

# OTS-HD Series

## THERMAL SMART HD MONOCULARS/VIEWERS



## MANUAL

OTS-HD USER'S GUIDE (REV. 2, DECEMBER, 2016)



**AMERICAN  
TECHNOLOGIES  
NETWORK  
CORP.**



## CAUTION!

**THIS PRODUCT CONTAINS NATURAL RUBBER LATEX WHICH MAY CAUSE ALLERGIC REACTIONS.**

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## FEATURES



RECORD HD VIDEO



GPS GEOTAG



WiFi



OBSIDIAN USER INTERFACE



SMOOTH ZOOM



BLUETOOTH



E-COMPASS



3D GYROSCOPE



SMART RANGE FINDER

## APPLICATION

The most technologically advanced line of thermal viewers on the market bar none! The all new Obsidian “T” II Thermal core beats at the heart of our systems. More power, more features, smaller packaging, and lower cost have allowed ATN to make the biggest update to its award winning thermal product line.

Record videos and photos onto a microSD card. Use ATN’s Smart Range Finder to quickly range in on any object. Smooth Zoom, built in Wi-Fi, Bluetooth, 3D Gyroscope, 3D Accelerometer, 3D Magnetometer are but a few of the features and sensors packed into these incredible systems.

# SPECIFICATIONS

	OTS-HD 384 1.25 - 5x	OTS-HD 384 2 - 8x	OTS-HD 384 4.5 - 18x	OTS-HD 384 9 - 36x	OTS-HD 640 1 - 10x	OTS-HD 640 1.5 - 15x	OTS-HD 640 2.5 - 25x	OTS-HD 640 5 - 50x
Sensor	384×288			640×480				
Magnification	1.25 - 5x	2 - 8x	4.5 - 18x	9 - 36x	1 - 10x	1.5 - 15x	2.5 - 25x	5 - 50x
Angle of view	16×12.5	12×9.5	6×4.7	3×2.4	32×25	24×19	12.5×9.7	6×4.7
Objective lens focal length	19 mm	25 mm	50 mm	100 mm	19 mm	25 mm	50 mm	100 mm
Micro Display	HD Display							
Core	ATN Obsidian "T" II							
Eye relief	65 mm							
Waterproof rating / IP rating	Weather resistant							
Video Record Resolution	1280×960 @ 30 fps							
Microphone	Yes							
MicroSD card	From 4 to 64 GB							
Micro USB	Yes							
Micro HDMI	Yes							
WiFi (Streaming, Gallery, & Controls)	iOS & Android							
Bluetooth	4.1							
GPS (Geotagging, Elevation, etc.)	Yes							

	OTS-HD 384 1.25 - 5x	OTS-HD 384 2 - 8x	OTS-HD 384 4.5 - 18x	OTS-HD 384 9 - 36x	OTS-HD 640 1 - 10x	OTS-HD 640 1.5 - 15x	OTS-HD 640 2.5 - 25x	OTS-HD 640 5 - 50x
3D Gyroscope	Yes, GS7							
3D Accelerometer	Yes							
3D Magnetometer	Yes							
E-Barometer	Yes							
E-Compass	Yes							
Smooth Zoom	Yes							
Battery life (Li-ion)	8 hr							
Battery type	4 AA (Lithium Recommended)							
Optional accessories	External Battery Pack							
Dimensions	6.85" x 3.16" x 3.14" 174x80.26x80 mm	8.81" x 3.16" x 3.14" 224x80.26x80 mm	10.67" x 3.97" x 3.47" 271x101x88 mm	6.85" x 3.16" x 3.14" 174x80.26x80 mm	8.81" x 3.16" x 3.14" 224x80.26x80 mm	10.67" x 3.97" x 3.47" 271x101x88 mm		
Weight	1.55 lb / 0.68 kg	1.85 lb / 0.84 kg	2.75 lb / 1.24 kg	1.55 lb / 0.68 kg		1.85 lb / 0.84 kg 2.75 lb / 1.24 kg		
Warranty	3 years							
Human Detection Range	625	800	1500	2500	625	800	1500	2500
Human Recognition Range	280	400	600	1100	280	400	600	1100
Human Identification Range	170	250	360	600	170	250	360	600

\* ATN reserves the right to change the above specifications at any time without notice

# PREPARING THE DEVICE

## UNPACKING

The following steps must be accomplished prior to each mission where the device is used:

1. Open packaging box, remove OTS-HD and check the content.
2. Make sure that nothing is missing.
3. Inspect the device for damage to optical surfaces, body, eyecups, operation buttons, etc.
4. Ensure that all optical surfaces are clean and ready for use.

### NOTE

***If any accessories are missing or broken contact ATN's Customer Service.***

## INSTALLATION OF BATTERIES

The OTS-HD will operate on four AA-type batteries.

