

# STEELGO II

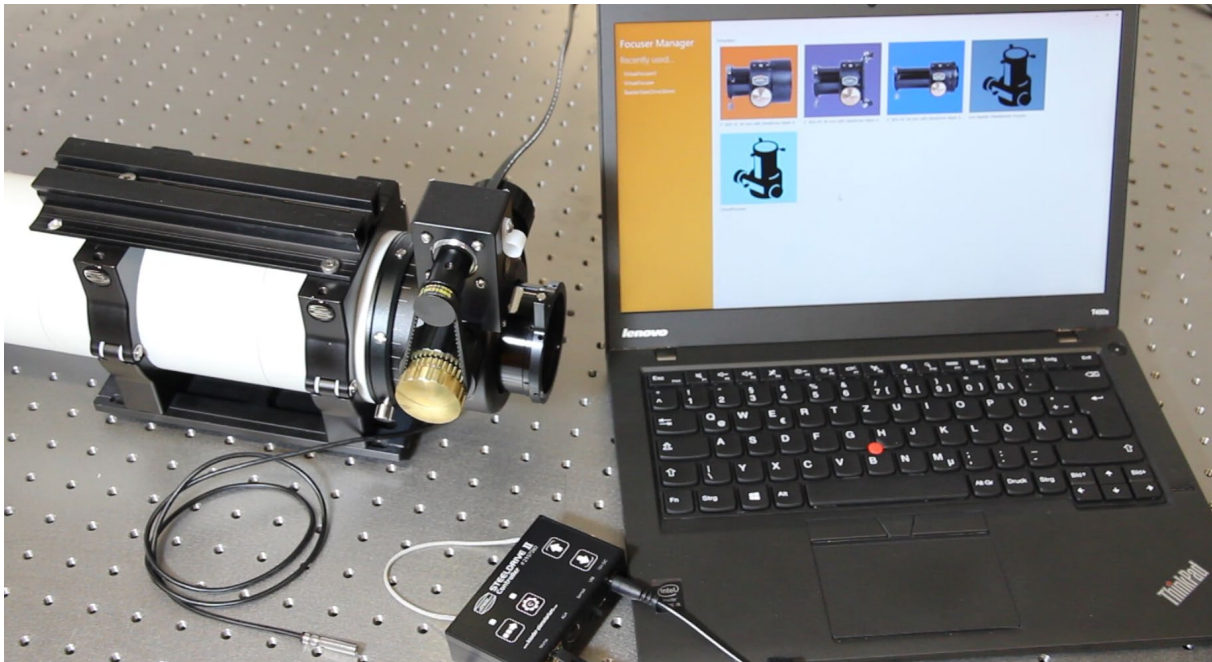
## Instruction manual

v 1.1.0



Visit the Steeldrive II product page to see additional videos for setting up the Steeldrive II motor and working with the Controller and SteelGo II Software

[www.baader-planetarium.com/steeldrive2](http://www.baader-planetarium.com/steeldrive2)



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## Introduction

SteelGo II is a modern, Windows-based control application for the Baader Steeldrive II (SD II) Motor-Focuser. It allows to fully utilize the functionality of the SD II in a user-friendly manner.

## 1. Features

- Control Baader focusers (and others) using a modern graphic user interface.
- Predefined layouts for all Baader Diamond Steeltrack® focusers.
- Empty layouts for other focusers are available and can be adjusted and saved as new templates.
- Extend the list of supported devices by installing new plugins.
- Store any number of configurations and bookmarks.
- Calculate and apply temperature compensation for various instrument configurations.
- Use both motor steps and metric units.
- Remotely monitor the focuser via infographics view and the 3D model view.
- Precisely calculate the gear ratio of your focuser.
- Log file with all (via keypad and remote) movements ensures traceability.
- See and filter the logs.

## 2. Installation

### 2.1 System requirements

The SteelGo II application requires the following:

- Windows 10
- 150 MB of free disc space
- 1 GB of RAM
- [NET Framework Version 4.5.2](#)

If [ASCOM](#) support is requested, there are additional requirements

- [NET Framework Version 3.5 SP1](#)
- [C++ redistributable \(both x86 and x64-versions\)](#)
- [ASCOM-Plattform 6.4](#)

## 2.2 Installation steps

The installer installs the SteelGo II application along with the required libraries. The following installation options are available:

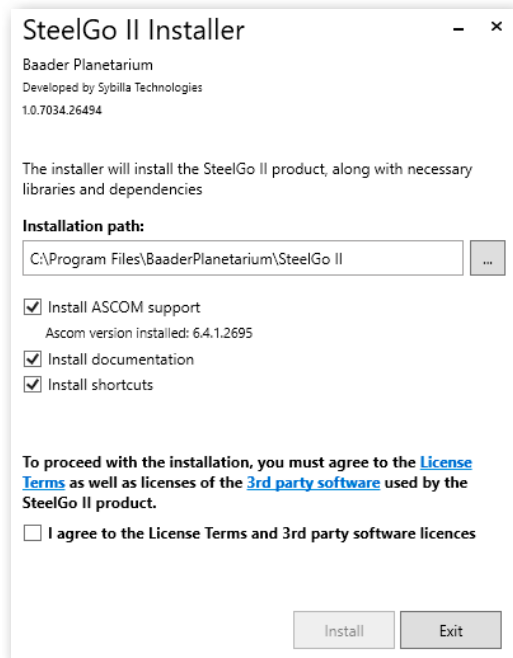


Figure 1: Installer main screen  
(ASCOM 6.4 has been detected as installed)

