

ROTARION

Autofocus



Instruction Manual



CAUTION!

ROTARION and accessories are optical instruments with moving parts to be used only by adults.



**MOVING
PARTS**

Keep away body and fingers from moving parts!

READ THIS MANUAL BEFORE USING ROTARION!

AstronSCIENTIFIC

ASTRONOMY MADE EASY

Congratulations on your purchase of ROTARION AUTOFOCUS!

ROTARION AUTOFOCUS is designed and manufactured to be used for daytime terrestrial observation and for nighttime astronomical observation.

ROTARION is a unique device, patented in the European Union and the United States, to be used with any telescope with a 2" focuser and four of your favorite 1.25" eyepieces.

For the first time, you can change the power or magnification of your telescope with just a simple click and the new chosen lens will focus automatically when connecting your ROTARION and ROTARION REMOTE CONTROL software or ROTARION HAND CONTROL to the ROTARION AUTOFOCUS found in this box.

ROTARION makes the eyepiece change easy. Automatic, quick, precise and without touching the telescope avoiding disturbances in the positioning or misalignment of the optical axis between eyepieces. No more searching in the dark for your next eyepiece!

The automatic eyepiece change allows you to adjust the correct magnification on your telescope by increasing or decreasing the focal length of the eyepiece used, the "zoom effect".

Re-locate lost objects out of the field of view due to improper alignment or poor tracking of the telescope. Quickly change to your largest eyepiece in mm to maximize your field of view and re-locate. All with a simple Click!

The ROTARION AUTOFOCUS connected to the ROTARION REMOTE CONTROL software includes an easy Training Procedure (“T” Key) so it can learn your variable focal offsets among your optics mounted on the ROTARION. The built-in algorithm calculates for you each time you order a lens change, the needed focus correction to make your optics par-focal, and it is compatible with many market available motor focusers.

ROTARION AUTOFOCUS is a device of the highest quality, designed and manufactured in BARCELONA with the latest state-of-the-art techniques and the best materials and components from the U.S.A., Japan, and Germany.

First, read this instruction manual thoroughly and then follow the assembly instructions step-by-step. If you follow the instructions correctly, even if it is initially laborious, the use of ROTARION AUTOFOCUS is very simple and easy.

All this to offer you many hours of enjoyment observation, and satisfaction with your telescope.

Maximum quality, universal, versatile, and easy to use, ROTARION continues our corporate mission:

AstronSCIENTIFIC

Astronomy Made Easy

In the Box

- ROTARION AUTOFOCUS with female SUBD-9 connector cable labeled "A", compatible with Moonlite or Robofocus stepper motors.
- Adapter wire A01 for Orion, TeleVue motor
- Adapter wire A02 for JMI motor
- Adapter wire A10 for FeatherTouch MSM20 motor
- Adapter wire A11 for Feather Touch HSM20 motor
- Plastic zip strap
- Double sided adhesive tape
- Instruction Manual

System Requirements

- It is necessary to have an ROTARION EyepieceWheel to use the ROTARION AUTOFOCUS.
- In addition, a telescope with a motor coupled to the focuser. The motor can be: Stepper (Moonlite, Starlight FeatherTouch) or DC (Orion, TeleVue, JMI)
- Specific wire to connect to the focusing motor included.
- ROTARION REMOTE CONTROL Software included with your ROTARION, a PC Windows XP / Vista / Win7 / Win8 compatible is required. You will also need a Serial port on your computer
- Optionally, you can use the ROTARION HAND CONTROL connected to the ROTARION, for the control of the ROTARION AUTOFOCUS, ideal for field use without a PC or computer.

Index

A-Introduction

B-Characteristics

C-Connecting the focuser's motor

D-Connecting the ROTARION AUTOFOCUS to your ROTARION EyepieceWheel

E-Config screen

- Mini Control
- Backlash
- Min Speed
- Max Speed
- Power Moving
- Power Stopped
- Max Position
- Motor Type
- Wiring (Motor model)
- Revers
- Selector ResetPos
- Position Reset

F-Control Screen

- Focuser Led
- Auto Advance keys
- Ruler
- Keys [IN] / [OUT]. Manual Advance
- Actual Position
- STOP key
- Focuser Training Offset Panel
- TRAINING key

G-Preparation & Training

1. Motor Type
2. Motor Model
3. Preparation
 - 3.1. Atmospheric Factors & Focusing
 - 3.2. Motor Focuser Systems
 - 3.3. Crayford and Rack-and-Pinion Focusers
 - 3.4. Other Focusers
4. TRAINING procedure
 - 3.1. Near Object
 - 3.2. Far Object
 - 3.3. Very Far Object
 - 3.4. TRAINING Completed

H-Ready for Observation

1. Observing an Object
2. Changing to a New Object
3. Resetting the Focuser

I-Additional Product Information

1. Product Compliance Information
2. Service, Maintenance, Cleaning, Disposal, Serial Number, and Dealer

J-Warranty

1. Warranty Period
2. Warranty Coverage
3. Warranty Nullity

A-Introduction

The ROTARION AUTOFOCUS of AstronSCIENTIFIC is a telescope par-focal system and focus controller, which works alongside the ROTARION EyepieceWheel automatic eyepiece exchanger. It is designed to control the motor that is commonly found in telescope focusers, whether DC type (DC motor) or Stepper type (stepper motor).

You can quick-change eyepieces and focus automatically. All with a single Click!