### NOTE

***We highly recommend using lithium AA batteries. They will provide much longer battery life. Use only 1.5 V batteries.***

Install batteries as follows:

1. Remove the battery cap by unscrewing it counter clockwise.
2. Insert batteries as shown.
3. Return the battery cap into the housing (screw clockwise until finger tight).

Do not over tighten as it will be difficult to remove the next time you replace batteries.



### NOTE

***Make sure that the device is turned off before changing sources of energy (batteries or USB in power supply mode).***

## MicroSD, USB AND HDMI PORTS

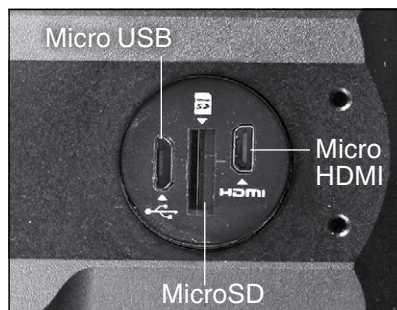
The device is equipped with MicroSD Card, Micro USB and Micro HDMI ports. You can find them under the cap on the right side of the device (we marked the cap with appropriate icons).

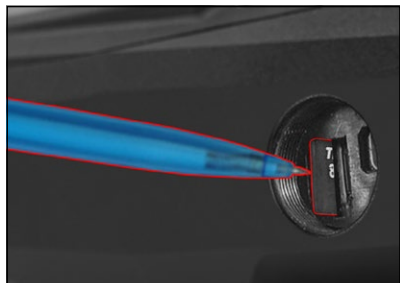
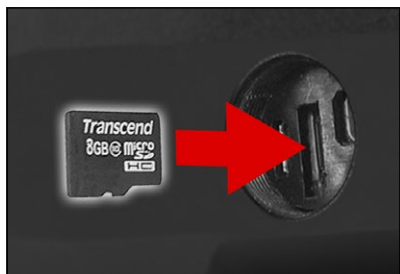
To open the cap you should unscrew it counterclockwise.

### NOTE

***Make sure that the device is turned off before inserting the microSD card into the slot.***

1. A new card should be formatted before usage.
2. Insert microSD card as shown.
3. To lock the card in the slot push it in with a thin object (a small coin, paper clip, toothpick, etc.).





4. Return the cap into the housing (screw clockwise until finger tight).

### NOTE

***There is only one correct direction to insert the microSD Card.***

***Do not force the card into the slot as it may damage both the scope and the card itself.***

To remove the microSD Card from the slot, push it in using the same thin object. When it pops up a few millimeters, it can be pulled with your fingers or tweezers.

### NOTE

***If you are going to record video we recommend using a Class 10 microSD card (10 MB/s) or faster and have capacity from 4 to 64 GB.***

## FIRMWARE UPDATE

Before operating your device please update the firmware to the latest version. To receive a notification of new firmware updates, please register your device on our website (you'll receive an email letting you know when new firmware becomes available).

To update the new firmware you will need a microSD Card and batteries that are fully charged.

### NOTE

***In the event of a power failure during an update the device may crash corrupting its system files and will need to be sent back to the ATN factory for service.***

***It is important not to use additional sources of power during firmware update!***

Update the new firmware as follows:

1. Download the \*.bin file from <https://www.atncorp.com/firmware> (You may need to create an account, if you didn't create it earlier) and copy to your microSD Card — root directory.

2. Insert the card into the device.

3. Turn ON the device.

4. In the "Firmware Update" dialog box select "Yes" to start the update.

5. When the update counter reaches "100%" the device will automatically restart.

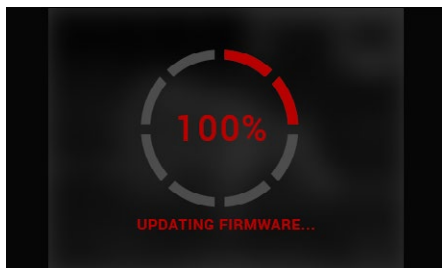
6. Once the device is powered up it will enter self configuration mode.

7. After completing it will automatically restart and will be ready for use.

8. Motion Sensing platform will be configured when first turned on.

9. Once the Firmware update completes, please do a factory reset before using the product.

10. Please remember to delete the Firmware File off of the microSD card after all steps are completed.





## NOTE

**If the device does not restart within 30 seconds, remove and re-insert the batteries and power-up the device.**

**Once the device has been updated you will need to either format the card or delete the update file manually. In the event you do not, the system will ask you if you wish to update the device every time you turn it on.**

## ON/OFF

To TURN ON the device press and hold the POWER button until you see the ATN splash screen.

