

Constant Height Masking Screens

All pulse-based products

Document Rev.1



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Contents

Introduction	3
Connecting your projector to a network using prospector	3
2-Way masking screen	4
Top/bottom masking	4
Side masking	4
How to use a Cinemascope projector on a 2-way side masking screen	4
Lens calculations	4
Example	4
Technical details for the example	4
Setting up all aspect ratio's	4
OSD	4
Connecting to Prospector	5
How to use prospector	5
JSON	6
To find the JSON command you need to use	6
How to use a 16:9 projector on a 2-way side masking (constant height) screen	8
Lens calculations	8
Example	8
Technical details for the example	8



Introduction

This document is describing how to specify and install a projector on a 2 way side masking screen or also known as a constant height screen. It includes the technical challenges as well as how to solve them with our projector. All setup information is based on using prospector.

Connecting your projector to a network using prospector

1. Start by preparing the projector and your device
 - a. Make sure your projector and your device (pc, pad, phone) is connected to the same network.
 - b. Go to your browser preferable google chrome and enter the IP address for your projector followed by the port number :9999 example 192.168.8.10:9999
 - c. Click on login in the menu and enter the correct pin in the login window 292920



2-Way masking screen

There are two types of 2-way masking screens, side masking and top/bottom masking. We will describe both versions below but focus on side masking as top bottom masking require no adjustment to the projector.

Top/bottom masking

No need to explain anything, you just mask the screen to cover the black bars, the projector is not using any aspect ratio changes at all. The only reason for using a screen like this is because you use a projector without aspect control. This is being used when screen size is cinemascope and content is both 16:9 and scope.

Side masking

This is the most common 2-way masking screen/constant height and is normally used when you have a scope projector.

How to use a Cinemascope projector on a 2-way side masking screen

Lens calculations

Example

The best way to explain this is to use an example:

Technical details for the example

- The screen in this example is a 2.40:1,
- 4 meter wide (13 feet),
- the projector is sitting 8 meter(26,2 feet) away.
- Your content is 2.35:1, 2.2:1, 1.85:1 and 16:9

First step is to calculate the lens: use the formula: Throw = Distance / Width → Throw = 8 / 4, Throw = 2
The lens you need is EN41 (use lens calculator for further help)

Based on the content, you can set the projector to match that format. To do this you need the FW version 1.4.19 MKII19 or later. In the MKII19 you have to set the cropping/aspect ratios manually. In the next release, 1.5 this can be done automatically.

Setting up all aspect ratio's

To set the different cropping formats, you can use the OSD, prospector or JSON, make sure you set the correct format on the screen masking as well.

OSD

From the OSD, hit the menu button, go to image/cropping and select the correct cropping format from the menu. Are the content 2.35:1 set the cropping format called 2.35:1 etc.

