

AC7

AC7-SDI

# User Manual



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# Product Introduction

# The AC7

## Resolution

First and foremost, the ultimate purpose of a field monitor is to be able to see what you are shooting. Shooting in HD and monitoring in SD is, we feel, a step in the wrong direction. That's why even with a 7 inch screen, the AC7 delivers HD a 1280x800 resolution. Simply put – this means that you truly see what you get, so there are no surprises in the editing room.

## Wide range of inputs

No matter how good a monitor is, if your camera doesn't work with it then it probably won't be very helpful to you. That's why all the standard HD inputs – HDMI, Component, and HD/SDI – are available on the AC7.

## Production-friendly accessories

Every production comes with a unique set of needs, and we've made sure to accommodate for as many of those as possibly with a range of innovative and useful accessories such as the click-in neoprene Sunhood, and HDMI splitter.

# Caring for your AC7 Monitor

\* The AC7's max input voltage is 18vDC. Over powering can result in damage to your AC7. SmallHD is not liable for any damage due to overpowering the unit.

\* Not all power sources are created equal. Using off-brand batteries can result in undesired performance and longevity issues.

\* Do not attempt to disassemble the AC7. Doing so voids warranty.

\* Water damage is not covered by warranty, but taking the right precautions when a water event occurs can sometimes preserve unit functionality.

\* Clean the screen with a high quality microfiber cloth only. Never spray the screen directly with any sort of cleaning fluid.

\* Always ask us if you have any questions about general operation. Contact SmallHD at [www.smallhd.com/support](http://www.smallhd.com/support)

**\*Much more information about the AC7 and other SmallHD products can be found online on our website and in video form at [www.smallhd.com](http://www.smallhd.com)**

# What should be in the box:

1. AC7 Field Monitor
2. Mini to standard USB cable
3. US Power Supply
4. SmallHD Cleaning Cloth
5. Quick-Start Guide

# Powering the AC7

With an amazing DC input voltage range of 7 to 18v, the AC7 can be used with nearly any battery on the production market.

## Battery Plates

The portable powering solution.

We offer several portable powering options to help our customers reduce the amount of charging equipment that is plugged in around the set. For example, if you're using a Canon 7D, then you only need to worry about keeping your LP-E6 batteries charged – just one charging station.

### Canon 5D/7D Battery Bracket

- Use your Canon's 5D/7D batteries rather than buy other (Canon Model Number: LP-E6)
- Holds 2 Batteries – Hot-Swap for Endless Power
- Runs a AC7 for 4 hours straight when using 2 LP-E6 batteries at once
- Fits snugly against the back of your AC7 monitor to maintain an incredibly low profile
- Lightest weight battery option so far for the AC7
- Output Voltage: 7.4v

### Sony NP-FV Battery Bracket

- Uses Sony NP-FV series batteries
- Holds 2 batteries at a time for maximum power
- Mounts sleekly on the back of the AC7
- Capacity is dependent on batteries
- Output Voltage: 7.2v

## **Panasonic Battery Bracket**

- Supports CGA-D54 style batteries
- Holds 2 batteries but will run on just one – Hot-Swap for endless power
- Will run a AC7 for over 12 hours straight when using high-capacity Panasonic batteries
- Also maintains a low profile when mounted snugly against the back of the AC7
- Output Voltage: 7.4v

## **SmallHD AC7 Universal Battery Plate**

- Enables lightning-fast one-handed battery changes
- Incredibly low profile and light weight
- Snaps in and only uses one screw to attach to the monitor
- Makes your monitor compatible with all current AC7 SmallHD battery brackets as well as some Anton Bauer and Marshall plates. (Marshall plate requires extra wire available on our website)

## **SmallHD Battery sleeve**

- Ships free with your AC7 (Upon request only)
- Attaches to your Universal Battery Plate
- Holds your legacy SmallHD battery pack.

## **Attaching the Battery Plate**

Your battery plate attaches by screws directly to the back of the Universal battery adapter plate –The Sony, Canon 5D/7D and Panasonic plates are attached at two points which are on the left and right side of the adapter plate.

If you lose a thumbscrew – go to this webpage and you can order more: <http://www.smallhd.com/store/thumb-screw>



# AC7 Power Supply

Take it with you where ever you go.

