

RealColor™ colour management and calibration

RealColor™ is projectiondesign's unique calibration software for projectors. It allows an installer or user to perfectly calibrate a projector to a specified white point and/or colour gamut. Using RealColor™ is straight forward with new projectors, as they are already calibrated and set up from the factory - ready to go. Just enter the desired white point in x,y coordinates (D65, for instance, is defined as $x=0.312$, $y=0.329$), and the projector will automatically adjust to that exact white point.

It is possible to upgrade most projectiondesign projectors' firmware to get the new functionality. However, upgrading to the new firmware is only part of the solution, one also needs to tell the projector what it is able to do in terms of colour gamut, and extreme colour coordinates.

Projector Calibration programme

The Projector Calibration programme enables users to upload data to the projector, so that RealColor™ can be used. The programme consists of a series of screens and steps that may or may not be completed, depending on the type of chroma meter is being used. Any type of meter can be used.

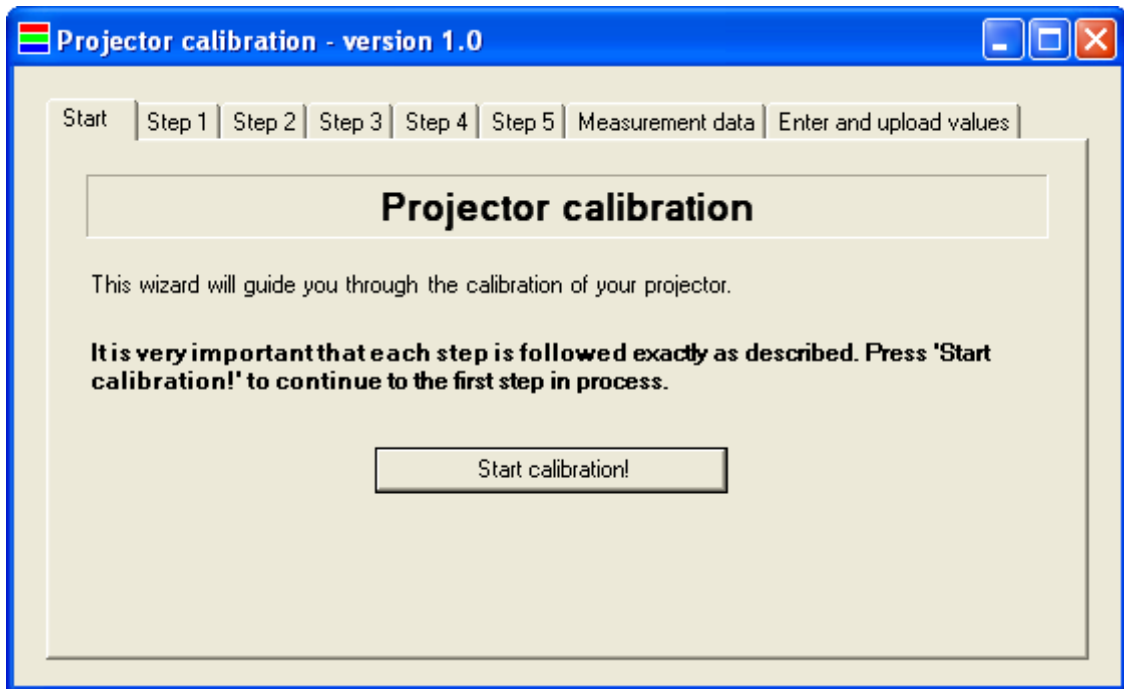
System Requirements

The Projector Calibration programme is primarily intended to be used with a Minolta-CL200 chroma meter, widely used in the AV industry, and highly portable. However, any other chroma meter can be used.

- Windows 2000/XP PC platform
- .net framework installed (can be installed using Windows Update function)
- chroma meter, Minolta CL-200, Photoresearch PR650 or similar
- RS232 communications cable

If so please see the tab <Enter and upload values> for the required values. Type these in manually before you upload the data to the projector.

NOTE! It is important that the projector is set to uncalibrated mode prior to performing the calibration procedure. A safe way to ensure this is to perform a factory reset, then setting colour temperature to for instance 7300K.