To TURN OFF the device press and hold the POWER button, until the dialog box “Shut down the device?” appears. Choose “Yes” to turn off.



## NOTE

**Upon startup you must perform a NUC.**

## USING KEYPAD

The KEYPAD is programmed to be used in two different ways:

- Short and Quick Taps — used for most functions and to get around the menu;
- Press and Hold — designed to be used on the following situations — ON/OFF, ZOOM, SHORTCUT MENU.

## NOTE

**Using LEFT or RIGHT buttons in menu you can quickly choose Exit Shortcut from any position.**



## FOCUSING

### DIOPTER ADJUSTMENT

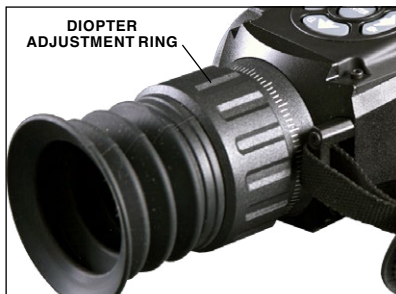
By rotating the Diopter Adjustment Ring you will achieve optimal sharpness for your vision.

We recommend that you first turn on the Carousel by clicking Enter button and optimizing your focus by making sure the Icons are sharply displayed.

## NOTE

**You do not take the rubber cap off the objective lens.**

**You should not need to re-adjust the Diopter Adjustment unless another user with different vision than yourself will be using the device.**





## FOCUS ADJUSTMENT

Remove the cap from the objective lens and rotate the focus adjustment ring as necessary to achieve the proper focus at various distances.

## COMPASS CALIBRATION



When the compass needs to be calibrated the word “CAL” appears instead of the Compass Scale. To calibrate you should rotate the device in three axis as pictured below.

### **NOTE**

***After calibrating the device please remember that the compass will work best when holding the OTS-HD parallel to the ground.***

Other possible Errors:

- ERR — an error was detected (you may need to restart the device or recalibrate the compass);
- SMF — your device is under Strong Magnetic Field (please, move away from the Magnetic Field);
- UPD — your firmware needs to be updated.

# INTERFACE

## HOMESCREEN

First screen you'll see after switching on the device is Homescreen. It consist of Scales, Status Bar icons and different Information Widgets.



### SCALES

E-Compass Scale shows yaw angle based on e-Magnetometer data.

Roll Scale shows viewer cant based on internal 3D Gyroscope.

Pitch Scale shows viewer inclination based on internal 3D Gyroscope.

### STATUS BAR

Its job is to display information about the current state of the system.

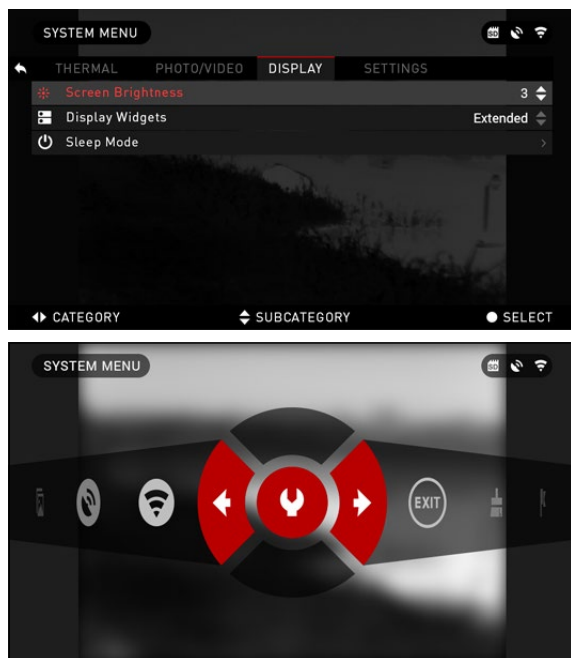
Currently inactive icons become invisible, so you may see only the important information at the moment:

- Battery — appears when energy level is low;
- SD Card — shows the presence or absence (red icon) of memory card;
- Bluetooth, GPS and WiFi — shows enable or disable the function.


### WIDGETS



They are interface elements which provide quick access to useful information. There are several types of widgets:



- Icons without value — is used for mode displaying (Photo and Video Modes);
- Only numerical value (Detailed Roll and Pitch Values);
- Icons with a numerical value which provide detailed numerical readings;
- Photo Preview (appears in the bottom of the homescreen, after the photo was taken).



Display widgets can be disabled from the System Menu.

To get a System Menu you should click on the CENTER button  from Homescreeen and access the Shortcut Carousel.

Then select the wrench icon with RIGHT or LEFT buttons  and push CENTER button  to enter the menu.

Select Display tab with RIGHT button  and choose subcategory Display Widgets with DOWN button .

