DustIQ Soiling Monitoring System

Firmware Update Instructions

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1 About this quick guide

This quick guide describes how to update the DustIQ firmware using SmartExplorer.

1.1 Software and applicable documents

The following documents contain further information on installation, maintenance and calibration:

– Instruction Manual DustIQ – Soiling Monitoring System

– Instruction Sheet and Datasheet – DustIQ Soiling Monitoring System

– Instruction Manual PMU485 – Smart Setup Hub for RS-485 instruments

The documents above and the following software can be downloaded at www.kippzonen.com:

– Smart Explorer, DustIQ Firmware Updates

1.2 General signs and symbols

The signs and symbols used in the operational manual have the following meaning:

Practical tip

i This symbol indicates important and useful information.

Action

✓ Prerequisite that must be met before performing an action.

▶ Step 1

⇨ Intermediate result of an action

▶ Step 2

⇨ Result of a completed action

1.3 Explanation of warnings

To avoid personal injury and material damage, you must observe the safety information and warnings in the operating manual. The warnings use the following danger levels:

⚠ **WARNING**

This indicates a potentially hazardous situation. If the hazardous situation is not avoided, it may result in death or serious injuries.

⚠ **CAUTION**

This indicates a potentially hazardous situation. If the hazardous situation is not avoided, it may moderately serious or minor injuries.

NOTICE

This indicates a situation from which damage may arise. If the situation is not avoided, products may be damaged.

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2 General safety instructions

2.1 Intended use and potential misuse
The DustIQ system is used to monitor the loss of light transmission caused by dust, sand, pollen, or any other particles on PV panels.

2.2 Potential misuse
Any use of the product that does not comply with the intended use, be this intentional or negligent, is forbidden by the manufacturer.
▶ Use the product only as described in the operational manual.

2.2 Operator obligations and personnel qualification
The installer is responsible for observing the safety regulations. Unqualified personnel working on the product can cause risks that could lead to serious injury.
▶ Have all activities carried out by qualified personnel.
▶ Obtain training from OTT HydroMet if necessary.
▶ Ensure that everybody who works on or with the product has read and understood the operational manual.

2.3 Personnel obligations
To avoid equipment damage and injury when handling the product, personnel are obliged to the following:
▶ Read the operational manual carefully before using the product for the first time.
▶ Pay attention to all safety information and warnings.
▶ If you do not understand the information and procedure explanations in this manual, stop the action and contact the service provider for assistance.
▶ Wear the necessary personal protective equipment.

2.4 Correct handling
If the product is not installed, used and maintained correctly, there is a risk of injury.
The manufacturer does not accept any liability for personal injury or material damage resulting from incorrect handling.
▶ Install and operate the product under the technical conditions described in the operational manual.
▶ Do not change or convert the product in any way. Do not perform any repairs yourself.
▶ Get OTT HydroMet to examine and repair any defects.
▶ Ensure that the product is correctly disposed of. Do not dispose of it in household waste.

2.5 Installation and maintenance at high places
When the product is installed and maintained at high places, special safety measures must be taken to avoid personal injury.
▶ Observe and follow the local safety regulations.
▶ Use suitable safety equipment. Inspect the safety equipment before use.
▶ Secure the person installing the product and the device used against falling down.
▶ Secure the instrument against falling down.

⚠ **CAUTION**

Risk of injury due to sharp edges!
The instrument has slightly sharp edges that can cause injury.
▶ Wear protective gloves during installation.
▶ Connect/disconnect data cable with care!

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2.8 Certification

CE (EU)
The equipment meets the essential requirements of EMC Directive 2014/30/EU.

FCC (US)
FCC Part 15, Class „B" Limits
This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:
1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause un-desired operation.

