



Videology[®]

Industrial-Grade Cameras

an inTEST Company

Application Note

Getting started

Using the GUI Application

Draft

Aegis Electronic Group
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Document History

| Revision | Issue Date | Reason |
|----------|------------|------------------|
| 0.1 | | Initial Creation |
| | | |
| | | |
| | | |

Application note

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1. Getting started

Below both versions of the 24C46 camera are shown. The top picture shows the coaxial camera, and the bottom picture shows the Twisted-pair camera.

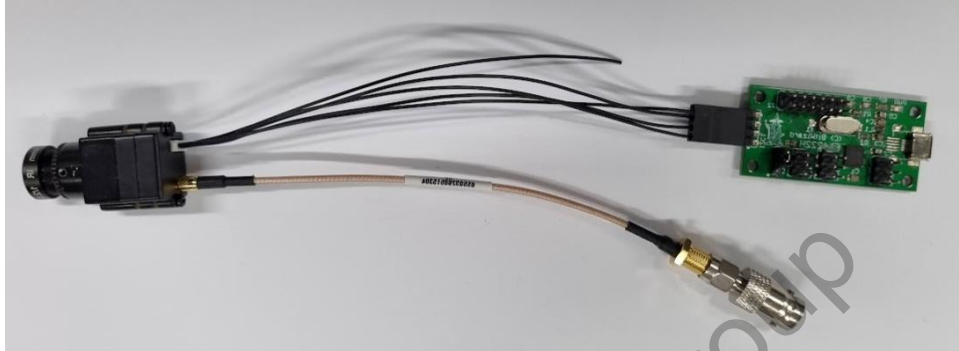


Figure 1 Coaxial camera connection

Coaxial Camera

Connect the MMCX coaxial cable to the MMCX connector of the camera, then connect the I²C board to the black 4 wire connector and make sure the exposed pins of the black connector are facing down. Then connect MMCX coaxial cable to an 75Ω coaxial cable to an AHD/TVI receiver to show the video. Connect the I²C board to a USB port of the computer.

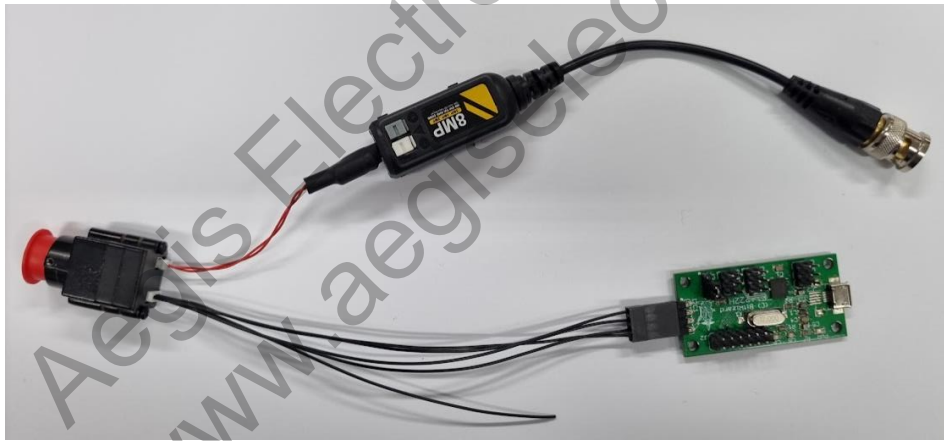


Figure 2 Twisted pair camera connection

Twisted-pair camera

Connect the Balun (with the twisted wire) to the 3-pin connector of the camera, then connect the I²C board to the black 4 wire connector and make sure the exposed pins of the black connector are facing down. Then connect the Balun with a 75Ω coaxial cable to an AHD/TVI receiver to show the video. Connect the I²C board to a USB port of the computer.

Once the I²C board is connected to the Computer the Camera will get power from the I²C board. The camera should give a picture a few seconds after power-up. Give the PC some time to install the driver of the I²C board. Check the Windows device manager; the **FT4222H** device should show up twice under Universal Serial Bus controllers!

