DeviceDrive click

USER MANUAL

DeviceDrive click is a complete Cloud-on-Module solution with Wi-Fi functionality and an integrated PCB antenna. The onboard WRF01-M24A module comes preloaded with DeviceDrive firmware.

MIKROE

To our valued customers

I want to express my thanks to you for being interested in our products and for having confidence in Mikroelektronika.

The primary aim of our company is to design and produce high quality electronic products and to constantly improve the performance thereof in order to better suit your needs.

Nebojsa Matic
CEO

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Introduction

WRF01 is a Wi-Fi (802.11B/G/N) module from DeviceDrive. By using the DeviceDrive click, you can connect it to your PC and simulate real device behaviour, to learn how the device works and how it communicates to the cloud and to the app.

This document introduces the WRF01 Client Simulator and aims at giving you a quick start for developing with the DeviceDrive click. The program communicates with the DeviceDrive click trough the serial ports and is suited for acting as a client and for prototyping IoT-Products.

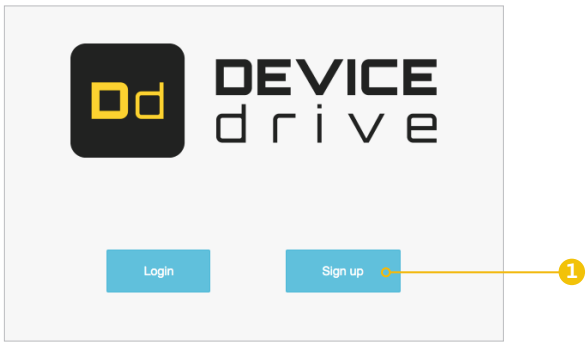
The following sections give the steps how to get started:

- Section 4: Set up your product in the cloud
- Section 5: Installing the software
- Section 6: Set up DeviceDrive click
- Section 7: Simulate IoT device
- Section 8: Send custom DeviceDrive click messages
- Section 9: Upgrading your WRF01

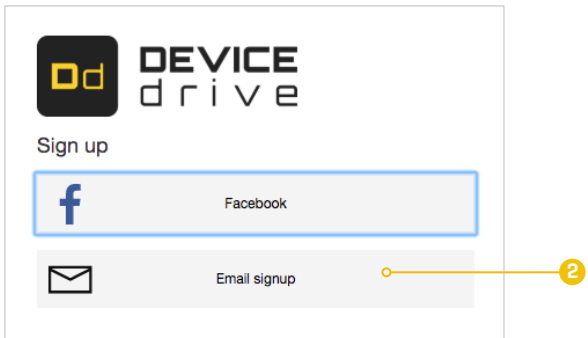
1. Set up your product in the cloud

In order to use the DeviceDrive click with the DeviceDrive cloud and the client simulator you need to sign up on the DeviceDrive management portal. If you already have an account, you can just sign in and create a new product on your account.
Goal: Get a valid product key to use with this tutorial
Procedure for signing up:

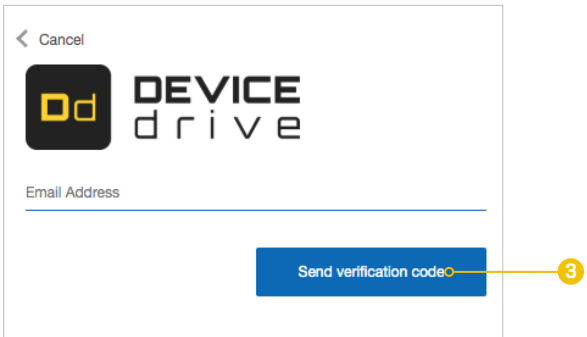
1. Sign up at ***https://manage.devicedrive.com***



