



# STEELDRIVE II

High precision, temperature compensating  
focusing motor for heavy loads

MADE IN GERMANY



**Baader  
Steeldrive II  
Controller**

#2957260



– ver. 01/23 –



## BAADER PLANETARIUM

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# Dear customer,

congratulations for purchasing a Steeldrive II (SD II) motor focuser. This manual describes installation and operation of the **Controller**.

In case of questions or problems, please consult the FAQ on our website or contact your dealer or us.

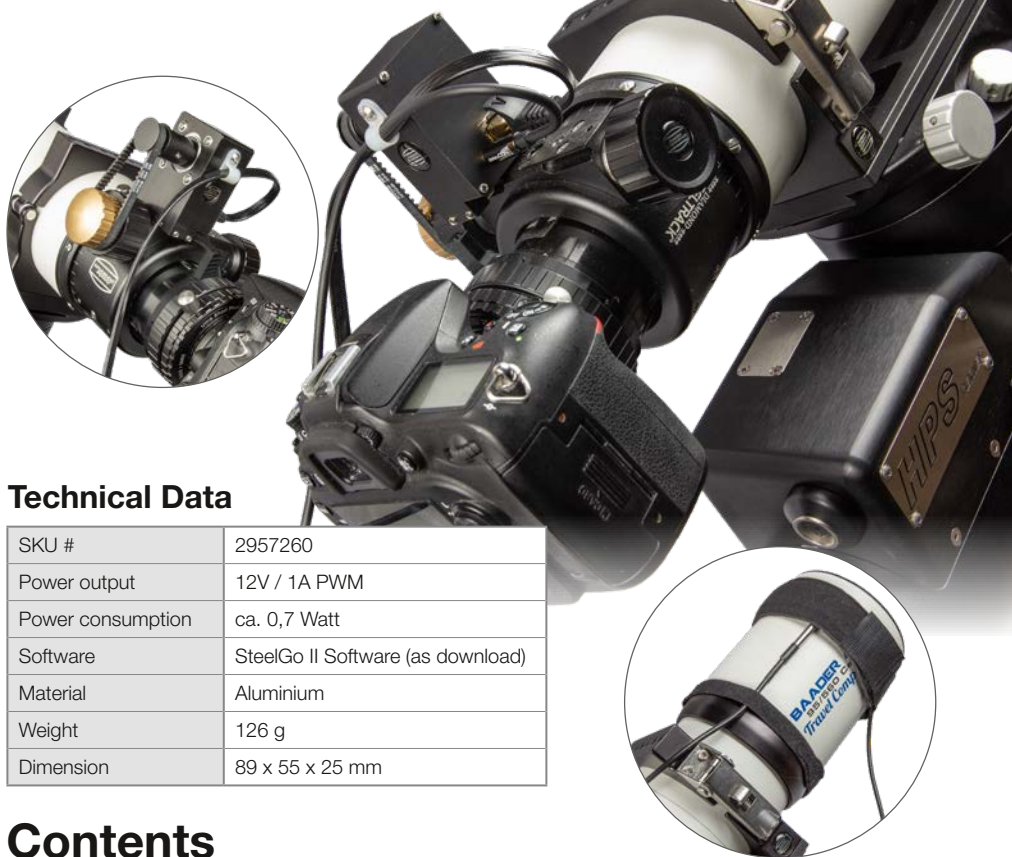
[www.baader-planetarium.com/en/steeldrive2](http://www.baader-planetarium.com/en/steeldrive2)

The Baader Steeldrive II motor focuser consists of the motor unit and the controller. Both units are also available separately. You always need one controller to operate one motor unit. But you can use one controller with several motor units one at a time – you only need to plug it into the motor unit which you want to use.