## MAIN OPERATIONS



ZOOM LEVEL

By pressing and holding the UP or DOWN button  on keypad you will be able to Zoom IN and OUT.

Current Zoom Level is displayed at the Zoom widget on the Homescreeen.

### NOTE

***When the device is launched for the first time you need to configure the lens option in the pop-up window before zooming.***



TAKING PHOTOS

Press the LEFT button  to TAKE A PHOTO.

Depending on the selected mode you will make one or several photos. You can choose from various photo modes in the System Menu.



VIDEO RECORDING


By pressing the RIGHT button  you will be able to RECORD VIDEO.

### NOTE


***Your recording will automatically stop when the memory card is full or the battery is out of power.***




## SHORTCUT CAROUSEL


The CENTER button  opens the menu and close it down when pressed again.


## SHORTCUT CAROUSEL

The Carousel is your access to a number of Shortcuts that allows you quick access to your scope's features. Just click on the CENTER button  from Homescreen to access the Carousel.

Buttons highlighted in Red are the only ones that active at a particular shortcut.

Movement between the items is carried out using the LEFT & RIGHT buttons , except the group of ON/OFF switches (WiFi, GPS, Bluetooth).

You should use the UP & DOWN buttons  between switches.

To turn ON or OFF a particular switch you should click the CENTER button  while having the switch selected. Example — WiFi.



**EXIT**  
Exit Carousel.



**NUC**  
The shortcut allows to make non-uniformity compensation (NUC).



**RANGEFINDER**  
Activates Smart Rangefinder feature.



**GALLERY**  
Gives you access to the library of Images and Videos that are stored on your scope's SD Card.



**WiFi MODULE**  
Turn ON/OFF WiFi.

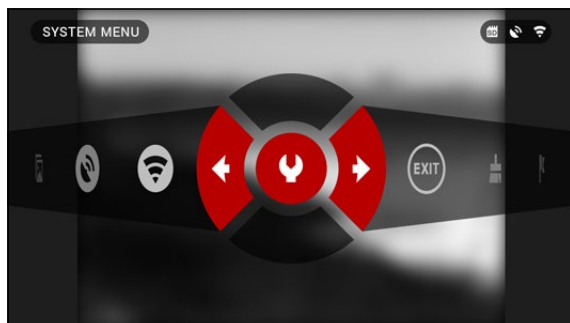




GPS module  
Turn ON/OFF GPS.




SYSTEM MENU  
Allows for access to various system options and adjustments.

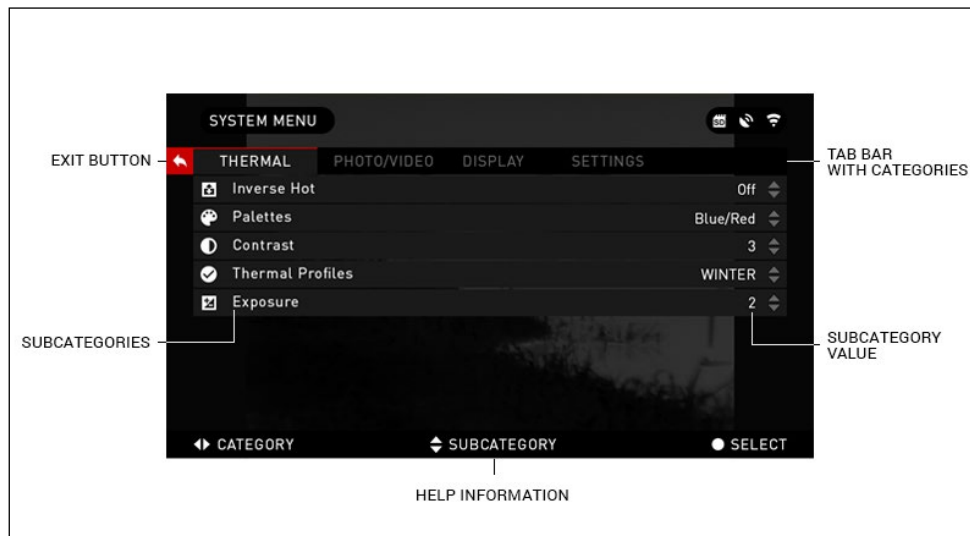
## USING SYSTEM MENU







To enter the System Menu you should open Shortcut Carousel with CENTER button  and select the wrench icon with RIGHT or LEFT buttons .

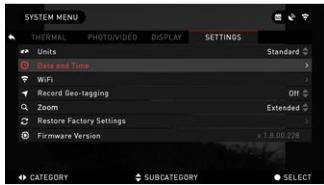
Then push CENTER button  to enter the menu.

