MONITORING DYNAMIC TURN INDICATORS WITH R&S®ADVISE

Products:

► R&S®AdVISE

This application note describes how to detect even small fails in dynamic turn indicators with R&S®AdVISE.

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Contents

1 Overview

With the Flashing Lights ROI, R&S®AdVISE is able to detect the frequency, duty cycle and pulse width of a flashing signal. As of release 5, R&S®AdVISE also allows the detection of artefacts in more complex flashing EUTs such as dynamic turn indicators.

Figure 1-1: Example of a Flashing Lights ROI monitoring a dynamic turn indicator

Unlike simple flashing indicators, dynamic turn indicators are composed of individual LEDs that are turned on in sequence from one side to the other.

As a result, there is much more to check than the flashing frequency. This application note shows how you can use the ROI flashing feature of R&S®AdVISE to monitor dynamic turn indicators for artifacts such as

► Change of speed

► Loss of dynamism

► Faulty or flickering LEDs

This Application Note comes together with a video, where different errors and their detection with the Flashing Light ROI are shown. That can be retrieved on the R&S®AdVISE homepage under https://www.rohde-schwarz.com/_251220-892288.html.

2 The flashing lights ROI

The flashing lights ROI is able to detect the frequency, duty cycle and pulse width of flashing signals. Since R&S®AdVISE Version 5.0 some extra features were added to also cover more complex signals.

Figure 2-1 shows the Provision flashing light ROI menu. The different parts of the menu and their functions are explained in the following chapter.
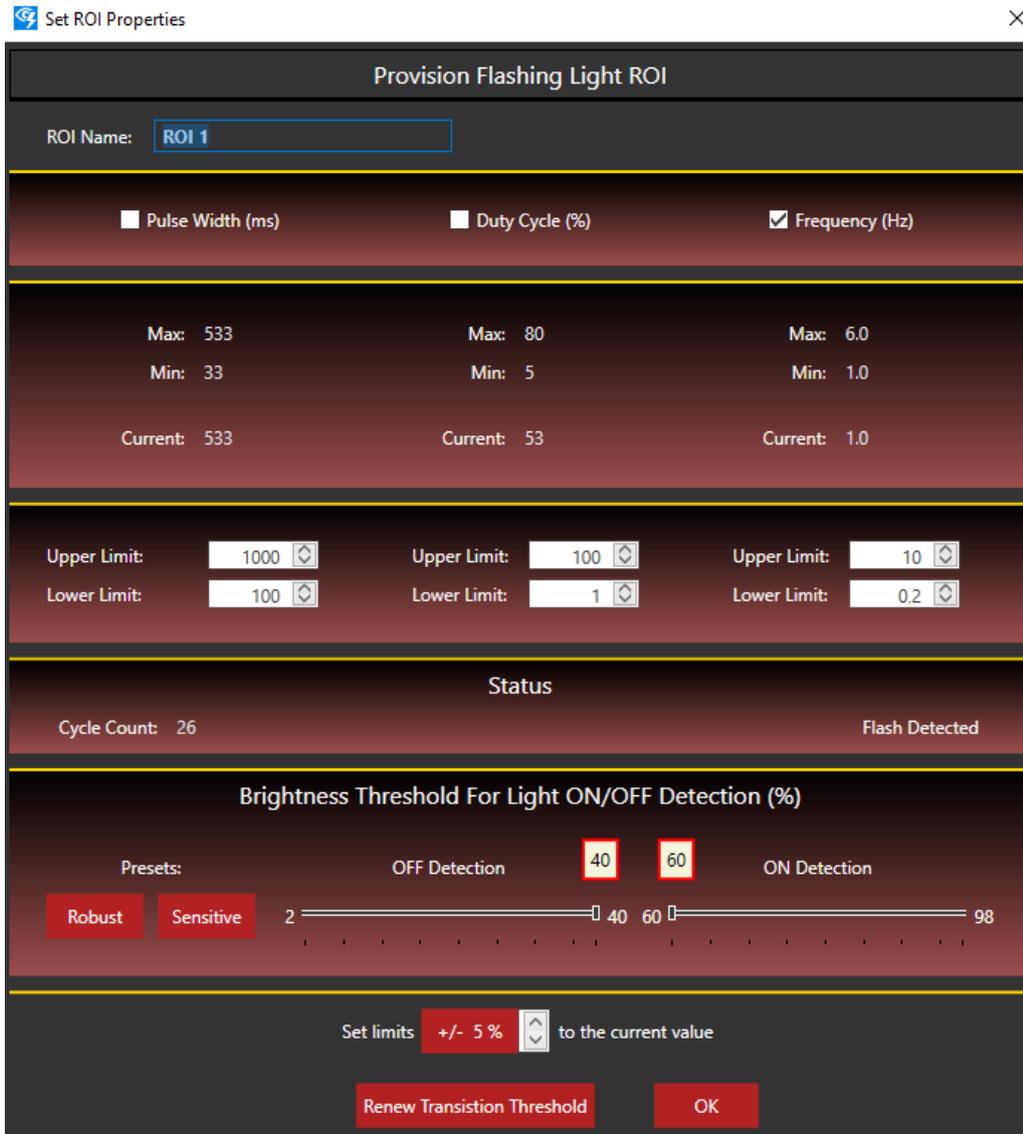
Figure 2-1: Provision Flashing Light ROI menu

