DLP® Pico™ Display and Light Control API (DLPC-API) User's Guide

This user's guide describes how to install and get started with the DLPC-API.

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1 Introduction

The DLP® Pico™ Display and Light Control API (hereafter referred to as the DLPC-API) is an API (application programming interface) intended to control the DLPC34xx chipset. This user's guide provides a brief introduction and overview of the DLPC-API. For the latest and complete documentation please download the API and view the associated HTML help files. These additional HTML help files are stored in the doc folder of the downloaded API.

The DLPC34xx chipset is composed of the DLPC34xx controller, an associated DMD, and an associated PMIC. The API only explicitly supports the DMDs and controllers mentioned in the HTML help files; however, the API has some level of compatibility with all DLPC34xx controllers.

The DLPC-API is a collection of C-language routines that provide the fundamental software pieces to use a DLP system in a display or light control application. Specifically, these routines can be used to configure and communicate with the DLPC34xx controller. Without the functions provided by this API, the user would be required to implement controller I^2C commands in their own software. This API eases development effort and reduces time to market. The API is primarily intended to communicate with the controller with a Windows PC. However, the provided source code enables the user to port the API to a different target platform (such as Linux, microcontroller, etc) and integrate the code into a custom solution.

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2 Setup and Installation

2.1 Installation

1. Navigate to http://www.ti.com/tool/DLPC-API to download the API.
2. Extract the downloaded ZIP file.
3. Run the installer (.exe file). This installer is required in order to agree to the license terms. After the installation is complete, the files are extracted into the specified folder for use.
   a. On the welcome page, click **Next**. It is generally not needed to close other applications.

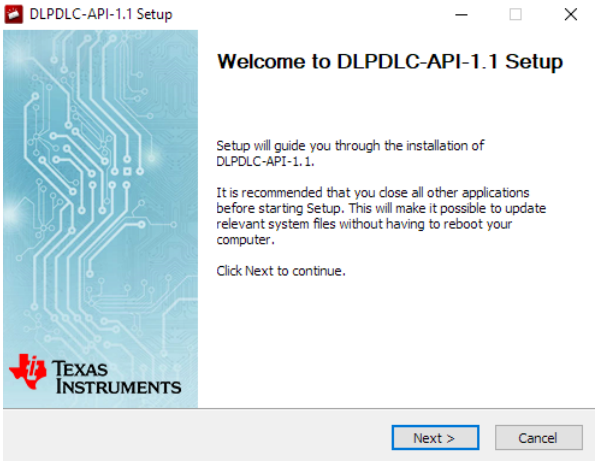

Figure 1. Installer Welcome Page

   b. Read the license agreement. If you accept the terms, click **I Agree** to continue.

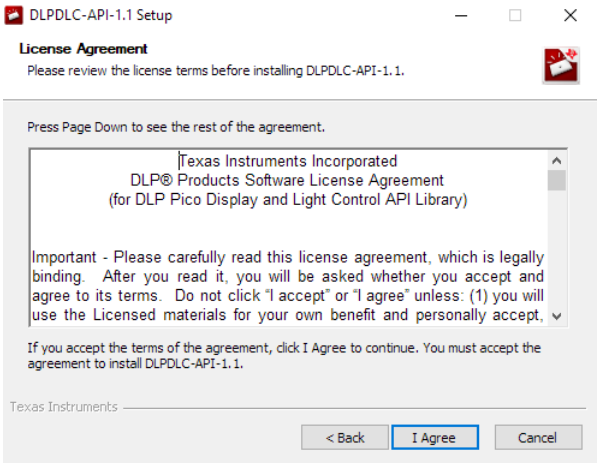

Figure 2. Installer License Agreement

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c. Enter a destination folder path in the *Choose Install Location* dialog box. This is the location where the software stores source files such as C code, documentation, and example code.

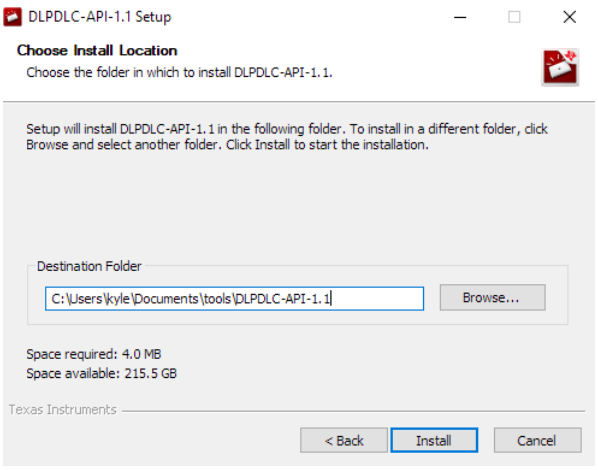

Figure 3. Installer Destination Folder

d. Click **Install**. The installation makes the API available at the selected installation directory. If desired, the HTML help files and installation directory automatically open.

e. Click **Finish**.

