



Boson[®] GUI v3.0

Quick Start Guide

January 11, 2022

Teledyne FLIR
Infrared Camera OEM

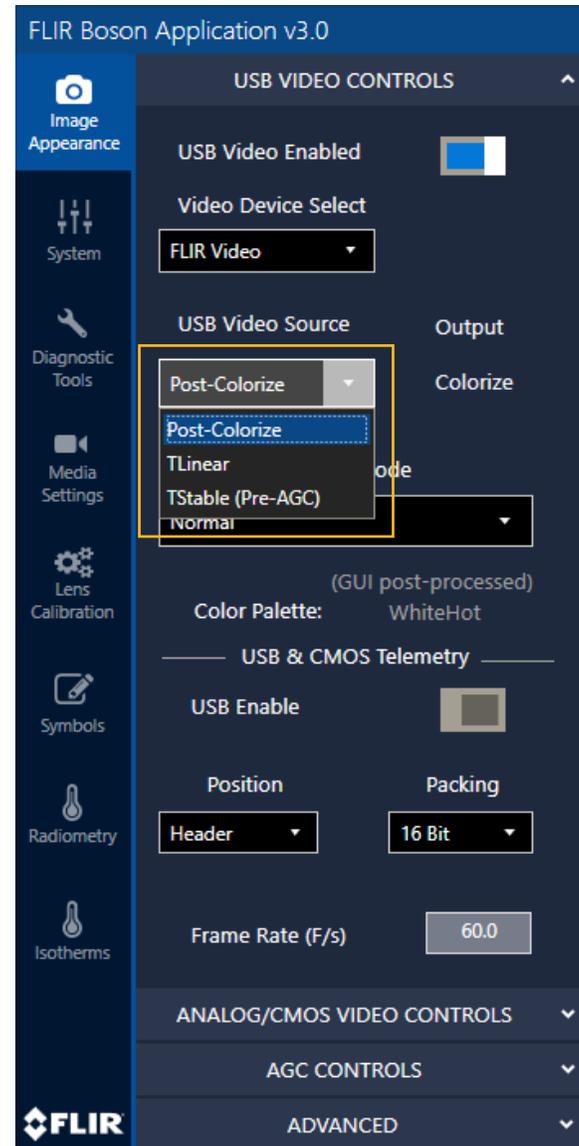
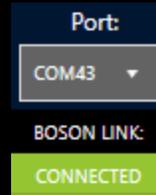
BOSON GUI 3.0

The Boson GUI 3.0 provides developers key command capabilities that simplify and streamline development and testing with the Boson thermal camera module.

- ✓ Operates on Windows 10 64-Bit
- ✓ Isotherms with colorization bar and highly-configurable settings
- ✓ Spot meter with statistics and temperature bar
- ✓ External sync with additional sensors to enable data fusion
- ✓ Radiometry settings including t-linear, environmental parameters, emissivity, and more.