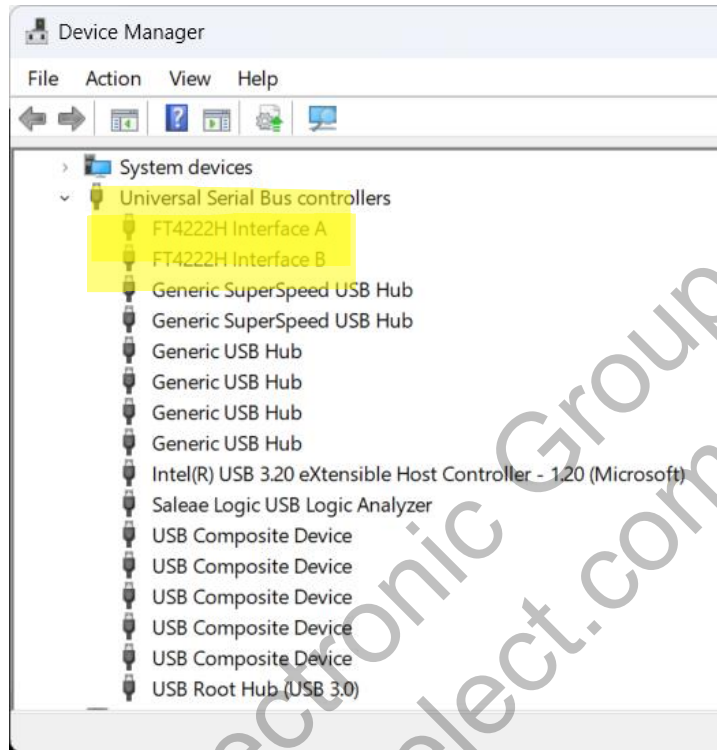


Figure 3 Windows device manager

2. The GUI tool and camera configuration

Once the I²C board driver have correctly installed the GUI tool can be used to control most aspects of the camera.

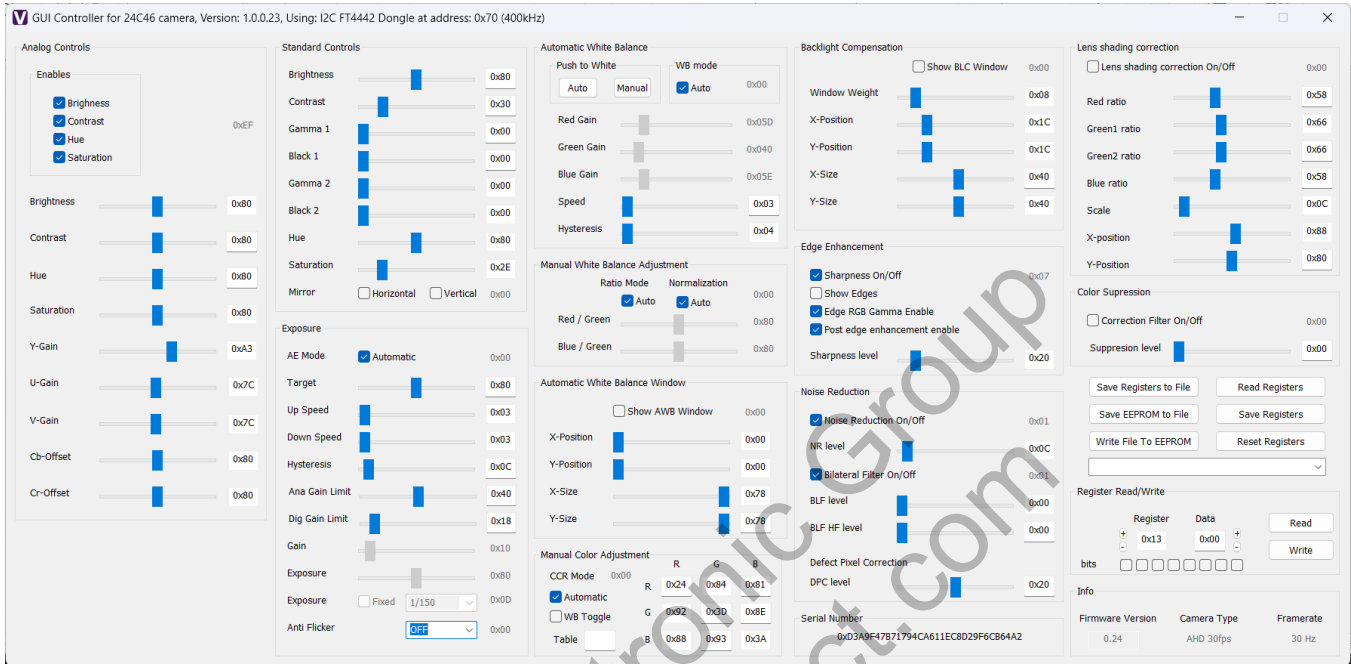


Figure 4 GUI tool for camera control

Installation

Unzip the SFT-20411_GUI controller_24C46.zip into a folder the following files should be in the folder:

- SFT-20411_pctool_gui_24C46.exe
- LibFT4222.dll
- vdiicdll.dll
- settings.cfg

Make sure the computer display has at least a resolution of 1920x1080!