IC (CA)
Canadian Radio Interference-Causing Equipment Regulation, ICES-003, „Class B"
This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

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3 Perform the firmware update

3.1 Connect DustIQ to your computer

3.1.1 Connect the data cable
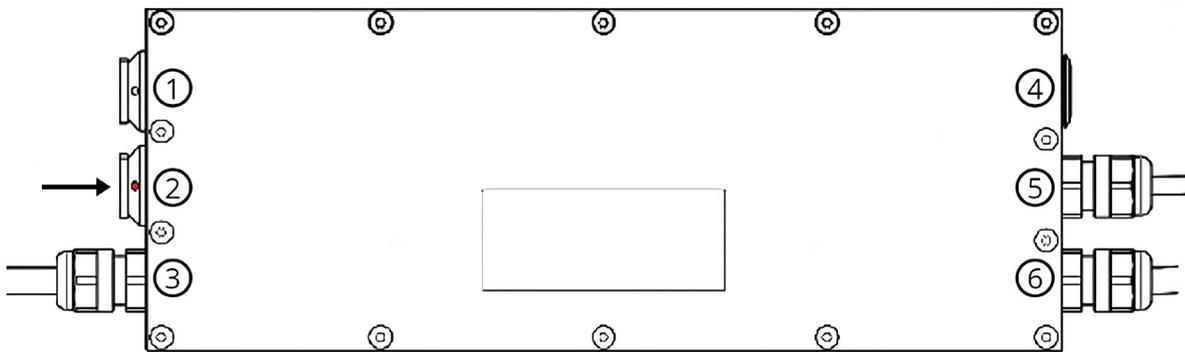
1	Daisy chain or temperature sensor	4	Calibration button
2	Host	5	Solar panel
3	Sensor 2	6	Sensor 1

▶ Connect all wires in the junction box, SCADA system or data logger.
▶ Locate the 8-pin connector correctly in the DustIQ socket labelled Host (2), it only fits one way.
⇨ The red dot on the connector is aligned to the red dot on the chassis socket.
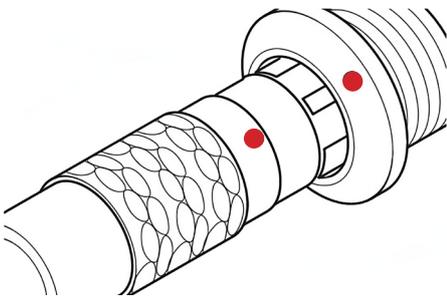
▶ Hold the connector by the end or by the grooved ring and push it into the socket.
⇨ Locking is done automatically.
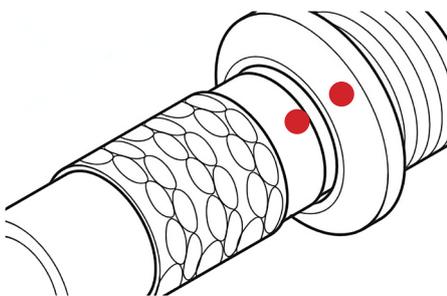
⇨ Data cable is connected.
▶ To unplug, pull the grooved ring back and then pull out the connector.

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3.1.2 Connect general USB converter (Smart Setup) and power supply

When using an USB-RS485 converter, the following connections need to be made:

Red – not connected
Green – not connected
Brown – not connected
Yellow – Modbus® RS-485
Gray – Modbus® RS-485
Blue – Modbus® common
Black – Power ground
White – Power 12 to 30 V DC