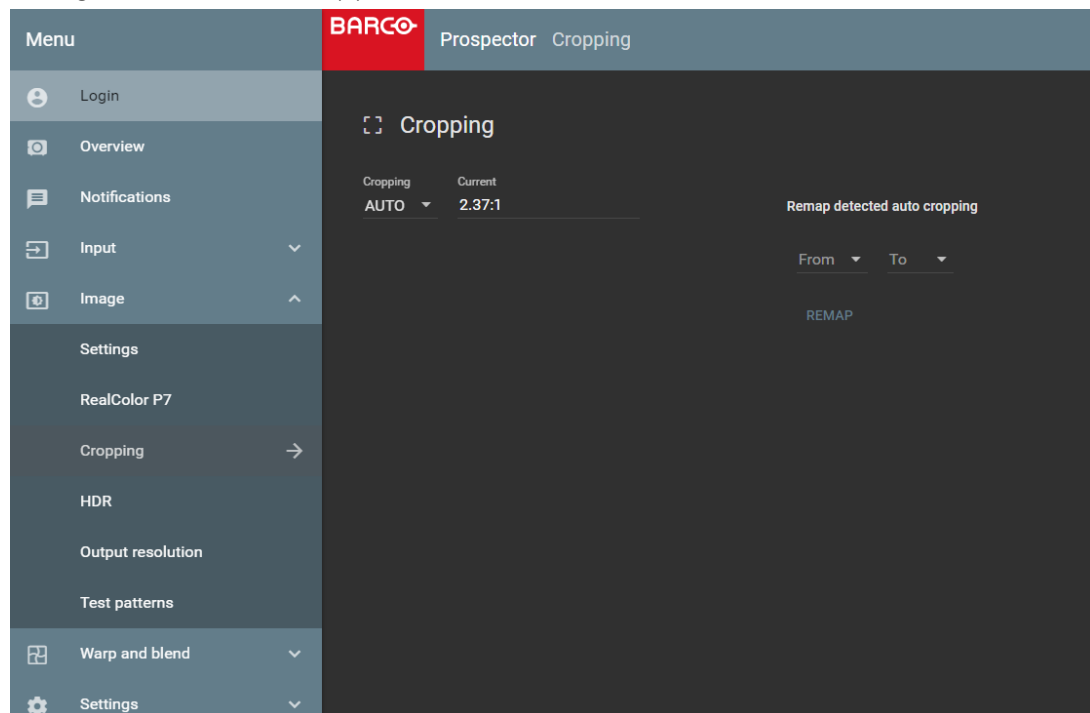


Connecting to Prospector

1. Make sure your projector and your device (pc, pad, phone) is connected to the same network.
 - a. Go to your browser preferable google chrome and enter the IP address for your projector followed by the port number :9999 example 192.168.8.10:9999
 - b. Click on login in the menu and enter the correct pin in the login window 292920

How to use prospector

With Prospector you can go to image/cropping and control all the different aspect ratio's that are coming in. For this functionality you need 1.5 FW or later



In this page you have several options

- Cropping
 - select the cropping format you would like to use in the dropdown menu, you have several aspects to choose from:
 - Auto
 - This will detect the incoming aspect ratio and set the same aspect ratio out*
 - Manual
 - Enables a completely new page where you can chose to define your own aspect ratio, very useful for foreign movies with subtitles.
 - 16:9, 1.85:1, 2.2:1, 2.35:1, 2.37:1, 2.39:1
 - Set the projector to the mentioned aspect ratio
- Current
 - Read out what the current incoming aspect ratio is
- Remap detected auto cropping
 - This option let you remap a detected aspect to another, for example if you detect 2.35, but want the projector to set it up as 2.37:1

*You can remap the incoming aspect ratio with a different output, see remap section



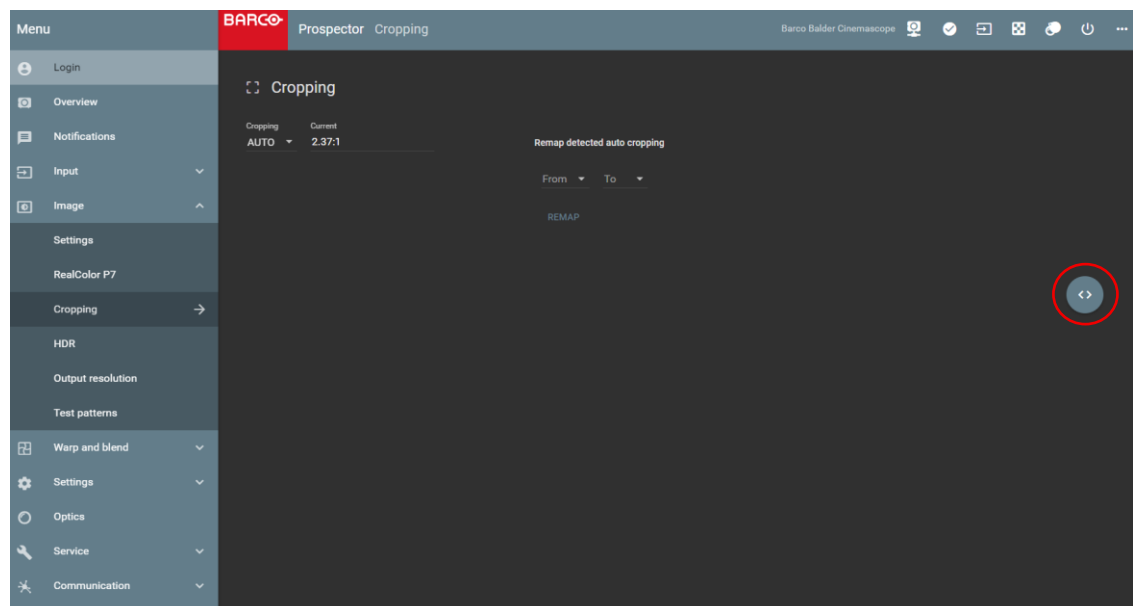
JSON

From JSON you can set the correct cropping format with the below commands:

