AVENGER 55XR
Thermal Imaging Riflescope
Model: TRS310

Operator's Manual

FUSION THERMAL
INFRARED HUNTING OPTICS

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Contents

DESCRIPTION

The Avenger 55XR is a military grade infrared rifle scope that combines our most advanced thermal performance technology with state-of-the-art media capabilities that include video, audio, still photography, and Wi-Fi. Designed for years of use every component has been carefully selected for quality and longevity, and the entire system has been ruggedized and thermally protected with our XGEN alloy housing. The Avenger platform is powered by two Protected 18650 type rechargeable batteries that provide an enormous amount of power for exceptionally long run times and maximum sensor performance. It has been equipped with the industry's highest quality quick release mount and a riser design by Unity Tactical. This riser features the Unity FAST interface allowing for the easy addition of reflex style red dots in the offset position, and because the little things matter we've protected our insanely expensive Arclight lens with a military-grade Tenebraex lens cover.

The unit was built exclusively for the American outdoorsman and was purposefully built for simplicity and ease of operation. While this manual explains everything in detail it is likely you will never need to read it more than once.

EXCLUSIVE TECHNOLOGY

WAVE12 Premium IR Thermal Sensor
Enhanced Sensor for Best-In-Class Image Resolution

Arclight Ultra HD Germanium Lens
High Purity Objective for Maximum IR Transmission

T3 Three Button Control System w/Center Tower
Three Buttons Control Everything

KISS Menu "Keep It Simple Stupid"
Simplified English Language Operating Menu

Micro Click Focus
Click-by-Click Precision Target Focus

XGEN Next Generation Armor
Body Armor & Heat Dissipating Body Housing

HeatSync App Compatible
Stream and manage media with the Fusion Thermal HeatSync App

FAST™ Compatible QD Mount
Easy Integrated Mounting of Available Offset Red Dot Mount

TECHNICAL SPECIFICATIONS

Thermal Sensor	640 x 512, VOx Uncooled (WAVE12)
Sensor Pixel Size	12 micron
Objective Lens Diameter	55mm (Arclight)
Frame Refresh Rate	50 Hz
Field-of-View	450' at 1000 yds (2.5x optical magnification)
Base Level Magnification	2.5x (before any digital zoom)
Digital Magnification	5x & 10x (2-step digital zoom)
Display Type/Resolution	Super HD OLED RGBW / 3.2 Million Dots
Color Palette Modes	4 (white hot, black hot, red hot, predator)
Reticle Design Options	7 (plus a "no reticle" 8th option)
Reticle Color Options	5 (white, black, red, green, blue)
Multiple Gun Profiles	Yes (save up to 5 different zeros)
Detection Range	Up to 2600 yds
Recognition & Identification Range	none published (see below)*
Start-Up Time/Cold Start	5 Seconds (logo appearance to functional use)
Start-Up Time/Power Saver Mode	Instant (button press to functional use)
Auto Shutdown Battery Saver	Yes (30 min. turn off with no use)
On Board Video Record	Yes (30GB Internal Hard Drive/50+ hours)
Video Output	Yes (via Wi-Fi & USB Pairing Function)
WIFI Equipped	Yes
Battery Type	(2x) 18650 Rechargeable – Protected Type Only
Expected Battery Life	7+ Hours (typical operation)**
External Power Supply Capable	Yes (via USB-C port)
Recoil Rating	300 Win Mag
Nitrogen Purged	Yes
Front Lens Housing Outside Diameter	60.5mm (lens cover interface)
Length	8.6" (housing front to housing back)
Weight	24.8oz (without mount or batteries)
UPC	850030459145

*There is no industry standardized test to determine a Recognition and/or Identification Range, thus they are meaningless specifications for comparative shopping. Unfortunately, many companies take the liberty of publishing fantasy numbers that only serve to mislead shoppers who are doing good faith research. We do not to participate in this practice.

**Verified by Fusion Thermal internal laboratory tests with supplied batteries in new condition that were fully charged at 68 degrees Fahrenheit with the Video Power Saver Mode enabled and WIFI turned off.

BUTTONS, COMPONENTS, AND CONTROLS

Down Button

Menu Button

Up Button

Display Focus

RIGHT SIDE

AVENGER 55XR

Power Button

FAST™ Mounting Interface for Offset Red Dot Mount (available separately)

Target Focus Knob

Record Button

LEFT SIDE

Battery Compartment

USB-C Port

Premium QD Mount

Tenebraex® Lens Cover

OPERATING THE AVENGER 55XR

Inserting Batteries and Turning the Unit On/Off

Unscrew the battery lid enclosure and insert two (2) protected type 18650 batteries into the battery compartment. Make note of the correct polarity as the unit will not operate if the polarity is incorrect.

To turn the unit on, press and hold the Power Button until the Fusion Thermal logo appears, about two seconds, and then release. To turn the unit off press and hold the Power Button until the Power Off countdown appears and then release it.