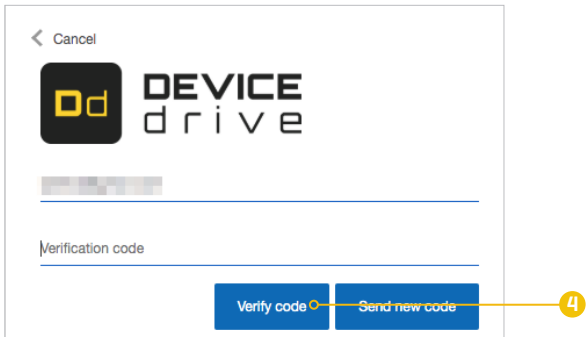
2. Press email signup



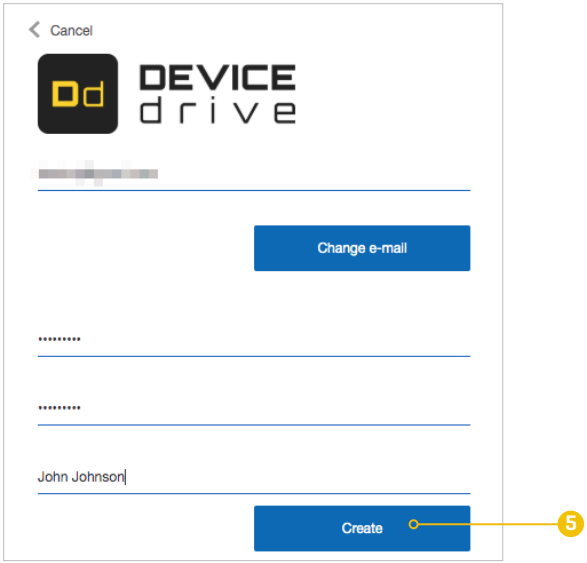
3. Enter your email address and press "Send verification code"



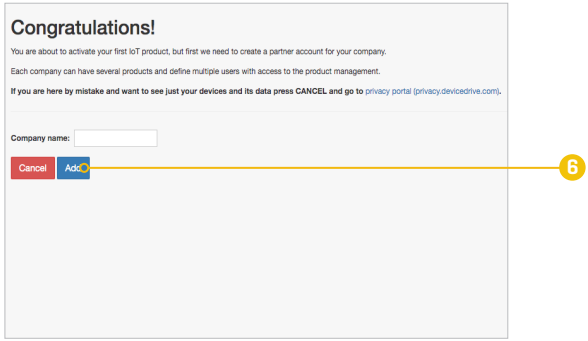
4. You will receive an email with your verification code. Copy this code to your clipboard and paste into the registration form. Then click "Verify code".



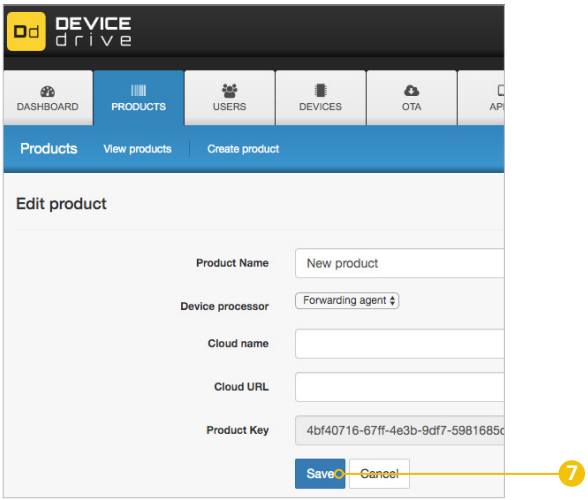
5. Enter your preferred password and your name. Then press “Create”.



6. Register your company name. This is the name of your DeviceDrive management account. It can contain several users and several products.



7. Register your test product. Enter a name for your product and select “Internal agent”. Then copy the product key to your clip board and press “Save”.



