Quick Start Guide

ST BrightSense evaluation kit

v.1.1 – March 2025

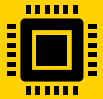
Contents

Prerequisites

Hardware

1. **EVK Main**: generic evaluation main board (STEVAL-EVK-U0I1)
2. **Promodule:** evaluation camera module (CAM-**G*) to plug on EVK Main

   OR **S-Board**: evaluation sensor board (STEVAL-**G*M*I1) to plug on EVK Main
3. **USB cable:** with Type-C connector and USB3.1 protocol (not provided by ST) at least is mandatory



Software

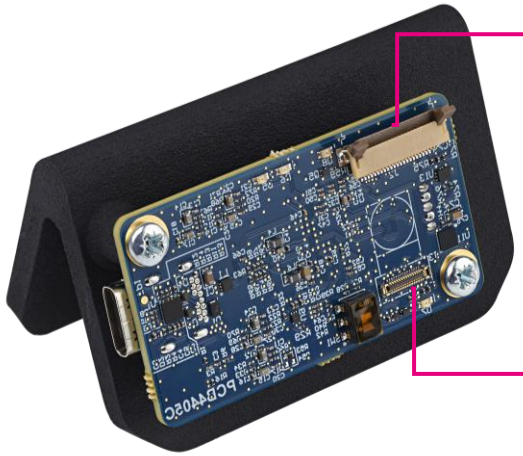
- OS: **Windows 10 or 11**
- **Admin rights**

1. Setup the evaluation hardware

Choose between two options

1. Setup the evaluation hardware

There are two hardware options possible with the EVK Main.



Option A: Connect an S-Board

S-Board are evaluation sensor board with an ST BrightSense image sensor soldered, M12 lens mount and default removable lens.

Option B: Connect a promodule

Promodules are turnkey evaluation camera modules including ST BrightSense image sensor, lens mount, flex cable and various defined lens options.

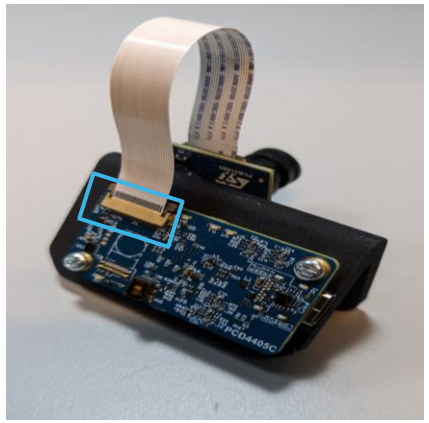
Caution : The EVK Main has no ESD protection. ESD could cause dysfunction of the sensor or the boards.

Option A: When using an S-Board

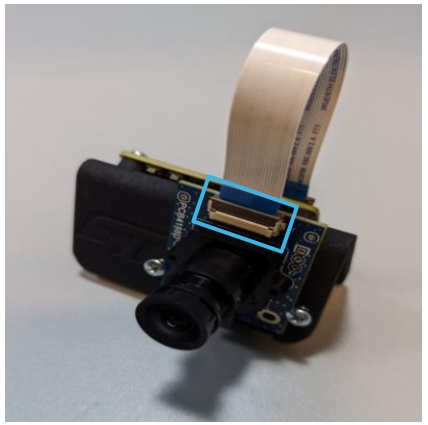
1. Setup the evaluation hardware

Install the S-Board on the back side of the holder

- The EVK Main features an input 22-pin FFC/FPC connector with Rpi 22-pin pinout type, as listed on the right.
- All S-Boards share the same 22-pin pinout, enabling users to switch between boards and their associated sensors at any time in a plug-and-play manner.
- Use the screws on the back side to fix the S-Board.



Front side



Back side

Pin #	Name	Type	Description
1	**GND**	Ground	Power Ground
2	**CAM_D0_N**	Output	Pixel Data Lane0 Negative
3	**CAM_D0_P**	Output	Pixel Data Lane0 Positive
4	**GND**	Ground	Power Ground
5	**CAM_D1_N**	Output	Pixel Data Lane1 Negative
6	**CAM_D1_P**	Output	Pixel Data Lane1Positive
7	**GND**	Ground	Power Ground
8	**CAM_CK_N**	Output	Pixel Clock Output Form Sensor Negative
9	**CAM_CK_P**	Output	Pixel Clock Output Form Sensor Positive
10	**GND**	Ground	Power Ground
11	**CAM_D2_N**	Output	Pixel Data Lane2 Negative
12	**CAM_D2_P**	Output	Pixel Data Lane2 Positive
13	**GND**	Ground	Power Ground
14	**CAM_D3_N**	Output	Pixel Data Lane3 Negative
15	**CAM_D3_P**	Output	Pixel Data Lane3 Positive
16	**GND**	Ground	Power Ground
17	**POWER-EN**	Input	Power Enable
18	**LED-EN**	I/O	LED Enable/XCLK
19	**GND**	Ground	Power Ground
20	**SCL**	Input	SCCB serial interface clock input
21	**SDA**	I/O	SCCB serial interface data I/O
22	**VCC**	Power	3.3V Power Supply

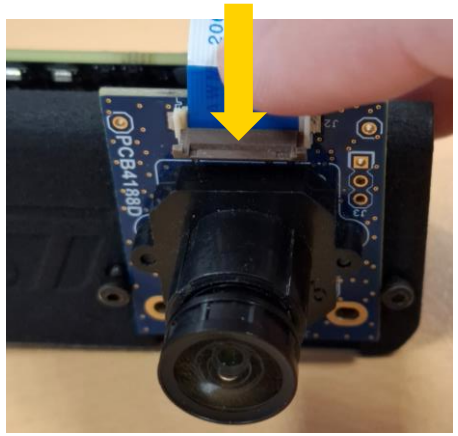
Option A: When using an S-Board

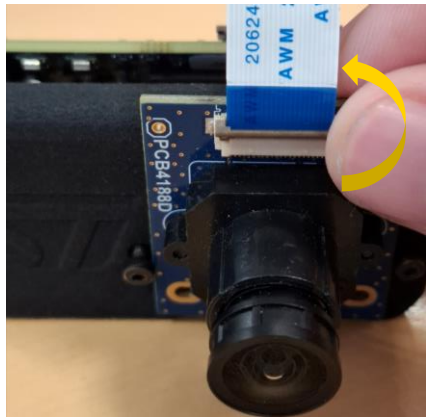
1. Setup the evaluation hardware

Connect properly the flex cable

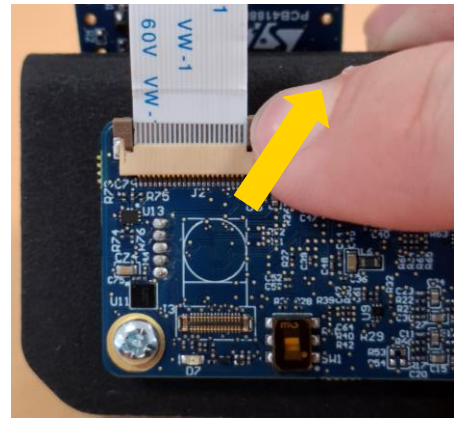
- A 22-pin FFC/FPC cable is provided with the S-Board.
- Make sure to plug the cable so that on the outer side are visible the black writing on the cable, the blue tail on the S-Board side and the white tail on the main board side.

