



INTEL® REALSENSE™ D400 SERIES

DEVICE FIRMWARE UPDATE (DFU) TOOL FOR WINDOWS

INSTALL AND USER GUIDE

VERSION 1.4

Legal Disclaimer

INFORMATION IN THIS DOCUMENT IS PROVIDED IN CONNECTION WITH INTEL® PRODUCTS. NO LICENSE, EXPRESS OR IMPLIED, BY ESTOPPEL OR OTHERWISE, TO ANY INTELLECTUAL PROPERTY RIGHTS IS GRANTED BY THIS DOCUMENT. EXCEPT AS PROVIDED IN INTEL'S TERMS AND CONDITIONS OF SALE FOR SUCH PRODUCTS, INTEL ASSUMES NO LIABILITY WHATSOEVER, AND INTEL DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY, RELATING TO SALE AND/OR USE OF INTEL PRODUCTS INCLUDING LIABILITY OR WARRANTIES RELATING TO FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT.

UNLESS OTHERWISE AGREED IN WRITING BY INTEL, THE INTEL PRODUCTS ARE NOT DESIGNED NOR INTENDED FOR ANY APPLICATION IN WHICH THE FAILURE OF THE INTEL PRODUCT COULD CREATE A SITUATION WHERE PERSONAL INJURY OR DEATH MAY OCCUR.

Intel may make changes to specifications and product descriptions at any time, without notice. Designers must not rely on the absence or characteristics of any features or instructions marked "reserved" or "undefined." Intel reserves these for future definition and shall have no responsibility whatsoever for conflicts or incompatibilities arising from future changes to them. The information here is subject to change without notice. Do not finalize a design with this information.

The products described in this document may contain design defects or errors known as errata which may cause the product to deviate from published specifications. Current characterized errata are available on request.
Contact your local Intel sales office or your distributor to obtain the latest specifications and before placing your product order.

All products, platforms, dates, and figures specified are preliminary based on current expectations, and are subject to change without notice. All dates specified are target dates, are provided for planning purposes only and are subject to change. This document contains information on products in the design phase of development. Do not finalize a design with this information. Revised information will be published when the product is available. Verify with your local sales office that you have the latest datasheet before finalizing a design.

Code names featured are used internally within Intel to identify products that are in development and not yet publicly announced for release. Customers, licensees and other third parties are not authorized by Intel to use code names in advertising, promotion or marketing of any product or services and any such use of Intel's internal code names is at the sole risk of the user.

Intel, RealSense, and the Intel logo are trademarks of Intel Corporation in the U.S. and other countries.

*Other names and brands may be claimed as the property of others.

Copyright © 2018, Intel Corporation. All rights reserved.



Device Firmware Update (DFU) for Windows







DFU Usage & Options Menu

- Device Firmware Update (DFU) tool required to update Intel® RealSense™ D400 series camera firmware
- Camera firmware is updated using “signed firmware” binary files provided by Intel Corp.
- DFU tool and latest available “signed firmware” binary file can be downloaded from <https://realsense.intel.com/intel-realsense-downloads/#firmware>

DFU for Windows Tool Options Menu

```
=====
Intel (TM) D400 Windows Device Firmware Update Tool for Intel RealSense Technology Main Menu
1: Update Camera Device.
2: Show camera devices that can be upgraded.
3: Recover devices stuck in Upgrade Mode.
4: Show connected camera device details.
5: Configure D400 Series Windows Device Firmware Update Tool Settings (Can run with or without camera device connected).
0: Quit
```

Depth Cameras Supported by DFU Tool

DEPTH CAMERA	DESCRIPTION	PACKAGE CONTENTS
	Intel® RealSense™ Depth Camera D415	<p>Intel® RealSense™ Depth Camera D415 </p> <p>USB3.1 Type-C to USB3.1 Micro-B Cable (Used to connect Depth Camera to host USB3.1 port) </p>
	Intel® RealSense™ Depth Camera D435	<p>Intel® RealSense™ Depth Camera D435 </p> <p>USB3 Type-C to USB3 Micro-B Cable (Used to connect Depth Camera to host USB3.1 port) </p>