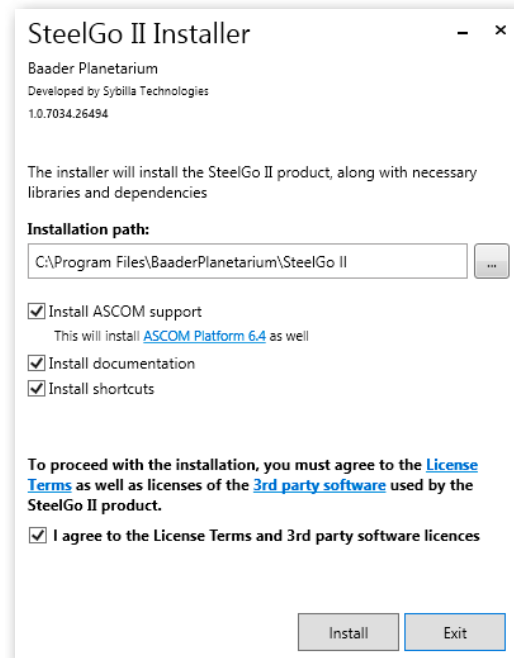


Figure 2: Installing ASCOM support  
(ASCOM Platform 6.4 has not been detected)

- **Installation path:** By default the installation path points to `C:\ProgramFiles\BaaderPlanetarium\SteelGo II`. You can change it according to your needs.
- **Install ASCOM-Support:** This installs simple ASCOM application for controlling focuser. If the ASCOM Platform 6.4 has been detected, the installer displays its version, otherwise, the ASCOM Platform 6.4 will be downloaded and installed before the SteelGo II application.
- **Install documentation:** This installs the SteelGo II product documentation.
- **Install shortcuts:** This installs the SteelGo II application Desktop and Program Menu shortcuts.

By default, the documentation and shortcuts are installed.

**To proceed with the installation, you must accept the License Terms as well as 3rd party software licenses. You can read License Terms by clicking on the “License Terms” link. To read Third Party Software Licenses, please follow the “3rd party software” link.**

To start the installation process, click the **Install** button.

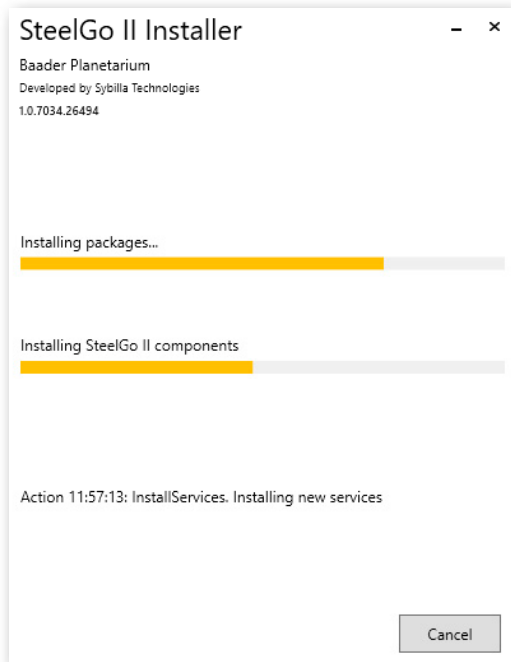


Figure 3: Installation progress

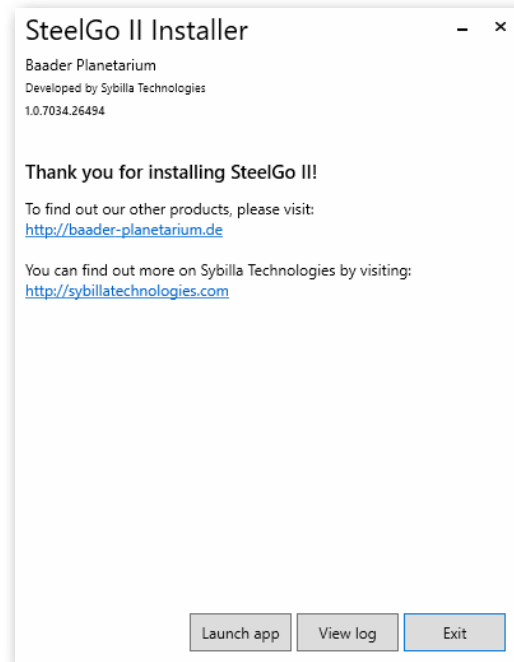


Figure 4: Installation finished

The installation takes some time (especially if ASCOM has to be installed as well). After the installation is finished you can exit the installer or launch the SteelGo II application.

## 2.3 Uninstallation

When uninstalling the product, the following options are available:

- **Remove Logs**  
This will remove all logs stored by the SteelGo II application
- **Remove app data**  
This will remove current user's SteelGo II configuration