This 12V/1.5A powering option is included with each AC7 and includes a detachable US-style cable, but can be replaced with additional Australian, European or UK style plugs that are available on the Store page on the website.

Output: 12v DC/1.5 Amps

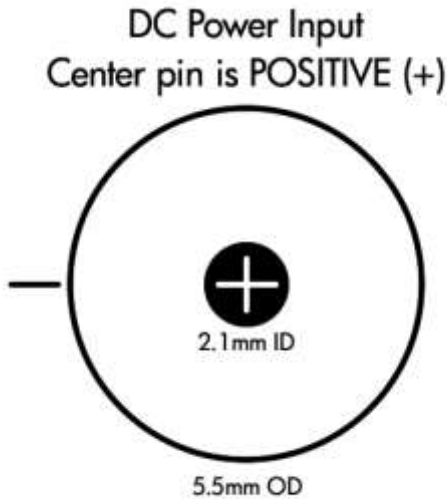
Output Plug Style: Male Barrel – 2.1mm ID/5.5mm OD

Input: 110-240c AC

Wall Plug Style: 2-Pin (no ground)

The AC7 has a barrel power input for powering from a wall plug using the included power supply, or from other sources such as Anton Bauer batteries.

The specifications of this plug are below:



# Locking Connectors for AC7-OLED Models only.

The AC7-OLED has a locking 4 pin Hirose connector on it, we sell multiple different power cable's including a Hirose to XLR 4 pin, Hirose to D-tap, and Hirose to Flying leads (which you can use to make your own custom cable.)

## Additional Power Options

Adaptable power for maximum performance.

SmallHD does not make custom power cables. However, if you need to fabricate a special connection to use your preferred battery, we recommend using the SmallHD D-Tap cable, and then adapting the D-Tap end to the connection of your choice. Or if you have the OLED just use the Hirose to Flying leads cable we offer.

As always, if you have any questions, call Support at 919.439.2166, or go to [www.smallhd.com/Support](http://www.smallhd.com/Support) and submit your questions.

# Using the AC7

## Operating the Menus

1 2 3



### 1 – Navigation Scroll Wheel

- \* Click to activate Main Menu
- \* Click to select items in menu
- \* Scroll right and left to adjust values
- \*(From no menu) Scroll any direction to access the Preset menu

### 2 – Back button/Custom Function A

- \* Press to reverse out of the menu
- \* Activate/deactivate Preset

### 3 – Custom Function B Button

- \* Activate/deactivate Preset

### **Activating the menu and adjusting a function:**

- 1 – Click the scroll wheel one time
- 2 – Roll the scroll wheel left or right to the proper sub menu
- 3 – Click the wheel to select the sub menu
- 4 – Roll the wheel to select the desired menu item
- 5 – Click the wheel to select the desired menu item
- 6 – Roll the wheel left or right to adjust the value
- 7 – Press the back button to exit out of the menu system.

**\*NOTE: SmallHD monitor software is constantly under development, which means there is a chance this manual might not always be accurate. Always refer to online documentation and videos for the most up-to-date information on AC7 software.**

### **The Preset Menu:**

The Preset menu is a list of selectable presets that can perform a variety of advanced functions. Named presets are pre-programmed to perform specific functions; therefore the user cannot modify some of their parameters. Generic presets (with the name "Preset" followed by a number) will store menu adjustments made to the AC7 in real time. The selected preset can be seen in the bottom right corner of the Main menu.

### **Accessing the Preset Menu:**

While not in any menus:

- 1 – Roll the scroll wheel to the right to display the menu
- 2 – Roll the wheel to the desired preset
- 3 – Click the wheel to select the preset
- 4 – Press the back button to exit the preset menu

## DSLR Scale Presets

The DSLR Scale presets are factory defined presets that enable the input signal from a variety of DSLR cameras to fill the screen of the AC7. Most monitors are unable to achieve this function. Special logic is in play when these presets are activated that keeps the image in full-screen mode even though the video signal may be changing aspect ratios behind the scenes (as in the case of the Canon 5D Mark 2, 60D, T2i, and T3i). As a result, the "Scale" and "CustomScale" menu functions are locked while using these presets.