- DFU Tool supports firmware updates for integrated depth cameras built with Intel® RealSense™ Vision Processor D4 and Depth Modules from Intel® RealSense™ D400 series
- For information on Intel® RealSense™ D400 series, refer to Datasheet at <https://realsense.intel.com/intel-realsense-downloads/#documents>

Best Known Configuration (BKC)



Intel will specify the version of each component that should be used in the setup for each software release. To ensure Intel can provide the best support it is important that the version of each component matches the latest “best known configuration” table.



Windows* 10 Host Hardware Requirements:

Component	Usage	Version
Intel processor-based platform with USB 3.1 port	Host System	N/A
4GBs DDR RAM	Required for Intel® RealSense™ D400 series camera functionality	SODIMM
>128 GB HDD/SSD	At least 128GBs for OS + LibRealSense Packages	N/A
Intel® RealSense™ D400 Series	Depth Camera	D400/D410/D415/D420/D430/D435



Windows 10 Host Software Requirements:

Component	Usage	Version	Location
Host Operating System - Windows 10	Update Camera Firmware / Run LibRealSense Examples	Windows 10, 64bit RS2 (Ver. 1703) Pro, 64bit	Press START Button -> Type “Winver” -> Press [ENTER]
Device Firmware Update Tool (DFU) for Intel® RealSense™ D400 Series Cameras	Install latest camera firmware on RealSense™ Cameras	Public Release	https://realsense.intel.com/intel-realsense-downloads/#firmware
Signed Firmware .bin file	Firmware .bin file for camera firmware update	Public Release	https://realsense.intel.com/intel-realsense-downloads/#firmware



The software installation process requires industry tools and software to be installed on a host system. The version of these tools is less strict than the software components, but recommended to align versions where possible.

Camera Enumeration



Device Enumeration – Windows* 10 Host System

In order for Windows* 10 to recognize D400 Series devices and install correct drivers; all **Windows Updates** must be applied prior to plugging D400 Series camera to Windows Host System. For below instructions, *D410* camera was used, device enumeration will differ from D400/D415/D420/D430/D435. Driver installation across Windows* 10 remains the same.

Enumeration Details

1. Plug D400 Series camera to Windows 10 Host via USB3.1 port.

> **"Setting Up Device"** dialog box should appear on very first plug in of device.

