doric

Firmware upgrade-downgrade Procedure for Doric Neuroscience Studio v5 and v6

Application Note

Version 1.1.0

Contents

1	Comparison of DNS version 5 and version 61.1Key differences between versions1.2Advantages of using .doric over other file formats	3 3 3
2	Upgrading to DNS version 62.1Installing the software from scratch2.2Checking DNS version number2.3Software Upgrade2.4Firmware Upgrade	5 12 13 14
3	Downgrading to DNS version 53.1Software Downgrade3.2Firmware Downgrade	20 20 21
4	Specifications	34
5	Support 5.1 Contact us	36 36

Comparison of DNS version 5 and version 6

Since July 2022, *Doric Lenses* has released version 6 of *Doric Neuroscience Studio* (DNS). In addition to fixing bugs, this new version has improved the user interface, added new features, and is compatible with the latest products. A detailed comparison can be found in Fig. 4.1 in the specification chapter.

1.1 Key differences between versions

However, there are key differences (see Table 1.1) which could influence the decision to upgrade to version 6:

- Saved channel configurations from version 5 are **no longer compatible** with version 6.
- Data is exclusively saved in HDF5 files .*doric* extension format (.*csv* and .*tiff* format from version 5 are no longer available). HDF5 files can be read with Matlab, Octave, and Python. Code examples are provided to facilitate data analysis with those external applications, HERE.

	DNS v5	DNS v6
Data file format	.csv, .tiff or .doric ¹	.doric ¹
Requires firmware update for older products		Х
Requires firmware downgrade for new products	Х	
Compatible v5 Configuration file	Х	
Fixed v5 Bugs		Х
New Features		Х
Continuously supported by Doric Lenses		Х

Table 1.1: Comparison Summary between Doric Neuroscience Studio v5 and v6

1.2 Advantages of using .doric over other file formats

- Stores heterogeneous data types (such as signal vectors, images, and videos) in a single file;
- Saves configuration parameters used to record the data;
- No maximum length, which is ideal for time-series recordings lasting more than a day and/or recordings with behavioral videos;
- Seamlessly integrate behaviour data with in vivo neural recordings;
- Compatible with Doric's new data analysis software, DANSE;
- Easily read .*doric* to Matlab, Python or Octave using provided codes¹ ;

¹Matlab, Python, R, and Octave codes are provided HERE to read .doric file format for data analysis.

Should you upgrade to version 6 or downgrade to version 5?

- 1. If you have a data analysis pipeline that requires a .csv file and a large number of configuration files that would be time-consuming to recreate \rightarrow *Downgrade to version 5 in section 3*.
- 2. Else \rightarrow Upgrade to version 6 in section 2.

Upgrading to DNS version 6

2.1 Installing the software from scratch

This section details instructions on how to install and set up *Doric Neuroscience Studio* (DNS) version 6 from scratch. However, if a previous version of DNS is already installed on the computer, see section 2.3 for instructions on upgrading to the newest version. If you do not know which version is currently installed, see section 2.2 for instructions on how to find the version number of the software.



REMINDER: Version 5 Configuration Files are NOT compatible with version 6. Please document the parameters used in version 5 BEFORE upgrading to version 6.



We recommend installing both:

- Doric Neuroscience Studio Data acquisition software. (Section 2.1.1)
- Doric Maintenance Tool Update tool for software and device firmware. (Section 2.1.2)

2.1.1 Installing Doric Neuroscience Studio

- 1. **Run** the Doric Neuroscience Studio Installer from the supplied USB key or download the latest version of the software from our Doric Neuroscience Studio webpage. See Table 4.1 and 4.2 for computer requirements.
- 2. Select the language to use during the installation.

Note: If a previous version of **Doric Neuroscience Studio** is already installed, the software will ask you to uninstall the previous version before installing the new one (see section 2.3).

- 3. Click **Next** in the Information window.
- 4. Choose where to install the software (Fig. 2.1) and click Next.

Select Destination Location Where should Doric Neuroscience Studio be installed?	(I)
Setup will install Doric Neuroscience Studio into the following	folder. lick Browse.
C:\Program Files\Doric Lenses\Doric Neuroscience Studio	Browse
At least 350.3 MB of free disk space is required.	
Back Nex	t Cancel

Figure 2.1: Select Destination Location

- 5. Choose if desired to create a shortcut in the Start Menu folder and click Next.
- 6. Several Options are possible:
 - Select Create a desktop shortcut if you want a shortcut to launch the software on your desktop (Fig. 2.2).
 - Select Doric Maintenance Tool to install the software required to update the firmware of devices (Fig. 2.2).
 - Select Device Driver for 33U, 37U, and 38U series cameras to install the drivers for USB cameras. This is necessary mainly for Behavior cameras and BFPD systems (Fig. 2.2).
 - Select Device Driver for all GigE cameras to install the drivers for Ethernet cameras (Fig. 2.2).