- 16:9:
{"jsonrpc": "2.0", "method": "property.set", "params": { "property": "image.window.main.cropping.aspectratio", "value": "16:9"}, "id": 92}
- 1.85:1:
{"jsonrpc": "2.0", "method": "property.set", "params": { "property": "image.window.main.cropping.aspectratio", "value": "1.85:1"}, "id": 103}
- 2.2:1:
{"jsonrpc": "2.0", "method": "property.set", "params": { "property": "image.window.main.cropping.aspectratio", "value": "2.2:1"}, "id": 104}
- 2.35:1:
{"jsonrpc": "2.0", "method": "property.set", "params": { "property": "image.window.main.cropping.aspectratio", "value": "2.35:1"}, "id": 93}
- 2.37:1:
{"jsonrpc": "2.0", "method": "property.set", "params": { "property": "image.window.main.cropping.aspectratio", "value": "2.37:1"}, "id": 94}
- 2.39:1:
{"jsonrpc": "2.0", "method": "property.set", "params": { "property": "image.window.main.cropping.aspectratio", "value": "2.39:1"}, "id": 95}

To find the JSON command you need to use

From prospector, when you have calculated the factor, you enable the little button looking like this in prospector. All the way in the bottom right of the prospector window



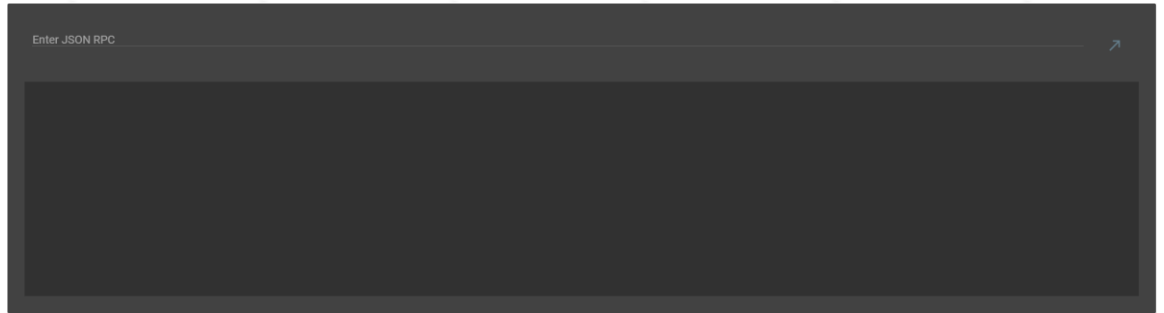
Prospector Image/cropping window



From that click the arrowbutton down and pencil. That will enable the command window



Below is command window you use to find the command you use.



When you test the cropping function with the calculated factor, the JSON command will be generated on the fly and you will see it the window above.



How to use a 16:9 projector on a 2-way side masking (constant height) screen

Based on the content, you can set the projector to match the aspect ratio. To do this you need the FW version 1.4.xx or later. In the 1.4.x release you have to set the cropping/aspect ratios manually. In the next release, 1.5 this can be done automatically.

Lens calculations

Example

The best way to explain this is to use an example:

Technical details for the example

- The screen in this example is a 2.40:1,
- 4 meter wide (13 feet),
- the projector is sitting 8 meter (26,2 feet) away.
- Your content is 2.35:1, 2.2:1, 1.85:1 and 16:9

First step is to calculate the lens, always use the full width of the screen to calculate.

Use the formula: $\text{Throw} = \text{Distance} / \text{Width} \rightarrow \text{Throw} = 8 / 4, \text{Throw} = 2$

The lens you need is EN41 (use lens calculator for further help)

That means we overshoot/overscan the screen, image will actually be over and under the screen. It is very important you install the projector this way. The whole concept is based on this way of installing the projector.



When source is scope the black bars end's up outside the screen and the image fills the screen.



The challenge is all other aspect ratios. In the 1.4 SW version we have three different ways of setting the different aspect ratio's and we recommend using a control system as this will give you a lot more flexibility then the OSD. Below are the three ways of setting correct aspect ratio?