2.1 Frequency, Duty Cycle and Pulse Width

Each of the three parameters can be selected and deselected separately by ticking or unticking the checkbox next to the parameter, as shown in Figure 2-2. Right below each of the columns, the maximum and minimum value are displayed, that have occurred since the first calibration of the ROI, as well as the current value.

Figure 2-2: Parameters of flashing lights ROI

The following chart, Figure 2-3, shows a possible signal of a flashing light together with the frequency, duty cycle and pulse width to demonstrate their correlation.

$$frequency = \frac{1}{intervall\ time}$$

$$duty\ cycle = \frac{pulse\ width}{intervall\ time}$$
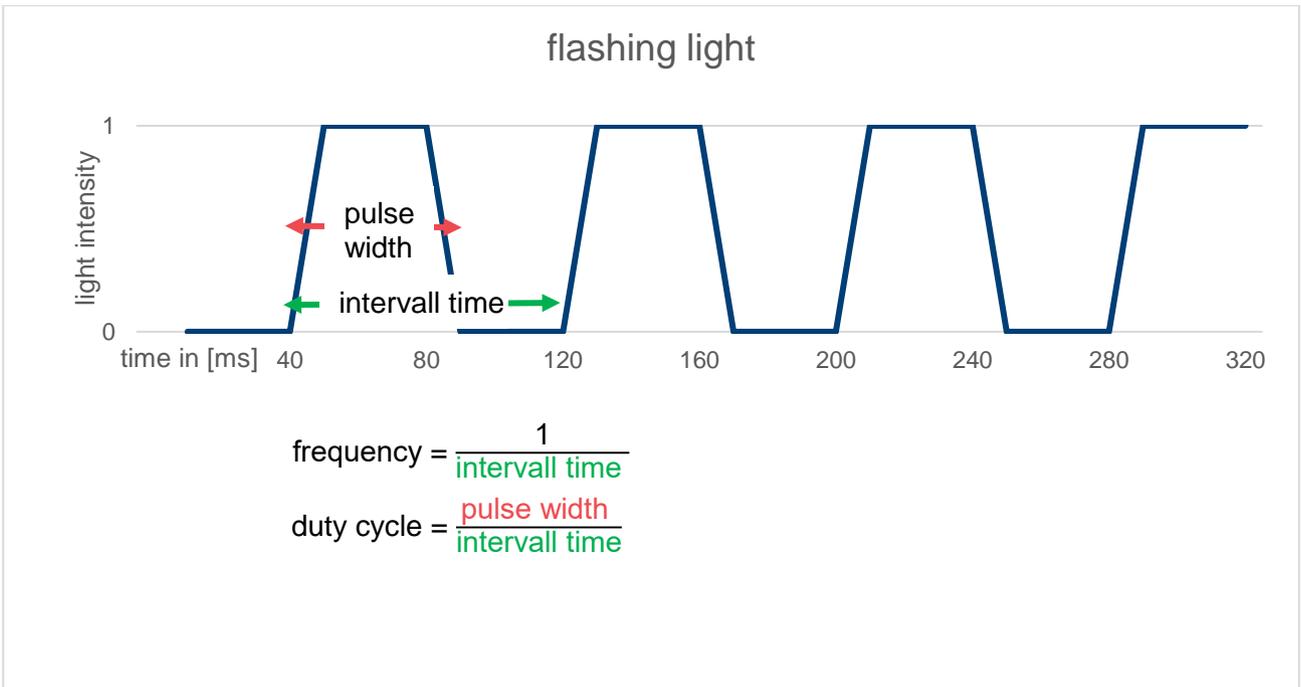
Figure 2-3: Signal of flashing light

