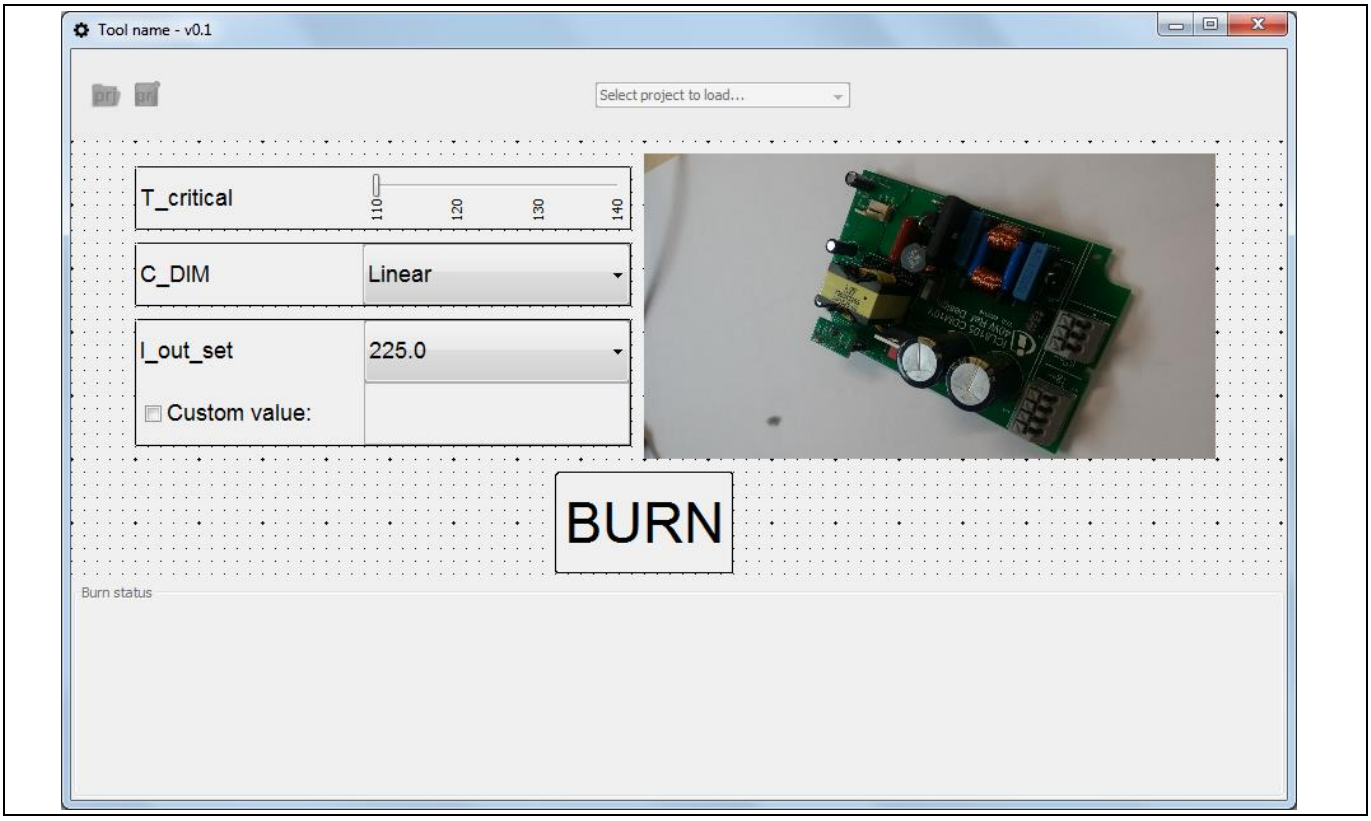

Figure 8 XDP™ GUI Builder Project Ready to be Saved

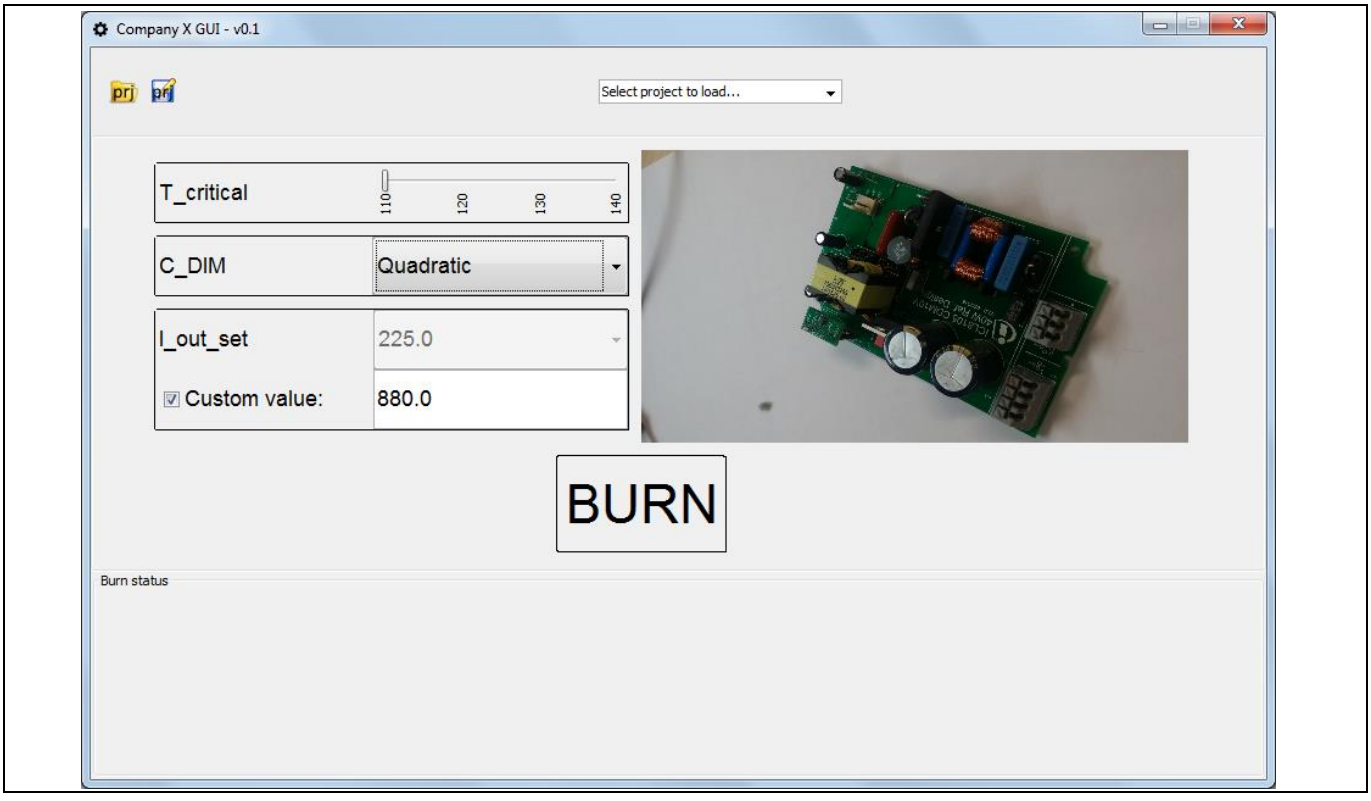

Figure 9 XDP™ GUI Builder Project Opened in XDP™ GUI and Burning-in Progress

6 XDP™ GUI

This chapter describes the workflow for burning configuration parameters into XDP™ digital power devices using the XDP™ GUI tool. This chapter can be used as a basis for the customer's own document for their customized burning tool.

6.1 Introduction and Purpose of XDP™ GUI

XDP™ GUI is a software tool which provides an easy way for the user to set or adjust a certain number of configuration parameters and burn them to up to four XDP™ digital power chips at the same time. The tool is distributed as a stand-alone executable.

The hardware setup required for this process is show in **Figure 10**. The recommended USB cables are shielded USB 2.0 cables (GTIN: 4007249784216).

Optionally, a USB hub with external power supply can be used if not enough USB slots are available on the PC.