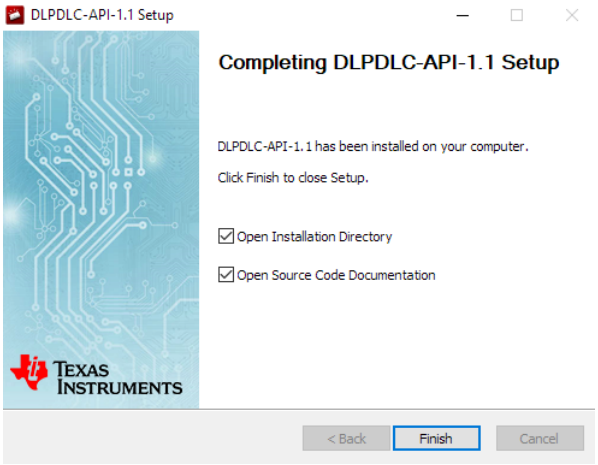

Figure 4. Installer Completion

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4. At this point, the API files are available in the specified folder.

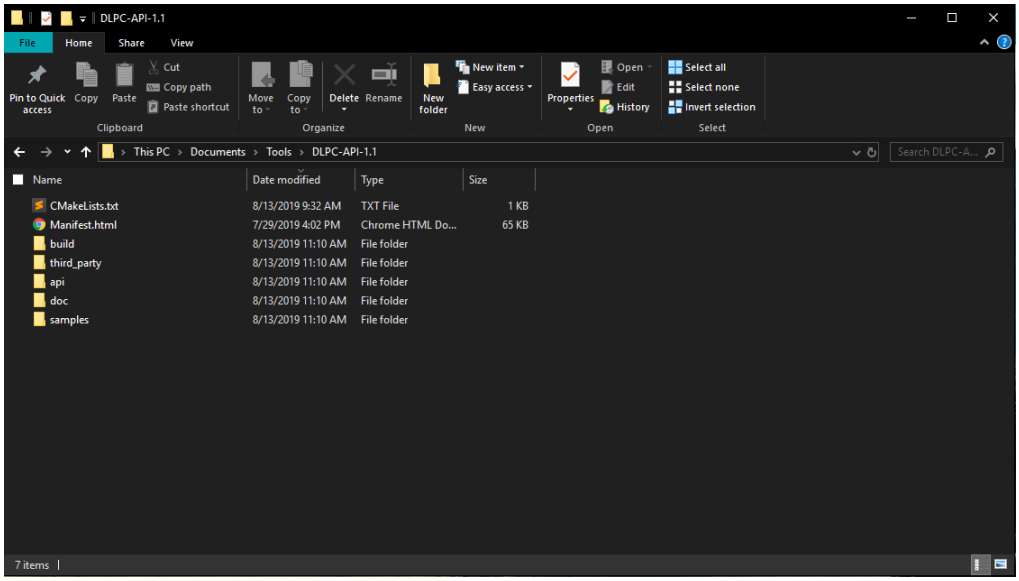

Figure 5. Example API Files

5. Review the index.html help file for further code documentation. The help file may have automatically been opened during the final installer page, and can also be directly accessed in the doc folder.