B-Characteristics

- Connects directly to the ROTARION EyepieceWheel automatic eyepiece exchanger.
- Obtains energy from the ROTARION EyepieceWheel itself.
- Compatible with any DC focusing motor that uses 5 to 12V such as Orion, TeleVue, JMI, etc.
- Compatible with Moonlite, Robofocus, Feather Touch stepper motors.
- The output is a 9 pin SUBD female connector compatible with Moonlite motors. A specific cable is required for all other motors.
- Red LED indicator of focuser movement.
- Adjustable speed control and PWM frequency control to optimize performance with your specific motor model.

C-Connecting the Motor Focuser

The ROTARION AUTOFOCUS output is a female SUBD-9 connector labeled "A", compatible with Moonlite or Robofocus stepper motors.

To connect it to another motor, you need a specific adapter cable for the motor. Various types of cables are available from AstronSCIENTIFIC distributors.

The adaptor cables found in the box are:

A01: for DC motor ORION, TeleVue

A02: for DC motor JMI

A10: for stepper motor Feather Touch MSM20

A11: for stepper motor Feather Touch HSM20

These cables have a SUBD-9 male connector on one end and a specific connector for the motor focuser on the other end.

Attach the connector of the ROTARION AUTOFOCUS marked "A" to the motor cable that corresponds to your focuser marked "Axx". Connect the other end of the motor cable to your motor focuser.

D- Connecting the ROTARION AUTOFOCUS to your ROTARION EyepieceWheel

The second ROTARION AUTOFOCUS cable must be connected to the ROTARION EyepieceWheel Focuser port **(5)**. Although the connector looks like a mini-USB, it is a data and power cable.



*ROTARION EyepieceWheel
Connectors*

- | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none">1 Power input2 Serial Port3 USB Port4 Status Led5 AUTOFOCUS Port |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Connect the Serial Port **(2)** to the PC/computer or ROTARION HAND CONTROL. The RED LED in the ROTARION AUTOFOCUS box should blink 3 times. If not verify the power supply in the ROTARION and also verify the micro-USB cable connector from the ROTARION AUTOFOCUS to the ROTARION.

Currently the USB port (3) is operative for the ROTARION EyepieceWheel only. ROTARION AUTOFOCUS control via USB port is not available yet.

CAUTION: Although the Focuser port's power and data connector (5) has the form of a mini USB, **IT IS NOT A USB CONNECTOR.**

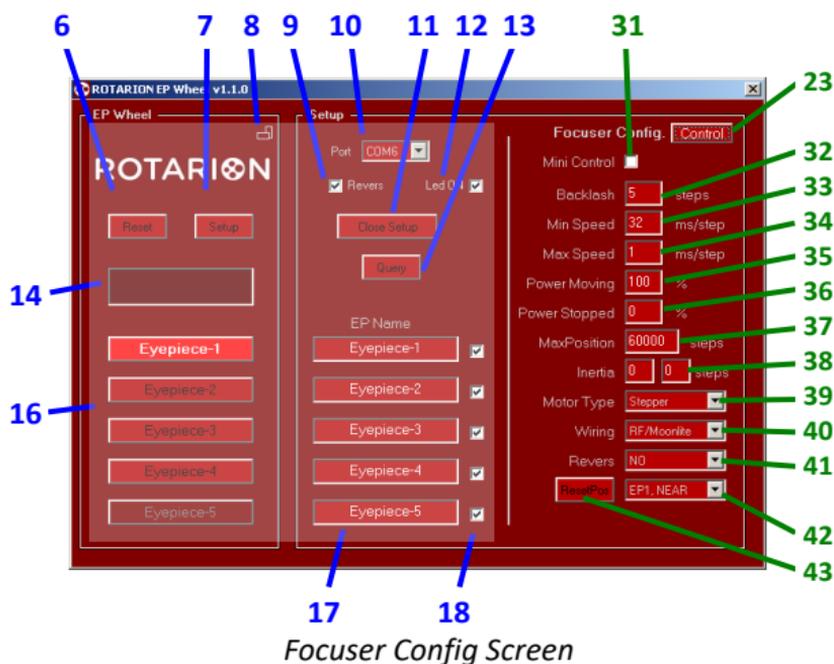
Never connect a mini-USB connector from another device. It could seriously damage both.

Now let's get to know the ROTARION REMOTE CONTROL software that simultaneously controls the ROTARION EyepieceWheel and the ROTARION AUTOFOCUS.

In **blue** color we have marked the legends referring to the basic operation of the ROTARION EyepieceWheel, and in **green** color the legends referring to the ROTARION AUTOFOCUS.

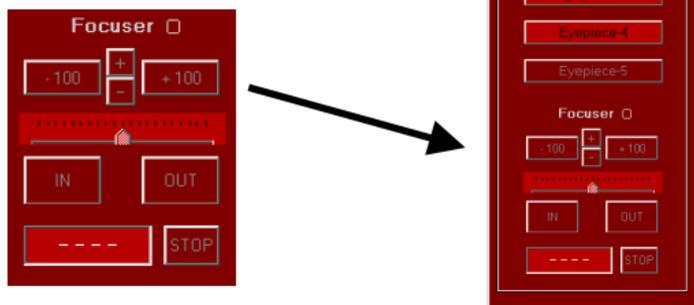
E-Config Screen

Select the [Config] / [Control] button (23) to access the ROTARION AUTOFOCUS configurable parameters.



Mini Control (31)

When you activate this box and the Setup screen (7) or (11) is closed, the ROTARION AUTOFOCUS mini-control panel will appear at the bottom of the ROTARION REMOTE CONTROL main screen.



Backlash (32)

The Backlash is a slack in the focuser mechanism that is noticed during movement. That is, depending on the focuser and after moving in one direction, by reversing the motion a substantial distance the motor may have to move the before the focuser begins to move.

