

White Paper

Autoset

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1 INTRODUCTION

The manual adjustments on a display to create a crisp and clear image are not always straightforward if the analog video signal is unknown, exotic, or if you just want to see a correct display according to your input.

Autoset is the ability to have your display set up automatically within maximum 8 seconds, while saving the settings for future use.

2 AUTOSSET EXPLAINED

2.1 Functionality

What will Autoset do to your display setup?

1. Define the **number of pixels** on a horizontal line
 - ✓ Searching through a list of pre-defined timings to guess the horizontal resolution
2. Adjusting the **phase**
 - ✓ Making sure the digital sampling of the analog video signal occurs at the optimum position in the pixel to create a sharp and crisp image.
 - ✓ This makes use of the digital APA functionality.
3. **Geometry** alignment
 - ✓ Correct position and resolution is set.
4. Optimizing **Color** Settings
 - ✓ Delivering a perfect color representation (within each panel's color temperature range).
5. **Saving settings** in a user scanset
 - ✓ If automatic saving is enabled.
 - ✓ A scanset contains sufficient information of the video signal for a correct representation on the display.

2.2 User interface

Autoset is available as a fully automatic feature without any user interaction. However, the user can still have complete control of the Autoset functionality and decide to work in manual mode.

- Automatic Autoset (by default, enabled)
 - ✓ If enabled, autoset starts working as soon as a new timing has been applied to the display which has no known scanset stored in the database.
 - ✓ If disabled, Autoset will only start when commanded by the user
- Manual Autoset start
 - ✓ A menu entry will be available for a manual autoset start.
 - ✓ A special button combination will allow a user to start the autoset.
 - ✓ At the end, an undo option which is visible for a few seconds, can revert the autoset operation to its previous state.
- Automatic Scanset saving (by default, enabled)
 - ✓ If enabled, all settings that have changed manually or changed by the autoset functionality will be saved in the currently active scanset after a stabilization period of about 5 seconds.

- ✓ Only when the currently active scanset used is a fixed factory scanset or a protected scanset, a new free scanset is selected and the settings are saved.
- ✓ If disabled, the user explicitly has to save his settings manual or else the adjustments made will be lost upon power down or if a new timing has been detected at the video input port.

2.3 Scansets

Scansets are internal database elements that contain all the information that a Barco display needs to output a correct image and that are video dependent. The parameters included are for several settings like geometry, timing, color and clamping.