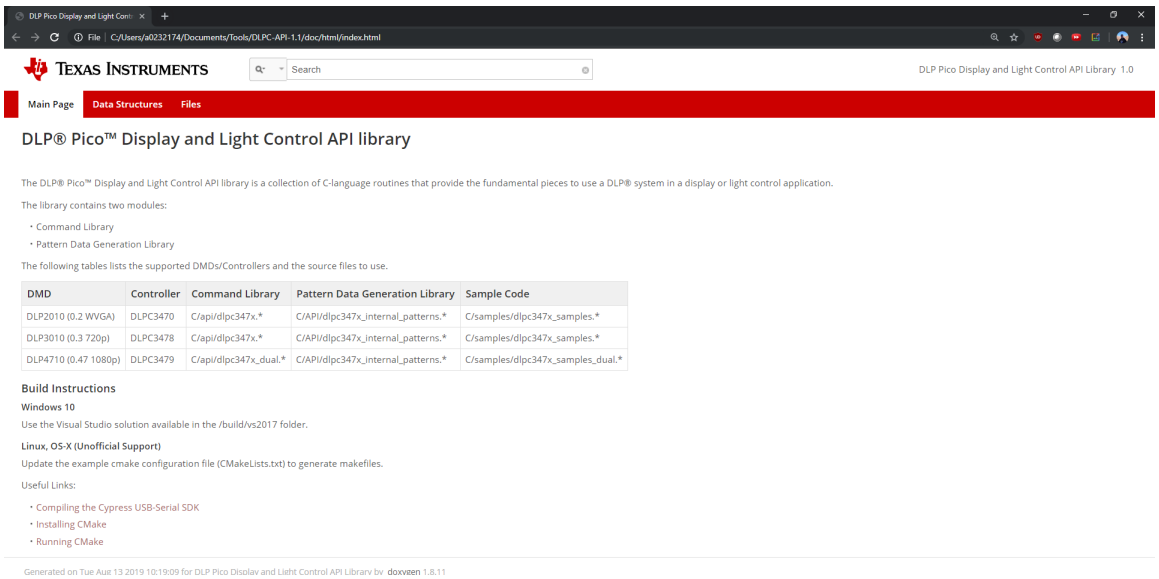

Figure 6. Example HTML Help File Documentation

2.2 Setup with Windows 10 and Visual Studio

The following setup shows how to utilize the provided Microsoft Visual Studio solution on a Windows 10 PC. It assumes a DLP3010EVM-LC is used; however, similar instructions can be followed for other EVMs (evaluation modules).

1. Navigate to the folder in which the DLPC-API was installed. Then go to the build/vs2017 folder and select the Visual Studio solution (.sln) file.
2. You may see a prompt offering the option to retarget the solution to a different version of the Visual C++ platform toolset. The target platform is 10.0.17763.0; however, it is likely other 10.0 builds can operate correctly.

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3. Connect the EVM to the PC, provide power, and turn it on.
4. Select the dlpc347x project file and then select **Local Windows Debugger** to build and run the project.
   - When using EVMs with two controllers, such as the DLP4710EVM-LC, use the dlpc347x_dual project file. By default, the project runs with the DLP3010EVM-LC. To use a different EVM, the defaults need to be changed. The dlpc347x_samples.c file (dlpc347x_dual_samples.c file for a system with two controllers) must be modified as appropriate.
5. The program connects to the EVM, sets up internal patterns, and begins displaying patterns.
6. The dlpc347x_samples.c file (dlpc347x_dual_samples.c file for a system with two controllers) can be modified as desired. Pattern functions are not available in "display only" EVMs (non-Light Control EVMs).

2.3 Setup with non-Windows Systems

The DLPC-API is currently only officially supported on Windows 10. However, one is free to port it to other systems as there are no known technical limitations. A CMakeLists.txt sample file is provided to assist in the process of porting to other environments. A different version of the Cypress SDK may be needed for specific systems. For the latest official support, always refer to the HTML help file.

3 Cypress and I²C

All DLPC-API code that configures the DLPC34xx controller is ultimately translated into I²C commands. This is because the only configuration interface available to the DLPC34xx is the I²C interface. However, most DLP Pico EVMs make use of a Cypress IC to communicate to a PC over USB. The Cypress IC converts the USB communication to the appropriate I²C commands which are then sent to the DLPC34xx controller. The required Cypress libraries are provided as part of the DLPC-API along with various functions to enable easy communication.

If the DLPC-API is run from a PC that is connected to the EVM over USB, the communication functionality does not need to be modified. If however, the code is ported to another system that directly connects to the DLPC34xx controller by I²C, a new communication protocol needs to be implemented.

4 Conclusion

The DLPC-API enables faster development of the DLPC34xx chipset. The API can be used for both development and in an end user application. The modular code enables a wide variety of custom applications. For assistance please visit e2e.ti.com.

5 Related Links

Table 1. Related Links

PART	PRODUCT FOLDER	TECHNICAL DOCUMENTS	TOOLS & SOFTWARE
DLP2010	Click here	Click here	Click here
DLP3010	Click here	Click here	Click here
DLP4710	Click here	Click here	Click here
DLPC3430 and DLPC3435	Click here	Click here	Click here
DLPC3433 and DLPC3438	Click here	Click here	Click here
DLPC3439	Click here	Click here	Click here
DLPC3470	Click here	Click here	Click here
DLPC3478	Click here	Click here	Click here
DLPC3479	Click here	Click here	Click here

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