



NexStar 102SLT

MAKSUTOV-CASSEGRAIN



INSTRUCTION MANUAL

#23090

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INTRODUCTION

Congratulations on your purchase of the Celestron NexStar SLT telescope- the perfect combination of power and portability. This "Star Locating Telescope" (SLT) features innovative automated technologies that make navigating the night sky as easy as pressing a few buttons. In fact, you can have your NexStar SLT up and running after locating just three bright celestial objects. If you are new to astronomy, you may wish to start off by using the NexStar's built-in Sky Tour feature, which commands the NexStar to find the most interesting objects in the sky and automatically slews to each one. Or, if you are more experienced, you will appreciate the comprehensive database of over 40,000 objects, including customized lists of all the best deep-sky objects, planets, bright double stars. No matter your experience level, your NexStar SLT will be your constant companion and guide, unlocking the wonders of the night sky.

Some of the many standard features of the NexStar SLT include:

- Incredible 3°/second slew speed.
- Fully enclosed motors and optical encoders for position location.
- Computerized hand control with 40,000 object database.
- Storage for programmable user defined objects.
- Many other high performance features!

Take time to read through this manual before embarking on your journey through the Universe. It may take a few observing sessions to become familiar with your NexStar SLT, so you should keep this manual handy until you have fully mastered your telescope's operation. The NexStar+ hand control has built-in instructions to guide you through all the alignment procedures to have the telescope up and running in minutes. Use this manual in conjunction with the on-screen instructions provided by the hand control. The manual gives detailed information regarding each step as well as needed reference material and helpful hints guaranteed to make your observing experience as simple and pleasurable as possible.

Your NexStar SLT telescope is designed to give you years of fun and rewarding observations. However, there are a few things to consider before using your telescope that will ensure your safety and protect your equipment.

SOLAR WARNING



- Never look directly at the Sun with the naked eye or with a telescope (unless you have the proper solar filter). Permanent and irreversible eye damage may result.
- Never use your telescope to project an image of the Sun onto any surface. Internal heat build-up can damage the telescope and any accessories attached to it.
- Never use an eyepiece solar filter or a Herschel wedge. Internal heat build-up inside the telescope can cause these devices to crack or break, allowing unfiltered sunlight to pass through to the eye.
- Never leave the telescope unsupervised. Make sure an adult who is familiar with the correct operating procedures is with your telescope at all times, especially when children are present.

WHAT'S IN THE BOX



1	Corrector Lens
2	Fork Arm
3	Battery Compartment
4	Tripod Coupling Screw
5	Tripod
6	Accessory Tray
7	Tripod Leg Extension Clamp
8	Telescope Optical Tube
9	StarPointer Finderscope
10	Eyepiece
11	Star Diagonal
12	Hand Control

PARTS LIST

- Optical Tube Assembly
- 1.25" Star Diagonal
- 25mm and 9mm Eyepieces – 1.25"
- StarPointer Finderscope and Mounting Bracket
- Tripod
- Deluxe Accessory Tray
- NexStar+ Hand Control
- Astronomy Software Download Card

ASSEMBLY AND SETUP

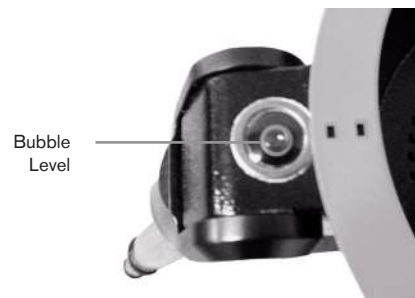
Your NexStar SLT comes in three major sections: the optical tube, the fork arm and the tripod. These sections can be attached in seconds using the quick release coupling screw located under the tripod mounting platform and the dovetail mounting clamp located on the inside of the fork arm. To begin, remove all of the accessories from their individual boxes. Remember to save all of the containers so that they can be used to transport the telescope. Before attaching the visual accessories, the telescope tube should be mounted to its tripod. First, install the accessory tray onto the tripod legs:

ACCESSORY TRAY AND TRIPOD

1. Remove the tripod from the box and spread the legs apart until the center leg brace is fully extended.
2. Locate the accessory tray, and place it on top of the tripod center support brace in between the tripod legs
3. Rotate the accessory tray so that the central hole in the tray slides over the flange post in the center of the support bracket.
4. Finally, rotate the tray so that the locking tabs slide under the locking clips on support bracket. You will here the tray snap into place.

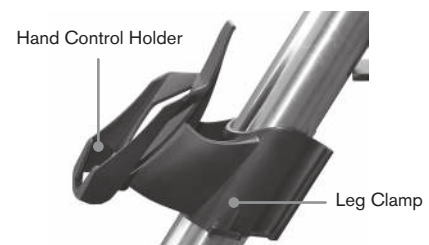
It is a good idea to level the tripod and adjust the height of the tripod legs before attaching the fork arm and tube. Minor adjustments can be made later. To adjust the height of the tripod legs:

1. Loosen the tripod leg locking bolt located on the side of each leg.
2. Slide the inner portion of each leg down about 6 to 8 inches, or until the tripod reaches your desired height for observing.
3. Adjust the tripod height until the bubble level on the tripod leg is centered.
4. Tighten the tripod locking bolts to hold each leg in place.