To the S-Board





To the main board side



Option B: When using a promodule

1. Setup the evaluation hardware

Connect the promodule to the main board

- The EVK Main features a 30-pin input connector for camera modules.
- All ST BrightSense promodules by ST and camera modules from partners feature the same connector and pinout as listed of the right, enabling users to switch promodules instantly in a plug-and-play manner.

Pin #	Name	Type	Description
1	VANA_2V8	Power	2.8V Power Supply
2	GND	Ground	Power Ground
3	GND	Ground	Power Ground
4	VCORE_1V15	Power	1.15V Power Supply
5	VDDIO_1V8	Power	1.8V Power Supply
6	XSHUTDOWN	Input	Power Enable
7	GPIO0	I/O	GPIO0
8	GND	Ground	Power Ground
9	GPIO1	I/O	GPIO1
10	DATA1P	Output	Pixel Data Lane1 Positive
11	GPIO2	I/O	GPIO2
12	DATA1N	Output	Pixel Data Lane1 Negative
13	GPIO3	I/O	GPIO3
14	GND	Ground	Power Ground
15	NC	/	Not Connected
16	CLKP	Output	Pixel Clock Output Form Sensor Positive
17	NC	/	Not Connected
18	CLKN	Output	Pixel Clock Output Form Sensor Negative
19	NC	/	Not Connected
20	GND	Ground	Power Ground
21	NC	/	Not Connected
22	DATA2P	Output	Pixel Data Lane2 Positive
23	GND	Ground	Power Ground
24	DATA2N	Output	Pixel Data Lane1 Positive
25	SCL	Input	SCCB serial interface clock input
26	GND	Ground	Power Ground
27	SDA	I/O	SCCB serial interface data I/O
28	CLKIN	Input	Master Clock Input
29	GND	Ground	Power Ground
30	GND	Ground	Power Ground

Finalize your setup

1. Setup the evaluation hardware

Finalize your setup and connect the USB cable.

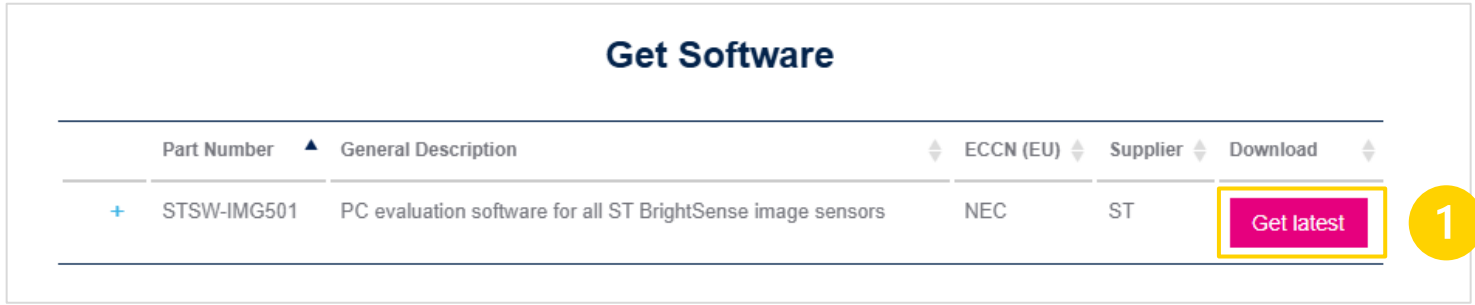
1. Once the promodule or S-Board connected, finalize your setup by placing the EVK Main:
   - On a flat surface such as a desk
   - Or inserted on a laptop as a webcam levering the slit of its V-shape design
   - Or fixed on a tripod using the tripod connector on the bottom face of the holder.
2. Connect the EVK Main to the PC using the USB-C connector. The USB cable performs both the power supply and the data transmission. ! Use a USB 3.1 cable with Type-C connector !
3. Once the EVK Main is power supplied, a green LED will turn on.