Click *Next* once the selection is done.

Select Additional Tasks Which additional tasks should be performed?		(Index)
Select the additional tasks you would like Set Neuroscience Studio, then click Next.	tup to perform while installing	g Doric
Create a desktop shortcut		
External Tools(s) :		
Doric Maintenance Tool (Doric Lenses In	ic.)	
External Driver(s) :		
Device Driver for 33U, 37U, 38U series	cameras (The Imaging Sourc	e)
Device Driver for all GigE cameras (The	Imaging Source)	
	Back Next	Cancel

Figure 2.2: Select complementary installations

7. When ready, **click** *Install* to begin the process. This should take a few moments. <u>Note:</u> If you have selected the installation of *Doric Maintenance Tool* and/or the installation of another driver, their installation will start the first installation and will be covered in the next sections. When the installation is done, the message in figure 2.3 will pop up.



8. Click **Finish** to exit the setup. The software is ready for use.

2.1.2 Installing Doric Maintenance Tool

If Doric Maintenance Tool was checked marked during the DNS setup (as in Fig. 2.2), the Doric Maintenance Tool installation should begin automatically once the Doric Neuroscience Studio setup is done. Skip to step 1, below for further installation instructions.

If you need to install *Doric Maintenance Tools* manually, you can find a link to download it HERE. Select the icon in the *Download* column (Fig. 2.4) and a .exe file should pop up at the bottom, left of the window (Fig. 2.5). Double-click on the .exe file to launch the setup of the software (Fig. 2.5).

Doric Maintenance Tool Downloads

Version	Release date	Download
1.1.5.0	2022-08-15	₹ 🖓

Figure 2.4: Download Doric Maintenace Tools from the Doric Lenses website



Figure 2.5: Click on the .exe file to launch the Doric Maintenance Tool Setup

1. **Select** the language to use during the installation.

Note: If a previous version of **Doric Maintenance Tool** is already installed, the software will ask to uninstall the previous version before installing the new one (see section 2.3).

- 2. Click **Next** in the Information window.
- 3. **Choose** where to install the software (Fig. 2.6) and click **Next**.

Select Destination Location Where should Doric Maintenance Tool be installed?	
Setup will install Doric Maintenance Tool into the following fol	der.
To continue, click Next. If you would like to select a different folder, o	lick Browse.
C:\Program Files\Doric Lenses\Doric Maintenance Tool	Browse
At least 233.6 MB of free disk space is required.	
Back Nex	t Cancel

Figure 2.6: Select Destination Location

- 4. Choose if desired to create a shortcut in the Start Menu folder and click Next.
- 5. Unselect Create a desktop shortcut if you do not want a desktop shortcut for Doric Maintenance Tool on your desktop and click Next.
- 6. When ready, click **Install** to begin the process. This should take a few moments. When the installation is done, the message in figure 2.7 will show up.



Figure 2.7: Successful Installation of the Doric Maintenance Tools

7. Click **Finish** to exit the setup.

2.1.3 USB Camera Driver

The installation of the Camera Driver is simpler than the other installations. It will automatically start if the **Device Driver for 33U, 37U, and 38U series cameras** is checked during the installation of *Doric Neuroscience Studio* (Fig. 2.2).

ady to Install Setup is now ready to begin installing Cam33U Driver and Tools on your computer.		Ð
Click Install to continue with the installation, or click Back if you want to review or click Each if	hange any settings.	~
Full installation Selected components: DirectShow driver components and service		
		~
<	>	
E	Install	Cancel

Figure 2.8: Successful Installation of the Doric Neuroscience Studio

1. Click **Install** to begin the process (Fig. 2.8). This should take a few moments. When the installation is done, the message in figure 2.9 will show up.



Figure 2.9: Successful Installation of the Doric Neuroscience Studio

2. Click **Finish** to exit the setup.

2.1.4 Ethernet Camera Driver

This installation is necessary if you plan to use GigE Ethernet camera for the experiments. The installation will automatically start if the **Device Driver for all GigE cameras** is checked during the installation of *Doric Neuroscience Studio* (Fig. 2.2).

- 1. Click **Next** in the Welcome window
- 2. In Select Components windows, it is possible to select different options Fig. 2.10):
 - Full installation: all the components will be install.
 - Compact installation: to only install the driver.
 - Custom installation: to select what will be install during the process.

Note: In the same time as the driver it is possible to install 2 options:

- Kernel-Mode filter driver to enhances the performance. It is recommended to use it if possible.
- IP configuration API files consists of two DLLs:*ipconfig_api_x64.dll* and *ipconfig_api_win32.dll*.These DLLs can be imported into a C# program. Using the API, a program can query camera name, serial number, IP adress, firmware version and so on (for more information about this module, see here).

When components had been selected, click on **Next** to start the installation.