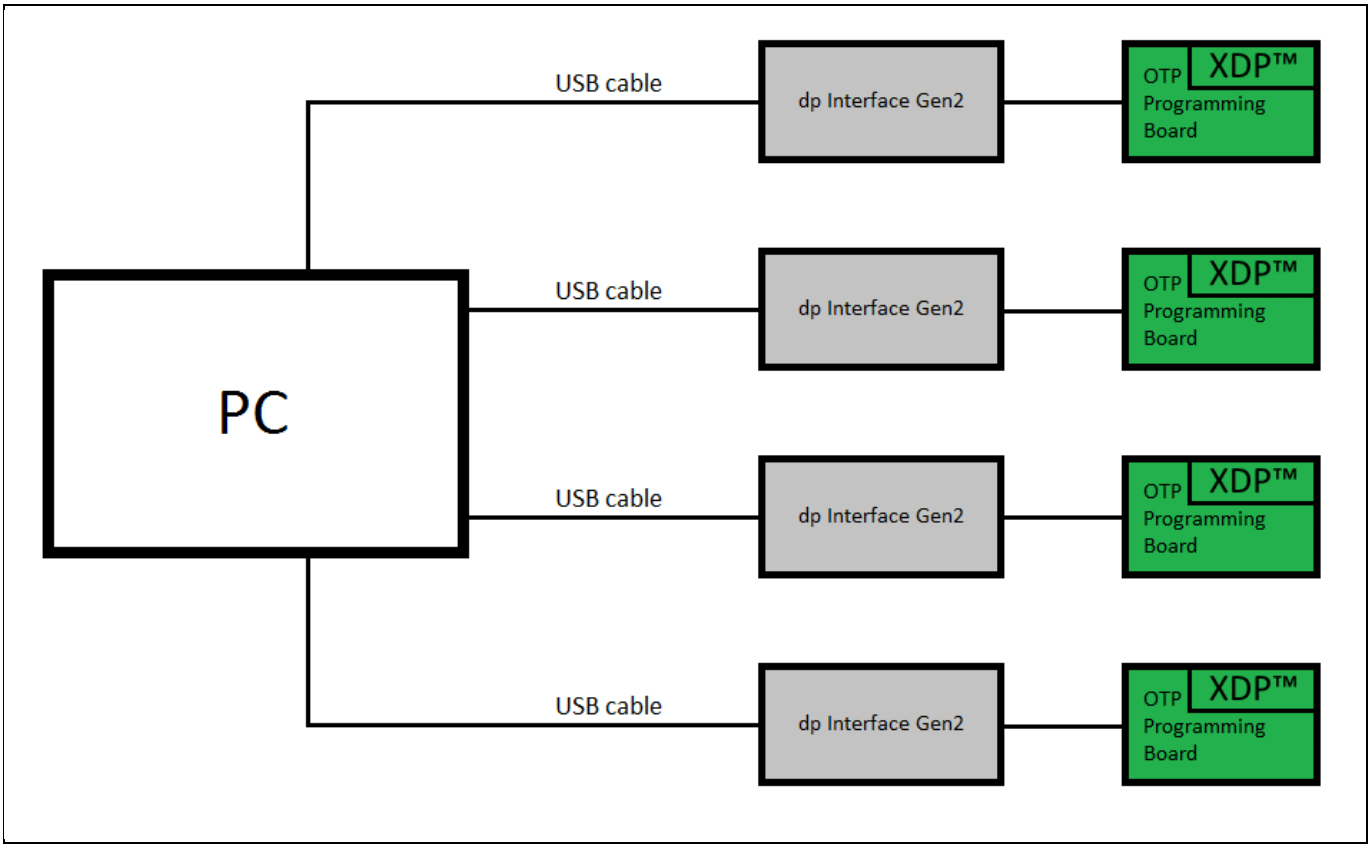

Figure 10 Block Diagram of the Typical ICL8105 Burning Setup without a USB Hub

Each project file of type *.dpcgprj contains information about the GUI layout and a parameter configuration file (CSV file).

A CSV file contains the full set of parameters and allows changing of some of them with XDP™ GUI.

Generally, the user selects the values for the parameters that are shown and then clicks the button for burning them to the ICL8105 chips. The typical parameter burning time is between 3 and 4 seconds.

After the parameters have been burned, the chips can be replaced with new ones for the next burn process iteration.