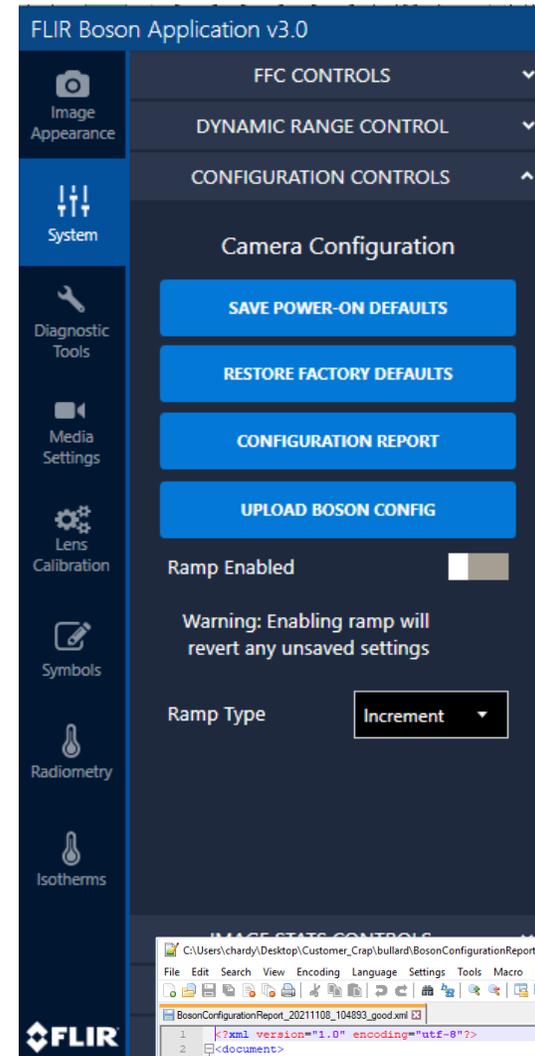
RADIOMETRIC OUTPUT

- Connect to COMs to access t-linear/t-stable options
- **T-linear**: The temperature linear output for most radiometric use cases
 - Conversion to temperature:
Temperature (Kelvin) = 0.01 * pixel value
- **T-stable**: A flux linear output and should not be used in most cases
- **Post-colorize**: The standard colorized output that supports isotherms and symbols



CONFIGURATION REPORTS

- Configuration reports are useful for changing settings (or reading them) not accessible in the GUI.
 - Allows easy configuration uploads to other cameras.
 - Make sure to delete unnecessary entries within config .xml files before uploading.
 - While using radiometric cameras, delete fields that denote RBFO to avoid radiometric calibration corruption.
- To view files properly, use NotePad++ and install the XML Tools Plugin. Under the Plugins dropdown, select pretty print while viewing the .xml file.



```
C:\Users\chardy\Desktop\Customer_Crap\bullard\BosonConfigurationReport_20211108_104893_good.xml - Notepad++
File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
BosonConfigurationReport_20211108_104893_good.xml
1 <?xml version="1.0" encoding="utf-8"?>
2 <document>
3 <metadata>
4 <gui version="3.0"/>
5 <report version="1.1.3"/>
6 <date>11/08/2021 17:24:29</date>
7 </metadata>
8 <functions>
9 <function setter="TLinearSetControl" getter="TLinearGetControl">
10 <arg name="data" class="Boson.Camera+FLR_ENABLE_E">FLR_ENABLE</arg>
11 </function>
```

CONFIGURATION REPORTS

Delete these fields from config .xml reports if you plan on uploading them to another camera using radiometry. They will corrupt the RBFO terms (radiometric calibration terms) used on the camera.