- 3. When the installation is done, the message in figure 2.11 will show up.
- 4. Click **Finish** to exit the setup.

3.0 MF
3.0 ML
1.1 ME

Figure 2.10: Options selection in Ethernet Camera driver installation



Figure 2.11: Successful Installation of the Ethernet Camera Driver

2.2 Checking DNS version number

1. Make sure to keep the software regularly updated. By selecting **Help | Check for updates**, the **Update** window will appear (see Fig. 2.12).



Figure 2.12: Update Window

2. Should the installed version be older than the online one, the **Update** window will appear in Fig. (2.12a) asking to install the newest version with **Doric Maintenance Tool**. The procedure is described below, otherwise, the **Update checked** window will appear if the version is up to date.

2.3 Software Upgrade

If you do not have Doric Maintenance Tool, see section 2.1.2.

- 1. Disconnect all Doric devices from the computer before starting the update and close Doric Neuroscience Studio.
- 2. **Open** Doric Maintenance Tool and **Select** the tab Software(s).

Doric Maintenance Tool		—		×
File Help				
Device(s) Plugin(s) Software(s)				
Name	Status			
Doric Maintenance Tool	lnstalled			
Doric Memory Manager	Not installed			
Doric Neuroscience Studio				
Software Version : Installed : 6.1.1.1 Available : 6.1.1.3				
Software Description : No description available at the moment. [No device se	ected]			
Website : https://neuro.doriclenses.com/products/doric-neurosc	ience-studio			
Check for server updates New version(s) available		Update	from serv	er
			Clos	se

Figure 2.13: Doric Maintenance Tool - Overview

- 3. Select Doric Neuroscience Studio and click on Check for server updates (Fig 2.13).
- 4. The version displayed next to Available will be updated to the latest version available.
- 5. **Click** on *Update from server* to start the update of the version. After a short download time, *Doric Maintenance Tool* will turn off and the installation window will be displayed.
- 6. **Select** the language to use during the installation.
- 7. The installer will immediately detect the previous version and present the option of uninstalling it (Fig. 2.14). Click Yes.



Figure 2.14: Uninstall Window

- 8. When the program asks if you are certain, **Click Yes**.
- 9. When the previous version is uninstalled (Fig. 2.14), the installation of the new version needs to be done like the first installation (see section 3.1.2).



Figure 2.15: Uninstall Completion

10. Once the installation is finished, the update is complete.



Note: Always update **Doric Maintenance Tool** at the same time as **Doric Neuroscience Studio**.



2.4 Firmware Upgrade

2.4.1 Video tutorials link

Videos tutorials are available HERE, to facilitate the update and to solve common issues. Videos include:

- Light Source update
- Light Source issue with motherboard bootloader
- Light Source issue with channels not visible
- Fiber Photometry Console Update

2.4.2 Installation Procedure

To update the firmware version, **close** *Doric Neuroscience Studio*.

- 1. Open Doric Maintenance Tool. (The software can be installed at the same time as Doric Neuroscience Studio)
- 2. Turn On the device.



<u>Note:</u> Always upgrade the firmware of **ONE device** at a time. All other devices should be **turned OFF** to avoid possible conflict when erasing device programming.



Doric Maintenance Tool			- 0 ×		
File Help					
Device(s) Plugin(e) Software(s)					
Name	Status				
BFPD	Not connected				
Camera	Not connected		U		
Electrophysiology Console (1st Gen.)	Not connected		U		
Fiber Photometry Console (1st Gen.)	Not connected		U		
Fiber Photometry Console (2nd Gen.)	Not connected		U		
LightSource (1st Gen.)	Not connected		U		
LISER (2nd Gen.)	Not connected		U		
Microscope Dual	Not connected		U		
Microscope Single	Not connected		U		
Microscope USB 3.0	Connected				
Doric Microscope USB3.0 Single (Port #2	2) Connected				
Microscope USB 3.0 LISER	O Not connected		U		
OTPG	O Not connected				
Bootloader Version : 5	Notherboard Version : Installed :5.6 Available :5.3	Channet(c) Version : Installed : 1.0.0 Available : 1.1.0			
Device Description : * Make sure to only have one port connected at a time (USB3 or USB2). Website : https://webric.com/pages/miniaturized-fluorescence-microscopy					
Check for server updates New version(s) availab	le	Update from server			
4					

Figure 2.16: Doric Maintenance Tool home page

- 3. In the list under Name, select the device to update (its status needs to be Connected) (Fig. 2.16).
- 4. **Select** Check for server updates. Doric Maintenance Tool will connect to the server and verify if an update is available (Fig. 2.16).
- 5. Under Motherboard Version and Channel(s) Version, the present versions and the available versions are displayed (Fig. 2.16).
- 6. **Select** *Update from the server* to launch the update. (Sometimes, an update may be necessary without using the server version. In this case, a representative of Doric Lenses will send you an updated file and you must use *Update manually* instead of *Update from server*) (Fig. 2.16). For *LED Drivers*, no selection is necessary, as running the update will do both the motherboard and the channel(s) automatically.