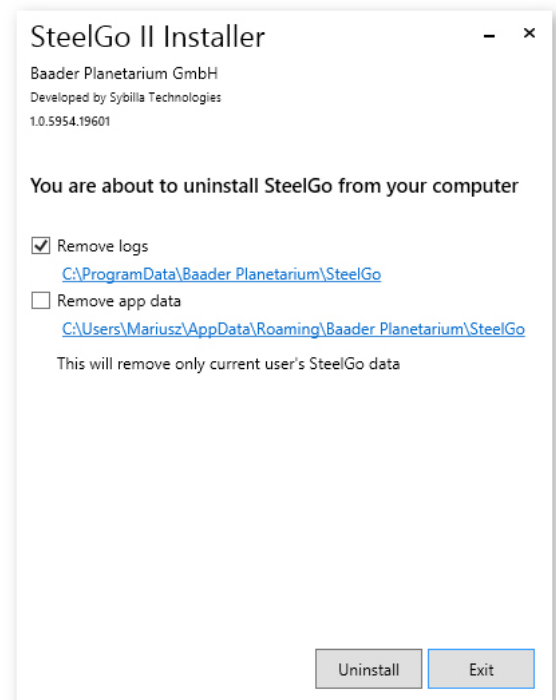


Figure 5: Uninstallation-Settings

## 3. Plugins

SteelGo II is based on the plugin architecture, each focuser template visible in the starting screen is a separate plugin. The plugin contains information about the device communication protocol, limits and behaviour. It assures the separation of the logic from user interface and also the comfortable update and adding extensions experience for the user. Plugins are maintained during the install, uninstall and update processes.

## 4. Starting Screen

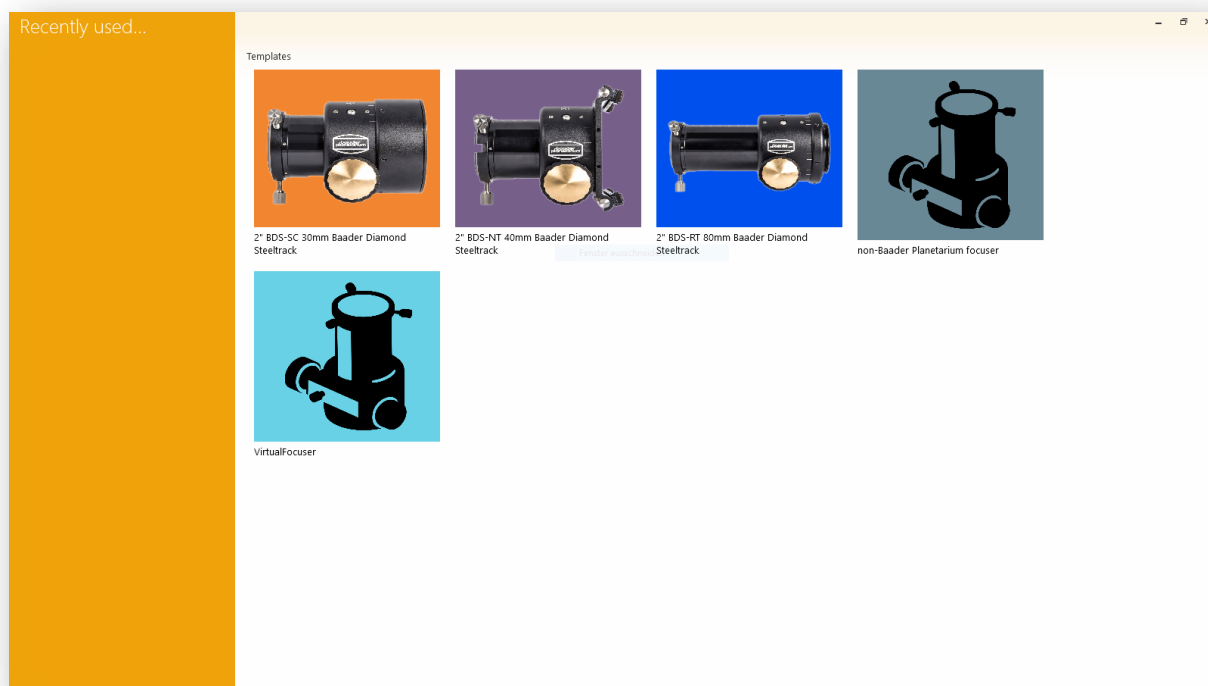


Figure 6: SteelGo II Starting Screen

This is the window that shows up when the program starts. In the main part of the window you can see configuration templates for focuser plugins you have installed. You can always test the application by choosing the VirtualFocuser template.

In order to create a new focuser configuration, select the appropriate focuser plugin, a wizard will guide you through the configuration process (see [Manual Homing Wizard](#)).

- You can create **any number of configurations**. The SD II Controller is updated with the appropriate settings on connection. This enables you to have multiple motor units installed on different telescopes, which can be used individually with only one controller unit. This significantly reduces the cost of motorizing all your instruments.
- Another example would be having multiple configurations for different setups of the same telescope (eg. deep sky, spectroscopy, etc.).

On the left panel you can quickly access the already configured devices you have recently used. When you click one of them, the main screen with the chosen device and configuration will show up (see [Main screen](#)) and the starting screen will disappear.

## 5. Manual Homing Wizard

Follow the instructions displayed on the screen to configure the focuser.