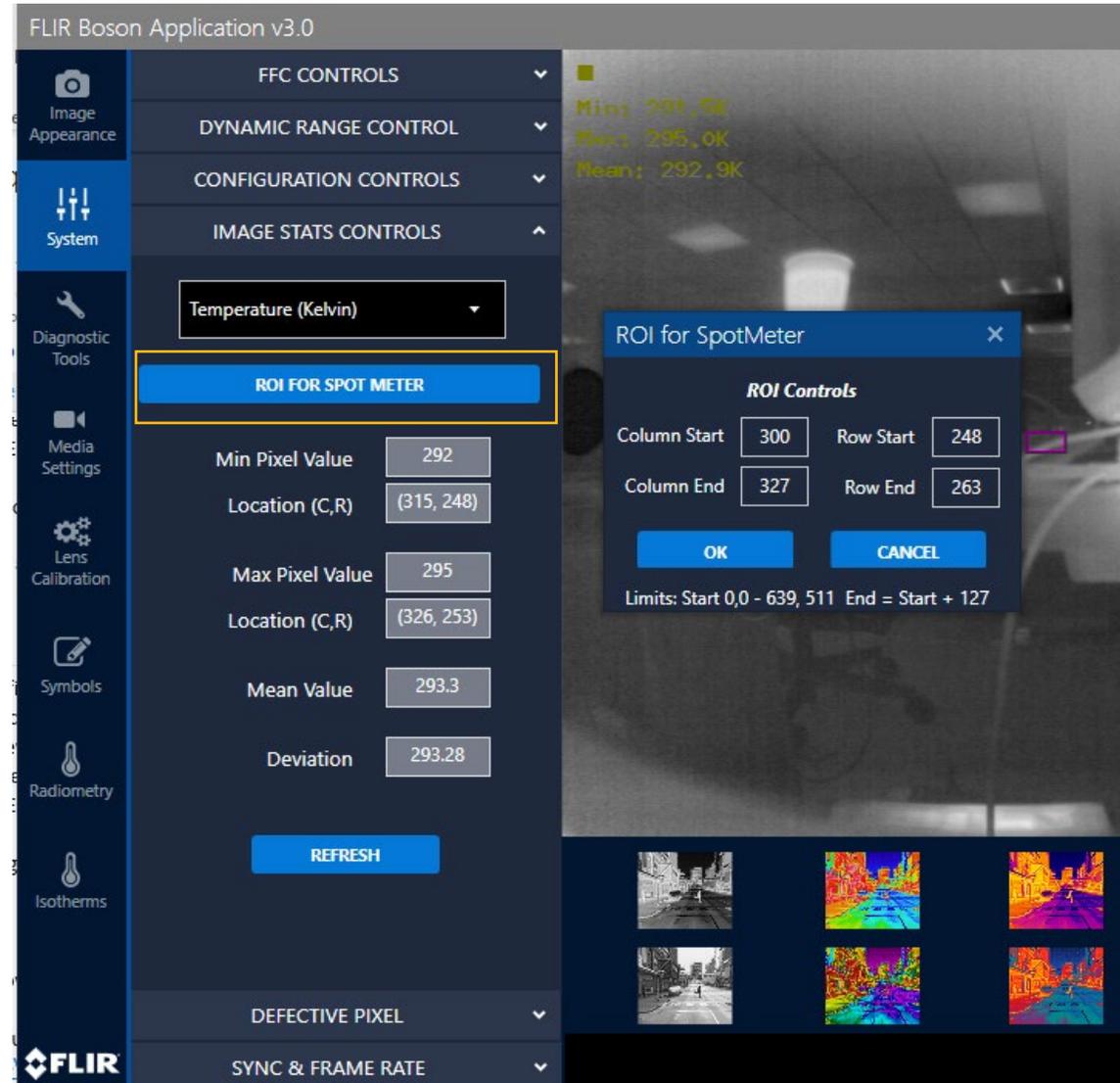
```

701 </function>
702 <function setter="radiometrySetOffset_Lens_HG" getter="radiometryGetOffset_Lens_HG">
703   <arg name="FLR_RESULT" class="Boson.Camera+FLR_RESULT">R_CAM_DSPCH_BAD_CMD_ID</arg>
704 </function>
705 <function setter="radiometrySetOffset_Lens_LG" getter="radiometryGetOffset_Lens_LG">
706   <arg name="FLR_RESULT" class="Boson.Camera+FLR_RESULT">R_CAM_DSPCH_BAD_CMD_ID</arg>
707 </function>
708 <function setter="radiometrySetOffset_Sh_h" getter="radiometryGetOffset_Sh_h">
709   <arg name="data" class="System.Double">0</arg>
710 </function>
711 <function setter="radiometrySetOffset_Sh_p" getter="radiometryGetOffset_Sh_p">
712   <arg name="data" class="System.Double">0</arg>
713 </function>
714 <function setter="null" getter="radiometryGetRBFOHighGainDefault">
715   <arg name="data" class="Boson.Camera+FLR_RADIOOMETRY_RBFO_PARAMS_T">
716     <field name="RBFO_R" class="System.Double">931000</field>
717     <field name="RBFO_B" class="System.Double">1524</field>
718     <field name="RBFO_F" class="System.Double">1</field>
719     <field name="RBFO_O" class="System.Double">9800</field>
720   </arg>
721 </function>
722 <function setter="radiometrySetRBFOHighGainFactory" getter="radiometryGetRBFOHighGainFactory">
723   <arg name="data" class="Boson.Camera+FLR_RADIOOMETRY_RBFO_PARAMS_T">
724     <field name="RBFO_R" class="System.Double">994455.75</field>
725     <field name="RBFO_B" class="System.Double">1524</field>
726     <field name="RBFO_F" class="System.Double">1</field>
727     <field name="RBFO_O" class="System.Double">9278.78125</field>
728   </arg>
729 </function>
730 <function setter="null" getter="radiometryGetRBFOLowGainDefault">
731   <arg name="data" class="Boson.Camera+FLR_RADIOOMETRY_RBFO_PARAMS_T">
732     <field name="RBFO_R" class="System.Double">255500</field>
733     <field name="RBFO_B" class="System.Double">1530</field>
734     <field name="RBFO_F" class="System.Double">1.5</field>
735     <field name="RBFO_O" class="System.Double">5460</field>
736   </arg>
737 </function>
738 <function setter="radiometrySetRBFOLowGainFactory" getter="radiometryGetRBFOLowGainFactory">
739   <arg name="data" class="Boson.Camera+FLR_RADIOOMETRY_RBFO_PARAMS_T">
740     <field name="RBFO_R" class="System.Double">254508.421875</field>
741     <field name="RBFO_B" class="System.Double">1530</field>
742     <field name="RBFO_F" class="System.Double">1.5</field>
743     <field name="RBFO_O" class="System.Double">5465.21728515625</field>
744   </arg>
745 </function>
746 <function setter="null" getter="radiometryGetRadiometryCapable">
747   <arg name="data" class="Boson.Camera+FLR_ENABLE_E">FLR_ENABLE</arg>
748 </function>
749 <function setter="radiometrySetRbfoScaledMode" getter="radiometryGetRbfoScaledMode">
750   <arg name="FLR_RESULT" class="Boson.Camera+FLR_RESULT">R_CAM_DSPCH_BAD_CMD_ID</arg>
751 </function>
752 <function setter="radiometrySetReflectivityWindow" getter="radiometryGetReflectivityWindow">
753   <arg name="data" class="System.Double">0</arg>
754 </function>
755 <function setter="null" getter="radiometryGetResponsivityFpaTemp">
756   <arg name="data" class="System.Double">1.05024909973145</arg>