Figure 2.17: Doric Maintenance Tool Update Selection

- 7. **Choose** between updating the *Motherboard* or the *Channels* (if you need to update both, **select** *Channels* first, then repeat the process for the *Motherboard* once the first update is successful) (Fig. 2.17).
 - Note that some devices (such as consoles) require changing the USB connection on the device to the service USB port when updating the Channels (Fig. 2.18). In such cases, the name of the device connected to the computer will change to *Channels* (FPGA (Port #) (Fig. 2.19). Running the firmware update on the changed name will work perfectly and once the USB is reconnected to its normal port, the real name will come back.



Figure 2.18: Change the location of the USB connection to the service port

File Help	
Devices Plugins Softwares	
Name	Status
Assisted Rotary Joint	Not connected
BFPD	Not connected
Camera	Not connected
 Channels 	Connected
🛕 FPGA (Port #10)	Connected
Electrophysiology Console (1st Gen.)	Not connected
Fiber Photometry Console (1st Gen.)	Not connected
Fiber Photometry Console (2nd Gen.)	Not connected
LightSource (1st Gen.)	Not connected
LISER (2nd Gen.)	Not connected
Microscope Dual	Not connected
Microscope Single	Not connected
Microscope USB 3.0	Not connected
Microscope USB 3.0 LISER	O Not connected
OTPG	Not connected

Figure 2.19: Doric Maintenance Tool Channel-Port device name change

8. Wait the end of the installation and select OK.



9. Wait 10 seconds and turn OFF the device. Turn ON the device and start Doric Neuroscience Studio.

2.4.3 Specifics of USB-3 driven devices

This section is specific to devices connected through a USB-3 cable to a computer (i.e NC500 console, FMD Gen 3 microscope driver...). To update the firmware version, **close** *Doric Neuroscience Studio*.

- 1. **Open** Doric Maintenance Tool.
- 2. Turn ON the device.
- 3. In the list under Name, select the device to update (its status needs to be Connected) (Fig. 2.20).
- 4. **Select** Check for server updates. Doric Maintenance Tool will connect to the server and verify if an update is available (Fig. 2.20).
- 5. Under *Motherboard Version* (and *Channel(s) Version* if applicable to the device), the present versions and the available versions are displayed (Fig. 2.16).

6. **Select** *Update from the server* to launch the update. (Sometimes, an update may be necessary without using the server version. In this case, a representative of Doric Lenses will send you an updated file and you must use *Update manually* instead of *Update from server*) (Fig. 2.20).

😥 Doric Maintenance Tool —					×
File Help					
Devices Plugins Soft	wares				
Name		Status			
Assisted Rotary Joint		Not connected			
BBC300		Not connected			
BFPD		Not connected			
Camera		Not connected			
Electrophysiology Console		Not connected			
Fiber Photometry Console		Not connected			
FMD		Not connected			
FMD2		Not connected			
🔻 FMD3		Connected			
FMD3 (Port #20)		Connected			
FMD3 LISER		Not connected			
IMU		Not connected			
Light Source		Not connected			
LISER		Not connected			
NC500		Not connected			
UIPG Vich Gran		Not connected			
voluscan					
Check for server updates		B Update from	server	Update ma	
Motherboard Version		Channel(s) Version			
Installed : 5.8.7		Installed : 1.2.0			
Available : 5.8.7		Available : 1.2.0			
Device Description					
Fluorescence Microscope Drive	ers Gen 3 are all inte	egrated drivers that control	the video	o acquisitio	on,
and include the light sources. T	hey are designed to	be used with efocus Fluor	escenc	e Microsco	pe
Bodies Gen 3 (eTFMB3, eTOSFM3).					
*Make sure to only have one po	ort connected at a tir	me (USB3 or USB2).			
Website :					
https://neuro.doriclenses.com/collections/1-color-deep-brain-fluorescence-microscope-gen-3/					
producismuorescence-microscope-unvergenes					

Figure 2.20: Doric Maintenance Tool home page

7. **Choose** between updating the *Motherboard* or the *Channels* (if you need to update both, **select** *Channels* first, then repeat the process for the *Motherboard* once the first update is successful) (Fig.2.21).



Figure 2.21: Doric Maintenance Tool Update Selection

8. At the end of the update, a pop-up window will offer to update the USB3 driver as well (Fig.2.22). We recommend doing it with usage of the latest versions of Doric Neuroscience Studio v6. Before choosing to do this update and pressing OK, you will need to change the configuration of the device from an Operating mode to a Programming one. To do so, turn OFF the device, and slide the small cursor at its back located at one side of the USB service port from O to P using your nail or a non sharp tip (Fig. 2.23).