To compensate it, the AUTOFOCUS can add additional steps to the distance each time the direction of rotation is reversed. The default value is 0

Min Speed (33)

Specifies the minimum speed at which the motor will move, in milliseconds / step. Value from 1...99 ms / step

Max Speed (34)

Specifies the maximum speed at which the motor will move, in milliseconds / step. Value from 1...99 ms / step

In stepping motors, the movement starts at **Min Speed** and is increased by a ramp to **Max Speed**.

In DC motors, there is no speed increase by ramp. **Min** and **Max Speed** values are the same.

Note: As the speed is expressed in ms / step, the value for the minimum speed must be greater than the value for the maximum speed.

Power Moving (35)

The Power Moving is the% of the total power (PWM) that is applied to the motor when it is moving. Range 0...100%

Power Stopped (36)

Power Stopped is the % of the total power (PWM) that is applied to the motor when it is stationary. Value from 0...100%

In a stepper motor, the Power Stopped allows the motor to maintain a certain torque when it is at rest. If the motor has a gearbox, you can leave it at 0%; In this way you avoid the heating of the motor.

In a DC motor, no power is applied while at rest because it would move. However, it is used to brake the engine and stop it in the shortest possible time (shorter distance).

Default is 0% for stepper motors and 100% for DC motors.

Max Position (37)

Specifies your maximum focuser range. If this value is reached the motor stops. Max Position is 60,000 steps, but you may type a lower value when finding your specific mechanical focuser range from IN to OUT.

The minimum value for the Current Position counter (25) is "0", that is your focuser all the way IN. Therefore, it is unable to take negative values.

The value of **Max Position** must be greater than your actual focus coordinate displayed at the **Current Position** counter, and your future position when clicking the auto advance keys (+10, +100, +1000, etc..). If any are larger, the upper and lower warning messages will appear.

Verify if you can increase your Max Position value without causing a mechanical problem in your focuser!

Click [YES] to continue and increase the Max Position value.

MaxPosition is less than Actual Position.

Please, check the values

OK

MaxPosition is less than New Position.

Please, check the values

OK

Inertia (38)

Specifies the compensation in number of inertia steps for DC motors for heavy optical/imaging gear loads. It is in development. Leave the values at 0.

Motor Type (39)

You need to identify what type of motor and model is in your focuser.

Select from the drop-down list your motor focuser type, which will connect to the AUTOFOCUS: Types of motor: DC (direct current), Stepper (step by step).



Wiring (Motor model) (40)

Select from the drop-down list the "model" of motor, depending on the Motor Type (39) selected in the previous section. If it does not match any of the list, choose one that is compatible.



When selecting the motor model, an automatic preset of the Speed and Power parameters is made. It is possible to change these values to suit the type of motor and / or telescope focuser.

models of motor:

motor DC: Orion, TeleVue, JMI

motor Stepper: RoboFocus, Moonlite, FeatherTouch

Note: Remember that if you have changed the Speed / Power parameters for one motor and select another one, default parameters are loaded. If you then re-select the motor you had previously, the default values for that motor are loaded. The previously changed values are not recovered and you must re-enter them.

Revers (41)

It allows the motor to be turned in inverted mode, to adjust the [IN] and [OUT] keys with the movement of the focuser. See section (24) [IN] / [OUT] Keys



Selector ResetPos (42)

Select the value from the drop-down list to be used as the reference value for the **Current Position** counter. See next section.



Reset Position Key (43)

Pressing this button resets the **Current Position** counter. That is, the telescope user has moved the focuser without the [IN] or [OUT] or the auto advance keys (21) and the ROTARION AUTOFOCUS has lost your focuser mechanical coordinate and is not focusing correctly.



To correct it, the user must synchronize again the focuser mechanical coordinate with a previous focused object used during the **TRAINING** procedure in the **Current Position** counter. To proceed choose one of the following reference values from the selector ResetPos (42) drop-down list.

Reference values:

POS-1 NEAR: Position for NEAR object in eyepiece POS-1

POS-1 FAR: Position for FAR object in eyepiece in POS-1

POS-1 VFAR: position for VERY FAR object in eyepiece in POS-1

30000: Intermediate focuser coordinate of telescope travel. Recommended for Schmidt Cassegrain and similar telescopes with internal primary mirror displacement.

0: Maximum IN (inward) focuser coordinate.
Recommended for Crayford and rack-and-pinion focusers found in most refractor and reflector telescopes.

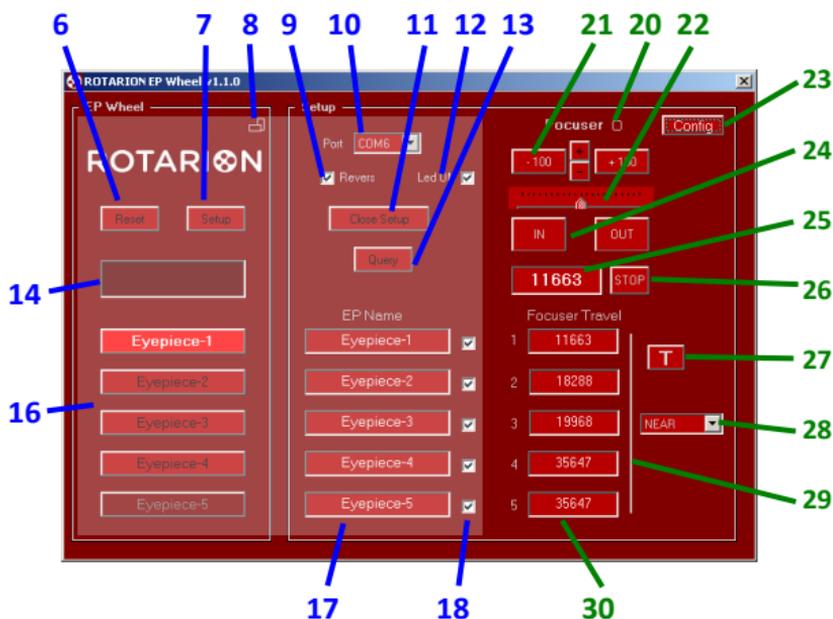
Once you have focus one of the previous chosen references values (POS-1 NEAR, POS-1 FAR,...30000, 0), to the question "Are you sure?", click [YES].