- Use preset "**Canon DSLR**" for Canon DSLR (480p output) cameras during LiveView/Record mode. Use preset "**Nikon DSLR**" for Nikon DSLR (720p output) cameras during LiveView/Record mode.
- Use preset "**C PLAYBACK**" when reviewing footage already recorded onto the Canon DSLR.

**\*Many of the menu functions are described in video format on the video section of the SmallHD website**

**[www.smallhd.com/videos/](http://www.smallhd.com/videos/) View videos such as "Nikon Preset" and "Preset Menu Demo" are great resources for learning how to navigate your presets.**

This Preset Menu shows the Nikon DSLR Record preset is selected.

**PRESET 1**

**PRESET 2**

**PRESET 3**

**PRESET 4**

**PRESET 5**

**PRESET 6**

**PRESET 7**

**PRESET 8**

**PRESET 9**

**NIKON DSLR**

**CANON DSLR**

**C PLAYBACK**

# DSLR SCALE



INACTIVE



**ACTIVE**

Most Canon and Nikon DSLR's output signals do not fill a monitor's screen completely. The AC7's "DSLR Scale" function enables the operator to quickly and easily fill the full screen with the incoming signal, removing those useless black bars, giving you a larger, more detailed look at the scene.

## Assigning Function Buttons

The AC7 has two buttons that can be assigned to custom functions for a convenient one-press ON/OFF of your favorite features.

While not in any menus:

- 1 – Press and hold either of the two buttons (1 or 2) for 3 seconds and release
- 2 – Scroll with the scroll wheel to the desired function and click the scroll wheel to select it
- 3 – Press the Back button to exit the menu

**This Menu shows that a function button is set to the 1 : 1 Mapping tool. (Menu may appear different on your monitor.)**

Focus Plus

Focus Max

**Focus in Color**

Peaking

1:1 Mapping

Freeze

Image Flip

FalseColor HML

FalseColor HL

2x Zoom

2x Anamorphic

# Image Menu

The image menu controls Brightness, Contrast, Hue, Saturation, Sharpness and Gamma. Below is a description of each.

| <b>Function</b>       | <b>Range</b> | <b>Description</b>  |
|-----------------------|--------------|---|
| Contrast (LCD ONLY)   | 0-100        | Controls the maximum white point of the signal.           |
| Brightness (LCD ONLY) | 0-100        | Controls the maximum black point of the signal.           |
| Hue                   | 0-100        | Also known as Tint or Phase.                              |
| Saturation            | 0-100        | Also known as Chroma.                                     |
| Sharpness (LCD ONLY)  | 0-100        | Amount of edge enhancement is applied.                    |
| RGB Control           | 0-100        | Adjusts RGB Gain and Offset for all three color channels. |
| Gamma (LCD ONLY)      | 2.2          | Standard Gamma (not adjustable)                           |



# Tools Menu

The Tools menu provides access to the many software tools of the AC7 to, among other things, aid in focus and exposure.

Some of the functions are explained in greater detail in later pages, marked by the asterisk (\*).

| Function        | Range  | Description   |
|-----------------|--|---|
| Focus Assist    | Color, Plus, Max, Off                        | Color highlights your in focus edges in the edge color of your choice. Plus and max Darken image and outlines area in focus in white. |
| Edge Color      | R,B,Y,C,M,G                                  | Select the color of your focus assist edge in this menu.  |
| Peaking         | On, Off                                      | Over-sharpens the image to give a frosted look to areas in focus.   |
| Exposure Assist | HML, HL                                      | Overlays varying IRE levels in specific colors.   |
| 1:1 Mapping*    | On, Off                                      | Maps the native signal data to the screen of the AC7 – one native pixel to one AC7 screen pixel, no scaling.                          |
| 2X Zoom         | On, Off                                      | A 2x digital zoom feature that allows you to get a closer view of your image.   |
| Aspect Scale    | 16:9, 4:3, 2.35:1, 1.85:1, 15:9, 16:10, AUTO | Defines the initial scaling parameters for the AC7. 16:9, 4:3, etc.   |

