

XDP[™] digital power

About this document

Scope and purpose

The purpose of this document is to give a quick guide to operation of the XDPL8221 reference board for all power classes of LED lighting applications, and how to use the .dp Vision software to program the operating parameters of the digital controller XDPL8221.

Intended audience

This document is intended for anyone who wants to evaluate the XDPL8221 reference design for LED lighting.

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Tools

1 Tools

1.1 Required hardware and software tools

The required hardware and software tools are listed in **Table 1**. Please order all the hardware tools and download and install all the software tools.

i able I Required flatuware and software tools for getting started	Table 1	Required hardware and software tools for getting started
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Name	Ordering link	Description	Ordering content	
Please order all the hardware tools. Click on the links below:				
XDPL8221 reference board	Click on the link: device-Demo	XDPL8221 reference board for LED lighting	XDPL8221 reference board Driver for LED lighting Programming cable To connect the XDPL8221 reference board with the .dp Interface Gen2	
.dp Interface Gen2	Click on the link: IF-BOARD.DP-GEN2	Interface board to contro XDPL8221 from PC/notebook	.dp Interface Gen2 Interface for programming the XDPL8221 digital controller USB cable To connect the .dp Interface Gen2 with a PC	
Please download and inst	all all the software tools	. Click on the links below:		
Graphic User Interface (GUI) for read and write access to the parameters in the OTP	Click on the link and follow the instruction in the right column: <u>.dp Vision</u>	Accept the mentioned terms and conditions Click "Run" Install "dp.vision"	.dp Vision installer (*.msi)	
dpVision_folder_set-up Copies auxiliary files including the parameters .csv file to the respective directory structure	Click on the link and follow the instruction in the next column: REF-XDPL8221- U50W_ dpVision_ folder_set-up	On the website of the respective board, choose and open the appropriate .zip file (e.g. for the 50 W reference board, choose " REF-XDPL8221-U50W_ dpvision_folder_set-up " Double-click the *.msi file to install	XDP [™] digital power – dp Vision set-up with the following documents: XDPL8221 parameters .csv file XDPL images file XDPL bystem simulation and design creation tool .dp Interface Gen2 firmware	



Getting started

2 Getting started

Attention: The instructions of this manual work without V AC connection.

Attention: Before you connect the reference board to the mains, pay attention to the safety hints in the recent "REF-XDPL8221-U50W Engineering report Vx.x" thoroughly. Incorrect use of the reference board could be dangerous, and even life-threatening!

2.1 Hardware connection

Connect the .dp Interface Gen2 to a notebook/PC with the USB cable.



Figure 1 Connection between .dp Interface Gen2 and notebook

Note: Sometimes the detection of the .dp Interface Gen2 fails on USB3.0 ports. Therefore the use of a USB2.0 port might be necessary (which can be provided by an external USB2.0 hub if the machine only offers USB3.0 ports).



Getting started

Connect the .dp Interface Gen2 to the XDPL8221 reference board with the programming cable.



Figure 2 .dp Interface Gen2 connection



Figure 4 Connection between the .dp Interface Gen2 and the XDPL8221 reference board

Note: Please ensure that the connector of the programming cable is plugged in correctly: the colored wire indicates Pin 1 and should be connected to the V_{cc} pin on the XDPL8221 reference board.



Figure 5 Program connector V_{cc}, UART, GND

Pin 1 should be connected to the V_{cc} pin



Figure 5 Programming interface V_{cc}, UART, GND



Getting started

2.2 Parameter configuration

Start the .dp Vision program by clicking the ".dp Vision" shortcut on the desktop. The screen shown in Figure 6 will appear.





Load the XDPL8221 parameters configuration file (*.csv) in the folder (*HOME*) *Infineon Technologies AG*\.*dp* vision*Parameters* as shown in **Figure 8**. Please select the corresponding file (e.g., for a 50 W board choose the "XDPL8221_FWvx.x.x_50W" file).

Select the appropriate .csv file to open



Figure 7 Load the .csv file

After loading the parameters .csv file, a list of XDPL8221 configurable parameters will show (see the box on the left in **Figure 8**). These values can be modified by users and will turn blue.