The System Menu consist of Tab Bar at the top of the screen, list of subcategories in the center and Help Information at the bottom.



On the left side of the Tab Bar you will find the Exit (with arrow icon). Pressing it with CENTER button  will bring you back to the Homescreen.

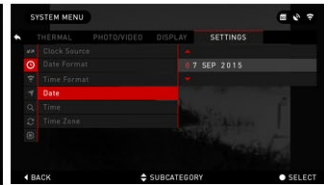
Movement between the tabs is carried out using the LEFT and RIGHT buttons . Each tab includes subcategories. To select a particular subcategory you should use the UP and DOWN buttons  and press CENTER button .




FIRST LEVEL




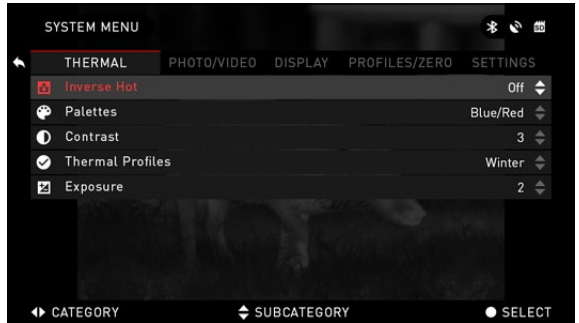
SECOND LEVEL




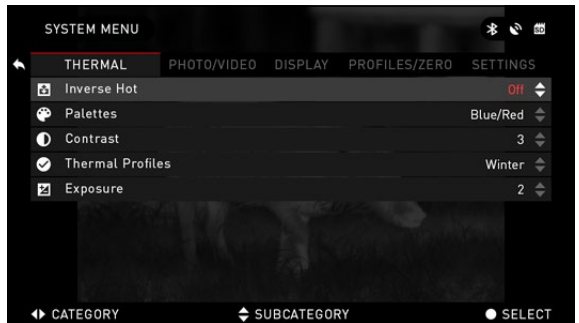
THIRD LEVEL


To change a particular value you should follow next few steps. Select the subcategory you needed with the UP or DOWN buttons .

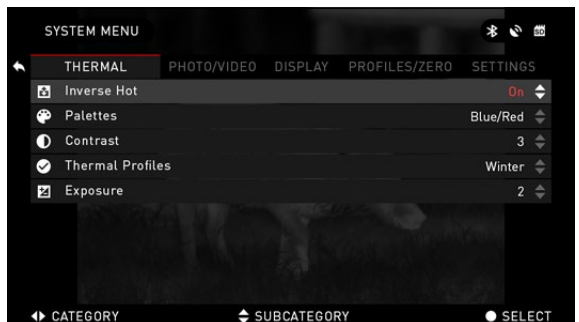
Press the CENTER button  to select a particular value (once selected it will turn red).



Change the value with the UP and DOWN buttons .

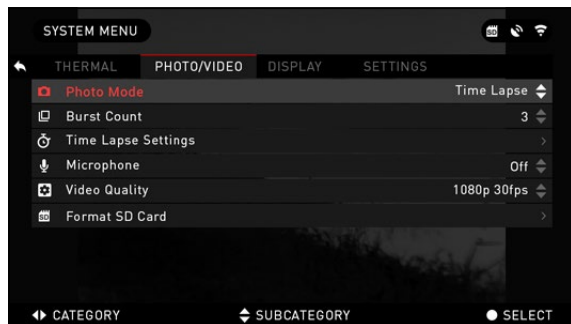



To select a new value press CENTER button  to confirm the change.



# FUNCTIONS

## PHOTO MODES AND VIDEO





Press the LEFT button  while staying in Homescreeen to TAKE A PHOTO.

You must have a Micro SD card inserted in the device for these features to work. All files will be stored on the Micro SD card.



Depending on the selected mode you will make one or several photos. You can choose from various photo modes in

the System Menu.

To enter the System Menu you should open Shortcut Carousel with CENTER button  and select the wrench icon with RIGHT or LEFT buttons .

Then push CENTER button  to enter the menu.

There are three photo modes to choose from. Switching between modes is done in the System Menu from Photo/Video tab, subcategory Photo Mode.

Use UP or DOWN buttons  to switch between modes. Press the CENTER button  to select a particular value (once selected it will turn red).



### NORMAL

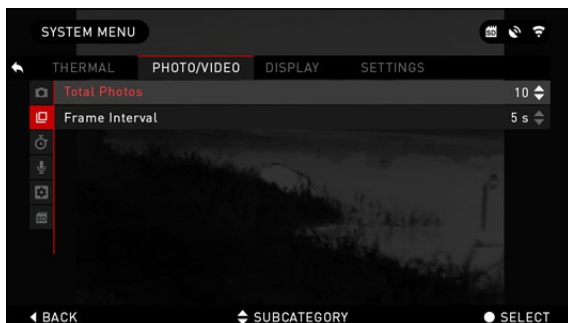
This default mode allows you to take one photo at a time.