Special Note: The Power Button may also be used for secondary functions, explained later in this manual.

Caution: Use Protected 18650 Batteries only! Protected 18650 batteries have a small electronic circuit integrated into the cell packaging and are a safer alternative to non-protected variants. Protected 18650 batteries are the only types authorized for use.

Getting into Focus

Display Focus: With the unit powered on you are now ready to set it up for your personal use, and this begins with the Display Focus located on the eyepiece. Properly adjusting the Display Focus is critical for best performance as you will want the reticle and information written on the internal display screen to look perfect for your vision. Every user will need to make this adjustment as the strength of everyone's vision is different. Here's how to do it: With the unit powered on, push your eye against the rubber eye cup far enough so you can see the entire display screen and the information displayed. Next twist the eyepiece back and forth until the reticle and other information displayed on the display screen comes into sharp focus.

Helpful Tip: If you leave the front objective lens cover in place when adjusting the Display Focus you will not be distracted by images created by the thermal scope (which are adjusted with the Target Focus, explained below), so keep it covered until you've completed the task of setting the Display Focus.

Target Focus: The Avenger 55XR is equipped with our top-end Micro Click Focus, the most advanced and precise focus system in the thermal industry. If you've used other thermal scopes, especially ones with a collar focus design, you'll soon find this system to be vastly superior. It is exceptionally easy to use and was designed with a large focus knob, so you won't have trouble finding it in complete darkness or have difficulty using it with a gloved hand. Simple and easy to use, just twist directionally until your viewed subject comes into sharp focus.

Special Note: The Avenger optical system was designed to provide an outstanding depth of field. After initial focus, you will find that near-to-far target focus will be achieved with only a few micro clicks.

T3 – 3 BUTTON CONTROL SYSTEM W/ CENTER TOWER

The Avenger 55XR features our acclaimed T3 - Three Button Control System, a highly intuitive three button design with a central tower that makes operating your thermal simple and easy. Every command you need is right at your fingertips, and the **Menu Button** (center tower) evenly splits the button control panel, so you always know where your fingers are even in the dark. It's also the perfect complement to our KISS (Keep it Simple Stupid) Simplified Operators Menu (see page 9).

In addition to assisting your menu navigation, each of our T3 buttons have Smart Button assignments, which allow you to quickly execute important commands without the need to enter the **Main Menu**.

Up Button (button closest to the objective lens)

As a Smart Button, the **Up Button** has two assignments:

1. Quick Press: Give the **Up Button** a *quick press* and you will initiate the digital zoom feature. The first *quick press* will double your base level optical magnification from 2.5x to 5x digital. The next *quick press* will double the 5x digital to 10x digital. The next *quick press* will bring you back to your 2.5x base level optical magnification.
2. Long Press: If you press and hold the **Up Button** it changes the current **Color Palette** setting. The options are: White Hot, Black Hot, Red Hot, and Predator. Successive *long presses* will rotate thru each color palette option.

Menu Button – Center Tower

As a Smart Button the **Menu Button** has two assignments:

1. Quick Press: Give the **Menu Button** a *quick press* and it will manually NUC the sensor. NUC (Non-Uniformity Correction) is a process of sensor recalibration that keeps the thermal system operating at peak performance. The Avenger 55XR has an Automatic NUC feature that when turned on (menu option) will cause the unit to automatically NUC the system when required (see page 15). The manual NUC feature is provided so you can NUC the sensor anytime you want, or if you would prefer not to utilize the Automatic NUC feature.
2. Long Press: If you press and hold the **Menu Button** you will enter the **Main Menu** which is your access point for the full complement of Avenger 55XR features and settings.

Special Note: When a NUC occurs, you will hear a clicking noise and observe a momentary screen freeze caused by the activation of the internal shutter. This is completely normal and an indication that everything is operating properly.

⊻ Down Button (button closest to the eyepiece)

As a Smart Button the **Down Button** has two assignments:

1. Quick Press: Give the **Down Button** a *quick press* and it changes the current **Reticle Type** setting. Successive *quick presses* will rotate thru each of the seven available **Reticle Type** options and the eighth no reticle option.

2. Long Press: If you press and hold the **Down Button** it changes the current Reticle Color. The options are Red, Green, Blue, White and Black. Successive *long presses* will rotate thru each reticle color option.

⏻ Power Button

While the **Power Button** is not part of our control system it does have Smart Button assignment capabilities. As the default, if you give the **Power Button** a *quick press* the unit will enter a Power Saving mode and turn off the display and other non-critical functions. A second *quick press* instantly brings the unit back to full operational status. This feature is not only helpful for extending battery life, but also keeps the display from illuminating your surrounding environment while not being held to your eye. The *quick press* function of the **Power Button** may optionally be changed if desired to rotate through **Image Mode** options or **Reticle Brightness** settings (see page 16).