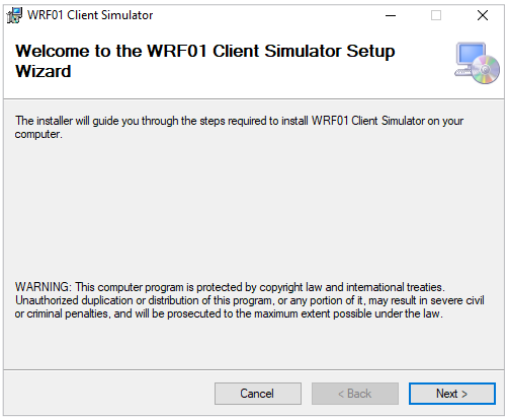
8. Paste the product key somewhere (e.g. Notepad) so that you can use it later.

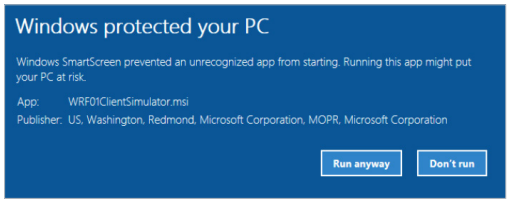
2. Installing the Client Simulator

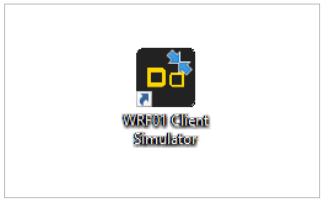
Download the software from ***https://devicedrive.com/downloads***

Run the installer. This will install the software and add the examples folder to the program folder.

NOTE: *If your Antivirus complains that the software package is not signed, please ignore and run the install anyway.*







After the install is finished, you can launch the program from the start menu or the desktop icon.

3. Set up DeviceDrive click

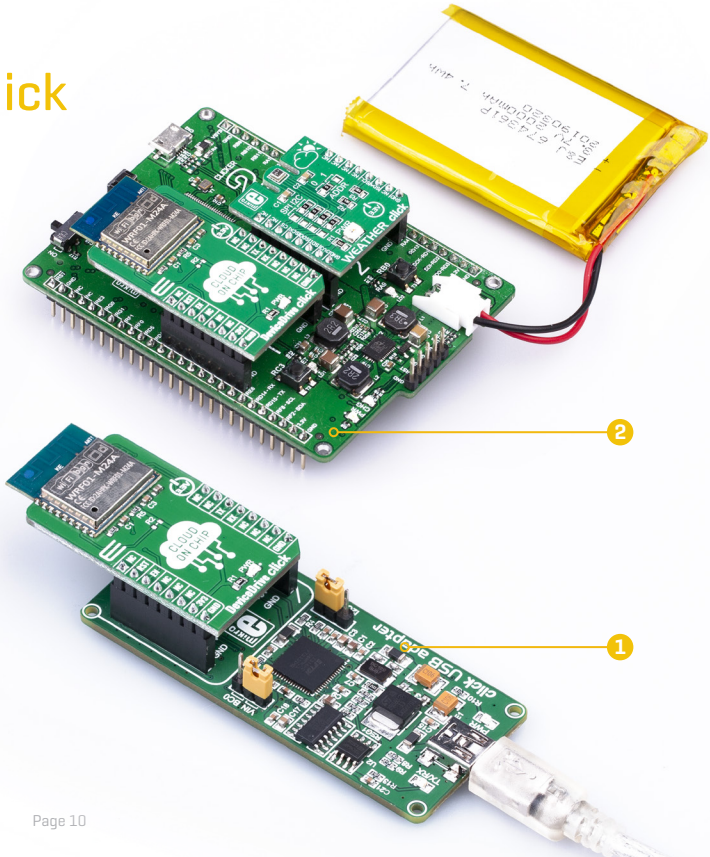
This section describes how to connect your DeviceDrive click to the network and configure your product key.

3.1 Connect DeviceDrive click

Considering that DeviceDrive click is a board with UART interface you will need additional board to make it working. There are severals ways that you can put in use your DeviceDrive click board.