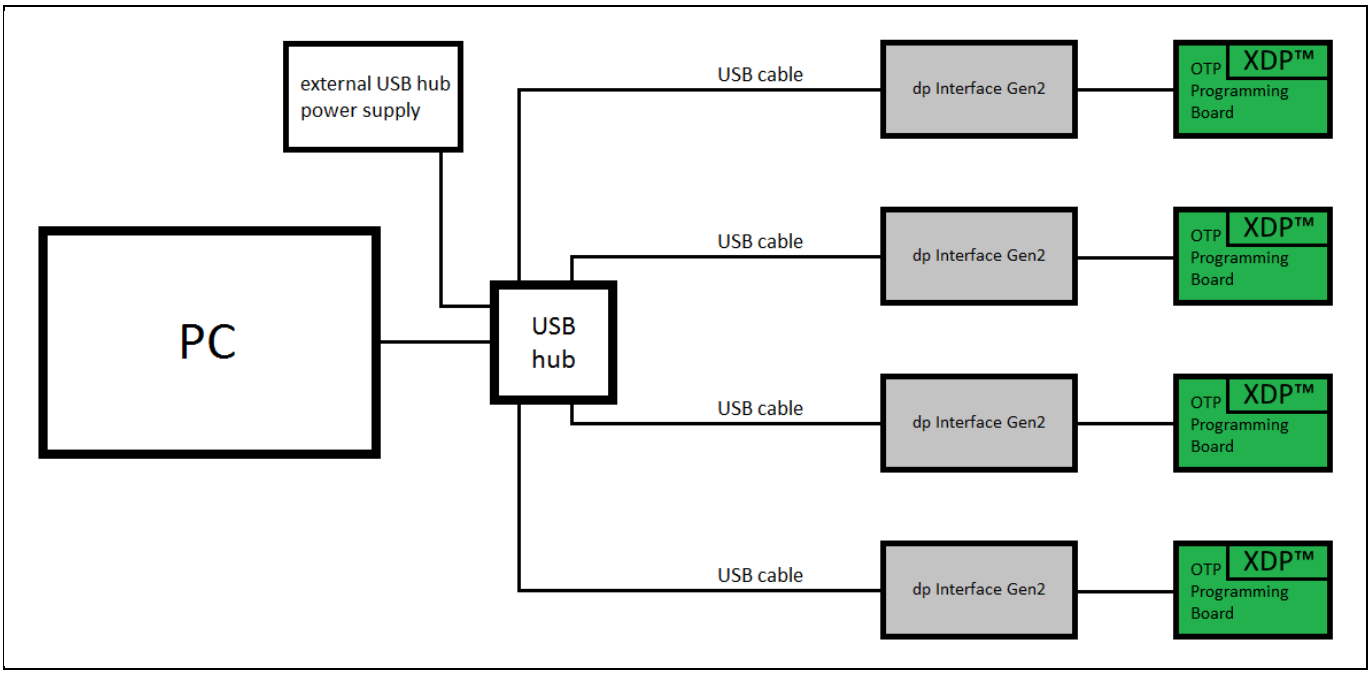

Figure 11 Block Diagram of the Typical XDP™ Burning Setup with a USB Hub

6.2 GUI Usage

6.2.1 Main GUI Layout

Figure 12 shows the main window of XDP™ GUI when two boards are connected. The central part of the window is blank because no project is loaded. At startup, as well as during operation, the software detects and indicates how many interface boards are connected.

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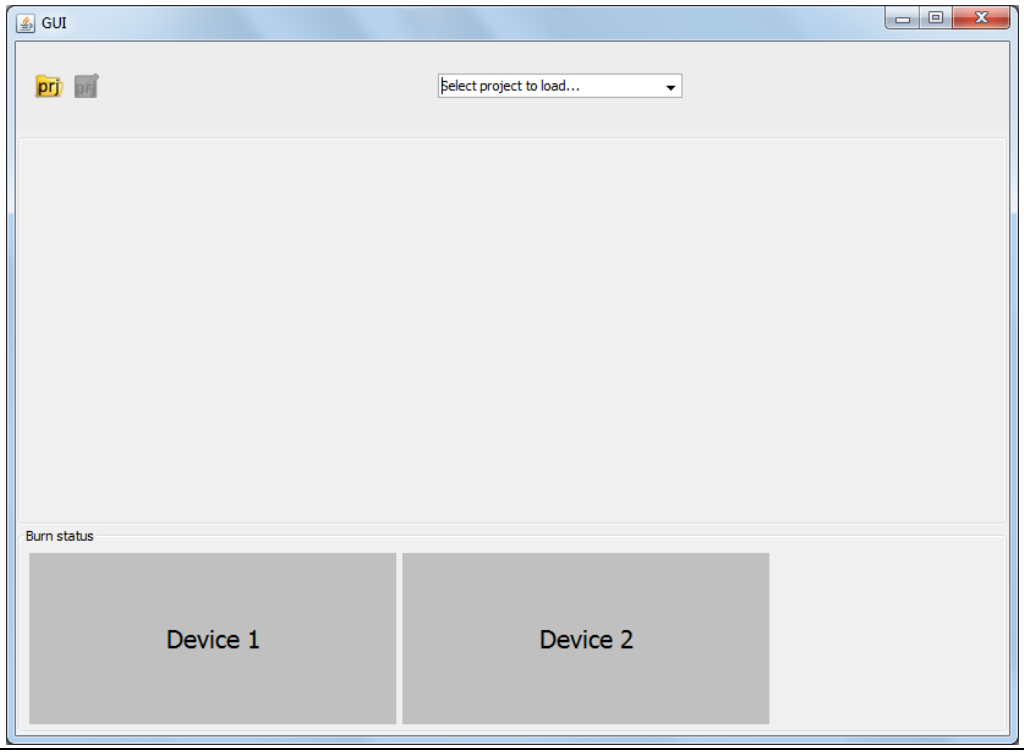