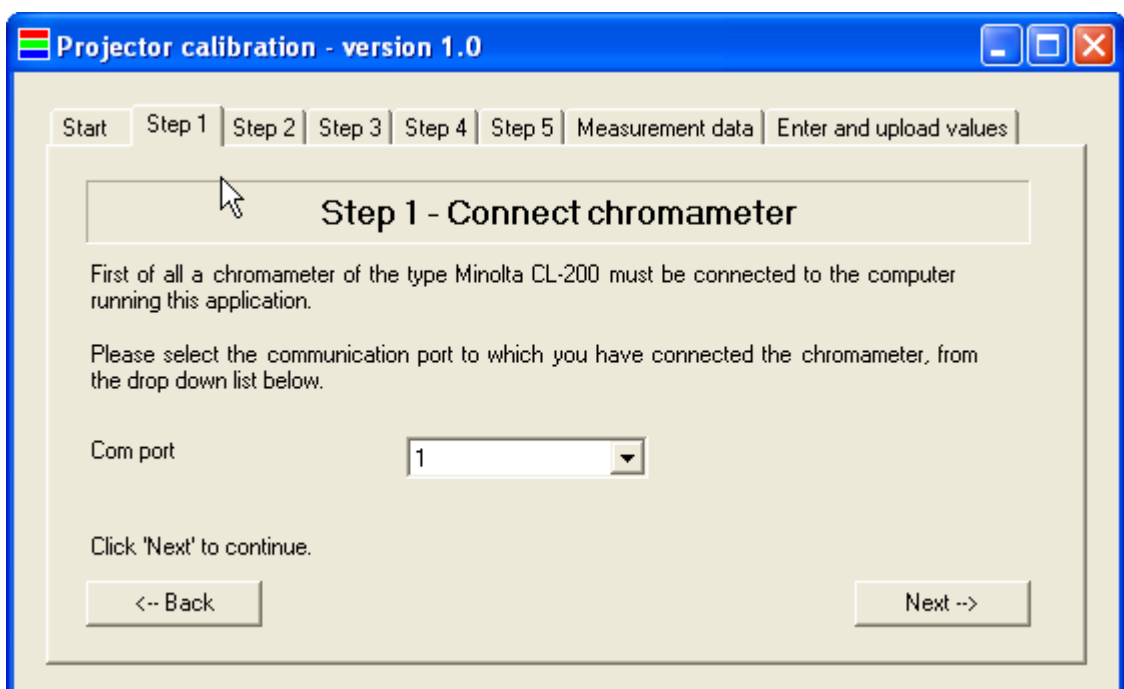


Welcoming Screen

The Projector Calibration programme is built as a simple, tabbed programme interface. The welcoming screen is simple, and has direct access to all the other tabs:

Procedure

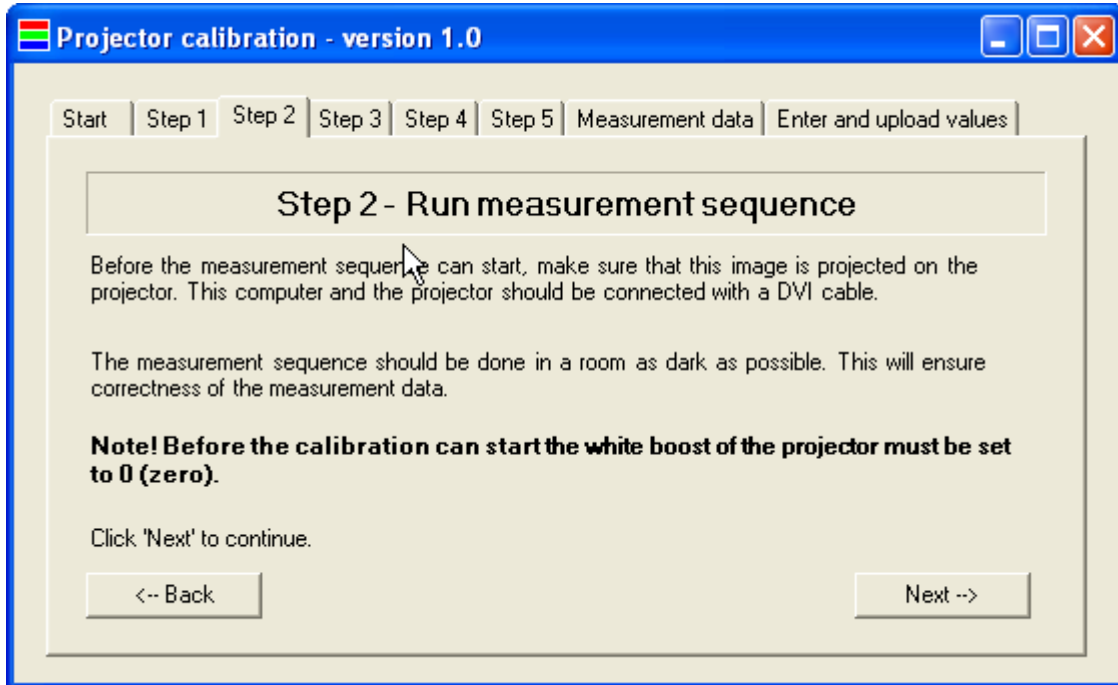
It is important to note that there are two different ways of using the Projector Calibration programme. This depends on what chroma meter is used. If the Minolta CL-200 is used, follow the steps from Step1 to Step5, for automatic updates. If any other chroma meter is used, only the tab <Enter and Upload values> needs to be used. Detailed information on each step follows:



Step 1

Step 1 only applies if a Minolta CL-200 chroma meter is used for the calibration.

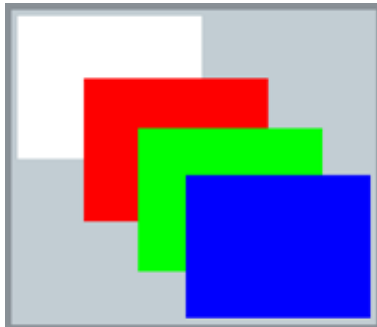
In Step 1 connect the CL-200 to a serial com port on the computer, select the correct setting in the drop-down box, and hit “next -->”



Step 2

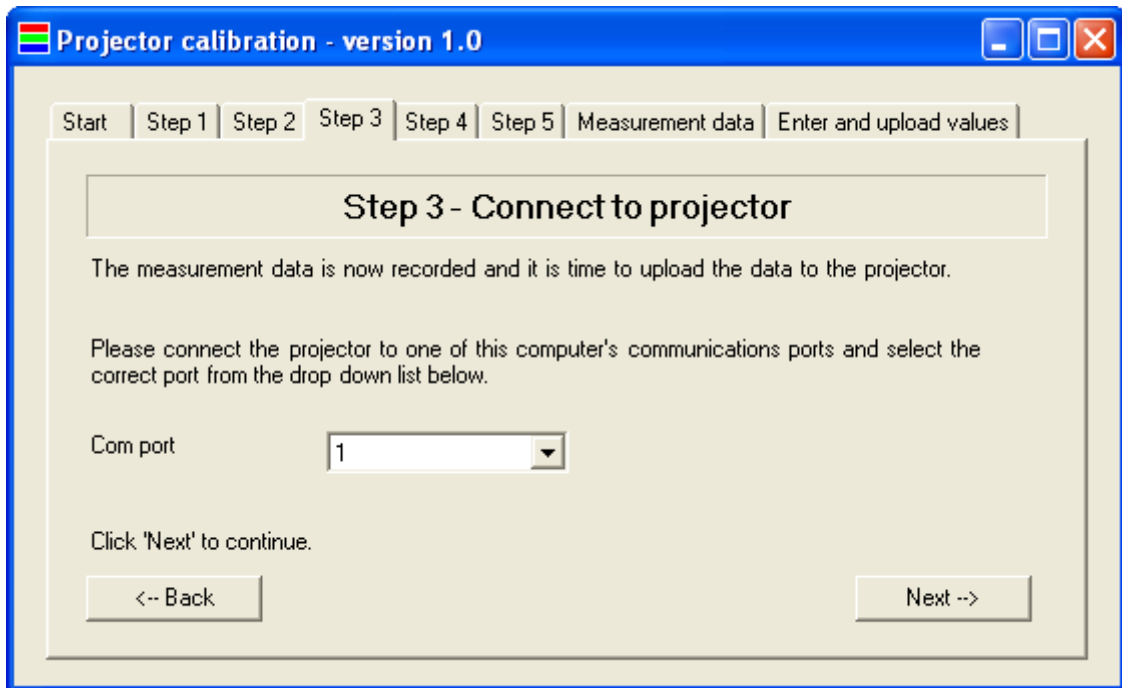
Step 2 only applies if a Minolta CL-200 chroma meter is used for the calibration.