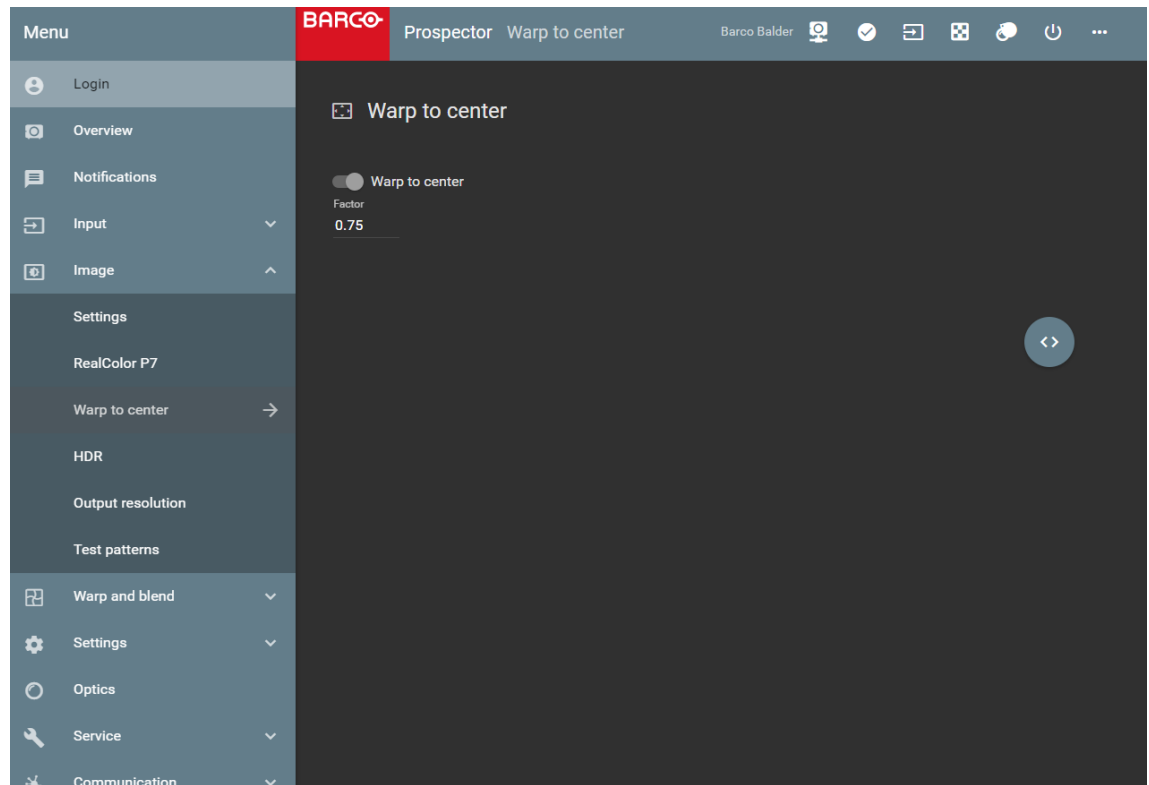
OSD

In the OSD you can only set two different formats, scope and 16:9, Warp to center off means you have scope content with black bars as image above. You find this feature under Image/warp to center
Turning this feature on means you adjust so 16:9 content fills the screen, the result is like below. When it's off you can enjoy scope content. When only OSD adjustment is used, you cannot differentiate between 16:9, 1.85:1 and 2.2:1 They all use the same setting. See Prospector chapter for more details about this.



Prospector

With prospector you can also turn it on and off the same way as in the OSD, but you have a lot more options. You can also calculate, program and set all aspects to be shown correctly on the screen. You can also use this to learn all JSON commands. See JSON chapter for more details.



Prospector Image/Warp to center window

To fully use this feature you need to calculate the factor. The factor will tell you how much you adjust the picture.

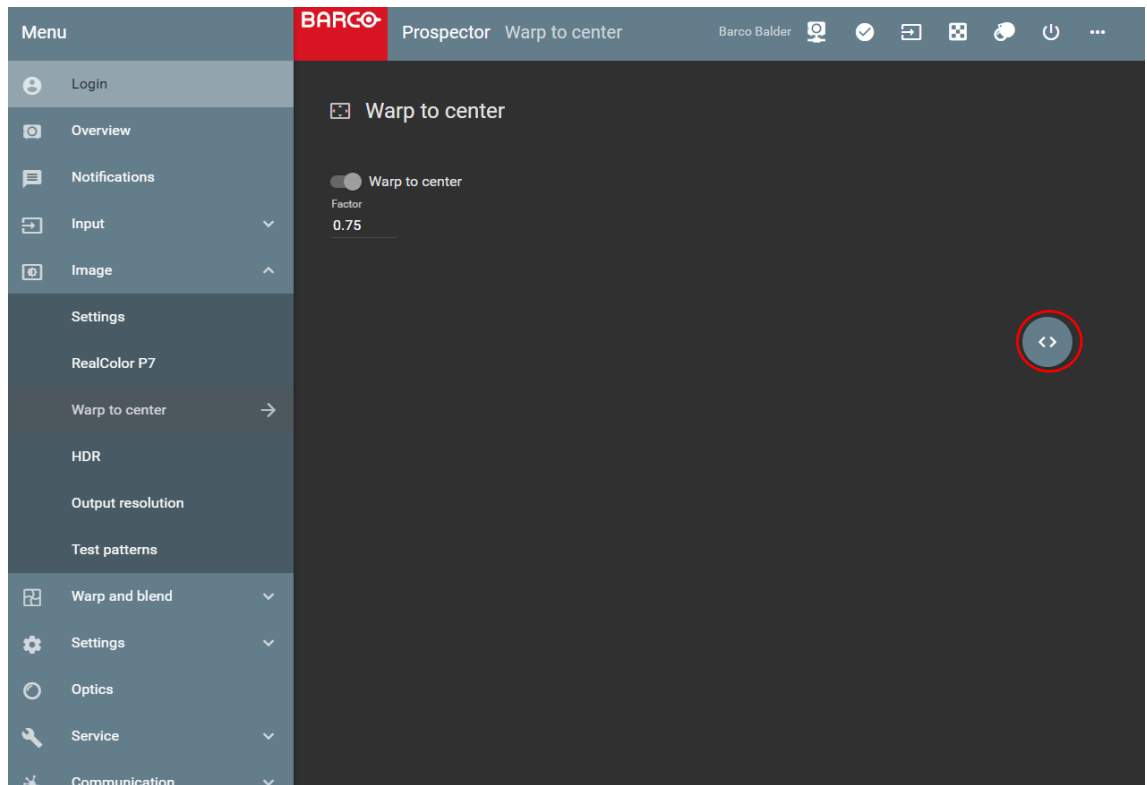
First of all when you have Cinemascope content, you set warp to center off.