Note: You should normally have the Eyepiece 1 selected and the object well focused before making a **Position Reset**.

F-Control Screen

Select the [Control] / [Config] key (23) to access the AUTOFOCUS Control screen



Focuser Control Screen

Focuser LED (20)

LED flashes when the focuser is in motion.



Auto Advance Keys (21)

When you press the forward keys, the motor moves the number of steps indicated on them. With the [+] and [-] buttons, you change the number of steps and the scaling factor of the ruler (22).



Range of steps: ± 1 , ± 10 , ± 100 , ± 1000 , ± 10000

CAUTION: The ROTARION AUTOFOCUS does not have the ability to detect when your focuser has reached the IN or OUT ends. Damage can occur if you try to go beyond the mechanical limits of your focuser. Find out if this can be a problem with your focusing mechanism of your telescope.

Ruler (22)

With this ruler you can follow the movement of the focuser. The cursor slides under the graduated scale the number of steps of the focuser motor.



The scale factor is adapted to the steps that you select using the + or - buttons.

To center the cursor, click on the graduated ruler.



[IN] / [OUT] Keys. Manual Advance (24)

Pressing the [IN] or [OUT] key causes the motor to move for as long as you hold it down.



Usually with the [IN] key you should move the position of the focuser inwards and use the [OUT] key to move it outward. If the movement using the [IN] and [OUT] keys does not match the direction of the focuser, you can activate the **Revers** function (41).

Current Position (25)

The Current Position measured in steps of the focuser appears in this display. Each step in the **OUT** direction increases the position, while in the **IN** direction decreases it.

STOP Button (26)

Pressing [STOP] stops/halts any movement of the focuser. Do it only in case of emergency, because it will be necessary to resynchronize the position.

Focuser Training Offset Panel (29)

In this panel you will find the training offset values of the focuser for each eyepiece located in POS-1 to PO-4.

For each eyepiece 3 different focusing distances are saved (offset), which are selected through the drop-down list (28)



NEAR: for NEAR objects

FAR: for FAR objects

VFAR: for VERY FAR objects

By means of the **TRAINING Procedure** explained later in this manual, the 3 panels of position of the focuser are configured.

TRAINING Button (27)



This button starts the **TRAINING Procedure**, which consists of adjusting the focus for 3 objects, with 3 focus distances: near, far and very far, and for each of the eyepieces.

See the *TRAINING Procedure* chapter later.



When you start **TRAINING**, the button lights up and an [OK] button is displayed beside it, which is used during the procedure.

G- Preparation & Training

When starting up for the first time, you must set the type and model of motor that corresponds to your focuser.

1. MOTOR TYPE

Choose the appropriate motor type from the **Motor Type (39)** list.



In the ROTARION HAND CONTROL choose the option

MENU 5. Focus Config MotorTyp < >

2. MOTOR MODEL

Choose the appropriate motor type from the **Wiring (40)** list.



In the ROTARION HAND CONTROL choose the option

MENU 5. Focus Config Wiring < >

3. PREPARATION

Before you begin the next Instructional Manual section "TRAINING PROCEDURE", please read the following and follow the indicated recommendations below.

3.1. ATMOSPHERIC FACTORS & FOCUSING

Local changes in atmosphere factors such as density, humidity, temperature, and pressure will decrease focus offset precision calculated by the "Training Procedure", as well as changing viewing locations (altitude, etc....) with different atmospheric factors. Therefore, since the

weather conditions can change even in a few minutes, it may be necessary to fine-focus the initially proposed ROTARION AUTOFOCUS focus coordinates.

When you fine-focus one or all eyepieces mounted in positions POS-1 till POS-4 using the IN or OUT keys or with the Auto Advance Keys (21), the system will memorize the new focus offsets reproducing later excellent autofocus results.

3.2. MOTOR FOCUSER SYSTEMS

The more mechanically precise is your focuser is, the better ROTARION AUTOFOCUS repeatability, and the better autofocus results you will get. As an example, a standard Crayford focuser can be less precise (due to shaft slippage, etc..) than a focuser with rack-and-pinion.

The more mechanically rigid the attachment is your motor to your focuser, the better focusing results you will get too. A direct motor to focuser connection without elastic parts or brackets that have flexure it produces better repeatability.

A stepper motor is highly recommended due to the motor type inherent precision over a standard DC motor. Although the ROTARION AUTOFOCUS powering a DC motor with a high-quality rack and pinion Crayford focuser such as the TeleVue, will produce excellent results.

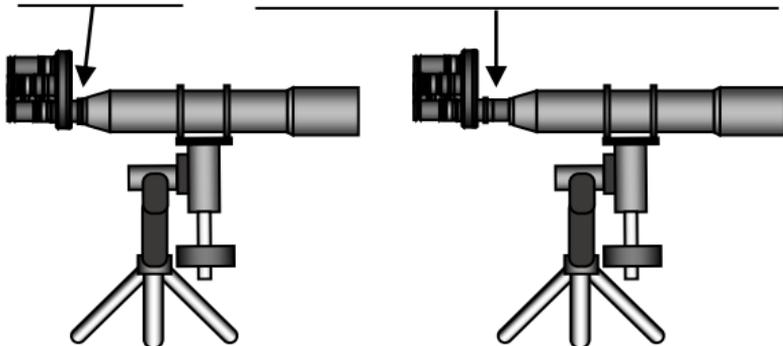
3.3. CRAYFORD AND RACK-AND-PINION FOCUSERS

For Crayford focusers and rack-and-pinion focusers found in most refractor and Newtonian telescopes, there is an easy mechanical repeatability test to validate your telescope motor focuser system and also how to calculate

your focuser range to be typed in "MAX POSITION" (37) box.