```

SPOT METER REGION OF INTEREST (ROI)

- The Spot Meter ROI is the purple box in the middle of the screen.
- Change the Spot Meter ROI with this tab.
- Spot Meter can use either temperature or counts.



The screenshot displays the FLIR Boson Application v3.0 interface. On the left is a navigation menu with icons for Image Appearance, System, Diagnostic Tools, Media Settings, Lens Calibration, Symbols, Radiometry, and Isotherms. The main panel shows several control sections: FFC CONTROLS, DYNAMIC RANGE CONTROL, CONFIGURATION CONTROLS, and IMAGE STATS CONTROLS. A dropdown menu is set to 'Temperature (Kelvin)'. A blue button labeled 'ROI FOR SPOT METER' is highlighted with a yellow box. Below it are input fields for 'Min Pixel Value' (292), 'Location (C,R)' (315, 248), 'Max Pixel Value' (295), 'Location (C,R)' (326, 253), 'Mean Value' (293.3), and 'Deviation' (293.28). A 'REFRESH' button is located below these fields. At the bottom of the main panel are sections for 'DEFECTIVE PIXEL' and 'SYNC & FRAME RATE'. On the right, a live video feed shows a street scene with a purple ROI box. A dialog box titled 'ROI for SpotMeter' is open, showing 'ROI Controls' with 'Column Start' (300), 'Row Start' (248), 'Column End' (327), and 'Row End' (263). It includes 'OK' and 'CANCEL' buttons and a note: 'Limits: Start 0,0 - 639, 511 End = Start + 127'. Below the video feed are six small thumbnail images showing different views or processing of the scene.