Figure 12 Main GUI Layout

6.2.2 Opening a Project File

Before burning, the user must open a project file with the dpcgprj extension. The project can be opened using the yellow “Open project file” icon on the toolbar or the dropdown box in the top center of the UI (**Figure 13**). The drop down box is filled based on project files available in the folder where the XDP_GUI.exe is located.

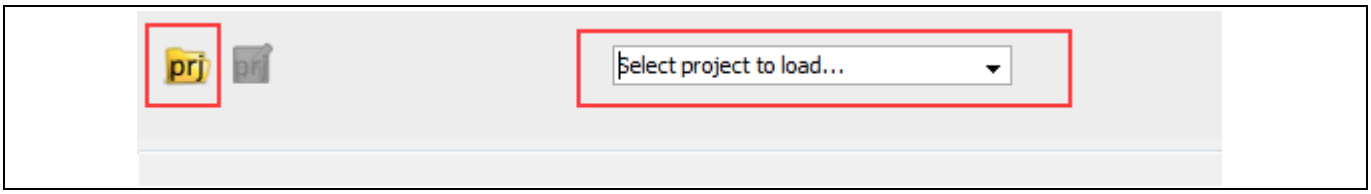

Figure 13 Project File Opening Options

Once the project is loaded, the project-specific UI will be displayed. An example is shown in **Figure 14**.