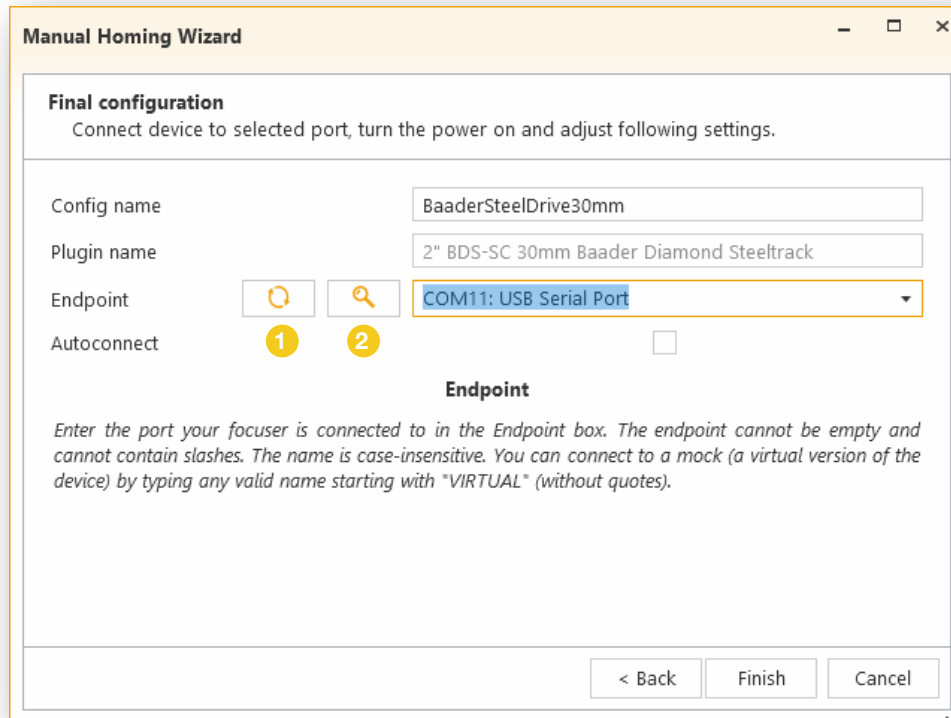


Figure 7: The Manual Homing Wizard's last page

On the wizard's last screen you can choose the **configuration name** (the default one is the same as the **plugin name**).

In the Endpoint field you should provide the name of the port to which the focuser you are configuring is connected to. The name is case-insensitive. It cannot be empty nor contain any slashes. You can type the name on your own or choose one of the autodetected ports (the inaccessible ones are marked with the red color). To refresh the autodetected list, click the **refresh button** ①.

By clicking the **detect button** ② you can attempt to communicate with all accessible ports in order to find any Steeldrive II devices connected to your computer. If any Steeldrive II device is detected, its name will appear next to the port name. **WARNING:** This process may disrupt other devices connected to the ports. A warning window will appear to confirm your decision. You can stop the warning window from appearing in the future (for this configuration) by clicking the box in the warning window or in the [Settings window](#).

Additionally, by typing a name starting with **VIRTUAL**, can connect to a virtual model.

Finally, you can check the **Autoconnect** box to make the application connect to the focuser immediately after this wizard ends (if it's the first-time configuration) or when the saved configuration is loaded.

After clicking **Finish** you will complete the manual homing wizard.

A new Icon (shortlink) with your focuser configuration will be placed automatically onto your desktop.

## 6. Main screen (Focuser)

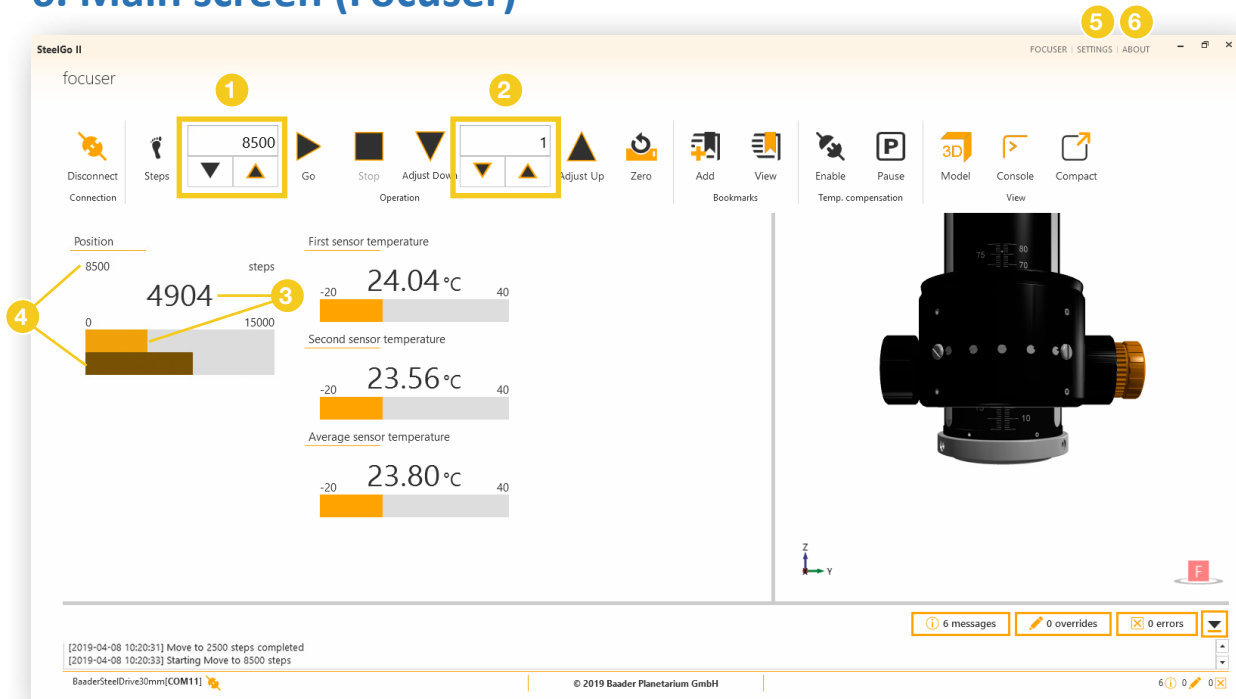


Figure 8: The software main screen

In the main screen you can do most of the focuser settings and operations.