Figure 2.22: Doric Maintenance Tool USB3 driver selection



Figure 2.23: USB3-driven devices, switch from Operating to Programming mode



9. **Turn ON** the device again and once it is recognized in the list, press *OK*. Another pop-up message will now ask you to choose the type of device you are updating (Fig. 2.24). Once you pressed on its corresponding button, the update should start automatically after downloading the firmware file.

🖗 Update Selection			×			
Which device are you updating?						
FMD3	FMD3 LISER	NC500	Cancel			

Figure 2.24: USB3-driven devices, choice of the device to be updated

10. **Wait** the end of the installation and when done, a message confirming for a *successful update* will appear (Fig. 2.25). It will invite you to press OK, which might automatically disconnect the device that will then reappear in Doric Maintenance Tool.



Figure 2.25: USB3-driven devices, successful update

- 11. Close Doric Maintenance Tool, turn OFF your device and switch back from **Programming mode to Operating mode** (reverse step as the one indicated at point 8.) (Fig. 2.23).
- 12. Turn ON the device and start Doric Neuroscience Studio.

Downgrading to DNS version 5

If your DNS is currently in version 6, see section 3.1.1 below for instructions on how to downgrade it to version 5. Note, using new or upgraded devices in DNS v5 also requires a firmware downgrade for each product, or else DNS v5 will not recognize the device(s) (see sections 3.2 and 3.2.3).

If you do not know which version of DNS you are currently using, see section 2.2.

3.1 Software Downgrade

3.1.1 Download DNS version 5

- 1. Uninstall Doric Neuroscience Studio version 6.
- 2. Download Doric Neuroscience Studio version 5 by clicking on the following link HERE.

Version	Release date	Download
5.4.1.23 (actual)	2021-10-15	🛃 🖓
5.3.3.14 (archive)	2019-10	Ł

Figure 3.1: Download DNS v5 from Doric Lenses website

- 3. **Run** the "Setup Doric Studio" execution file and follow the installation instructions. (See section 2.1.1 for a detailed step-by-step procedure.)
- 4. Launch DNS v5.

3.1.2 Download Doric Maintenance Tool

If not already installed, **download** *Doric Maintenance Tool* from the following link HERE. See section 2.1.2 for a detailed step-by-step procedure.

Doric Maintenance Tool Downloads

Version	Release date	Download
1.1.5.0	2022-08-15	🛃 🖓

Figure 3.2: Download Doric Maintenace Tools from the Doric Lenses website

3.2 Firmware Downgrade

3.2.1 Before getting started

- Verify that your hardware model is compatible with firmware updates. In doubt, please contact our technical support. (see section 5)
- It is highly recommended to use a computer running on Windows 10 to perform firmware updates.
- Make sure you have installed Doric Maintenance Tools. If not, see section 3.1.2.
- Firmware downgrade is a critical operation, as it could make the device unusable if the programming is not done correctly. We offer technical support during firmware updates via Remote Desktop control sessions. Do not hesitate to download the TeamViewer application and to **schedule a remote session with us** (see section 5).

3.2.2 Downgrade Instructions for LED Driver

1. **Download** the firmware .HEX files of the devices you want to downgrade (if available). Firmware downgrades are available for: Light Sources Drivers, Fiber Photometry Consoles, Bundle Fiber Photometry Driver, Optical TTL Pulse Generator, and Behavior Camera.

DOWNLOAD FIRMWARE FILES HERE

In this example, we will update a *LED driver* (Fig. 3.3). (See Section 3.2.3 for *Fiber Photometry Console* example, as there are slight differences in the process.)

Light Source

Device Firmware	Current Version	File Extension	Download .zip
Motherboard	2.18.6	.hex	
Channel	4.6.9	.hex	

Figure 3.3: Download a .hex file from our website for each device that needs to be downgraded

2. **Turn** ON the device you wish to downgrade. **Open** *Doric Maintenance Tool* application. Make sure to **close** *Doric Neuroscience Studio*.



Figure 3.4: Open Doric Maintenance Tool software



Note: Always downgrade the firmware of **ONE device** at a time. All other devices should be **turned OFF** to avoid possible conflict when erasing device programming.



3. Select the device to downgrade, and click Update Manually.

🖗 Doric Maintenance Tool			- 0	×
File Help				
Device(s) Plugin(s) Software(s)				
Name	Status			
BFPD Camera	 Not connected Not connected 			
Electrophysiology Console (1st Gen.)	Not connected			
Fiber Photometry Console (1st Gen.)	Not connected			
Fiber Photometry Console (2nd Gen.)	Not connected			
 LightSource (1st Gen.) 	Connected			
LightSource Driver (Port #10)	Connected			
LISER (2nd Gen.)	O Not connected			
Microscope Dual	O Not connected			
Microscope Single	Not connected			
Microscope USB 3.0	Not connected			
MICTOSCOPE 038 5.0 LISER				
LightSource Driver (Port #10)				
Bootloader Version : Installed : 3.2	Motherboard Version : Installed : 3.2.2 Available : N/A	Channel(s) Version : Installed : 5.3.4 Available : N/A		
Device Description : Doric programmable LightSource Drivers ar	e available in 1-, 2-, and 4-channel versions.			
Website : https://neuro.doriclenses.com/pages/light-g				
Check for server updates Update(s) not check	ed yet	Update from server	Update m	nanually
				Close

Figure 3.5: Select the device and the Update Manually button.