ATTACHING THE HAND CONTROL HOLDER

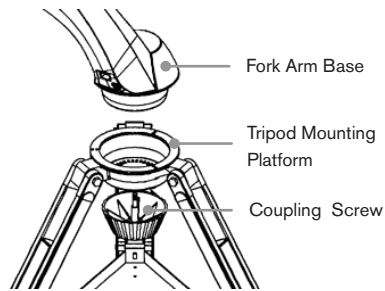
The NexStar SLT comes with a snap-on hand control holder that conveniently attaches to any of the tripod legs. To attach the hand control holder, simply position the holder with the square plastic tab facing up and push against the tripod leg until it snaps into place.



ATTACHING THE FORK ARM TO THE TRIPOD

With the tripod properly assembled, the telescope tube and fork arm can easily be attached using the quick release coupling screw located underneath the tripod mounting platform. To do this:

1. Place the fork arm base inside the tripod mounting platform.
2. Thread the coupling screw into the hole at the bottom of the fork arm base and hand tighten.

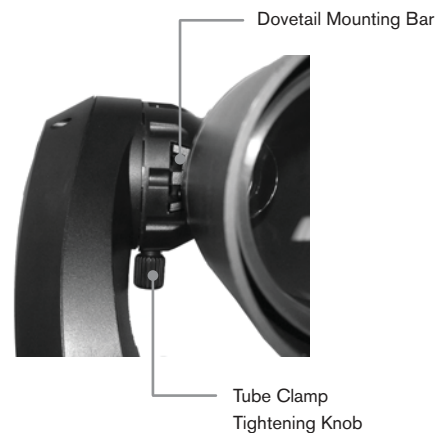


ATTACHING THE TELESCOPE TO THE FORK ARM

Your telescope optical tube has a built-on dovetail mounting bar used to attach the tube to the fork arm. To attach the telescope tube:

1. Loosen the tube clamp tightening knob.
2. Slide the dovetail mounting bar of the telescope tube into the fork arm clamp. Make sure that the logo on the side of the tube is right side up when the tube is aligned with the fork arm.
3. Tighten the tube clamp tightening knob by hand to secure the tube to the fork arm.

Your telescope is now fully assembled and you are ready to attach the accessories.



THE STAR DIAGONAL

The star diagonal diverts the light at a right angle from the light path of the telescope. For astronomical observing, this allows you to observe in positions that are more comfortable than if you were to look straight through. To attach the star diagonal:

1. Turn the thumbscrew on the eyepiece adapter at the end of the focuser barrel until it no longer extends into (i.e., obstructs) the inner diameter of the focus barrel. Remove the protective dust cap from the focuser barrel.
2. Slide the chrome portion of the star diagonal into the eyepiece adapter.
3. Tighten the thumbscrew on the eyepiece adapter to hold the star diagonal in place.



If you wish to change the orientation of the star diagonal, loosen the thumbscrew on the eyepiece adapter until the star diagonal rotates freely. Rotate the diagonal to the desired position and re-tighten the thumbscrew.

THE EYEPIECE

The eyepiece is the optical element that magnifies the image focused by the telescope. The eyepiece fits directly into the star diagonal. To install the eyepiece:

1. Loosen the thumbscrew on the star diagonal so it does not obstruct the inner diameter of the eyepiece end of the diagonal. Remove the protective dust cap from the star diagonal's barrel.
2. Slide the chrome portion of the low power 25mm eyepiece into the star diagonal.
3. Tighten the thumbscrew to hold the eyepiece in place.

To remove the eyepiece, loosen the thumbscrew on the star diagonal and slide the eyepiece out.



Eyepieces are commonly referred to by their focal length and barrel diameter. The focal length of each eyepiece is printed on the eyepiece barrel. The longer the focal length (i.e., the larger the number), the lower the eyepiece power or magnification. The shorter the focal length (i.e., the smaller the number), the higher the magnification. Generally, you will use low-to-moderate power when viewing. For more information on how to determine power, see the section on “Calculating Magnification” (page 10).

Barrel diameter is the diameter of the barrel that slides into the star diagonal or focuser. The NexStar uses eyepieces with a standard 1.25" barrel diameter.

FOCUSING

The NexStar SLT's focusing mechanism controls the primary mirror, which is mounted on a ring that slides back and forth on the primary baffle tube. The focusing knob, which moves the primary mirror, is on the rear cell of the telescope just below the star diagonal and eyepiece. Turn the focusing knob until the image is sharp. If the knob will not turn, it has reached the end of its travel on the focusing mechanism. Turn the knob in the opposite direction until the image is sharp. Once an image is in focus, turn the knob clockwise to focus on a closer object and counterclockwise for a more distant object. A single turn of the focusing knob moves the primary mirror only slightly. Therefore, it will take many turns (about 25) to go from close focus (approximately 20 feet) to infinity.