Getting started

List of configurable parameters

Click on the message bar for detailed information

Infineon Technologies AG, .dp Vision V2.0.9.1 (Build 8092017142632)			- 0
File Functions Tools Help			
● ④ ⊗ □ ■ ■ ■ ■ ■ ■ 2 @ € ^{2brice} Nn- Gibrait-	cation Apartid: • Polid: •		Quick Start Guide [1]
Design parameters Parameter de	cription		
D Name Value Unit			
Output Set-Points			
Hardware Configuration			
PFC Protections			
Flyback Protections			
Adaptive Temperature Protection			
General Protections			
Startup and Shutdown			
PFC Control Loop Deplanatory (age		
Flyback Control Loop			
Dimming			
Fine Tuning Parameters			
		Important Cafeby Instructions and Logal Notas	
		important safety instructions and Legal Notes	
		The final extre needs to be tested according to all calculat normative requirements. This means that	
		the following actions are mandatony please also refer to the Documentation for further information:	
		and remoting account of a manual of the part of the pa	
		1. 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 huming bandware, is fully tested and working as proported.	
		 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,)	
		Functionalities of this tool are believed to be accurate, but are not guaranteed to be entirely free of	
		error. The functionality of this tool is subject to change for functional or performance improvements	
		without notice. Please make sure your tool is the latest edition. While the information herein is	
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		implied or statutory. Infineon Technologies specifically disclaims any implied warranty of	
		merchantability or fitness for a particular purpose.	
•			
Thursday, June 28, 2018 17:37:37 [Memory] Minimum: 6 MB, Current: 171 MB, Maximum: 171 MB			C approve at 2

Figure 8 Parameters file loaded in .dp Vision

Note: The message bar shown in Figure 8 provides detailed information. For further information, please refer to the "dpvision User manual".

Message description	×	
Quick Start Guide Click on Open Configuration Set icon (or choose Open item from menu File->Open) to load configuration file.		
Warning Info Message 1 of 1		
2		

Figure 9 Message description



Getting started

There are two options available to configure the IC based on the parameter values in .dp Vision.

- 1) Non-permanent for testing
- 2) Permanent for regular operation

1) Test configuration

This function will download the parameter values from .dp Vision into the XDPL8221 RAM memory space, and it will then be followed by an automatic IC start-up for application testing with the new configuration. As long as the board is activated, the V_{cc} is supplied.

Parameters configuration with this option is not permanent, because the loaded RAM content gets lost once the IC supply voltage is turned off or the IC restarts due to certain protections. For detailed information, please refer to the "dpvision User manual" in the "Documents" folder.

Table 2 shows the procedures for using test configuration function in .dp Vision to load the new parameter values in the RAM and test the application with the new configuration.

Step	Instruction	
1	Open configuration file and change parameter value (see example in Figure 8).	
2	Ensure that the primary supply voltage (AC input) to the board is not active and the hardware connection for configuration is OK based on Figure 2 and Figure 4 .	
3	Press local to supply power and establish a connection to the target XDPL8221. After this, XDPL8221 will be in configuration mode and the device status local should change to local.	
4 (optional)	Ensure that the LED output is connected to a load, and switch on AC input (e.g. 230 V AC). After this, the board will not start because XDPL8221 is still in configuration mode.	
5	Press It to test the configuration with target XDPL8221. After this, the IC will automatically start normal operation with the new configuration and the window below will pop up: Image: Configuration of the present of the	
6	Press "Close" on the pop-up window	
0		
7	To test another configuration, repeat these steps.	

Table 2 Test configuration procedures

Note: If there is any error between steps 1 and 7, refer to the message bar of .dp Vision for the error message. For further information, please refer to the "dpvision User manual".



Getting started

2) Burn configuration

As the XDPL8221 chip on the 50 W reference design PCB has a first full set of parameters in its One-Time Programmable (OTP) memory space, only changed parameters are written in the OTP memory. For detailed information, please refer to the "dpvision User manual" in the "Documents" folder.

Table 3 shows the procedures to burn a parameter update in .dp Vision into the OTP memory.

Table 3	Burn configuration procedures	
Step	Instruction	
1	Load configuration file (see example in Figure 8).	
2	Modify the parameter value needed, then press [File] >> [Save] or [File] >> [Save as], to save the configuration file. Otherwise, proceed to step 3.	
3 (optional)	Disconnect or turn off AC input voltage and check the hardware connection for configuration, see Figure 2 and Figure 4 .	
4	Press 🕲 to supply power and establish connection to the target XDPL8221. After this, XDPL8221 will enter configuration mode and the device status 🧕 should change to 🧕.	
5	<text><text><text><image/></text></text></text>	
	Note: If the parameter configuration is equivalent to the pre-existing parameters, the XDPL8221 will not burn them in the OTP memory.	
6	Press "Proceed" or "Yes" to burn the configuration. After this, a window pops up indicating success.	
7	Press "OK" on the pop-up window then disconnect the programming cable from the board connector and test the application, if needed.	



Getting started

Revision history

Major changes since the last revision

Page or reference	Description of change
All	First release

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