Range IN = 0

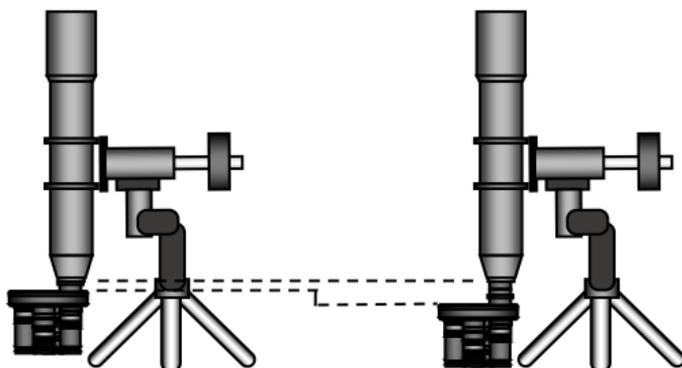
Range max OUT = "Max POSITION" (37)



Place your telescope horizontally, as seen on the previous drawing, and using the [IN] & [OUT] focusing keys or the Auto Advance Keys (21) founded in the ROTARION REMOTE CONTROL software, find your focuser travel steps for both IN and OUT ranges.

That is, the range outward or "IN-to-OUT" and the range inward or "OUT-to-IN". If the difference among IN-to-OUT and OUT-to-IN ranges or focus travel numbers are less than 5%, then OK. Type the larger number of steps in the "MAX POSITION" box (37).

Place your telescope vertical aiming the Zenit, as seen below, loaded with your ROTARION and any other needed accessories and repeat the test "IN-to-OUT" and "OUT-to-IN".



If there is over 5% difference among your “IN-to-OUT” and/or your “OUT-to-IN” vertical ranges in number of steps to the number you calculated on the previous focuser horizontal test and typed in the “MAX POSITION” box (37), you either have mechanical focuser problems or your motor does not have the necessary precision or power to achieve focusing repeatability. Fix it or replace the non-performing focuser parts before proceeding with the “TRAINING PROCEDURE”.

3.4. OTHER FOCUSERS:

For some reflecting telescopes without Crayford focusers and with focusing by internal primary mirror displacement such as the Schmidt Cassegrain, or similar, it is not necessary to perform the previous procedure, since it is sometimes difficult to measure those telescope’s focus range.

Instead, and before doing the “TRAINING PROCEDURE”, you must focus manually the POS-1 eyepiece and fine-tune the focus to a NEAR object using the IN or OUT keys or with the Auto Advance Keys (21) and select the “30,000” option in the drop-down menu (42) and after do a “RESET POSITION” (43) found in the SETUP>CONFIG screen.

The result should be a “30,000” displayed at the “CURRENT POSITION” counter (25) and a NEAR object focused with eyepiece in position POS-1 of the ROTARION. If so, proceed to the TRAINING PROCEDURE.

If you do not follow the previous recommendation, you may reach “0” in the “CURRENT POSITION” counter (25) when focusing later with higher power and small mm number eyepiece while teaching the ROTARION AUTOFOCUS for the FAR and VERY FAR offsets. If so, you

will be unable to complete the TRAINING PROCEDURE correctly, you will have to repeat the TRAINING PROCEDURE again from a largest focus coordinate in eyepiece POS-1, selecting and focusing a NEAR object again, and resetting "CURRENT POSITION" counter (25) to 30,000, as explained previously in this section.

4. TRAINING PROCEDURE

TERRESTRIAL USE

If you are going to use your ROTARION for terrestrial observation such as birding or digiscoping, place your telescope horizontally and define your viewing area as in NEAR, FAR, and VERY FAR. Choose 3 non-moving objects NEAR, FAR and VERY FAR as focusing reference.

The smaller the range of view or viewing distance among NEAR, FAR & VERY FAR, the better autofocus results you will get for objects located within that viewing area.

Example: it is better to define a viewing area from NEAR to VERY FAR of 0,5 to 3 miles (or Km) than a viewing area of twice or double the range such as from 0,5 to 6 miles (or Km). The smaller the viewing area, the more precise automatic focusing results you will achieve within that range.

ASTRONOMICAL USE

If you are going to use your ROTARION for nighttime astronomical observation or astro-imaging, place your telescope inclined to your most common position (for example, around 60, 70 or 80 degrees over the horizon) and define your viewing area as in NEAR=Moon, FAR=Planets and VERY FAR=Stars.

TRAINING

With your telescope select 3 objects at different distances:

- 3a** First object NEAR / (Near-Moon)
- 3b** Second object FAR / (Far-Planet)
- 3c** Third object VERY FAR / (Very Far-Star)

1 Before starting the TRAINING Procedure, you will need to select the eyepiece from POS-1.

T Press the [TRAINING] button (you must have the eyepiece in position 1). Accept the question of whether you are sure to start TRAINING.



In the ROTARION HAND CONTROL choose the option

MENU 5. Focus Config Training ON

Accept the question **Are You Sure? Yes**

In the bottom line appears **TN: 0**

The flashing **T** key remind us that we are in Training and the **N** indicates the NEAR object chosen in point 3a.