Run the executable "SFT-20411_pctool_gui_24C46.exe" file by double clicking it. The Camera Gui application will open.

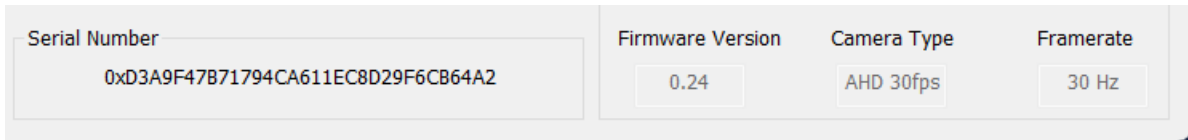
The application frame in the top will show the version and the current I²C address and the current

GUI Controller for 24C46 camera, Version: 1.0.0.23, Using: I2C FT4442 Dongle at address: 0x70 (400kHz)

I²C speed, the default I²C for the 24C26 camera is: **0x70** and the default speed is **400kHz**.

Both the I²C address and the I²C speed that the Gui tool uses, can be changed in the "settings.cfg" file. This is a text file that can be edited using a basic text editor. Th Gui tool will read this text file at startup.

In the bottom of the application window the **unique serial number** of the camera is shown as well as the camera's **firmware version** the Camera Type and the current **framerate**.

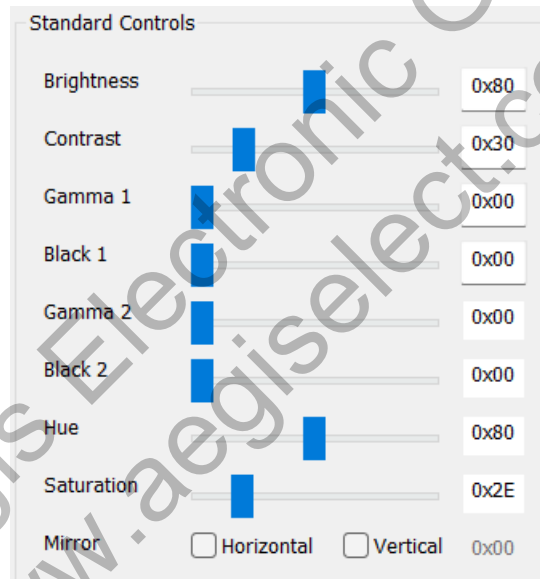


When these numbers show up correctly the I²C connection to the camera is up and running.

For controlling the camera via registers and the Gui tool application, please consult the 24C46 camera's User guide: "UG-24C46X-2_revC.pdf"

Standard Controls

The standard controls allow basic image adjustments like brightness, contrast, gamma, hue, saturation, and mirror modes.



Exposure Control

The exposure control settings control how the camera regulates the electronic shutter and the video gain. The AE regulation can be set to automatic or to manual. In automatic mode the AE regulation loop will regulate using the target, up-speed, down-speed, hysteresis, and gain limits. In manual mode the exposure (electronic shutter) and gain can be set. The exposure can either be set in steps from 0 to 255 or by fixed times like: 1/100th, 1/500th, etc. The anti-flicker can be enabled in automatic exposure mode, there are several settings for anti-flicker.

| Parameter | Value | Hex |
|----------------|---|------|
| AE Mode | <input checked="" type="checkbox"/> Automatic | 0x00 |
| Target | Slider (approx. 80) | 0x80 |
| Up Speed | Slider (approx. 3) | 0x03 |
| Down Speed | Slider (approx. 3) | 0x03 |
| Hysteresis | Slider (approx. 12) | 0x0C |
| Ana Gain Limit | Slider (approx. 40) | 0x40 |
| Dig Gain Limit | Slider (approx. 18) | 0x18 |
| Gain | Slider (approx. 10) | 0x10 |
| Exposure | Slider (approx. 80) | 0x80 |
| Exposure | <input type="checkbox"/> Fixed 1/150 | 0x0D |
| Anti Flicker | OFF | 0x00 |

White balance and color control

The automatic white balance can be set to automatic or manual mode. The Push-to-white mode will adjust the white balance automatically and then hold the current setting, this mode takes a bit of time and afterwards the camera will be in fixed/manual mode.