**NOTE:** If you are not yet connected to the focuser, you should start by clicking the **Connect** button. The **Disconnect** button allows you to safely disconnect from the device.

- The **Steps/Millimetres** button controls the units in which the information is displayed and interpreted (when inputted by the user).
- The **Target position control** ① allows you enter the desired absolute position of the focuser. The units depend on the current state of the **Steps/Millimetres** button.
- The **Go** button moves the focuser to the **target position** ④.
- The **Stop** button interrupts any movement of the focuser.
- With **Adjust Up** and **Adjust Down** you can do position adjustments (by the value set in the **relative position control** ②) relative to the current position of the focuser. The units depend on the current state of the **Steps/Millimetres** button.
- The **Zero** button performs:
  - If **USE ENDSTOP** (see [Motor Settings](#)) is **enabled**, the focuser will move DOWN until the HALL-Sensor is activated. It will then stop (with deceleration ramp) and subsequently move back to the exact position the sensor was triggered. Then the absolute position is set to 0.
  - If **USE ENDSTOP** is **disabled**, the current position will be set to 0
- The **Add bookmark** button adds the current position and temperature to the saved bookmarks list. You can view them by clicking on the **View bookmarks** button (see [Bookmarks window](#)).
- The **Enable/Disable** button allows for switching temperature compensation on and off.



- The **Pause/Unpause** button allows for pausing/unpausing temperature compensation.
- The **3D-Model** button allows you to turn the 3D model of the focuser on and off. You can rotate the model by right-clicking it and dragging. Also CTRL+F, CTRL+B, CTRL+L, CTRL+R, CTRL+U and CTRL+D restore the focuser to one of the corresponding positions (front, back, left, right, up, down).
- The **Console** button shows and hides the console (see [Console](#)).
- The **Compact View** button hides most of the elements of the screen. You can go back to the full view by clicking the **Full view** button.

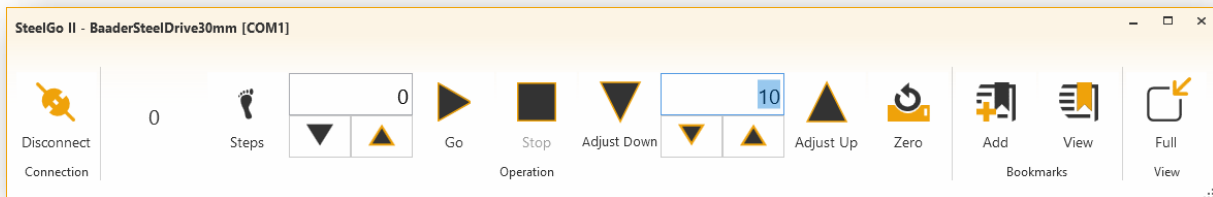


Figure 9: The compact view

Below the ribbon with buttons you can find the information about the focuser's position: its **current position** **3**, the position the focuser is going to (**target position** **4**), current units and the minimum and maximum possible positions.

If the focuser is equipped with temperature sensors, their readings are displayed as well.

You can access the program's setting by clicking on the [Settings](#) **5** link.

To view information about the program, click the **About** **6** link.

Additionally, you can operate the focuser using [Keyboard shortcuts](#).

