DATASHEET

RGB Colour Wheel User Interface Object for Crestron

Revision: 1.0
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Summary

This datasheet relates to Ultamation's RGB Colour Wheel User Interface Module for Crestron control systems with GUIs that support 2-D slider objects.

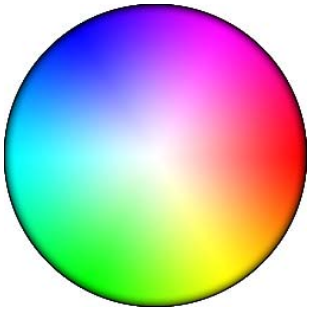
The purpose of the module is to provide visual model in the form of a rainbow colour wheel for selection of colour for lighting. A 2-D disc provides selection of any colour of the rainbow, and in conjunction with a 1-D slider for luminosity, any of the possible 16 million+ colours can be selected.

The module produces the corresponding red, green and blue values for the selected colour which can then drive, for example, a DMX RGB light fitting.

Ultamation cannot provide any assistance in the control of specific light fittings or controllers, and it should be noted that some light fittings may require additional data (e.g. RGBW).

Programming Notes

Use of the RGB colour wheel is extremely easy, but proper configuration of the touch panel objects is essential.



The User Interface

Two user interface objects are required.

- A 2-D slider object for the colour wheel
- A 1-D slider object for the luminosity control

The 2-D slider is a standard Crestron slider object, with the following properties:

Property	Setting
Analog Touch/Feedback Join	Set this to the desired analog join (touch panel OUTPUT) for the X component of the control. Once the control is set to 2-D mode, the Y component will automatically use the next join up.
Digital Press Join	Set this to the desired digital join (touch panel OUTPUT) to indicate the control is in use. This must be connected to the module's "modify" input.
Signed Touch	This MUST be ticked. Otherwise the control will produce erratic values.
Spring Return	This MUST NOT be ticked. If it is, the control will always select white (the centre of the control) when the user stops moving their finger.
Graphic	Select a suitable image for the background of the control. The control expects the colours to proceed in the following way (from "3 o'clock", or "east", going clockwise): Red, Yellow, Green, Cyan, Blue, Magenta With saturation towards the centre of the control – i.e. the centre is a degree of "white". A suitable graphic is included in the module's package.
Design	The control MUST be 2-D Signed Feedback SHOULD be selected if you wish to show a crosshair on the control, though this is not essential. If you do not require a crosshair, select indicator type to None.

The 2-D control should be of a suitable size to allow for fine-grained selection of colour. We have found 256x256 pixels works well on today's panel resolutions.

The 1-D slider is also a standard object, with the following properties:

Property	Setting
Analog Touch/Feedback Join	Set this to the desired analog join (touch panel OUTPUT) for the L component of the control.
Digital Press Join	Set this to the desired digital join (touch panel OUTPUT) to indicate the control is in use. This must be connected to the module's "modify" input. We recommend you set this to the SAME value as used for the 2-D control.
Signed Touch	This MUST NOT be ticked.
Spring Return	This MUST NOT be ticked.
Graphic	Select a suitable image for the background of the control. A suitable graphic for a horizontal control is included in the module's package.
Design	The control will normally be 1-D, but can be vertical or horizontal, using a bar or line indicator.

This will result in the following joins being defined on your touch panel:

Join Type	Purpose
Digital Output	ColourWheel_Modify (both the 2-D and 1-D slider)
Analog Output	ColourWheel_X (the 2-D slider)
Analog Output	ColourWheel_Y (the 2-D slider)
Analog Output	ColourWheel_L (the 1-D slider)

These joins are simply connected to the inputs of the RGB Colour Wheel module.

The "modify" digital should ONLY be connected to the signals from the user interface in order to provide the most efficient processing of the large amounts of data coming from the colour wheel control.

The module will output the following results while modify is high, and X, Y or L change.

Join Type	Purpose
Analog Output	Red – the red component (0-100%)
Analog Output	Green – the green component (0-100%)
Analog Output	Blue – the blue component (0-100%)

Analog Output	Theta – the angle in pseudo-degrees, where 0 is 3-o'clock, working anti-clockwise up to 1,535. There is a reason for this… but you shouldn't need to worry about that. It's not required for colour selection.
Analog Output	Radius – the distance from the centre of the control, where 0 is the centre and 32,768 (50%) is the far edge. Again, there's a reason for this, but it's not generally important.

The two signals Theta and Radius can be used to confirm that you have correct operation/configuration with the user interface, or you may have some other creative use for the angle/radius information.

Example Program

A simple example program is included in the package. The graphics assets included with this package may ONLY be used with a purchased licence for this module.

Technical Notes

The module uses a combination of CORDIC arctan and Newton-Raphson approximations to determine the angle and distance of the user's finger from the centre of the control. Unlike some techniques based on look-up tables, this provides an incredibly high resolution of values with good linear spread without the memory overhead of large tables.

Licence

Purchase of this software gives you (or the company, if purchased on behalf of an organisation) the right to implement the module in any number of your own projects only. The software may not be passed on to any 3rd party, even in a modified form.

Future revisions of the software, whether bug fixes or additional features, will be provided free of charge to existing customers.

This module is password protected and any attempt to subvert or defeat this protection is strictly prohibited.