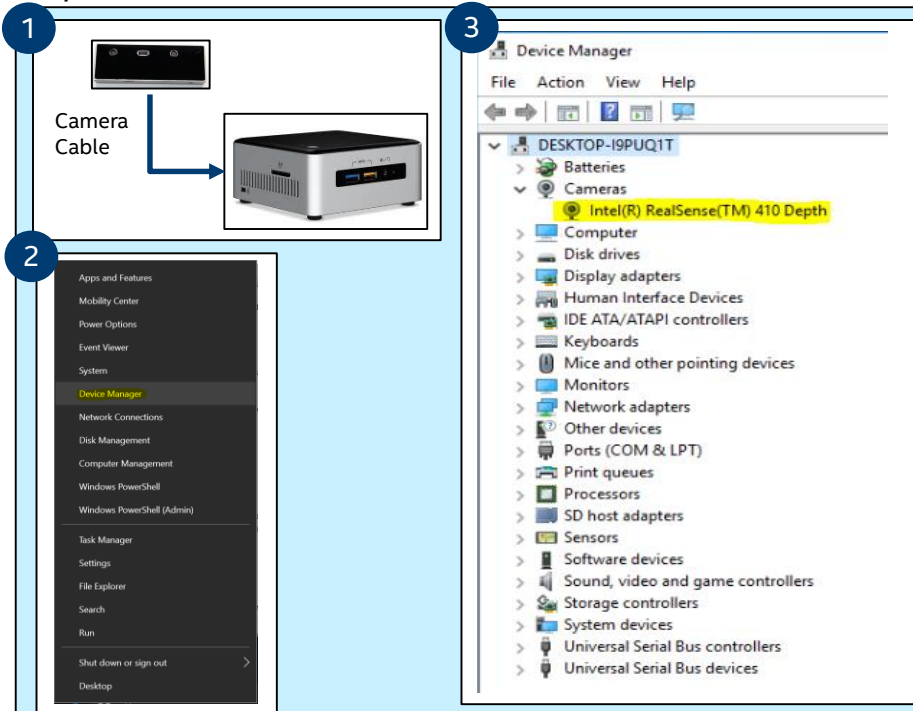
2. Open Device Manager

> Right click Start button.
> Click on Device Manager.

3. Notice the D400 series number of appropriate camera is shown under "Cameras".

If camera is not shown under **"Cameras"**, please make sure all **Windows 10 Updates** are downloaded and installed.

Also verify if **Windows 10 RS2 1706** is installed.



DFU Tool Install/Usage

DFU Tool Install/Usage on Windows* 10 Host

Steps

1. Install Windows* 10 on Host with USB3.1 port.
2. Copy and paste DFU tool and corresponding D400 series firmware .bin files (signed firmware) to Windows* 10 host system.
Note what directory files are stored.
3. Open to DFU Tool directory; and right click **"intel-realsense-dfu.exe"** and choose, **"Run as administrator"**.
> You can also open a command line as admin and run the "intel-realsense-dfu.exe" from there.
4. Plug in D400 series camera/s to host USB3.1 port
5. Command line window should appear with main menu of tool being displayed.
 - Press "2" then [ENTER] to display a list of upgradeable cameras.

1

3

2

4

5

```

=====
Intel (TM) D400 Windows Device Firmware Update Tool for Intel RealSense Technology Main Menu
1: Update Camera Device.
2: Show camera devices that can be upgraded.
3: Recover devices stuck in Upgrade Mode.
4: Show connected camera device details.
5: Configure D400 Series Windows Device Firmware Update Tool Settings (Can run with or without camera device connected).
0: Quit
    
```

DFU Tool Install/Usage on Windows* 10 Host

Steps (Contd.)

6. Notice a list is produced in command line window; press "1" [ENTER] to select D400 series camera and begin firmware update process.
7. Prompt asks user to input file path of firmware .bin file.
 - > Type the full file path with firmware filename included and press [ENTER].
8. Notice output of downloaded bytes transmitting, this process takes ~3 minutes until completion.

6

```
=====
Intel (TM) Updatable Devices List
[1]Intel(R) RealSense(TM) 420 Depth (FW Version: 5.8.15.0)
[2]Intel(R) RealSense(TM) 415 Depth (FW Version: 5.9.2.0)

Press any key to continue . . .
```

7

```
=====
Intel (TM) Firmware Update:
[1] Intel(R) RealSense(TM) 420 Depth (FW Version: 5.8.15.0)
[2] Intel(R) RealSense(TM) 415 Depth (FW Version: 5.9.2.0)

Enter camera number to update: (any out of bounds index to go back to main menu)1
Enter path and filename (e.g. c:\Documents\newFirmware.bin: )
```

8

```
C:\Users\intel\Downloads\Windows_DFU_Tool\RS400Package\RS400DfuConsole.exe
Downloaded 1024, bytes remaining 1481500
Downloaded 1024, bytes remaining 1480476
Downloaded 1024, bytes remaining 1479452
Downloaded 1024, bytes remaining 1478428
Downloaded 1024, bytes remaining 1477404
Downloaded 1024, bytes remaining 1476380
Downloaded 1024, bytes remaining 1475356
Downloaded 1024, bytes remaining 1474332
Downloaded 1024, bytes remaining 1473308
Downloaded 1024, bytes remaining 1472284
Downloaded 1024, bytes remaining 1471260
Downloaded 1024, bytes remaining 1470236
Downloaded 1024, bytes remaining 1469212
Downloaded 1024, bytes remaining 1468188
```



Steps (Contd.)