## Steeldrive II Control Unit – Highlights #2957260

- Controls the temperature compensating Steeldrive II focusing motor for Baader Steeltrack® (Classic and Diamond) focusers and optionally many other focusers
- AUX port for precise temperature control e. g. of dew shield heaters, optical filters or instruments with a precision of  $\pm 0.1$  degree
- Intuitive handling: The back-illuminated hand control makes fast switching between normal speed, jogging and single step mode easy
- 12V power supply included, as well as 3 m USB cable to connect to a PC
- Incl. revised, powerful SteelGo II Software (as download)
- Made in Germany: The housing is CNC-milled from Aluminium in our factory. The electronical boards are made by a German company according to our specifications.



## Technical Data

SKU #	2957260
Power output	12V / 1A PWM
Power consumption	ca. 0,7 Watt
Software	SteelGo II Software (as download)
Material	Aluminium
Weight	126 g
Dimension	89 x 55 x 25 mm

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# 1. Scope of Delivery

## Scope of Delivery of the Steeldrive Controller #2957260

The controller is used for manual operation of the motor focuser with the keypad as well as to connect it to a computer. The control electronics are built into this unit.

1. Steeldrive II (SD II) Controller
2. Micro-USB Cable (3 m)
3. 12V / 1.5A power supply with EU-plug
4. Further plugs for US- and UK-sockets
5. Velcro tapes (cable ties) for strain-relieving cable management



## Optional Accessories

- Additional temperature sensor #2957263
- Metal Magnet Ring for Homing-Sensor – fitting for Baader Diamond Steel-track® focusers #2957264
- Mini DIN / Cinch adapter cable to connect heat pads (dew shield heaters) #2957262

For further accessories like adapters to use the SD II motor unit with other focusers, please visit [www.baader-planetarium.com/en/bds](http://www.baader-planetarium.com/en/bds)

## 2. Dimensions and Ports

### Dimensions

See image below.



### Ports

1. RJ45-port, connects to the motor unit (*no network functionality*)
2. 8-pin Mini DIN port e. g. for dew shield heaters or other uses (adapter cable e. g. for cinch is available separately)
3. 3.5 mm phone jacket for temperature sensor
4. Micro USB port for PC connection
5. Power inlet for 5.5 x 2.1 mm plug, 12V / 1.5A





### 3. Installation of the Controller



In addition to this manual: see the installation of the SD II Controller as video

[http://bit.ly/sd2\\_cables](http://bit.ly/sd2_cables)

1. Connect SD II Motor Unit and SD II Controller with the CAT 7 RJ45-cable (included in the scope of delivery of the SD II Motor Unit).
2. Connect temperature sensor, USB-cable or AUX-devices, if desired.
3. Finally, connect the power supply.
4. Carefully bind all cables for the remote operation together with the included Velcro tape(s) **5**, so that the connector of the RJ45-cable can keep the strain away from the other cables.

### 4. Steeldrive II: Three Operation Modes

1. **Manual:** The Steeldrive II focuser is operated completely with the keys on the controller. To do so, please take a look on the keys and their functions in the next chapter.
2. **ASCOTM:** You can operate the SD II through the ASCOM-driver with common observatory control software.
3. **SteelGo II:** You can use the SteelGo II software on a PC which is connected to the Controller. This way, you can easily use all the functions of your SD II. All options of SteelGo II are described in a separate manual.

Both operation modes "ASCOTM" and "SteelGo II" are described in detail in the separate SteelGo II manual.



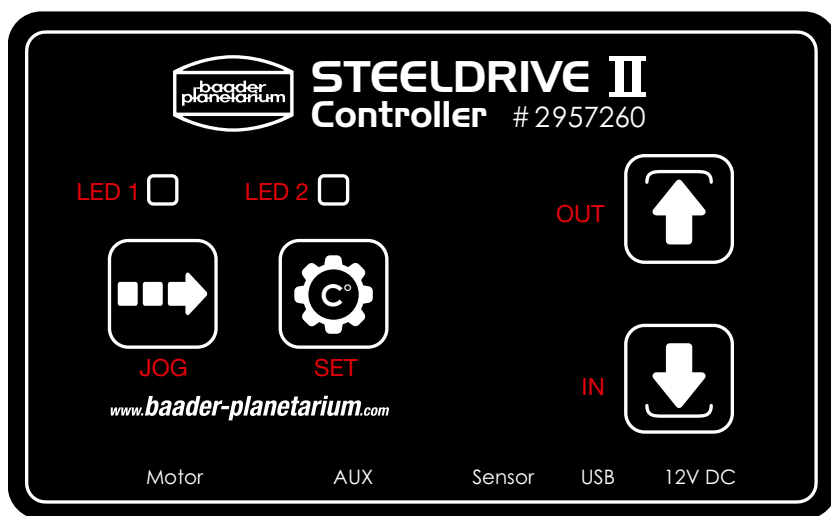
## 5. Manual Operation with the Steeldrive II Controller