Automatic White Balance

Push to White:

WB mode: Auto 0x00

Red Gain: 0x05D

Green Gain: 0x040

Blue Gain: 0x05E

Speed: 0x03

Hysteresis: 0x04

Manual White Balance Adjustment

Ratio Mode: Auto

Normalization: Auto 0x00

Red / Green: 0x80

Blue / Green: 0x80

Automatic White Balance Window

Show AWB Window 0x00

X-Position: 0x00

Y-Position: 0x00

X-Size: 0x78

Y-Size: 0x78

Manual Color Adjustment

CCR Mode: 0x00

Automatic

WB Toggle

Table:

| | R | G | B |
|---|------|------|------|
| R | 0x24 | 0x84 | 0x81 |
| G | 0x92 | 0x3D | 0x8E |
| B | 0x88 | 0x93 | 0x3A |

In Manual mode the RED, BLUE and GREEN gains can be adjusted. It is best to keep the green gain at its default value.

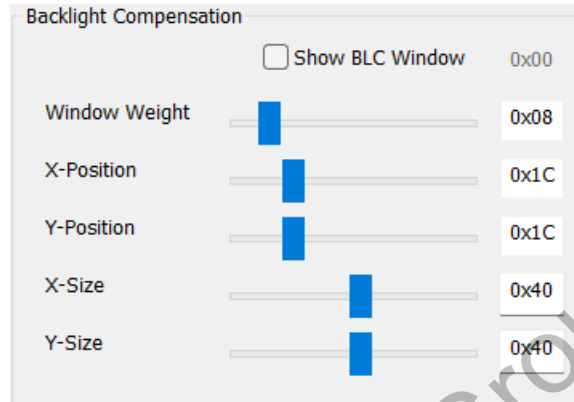
The manual white balance adjustment allows changing how the AWB algorithm behaves, these parameters should only be changed by experts.

A window can be set to limit which part of the video is used by the AWB algorithm to adjust the color automatically.

The color correction matrix can be adjusted. These setting should only be done by experts.

Backlight control

A backlight compensation window (BLC) can be used to control the AEX behavior. A weight factor can be set to change the impact of the BLC window. A BLC window can be used to adjust the AE level of a part of the video or to exclude a part of video for the AEX regulation loop.



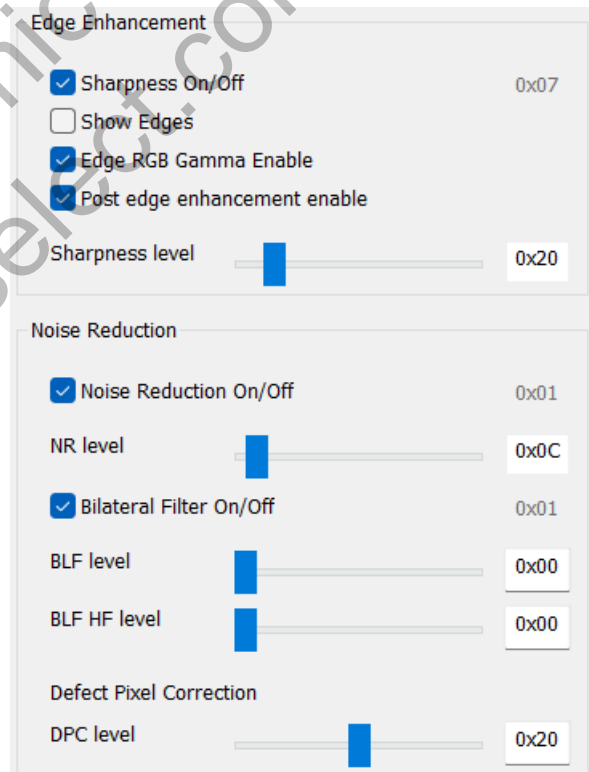
Sharpness and Noise reduction control

Edge enhanced (or sharpness) can be applied to the video to get a better sharpness impression.

Noise reduction (NR) can be applied to reduce the noise of the overall video, too much noise reduction will result in a blurred image.