4. Carefully read this message before **selecting** the OK button.



Figure 3.6: Warning Message

REMEMBER: Upgrade the channel first, the motherboard second.

5. From the file extension dropdown (1 in Fig. 3.7), **select** the bottom option from the list (DriverHybridChannel*.hex, in this case). Then **find** and **select** the .hex file that you saved earlier (from step 1, Fig. 3.3). You may need to go to the documents or downloads folder to find those downloads. Finally, **select** Open button to start the downgrade process.

→ ✓ ↑	Bureau				✓ Ö Rechercher dans: Bureau
rganiser 👻 Nouveau dossier	r				≣≡ ▾ □□ (
Téléchargement Non Téléchargement Non Documents Téléchargement Téléchargement Non Téléchargement Téléchargement Non Téléchargement Non Téléchargement Non Téléchargement Non Téléchargement Non Téléchargement Non Téléchargement Téléchargement Non Téléchargement Non Téléchargement Téléchargement Non Téléchargement Téléchargement Téléchargement Téléchargement Non Téléchargement Téléchargement Tél	2	Modifié le	Туре	Taille	
FPC_V6_Channe	erHybridCha V4.6.9.produ				
OneDrive	tion.hex				
OneDrive - Persor					
Ce PC					
E Bureau					
Documents					
Musique					
Objets 3D					
Téléchargement:					
Vidéos					
Windows (C:)					
🛫 data (\\SRV2019-					
🛨 MARK09 (\\SRV2					1
🞐 Réseau 🛛 🗸					
Nom du fichi	ier :				DriverHybridChannel*.hex Doric-LS_Default_Firmware_V*.he Doric-LS_Enbedded_Firmware_V*.he

Figure 3.7: Select the proper Channel .hex extension and the downloaded file

6. Wait until the loading is completed.



Figure 3.8: Example loading bar



Repeat similar steps to downgrade the motherboard firmware: Select the bottom option from the list (Driver-HybridMotherboard*.hex, in this case). Then find and select the .hex file that you saved earlier (from step 1, Fig. 3.3). Finally, select Open to start the downgrade process.

Choose the Motherboard Firmware File (.hex)	×
← → ~ ↑ 🔄 > Ce PC > Images > downgrade firmware	✓ O Rechercher dans : downgrad
Organiser 👻 Nouveau dossier	■ • 1 ?
 Teléchargement * Documents * Images * downgrade firm FPC FPC_V6_Channe Template respon OneDrive OneDrive OneDrive - Persor C e PC Bureau Documents Images Musique Objets 3D Teléchargement: Vidéos Windows (C:) 	
🛫 data (\\SRV2019	
T MARK09 (\\SRVZ	1
🖆 Réseau 🗸 🗸	-
Nom du fichier : DriverHybridMotherboard.production.2.18.6.hex	DriverHybridMotherboard*.hex Doric-MBL_Firmware_V*.hex Doric-MBL_USER_Only_Firmware_V*.hex Doric-MBL_USER_1Ch_Firmware_V*.hex Doric-MBL_USER_2Ch_Firmware_V*.hex
	DriverHybridMotherboard*.hex

Figure 3.9: Select the proper Motherboard .hex extension and the downloaded file

8. Wait until the loading is completed.



Figure 3.10: Example loading bar



9. **Select** the OK button.



Figure 3.11: Successful downgrading message.

- 10. Turn OFF, the LED driver and close Doric Maintenance Tool.
- 11. Turn ON the device, then open Doric Neuroscience Studio version 5.

3.2.3 Downgrade Instruction for the Fiber Photometry Console

1. **Download** the firmware .HEX files *Fiber Photometry Console*. DOWNLOAD FIRMWARE FILES HERE

Fiber Photometry Console

This firmware package is compatible for the following devices :

• FPC : Fiber Photometry Console (all versions)

Device Firmware	Current Version	File Extension	Download .zip
Motherboard	2.18.7	.hex	
Channel	2.1.5	.mcs	™ .∰

Figure 3.12: Download .hex file from the Doric Lenses website

2. Turn ON the device you wish to downgrade. Open Doric Maintenance Tool application.



Figure 3.13: Open Doric Maintenance Tool software



Note: Always downgrade the firmware of **ONE device** at a time. All other devices should be **turned OFF** to avoid possible conflict when erasing device programming.