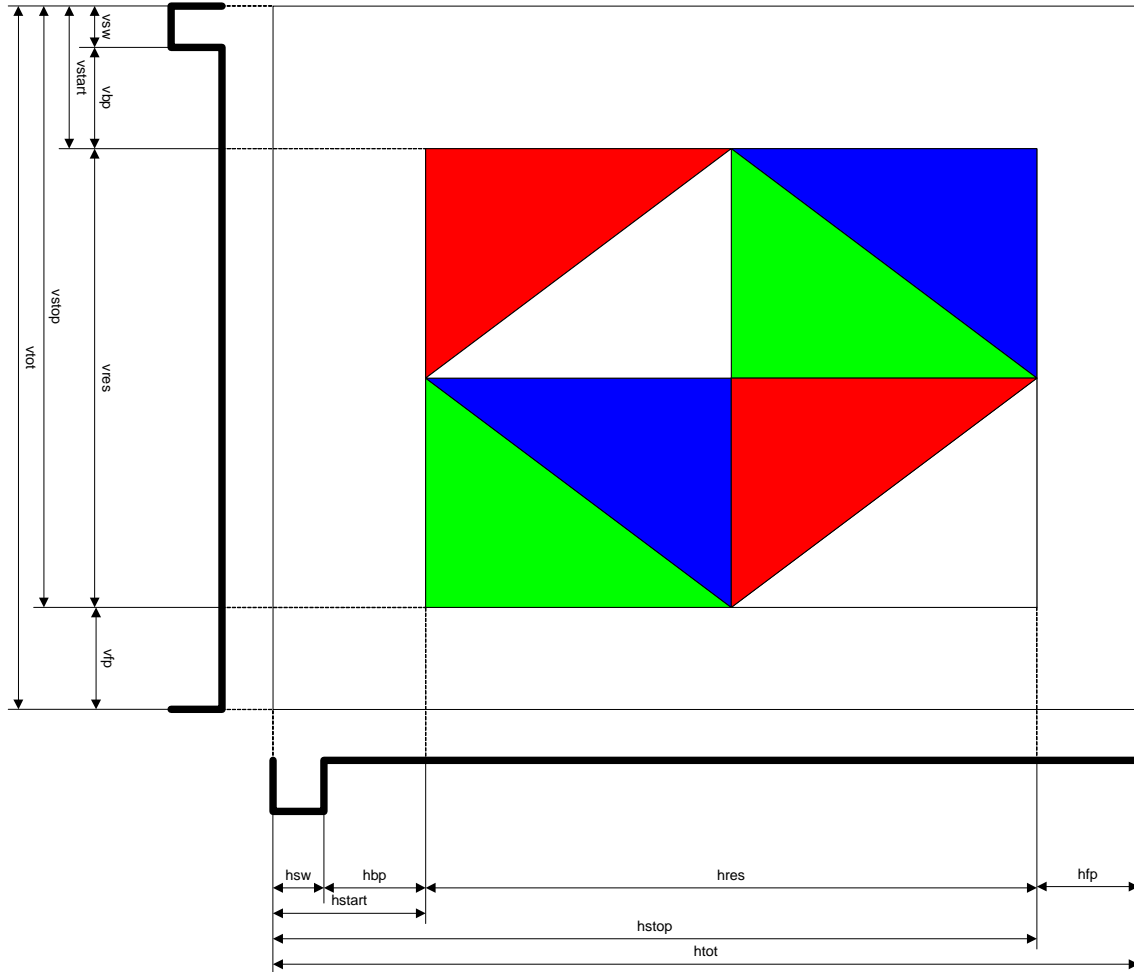
Barco has provided some fixed or predefined scansets that serve as starting points for manual display setup. There will be a certain amount of user scansets available to save changed parameters obtained by autoset or manual adjustments.

A choice will be given whether a scanset can be protected or unprotected. In the protected mode, a scanset can be overwritten by new parameters.

3 MORE IN DETAIL

A video signal is built up by a horizontal number of pixels and a vertical number of lines. The picture below shows a complete picture frame. The active area that is meant to be displayed is defined by the colored area of width $hres$ and height $vres$, the **resolution** of the video signal.

The **blanking** signals on both horizontal and vertical lines are not supposed to be visible and contain the synchronization (hsw and vsw), back porch (hbp and vbp) and front porch (hfp and vfp).



Video signal build-up

There are a few requirements during the detection phase of Autose (the initial 2 seconds) to which an incoming analog video signal must fulfill to work perfectly.

- On all 4 sides of the outer border of the active area, at least one pixel must contain a minimum of 50% video information in the red, green or blue channels

- ✓ The Autaset functionality needs a good detection of the transition from the blanking to the active video and vice versa. As the video level in the blanking area is comparable to a black color, there needs to be sufficient color information on the edge of the active area.
- Blanking areas may not contain any video information
 - ✓ This video information could otherwise be misinterpreted as real video information and wrong measurement would be taken.
- The horizontal front and back porch must be at least some pixels wide.
- The input signal must contain some high frequency contrast in the green channel
 - ✓ This is for the digital Automatic Phase Adjust (APA) functionality to work correctly
- The input signal must contain pixels at the maximum and minimum video levels in the red, green and blue channels.
 - ✓ AGC uses this information for correct color representation.
- The number of pixels on a line must be even.
- Image content should be stable within the 2 second timeframe that digital APA is functional.

4 CONCLUSION

Autoset is a smart feature of Barco displays which enables a quick setup. At all times, a picture is shown within 8 seconds, even if one of the requirements is not fully met.

The user still has full control of the functionality and will be able to choose between quick Autoset or manual adjustment.