4.1. NEAR OBJECT



Using the eyepiece in position 1 (POS-1) and using the [IN] / [OUT] keys, focus on the closest object chosen in point 3a.

With a good fine focus, press the [OK] key that appears next to the TRAINING key.



A window appears with the confirmation that you have well-focused the NEAR object of eyepiece 1 in POS-1. Click [YES].



A window appears that reminds us that you must change to the eyepiece-2 in POS-2. Click [OK].



In the ROTARION HAND CONTROL focus with the IN and OUT keys and briefly press MENU and accept the question EP1, NEAR OK?

2

Change from eyepiece-1 to eyepiece-2 in POS-2 using (16) keys

Using the eyepiece in POS-2 and using the [IN] / [OUT] focusing keys, focus the same object chosen in point 3a.

With a good fine focus, press the [OK] key.



Confirm that you have well focused the NEAR object of the eyepiece 2 in POS-2. Click [YES].



A window appears that reminds us that you must change to the next eyepiece-3 in POS-3. Click [OK].

You Need To Go
To Position 3
To Continue Training

OK

In the ROTARION HAND CONTROL focus with the IN and OUT keys and briefly press MENU and accept the question EP2, NEAR OK?

3

Change from eyepiece-2 located in POS-2 to eyepiece-3 in POS-3 using the (16) keys.

Using the eyepiece in POS-3 and using the [IN] / [OUT] keys, focus the same object chosen in point 3a.

With a good fine focus, press the [OK] key.

OK

Confirm that you have well focused the NEAR object of the eyepiece 3. Click [YES].

Eyepiece POS-3,
NEAR Object Focus OK ?

No

Yes

A window appears that reminds us that you must change to the eyepiece-4 in POS-4. Click [OK].

You Need To Go
To Position 4
To Continue Training

OK

In the ROTARION HAND CONTROL focus with the IN and OUT keys and briefly press MENU and accept the question EP3, NEAR OK?

4

Change from eyepiece-3 to eyepiece-4 in POS-4 using the **(16)** keys.

Using the eyepiece in POS-4 and using the [IN] / [OUT] keys, focus the same object chosen in point 3a.

With a good fine focus, press the [OK] key.



Confirm that you have well focused the NEAR object of the eyepiece 4. Click [YES].

**Eyepiece POS-4,
NEAR Object Focus OK ?**

No

Yes

“We already know the focus coordinates for NEAR objects”

1

Now you must select eyepiece-1 in POS-1.

This window reminds us, and indicates that you must select the FAR object (distant) chosen in point 3b with the eyepiece 1 in POS-1. Click [OK].

**You Need To Go
To Position 1
To Continue Training**

Now Over a FAR Object

OK

In the ROTARION HAND CONTROL focus with the **IN** and **OUT** keys and briefly press **MENU** and accept the question **EP4, NEAR OK?**

In the bottom line the **N** letter change to **F** indicating the FAR object chosen in point 3b.

4.2. FAR OBJECT

TRAINING FAR Object

Using the eyepiece in position 1 and using the [IN] / [OUT] keys, focus the far object chosen in 3b.

With a good fine focus, press the [OK] key.



A window appears with the confirmation that you have well-focused the FAR object (distant) of the eyepiece 1 in POS-1. Click [YES].

Eyepiece POS-1,
FAR Object Focus OK ?

No

Yes

A window appears that reminds us that you must change to the eyepiece-2 in POS-2. Click [OK].

You Need To Go
To Position 2
To Continue Training

OK

In the ROTARION HAND CONTROL focus with the IN and OUT keys and briefly press MENU and accept the question EP1, FAR OK?

2

Change from eyepiece-1 to eyepiece-2 using the (16) keys.

Using the eyepiece in POS-2 and using the [IN] / [OUT] keys, focus the same object chosen in point 3b.

With a good fine focus, press the [OK] key.



Confirm that you have well focused the FAR object on the eyepiece 2. Click [YES].



A window appears that reminds us that you must change to the eyepiece 3 in POS-3. Click [OK].



In the ROTARION HAND CONTROL focus with the IN and OUT keys and briefly press MENU and accept the question EP2, FAR OK?

3

Change from eyepieces from POS-2 to POS-3 using the (16) keys.

Using the eyepiece in position 3 and using the [IN] / [OUT] keys, focus the same object chosen in point 3b.

With a good fine focus, press the [OK] key.



Confirm that you have well focused the FAR object of the eyepiece 3. Click [YES].



A window appears that reminds us that you must change to the eyepiece 4 in POS-4. Click [OK].



In the ROTARION HAND CONTROL focus with the **IN** and **OUT** keys and briefly press **MENU** and accept the question **EP3, FAR OK?**

4

Change from eyepiece in POS-3 to the eyepiece in POS-4 using the **(16)** keys.

Using the eyepiece in POS-4 and using the [IN] / [OUT] keys, focus the same object chosen in point 3b.

With a good fine focus, press the [OK] key.

OK

Confirm that you have well focused the FAR object of the eyepiece 4. Click [YES].

**Eyepiece POS-4,
FAR Object Focus OK ?**

No

Yes

“We already know the focus coordinates for FAR objects”

1

Now you must change to eyepiece-1 in POS-1.

This window reminds us, and indicates that you must select the VERY FAR object (very distant) chosen in point 3c. Click [OK].

**You Need To Go
To Position 1
To Continue Training**

Now Over a VERY FAR Object

OK

In the ROTARION HAND CONTROL focus with the **IN** and **OUT** keys and briefly press **MENU** and accept the question **EP4, FAR OK?**

In the bottom line the **F** letter change to **V** indicating the VERY FAR object chosen in point 3c.