2. Install & run the evaluation software

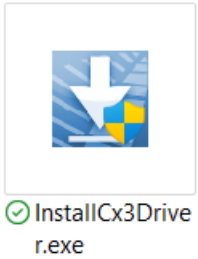
EVK driver installation

2. Install & run the evaluation software

1 Download & unzip **STSW-IMG501** from st.com



2 Launch “InstallCx3Driver.exe”

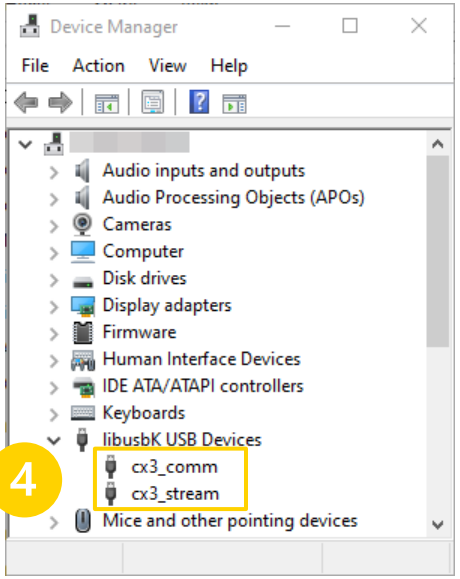


Check driver

2. Install & run the evaluation software

3 Once CX3 driver installed, launch “EVK GS_1.*.*_win64.exe”

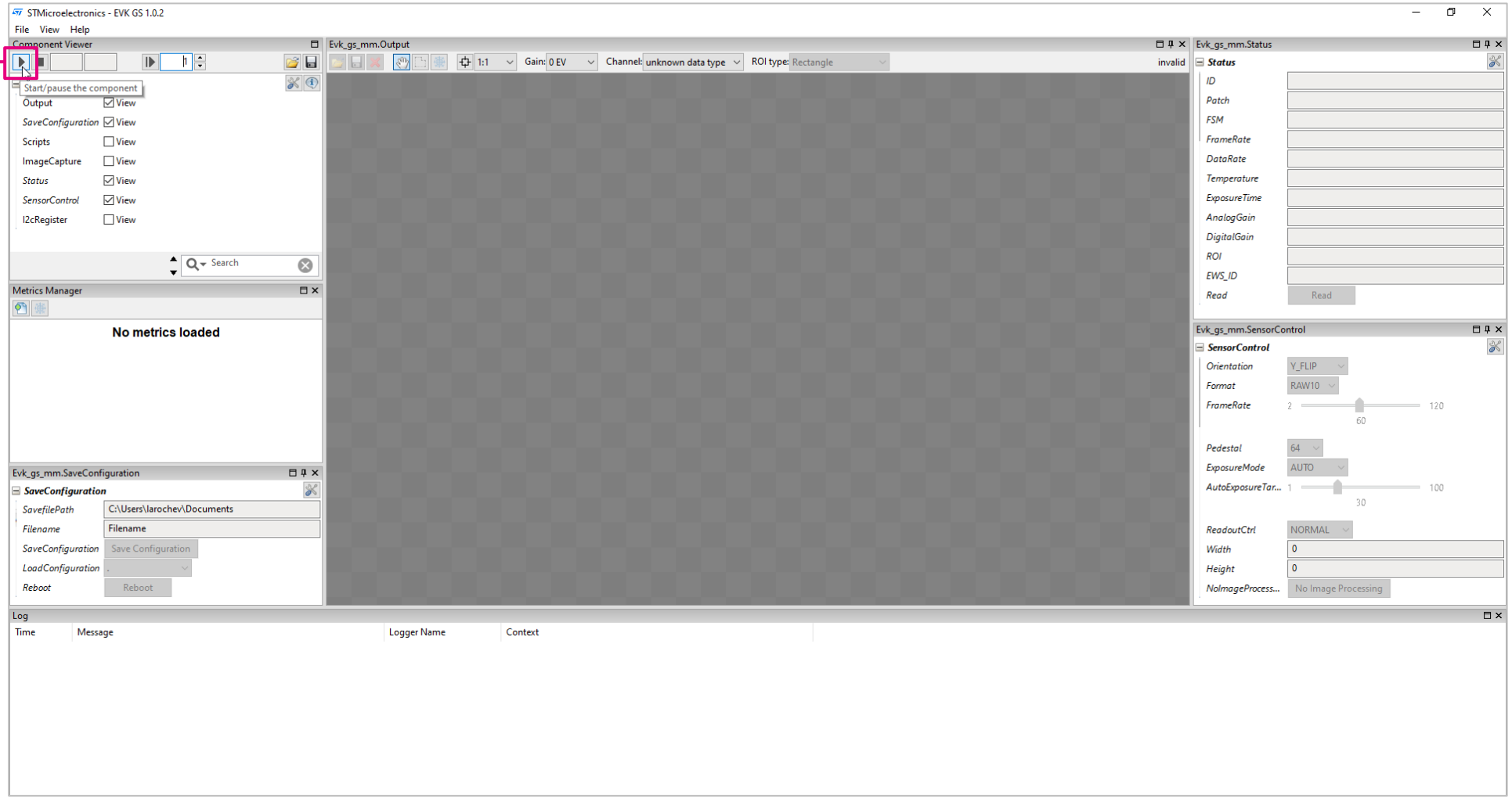
4 Check for “cx3_comm” & “cx3_stream” entry in “Device Manager” to make sure both installations were done.



Start streaming in the GUI

2. Install & run the evaluation software

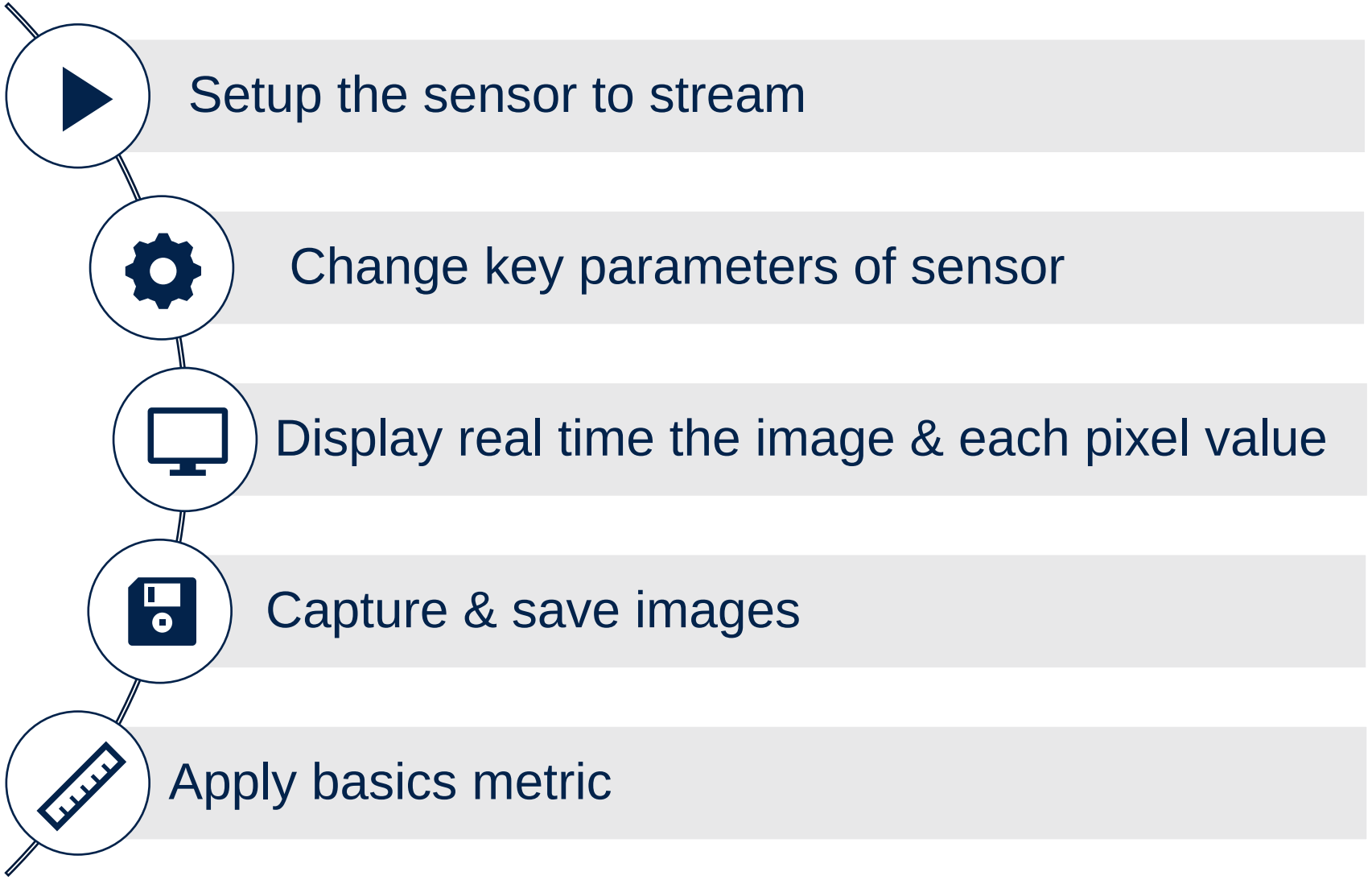
Press **play** button to start streaming