### TIME LAPSE


Time-lapse is where the device takes a sequence of images of a subject with an interval of time between each image.

The interval and the number of photos taken can be changed in the System Menu.





To make changes choose the Photo/Video Tab in System Menu, then use UP or DOWN buttons  to select Time Lapse Settings.

Press the Center button  to enter the mode settings. While you are in this mode, the Time Lapse widget appears.



## BURST



Burst mode captures a series of photos.

You can select the best image of the group or arrange them in a sequence to study the transitions in detail.

The number of the photos taken can be changed in the System Menu. While you are in this mode, the Burst widget appears.





Regardless of which mode you are using the preview appears after a photograph is taken on the bottom of the screen for several seconds.

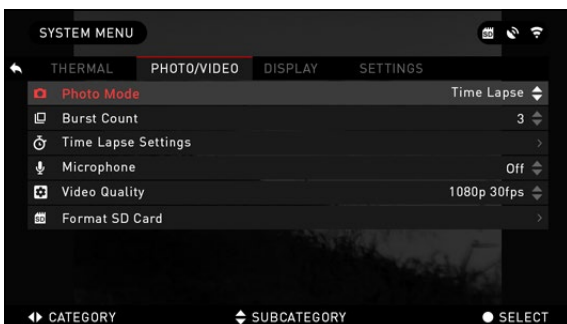
If you press the RIGHT button  to Start Video recording. Press RIGHT button  again to stop Video recording.

## NOTE

***It may best to turn OFF the Microphone in conditions of extreme wind.***

You can turn on the microphone and switch the quality of the video in the System Settings (Photo/Video tab).

To enter the System Menu you should open Shortcut Carousel with CENTER button  and select the wrench icon with RIGHT or LEFT buttons .





Then push CENTER button



to enter the menu.  
You must have a Micro SD card inserted in the device for these features to work.

All files will be stored on the Micro SD card. Recorded videos you can find in the Gallery on your device.

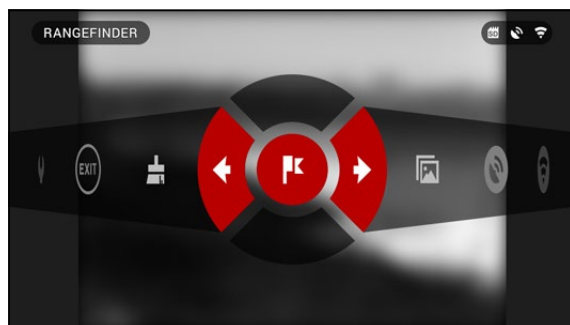
While recording the Counter widget and Time Stamp appear.

## RANGEFINDER

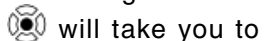
Using the Smart Range Finder you will quickly be able to estimate the distance to your target as long as you have reasonable knowledge of the size of your target.

### RANGEFINDER

To use select the Flag Icon from the Shortcut Carousel.






Pressing the CENTER button

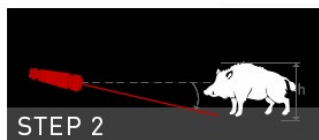
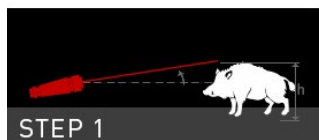


will take you to the Main Screen of the Rangefinder feature.



To measure the distance, follow the next steps:



1. Put the arrow-mark on the top of the target and press the CENTER button , wait for the scope to take the readings (it will take a number of readings so try to keep your monocular steady);
2. Put the arrow-mark under the target and press the CENTER button ;
3. If satisfied with the value press the LEFT button  to go back to the Homescreen or repeat steps 1 and 2 if necessary.



## NOTE

**During the measurement process, you can zoom in and out using standard buttons (UP and DOWN).**

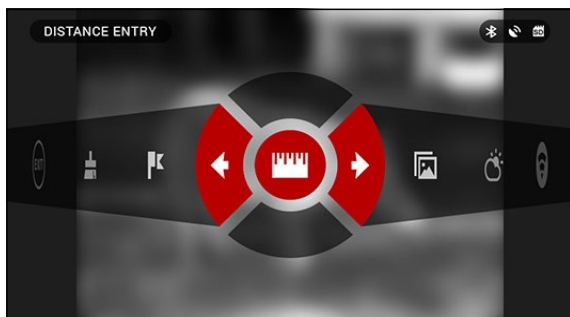
If the target height is incorrect you can change it:



- Press the RIGHT button  to enter the Menu;
- Choose one of the presets or input the height manually;
- Accept the height with CENTER button  and go back to the Main Screen.