Special Note: When the device is placed in Power Saver mode battery consumption is minimized, but some electronics are still operating and thus the device will completely drain the batteries if not turned off prior to storing.

Media (Video, Camera, Audio)

The Avenger 55XR comes with an exceptionally advanced media package including capabilities for video, still photography and audio capture. You should familiarize yourself with all of the settings that control and operate these features. Complete explanations for all these features can be found in the **Main Menu** section of this manual.

The status of the video function is indicated to the user by the presence or absence of a green or red dot in the left-hand corner of the display. Below is a guide to what you might see.

No Dot Visible = Video Function is not active.
Blinking Green Dot = Video Function is starting up. The typical start-up time is 18 seconds.
Solid Green Dot = Video Function is operating and in standby mode.
Blinking Red Dot = Video Function is recording. *
Camera Icon = Still photograph image is captured.

*To enable audio recording along with the video, the Microphone must be turned on by a setting found in the **Video Recording** section of the **Main Menu**.

Capturing Video

If the video function is not active (no green dot), a *quick press* of the **Record Button** will activate the Video function startup process (green dot blinking), and after about 18 seconds the media system will be fully active and ready to go (solid green dot). A *long press* of **the Record Button** will activate the recording of video footage, (blinking red dot), and show a time counter next to the dot. If the unit is actively recording and you wish to stop recording, a *long press* of the **Record Button** will end the recording of video footage.

Special Note: For efficiency, the video system saves recordings in 3-minute intervals. For example, a 10-minute-long video will be saved on the device as 4 video files. The internal 30GB memory will store 50+ hours of video footage, with an additional 5GB reserve storage also accessible via the Files Storage menu.

Capturing Still Images

If the video function is active and ready to go (solid green dot), or if the video is actively recording video (blinking red dot), a *quick press* of the **Record Button** will capture a still image. When a still image is captured, the green/red dot is momentarily replaced by a camera icon indicating capture success.

KISS (KEEP IT SIMPLE STUPID) SIMPLIFIED OPERATORS MENU

You're going to love how easy the Avenger 55XR is to operate. Our simplified layered menu system uses words not icons and was written in English "for" Americans "by" Americans. It is so simple to use you could easily operate it without reading this manual. For access to everything press and hold the **Menu Button** (Center Tower) until the **Main Menu** appears. You will note that the **Main Menu** has five master categories, **Image Mode, Color Palette, Sighting, Video Recording** and **Settings**. Under each of these master categories reside sub menus, each of which leads to functions that accomplish specific tasks.

Main Menu > Image Mode

The **Image Mode** section of the menu is where you go to control all your sensor settings, namely **Brightness**, **Contrast**, **Sensitivity**, and **Detailing**. Our extensive testing and experience have led us to develop three preset sensor settings that will cover virtually all operational situations you may encounter. They are **Standard**, **Enhanced**, and **Search/Track/Rescue**. We also offer a **User Defined** option that will allow you, the thermal operator, to adjust and save up to three different combinations of sensor settings that may be required for your unique situations.

Standard: As expected the **Standard** image mode is perfect for most observation requirements. Use this as your regular image mode as it offers the near perfect balance of all sensor settings and results in maximum battery life.

Enhanced: The **Enhanced** image mode brings additional brightness to the scene and may be helpful under adverse observation conditions such as rain, fog, or high humidity.

Search/Track/Rescue: This Fusion Thermal exclusive provides the thermal operator with a super contrast mode that dramatically reduces the observation of noncritical items in favor of displaying more important targets of interest. When you want to maximize your chances of finding something important to you, **Search/Track/Rescue** is how you get it done.

User Defined: Our operating system allows you to create your own personalized **Image Mode** profiles to meet your unique operating requirements. To create your unique profile, go to the **User Defined** menu option under the **Image Mode** section of the menu. There you will find the three profile options, **User 1**, **User 2**, and **User 3**. You can enter each of them, one at a time, and adjust the four available sensor parameters as desired. The sensor parameters available are **Brightness**, **Contrast**, **Sensitivity**, and **Detailing**. To create a unique profile simply navigate to each of the parameters and use the <u>Up Button</u> and/or <u>Down Button</u> to adjust. Press the <u>Menu Button</u> to save your adjustment. Move from one parameter to the next. When you are done simply exit the menu and the device will save your adjustments.

Helpful Tip: For easy reference, the Avenger 55XR will display the current Image Mode setting in the upper left-hand corner of the display screen, designated by an S for Standard, E for Enhanced, STR for Search/Track/Rescue or U1, U2 or U3 for the User Defined settings.

Special Note: The default setting for each User Defined image mode is the same as the Standard image mode. If you want to return any User Defined Image Mode back to its default, there is a Yes/No menu option labeled Reset Image Mode for this purpose. Using this feature will only reset the current User Defined profile to default settings.