3. Explore the evaluation GUI features

GUI features

3. Explore the evaluation GUI features



GUI overview

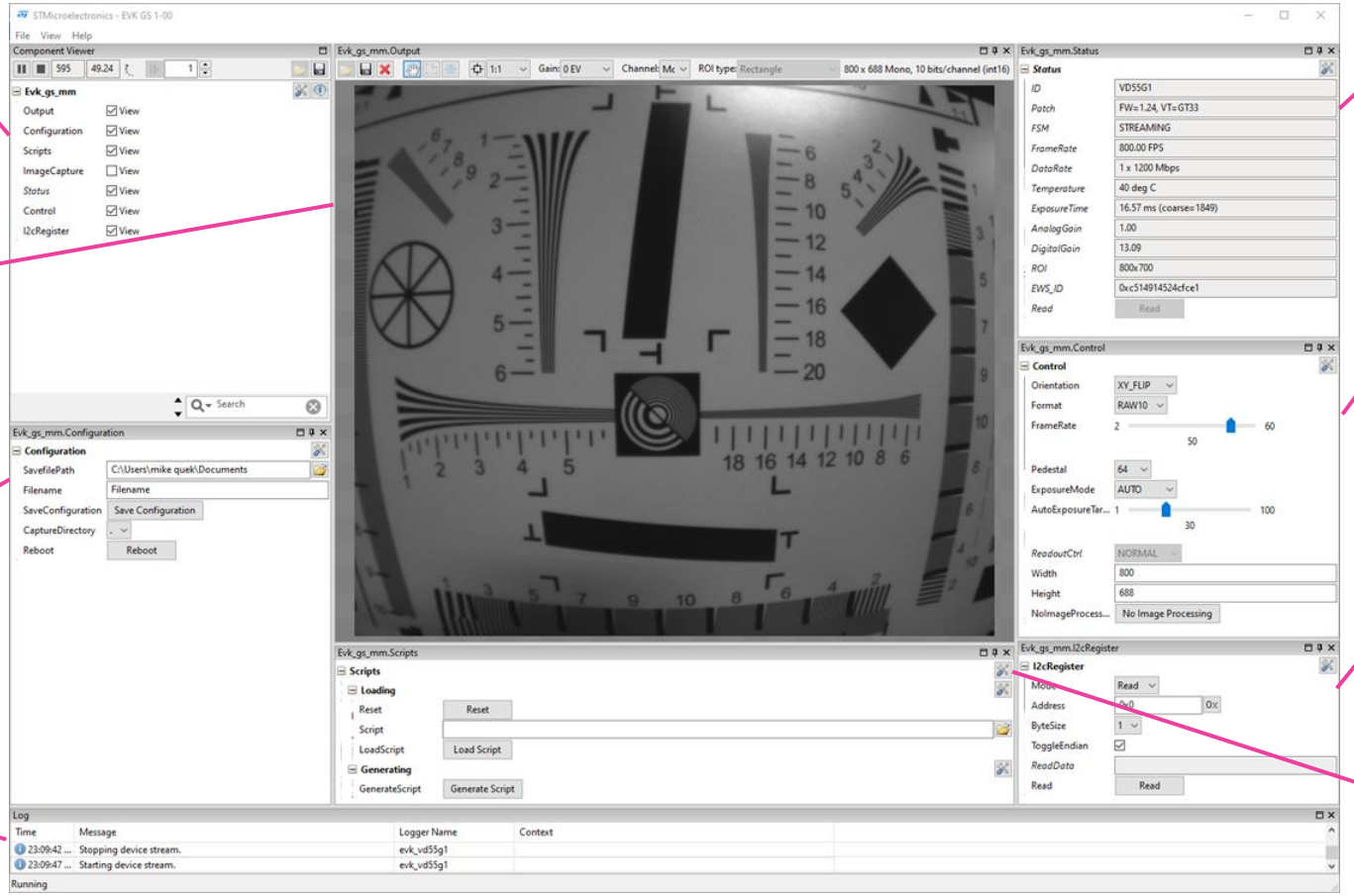
3. Explore the evaluation GUI features

Main panel

Image output

Configuration

Logger



Status panel

Control panel

I2c register

Script panel

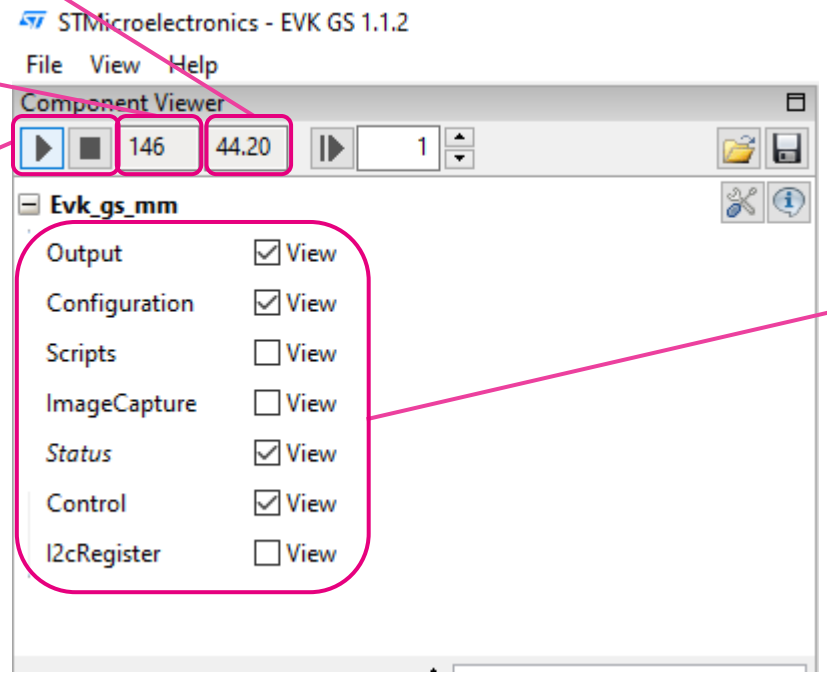
Main panel description

3. Explore the evaluation GUI features

Viewed Frame rate

Current frame number

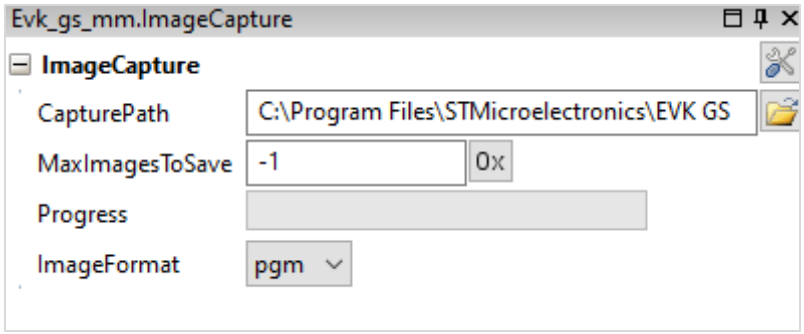
Start / Pause