## DISTANCE ENTRY

Allows you to input or correct the distance manually. To launch you should choose it in the Shortcuts.



Change distance value using UP and DOWN buttons . To accept the new distance press CENTER button .

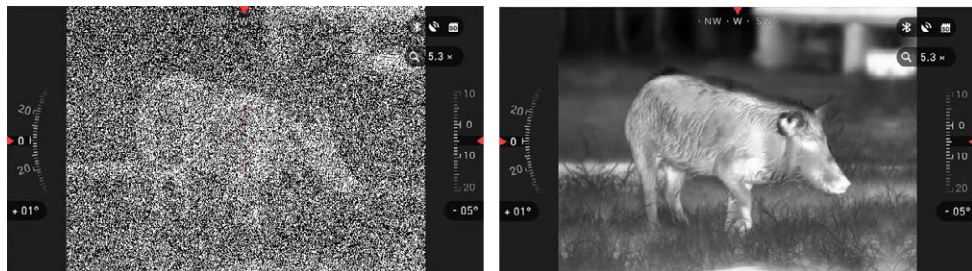


# HOW TO PERFORM A NUC

NUC'ing is required to improve image quality when the image is degraded by various environmental events.

There are multiple NUC tables to span the full operating temperature range, and the camera automatically selects the optimum table based on its temperature.






*Example:* Change of temperature, continues viewing of a particular warm object, movement from one environment to another all may cause image degradation.



To clean up the image you will need to press the NUC from the Shortcut Carousel while closing the objective lens with a solid object (lens cap, hand, book, etc..).

## PIXEL CORRECTION PROCEDURE

Pixel Correction Procedure is intended to correct “neutral” pixels that are visible in the FOV, but are not responding to the changing environment or scenery. They may be white or black and remain static and or nonresponsive.

1. Enter the Carousel by pressing the CENTER button .
2. Select System Settings.
3. Select Thermal Category.
4. Select Pixel Correction Subcategory.
5. Select Manual Correction.
6. You should see a targeting reticle, use the key pad to move the reticle over the neutral pixel. If it is hard to target the neutral pixel, press the CENTER button  and select Zoom. Use the UP and DOWN buttons  to zoom in and out on to the neutral pixel in order to isolate it. Once you have isolated the neutral pixel, press the CENTER button  to escape from the zoom function.
7. Once the reticle is positioned over the neutral pixel, press the CENTER button  and select Save. This should correct the pixel.

### NOTE

***If after you have done the procedure outlined above and the neutral pixel has not been corrected. Try the process on a pixel directly adjacent to the neutral pixel in order to make a uniformed correction in the FOV.***

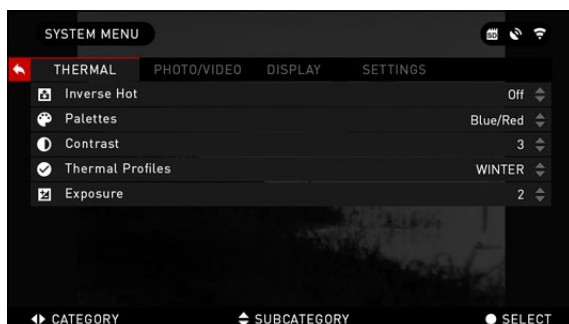
# SYSTEM MENU

## THERMAL

**INVERSE HOT** — swap the appearance of coldest and hot-test color.

**PALETTES** — the range of colors used in displaying.

**CONTRAST** — the difference in luminance and color that makes an object more distinguishable.



## PHOTO/VIDEO

**PHOTO MODE** — includes Single (capture a single photo), Time Lapse (series of photos at timed intervals) and Burst (up to 10 photos in one second) modes.

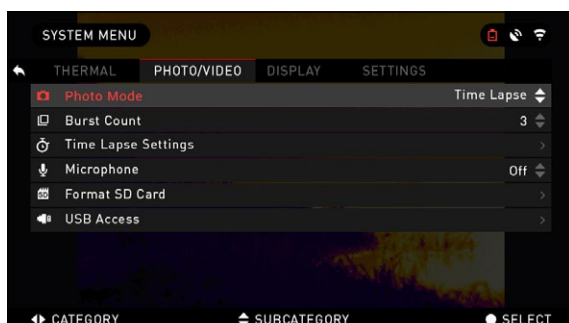
**BURST COUNT** — amount of photos in one second (2 – 10).

### TIME LAPSE SETTINGS

- Total Photos — amount of photos in a series (2 – 10).
- Frame Interval — length of the interval (2 – 15 sec).