For astronomical viewing, out of focus star images are very diffuse, making them difficult to see. If you turn the focus knob too quickly, you can go right through focus without seeing the image. To avoid this problem, your first astronomical target should be a bright object (like the Moon or a planet) so that the image is visible even when out of focus.

Critical focusing is best accomplished when the focusing knob is turned in such a manner that the mirror moves against the pull of gravity. In doing so, any mirror shift is minimized. For astronomical observing, both visually and photographically, this is done by turning the focus knob counterclockwise.

Tip: If you are fine-tuning your focus, it's better to turn the focus knob counterclockwise rather than clockwise. This will prevent unwanted shift in the primary mirror and ensure that your image remains as sharp as possible.

THE STARPOINTER FINDERSCOPE

The StarPointer is the quickest and easiest way to point your telescope exactly at a desired object in the sky. It's like having a laser pointer that you can shine directly onto the night sky. The StarPointer is a zero magnification pointing tool that uses a coated glass window to superimpose the image of a small red dot onto the night sky. While keeping both eyes open when looking through the StarPointer, simply move your telescope until the red dot, seen through the StarPointer, merges with the object as seen with your unaided eye. The red dot is produced by a light-emitting diode (LED); it is not a laser beam and will not damage the glass window or your eye. The StarPointer comes equipped with a variable brightness control and two axes alignment control. Before the StarPointer is ready for use, it must be attached to the telescope tube and properly aligned.

STARPOINTER INSTALLATION

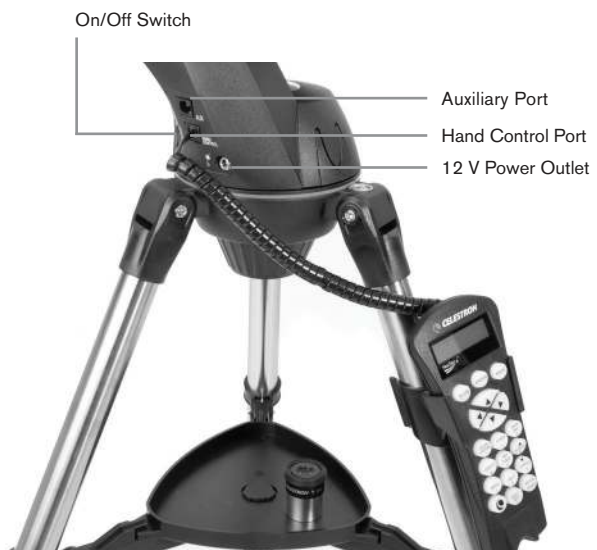
1. Slide the finderscope bracket into the dovetail slot on the telescope tube near the focuser.
2. The large window on the finder should be facing the front of the telescope.
3. Secure the bracket by tightening the setscrew on the dovetail slot.

Your StarPointer finderscope is shipped with a clear plastic tab inserted between the battery and the contact to prevent the battery from accidentally being discharged in shipment. Pull this tab out before using your finderscope.



ATTACHING THE HAND CONTROL

The NexStar SLT hand control has a phone jack type connector at the end of its cord. Plug the phone jack connector into the outlet at the base of the telescope's fork arm. Push the connector into the outlet until it clicks into place and place the hand control into its holder as described previously in the Assembly section of the manual.



POWERING THE NEXSTAR SLT

The NexStar SLT can be powered by 8 user-supplied AA size alkaline batteries or an optional 12V AC adapter. To install batteries into the NexStar SLT:

1. Squeeze the tabs on both sides of the battery compartment cover while lifting upward.
2. Insert 8 AA batteries into battery compartment holders.
3. Place the battery compartment cover over the batteries and push down until the cover snaps in place.
4. Flip the power switch to the “On” position. The light on the power button should come on.

In case of a loss of power, the optical tube can be moved by hand. However, when powered on, the telescope should always be controlled via the hand control. The NexStar SLT will lose its star alignment if moved by hand when powered on.



Removing the Battery
Compartment Cover

STARPOINTER OPERATION

The StarPointer finderscope helps you aim your telescope by looking through its round glass window and covering your target with the red dot projection. The first time you assemble your telescope, you will need to align the StarPointer with the main optics of the telescope. **Although this step can be done at night, it is significantly easier during the day.** Once you have completed the finderscope alignment, you should not have to repeat this step unless the finderscope is bumped, dropped, or removed during transit. To align the StarPointer:

1. Take the telescope outside during the day. Using your naked eye, find an easily recognizable object, such as a streetlight, car license plate, or tall tree. The object should be as far away as possible, but at least a quarter mile away.
2. Remove the main dust cover from the telescope and make sure your lowest power (longest focal length) eyepiece is installed in the focuser.
3. Power on your telescope and use the directional buttons to position the tube so that it is roughly pointing toward the object you chose in step 1.
4. Look into the eyepiece and use the directional buttons to move the telescope until the object you chose is perfectly centered in the field of view. If the image is blurry, gently turn the focus knob until it comes into sharp focus.

Note: The image in the telescope eyepiece may appear upside-down or mirror reversed, depending on the type of telescope you have. This is perfectly normal in an astronomical telescope.