& Stop streaming



Select which panel to display

ImageCapture panel: overview

3. Explore the evaluation GUI features



1

Select the destination folder with **CapturePath**

2

Configure the number of frames to save with **MaxImagesToSave**

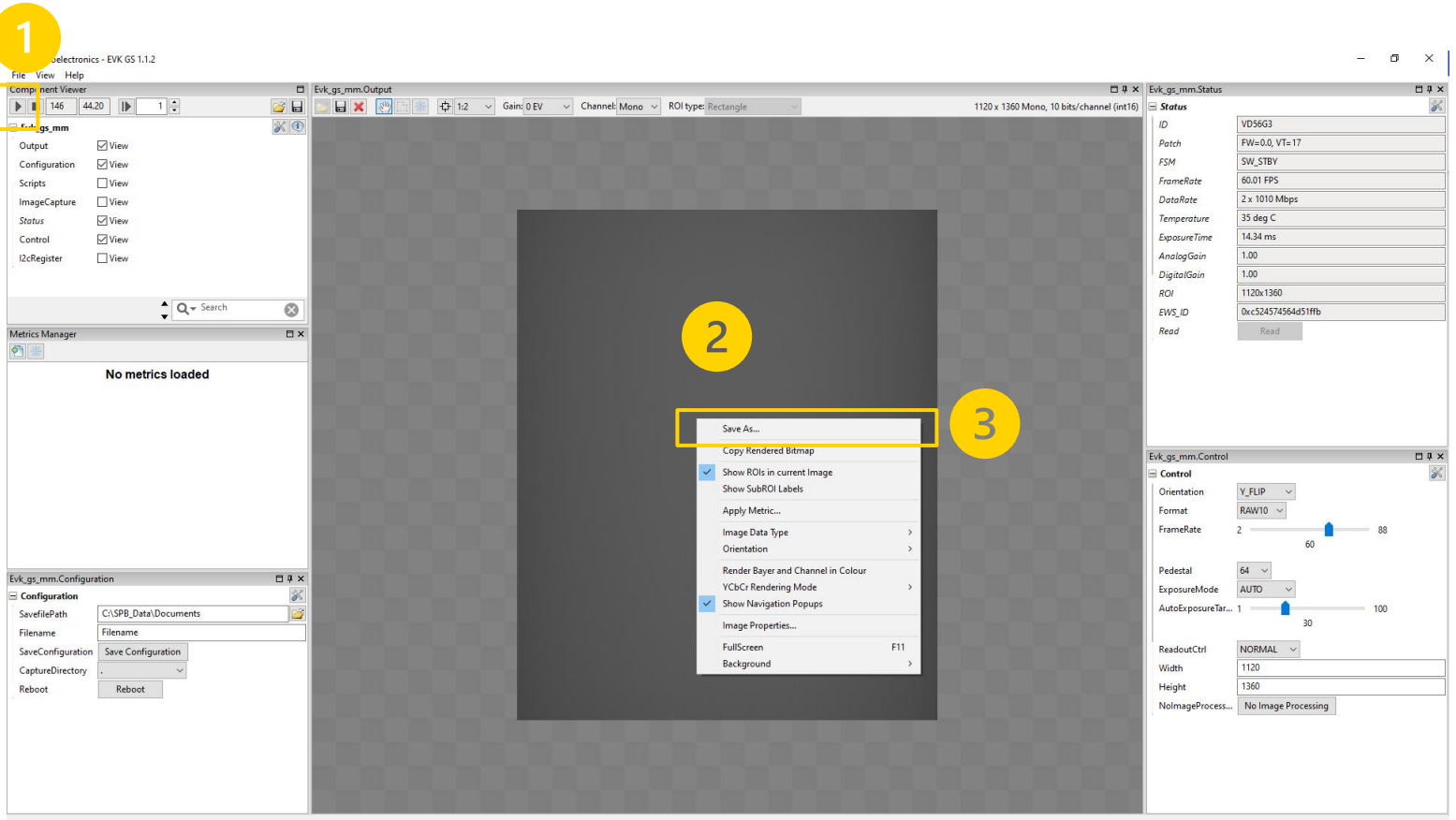
- A value of -1 will wait the user to Press the Stop button
- Any other positive value will automatically Stop the sensor

3

Select the **ImageFormat** (.pgm / .jpg / .png / .bmp)

How to save a single frame?