+   B+
−   A−
Common ground
RS-485 USB converter
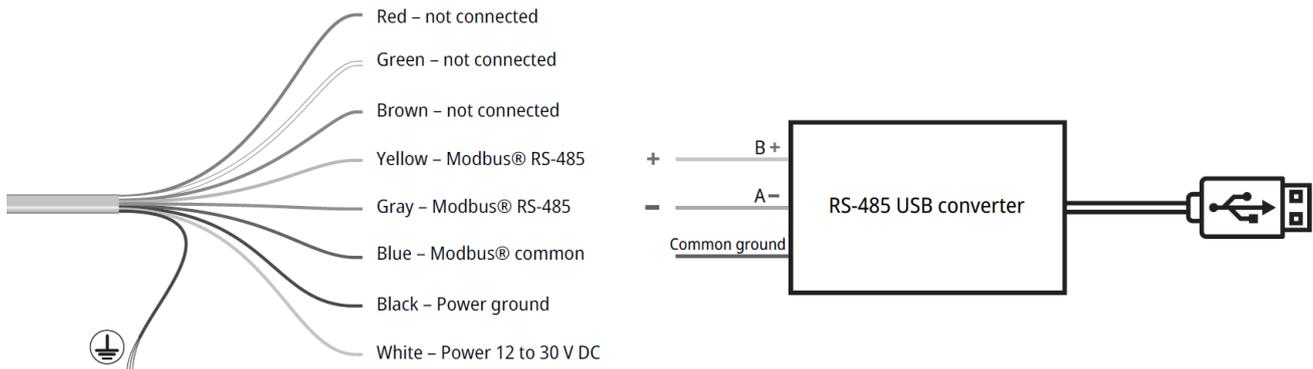
▶ Ensure that the power supply is switched off.
▶ Connect the white (12-30 V) and black (ground) wire to the power supply.
▶ Connect the yellow (+), gray (-) and blue wires (Modbus common) to the RS-485 converter.
▶ Isolate and seal all wires that are not connected and not in use.
▶ Plug the connector into the USB socket.
▶ Switch on the power supply.

⇨ Smart Setup (USB converter) and power supply are connected.

▶ Install the correct driver for your USB converter/Smart Setup.

⇨ Smart Setup (general USB converter) can be used.

3.1.3 Connect Kipp&Zonen PMU485 Smart Setup Hub

When using the PMU485 Smart Setup Hub, the following connections need to be made:

Red – not connected
Green – not connected
Brown – not connected
Yellow – Modbus® RS-485
Gray – Modbus® RS-485
Blue – Modbus® common
Black – Power ground
White – Power 12 to 30 V DC

+   B+
−   A−
Common ground
RS-485 USB converter
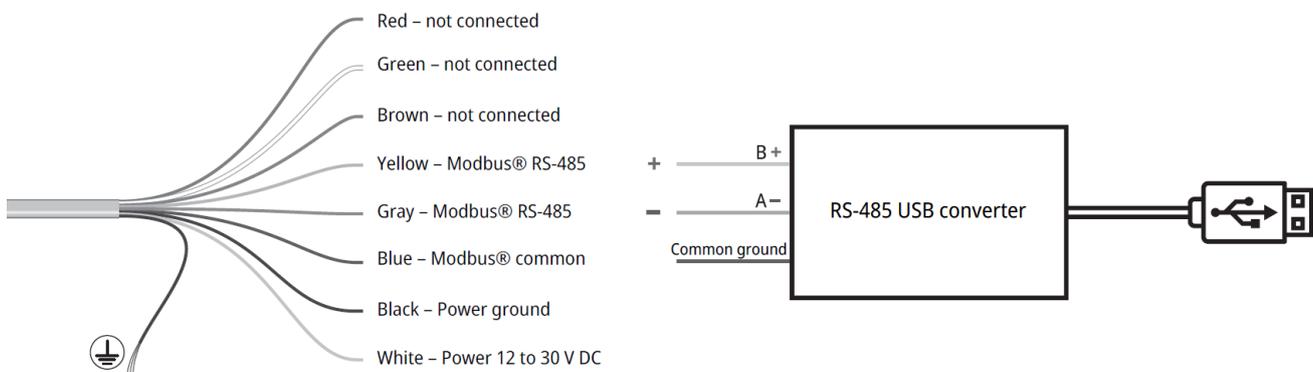
ℹ Further information can be found on the following website:
https://www.kippzonen.com/Product/534/PMU485

ℹ The needed drivers come standard with Windows 7, 8, 10 or are automatically downloaded when the PMU485 is plugged in.

⇨ PMU485 Smart Setup Hub can be used.