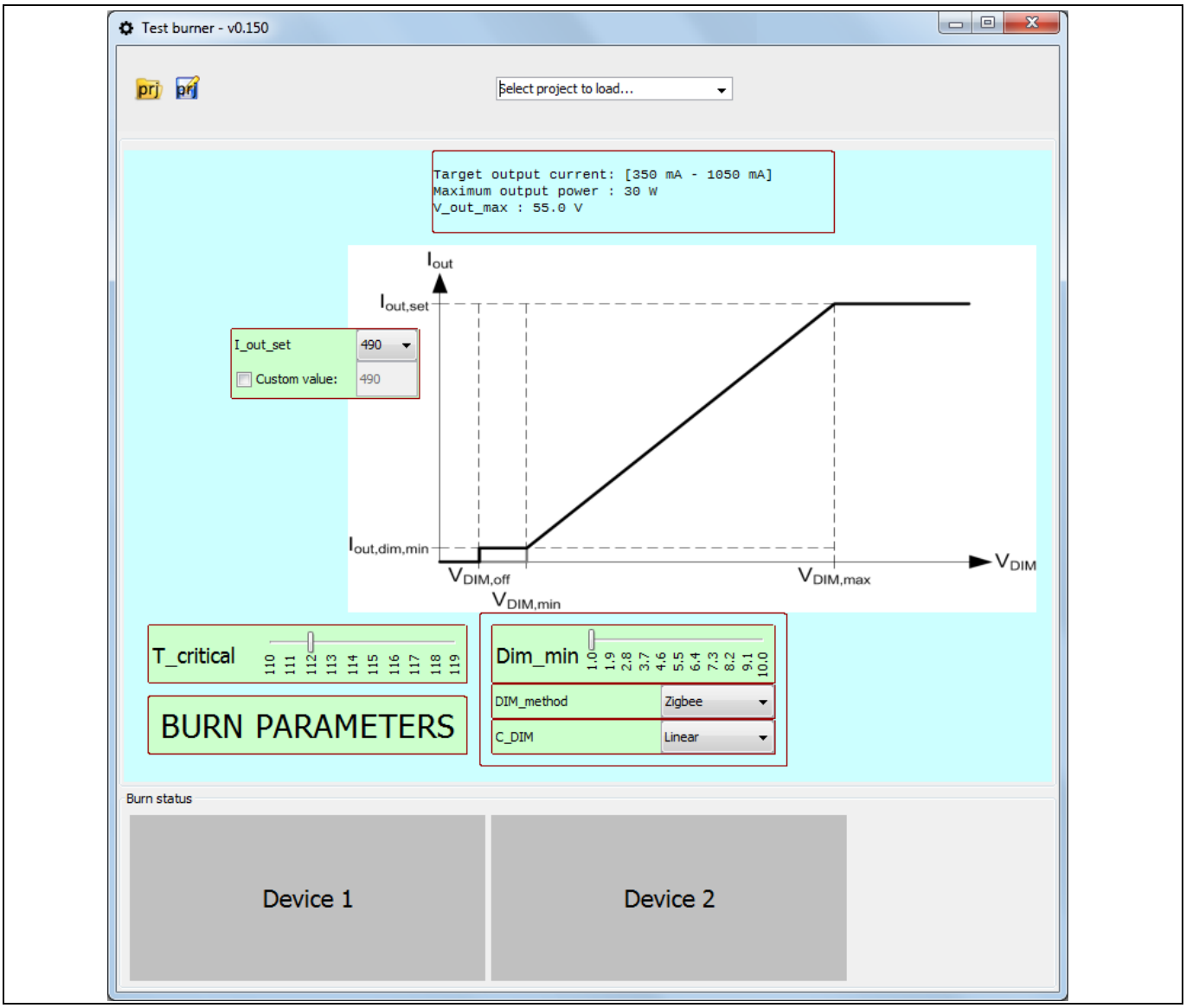

Figure 14 XDP™ GUI with Example Project Loaded

6.2.3 Burn Status

The bottom of the screen shows several status buttons, each one corresponding to one ICL8105 device (and .dp Interface Gen2). The status buttons are gray when the chips are ready for burning. Please note that no more than four interface boards (dpIfGen2) can be connected. The user should make sure the interface boards are connected and that all ICL8105 chips are in place, ready for burning.

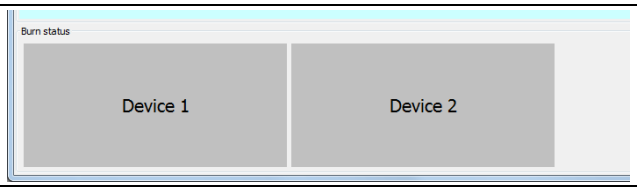

Figure 15 Burn status area

6.2.4 “BURN” Button

The button which starts the parallel burning procedure, usually containing the word “BURN” in its caption (see **Figure 16**), should be prominent, but this depends on the project layout. The project may also contain a variant of this button that is used for download to RAM only (“TEST”). In order to convert a “BURN” button into a “TEST” button, double click it and select “Test configuration” from the “Button action:” combo box in the dialog.