SPOT METER ACCURACY INDICATOR

Measures stability to determine if radiometric accuracy is ideal

RADIOMETRY STATUS ^

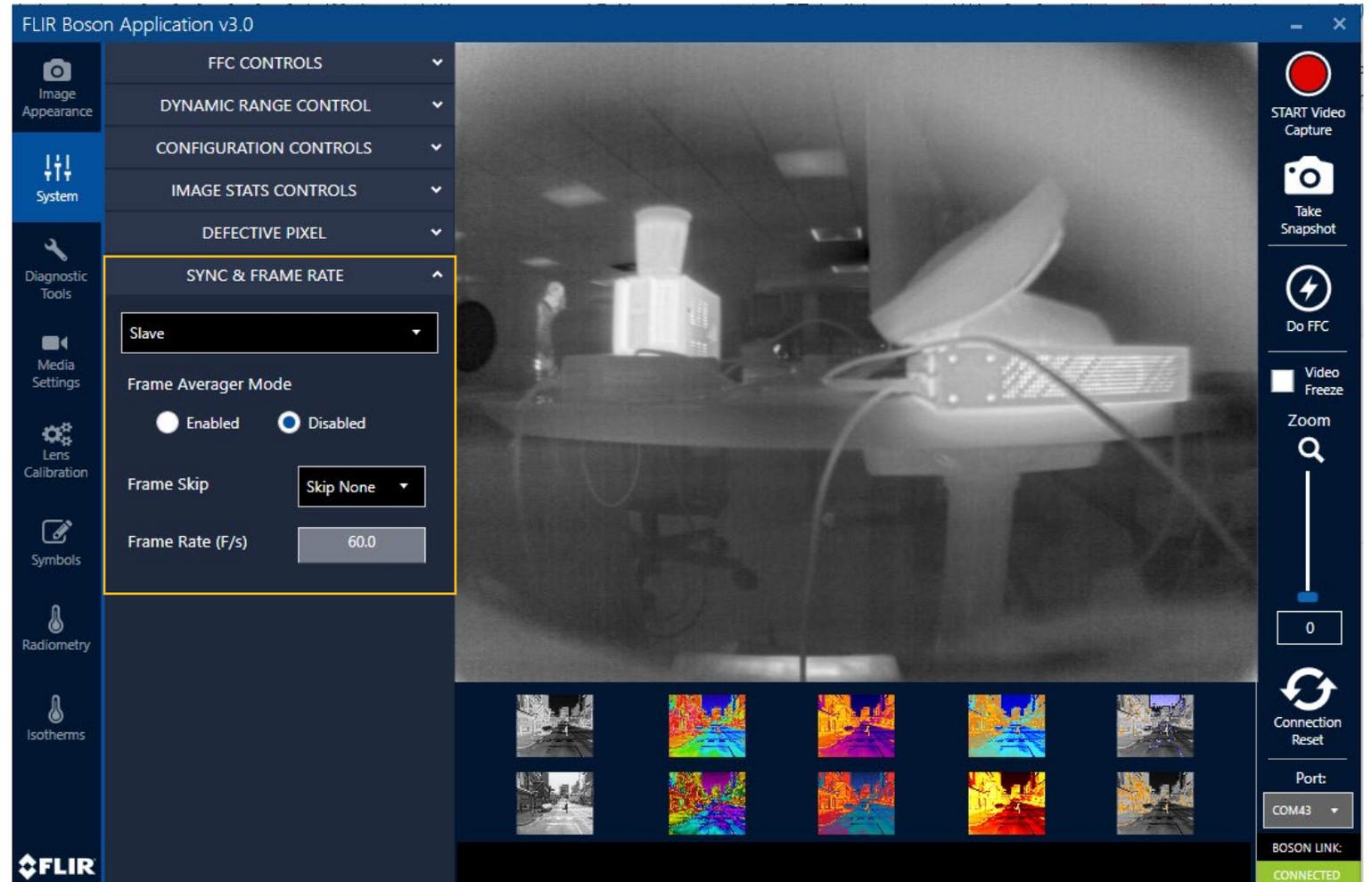
ΔK Damping Factor	0.85000002
Applied Clip	16383
Spot Meter Accuracy	BEST
Accuracy Status Bits	111111