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3.2 Update the firmware

▶ Connect DustIQ to your computer.

▶ Check the **Windows Device Manager** to find which COM port (1) is connected.
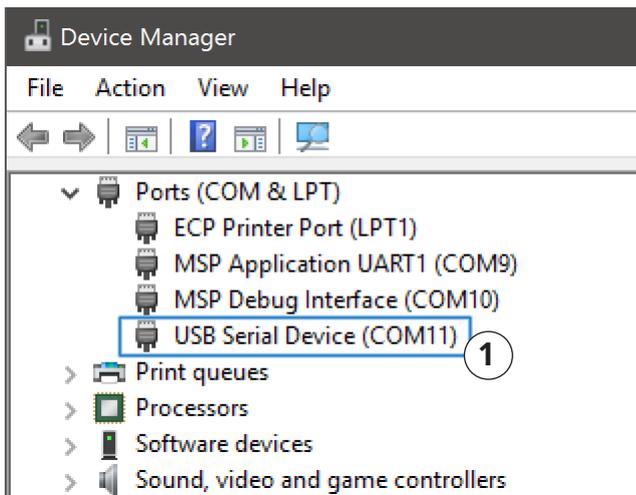
▶ Download the Firmware Update Program from the Kipp&Zonen web page.

▶ Start the **FirmwareUpdate.exe** (1) application.
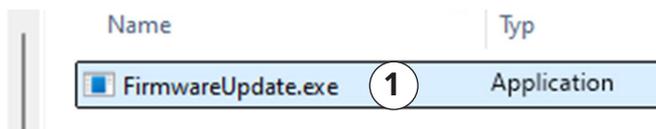
▶ Select the correct COM port (1) in the Firmware Update Program.
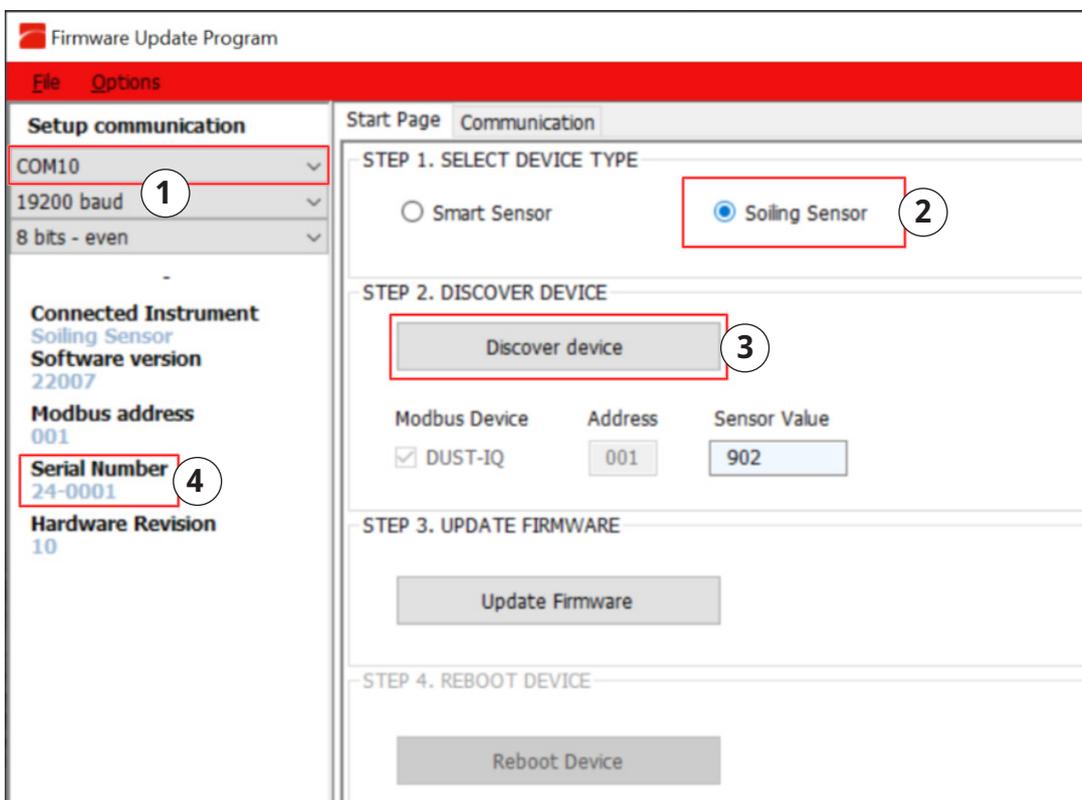
▶ Select „Soiling Sensor" (2) as device type.