Step 2 is the most important step in the process. When using the Minolta CL-200 chroma meter, this will automatically measure and store all required data through a set procedure. Follow the information on the screen, connecting the computer source through DVI (preferred) or VGA (not preferred). It is important that the Projector Calibration programme is displayed on the projector, as the programme will generate the test images needed, pure white, pure red, pure green and pure blue in a slow slideshow series, as can



be seen to the left:

Once the record and store procedure has finished, the programme will

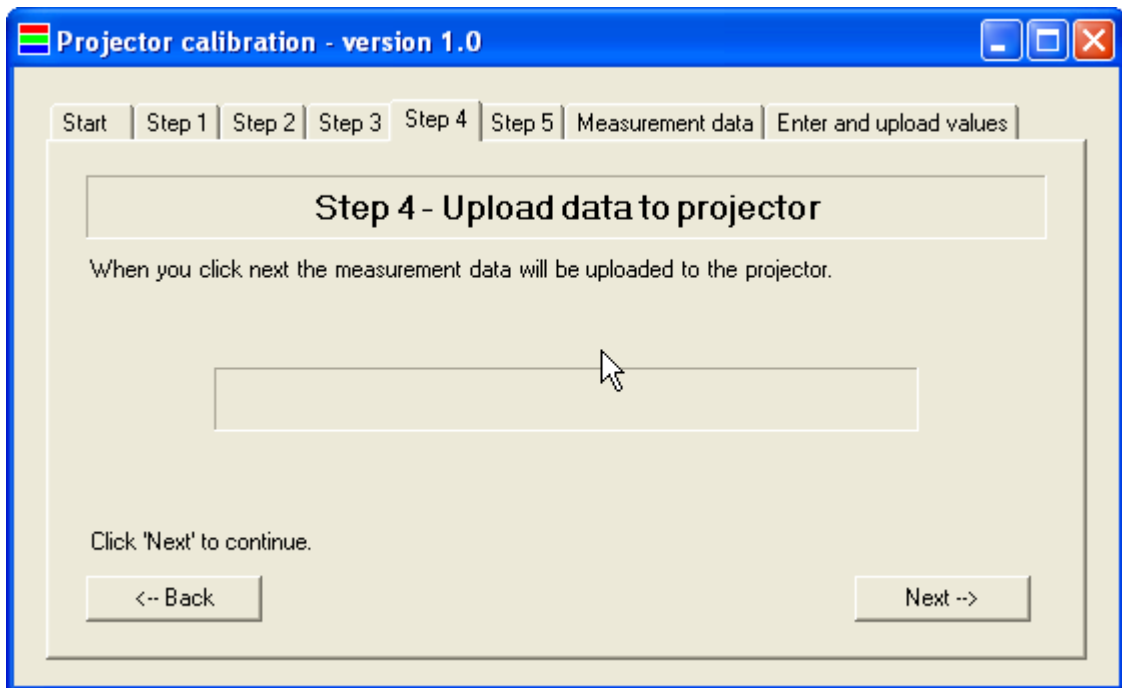


automatically move to the next screen.

Step 3

Step 3 only applies if a Minolta CL-200 chroma meter is used for the calibration.

Once finished with Step 2, the record and store data process, disconnect the RS232 communications cable from the Minolta CL-200, and connect it to the projector, so that data can be uploaded. Select the correct com port from the drop down and connect to the projector by hitting "Next -->"