3. Explore the evaluation GUI features



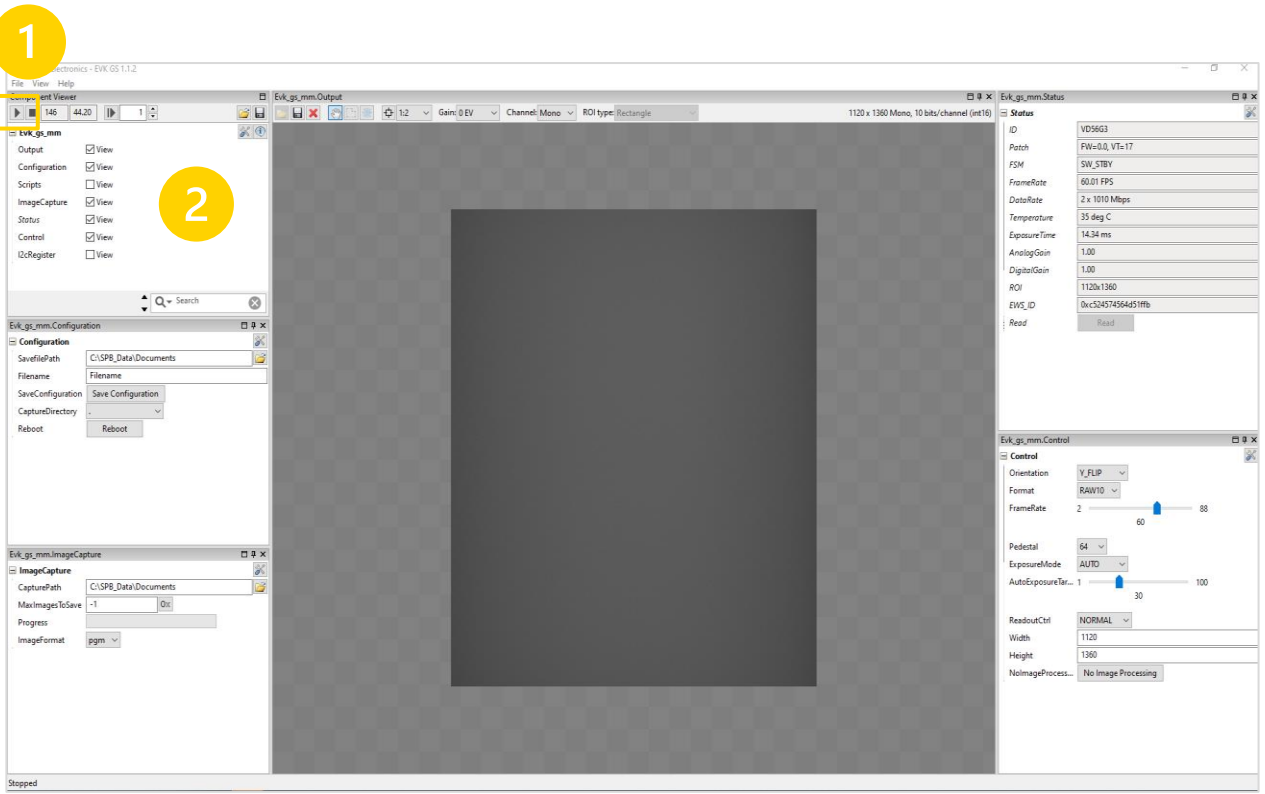
1 Press **Pause** button

2 **Right click** on the image

3 Click **Save as…**

How to save consecutive frames?

3. Explore the evaluation GUI features



1. **Stop** the sensor if streaming
2. Open the **ImageCapture** panel
3. Configure the **ImageCapture** panel (cf. ImageCapture panel description)
4. Press **Play** button to save the sequence and process the buffer in the selected format
5. The sequence is available in a timestamp folder

Metrics Manager: overview

3. Explore the evaluation GUI features

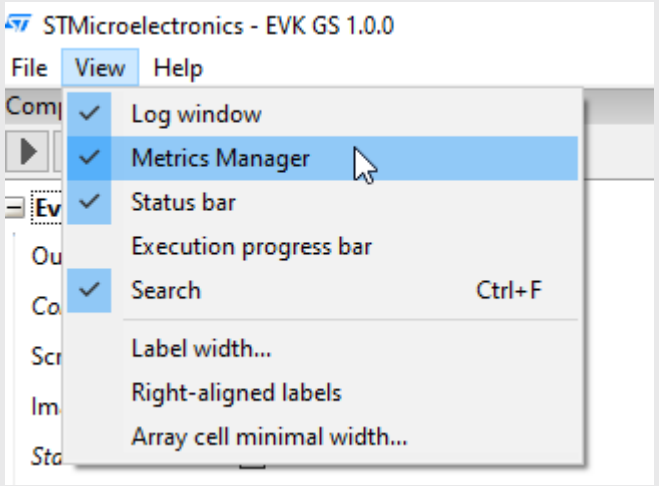
Description

The Metrics Manager panel enables applying various metrics on the image

- Mode Bayer / Mono
- Display Statistics: Min /Max / Std / SNR
- Create ROI
- Show histogram
- Show Line & column average
- Apply smoothing on statistics

Display the Metrics Manager

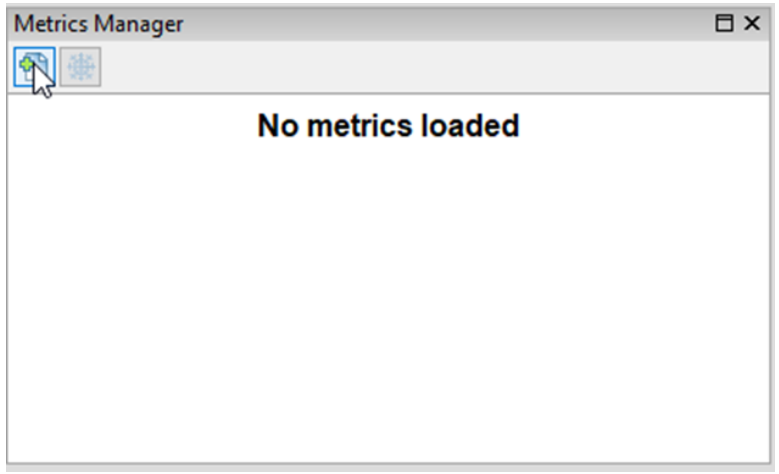
The Metrics Manager panel can be activated from the “View” section of the top toolbar.