▶ Click on the **Discover device** button (3) and check if the correct device is connected from the serial number (4).

⇨ DustIQ is connected.

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▶ Click on the **Update Firmware** button (1) and choose the firmware file (2).
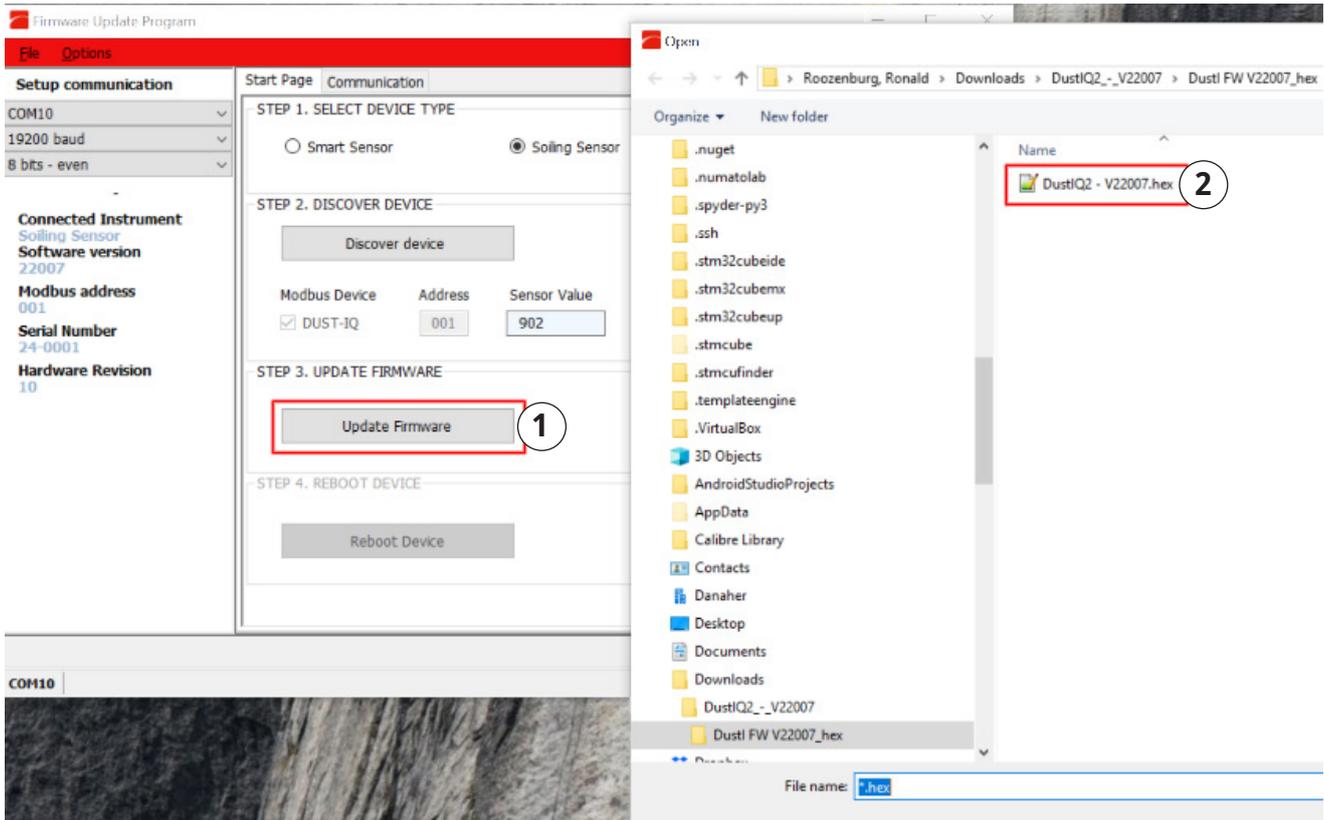
⇨ The green bar (1) will indicate that the update process is busy.