3. Select the device to downgrade, and click Update Manually (Fig. 3.14).

🖗 Doric Maintenance Tool			- 🗆 ×
File Help			
Device(s) Plugin(s) Software(s)			
Name	Status		
Assisted Rotary Joint	Not connected		
BFPD	Not connected		
Camera	Not connected		
Electrophysiology Console (1st Gen.)	Not connected		
Fiber Photometry Console (1st Gen.)	Connected 🛛 🚽		
Optogenetics System (Port #4)	Connected		
Fiber Photometry Console (2nd Gen.)	Not connected		
LightSource (1st Gen.)	Not connected		
LISER (2nd Gen.)	Not connected		
Microscope Dual	Not connected		
Microscope Single	Not connected		
Microscope USB 3.0	Not connected		
Optogenetics System (Port #4)			
Bootloader Version : Installed : 2.0	Motherboard Version : Installed : 2.18.7 Available : 3.2.2	Channel(s) Version : Installed : 2.1.5 Available : 2.1.10	
Device Description : This FPGA-based data acquisition unit synch	nronizes the output control and the input data :	acquisition.	
Website : https://neuro.doriclenses.com/pages/fiber-pl			
Check for server updates New version(s) availa	1010	Update from server	update manually
			Close

Figure 3.14: Select the device and the Update Manually button.

4. Select the Channels button.



Figure 3.15: Select the Channel button.

REMEMBER: Upgrade the channel first, the motherboard second.

5. **Unplug** the USB cord connected to the *Fiber Photometry Console* and **plug** it into the service port at the other side of the console, as per Fig. 3.16. Then **select** the OK button (Fig. 3.17). Note that it is normal for the name of the device connected to the computer to change to *Channels* (FPGA (Port #) when the USB is connected to the service port.

		• ⁴⁴ . O	3
USB-B service port	۰	12 VDC power input	
		USB-B con to comp	nection outer

Figure 3.16: Change the location of the USB connection to the service port

Ø	Change USB Connection (Port)		×
•	To update the console (FP/EP) channel(s), you need to chang cable from USB port to the SERVICE port.Please, make sure yo OK when it's done. You will than be able to choose the firmw for the update to start automatically.	e the connec ou do so NOV are file (.mcs	ted USB V and press) and wait
		ок	Cancel

Figure 3.17: Change the USB location message

6. **Find** and **select** the .hex file that you saved earlier (from step 1, Fig. 3.12). You may need to go to the documents or downloads folder to find those downloads. Finally, **select** Open button to start the downgrade process.

Duvrir					×
\leftarrow \rightarrow \checkmark \uparrow \Box \rightarrow CePC \rightarrow Images \rightarrow downgrade firmware \rightarrow Console \checkmark	5	Q	Rechercher	dans : Con	isole
Organiser 🔻 Nouveau dossier				-	•
Téléchargemuit Documents Images Console downgrade firm FPC LED Driver OneDrive OneDrive OneDrive OneDrive Documents Images Documents Images Documents Images Musique Olgists JD Téléchargement: Vidéos Windows (C:) data (\SRV2019 MARKO9 (\SRVz					
Nom du fichier :	Ŷ	FPC	*.mcs Ouvrir	Anni	∼ Jler
		_			

Figure 3.18: Select .hex file

7. Wait until the loading is completed.



Figure 3.20: Successful downgrading message.

9. Turn OFF the Fiber Photometry Console and then turn it back ON.

10. Next, to downgrade the Console's motherboard, **re-plug** the USB cable into its usual spot (*i.e.* NOT the service port), as per Fig. 3.21.



Figure 3.21: Replace the USB cable to the regular port

11. **Select** the device one more time, and **click** *Update Manually*.

💭 Doric Maintenance Tool			- 🗆	\times		
File Help						
Device(s) Plugin(s) Software(s)						
Nama	Chatur					
Assisted Rotary Joint	Not connected					
Gamera						
Electrophyriology Concole (1rt Gen.)						
Fiber Photometry Console (1st Gen.)						
Ontogenetics System (Port #4)	Connected 1					
Fiber Photometry Console (2nd Gen.)	Not connected					
LightSource (1st Gen.)	Not connected					
LISER (2nd Gen.)	Not connected					
Microscope Dual	Not connected					
Microscope Single	Not connected					
Microscope USB 3.0	Not connected					
Optogenetics System (Port #4)						
Bootloader Version : Installed : 2.0	Motherboard Version : Installed : 2.18.7 Available : 3.2.2	Channel(s) Version : Installed : 2.1.5 Available : 2.1.10				
Device Description : This FPGA-based data acquisition unit synchronizes the output control and the input data acquisition. Website : https://neuro.doriclenses.com/pages/fiber-photometry						
Check for server updates New version(s) availa	able	Update from server	Update ma	nually		
				Close		

Figure 3.22: Select the device and the Update Manually button.