## 6.1 Bookmarks window & Temperature Compensation Calculation

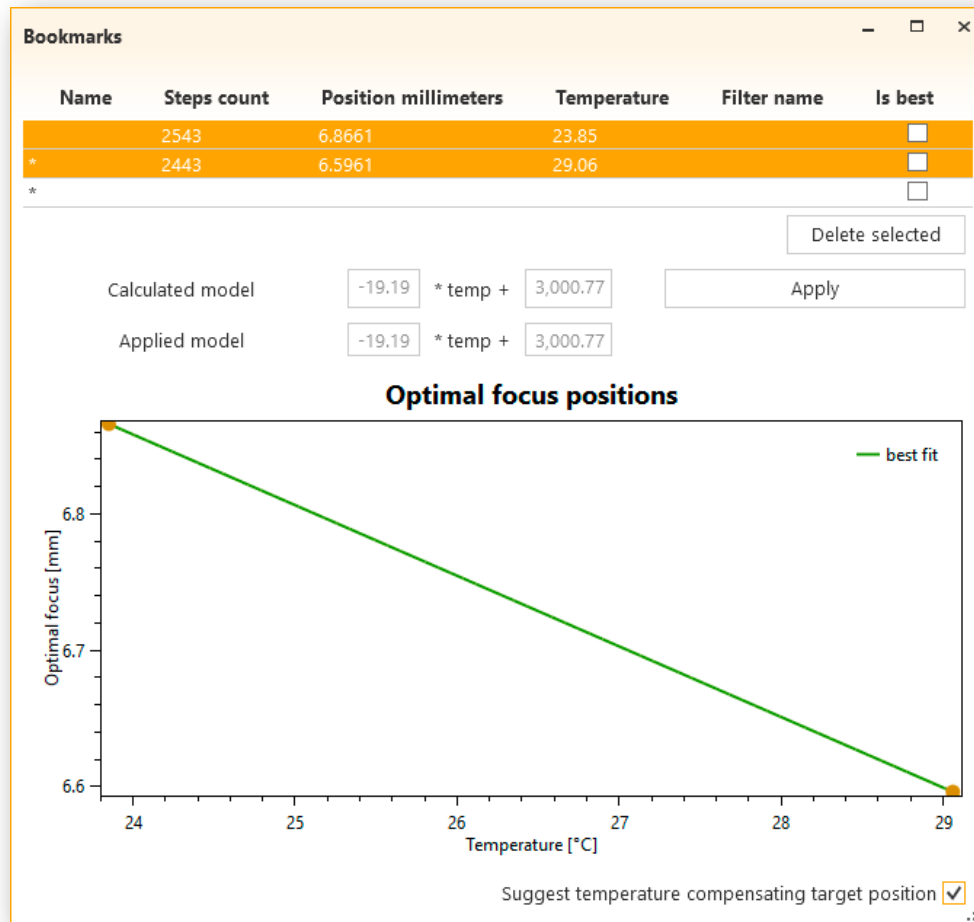


Figure 10: Bookmarks and Temperature Compensation Window

Positions that have been added by clicking the **Add bookmark** in the main screen will appear in this window.

- You can manually enter new rows by typing information into the last row.
- You can modify any field's value by double clicking it.
- To select multiple rows, click them while holding the CTRL key.
- To delete rows, select them and then click the **Delete selected** button.
- When you select a row, its position is copied into the **target position** field ([Main screen](#)).

You can calculate a temperature compensation by selecting at least 2 rows, then click **Apply** in order to save the compensation factor. (Additional information about automatic temperature compensation in the [settings](#) section)

When the **Suggest temperature compensated target position** box is enabled, the compensation is applied to the bookmark position before copying it to the target position in the main focuser window. (Note: The compensation requires a temperature sensor connected to your focuser.)

All values and entries you see here are stored in the current configuration file.

## 6.2 Console

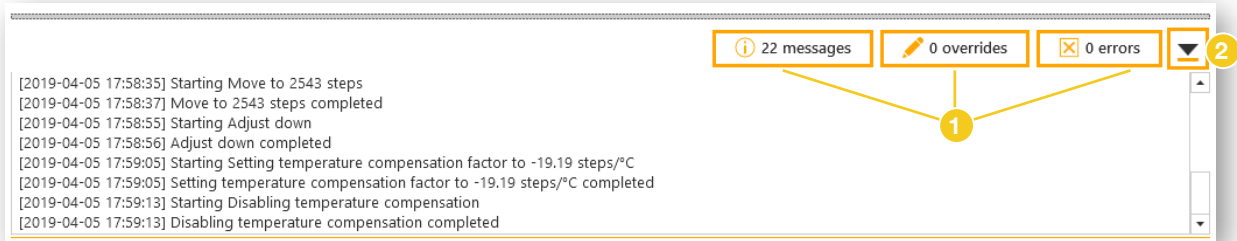


Figure 11: The Console

In the Console, you can see timestamped messages about commands you are issuing. You can filter the message by toggling the **messages**, **overrides** and **errors** buttons **1**.

The **Scroll down lock** **2** toggle button allows you to keep the console always on the bottom (i.e. where the newest entries are) or at whatever position you left it.

## 6.3 Status bar



Figure 12: The status bar

On the very bottom of the main window is the status bar. On the left side you can find the configuration and port's names and icons showing the focuser's state: connection and movement. On the right side there are icons indicating the number of informational messages, overwrites and errors you can see in the [Console](#).

## 7. Settings screen

By clicking the **Settings** button (top right in main window) you will get to the settings windows which allows access to further settings by switching through the settings tabs (Figure 13).

The changes you make in the settings are stored in the current configuration file.

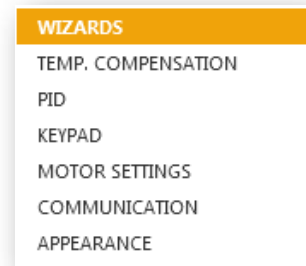


Figure 13: Settings options

### 7.1 Wizards

From here you can launch the [Calibration Wizard](#) and the [Override Wizard](#).

By toggling the **Show handshake warning** button, you can hide or show the warning window that is displayed during the [Manual Homing Wizard's](#) detection procedure.

### 7.2 Temperature Compensation Settings

You can control PID settings in this screen by entering a new value and clicking the **Change** button.

- **Source:** The temperature sensor to be used for the calculation of the compensation. 'First Sensor' is plugged into the motor unit, 'Second Sensor' is plugged into the controller unit.
- **Enabled:** The state of the temperature compensation. Can be toggled with the button in the bookmark/temperature section of the [main window \(focuser\)](#).
- **Paused:** The state of the temperature compensation pause. While paused, no automatic temperature compensation movement is carried out until it is unpaused again. Temperature drifts are still measured in background.
- **Period:** The temperature compensation movements are only carried every period (if the Delta T threshold is also exceeded).
- **Factor:** If Period and DeltaT are exceeded, the focuser will move the set number of steps/°C change of temperature since the last correction movement.
- **DeltaT:** Compensation movement is only issued if the change of temperature was greater than DeltaT (and Period has passed)

### 7.3 PID (proportional–integral–derivative controller )

The built in PID-controller can be used to precisely control the temperature of dew-heaters, optical filters and much more. With the optional adapter cable, you may attach dew heaters up to 10W directly to the SteelDrivell controller.

- **PID Source:** The temperature sensor to be used for the PID temperature control.
- **PID enabled:** The current state of the PID controller
- **PID target:** The target temperature /setpoint. [°C]
- **PID PWM:** The current PWM power output [%].