5. Once the object is centered in your eyepiece, turn on the finderscope by turning the power switch knob clockwise as far as it will go.
6. With your head positioned about a foot behind the StarPointer finderscope, look through the round window and locate the red dot. It will probably be close to, but not on top of, the object you see when you are looking through the eyepiece.
7. **Without moving the telescope,** use the two adjustment knobs on the side and underneath the StarPointer. One controls the left-right motion of the dot, while the other controls the up-down motion. Adjust both until the red dot appears over the same object you are observing in the 25mm eyepiece.

Now choose some other distant targets to practice aiming your telescope. Look through the StarPointer window and place the red dot on the target you are trying to view and verify that it is in the eyepiece of the scope.

Note: Be sure to turn off the StarPointer finderscope when not in use to conserve battery power. New batteries can be purchased online or at watch/electronic stores.

THE NEXSTAR+ HAND CONTROL

You have received a newly upgraded NexStar+ hand control with your telescope. The hand control now features a USB connector used for linking to a PC with control software, and to perform firmware updates.

1. LIQUID CRYSTAL DISPLAY (LCD) WINDOW: Red backlighting for comfortable nighttime viewing of telescope information and scrolling text. Remove the clear protective tape from the screen before use.

2. ALIGN: Instructs the telescope to begin the default alignment procedure. It is also used to select a star or object as an alignment position.

3. DIRECTION KEYS: Slews your telescope in the desired direction. Use the direction keys to center objects in the eyepiece or to manually slew your telescope.

4. CATALOG KEYS: Allow direct access to each of the main catalogs in the database of thousands of objects.

Your telescope contains the following catalogs in its database:

- **Solar System** – All 7 planets in our Solar System plus the Moon, Sun, and Pluto
- **Stars** – Custom lists of all the brightest stars, double stars, variable stars, constellations and asterisms
- **Deep Sky** – Custom lists of all the best galaxies, nebulae, and clusters, as well as the complete Messier and select NGC catalogs.

5. IDENTIFY: Searches your telescope's database and displays the name and offset distances to the nearest matching objects.

6. MENU: Displays setup and utilities functions, such as tracking rate, user-defined objects, and others.

7. OPTION (CELESTRON LOGO): Works similar to the SHIFT key on a keyboard and can be used in combination with other keys to access more advanced features and functions to be added with later firmware updates.

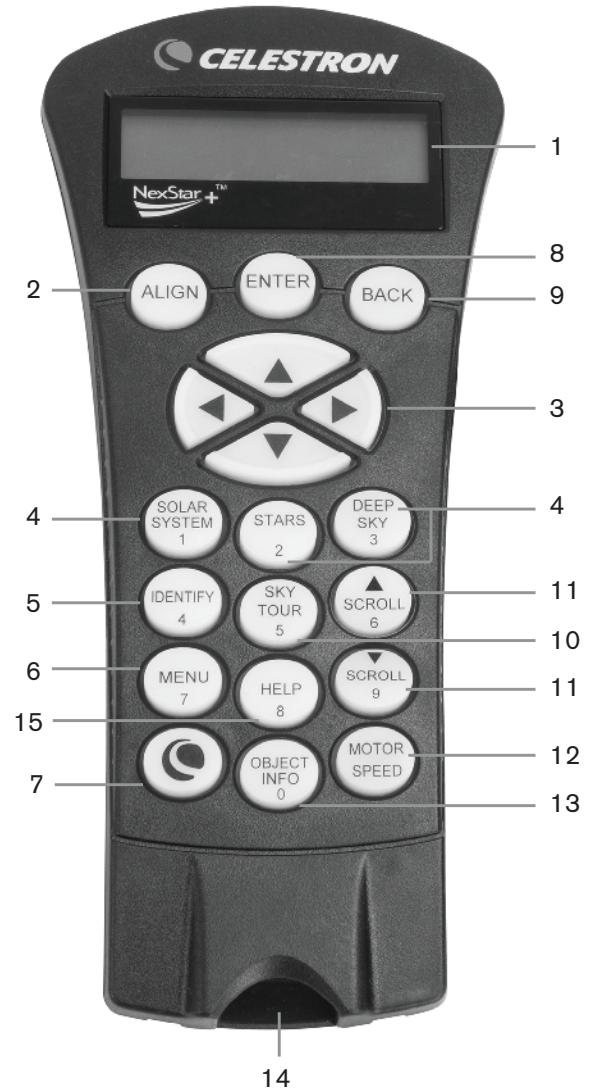
8. ENTER: Pressing ENTER allows you to select any of your telescope's functions, accept entered parameters and slews the telescope to displayed objects.

9. BACK: Pressing BACK will take you out of the current menu and display the previous level of the menu path. Press BACK repeatedly to get back to a main menu or use to erase data entered by mistake.

10. SKY TOUR: Activates the tour mode, which seeks out all of the best objects in the sky and automatically slews your telescope to those objects.

11. SCROLL KEYS: Used to scroll UP and DOWN within any of the menu lists. A double arrow symbol on the right side of the LCD indicates that the scroll keys can be used to view additional information. The buttons have an angled shape to make it easier to locate without looking.