12. Select the Motherboard button.



Figure 3.23: Select the Motherboard button.

13. **Select** the bottom option from the dropdown list (DriverHybridMotherboard*.hex, in the case of Fig. 3.24). Then **find** and **select** the .hex file that you saved earlier (from step 1, Fig. 3.12). Finally, **select** *Open* button to start the downgrade process.

Choose the Motherboard Firmware File (.hex)					×
\leftarrow \rightarrow \checkmark \uparrow \Box \rightarrow Ce PC \rightarrow Images \rightarrow downgrade firmware \checkmark	Ō	,⊂ Re	chercher dan	s : downg	jrad
Organiser 🔻 Nouveau dossier			-		•
Teléchargement * ` Documents * ` Images * downgrade firm FPC * Comments * ` Templete respon OneDrive OneDrive <p< th=""><th></th><th></th><th></th><th></th><th></th></p<>					
💣 Réseau 🗸 V		<u> </u>	_		
Nom du fichier : DriverHybridMotherboard.production 2.18.6.hex	~	DriverHy Doric-M Doric-M Doric-M Doric-M DriverHy	/bridMotherb BL_Firmware BL_LISER_On BL_LISER_1CI BL_LISER_2CI /bridMotherb	oard*.he _V*.hex ly_Firmwa _Firmwa oard*.he	x ~ are_V*.hex re_V*.hex re_V*.hex

Figure 3.24: Select the proper Motherboard .hex extension and the downloaded file

14. Wait until the loading is completed.



Figure 3.25: Example loading bar



WARNING: Do NOT turn OFF the device while an update is in progress.



15. Select the OK button.



Figure 3.26: Successful downgrading message

- 16. **Turn OFF** the Fiber Photometry Console and **close** Doric Maintenance Tool.
- 17. **Turn ON** the device, then **open** *Doric Neuroscience Studio* version 5.

Specifications

	Table 4.1:	Doric Neu	roscience .	Studio	Hardware	Reauirements
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SPECIFICATIONS	VALUE	NOTES
Operating System Memory (Minimum/Recommended) Processor Speed (Minimum/Recommended) Hard Drive	Windows 7, 8 , 10 4 GB/16 GB 2 Ghz Quad-Core i5/ 3.46 Ghz Eight-core i7 500 MB	64-bit

Table 4.2: Doric Neuroscience Studio Module Hardware Requirements

MODULE	REQUIRED HARDWARE	NOTE
Microscopy	Dedicated Graphics Card i7 or greater CPU Gigabit ethernet card	Do not use a USB to ethernet adapter
Behavior Camera	Power USB3 or Gigabit ethernet port	

	DORIC NEUROSCIENCE STUDIO					
	V5.4.1.23	V6.0.1.0				
	DNS					
	File Format					
Microscope	.tiff .doric (HDF5)	.doric (HDF5)				
Fiber photometry	.csv .doric (HDF5)	.doric (HDF5)				
OTPG	.csv	.doric (HDF5)				
Behavior camera	.avi	.avimp4mkvmpeg ,doric(HDF5) for config and timestamp				
Read Files Example	Matlab - Octave	Matlab - Octave - Python - R				
	Device support					
	OTPG_4, OTPG_8 LEDD, LEDFLS, LDMD, LDFLS, CeYAG	OTPG_4, OTPG_8 LEDD, LEDFLS, LDMD, LDFLS, CeYAG LISER *NEW				
Available Modules	FPC, EPC Gen.1 BFPD	FPC, EPC Gen.1 BFPD				
	FMD Gen.1, FMD-2C Gen.2 (Ethernet)	FMD Gen.1, FMD-2C Gen.2 (Ethernet) FMD Gen.3 (USB3) *NEW Behavior camera				
	released after 2021	released before 2015				
Unsupported products	(FMD Gen.3, LISER,)	(LEDRVP & OPTG_4 Gen.1)				
Firmware updates	Manual update	Doric Maintenance Tool update from web server				
DLL for third party integration	OTPG, Light sources	OTPG, Light sources				
Updates	No more update	Free updates with new functionalities as key press Event recording, custom waveform analog voltage output, and more				
Analysis Modules						
Video and trace viewer & basic animal video tracking	Behavioral Tracking Analyzer	Behavior Analyzer				
Microscope data analysis (align, dF/F,)	Image Analyzer	Image Analyzer				
Ephys Data analysis (filters, spike finder,)	Electrophy Analyzer					
Photometry data analysis (baseline correction, dF/F,)	Photometry Analyzer	Signal Analyzer				
Light propagation simulation	Optrode Simulator	Optrode Simulator (soon)				
File viewer reader	-	HDF5 Viewer				

Support

5.1 Contact us

For any questions or comments, do not hesitate to contact us by: **Phone** 1-418-877-5600 **Web** doriclenses.com **Email** sales@doriclenses.com



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