Main Menu > Color Palette

The Avenger 55XR offers four different **Color Palette** options: **White Hot**, **Black Hot**, **Red Hot** and **Predator**. A color palette choice determines how hot and cold subjects appear when you are using your thermal device. Which color palette works best for you is a personal choice and something you will determine over time from using the device. However, we can offer a few hints from our experience. **White Hot** and **Red Hot** (which is white hot with the hottest subjects displayed in red) are generally best for detecting the presence of heat generating subjects. These are the best choices for finding things quickly. **Black Hot** generally offers the greatest resolution potential and may be helpful when you want to see the maximum amount of detail on an observed target. **Predator** is helpful when there are many competing sources of heat in the same scene. When this happens the Predator color palette will assign a unique color to each object with a temperature differential.

*Smart Button Accessible: While Color Palette may be adjusted from the Main Menu it is also easily adjusted by **long press** the <u>Up Button</u> during normal operation.*

Main Menu > Sighting

The **Sighting** section of the **Main Menu** is where you go to set and control all subjects related to shooting. The options are **Select a Gun**, **Zero the Scope**, **Reticle Type**, **Reticle Color**, and **Reticle Brightness**.

Select a Gun Profile

When you start the zeroing process the first step is to select a **Gun Profile**.

The Avenger 55XR allows you to select and save up to five different **Gun Profiles**. Each of the profiles are designated as a G number: G1, G2, G3, G4 and G5. Having multiple profiles is very helpful for anyone wanting to use their Avenger 40 on multiple guns as it creates an easy way to save your zero settings for each gun under its own unique profile. Profiles may also be used to save zero settings when you want to shoot a different ammunition out of the same gun or have multiple zero distances for the same gun. In addition to zero settings, the selected reticle type, reticle color and reticle brightness will be saved under your gun profile.

Zero The Scope

The Avenger 55XR is equipped with two different methods for sighting in your thermal scope. You won't need to use both, but instead, you will choose one of these methods based on the time you have and the level of precision desired for your sight-in.

Easy Zero

Easy Zero is a simple and fast way to get everything sighted in and is a great choice if you're short on time. It's also ideal if you can observe bullet impacts on your target as you are shooting. To access the **Easy Zero** function, *long press* the **Menu Button** and enter the **Main Menu**, now scroll down to the **Sighting** option and *quick press* the **Menu Button**. Next, scroll down to the **Easy Zero** option and *quick press* the **Menu Button** to enter. Now you are in the **Easy Zero** interface and ready to shoot at your target. Take aim and fire at your desired point of impact. If possible, make note of the location of the bullets strike point after shooting. Now realign your reticle with your original aiming point and freeze the screen with a *quick press* of the **Menu Button**. When you freeze the screen, you will notice a second "white" reticle will appear, and this reticle will overlay your normal shooting reticle. You will also notice that the menu options have changed, and that the **Up-Down** option will be highlighted in a white bar. If you need to make an **Up-Down** correction *quick press* the **Menu Button** and enter the **Up-Down** interface, if not scroll down to the **Left-Right** option and enter. Once inside an interface use the **Up Button** and **Down Button** to make the correction by moving the normal aiming reticle to the location of the observed bullet strike. You will notice that the white reticle will remain at the original aiming point as a reference. A *quick press* of the **Menu Button** will save your adjustments and exit you from the interface, moving you up one level in the menu. Make additional adjustments if needed as described above.

Special Note: *The digital zoom feature cannot be used when using the Easy Zero function. If you attempt to do so you will be prompted (Set to Lowest Magnification) to reduce the magnification of the scope in the display. Choose the Traditional Zero option if sighting in with digital zoom is desired.*

Traditional Zero

The **Traditional Zero** allows you to use the digital zoom feature during the sight-in process. Using higher zoom has obvious advantages, but our system also gives you enhanced control over point-of-impact when you digitally zoom up your scope. See Helpful Tip below. This method is ideal if you are interested in the enhanced control over point-of-impact that can be accomplished by using the digital zoom feature. To make things simple and straight forward we split the vertical (Up-Down) adjustment from the horizontal (Left-Right) adjustment. When you sight in your scope you start with one type of adjustment and then move to the other. After each adjustment, a press of the **Menu Button** will save your current adjustment and bring you up one level in the menu so you can continue with additional adjustments if needed. There is another menu option called **Back to Center** if you want to bring all adjustments back to 0.00 and start over.

Helpful Tip: *If a greater degree of control over the point of impact is desired when sighting in, you may want to use the Traditional Zero feature and engage the digital zoom. Every time you double the magnification of the scope via digital zoom you cut the adjustment value in half, see the table below. To make things easy your scope will display*

these adjustment value changes for you, and they may be observed in the display. If use of the digital zoom feature is desired you must zoom up the scope prior to entering the Traditional Zero function.