As soon as you connect the SD II Controller (hand-control) to the power supply included in the scope of delivery, it will start up, and the backlight illumination will turn on. With the keypad of the controller, you can use the following functions even without a computer.



In addition to this manual:  
see the functions of the SD II  
Controller as video



[http://bit.ly/sd2\\_controller-en](http://bit.ly/sd2_controller-en)



The four keys and two LEDs on the front of the SD II Control Unit



### 5.1 Setting the Zero Position (Zeroing)

#### **Option 1: Manual** homing *without* Homing-Sensor

1. Disconnect the SD II Controller from the power supply. Move the focuser to the innermost position with the fine focuser
2. Switch the SD II Controller on by connecting it to the power supply.
3. Press SET  once; LED 2 will light up.
4. Push and hold IN  for three seconds. The current position will be saved as zero position, and the controller will return to normal mode.

**Please note:** You need the SteelGo II software to set which mode is used. Alternatively, you can use the Override-Limits-Mode.

### Option 2: Manual Homing *with* the Homing-Sensor

1. Perform steps 1 and 2 as in option 1
2. Move the focuser with OUT  approximately 1 to 2 cm outwards
3. Then move the focuser by pushing IN  until the homing-sensor responds and the focuser automatically stops.

The current position is then saved automatically as "zero position".

### Option 3: Automatic Homing *with* the Homing-Sensor



1. Connect the SD II Controller with the USB port of your computer
2. Activate the option **"Use-Endstop"** (Settings » Motor Settings) in the Steel-Go II software.

This option has to be set only once and is stored in the controller. So, you can use the automatic homing even if the SD II is not connected to a computer (see 3b).

#### 3. a) Automatic Homing with SteelGo II software:




Click "Zero" in the software. Now, the focuser will move inwards until the homing-sensor is activated, and the zero-position is saved automatically.

#### b) Automatic Homing with Steeldrive II Controller:

- Press SET  once, LED 2 lights up.
- Press and hold IN  for three seconds. Now, the focuser will move inwards until the homing-sensor is activated, and the zero-position is saved automatically. Then, the controller returns to normal mode.

## 5.2 Setting the outer limit






The outer position of the focuser depends on the model of the focuser and the telescope. By default, the controller is set to the maximum length of the BDS-SC-focuser (30 mm). If the focuser shall mover further than to the current limit, you need to activate the Override-Limits-Mode first (see 5.7), otherwise you can't move it to the new outer limit.

1. Move the focuser with OUT  to the outermost position to which it shall move later. If necessary, activate the Override-Limits-Mode.
2. Press SET  once, LED 2 lights up.
3. Press and hold OUT  for three seconds, until LED 2 turns off again.






Now, the new value for the outer limit is saved, and the Steeldrive II returns to the normal mode (all LEDs are off).

## 5.3 Focusing with the Steeldrive II

The controller features three speeds. You can easily switch between them:

- **Normal Mode:** Standard mode, is activated automatically once the controller is connected to the power supply. Press and hold the IN  or OUT  key to move the focuser continuously in- or outwards (as long as the key is held).
- **Jogging Mode:** Is activated by pressing the key JOG  once. LED 1 lights up. Once the Jogging-Mode is activated, a single push on the IN  or OUT  key moves the focuser for a predetermined number of steps inwards or outwards (by default, this corresponds to ca. 0.05 mm with a Baader Diamond Steeltrack® focuser).