Option 1 – click USB adapter (or any USB to UART converter)

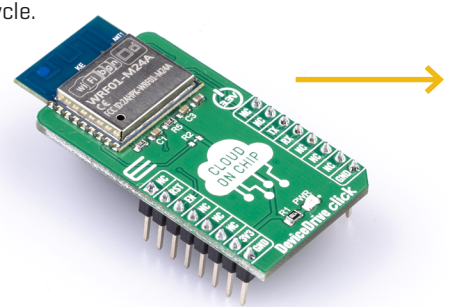
Option 2 – clicker 2 (or any other development system with mikroBUS™ socket).

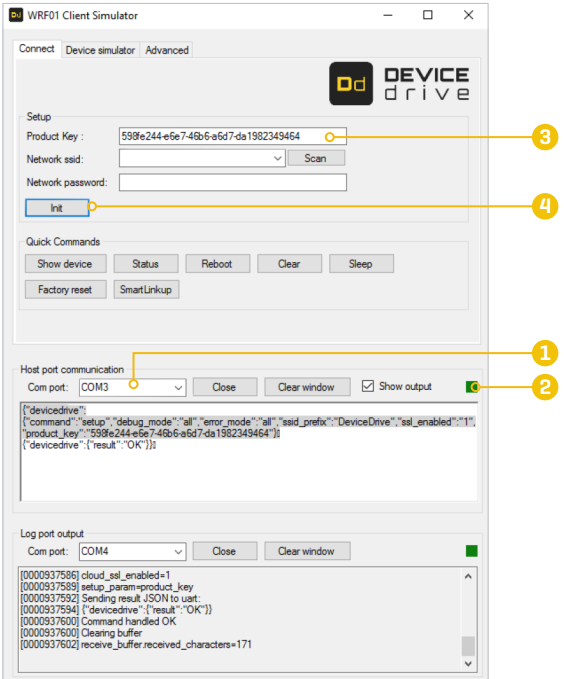


3.2 Connecting to PC over USB/UART converter

Your computer will recognize the device, and designate a COM port for it. As soon this is done, will see the COM port in the dropdown **(1)** in the picture above.

If the connection is successful, the color of the Connection Status Indicator **(2)** will change from Red to Green. The Host port communication window will give you the exact communication log between the Simulator and WRF01. Use this to learn about how the WRF01 behaves in a normal operating cycle.





NOTE: *It is possible to mix up the host port and the log port in the two windows. It is recommended to plug in the HOST port first, and then select the port in the host communication window before connecting the log port.*

When DeviceDrive click is connected, enter the product key (the one from the management portal) in to the field marked "Product Key" **(3)**. If you want the device online right away enter the network ssid and password in their fields. If your product key is defined as a "Forwarding product", you can enter these right away, and start sending data, but if you have an "Internal product" and wish to use the mobile app SDK's, you should LinkUp using the app. In addition, you can attach the log port to your computer with an USB mini cable. This will also register as a COM port in your system. In the "Log port Output" window, select the new COM port.

Check the status indicator on the right-hand side to see that the connection is successful.

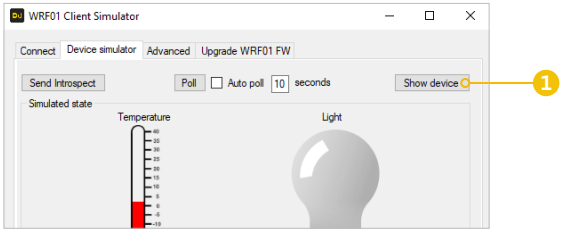
When you are ready, press "Init" **(4)**. This will initiate the WRF01. You should see the message "Response OK" in the Serial output window, and if you attached the Log port, you should see the WRF01 internal workings while connecting to your access point (router).

Hold your mouse over the quick commands to get more information about them.

3.3 Setting up DeviceDrive click with LinkUp

Linkup is only required if your device is an "Internal product" in the DeviceDrive system.

To make the DeviceDrive click ready for LinkUp, use the "Show Device" **(1)** button to enable the local AP.