REFRESH

FRAMERATE AND SYNC CONTROL

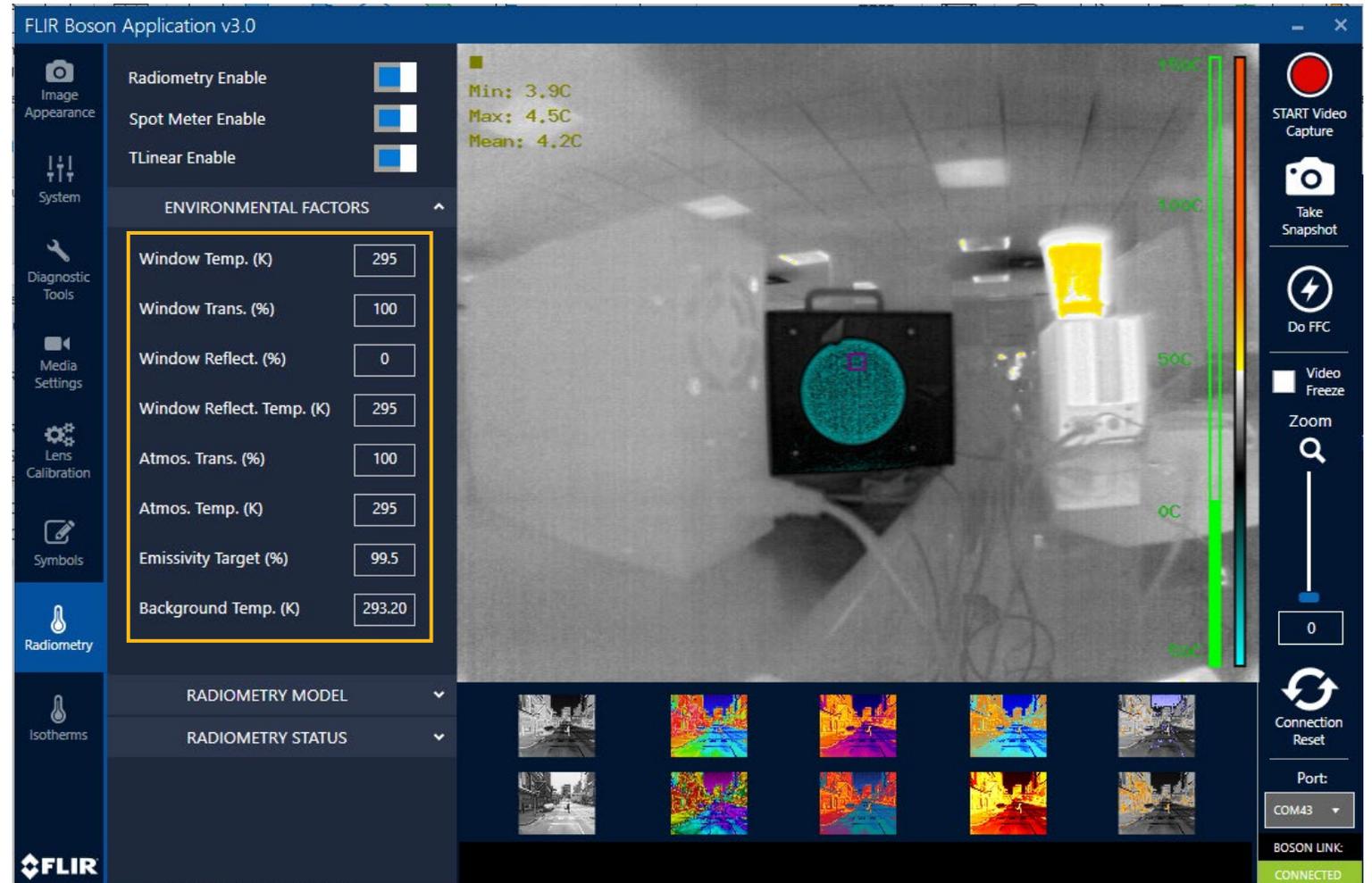
Refer to datasheet for explanation of each parameter below.