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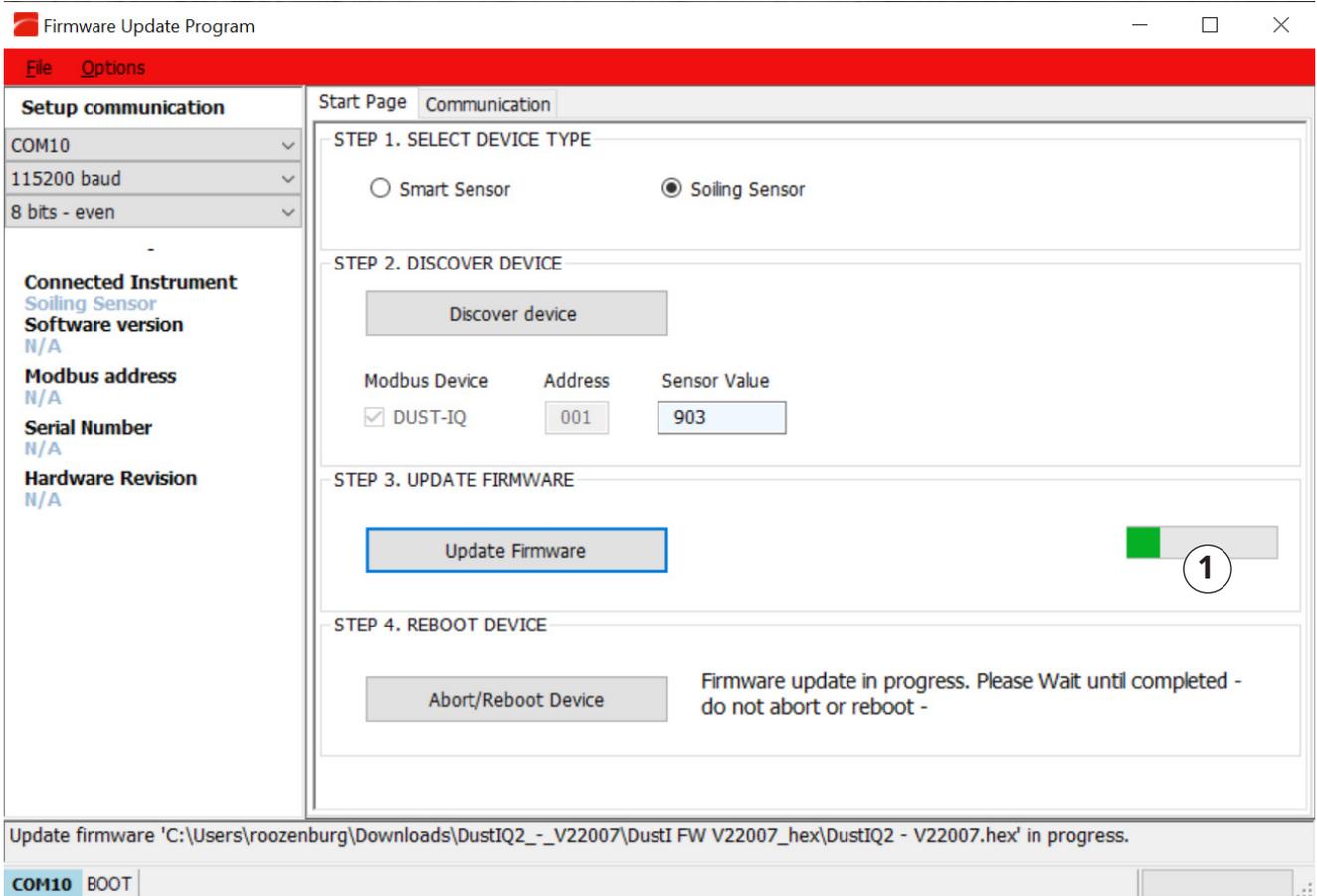
⇨ If the update is successfull **this message** (1) will be presented.