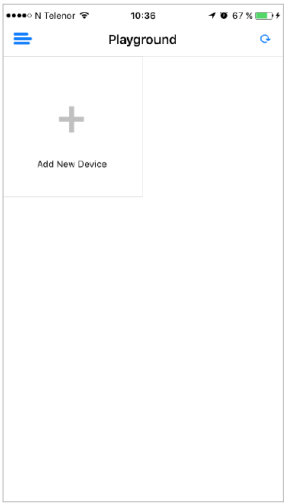
NOTE: *You can also use SmartLinkup to initiate the SmartLinkup procedure. This procedure lets the user connect the device without having to use the Soft AP.*

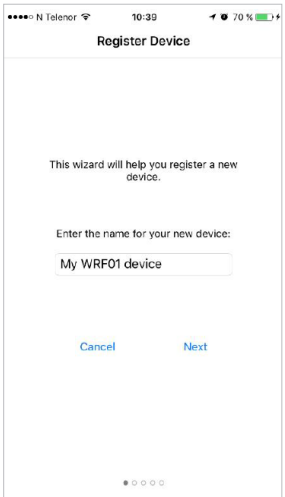
GET IT ON Google Play

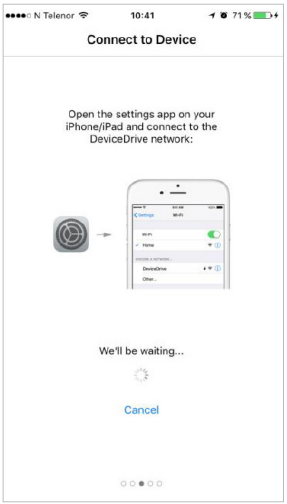
Download on the App Store

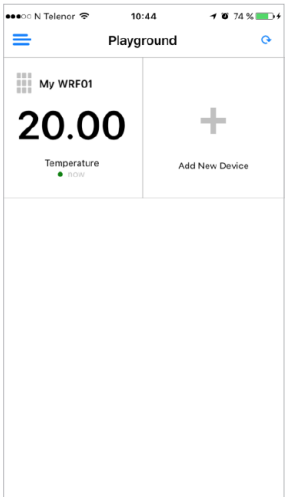
The DeviceDrive Playground App is available on ***Apple Store*** and ***Android Play***. When you are using the LinkUp procedure, the SSID and password for your network is sent, along with the security token for your device. This is the reason that you need to use the LinkUp system when working with Internal Products. For more information about how to use the DeviceDrive Playground app and the internal product, please see ***this video*** and the ***documentation***.

The screenshots below show how the Playground app lets you link up your new device and show the simulated data from the device simulator.









The device state is shown in the app after the introspect and current state have been sent to the cloud. The next section describes how to simulate device behavior.

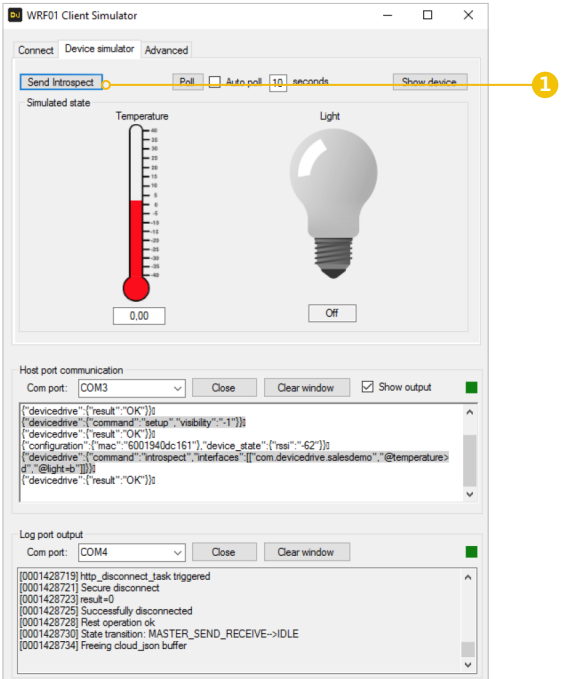
4. Device Simulator

On the top of the DeviceDrive WRF01 Client Simulator, you will find the Device Simulator tab. This tab gives you the opportunity to test the introspection functionality and lets you integrate the DeviceDrive click with an app with our SDK or the DeviceDrive Playground app.