Avenger 55XR Adjustment Values	
2.5x Base Level Magnification	**.23"** @ 50 yds per button press
5x Digital Zoom	**.11"** @ 50 yds per button press
10x Digital Zoom	**.06"** @ 50 yds per button press

Up-Down: To make a vertical point-of-impact adjustment, enter the **Up-Down** adjustment function by *quick pressing* the **Up-Down** menu option. From this screen aim at your target and fire a shot. Note the point-of-impact as compared to your original aiming point. If your bullet struck the target above your original aiming point you will need to bring down the bullet's point-of-impact. To accomplish this simply *quick press* the <u>Down Button</u> while taking note of the adjustment amount in the top status bar. You will also notice that a downward pointing directional arrow will appear on the top status bar that confirms the direction you are moving the bullet point-of-impact. The adjustment value for each button press depends on your current level of magnification, see the table above. Make your adjustments as needed, and when you are finished *quick press* the <u>Menu Button</u> to save and exit up to the next level. If you need to go back and tweak an adjustment you will notice that the software will restore your current session values to 0.00 while keeping your cumulative adjustment values, displayed by the bottom set of numbers, exactly as you left them during your last session. This feature is very helpful so you can keep up with your overall cumulative adjustments while observing your current adjustments.

Left-Right: The process of sighting-in for **Left-Right** point-of-impact errors is the same as described above for **Up-Down** with expected substitutions. The <u>Up Button</u> is used to move the bullet point-of-impact to the right, and the <u>Down Button</u> is used to move the bullet point-of-impact to the left.

Back to Center: This **Sighting** menu option acts like a reset button and if selected will bring the sight-in adjustments for both **Up-Down** and **Left-Right** back to 0.00. The reset only applies to the current selected gun profile and will only reset sight-in adjustments. It will not reset reticle type, reticle color, or reticle brightness. Nor will it reset any information in other gun profiles.

Helpful Tip: While our system will allow you to sight-in at any distance, we highly recommend sighting-in for a 50 yard zero. Why? The Avenger 55XR mounting system was optimized for the AR Style Weapon platform and as such a 50 yard zero will provide a Point-Blank-Range (PBR) for a 5" target radius up to and beyond 250 yards for many common AR cartridges. (PBR denotes the distance over which a certain firearm can hit a given size target without the need to compensate for bullet drop.) Additionally, all thermal scopes, as compared to traditional day scopes, are handicapped by limited image resolution and a 50-yard sight-in distance makes things easy. Our favorite target is a small Hot Hands™ hand warmer packet taped to a political yard sign. The Hot Hands hand warmer packet creates the necessary heat differential needed to achieve an easy to see target, and using a political sign gives a meaningful use to an otherwise nuisance item.

Reticle Type

The Avenger 55XR offers seven different reticle options and an eight "no reticle" option. The no reticle feature is helpful when the Avenger 55XR is used as an observation device. The reticle options are Mil-Hash, Plex Solid, Plex-Open, Fine Cross, German 4 Dot, Dot, and Pro Hunter.

*Smart Button Accessible: While the Reticle Type may be adjusted from the Main Menu it is easily adjusted by **quick press** the Down Button during normal operation.*

Reticle Color

The Avenger 55XR offers five different **Reticle Color** options: **Red**, **Green**, **Blue**, **White**, and **Black**. The best color selection often depends upon the color palette selected and individual vision considerations.

*Smart Button Accessible: While the Reticle Color may be adjusted from the Main Menu it is easily adjusted by **long press** the Down Button during normal operation.*

Reticle Brightness

The Avenger 55XR offers five different **Reticle Brightness** settings with **Bright 1** being the lowest level of brightness and **Bright 5** being the highest. The operator simply needs to select the brightness level best suited to their needs

Main Menu > Video Recording Settings

The **Video Recording** section of the main menu is where you go to set and control the media related functions of your Avenger 55XR. The menu options are: **Available File Space**, **USB Pairing**, **Wi-Fi**, **Erase all Video Files**, **Video Readiness Mode**, **Microphone**, **Date-Time Stamp**, and **Files Storage**.

Available File Space

The Avenger 55XR has a large 30 Gig internal hard drive capable of large amounts of media storage, 50 hours or more can be achieved in most circumstances. This menu feature allows you to see at a glance how much file space is available for additional recording. The available file space amount will only display when the video firmware is running and completely booted up (solid green dot). It will not display if the unit is in Video Power Saver Mode (no green dot), or while the video firmware is booting up (blinking green dot).

USB Pairing

Transferring prerecorded media files from the Avenger 55XR to your desktop via the included USB/USB-C cable is simple and easy, and it will work with both Windows and Apple devices. However, since your USB port may also be used for connecting an external battery the hook-up sequence you need to follow is important. First, navigate to the USB Pairing menu option in the menu and select it. This will turn on the USB Pairing function, see the special note below about exiting this function. Second, plug in the USB end of the cable to your computer BEFORE connecting the USB-C end of the cable to the Avenger. Once everything is connected a new screen will display on your desktop detailing all the available media files. As a point of reference, your Avenger is acting just like a typical USB jump drive when in USB Paring Mode.