***Please note:** The amount of steps can be changed in the SteelGo II Software.*

- **Single Step Mode:** Is activated by pushing the SET  button while the Jogging Mode is already active (LED 1 is on for Jogging Mode). LED 1 and 2 light up. Once the Single Step Mode is activated, the focuser is moved for one step (0.0027 mm – 2.7µ – with a Baader Diamond Steeltrack® focuser) inwards or outwards each time you push the IN  or OUT  key. Press SET  again to return to the Jogging-Mode; press JOG  to return to the Normal Mode.



***Please note:** The single steps can also be configured in the SteelGo II software. This way, you can also use two Speed-Modes with different steps, according to the requirements of your telescope.*

### Recommended way of focusing:

1. Use the **Normal Mode** to move the focuser near the focus point
2. Use the **Jogging Mode** to move the focuser to the focus point as close as the step width of one jogging step
3. If necessary, use the **Single Step Mode** to achieve perfect focus.
4. Save the focus point to access it later (see 5.4)


## 5.4 Saving a Focus Position

Once you have found the focus position, you can save it as a favorite. Do the following steps in normal mode (LED 1 and 2 are off):

1. Push SET  to switch into the settings mode (LED 2 is on)
2. Push and hold JOG  for three seconds until LED 2 is off. Now, the current position is saved as favorite.

# 5.5 Returning to a saved Focus Position



If you are in normal mode (LED 1 and 2 are off):

1. Push and hold JOG  for three seconds. Now, the focuser moves to the stored position.

Over time, small errors caused by slippage may add up. We recommend that you move the focuser to the zero position defined by the homing sensor before you move it to a stored position.

# 5.6 Activating and Deactivating the Temperature Compensation

The automatic temperature compensation must be configured through the SteelGo II software and a PC. It can only be turned on or off with the key pad of the controller.






- **Activate:** When in normal mode (all LEDs are off), push and hold SET  for three seconds. Now, LED 2 is blinking slowly.
- **Deactivate:** Once the temperature compensation is active (LED 2 is blinking slowly) and you are in normal mode, you can turn it off by pushing and holding SET  for three seconds. Then, LED 2 will go off.



Overview of the functions of the SD II Controller – printed on the back of the controller.








# 5.7 Override-Limits-Mode

If necessary, you can ignore the limits which are set in the Steeldrive II. This is e.g. useful if you want to set a new outer limit, which is farther outwards than the current one.

1. When in normal mode, push SET  once until LED 2 lights up.
2. Now hold SET  for three seconds, until LED 2 flashes fast.
3. Now you can move the focuser with IN  and OUT  to a new limit.
4. To leave the override-limits-mode, hold SET  for three seconds to return to normal mode, until LED 2 goes out.

If desired, you can save the new outer limit (see 5.2).

# 5.8 Overview of the Functions of the SD II Controller

Mode Key	Normal-Mode	 Settings-Mode (LED 2 active)	 JOG-Mode (LED 1 active)	 Single-Step-Mode (LED 1+2 active)
 OUT	Move outwards	Save outer limit (hold 3 s)	Jog outwards	Single step outwards
 IN	Move inwards	Set or GoTo zero position (hold 3 s)	Jog inwards	Single step inwards
 JOG	Switch to JOG-Mode	Save position/ focus (hold 3 s)	Exit JOG-Mode	Switch to NORMAL-Mode
 SET	Switch to SET- TINGS-Mode  ----- Temperature- Compensation on/off (hold 3 s)	Exit SET-Mode ----- Activate Overri- de-Limits-Mode (hold 3 s)	Switch to SINGLE-STEP- Mode	Switch to JOG-Mode

# STEELDRIVE II

**High precision, temperature compensating  
focusing motor for heavy loads**

Set with Motor and Control Unit: #2957165



**Baader  
Steeldrive II  
Motor unit**

#2957265

**Baader  
Steeldrive II  
Controller**

#2957260

**SteelGo II Software-Download:**

[www.baader-planetarium.com/steelgo2](http://www.baader-planetarium.com/steelgo2)

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