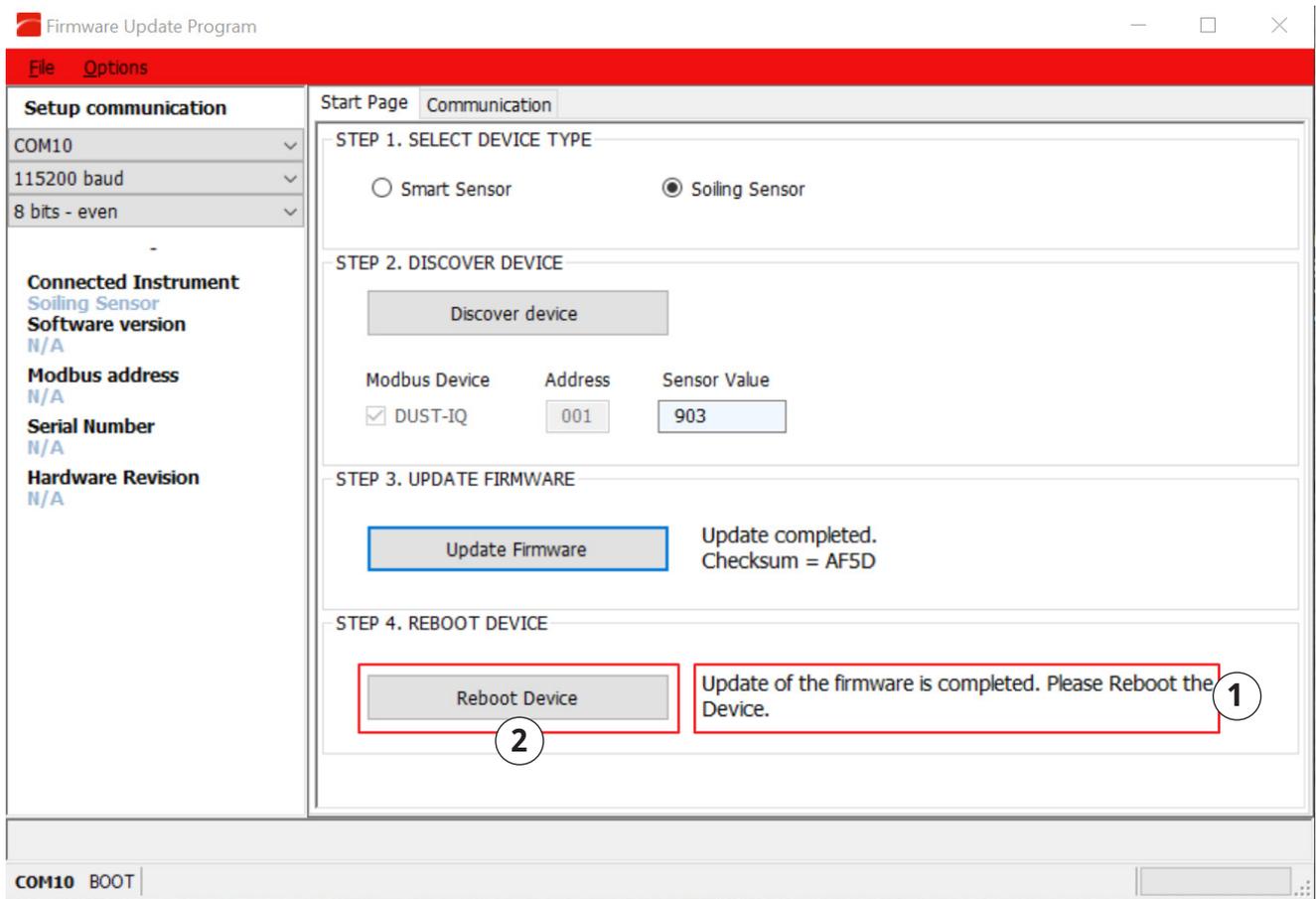
▶ Click on the **Reboot Device** button (2) to reboot the device.
▶ After the reboot is done, validate that the software version is correct (1).