Special Note: You will see the following words written in green at the top of the screen, "Turn Off the Device to Exit the Mode". This message tells you that the only way to exit the USB Pairing function is to turn off the device.

Wi-Fi

Your Avenger is equipped with a powerful internal Wi-Fi transmitter. The Wi-Fi transmitter in your device is active and positioned for use with our Heat Sync app slated for release in June 2023. The WIFI name will display as the serial number of your device, and the Password is 12345678.

Special Note: The Wi-Fi will only turn on if the video firmware is active and running on your device (green dot visible in the top left of the status bar). If the device is in the Video Power Saver Mode (no green dot visible) and the Wi-Fi is turned on the device will automatically boot up the video firmware (green dot blinking) so that the Wi-Fi may activate. This video firmware is a large program and may take about 18 seconds to boot up. Once it is active (solid green dot), the Wi-Fi will turn on automatically.

Special Note: Some functions of the device cannot be turned on or off when the Wi-Fi is operating, notably the Microphone. If the use of the microphone is desired while using Wi-Fi, such as live video streaming with audio, turn off the Wi-Fi, turn on the microphone, and then turn Wi-Fi back on. Also, if you want to enter the Date and Time Stamp settings area or the USB Pairing Feature, Wi-Fi must be off.

Special Note: The Wi-Fi feature uses a considerable amount of battery power; it is best to keep Wi-Fi off if not immediately in use. Wi-Fi will automatically turn off every time the unit is powered down.

Erase all Video Files

This function is used to erase all of the video files saved to the internal hard drive. If you select "Yes", all saved files will be erased and are unrecoverable. You must have sufficient battery reserves to utilize this feature. If sufficient battery reserves are not available, the warning message "Power Level Too Low" in red will appear at the top of your screen.

Video Readiness Mode

To maximize operating battery life we have created a **Video Power Saving Mode** that keeps the video operating firmware idle until needed. Thus, you will find two video operating mode options in the menu, and you can select which one best serves your current needs. The first is called "Video Quick Start Mode". When your device is set to "Video Quick Start Mode" the video firmware will automatically boot up when the unit is turned on. It will take about 18 seconds for the program to load (green dot blinking) and once booted up (solid green dot) will remain active until the device is turned off. The second is called "Video Power Saver Mode". When this mode is selected the video function is off (no visible green dot). If you decide to use the video feature while in "Video Power Saver Mode" you simply push the video button, and the firmware will boot up the video system (green dot blinking) and be ready for use in about 18 seconds (solid green dot). Once booted up the only way to turn off the video firmware is to turn off the device.

Microphone

Your Avenger is equipped with an exceptionally high-quality miniature microphone that may be activated to record audio as an enhancement to your video files. The microphone port is located on the bottom of the device and is protected with a water-resistant membrane, but care should be taken to prevent water exposure to the device.

Special Note: The microphone cannot be turned on if the Wi-Fi is already operational. However, if you wish to use both simultaneously first make sure the Wi-Fi is off, then turn on the microphone followed by the WIFI. If the device is in "Video Power Saver Mode" and you turn on the WI-FI, the unit will need to boot up the video firmware before the WI-FI will be active.

Files Storage

This menu option allows you to switch from the **Basic** (primary) 30GB internal storage to a secondary **Reserve** (backup) with 5.7GB of additional storage. The **Basic** will accommodate approximately 50+ hours of video, and the **Reserve** provides for an additional 6+ hours.

The default setting for **Files Storage** is **Basic**. Using the **Reserve feature** should be for emergency purposes only as it will pull memory resources away from the operating system and may slow down the unit's response and function. We have provided this feature to allow for the capture of video when the primary 30 GB hard drive is full, and an important filming opportunity arises.

The unit will automatically revert back to the Basic memory selection when the unit is powered down.

Special Note: You must have the Reserve feature selected to access any video/photo files saved while using the Reserve memory as the memory storage is completely separate from the Basic.

Main Menu > Settings

The **Settings** section of the **Main Menu** is where you go to set and control many of the operational features of the Avenger 55XR, namely **Automatic NUC**, **Blind Pixel Correction**, **Auto Power Off**, **Menu Transparency**, **Status Bar Display**, **On Off Power Button**, **Zoom Value Image and Date**, **Time**.

Automatic NUC

To maintain peak performance thermal devices occasionally need to perform a sensor temperature recalibration commonly referred to as **NUC (Non-Uniformity Correction)** – pronounced "nuke". This required function maintains top performance and eliminates image defects such as vertical bars and phantom images. When the **Automatic NUC** feature is set to the "On" position the Avenger 55XR software will detect when a NUC is required and automatically perform the calibration for you, no user action will be required. Keeping the Automatic NUC setting in the "On" position is the factory default and highly recommended.

