

**Technical note T137: CCI low reflectance mode**

CCI – Low reflectance surfaces

# Low reflectance mode

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**TIP:** The zoom function can enlarge the pixels to easily determine if light saturation is occurring, shown by yellow pixels in the live video feed.

## What is a low reflectance surface?

A low reflectance surface is one that reflects a low proportion of light towards the interferometer lens, such as dull or rough surfaces as well as parts with steep slopes.

## CCI low reflectance measurements

The Claritas 20 light conditioning ensures the CCI has industry leading data quality. When combined with the software's low reflectance mode, it provides exceptionally high data quality and quantity for low reflectance surfaces when compared to standard modes. The software allows for fine tuning of the threshold for the detection of the peak of the interference pattern that indicates the height of the surface. Automatic light level functions, can also be used to optimise the light levels, leading to further improvements in data quality. All of this significantly reduces the need for data filling techniques more regularly used on other interferometers.

## Non-measured points

When measuring using conventional techniques on a low reflectance surface, the lack of reflectivity can cause non-measured points (NM) in the data. Low reflectance mode decreases their occurrence.

## Low reflectance measurements

Figure 1 shows a low reflectance rough surface measured using a standard mode. It shows there is a considerable amount of non-measured points. Figure 2 shows a significantly improved measurement at the same location using the CCI's Low Reflectance mode, which has a considerable reduction in the number of non-measured points. It is possible to reduce the non-measured points to negligible amounts by optimising the instrument set up with the correct light and threshold level using the simple user interface and system automation.

Fig. 1: Standard measurement on a rough, low reflectance surface

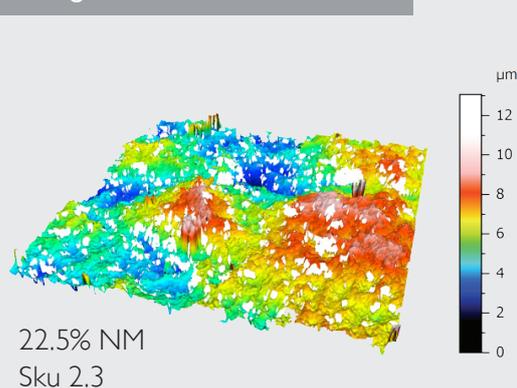
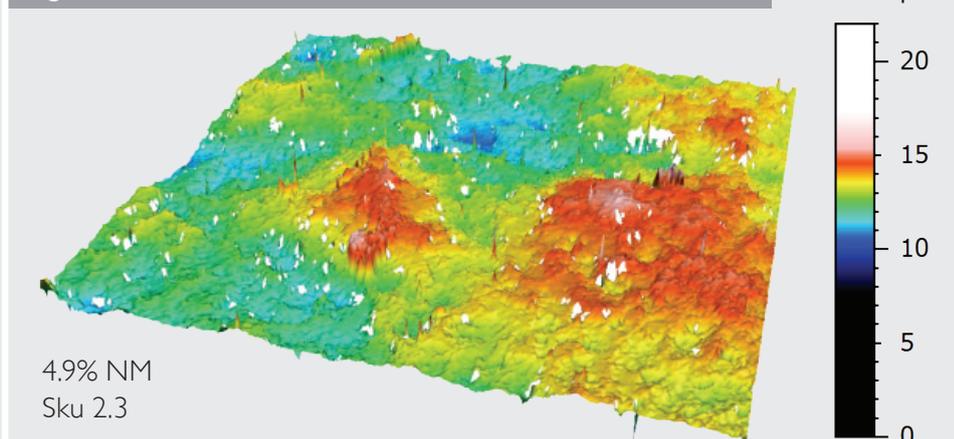


Fig. 2: CCI low reflectance measurement at the same location



## Adjusting the threshold level

Taylor Hobson's CCI software allows users to fine tune the detection threshold for the interference intensity to increase the quality and quantity of measured data. There are dedicated modes for measuring low reflectance surfaces with four threshold levels as shown in Figure 3.