Metrics Manager: adding metrics

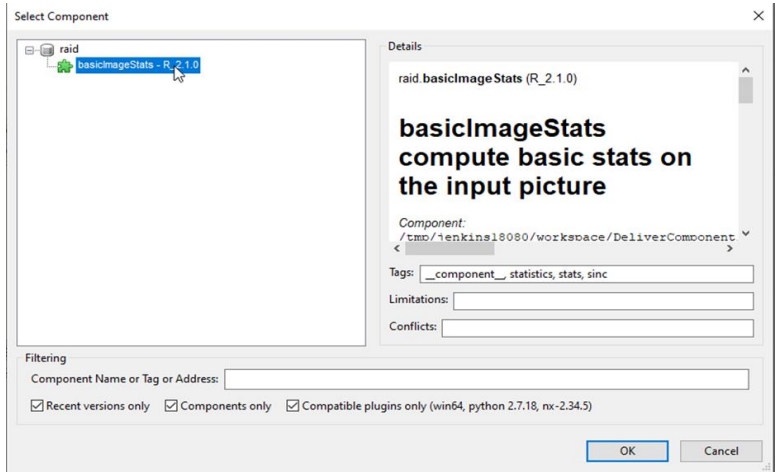
3. Explore the evaluation GUI features

1 **Add metric component**



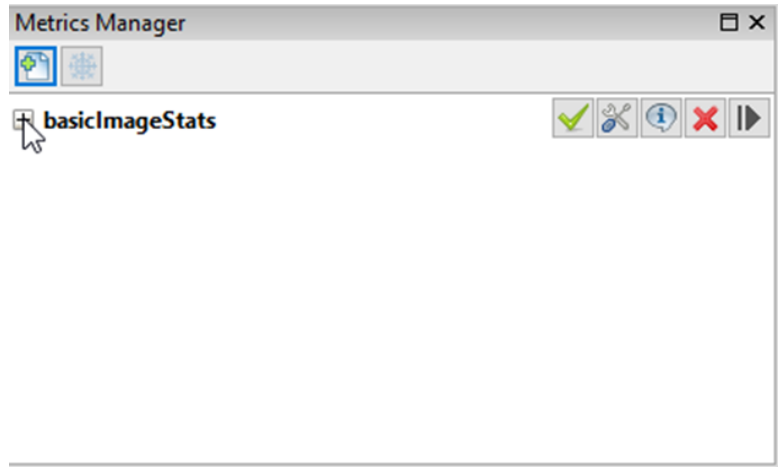
- Click on “add metric” icon

2 **Select basicImageStats**



- Select component *basicImageStats*

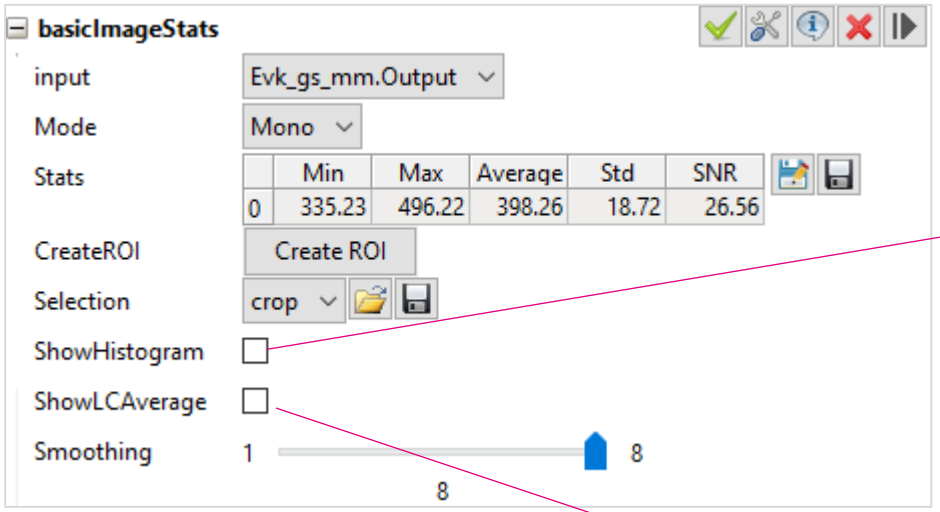
3 **View all features**

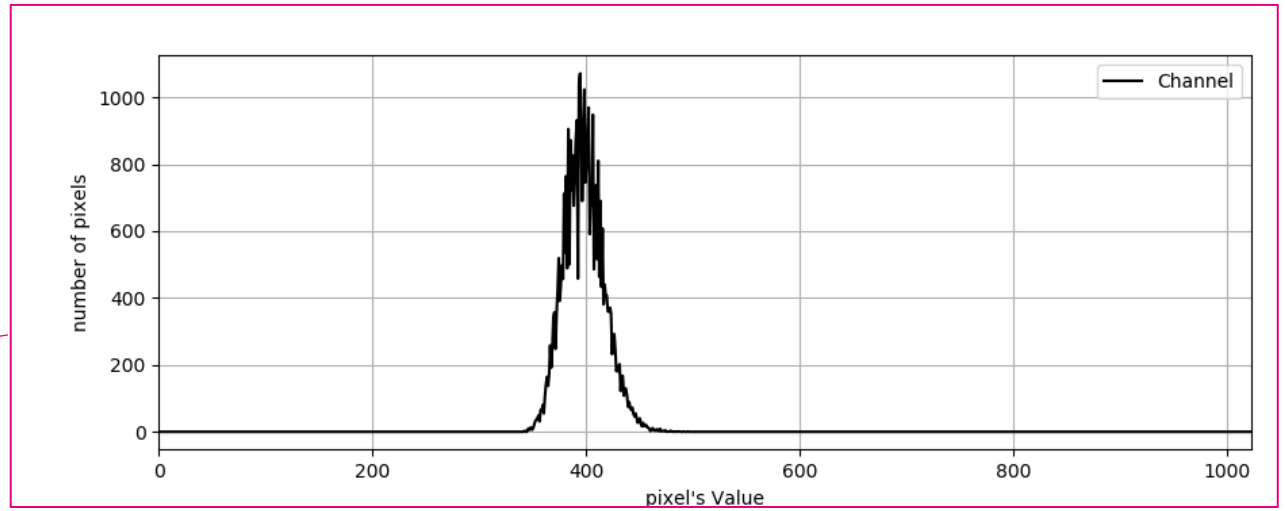


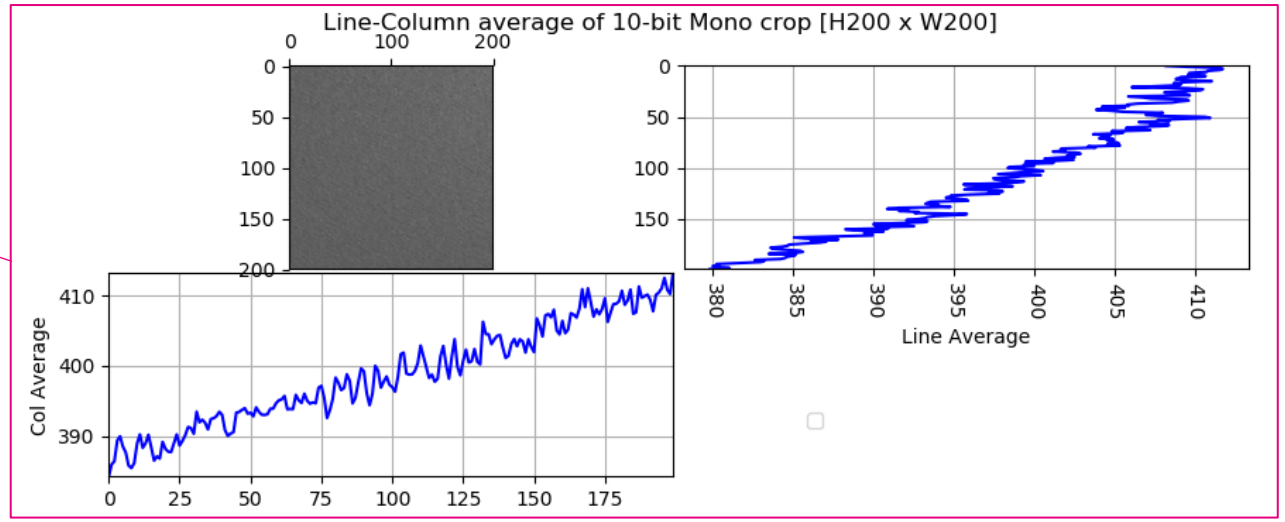
- Click on the cross button to display all the options

Metrics Manager: displaying data

3. Explore the evaluation GUI features







FAQ & additional resources

How to save the current sensor configuration?