9. When firmware upgrade is complete, the camera will reset. A windows icon saying "Device is undergoing additional setup" should pop up. The main menu will appear again.
10. Verify the firmware version installed on camera by pressing, "4" and [ENTER] followed by "1" and [ENTER]
Notice the firmware version has changed on the Intel® RealSense™ Camera selected for firmware update

9

 Setting up device
A device is undergoing additional setup.

10

```
Intel (TM) All Cameras List (including non Intel)
[1]Integrated Camera
[2]Intel(R) RealSense(TM) 420 Depth (FW Version: 5.9.2.0)
[3]Intel(R) RealSense(TM) 415 Depth (FW Version: 5.9.2.0)

Press any key to continue . . .
```

Intel Customer Support via Email

Intel® Customer Support via Email

- Submit a service request to Intel Customer Support through email at <http://customercare.intel.com>

Intel® Customer Support

1. Go to <http://customercare.intel.com> and Sign Up to create an account.
2. Create an account.
3. Request Support and sign in.
4. Enter "RealSense" under "3. Find your product or service".

The sequence of screenshots illustrates the process:

- Step 1:** The Intel Customer Support homepage. The 'Sign in or Sign Up' link is circled in red.
- Step 2:** The 'Sign In' page. The 'Create an account' link is circled in red.
- Step 3:** The 'Request Support' button is circled in red.
- Step 4:** The search bar on the 'Find your product or service' page with 'Realsense' entered.

Intel® Customer Support via Email (Cont.)

- Submit a service request to Intel Customer Support through email at <http://customercare.intel.com>

Intel® Customer Support

5. Select the RealSense™ Product you need support for.
6. Describe your issue and click on “Next Details”.
7. Provide more details on environment and issue.
8. Once all details are entered, submit request.

5

6

7

8

RealSense™ Community Issue Submission

RealSense™ Community Issue Submission

- Customers need to login on the Intel® RealSense™ Community
- RealSense™ Community Link: <https://communities.intel.com/community/tech>

RealSense™ Community – Issue Submission Form

1. Open Welcome document, click: <https://communities.intel.com/docs/D/OC-111552>
2. Click on “Click [HERE](#) to register”.
3. Register your account with valid email address. A verification email will be sent to registered email address.
4. Log into your email and activate account by clicking on link from Intel® email.
5. Return to website and log in: <https://communities.intel.com/community/tech>

1 Welcome New Members (READ THIS FIRST)
Created by mray, intel on Feb 3, 2017 3:52 PM. Last modified by mray, intel on Feb 3, 2017 3:52 PM.

Welcome to Intel's Support Community!

This is a community where members can ask and answer questions about Intel products. We have forums set up by product, but also a General Forum in case you don't know where to go. For more information, click on the link below: <http://www.intel.com/content/www/us/en/support/contact-support.html#q4>

In our Community Forums, you will be able to search and review posts without posting. In order to post a question or comment, you will first need to join as a Member. **Click HERE to register**

Select the forum you are interested in and I will bring you to the overview for that forum. You can search and ask a question there. Or you can select the Discussions tab and search on-going.

2 **Click HERE to register**

3 Register for Intel Communities
If you already have an Intel account, [log in here](#)

All fields required.

First Name Last Name

Username

Password

Confirm Password

Email

Enter the code:

This helps prevent automated registrations.

☐ I agree to these [terms and conditions](#).

Need Help? Email Us

Additional information can be provided after registration by editing your profile.

4 Verify your e-mail

Action Required

Welcome - we have added a profile for you as a result of your interest in Intel Communities.

Please retain this e-mail for future reference.

Login ID:

E-mail Address:

What you need to do

Please verify your e-mail address by clicking on the **Verify** link, copying the URL into your browser.

Your password should be protected as confidential. Your use of the password and Intel's websites are governed by Intel's Terms and Conditions of Use located from the bottom of each respective site's web pages.

If you have any questions, please contact us [here](#).

Visit this [link](#) any time to manage your profile.

Please DO NOT reply to this e-mail message. This is an automated response.