Special Note: When a NUC occurs, you will hear a clicking noise when the internal shutter deploys, and the user may observe a momentary screen freeze. This is completely normal and an indication that everything is operating properly.

Helpful Tip: A manual NUC can be performed at any time with a quick press of the Menu Button.

Status Bar Display

The top status bar displays important information about the current operational settings of your device. However, there may be times when you prefer a cleaner view of the scene. For those occasions, the firmware allows you the ability to turn on or off the status bar display in this menu setting. The only thing that will continue to appear in the display is the video status indicator, green or red dot.

On/Off Power Button Function

While the **Power Button** is not considered part of the control panel, we have added a menu option that will allow you to use it as a Smart Button providing a shortcut to other operational functions. Remember to power down the unit requires a *long press*, but a *quick press* of the Power Button can have one of three functions.

   Power Saver Mode: Choosing this option will allow you the operator to turn off non-essential device operations during periods of inactivity without completely shutting down the unit. This has the advantage of saving power with the ability to instantaneously return the unit to full operating function with a single *quick press* of the **Power Button**.

Image Mode: Choosing this option will allow you to quickly cycle through all six Image Mode settings**. Standard (S)**, **Enhanced (E)**, **Search/Track/Rescue (STR)**, and the **three User Defined Modes**.

Reticle Brightness: Choosing this option will allow you to quickly cycle through all five preset Reticle Brightness options.

Blind Pixel Correction

There are hundreds of thousands of pixels of the face of every thermal sensor. Occasionally one or more of these pixels strays out of calibration and needs to be corrected, causing a white or black dot to suddenly appear on your screen that cannot be removed by performing a NUC. These small dots (blind pixels) are normal, harmless, and are to be expected with all thermal devices. Fortunately, you can fix this with our built-in correction feature. First, go to the **Blind Pixel Correction** section of the **Settings** menu and enter the function. A small targeting reticle will appear with a flashing dot in the middle. Second, move the flashing dot so that it is directly over the blind pixel using the **Up Button** and **Down Button.** A quick press of the Menu Button will toggle between horizontal and vertical movement. Third, once the flashing dot is directly over the blind pixel *long press* the **Menu Button** to recalibrate the pixel and exit the function. You will get a message in the status bar that confirms the system is saving your recalibration.

*Special Note: While moving the reticle into position, holding the Up or Down button will move the reticle quickly, while a **quick press** will allow you to slowly fine tune the position.*

Auto Power Off

The preserve battery life the software includes an automatic turn-off feature. When set to the "On" position the Avenger 55XR will automatically power down if no device use has been detected for 30 minutes.

Menu Transparency

To keep the top **Status Bar** and **Main Menu** as unobtrusive as possible the user can change the transparency of the menu background from very dark to nearly transparent. To make a transparency adjustment, go to the **Settings** section of the **Main Menu** and navigate to **Menu Transparency.** Setting 1 makes the menu background dark black (non-transparent) and setting 5 makes the menu more "see thru" or (transparent).

Zoom Value Image

The traditional way to express magnification levels in thermal scopes is in steps. For example, the first "base" level magnification would be 1x, the next step would be 2x and the next step would be 4x, each step doubling the magnification of the prior. In the Avenger 55XR we would call this traditional view "Digital (Thermal Core)". For those users who would prefer a display of magnification level more in line with what is actually being experienced while viewing the scene, we have added a second option. We call this option Total (Digital + Optical), and this is the devices' default setting. If this option were selected for the Avenger 55XR, the displayed levels of magnification would be 2.5x, 5x and 10x.

Date / Time

Within this menu option, the user can change date and time display types and adjust values. The options are simply navigated by using the **Menu Button** to select and the **Up Button** and **Down Button** to change. You have the option to display time in the US Standard 12-hour clock format that will show AM or PM, or the 24-hour clock format commonly referred to as military time. There are also three different options for how the date may be displayed.

Device Factory Reset

The Device Factory Reset is a quick and easy way to restore device menu settings back to the original default factory configuration. This function **does not** reset saved user settings such as User Image Mode adjustments, Gun profiles, or Sight-In adjustments.

About the Device

This section of the menu contains specific information about the device including the software version.

OTHER FUNCTIONAL AND OPERATIONAL CONSIDERATIONS

Digital Zoom

The Avenger 55XR has a base level magnification of 2.5x. It also has two additional digital magnification steps that can be accessed by a *short press* of the **Up Button**. The first *short press* will double your base level optical magnification of 2.5x to 5x. The next *short press* will double the 5x to 10x. The next *short press* will bring you back to your 2.5x base level optical magnification.

Helpful Tip: We are often asked if digital zoom may be used during the sighting in process, and the answer is yes if you are using the Traditional Zero function. The software will keep up with all adjustments necessary to keep everything aligned. However, you will need to engage the digital zoom before beginning the zeroing process.