4.3. VERY FAR Object

TRAINING VERY FAR Object

Using the eyepiece in position 1 and using the [IN] / [OUT] keys, focus the VERY FAR object chosen in 3c.

With a good fine focus, press the [OK] key.



Confirm that you have well focused the VERY FAR object of eyepiece-1. Click [YES].

Eyepiece POS-1,
VERY FAR Object Focus OK ?

No

Yes

A window appears that reminds us that you must change to the eyepiece 2 in POS-2. Click [OK].

You Need To Go
To Position 2
To Continue Training

OK

In the ROTARION HAND CONTROL focus with the IN and OUT keys and briefly press MENU and accept the question EP1, VFAR OK?

2

Change from eyepiece-1 to eyepiece-2 in POS-2 using the (16) keys.

Using the eyepiece in position 2 and using the [IN] / [OUT] keys, focus the same object chosen in point 3c.

With a good fine focus, press the [OK] key.



Confirm that you have well focused the VERY FAR object of the eyepiece 2. Click [YES].



A window appears that reminds us that you must change to the eyepiece 3 in POS-3. Click [OK].



In the ROTARION HAND CONTROL focus with the IN and OUT keys and briefly press MENU and accept the question EP2, VFAR OK?

3 Change from eyepiece-2 to eyepiece-3 in POS-3 using the (16) keys.

Using the eyepiece in position 3 and using the [IN] / [OUT] keys, focus the same object chosen in point 3c.

With a good fine focus, press the [OK] key.



Confirm that you have well focused the FAR object of the eyepiece 3. Click [YES].



A window appears that reminds us that you must change to the eyepiece 4 in POS-4. Click [OK].



In the ROTARION HAND CONTROL focus with the **IN** and **OUT** keys and briefly press **MENU** and accept the question **EP3, VFAR OK?**

4

Change from eyepiece-3 to eyepiece-4 in POS-4 using the **(16)** keys.

Using the eyepiece in position 3 and using the [IN] / [OUT] keys, focus the same object chosen in point 3c.

With a good fine focus, press the [OK] key.

OK

Confirm that you have well focused the VERY FAR object of the eyepiece 4. Click [YES].

**Eyepiece POS-4,
VERY FAR Object Focus OK ?**

No

Yes

“We already know the focus coordinates for VERY FAR objects”

TRAINING Procedure is over!

You have successfully completed the TRAINING PROCEDURE, click [OK] to go to your ROTARION REMOTE CONTROL software MAIN SCREEN.

TRAINING COMPLETED

ROTARION Autofocus READY

Go to Main Screen

OK

In the ROTARION HAND CONTROL focus with the **IN** and **OUT** keys and briefly press **MENU** In the ROTARION HAND CONTROL focus with the **IN** and **OUT** keys and briefly press **MENU** and accept the question **EP4, VFAR OK?**

Appears **TRAINING Is DONE.** Training is over.

4.4. TRAINING completed

During the TRAINING procedure, you have entered in the memory of the ROTARION AUTOFOCUS the focus coordinates for objects NEAR, FAR and VERY far for each of the eyepieces in POS-1 till POS-4.

You can access these coordinates **(30)** of the [FOCUS OFFSETS] panel using the drop-down list **(28)**.

Note: We can change these values if necessary or by experimentation. We recommend not to change the focus coordinates obtained by the TRAINING.

In the ROTARION HAND CONTROL we can access them through the option:

MENU 5. Focus Config Travel NEAR/FAST/VFAST

H-Ready for Observation

1. Observing an Object

Once the TRAINING is done you have the equipment ready for observation either for daytime terrestrial use or nighttime astronomy use, using only the ROTARION REMOTE CONTROL main screen with the ROTARION AUTOFOCUS mini panel activated (31).

When you select an object for observation, you first observe it with the eyepiece of smaller magnification and with the largest mm number, Eyepiece 1, situated at position POS-1. Decide if the observed object is NEAR, FAR or VERYFAR (28) and use the number of steps indicated in the panel using the drop-down list so it equals the number in the counter "CURRENT POSITION" (25) as the initial focusing coordinate. Then you continue to fine-tune the focus to sharpen the image using always the [IN] or [OUT] keys or with the Auto Advance Keys (21).

Once the object in POS-1, is in focus and centered, you are ready to change to eyepiece in position POS-2

When you change to position POS-2 (where you have a more powerful eyepiece, Eyepiece 2) the program calculates the focus coordinate for this eyepiece using mathematical algorithms. These algorithms use the values set during the TRAINING procedure. This way, the object will appear automatically focused or nearly focused.

If necessary, fine-tune the focus of POS-2 lens using the [IN] or [OUT] keys or with the Auto Advance Keys (21). If the ROTARION AUTOFOCUS algorithm focus proposal for the second eyepiece in POS-2 needs user's fine focus improvement, may be due to changing atmospheric conditions, the ROTARION AUTOFOCUS will memorize the new user's focus offset among POS-1 and POS-2 optics.

Similarly, when selecting position POS-3 (where you have a higher-powered eyepiece, Eyepiece 3) the software calculates the focus coordinate for this third eyepiece using the value you have set for the Eyepiece 2 in POS-2 and the focus values memorized during TRAINING.

The object will appear in the Eyepiece 3 visual field automatically focused or nearly focused. If necessary, again, fine-tune the focus. If you must fine focus the third eyepiece in POS-3, the ROTARION AUTOFOCUS will memorize the new focus adjustment among POS-2 and POS-3.

Follow the previous procedure for your fourth position POS-4 eyepiece or ROTARION PRIMEFOCUS kit (if installed).