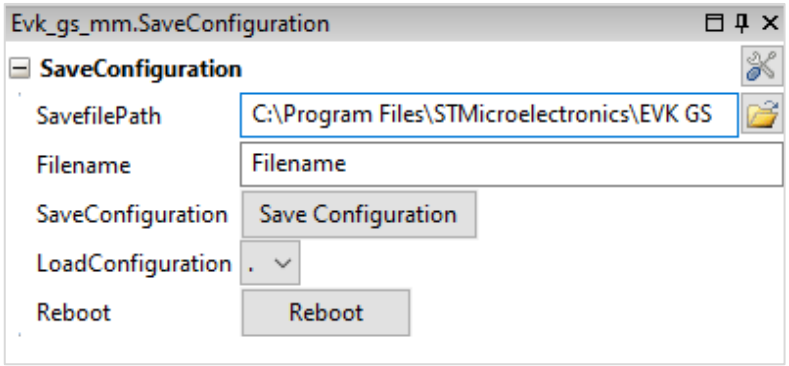
FAQ & additional resources

1 Open **SaveConfiguration** panel in the main panel

2 Select the **path** to save the configuration file and Choose the Filename

3 Click on **Save Configuration** button

! Only data in SensorControl panel are saved.



Example of configuration file content

Parameter	Default value for VD55G1
Orientation	Y_FLIP
Format	RAW10
FrameRate	60
Pedestal	64
ExposureMode	AUTO
AutoExposureTarget	30
Exposure	1000
AnalogGain	1
DigitalGain	1
ReadoutCtrl	NORMAL
ActiveResolution	800x704
Width	800
Height	704
EnableLED	FALSE

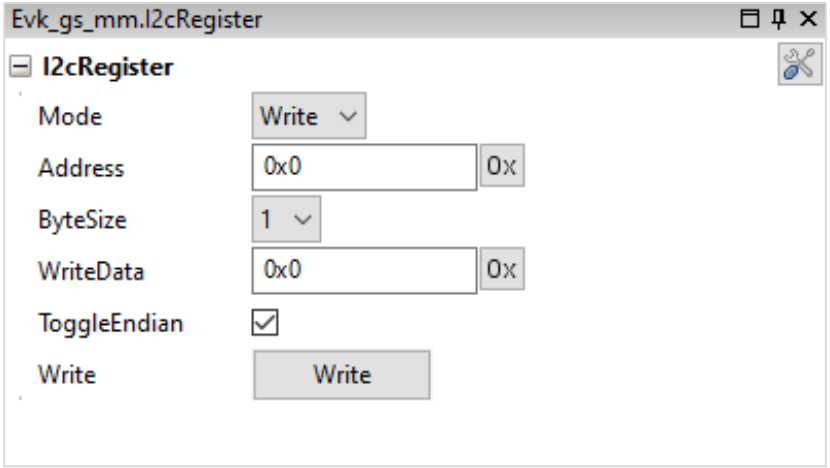
How to read or write specific registers?

FAQ & additional resources

Read specific register

1. Open **I2cRegister** panel in main panel
2. Choose the mode: Read
3. Set the register address
4. Click on **Read** button

Write specific register



1. Open **I2cRegister** panel in main panel
2. Choose the mode: Write
3. Set the register address & register value
4. Click on **Write** button

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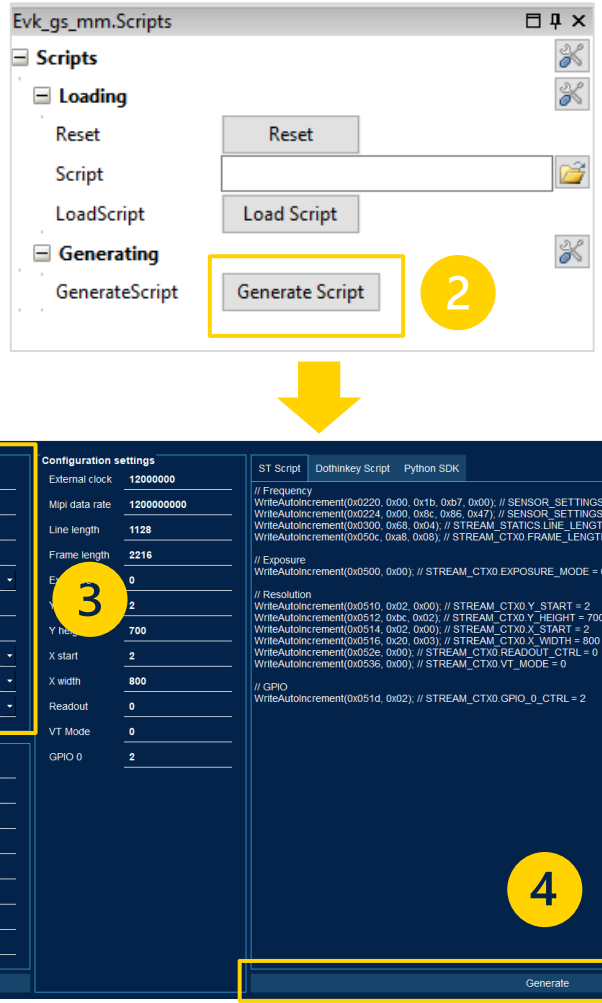
How to generate a script?

FAQ & additional resources

1. Open **Scripts** panel in the main panel
2. Click on **GenerateScript** button to open Script generator GUI
3. Set parameter in **configuration inputs** on new GUI to update Configuration settings
4. Click on **Generate** button to save script as .txt file



Sensor boot but not able to stream image?

FAQ & additional resources

- USB cable with Type-C connector for the EVK Main side
- USB3.1 protocol compliant
- Careful with USB charging cable: not enough bandwidth for image streaming

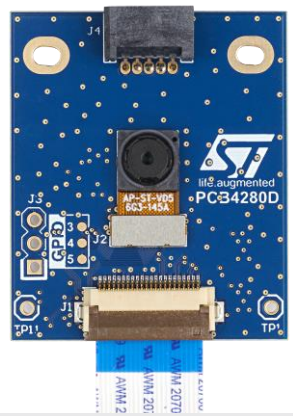
How to move from evaluation to development?

FAQ & additional resources

When using an S-Board

- No need to purchase new items: the S-Board can also be connected to various embedded processing platforms with its flex cable.
- Download free drivers from st.com to get started immediately on your platform.

When using a promodule



- Purchase a P-Board (STEVAL-CAM-M0I): a generic MIPI CSI-2 board to connect any promodule to various processing platforms.
- Download free drivers from st.com to get started immediately on your platform.

Additional resources

FAQ & additional resources

Reuse EVK Main board design for your project

- Bill of Materials of EVK Main (STEVAL-EVK-U0I)
- Gerber files of EVK Main (STEVAL-EVK-U0I)
- Schematics of EVK Main (STEAL-EVK-U0I)

Reuse EVK Main mechanical design for your project

- Board 3D step file from EVK Main (STEVAL-EVK-U0I)
- Mechanical holder 3D step file from EVK Main (STEVAL-EVK-U0I)
- Mechanical holder 3MF file from EVK Main (STEAL-EVK-U0I)

Have more questions?

Ask the ST Imaging Community!

Our community and experts will
help you anytime wherever you are.

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