|               |                   |  |
|---------------|-------------------|--|
| CustomScale   | 0-1000(x4)        | Stretch, shrink and move the image on screen pixel-by-pixel.   |
| DSLR Scale    | Canon, Nikon, Off | Use this setting to help get a full screen image on your monitor. Even if your camera output's image in strange format or aspect ratio like the 5DmkII (Cont pg12) |
| 2x Anamorphic | On, Off           | Desqueeze the image when using a 2x anamorphic lens. So that your image looks normal even when using anamorphic.   |
| Freeze        | On, Off           | When activated will freeze the image on-screen. Turn off to resume normal video.   |
| Image Flip    | H                 | Flip the image horizontally  |
| Blue Only     | On, Off           | Turns the Red and Green color channels off. Used for calibrating to color bars.  |
| Monochrome    | On, Off           | Removes all color and leaves only the Luminance data of the signal.  |
| Negative      | On, Off           | Invert's the colors of your monitor.   |

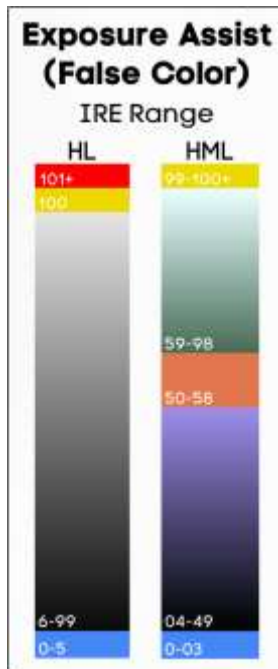
## False Color

False color evaluates the incoming IRE levels (exposure) of the signal and then changes the colors of the pixels to represent what those IRE levels are. This is a quick way to gauge the exposure levels within an image in a very clear way.

The AC7 currently has two different types of False Color.

False Color HML (High / Mid / Low)

Meaning High, Medium, Low, has colors for over-exposed, under-exposed and mid-range. The scale is below



False Color HL (High / Low)

Meaning High, Low, has colors for over and underexposed. The remaining middle will be monochrome.

# FALSE COLOR HL



INACTIVE



**ACTIVE**

# FALSE COLOR HML



INACTIVE



**ACTIVE**

# FOCUS ASSIST PLUS



INACTIVE



**ACTIVE**

One of the underlying principles behind SmallHD’s products is that they should greatly improve the operator’s ability to focus a high-definition camera. Increasing resolution is step number 1, as it adds detail to a scene that you wouldn’t otherwise see. In addition, the AC7 now offers one of the most accurate in-monitor focus assist filters on the market: “Focus Assist Plus”.

# FOCUS IN COLOR



INACTIVE



**ACTIVE**

Via a recent firmware update we now have “Focus in Color”, improving even further on our already extremely accurate focus tool: “Focus Assist Plus”

# FOCUS ASSIST MAX



INACTIVE



**ACTIVE**

Due to demand, we've added an even more intense version of Focus Assist Plus called "Focus Assist Max" for those situations where you might otherwise be struggling to see details.



# 2X ZOOM



INACTIVE



**ACTIVE**

“2X Zoom”, or 1:2 pixel mapping simply zooms into the image past its native resolution allowing for a very fine look at the details of your image.

# ANAMORPHIC DESQUEEZE



INACTIVE



**ACTIVE**

Anamorphic lenses are often both beautiful and strange. Make them look less strange by using our “Anamorphic Desqueeze” filter. Even works on 2X anamorphics, stretching and cropping to a 2:35 aspect ratio for a 16:9 input (pictured).

# FRAMING GUIDES



INACTIVE



**ACTIVE**

The AC7 comes equipped with several “Framing Guides” to help you line up your shot. The options available are Crosshair, Crosshatch, Aspect, and Title guides.

# MONOCHROME



## INACTIVE



## ACTIVE

Have the choice to monitor in black and white with “Monochrome”. Some prefer monochrome while pulling focus because it can be easier on the eyes not having chrominance interfering with the focal plane. Another simple benefit is when shooting in color, but plan to deliver the final product in monochrome, you can avoid surprises in the edit bay.

## 1:1 Mapping

When activated, each native pixel of the input signal is mapped to a native pixel on the display. This is also called "Pixel to Pixel".