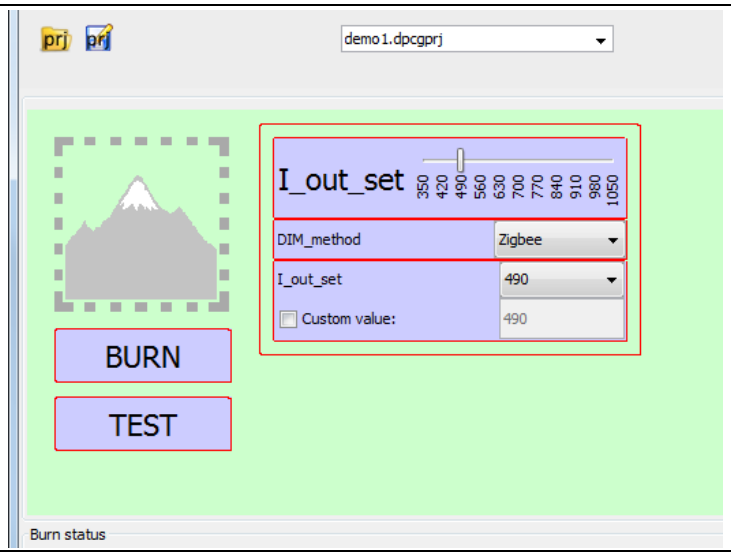

Figure 16 “BURN” and “TEST” Buttons

Once the user has configured the parameter values, they can test the configuration using the “TEST” button (if provided by the project) and, once the configuration is satisfactory, “BURN” it to the device.

When burning starts, the button turns yellow, and when the burning procedure is finished it turns to either green, red or blue color depending on the result:

- Green - burning succeeded
- Red - burning failed
- Blue - nothing to be burned (the configuration is the same as the one on the chip).

When the green status is displayed, the button color will revert to gray after a period of time, so as to streamline the burning process when many devices need to be configured.

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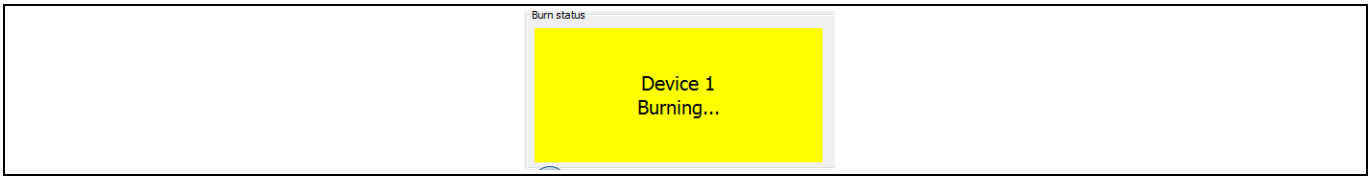

Figure 17 Burning in Progress



Figure 18 Testing Succeeded

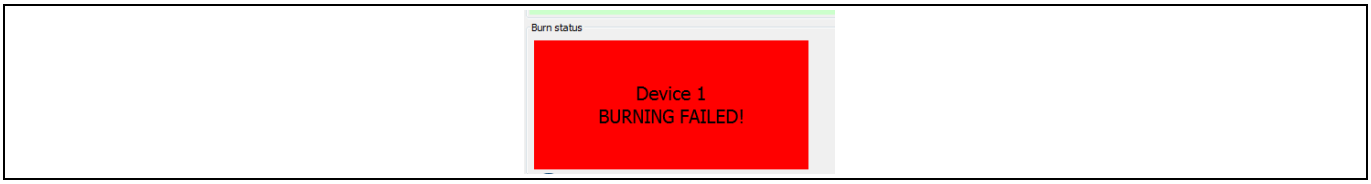

Figure 19 Burning Failed

If burning fails for one or more devices, message boxes describing the errors will be displayed. After dismissing the message boxes, they can be invoked again by clicking the corresponding status button. If you are not able to resolve the issue, please send a screenshot of this dialog to your Infineon contact.

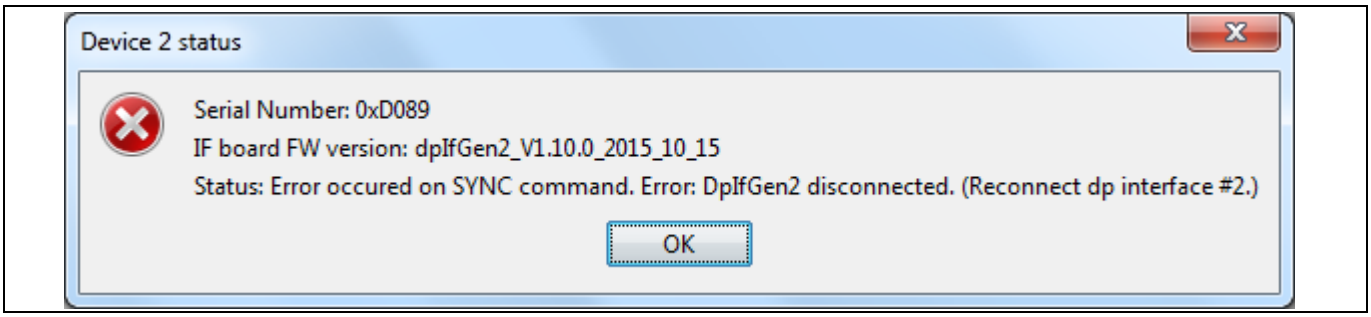

Figure 20 Failure Report Example

After burning, the chips can be replaced with the next set for burning.