    ⇨ Correct software version has been validated.
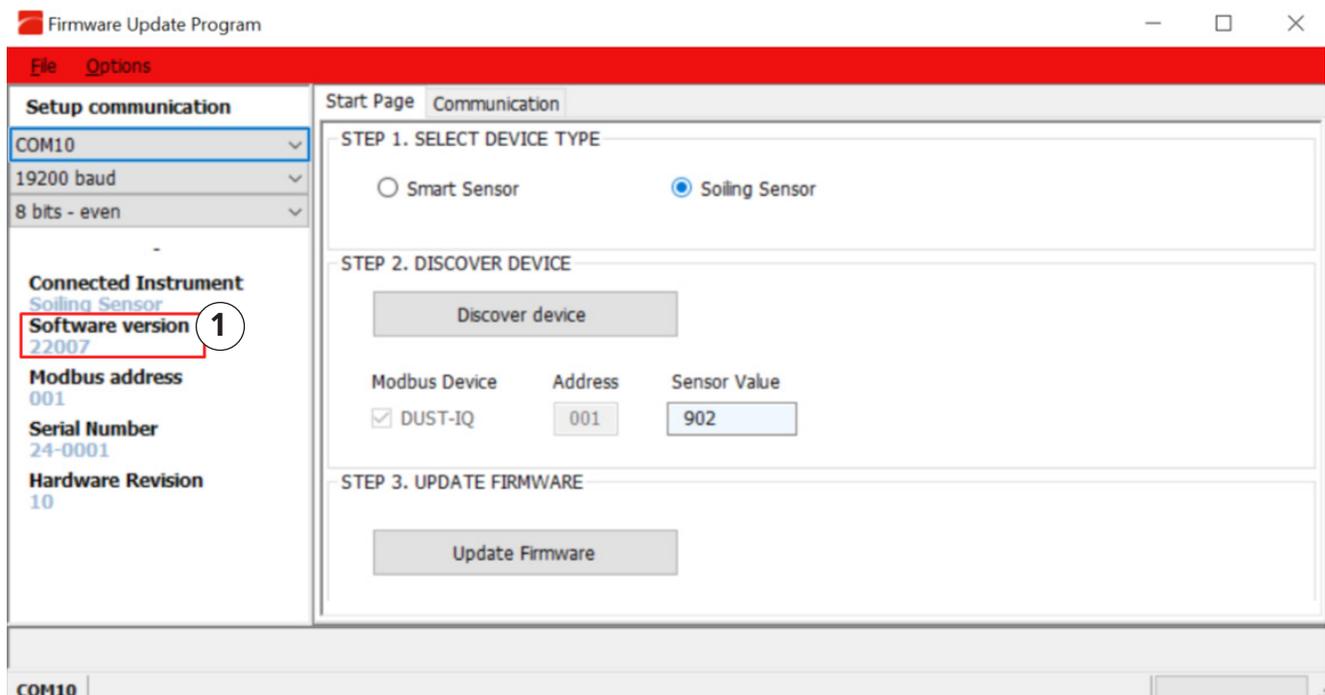
⇨ **The firmware has been updated.**

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