12. MOTOR SPEED: Similar to the Rate Button on the original NexStar hand control, it allows you to change the motor's speed when the direction keys are pressed.

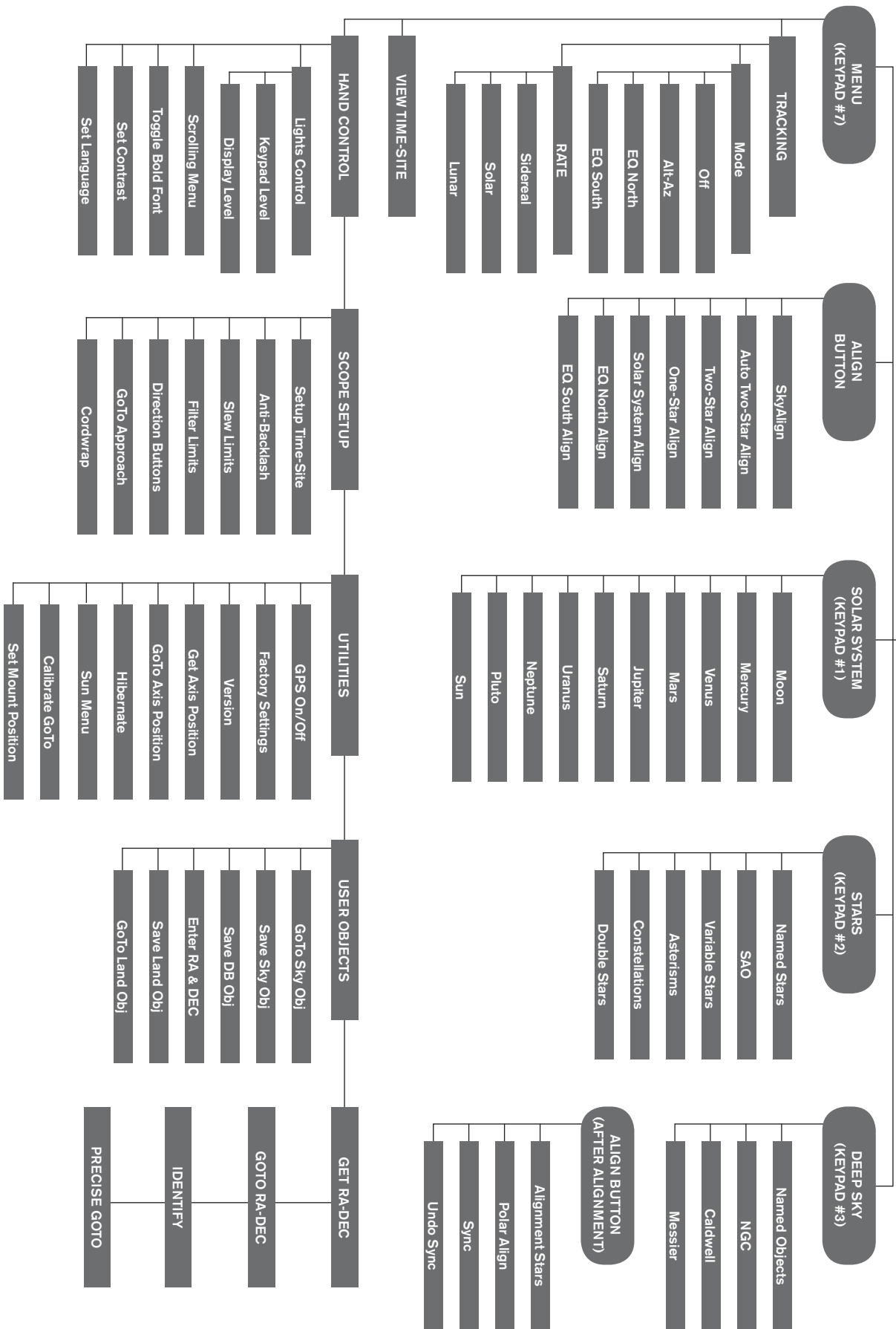


13. OBJECT INFO: Displays coordinates and valuable information about objects selected from your telescope's database.

14. MINI USB PORT (cable not included): Links to PC to control telescope with desktop or to perform firmware updates.

15. HELP MENU: In future firmware updates, this button will offer troubleshooting tips. For your convenience, it currently functions as a shortcut to the Messier Catalog.

NexStar SLT Menu Tree



CALCULATING MAGNIFICATION

You can change the power of your telescope just by changing the eyepiece (ocular). To determine the magnification of your telescope, simply divide the focal length of the telescope by the focal length of the eyepiece used. In equation format, the formula looks like this:

$$\text{Magnification} = \frac{\text{Focal length of Telescope (mm)}}{\text{Focal length of Eyepiece (mm)}}$$

Let's say, for example, you are using the 25mm eyepiece. To determine the magnification you simply divide the focal length of your telescope (for example, the NexStar 102SLT MAK has a focal length of 1325mm) by the focal length of the eyepiece, 25mm. Dividing 1325 by 25 yields a magnification of 53 power.