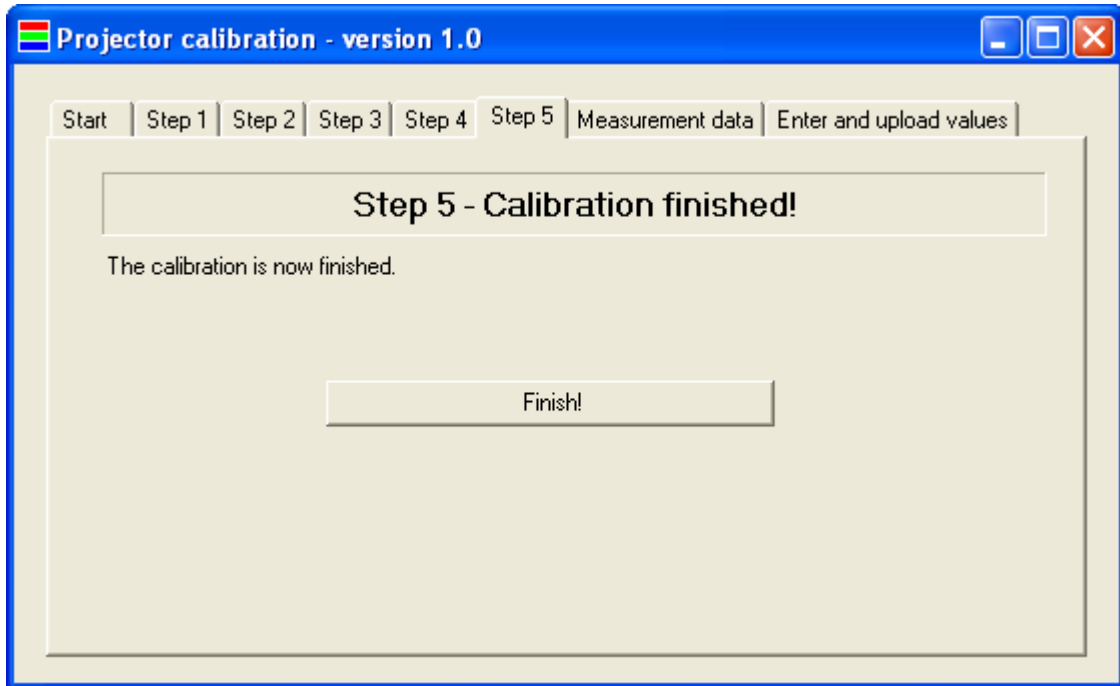


Step 4

Step 4 only applies if a Minolta CL-200 chroma meter is used for the

calibration.

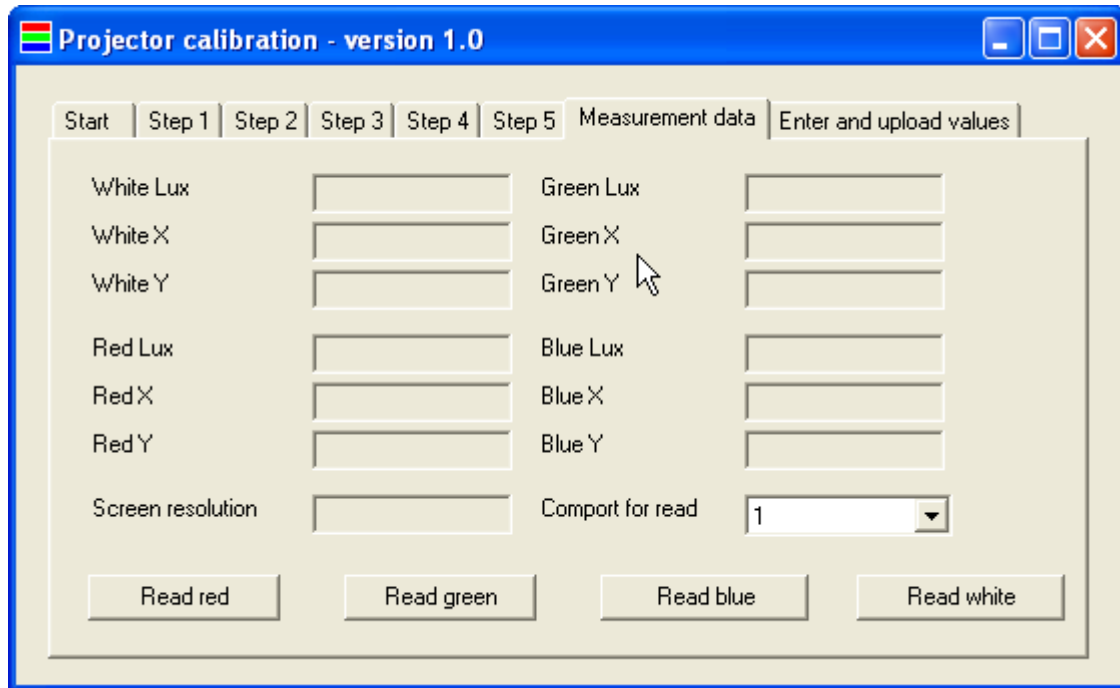
Upload the recorded data to the projector by hitting “Next -->”. Upload will commence and finish automatically, and move to the next screen.



Step 5

Step 5 only applies if a Minolta CL-200 chroma meter is used for the calibration.