6.2.5 Printing Current Configuration

Every configuration, burned or tested, is saved as a CSV file in a folder named “BurnedConfigurations” located in the same folder as XDP_GUI.exe. The configurations are stored regardless of whether burning succeeded or not. The XDP™ GUI software does not directly support printing, but these files can be opened using any editor or word processor and printed.

6.2.6 Appendix A – Error Messages

There are a number of errors that can happen during the burning process, most of which can have multiple potential root causes and thus different actions need to be taken.

1. The chip and CSV do not match; make sure the CSV file matches the chip version.
2. Communication problem; reconnect all USB cables (if the problem persists, the cable might need to be replaced).
3. The chip is faulty; replace the chip.
4. The chip might not be seated properly; reseat the chip.
5. The chip is full; replace the chip.

Following is the list of error messages that may be encountered during the parameter burning process. Next to them are listed the ordinary numbers of the root cause/solution pair in order of likelihood.

1. “Error occurred on SYNC command.” 4, 2, 3
2. “Error with APPEND_PATCHES command.“ 2
3. “Error while reading number of free patch.” 2
4. “Error occurred when attempting to set programming voltage on board <board_number>.” 2, 3
5. “Error while reading number of free patches on board <board_number>.” 2
6. “Invalid CFG_USER_ID_A value. (CSV: <csv_val>; CHIP: <chip_val>)” 1
7. “Not enough patch space left on device <board_number>. Replace the device and then try again.” 5
8. “Error with burn new patch (on board <board_number>). Different CRC detected: - dpICL8105ParameterBurner: <expected> - Firmware: <actual>.” 3
9. “New configuration is successfully downloaded to RAM, but encountered an error when trying to perform APP_BURNING (Phase one) command (on board <board_number>). Please check the firmware version of the connected device.” 2, 3
10. “New configuration is successfully downloaded to RAM, but encountered an error when trying to perform APP_BURNING (Phase two) command (on board <board_number>). Please check the firmware version of the connected device.” 2, 3
11. “Error occurred when attempting to set steady state voltage.” 2, 3
12. “Error when try to stop application on board <board_number>.” 2, 3
13. “Interface Board <board_number> is not connected.” 2

6.2.7 Appendix B – Frequently Asked Questions

1. ***How can I update my project with a new csv configuration file?***
   Assuming the project is open, click the “Open CSV” button. After you have selected a new csv file, a dialog will appear asking if you want to reset the GUI or reuse it. Click the “Reuse” button and the application will preserve the GUI layout, but the parameters will need to be selected for input boxes again. This is to ensure the user chooses the correct parameters for each box.
2. ***Do I need a special parameter configuration file or can I use the ones I used with .dp Vision?***
   If the end user requires being able to change some parameters in XDP™ GUI prior to parallel burning, special configuration files are needed. Otherwise, if no parameter changing in XDP™ GUI is required but only parallel burning of a parameter configuration already created in .dp Vision, any .dp Vision configuration file can be used. To acquire the special configuration files, refer to the Application package supplied by your Infineon contact.
3. ***How do I change the XDP™ GUI icon, as displayed by windows explorer?***
   While the title bar icon of XDP™ GUI can be changed using XDP™ GUI Builder, the icon of the XDP™ GUI executable must be changed using a third-party tool (e.g. Resource Hacker™; http://www.angusj.com/resourcehacker/). Using this tool, the icon replacement method is as follows:
   - Run ResourceHacker.exe
   - Open XDP_GUI.exe in Resource Hacker
   - Right-click “Icon” in the resource tree and select “Replace Icon…”.
   - Click the “Open file with new icon…” button.
   - Navigate to the icon you want to use (or exe, dll, shortcut you want to use the icon from).
   - Click “Open” and then “Replace”.
   - Click the “Save” icon in the toolbar.

Revision History

Major changes since the last revision

Page or Reference	Description of change
Chapter 3	Reworked
Chapter 6.2.7	Adapted FAQ

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