When viewing HD signals (720p and up), only a portion of the image will be displayed on the AC7 as 1:1 Mapping essentially performs a "zooming" effect on the native HD image

To move the viewable window around:

When 1:1 is activated and no menu is being displayed:

- 1 – Roll the scroll wheel to the **left**
- 2 – Now roll the wheel in either direction to move the window around
- 3 – Press button B to change the direction of movement
- 4 – Press the back button (Button A) to exit this dialog



**Left – Right**

**Up – Down**

# 1:1 PIXEL MAPPING



INACTIVE



**ACTIVE**

If you need to double check focus, or need a slightly closer look at an element of your scene, “1:1 Pixel Mapping” does the trick when it comes to 1080i/1080p signals, showing you a bit more detail than when the image is scaled to fit the screen

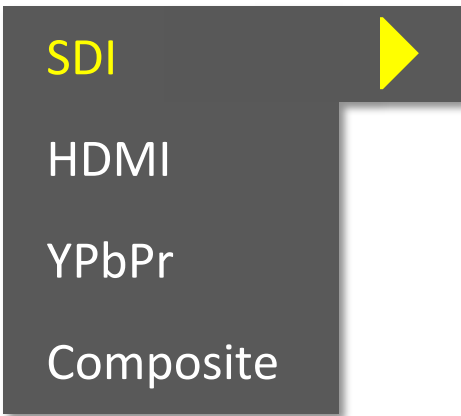
# Input Menu

The AC7 has 4 inputs to choose from:

- 1 – SDI
- 2 – HDMI
- 3 – YPbPr (SD/HD Component)
- 4 – Composite (SD Only)

## Changing inputs:

- 1 – Navigate to the “Input” sub menu with the scroll wheel
- 2 – Scroll to the desired input
- 3 – Click the scroll wheel once



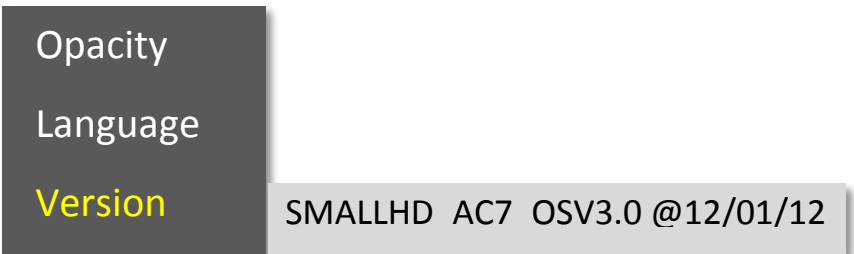
# System Menu

The System Menu provides access to critical system functions, listed below:

| Function      | Range                | Description  |
|---------------|----------------------|--|
| Backlight     | 0-5                  | Controls the overall light output of the display.                        |
| Menu Flip     | On, Off              | Adjusts the menus according to the mounting position/Image Flip setting. |
| Display       | Off, 10s, 5s, 2s, ON | Turns on Input format display for a set amount of seconds.               |
| Factory Reset |                      | Reverts the AC7 back to factory defaults                                 |
| USB Power     | Off, 5V              | Toggles power to the USB port, on or off.                                |

# Misc Menu

The Miscellaneous Menu simply contains options to change the menu background opacity level, and will display the current firmware version as a reference.





## PIP Menu

The AC7 allows two signals (1 HD and 1 SD) to be displayed simultaneously using the PIP or POP function, located in this menu.

| <b>Function</b> | <b>Range</b>         | <b>Description</b>                    |
|-----------------|----------------------|---------------------------------------|
| Multi Window    | PIP, POP (Full, 4:3) | Determines the type of windowed view. |
| Sub Source      | Composite            | Determines the secondary source.      |
| Position        | TL, TR, BL, BR       | Position of the window.               |
| Size            | Small, Medium, Large | Determines the size of the window.    |
| Border          | Black, Blue          | Border or no border.                  |
| Swap            | Swap                 | Swaps the two signals                 |

---

# Updating Firmware

The AC7 has the ability to upgrade its firmware based on new software developments. This is a unique ability of SmallHD monitors, and is very easy to do. To upgrade:

- 1 – Format your USB thumb drive to FAT file system
- 2 – Download the .BIN file from [www.smallhd.com/support](http://www.smallhd.com/support)
- 3 – Copy the .BIN file to your thumb drive
- 4 – Insert the thumb drive into the USB to mini-USB cable, then attach to usb port of the AC7.
- 5 – Hold down the scroll wheel and then turn the AC7 on.
- 6 – On screen instructions will inform when the process is complete.
- 7- Factory reset the monitor by selecting the option in the monitor's system menu.