Although the power is variable, each instrument under average skies has a limit to the highest useful magnification. The general rule is that 60 power can be used for every inch of aperture. For example, the NexStar 102SLT MAK in diameter. Multiplying 4 by 60 gives a maximum useful magnification of 240 power. Although this is the maximum useful magnification, most observing is done in the range of 20 to 35 power for every inch of aperture which is 80 to 140 times for the NexStar 102SLT MAK.

DETERMINING FIELD OF VIEW

Determining the field of view is important if you want to get an idea of the angular size of the object you are observing. To calculate the actual field of view, divide the apparent field of the eyepiece (supplied by the eyepiece manufacturer) by the magnification. In equation format, the formula looks like this:

$$\text{True Angular Field} = \frac{\text{Apparent Field of of Eyepiece}}{\text{Magnification}}$$

As you can see, before determining the field of view, you must calculate the magnification. Using the example in the previous section, we can determine the field of view using the same 25mm eyepiece. The 25mm eyepiece has an apparent field of view of 50°. Divide the 50° by the magnification, which is 53 power. This yields an actual field of view of .94°.

To convert degrees to feet at 1,000 yards, which is more useful for terrestrial observing, simply multiply by 52.5. Continuing with our example, multiply the angular field .94° by 52.5. This produces a linear field width of 49 feet at a distance of one thousand yards.

GENERAL OBSERVING HINTS

When working with any optical instrument, there are a few things to remember to ensure you get the best possible image:

- Never look through window glass. Glass found in household windows is optically imperfect, and as a result, may vary in thickness from one part of a window to the next. This inconsistency can and will affect the ability to focus your telescope. In most cases you will not be able to achieve a truly sharp image, while in some cases you may actually see a double image.
- Never look across or over objects that are producing heat waves. This includes asphalt parking lots on hot summer days or building rooftops.
- Hazy skies, fog, and mist can also make it difficult to focus when viewing terrestrially. The amount of detail seen under these conditions is greatly reduced.
- If you wear corrective lenses (specifically glasses), you may want to remove them when observing with an eyepiece attached to the telescope. When using a camera, however, you should always wear corrective lenses to ensure the sharpest possible focus. If you have astigmatism, corrective lenses must be worn at all times.

CELESTIAL OBSERVING

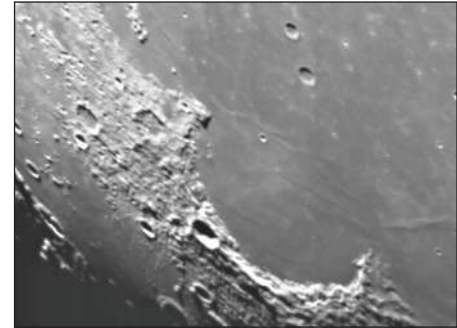
With your telescope set up, you are ready to use it for observing. This section covers visual observing hints for solar system and deep sky objects as well as general observing conditions that will affect your ability to observe.

OBSERVING THE MOON

Often, it is tempting to look at the Moon when it is full. At this time, the face we see is fully illuminated and its light can be overpowering. In addition, little or no contrast can be seen during this phase. One of the best times to observe the Moon is during its partial phases (around the time of first or third quarter). Long shadows reveal a great amount of detail on the lunar surface. At low power, you will be able to see most of the lunar disk at one time. Change to optional eyepieces for higher power (magnification) to focus in on a smaller area.

Lunar Observing Hints

To increase contrast and bring out detail on the lunar surface, use optional filters. A yellow filter works well to improve contrast, while a neutral density or polarizing filter will reduce overall surface brightness and glare.



OBSERVING THE PLANETS

Other fascinating targets include the five naked eye planets. You can see Venus go through its lunar-like phases. Mars can reveal a host of surface detail and one, if not both, of its polar caps. You may be able to see the cloud belts of Jupiter and the Great Red Spot (if it is visible at the time you are observing). In addition, you will also be able to see the moons of Jupiter as they orbit the giant planet. Saturn, with its beautiful rings, is visible at moderate power.

Planetary Observing Hints

- Remember that atmospheric conditions are usually the limiting factor on how much planetary detail will be visible. So, avoid observing the planets when they are low on the horizon or when they are directly over a source of radiating heat, such as a rooftop or chimney. See the "Seeing Conditions" section later in this manual (page 12).
- To increase contrast and bring out detail on the planetary surface, try using Celestron eyepiece filters.



OBSERVING THE SUN

Although overlooked by many amateur astronomers, solar observation is both rewarding and fun. However, because the Sun is so bright, special precautions must be taken when observing our star so as not to damage your eyes or your telescope. Use an approved solar filter that covers the entire objective opening. Always remove your StarPointer finderscope when viewing the Sun. Never project an image of the Sun through the telescope. Tremendous heat build-up may result inside the optical tube. This can damage the telescope and/or any accessories attached to the telescope.

Solar Observing Hints

- The best time to observe the Sun is in the early morning or late afternoon when the air is cooler.
- To center the Sun without looking into the eyepiece, watch the shadow of the telescope tube until it forms a circular shadow.
- To ensure accurate tracking on SLT models, be sure to select solar tracking rate.