- Cinemascope content = Cinemascope screen → warp to center off
- 16:9 content = scope screen → factor = $1.778 / \text{screen aspect}$
 - Example: 2.37:1 screen, content is 16:9
 - $1.778 / 2.37 = 0.75$ factor is 0.75
- 1.85 content = scope screen → factor = $1.85 / \text{screen aspect}$
 - Example: 2.37:1 screen, content is 1.85:1
 - $1.85 / 2.37 = 0.78$ factor is 0.78



JSON

From prospector, when you have calculated the factor, you enable the little button looking like this in prospector. All the way in the bottom right of the prospector window

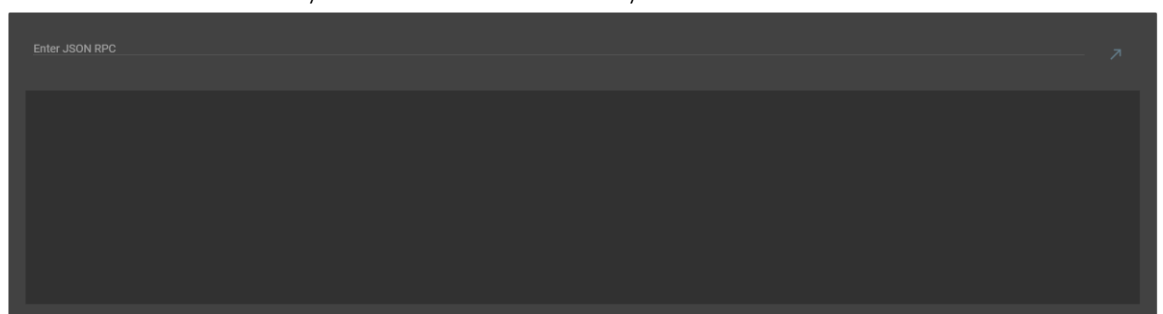


Prospector Image/Warp to center window

From that click the arrowbutton down and pencil. That will enable the command window



Below is command window you use to find the command you use.



When you test the warp to center function with the calculated factor, the JSON command will be generated on the fly and you will see it the window above.



JSON Commands

To enable warp to center with JSON use this command:

```
"jsonrpc": "2.0", "method": "property.set", "params": {"property": "image.window.main.center16_9.enable ", "value": true }, "id": 1}
```

To set a custom value to get other aspect ratio's then 16.9 you need to use this function:

```
"jsonrpc": "2.0", "method": "property.set", "params": {"property": "image.window.main.center16_9.factor ", "value": "0.75"}, "id": xx}
```

Where the "value": "0.75" is the factor you need to calculate as explained above, the ID is something you will get from the command window above when you test the function in JSON. A Unique ID will be generated based on what the factor is.

The ID is only important if you need to get feedback from the system that the command is properly set.

The system will reply with a command like this:

```
{
  "jsonrpc": "2.0",
  "id": 1234,
  "result": null
}
```

If the response contains "result", it was successful, otherwise it will contain "error" (and not "result")

The below is an example without the ID

```
{"jsonrpc":"2.0","method":"property.set","params":{"property":"image.window.main.center16_9.factor ","value":"0.75"}}
```