For a demonstration, go to <http://videos.smallhd.com> and watch the Upgrading Software video.

# Specifications

## AC7-LCD

| LCD                 |                             |
|---------------------|-----------------------------|
| Size                | 6.95 inch (diagonal)        |
| Resolution          | 1280x800 (RGB Pixels)       |
| Native Aspect Ratio | 16:10                       |
| Color               | (8 bit)                     |
| Brightness          | 400 Nits (cd/m2)            |
| Contrast Ratio      | 800:1                       |
| Viewing Angle       | 170/170 Horizontal/Vertical |

| Signal INPUTS   |
|-----------------|
| HDMI            |
| YPbPr/Component |
| Composite       |
| HD-SDI          |
| SD-SDI          |

| Signal OUTPUTS |
|----------------|
| SDI            |

| Signal Compatibility |                                    |
|----------------------|------------------------------------|
| HDMI In              | 480i/p, 576i/p, 720p, 1080i, 1080p |
| YPbPr                | 480i/p, 576i/p, 720p, 1080i, 1080p |
| Composite            | 480i/p, 576i/p                     |

| Power             |                            |
|-------------------|----------------------------|
| Input Voltage     | 7-18 Volts DC              |
| Consumption (MAX) |                            |
| Power Connector   | 5.5mm OD / 2.1mm ID Barrel |
| Polarity          | Center Pin – POSITIVE (+)  |

# Specifications

## AC7-OLED

| LCD                 |                             |
|---------------------|-----------------------------|
| Size                | 7.7 inch (diagonal)         |
| Resolution          | 1280x800 (RGB Pixels)       |
| Native Aspect Ratio | 16:10                       |
| Color               | (8 bit)                     |
| Brightness          | 250Nits (cd/m2)             |
| Contrast Ratio      | 10000:1                     |
| Viewing Angle       | 170/170 Horizontal/Vertical |

| Signal INPUTS   |
|-----------------|
| HDMI            |
| YPbPr/Component |
| Composite       |
| HD-SDI          |
| SD-SDI          |

| Signal OUTPUTS |
|----------------|
| SDI            |

| Signal Compatibility |                                    |
|----------------------|------------------------------------|
| HDMI In              | 480i/p, 576i/p, 720p, 1080i, 1080p |
| YPbPr                | 480i/p, 576i/p, 720p, 1080i, 1080p |
| Composite            | 480i/p, 576i/p                     |

| Power             |                            |
|-------------------|----------------------------|
| Input Voltage     | 7-18 Volts DC              |
| Consumption (MAX) |                            |
| Power Connector   | 5.5mm OD / 2.1mm ID Barrel |
| Polarity          | Center Pin – POSITIVE (+)  |

# Warranty

The AC7 comes with a one year limited hardware warranty. The limited hardware warranty covers defects in materials and workmanship of our products.

Warranty specifics:

- Warranty period begins on date of shipment
- Warranty is non-transferable; products not purchased directly from SmallHD or SmallHD approved affiliates and distributors do not qualify for warranty coverage.
- The customer shall be responsible for paying shipping charges required to return products to SmallHD for warranty repair. SmallHD shall pay for shipping of repaired products to the customer.

## **What is not covered by our warranty:**

- Problems resulting from accidents, abuse, or misuse
- Problems resulting from electrical power source issues
- 3rd-party servicing not authorized by SmallHD
- Failure to follow product instructions
- Water damage
- Scratches to the body or panel that occur as part of normal use

**For Dead Pixel Policy and other Warranty information, visit our website at [www.smallhd.com/support](http://www.smallhd.com/support).**

# Thank You!

Most importantly, we value your patronage. If you have any questions about general or extreme use, or want access to the latest documentation, videos, firmware and general information, please visit [www.smallhd.com](http://www.smallhd.com).