- External Sync options
- Frame skip options
- Averager enable/disable options



RADIOMETRIC T-LINEAR ENVIRONMENTAL FACTORS

- Tune to increase temperature measurement accuracy.
- Refer to datasheet for explanation of each parameter.



The screenshot shows the FLIR Boson Application v3.0 interface. The left sidebar contains navigation options: Image Appearance, System, Diagnostic Tools, Media Settings, Lens Calibration, Symbols, Radiometry (selected), and Isotherms. The main panel is divided into sections: Radiometry Enable (checked), Spot Meter Enable (checked), TLinear Enable (checked), ENVIRONMENTAL FACTORS (highlighted with a yellow box), RADIOMETRY MODEL, and RADIOMETRY STATUS. The ENVIRONMENTAL FACTORS section includes the following parameters:

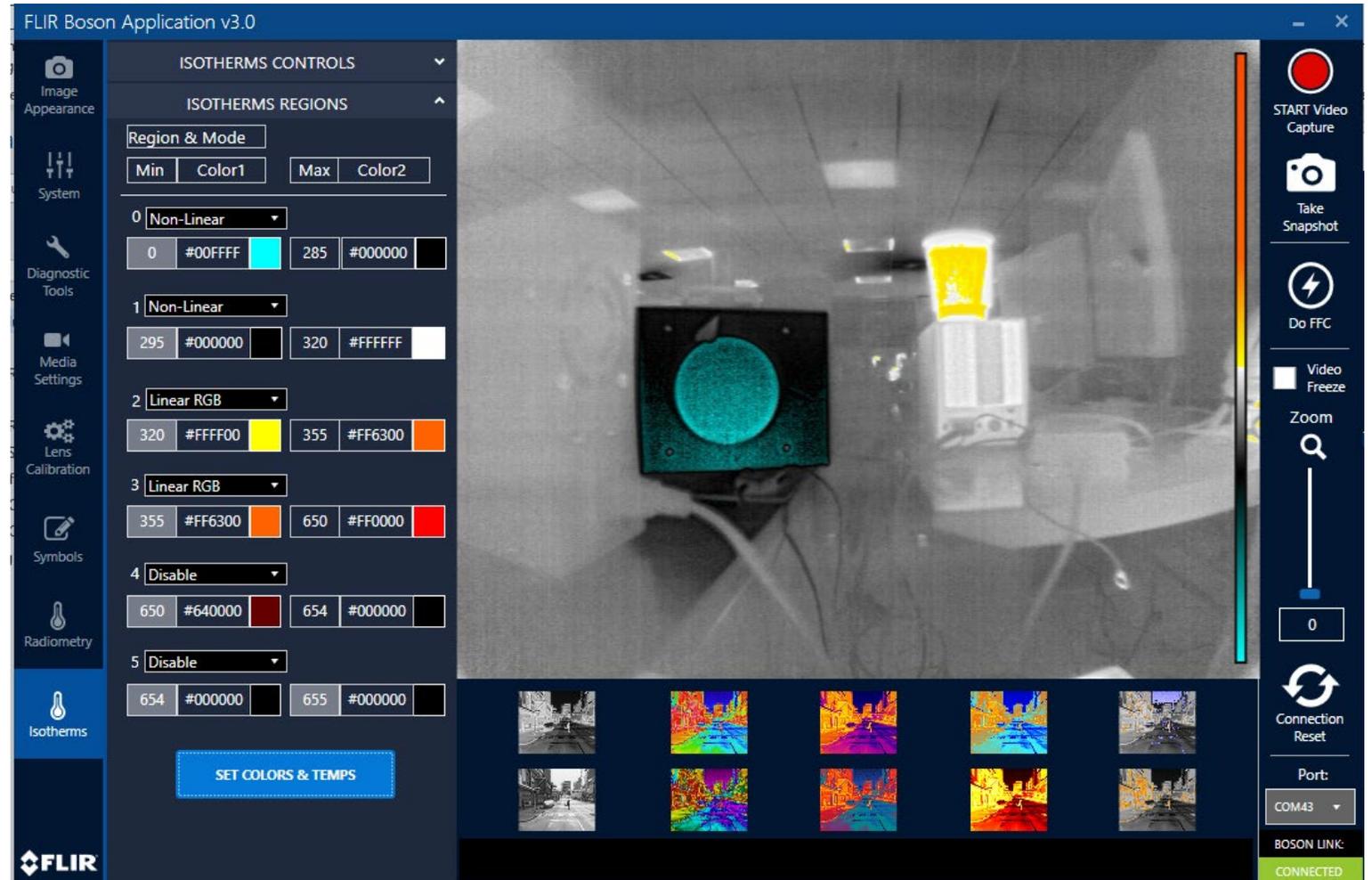
Parameter	Value
Window Temp. (K)	295
Window Trans. (%)	100
Window Reflect. (%)	0
Window Reflect. Temp. (K)	295
Atmos. Trans. (%)	100
Atmos. Temp. (K)	295
Emissivity Target (%)	99.5
Background Temp. (K)	293.20