The PWM output ist set to 50% by default. When you attach a dew heater it will be powered with approx 5W. You may change this value at any time. It is saved internally in the controller. When using the controller in standalone mode without a PC this can come in handy.

For precise temperature control, select a temperature sensor, eg. attached to your dew heater. Set the target temperature and enable. You should see the changing PWM value according to temperature.

## 7.4 Keypad settings

You can control keypad settings in this screen by entering a new value and clicking the **Change** button.

- **Illumination:** Change this value in order to dimm your keypad illumination if it is too bright at night.
- **Up/Down keys flipped:** In factory default, the keypad button with the arrow pointing upwards will move the focuser outwards (absolute position increasing) and the button with the arrow pointing downwards moves the focuser inwards (absolute position decreasing).

If you are standing behind your telescope and prefer to think of the arrow buttons as 'move away from me' (inwards) and 'move towards me' (outwards), enable this setting to flip the arrow button behaviour.

## 7.5 Motor settings

You can control motor settings in this screen by entering a new value and clicking the **Change** button.

- **Hold current:** This setting is inversely proportional to the holding current of the motor and thus to the holding torque. If you don't know exactly what you are doing, leave it at it's default value.
- **Move current:** This setting is inversely proportional to the holding current of the motor and thus to the holding torque. If you don't know exactly what you are doing, leave it at it's default value.
- **Microstepping:** Halfstep (2) is the default. It offers the highest focusing resolution. Fullstep (1) offers more torque and less noise while holding. Downside is a lower focusing resolution.
- **Use endstop:** If you are using the magnet holder or metal ring for the contactless homing sensor, set it to true in order to use the automatic homing/zeroing feature. (see Zero button)
- **Jog steps:** You can change the amount of steps for moving the focuser in Jogging Mode (default: 24 steps) – see also Controller manual.
- **Single steps:** You can change the amount of steps for moving the focuser in Single-Step-Mode (default: 1 step) – see also Controller manual
- **Saved focus:** here you can overwrite the focus point that has been set using the SD II Controller – see also Controller manual

## 7.6 Communication Settings

You can change the configuration's endpoint by typing its new value in the text field and then clicking the **Change port** button.

## 7.7 Appearance Settings



Figure 13: Appearance settings

By clicking on a specific color tile you can select the accent color of the application (i.e. the dominant non-background color).

You can choose one of the themes (light, dark and red) and font sizes from here as well.

## 8. Gear ratio Calibration Wizard

This wizard allows the program to calculate the length of a motor step specific for the current focuser.

After launching the wizard, follow the instructions displayed on the screen.

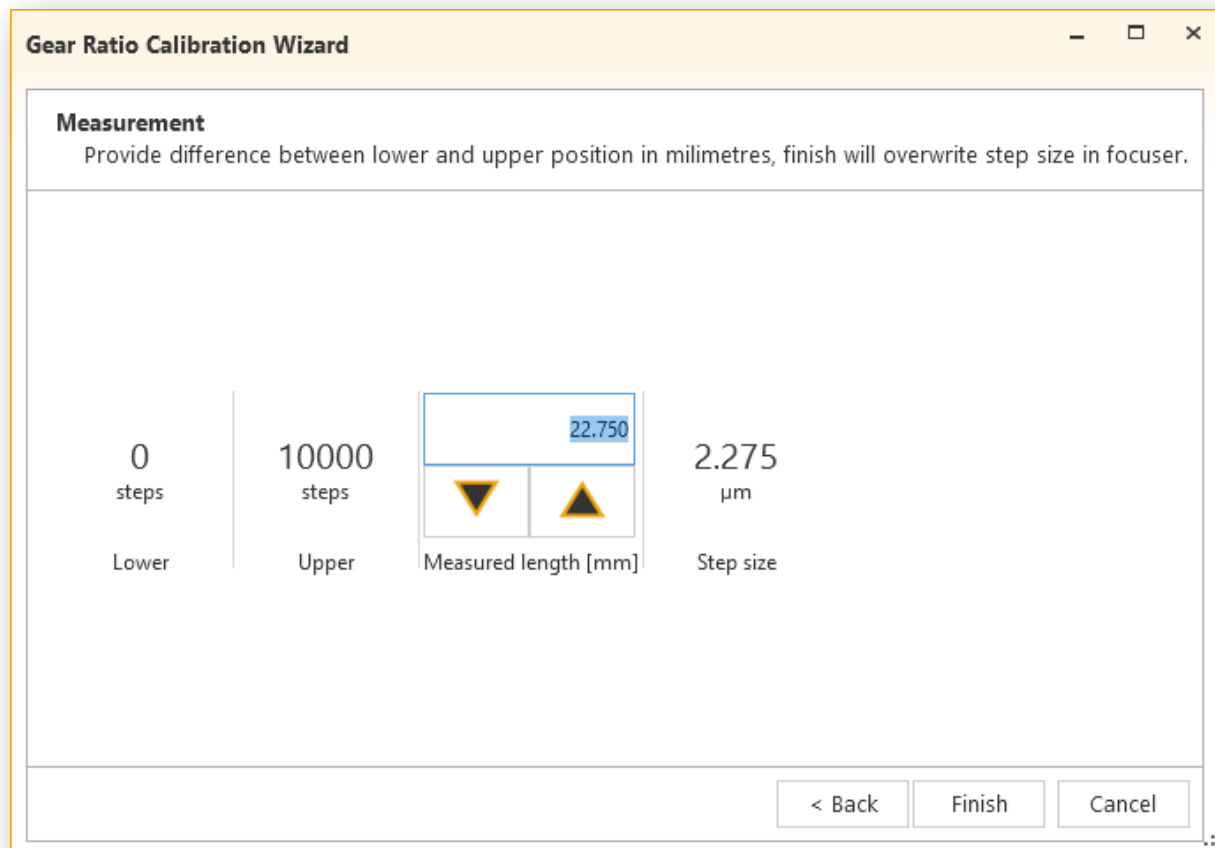


Figure 14: Gear ratio calibration wizard

## 9. Override-Wizard

**WARNING: THIS MAY BREAK YOUR FOCUSER AND AFFECT ITS WARRANTY.**

This wizard allows you to overwrite the current and maximum focuser position.