The limits for Go and Nogo values can be set via the [Set limits +/- 5 % to the current value] button down below or manually in the section shown in Figure 2-4. Right below the limits, the current status of the ROI is shown.

Figure 2-4: Limits and current status

2.2 Brightness Thresholds for Light On/Light Off Detection

In the last section, the brightness threshold for detection of Light On and Light Off status can be calibrated as shown in Figure 2-5.

Figure 2-5: Brightness detection for light on/off detection

To explain the function of the brightness threshold, we go back to the diagram of Figure 2-3.

A threshold has to be defined, where the signal status changes from Light On to Light Off and back, to measure the interval time and the pulse width.

This hysteresis function is demonstrated in Figure 2-6.
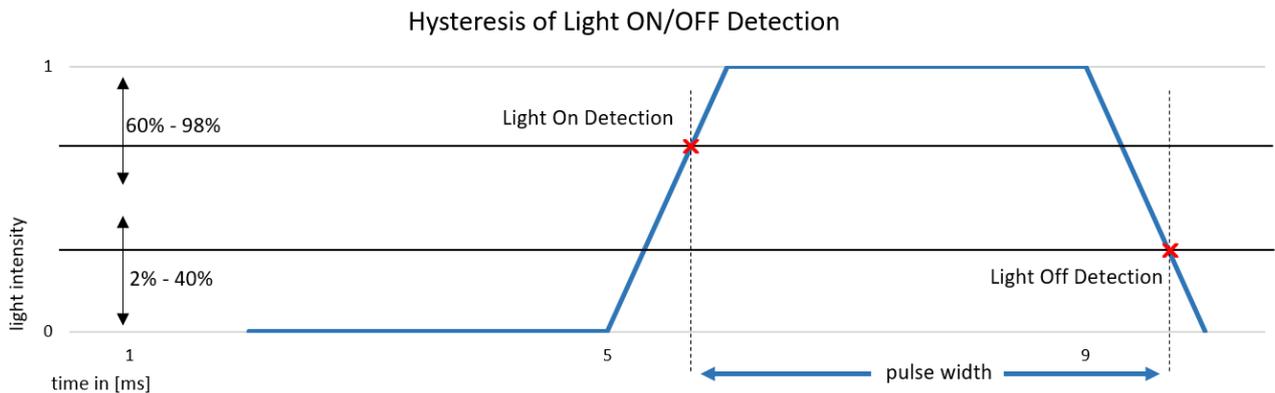
Figure 2-6: Brightness Threshold

The Light On Threshold can be defined between 60% and 98% and the Light Off threshold between 2% and 40%. The two Presets "Robust" and "Sensitive" set the thresholds to the following values:

Robust: Off Detection = 40%, On Detection = 60%

Sensitive: Off Detection = 10%, On Detection 90%

3 Configuration

► Add ROI Flashing Light **[⚿] Flashing Light**

The frame of the ROI should enclose the whole indicator that is supposed to be monitored as shown below.

► Configure the ROI in this order

1. Frequency, Duty Cycle and Pulse Width

— Frequency: ON

— Duty Cycle: ON

— Pulse Width: ON

2. Set Brightness Thresholds for Light On/Light Off Detection

— Set Preset: Sensitive

3. Limit setting

— Now wait for a few flashing cycles.

— Use the set Limit Button to set the limits +/- 3% to the current value.

— Then check the max and min values of each parameter and adjust the limits individually in such a way that they are as close as possible, but do not yet trigger an error.

► Ready to start the test.

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