Before you can start simulation, please make sure that you followed the steps in chapter Feil! Fant ikke referansekilden., 6.1 and 6.2.

To be able to send a status update, first press the "Send Introspect" **(1)** button. This sends a message to the cloud with the "capabilities" of your product. See the Serial specification documentation or this video about more information about the introspection document. This is a prerequisite for the APP you're using to control your device.

When the introspection document is sent you can click the temperature or light controller to send device data to the cloud. The app will automatically update with the new device data.

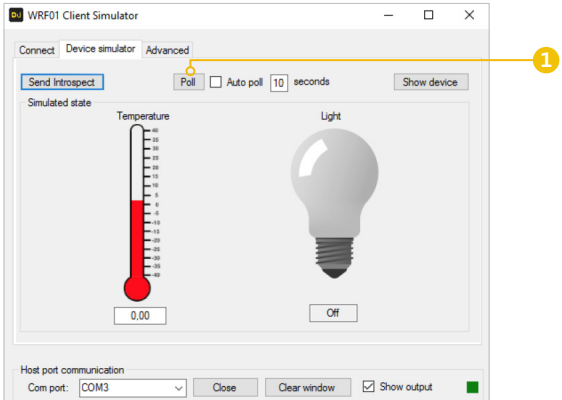


4.1 Data polling

This makes you able to send commands from the app to the device. If you are using the DeviceDrive Playground app, try to flip the button marked “Light”.

Press the “Poll” **(1)** button to read pending status updates from the app. You can check “Auto poll” to let this happen automatically at the given interval.

The simulated state will be updated according to the received messages.

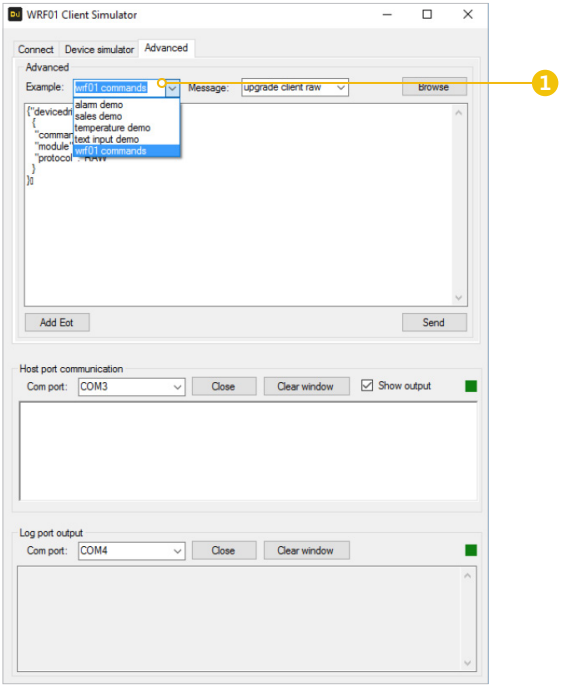


NOTE: *• Polling requires SSL to be enabled on the WRF01 (versions below 4.0). Please press “Init” again if the system does not receive messages.*
• Version 4.0 supports MQTT, so if the WRF01 is already connected to the server, the messages from the app will appear asynchronously without polling.
• There is no queue system in this software, so if you try to send or receive a lot of messages in rapid succession, you might experience the “System busy” error message. To resolve this, wait for the WRF01 to complete the current operation. This can be seen in the Log window. In a real application you can use our client SDK source code where a queue is implemented.