The ability to adjust the threshold allows users to prevent excessive threshold reduction which can cause false data (spikes) on the surface. These are avoided by starting with low reflectance mode 1 and gradually increasing to 4, whilst monitoring the number of non-measured points and the 3D slope parameter Sku. Figure 4 shows an example of a surface where excessive reduction has been used. This is indicated by the sudden increase in Sku.

## Spike filter

To further reduce the occurrence of false spikes, the Talysurf CCI software has a filter to detect and remove isolated spikes.

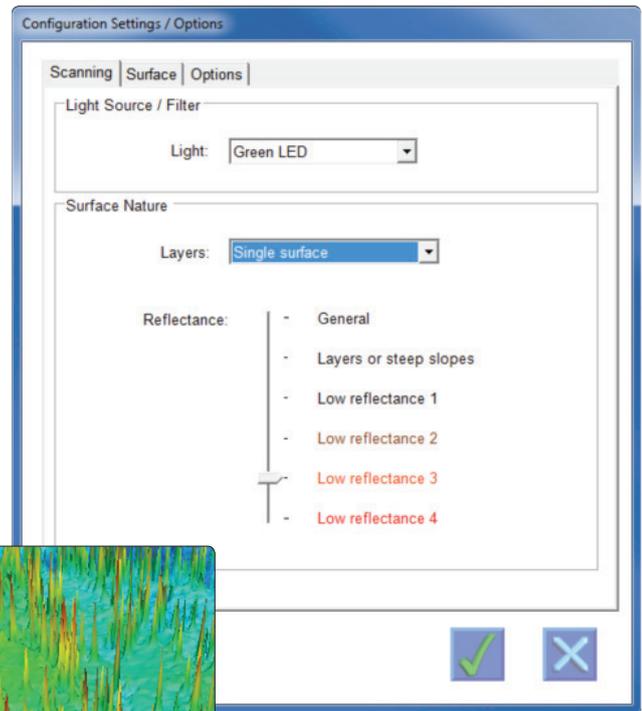
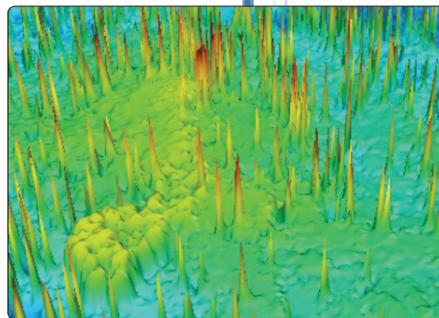


Fig. 3: CCI configuration menu



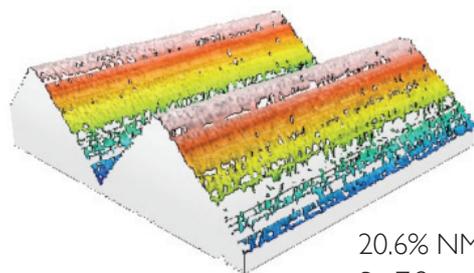
0.0% NM  
Sku 7.0

Fig. 4: Extract of a measurement with excessive threshold reduction

Fig. 5: Extract of a measurement on a 6 μm roughness standard

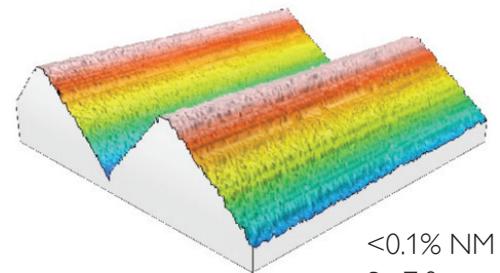
## Rough surfaces

Low reflectance mode is not just for dull surfaces, it can also be beneficial when measuring rough surfaces and parts with steep slopes. Figure 5 shows an example of a measurement on a 6 μm Ra roughness standard.



20.6% NM  
Sq 7.2

Standard measurement



<0.1% NM  
Sq 7.0

CCI low reflectance 4



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