Step 5 is simple, it only shows when the calibration finishes successfully. However, calibration is not finished, only upload of data is finished! Calibration is only finished when the projector settings have been set to the



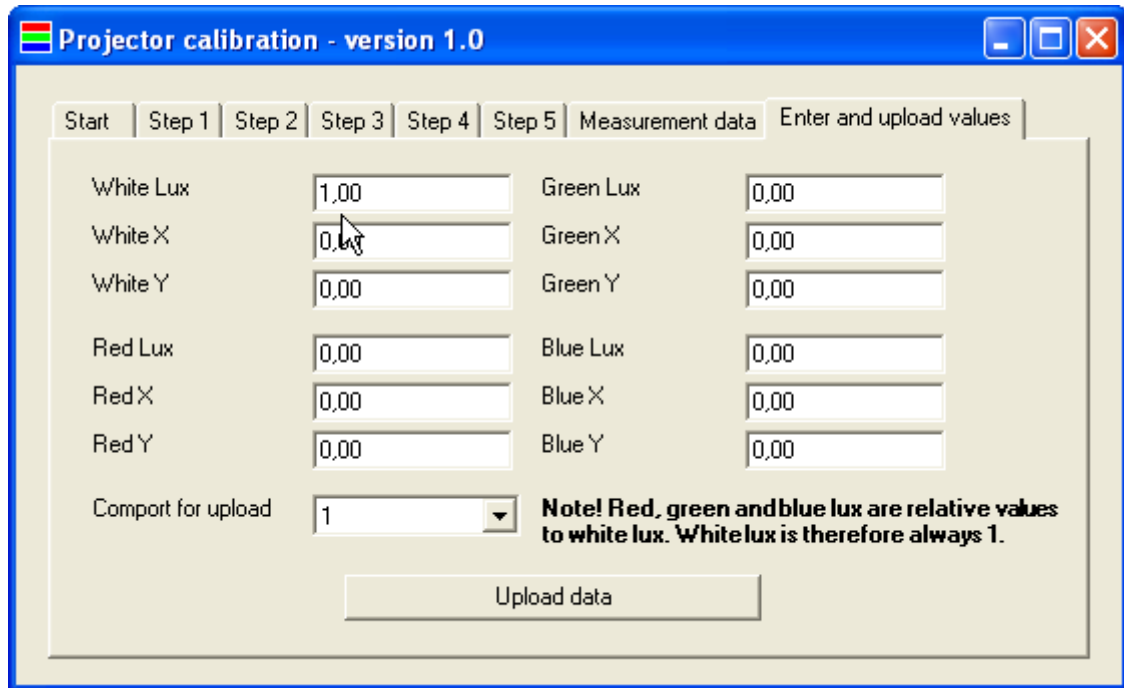
correct values, for instance calibrating to D65.

Measurement Data

The “Measurement Data” tab only applies if a Minolta CL-200 chroma meter is used for the calibration.

The “Measurement data” tab shows the data recorded during the previous 5 steps. I also allows for manual reading of each individual colour, red, green, blue and white, using the Minolta CL-200 chroma meter. The measurement set up is the same as before, with the CL-200 connected to the computer running the Projector calibration software package. To perform a manual reading, just display the proper colour on the projector, using for instance

a computer connected through the DVI port (this ensures you can drive the maximum colours as needed in order for the projector to have the biggest possible gamut), and press the buttons for red, green, blue and white. Once



done, the readings will display in the fields above.

Enter and upload values

This tab can be used with any and all chroma meters, and does not give an automatic reading.

Using any chroma meter, display each primary colour, including white, and record the reading manually. Values for each colour can be manually entered in the boxes shown above. Entering values manually is just as accurate as an automatic measurement, but just takes a little more time. When measurements and manual recording is finished, make sure the projector is corrected to the computer via the RS232 serial cable, and hit upload.

Once the upload is done, and the projector has received the correct values for each individual primary colour and white, RealColor™ management in the projector will work. To test this, reset the projector to D65 in the menu. Now, after this has been accomplished, take measurement reading from a white field. The colour coordinates of D65, $x=0.312$, $y=0.329$ should be shown on the chroma meter. Also, colour temperature should be 6500 degrees Kelvin. Please note, however, that minor deviations from the absolute values are normal, as a result of measurement techniques, measurement errors and environmental influences.