**MICROPHONE** — sound recording (ON/OFF).

**FORMAT SD CARD** — after you choose this subcategory you'll see a pop-up window asking you about formatting.



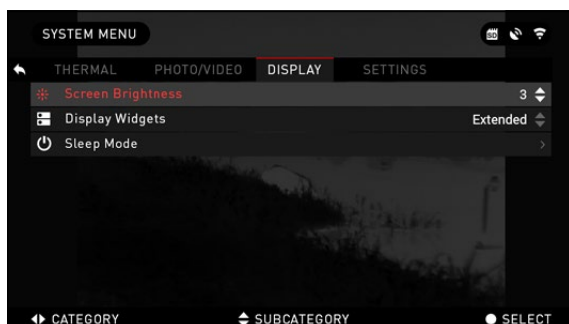
## NOTE

**Remember when formatting your microSD card you will loose all information on it, including photos and videos.**

## DISPLAY

**SCREEN BRIGHTNESS** — 1 – 5 with 1 being the dimmest and 5 the brightest. It is recommended that you use the brightest setting during the day for optimal performance.

**DISPLAY WIDGETS** — allows you to disable several widgets (Minimal/Extended).



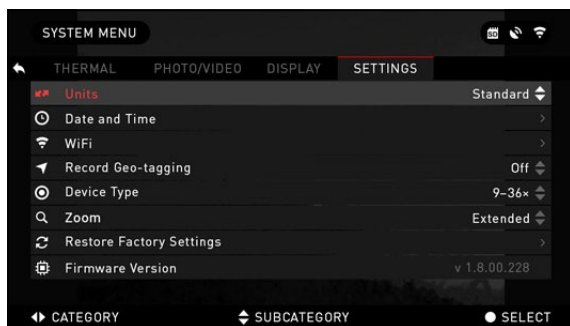
## SLEEP MODE

Sleep mode is activated when your scope is not in use for a set period of time (example: 1—60min). During sleep mode the display and some of the sensors will be inactive.

To get out of Sleep mode and get back to normal operations just physically move the device or press any of the buttons.

- Mode — allows you to switch the mode (ON/OFF).
- Hibernation Time — can be 1 – 60 min.

## SETTINGS



UNITS — can be Metric or Standard system.

### DATE AND TIME

- Clock Source — allows you to choose different types of sources to improve the accuracy (Manual, WiFi or GPS).

- Date Format — can be YYYY-MM-DD, MM-DD-YYYY, DD-MM-YYYY.

- Time Format — form of stating the time (24-hour or 12-hour).

- Date — enter the date.
- Time — enter the time.
- Time Zone — allows you to choose a geographical region with standard time.

WiFi — values are not changeable.

- SSID.
- Password.
- MAC Address.

RECORD GEO-TAGGING — adding geographical identification to your videos (ON/OFF).

DEVICE TYPE — to make all features work correctly you need to choose the type of your device (Example: 2x stands for 2–8x and 9x stands for 9–36x).

ZOOM — allows you to choose different types of zoom (Standard, Extended). Extended Zoom will give an electronic zoom of 10x your optical Zoom.

*Example:* 2–8x in Extended mode becomes 8– 20x. However, we would like to caution you that you will begin to see considerable pixelation at such a zoom.

RESTORE FACTORY SETTINGS — allows to reset all the settings to default.

FIRMWARE VERSION — allows you to learn on the firmware version currently running on your sight.

We recommend that you register your product on our home page ([www.atncorp.com/firmware](http://www.atncorp.com/firmware)) in order to make sure that you are getting emails when new firmware versions become available.

We are constantly working on new features, functions, and improvements that we provide to you free of charge via firmware upgrades.



# SERVICING

## WARNINGS AND CAUTIONS


- Always remember to turn off the device when it is not in use. If you do not plan on using it for a period of more than 10 days, you should remove the batteries.
- Do not disassemble, drop, open, crush, bend, deform, puncture, shred, microwave, incinerate, paint or insert foreign objects: it will void your warranty.
- Keep Lens Cap on when not in use.
- Avoid contact with dust, steam, and gas.
- This product contains natural rubber latex which may cause allergic reactions.
- The scope is a precision electro-optical instrument and must be handled carefully.
- Do not scratch the external lens surfaces or touch them with your fingers.

### CAUTION

***Failure to follow these safety instructions could result in damage to the device!***

## MOBILE APPLICATIONS



By utilizing the  ATN Obsidian app., you can control your device and view live streaming. Connect a phone or tablet and view everything simultaneously.



Want to see what you've recorded so far? No problem, once connected to the app. via WiFi, open up the Gallery and playback your latest adventures. All your photos and videos are right at your fingertips.



[iOS Application](#)



[Android Application](#)



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