After launching the wizard, follow the instructions displayed on the screen.

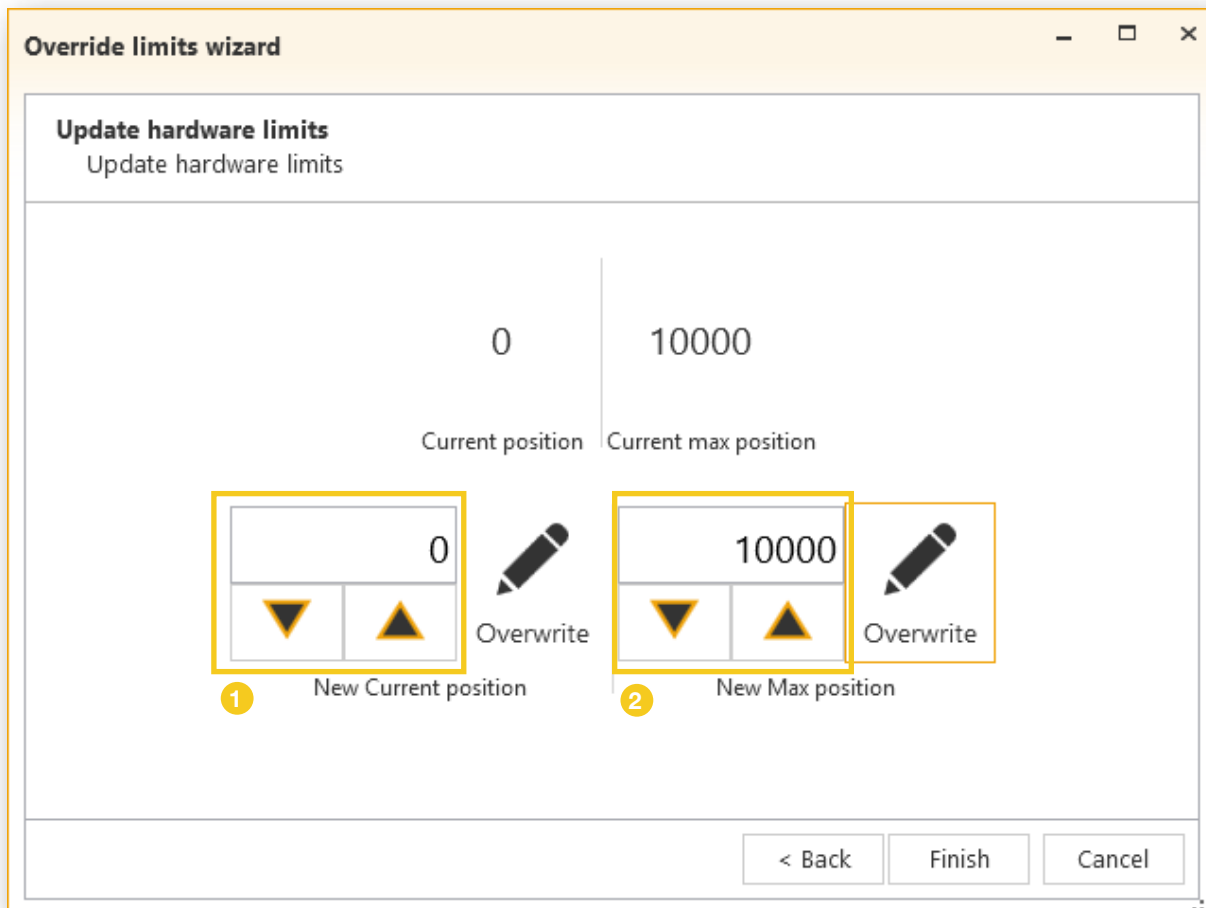


Figure 15: Override-Limits-Wizard

This left set of controls **1** allows to change the **current position** of the focuser (i.e. tell the device that it is in a different position than it is reporting).

This right set of controls **2** allows you to change the **limit** of the focuser (the maximum position to which the focuser will attempt to go to).

Leaving the wizard via a **Cancel** or **Finish** button results in leaving the override mode.

## 10. Keyboard shortcuts

SHORTCUT	Description
Alt+C	<b>C</b> onnect
Strg-Alt-D	<b>D</b> isconnect
Alt+S	Change unit to <b>S</b> teps
Alt+M	Change unit to <b>M</b> illimeters
Alt+G	<b>G</b> o
Alt+Leertaste	Stop
Alt+U	Step <b>U</b> p
Alt+D	Step <b>D</b> own
Alt+B	Add current position as a <b>B</b> ookmark
Alt+T	Open bookmarks menu
Alt+V	Compact <b>V</b> iew
Alt+F	<b>F</b> ull View



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