After the fine focus of POS-1 till POS-4, you can return to a previous (lower power) eyepiece and the viewed object will be automatically focused, with the latest memorized fine focus offset.

In other words, once you have fine-tuned the focus from POS-1 till POS-4, you can change back and forth to any chosen eyepiece and your ROTARION AUTOFOCUS will produce precise and well-focused results.

Moreover, the ROTARION AUTOFOCUS system allows the user to modify slightly the fine-focus offset without erasing the previous memorized fine-focus coordinate. If the user's focus modification is large, the algorithm will propose a new focus coordinate for the following more powerful eyepieces.

As indicated previously, for this focusing process to work accurately, it is necessary to work with good quality mechanical focusers & motor focus systems. Although the ROTARION AUTOFOCUS can operate with DC motors, the best results are obtained with stepper motors and rack and pinion focusers.

2. Changing to a New Object

If you change the observed object for another object at a different distance, you must go to POS-1 and focus again using the [IN] or [OUT] keys or with the Auto Advance Keys (21), so the system knows that you are observing a new object with new focus offsets and coordinates. After, you will have to go to POS-2 and focus again if necessary. The ROTARION AUTOFOCUS will erase the previous memorized fine-focus offsets from the previously viewed object and will calculate new ones for the new viewed object.

As you change from eyepiece in POS-1 to the POS-2 and so on, you may have to fine-focus and center the currently viewed object before changing to the next eyepiece so the ROTARION AUTOFOCUS memorizes the new fine-focus offsets and focus coordinates among POS-1 till POS-4.

3. Resetting the Focuser

If you accidentally or manually move the focuser without using the IN or OUT keys or without the Auto Advance Keys (21), the ROTARION AUTOFOCUS coordinate will not match the mechanical focus coordinates of your focuser and the ROTARION AUTOFOCUS will not work properly.

Therefore, you must synchronize again your focuser position with the ROTARION AUTOFOCUS coordinate displayed in the CURRENT POSITION counter (25).

Go to POS-1, select an object you chose during TRAINING and focus it, or move your focuser to max inward coordinate (0) and press the key RESET POSITION (43) found in the SETUP>CONFIG screen.

See in this manual Chapter E- Config Screen, section **Selector ResetPos (42)** and section **Reset Position (43)** and follow the procedure.

I-Additional Product Information

Please read the following instructions and information.

1. Product Compliance Information

The AstronSCIENTIFIC S.L. corporation with address at Marti i Julia 6-8, Barcelona 08834 Spain E.U. has certified this product with the IEC 61010-1 Norm for *Safety requirements for electrical equipment for measurement, control, and laboratory use* in compliance with the Bureau Veritas Consumer Products Services Germany GmbH corporation based at Türkheim, Germany.

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

- The CE Certificate Product Marking:



- Instruction Manual Version:
Rotarion AutoFocus V:1.0 CE

2. Service, Maintenance, Cleaning, Disposal, Serial Number, and Dealer:

Car adapter fuse:

- 4 Amp 12V 6.3x32mm, fast acting.
- To replace it, unscrew the tip and replace.

Operating environmental conditions:

- Max. 2000m. / 0-40 °C / 32-104 Fahrenheit and 80% humidity.

Degree of Protection IEC 60529:

- Not applicable.

The Power Supply:

- Input: 100-240Vac; 50/60Hz; 0,55A
Output: 12Vdc; 2A; Limited Power Source
- **Disconnect the Power Supply unit from the ROTARION. The Power Supply unit must be freely accessible and must not be covered nor obstructed for disconnecting the ROTARION when needed.**
- Only use the supplied Power Supply unit.
- Please compare the rating plate of the Power supply unit with the local mains voltage and frequency.

Maintenance technical data:

- Maintenance free.

Cleaning:

- Use a soft cloth without liquids.

Disposal:

- 

- Equipment with this symbol shall not be disposed of together with household or commercial waste.
- Please find out about separate disposal at your regional offices.
- The directive 2012/19/EU on waste electrical and electronic equipment (WEEE) is applicable in the European Union member states.

Serial Number (or PN): _____

Dealer: _____

Date: _____

J-Warranty

The warranty is extended to all countries where this product is distributed by AstronSCIENTIFIC S.L. or by a distributor assigned by it. This warranty is subject to the legal provisions of each country.

1. Warranty period

The Warranty period is 2 years from the date of the sales invoice issued by AstronSCIENTIFIC S.L. Or by the distributor authorized by AstronSCIENTIFIC S.L.

2. Warranty Coverage

The conformity of the product is warranted according to the use for which it is intended.

Within the warranty period, we will remedy any defect in the operation of the product due to its manufacture, whether repairing, replacing parts or providing a new product, provided that the option chosen is feasible and not economically disproportionate according to the criteria of AstronSCIENTIFIC S.L.

For any of the three options, repair, replacement of parts or exchange for a new product, the consumer must go to the authorized distributor of AstronSCIENTIFIC S.L. where the product was purchased.

3. Warranty Nullity

This warranty will not be valid in the following cases:

Misuse, improper use, neglect, accident, or deterioration of the product due to failure to comply with the warnings and restrictions contained in this Instruction Manual or in the operating instructions provided by AstronSCIENTIFIC S.L.

External agents such as water or other harmful chemicals, obstructive or corrosive.

Likewise, faults or malfunctions caused by incorrect voltages and electrical installations will not be covered by this guarantee.

This warranty does not cover any product that has been altered or repaired by any person other than AstronSCIENTIFIC S.L. repair personnel, or any product whose serial number, model number or identification has been removed, is defective or altered.

AstronSCIENTIFIC S.L. Shall not be liable for any indirect, special, incidental, or consequential damages related to the sale or use of the product.