The right side of the interface displays a thermal image of a room with a temperature scale on the right ranging from 0°C to 150°C. A red spot meter is overlaid on the image, showing a minimum of 3.9°C, a maximum of 4.5°C, and a mean of 4.2°C. The bottom right corner shows connection settings: Port: COM43 and BOSON LINK: CONNECTED.

ISOTHERMS

Isotherms allows configuration of ranges of temperatures or % to have customized colorization.

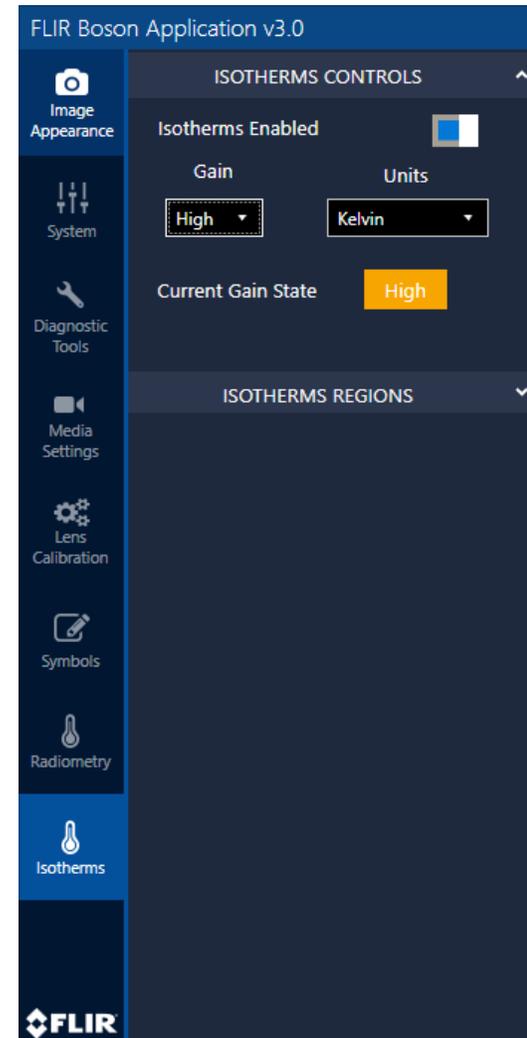
This can be used for highlighting objects of certain temperatures with radiometric cameras, while still using the 8-bit colorized output.



ISOTHERM OPTIONS

- **Non-linear:** Contrast optimized mapping of color region not linearly correlated to temperature or flux
- **Linear RGB:** RGB \geq RGB linear interpolation between colors
- **Disable:** Exclude from Isotherm regions
- **Single color:** No interpolation
- **Linear HSV:** Linear HSV interpolation between two colors
- **Standard:** Standard AGC output using current AGC colorization LUT

Isotherm controls need to be set to proper temperature units and the correct gain mode; i.e.: low gain is for high temperature measurement.





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