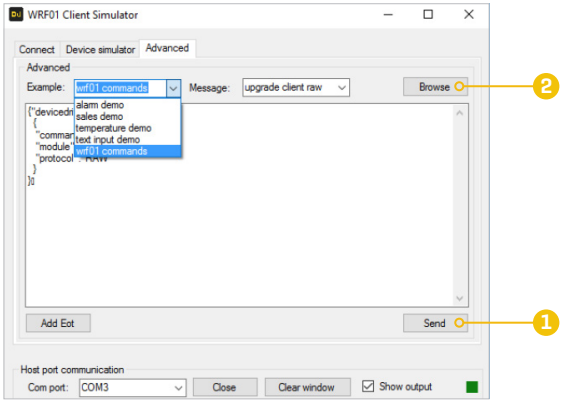
5. Advanced

Use the Advanced screen to send custom messages and choose from a set of predefined message templates.
This screen is suited for those who wish to tweak the messages sent to the server, or to test the whole range of the available commands for the WRF01. By default, the two drop-down menus should point to the folder that came bundled with the installation. To use the WRF01 commands, select “wrf01 commands” **(1)** in the first dropdown. In the second, you will be able to see the available commands. These match the “Serial specification documentation” and you can enter, or change the properties / values in the text field below.

Before pressing send, make sure that there is an EOT character at the end of your transmission. It will be marked with a small rectangle after your last bracket.



If there is no EOT char, press the “Add EOT” button.
When ready, press “Send” [1] to send the message or command to the device.
In addition to all of the available WRF01 commands, this software comes with some examples of introspection and status messages you can try.
In the text field you can add your own text or messages and send to the WRF01. If you are using your own cloud and require special messages, this is where you can send them.
The “Browse” [2] button lets you select the base folder to show template messages from.



NOTE: *This software strips your message of all <CR> <LF> characters before sending them to the WRF01. In a real-world application, do not use these characters in a WRF01 command. They have to comply exactly with the serial specification. If a command does not start with exactly {"devicedrive": the message will be interpreted as a cloud message transfer, and not a WRF01 command.*

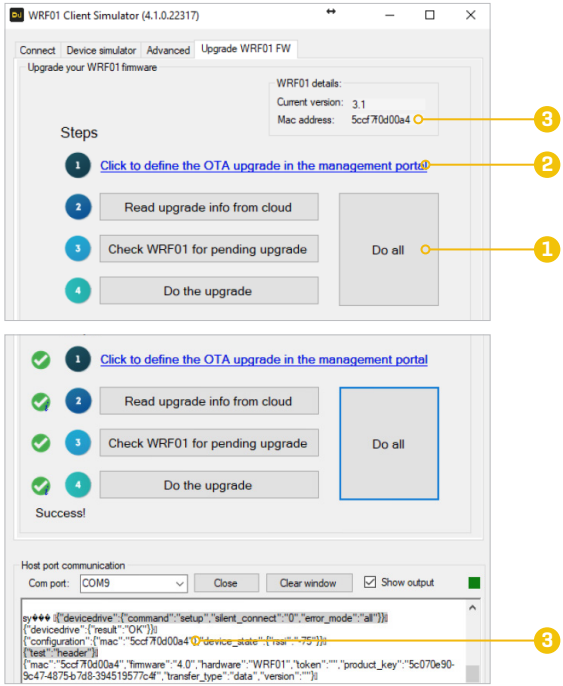
6. Upgrade demo board

The upgrade pane lets you easily experiment with upgrading and downgrading your WRF01 module on DeviceDrive click.
Notice that the upgrade itself has to be defined in the management portal.
Perform each of the steps manually or just press "Do all" **[1]** to upgrade automatically (but you still need to define the upgrade in the management portal).

Define the upgrade in the management portal (click the link in point 1) **[2]**.

Click each of point 2-4 or just press "Do all" to run automatically.

You should see that the current version field updates to the selected version **[3]**.



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