To ensure that you continue receiving our e-mail, please add us to your address book.

Intel is committed to protecting your privacy. For more information, please see the [Intel Privacy Notice](#).

[Legal Information](#) | [Trademarks](#) | © Intel Corporation. All rights reserved.
**Other names and brands may be claimed as the property of others.
***Intel is not responsible for content of sites outside our internet sites.

5 communities.intel.com/community/tech

Support Community

Overview Discussions People Subpages Welcome

Click HERE to register

Intel | Support | Support Communities

What would you like to do today?

Search the Community

RealSense™ Community Issue Submission (Cont.)

- Customers need to login on the Intel® RealSense™ Community
- RealSense™ Community Link: <https://communities.intel.com/community/tech>

RealSense™ Community – Issue Submission Form

- Click on “Intel® RealSense™ Community” under “Boards and Kits”.
- Click on link “Ask a question.”
- A window will open and user can ask a question or state an issue they are seeing with their RealSense™ Camera.
 - > Use a proper title (IE: D410 Intel® RealSense™ Camera does not stream video)
 - > Enter as much details about issue as possible. The more information – the better the RealSense™ community can help with an issue.
 - > Select a category for issue, such as “RealSense™ for PC”, depending on what camera is being used.
- When all information is entered, click “Post” submit issue to RealSense™ Community.

The screenshot shows the Intel RealSense Community website. On the left, under the 'Boards and Kits' section, the 'Intel® RealSense™ Community' link is highlighted with a yellow circle and labeled with a blue circle containing the number 6. On the right, the 'Ask a question' button is highlighted with a yellow circle and labeled with a blue circle containing the number 7. Below this, the 'Start a discussion' form is shown, with the 'Post' button highlighted with a yellow circle and labeled with a blue circle containing the number 9. The form includes a title field, a text area for the question, and a 'Categories' section with checkboxes for various RealSense products and use cases.

Boards and Kits

- Intel® NUC
- Intel® Compute Card
- Intel® Joule™
- Intel® Aero Platform for UAVs
- Intel® Curie™
- Intel® Edison™
- Intel® Galileo™
- Intel® RealSense™ Community**
- Intel® Compute Stick
- Desktop Boards
- Intel® IoT Gateway

ACTIONS

- Ask a question**
- View feeds

Start a discussion

Title

☐ Mark this discussion as a question - this encourages people to answer for points and helps you track answers.

Post body

Categories Help others find your content by selecting relevant categories

- ☐ Euclid Development Kit
- ☐ Issues
- ☐ Product Suggestions
- ☐ R200 Developer Kit
- ☐ RealSense for PC
- ☐ Robotic Development Kit
- ☐ SR300 Developer Kit
- ☐ Workarounds
- ☐ ZR300 Developer Kit

Post **Cancel**

Issue Submission via GitHub

Issue Submission Process on GitHub

- Customers need to create a GitHub account and login.
- GitHub Link: <https://github.com/IntelRealSense/libRealSense/issues>

GitHub Issue Submission Process for LibRealSense Releases

1. Once logged into site, click on **"Issues"** tab.
2. Click **"New Issue"** Icon.
3. Enter **proper** name of new issue.
4. Fill out **required information** such as, **camera model, FW version, OS**, and **actual issue description**.
5. When finished documenting issue, click icon **"Submit new issue"**.
6. Once a new issue is submitted, a **forum** is created allowing for Intel[®]™ teams to begin fixing / commenting on new issue.

1. IntelRealSense / libRealSense

2. New issue

3. Write Preview

4. Note: Please take advantage of RealSense [Community] <https://communities.intel.com/community/tech/realsense> and [Support] <https://www.intel.com/content/www/us/en/support/emerging-technologies/intel-realsense-technology.html> sites.

5. Submit new issue

6. Note: Please take advantage of RealSense [Community] and [Support] sites.

Required Info

Camera Model	R200 / F200 / SR300 / ZR300
Firmware Version	
Operating System & Version	
Kernel Version (Linux Only)	

Submit new issue