OBSERVING DEEP SKY OBJECTS

Deep sky objects are simply those objects outside the boundaries of our solar system. They include star clusters, planetary nebulae, diffuse nebulae, double stars and other galaxies outside our own Milky Way. Most deep sky objects have a large angular size. Therefore, low-to-moderate power is all you need to see them. Visually, they are too faint to reveal any of the color seen in long exposure photographs. Instead, they appear black and white. And, because of their low surface brightness, they should be observed from a dark sky location. Light pollution around large urban areas washes out most nebulae making them difficult, if not impossible, to observe. Light Pollution Reduction filters help reduce the background sky brightness, thus increasing contrast.

SEEING CONDITIONS

Viewing conditions affect what you can see through your telescope during an observing session. Conditions include transparency, sky illumination, and seeing. Understanding viewing conditions and the effect they have on observing will help you get the most out of your telescope.

TRANSPARENCY

Transparency is the clarity of the atmosphere which is affected by clouds, moisture, and other airborne particles. Thick cumulus clouds are completely opaque while cirrus can be thin, allowing the light from the brightest stars through. Hazy skies absorb more light than clear skies making fainter objects harder to see and reducing contrast on brighter objects. Aerosols ejected into the upper atmosphere from volcanic eruptions also affect transparency. Ideal conditions are when the night sky is inky black.

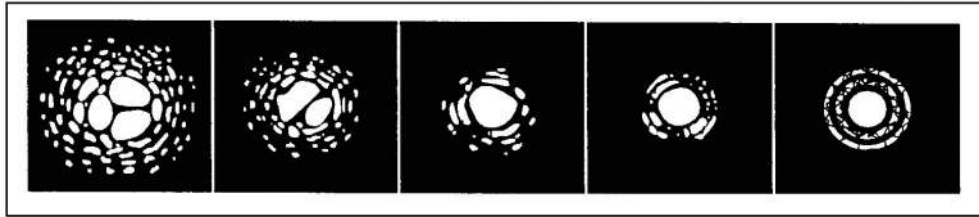
SKY ILLUMINATION

General sky brightening caused by the Moon, aurorae, natural airglow, and light pollution greatly affect transparency. While not a problem for the brighter stars and planets, bright skies reduce the contrast of extended nebulae making them difficult, if not impossible, to see. To maximize your observing, limit deep sky viewing to moonless nights far from the light polluted skies found around major urban areas. LPR filters enhance deep sky viewing from light polluted areas by blocking unwanted light while transmitting light from certain deep sky objects. You can, on the other hand, observe planets and stars from light polluted areas or when the Moon is out.

SEEING

“Seeing conditions” refers to the stability of the atmosphere and directly affects the amount of fine detail seen in extended objects. The air in our atmosphere acts as a lens that bends and distorts incoming light rays. The amount of bending depends on air density. Varying temperature layers have different densities and, therefore, bend light differently. Light rays from the same object arrive slightly displaced creating an imperfect or smeared image. These atmospheric disturbances vary from time to time and place to place. The size of the air parcels compared to your aperture determines the “seeing” quality. Under good seeing conditions, fine detail is visible on the brighter planets like Jupiter and Mars, and stars are pinpoint images. Under poor seeing conditions, images are blurred and stars appear as blobs.

The conditions described here apply to both visual and photographic observations.



Seeing conditions directly affect image quality. These drawings represent a point source (i.e., star) under bad seeing conditions (left) to excellent conditions (right). Most often, seeing conditions produce images that lie somewhere between these two extremes.

TELESCOPE MAINTENANCE

Your NexStar telescope requires little maintenance. There are a few things to remember that will ensure your telescope performs at its best.

CARE AND CLEANING OF THE OPTICS

Occasionally, dust and/or moisture may build up on the corrector plate of your telescope. Special care should be taken when cleaning any instrument so as not to damage the optics.

If dust has built up on the corrector plate, remove it with a brush (made of camel's hair) or a can of pressurized air. Spray at an angle to the lens for approximately two to four seconds. Then, use an optical cleaning solution and white tissue paper to remove any remaining debris. Apply the solution to the tissue and then apply the tissue paper to the lens. Low pressure strokes should go from the center of the corrector to the outer portion. Do NOT rub in circles!

You can use a commercially made lens cleaner or mix your own. A good cleaning solution is isopropyl alcohol mixed with distilled water. The solution should be 60% isopropyl alcohol and 40% distilled water. Or, liquid dish soap diluted with water (a couple of drops per one quart of water) can be used.

If moisture condenses on the inside of the corrector, remove the accessories from the rear cell of the telescope. Place the telescope in a dust-free environment and point it down. This will remove the moisture from the telescope tube.

To minimize the need to clean your telescope, replace all lens covers once you have finished using it. Since the rear cell is NOT sealed, the cover should be placed over the opening when not in use. This will prevent contaminants from entering the optical tube.

Internal adjustments and cleaning should be done only by the Celestron repair department. If your telescope is in need of internal cleaning, please call the factory for a return authorization number and price quote.