Status Bar

When the unit is powered on you will notice a small **Status Bar** across the top of the viewing screen. The status bar is there to provide constant communication of important information about the unit's operation. If you prefer a cleaner view of the scene the Status Bar may be disabled by using the On/Off function found under the Status Bar Display section of the menu.

The status bar displays the following information:
Currently Selected Gun Profile (top left corner – first line)
Color Palette (top left corner – first line, second from left)
Automatic NUC Icon (if activated) – first line, third from left)
Image Profile (top left corner – second line)
Magnification Level (top right corner – first line, second from right)
Battery Status Icon (top right corner - first line)
Current Time (top right corner – second line, second from right)
Battery Status Indicator Percentage (top right corner – second line)

Power Saving Mode

This device is equipped with a special **Power Saving** feature that allows the operator to turn off non-essential device operations during periods of inactivity without completely shutting down the unit. This has the advantage of saving power with the ability to instantaneously return the unit to full operating function with a single *quick press* of the **Power Button**. This feature is not only helpful for extending battery life but also keeps the display from illuminating your surrounding environment while not being held to your eye.

Special Note: Please familiarize yourself with this feature as sometimes operators mistakenly think their device is off when it is in Power Saver mode. When the device is placed in Power Saver mode battery consumption is minimized but some electronics are still operating, and thus will completely drain the batteries if not turned off prior to storing.

Battery Power Requirements

There are two methods to power your device. First, the Avenger 55XR is may be powered by two (2) *protected type* 18650 rechargeable Lithium Batteries. This is the simplest and most direct way to power the device and is the most desired. Unprotected 18650 batteries should never be used.

The second method of powering your device is with the use of a Fusion Thermal sourced external battery pack connected to the USB-C interface. These external battery packs can be used alone (no 18650 batteries installed), or in conjunction with installed 18650 batteries. If you use both, the device will utilize the power from the external battery source first, and once depleted, rely on the internal 18650 batteries. When the device is pulling its power from an external battery source a green icon with the letters USB will appear in the upper right-hand corner of the status bar. Never use external battery packs not sourced directly from Fusion Thermal. Unapproved battery packs may damage your device and this damage is not covered by warranty.

Helpful Tip: Keep your batteries in lifetime pairs. Never mix old and new batteries, damaged batteries, or batteries with different states of charge.

Battery Status Indicator

When two fully charged 18650 batteries are inserted into the device the Battery Status Indicator will show a solid blue icon in the top right corner of the status bar. As the unit depletes, the battery power icon will switch to green and display the remaining charge capacity with a percentage indicator. If the batteries are fully depleted, the unit will flash a "Change Batteries" message in red letters on the status bar just prior to shutting down.

Helpful Tip: AWAYS remove batteries before storing, even if the storage is short-term. Leaving batteries inside the unit while not in use will completely deplete them and potentially cause corrosion and damage to the unit. Please know this type of damage is not covered by warranty. All user settings will be retained even if batteries are removed.

Storage and Transportation

The device should be stored in a dark, dry, and well-ventilated environment. Always utilize the objective lens cover when not in use.

Helpful Tip: Store this unit as you would your firearms.

IMPORTANT NOTES & WARNINGS

The Avenger 55XR is a precision infrared electro optical device that was designed and constructed to the highest industry standards. It will provide decades of reliable service if properly cared for and maintained. Below are important notes and warnings that should be observed to achieve the longest and most productive useful life.

- Never attempt to modify, alter, or repair your device.
- Only use batteries from known manufactures that are purchased from reliable sources.
- Never knowingly use counterfeit or off-branded batteries.
- Never intentionally expose the germanium lens to direct sunlight or other high intensity light sources. Keep front lens cover closed when not using.
- After powering down wait a minimum of five seconds before turning it back on.
- Protect the device from strong side impacts.
- Only use high grade lens cleaning cloths to clean lens surfaces.
- Never intentionally expose the device to water or other liquids.

Warranty Registration

To register your warranty please visit https://www.fusionthermal.com/support/warranty-registration/ or scan the QR Code directly below.

Warranty Information

For complete information about our Fusion Thermal Qualified Thermal Products/Devices Consumer Warranty please visit https://www.fusionthermal.com/support/warranty/ or scan the QR Code directly below.

ITAR Control Statement

This product is subject to the International Traffic in Arms Regulations (ITAR). You may not export, re-export, resell, transfer, or otherwise dispose of this product to any other country without first obtaining approval from the U.S. Department of State, Directorate of Defense Trade in accordance with the ITAR, Title 22, and Code of Federal Regulations Part 120-130. Diversion contrary to U.S. law is prohibited.

For complete information about *our Export Restrictions Policy* please visit
https://www.fusionthermal.com/export-policy/ or scan the QR Code directly below.

Technical Support

Questions about your unit? Need technical support? We're ready to help. We are located in the United States and available Monday thru Friday 8:30 AM to 6:00 PM CST.

Please call us at 985-375-1185.