APPENDIX A: TECHNICAL SPECIFICATIONS

OPTICAL SPECIFICATIONS	Model # 23090 NexStar 102SLT
Optical Design	Maksutov-Cassegrain
Aperture	102mm
Focal Length	1325mm
Focal Ratio	12
Optical Coatings	SiO ₂
Highest Useful Magnification	241x
Resolution: Rayleigh Criterion Dawes Limit	1.37 arc seconds 1.14 arc seconds
Light Gathering Power	212x unaided eye
Eyepiece Magnification	53x (25mm) 147x (9mm)
Optical Tube Length	15"

Electronic Specifications

Input Voltage	12 V DC Nominal
Batteries Required	8 AA Alkaline
Power Supply Requirements	12 VDC-750 mA (Tip positive)

Mechanical Specifications

Motor: Type Resolution	DC Servo motors with encoders, both axes .26 arc sec
Slew Speeds	Nine slew speeds: 3° /sec, 2° /sec, 1°/sec, .64x, 32x, 16x, 8x, 4x, 2x
Hand Control	Double line, 16 character Liquid Crystal Display 19 fiber optic backlit LED buttons
Fork Arm	Cast aluminum

Software Specifications

Software Precision	16 bit, 20 arc sec. calculations
Ports	RS-232 communication port on hand control
Tracking Rates	Sidereal, Solar and Lunar
Tracking Modes	Alt-Az, EQ North & EQ South
Alignment Procedures	Sky Align, Auto 2-Star, 2-Star, One-Star, Solar System Align
Database	99 user defined programmable objects Expanded information on over 200 objects
Total Object Database	40,000 Objects

UPDATING THE HAND CONTROL FIRMWARE

Update hand control firmware over USB without external power or without connecting to the mount. To update the firmware, simply plug a mini USB cable (not included) from your PC to the port on the bottom of the hand control, and run Celestron Firmware Manager (CFM), available for free from the support section on Celestron.com.

CELESTRON TWO YEAR LIMITED WARRANTY

A. Celestron warrants this product to be free from defects in materials and workmanship for two years. Celestron will repair or replace such product or part thereof which, upon inspection by Celestron, is found to be defective in materials or workmanship. As a condition to the obligation of Celestron to repair or replace such product, the product must be returned to Celestron together with proof-of-purchase satisfactory to Celestron.

B. The Proper Return Authorization Number must be obtained from Celestron in advance of return. Please submit your request to Celestron's online technical support center at <https://www.celestron.com/pages/technical-support> to receive the number to be displayed on the outside of your shipping container.

All returns must be accompanied by a written statement setting forth the name, address, and daytime telephone number of the owner, together with a brief description of any claimed defects. Parts or product for which replacement is made shall become the property of Celestron.

The customer shall be responsible for all costs of transportation and insurance, both to and from the factory of Celestron, and shall be required to prepay such costs.

Celestron shall use reasonable efforts to repair or replace any product covered by this warranty within thirty days of receipt. In the event repair or replacement shall require more than thirty days, Celestron shall notify the customer accordingly. Celestron reserves the right to replace any product which has been discontinued from its product line with a new product of comparable value and function.

This warranty shall be void and of no force of effect in the event a covered product has been modified in design or function, or subjected to abuse, misuse, mishandling or unauthorized repair. Further, product malfunction or deterioration due to normal wear is not covered by this warranty.

CELESTRON DISCLAIMS ANY WARRANTIES, EXPRESSED OR IMPLIED, WHETHER OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE, EXCEPT AS EXPRESSLY SET FORTH HEREIN. THE SOLE OBLIGATION OF CELESTRON UNDER THIS LIMITED WARRANTY SHALL BE TO REPAIR OR REPLACE THE COVERED PRODUCT, IN ACCORDANCE WITH THE TERMS SET FORTH HEREIN. CELESTRON EXPRESSLY DISCLAIMS ANY LOST PROFITS, GENERAL, SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES WHICH MAY RESULT FROM BREACH OF ANY WARRANTY, OR ARISING OUT OF THE USE OR INABILITY TO USE ANY CELESTRON PRODUCT. ANY WARRANTIES WHICH ARE IMPLIED AND WHICH CANNOT BE DISCLAIMED SHALL BE LIMITED IN DURATION TO A TERM OF TWO YEARS FROM THE DATE OF ORIGINAL RETAIL PURCHASE.

Some states do not allow the exclusion or limitation of incidental or consequential damages or limitation on how long an implied warranty lasts, so the above limitations and exclusions may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. Celestron reserves the right to modify or discontinue, without prior notice to you, any model or style product. If warranty problems arise or if you need assistance in using your product, please visit Celestron's online technical support center at <https://www.celestron.com/pages/technical-support>.

NOTE: This warranty is valid to U.S.A. and Canadian customers who have purchased this product from an authorized Celestron dealer in the U.S.A. or Canada. Warranty outside the U.S.A. and Canada is valid only to customers who purchased from a Celestron's International Distributor or Authorized Celestron Dealer in the specific country. Please contact them for any warranty service.

FCC NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.



Product design and specifications are subject to change without prior notification. This product is designed and intended for use by those 14 years of age and older.