A bilateral noise filter (BLF) tries to reduce the noise, but keep the sharp edges in the video; this can be applied for lower video frequencies and high frequencies (HF)

Every image sensor has some defect pixels. A defect pixel filter (DPC) can be applied to reduce the visibility of defect pixels.



Lens Shading control

Lenses refract different colors of light with a different angle. This can result in a color mis-match at the edges of the video. E.g., video at the edges of the image can look darker or have a slightly different color.

Lens shading correction

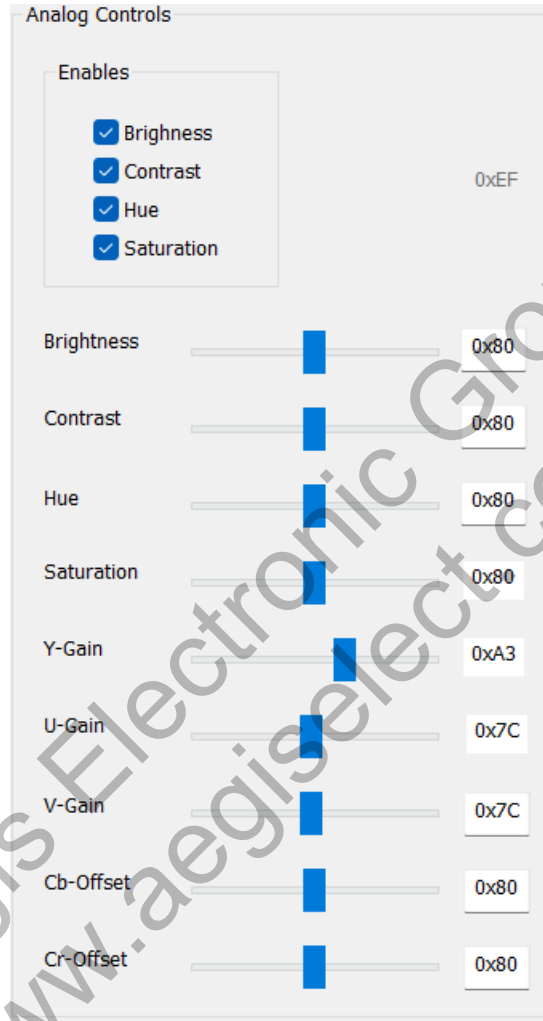
| | |
|---|------|
| <input type="checkbox"/> Lens shading correction On/Off | 0x00 |
| Red ratio | 0x58 |
| Green1 ratio | 0x66 |
| Green2 ratio | 0x66 |
| Blue ratio | 0x58 |
| Scale | 0x0C |
| X-position | 0x88 |
| Y-Position | 0x80 |

These parameters control the behavior of the Lens shading correction algorithm. The center of the lens and the scale factor should be set correctly, the RED, GREEN and BLUE gain can be adjusted to correct the color at the edge of the image.

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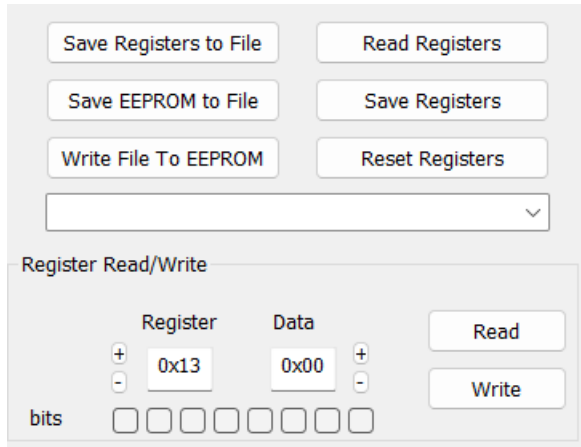
Analogue output control

The 24C46 camera is a digital camera with an analogue output signal. The analog output signal can be adjusted separately from the digital image processor. This allows adjusting the analogue signal. The GUI tool allows for basic adjustment, however the 24C46 camera has some more registers for analogue signal adjustments not available in the GUI tool.



Camera register control

The camera stores its settings in an EEPROM, and the register values can be stored into the EEPROM. The Read Register button will read the current register value from the camera into the GUI tool. The EEPROM content can be read from and written to a file. This file will have a "xxx.vis" extension and is a standard text file that can be opened in a text editor. For details about the EEPROM content refer to the User Guide document.



The registers can be saved and recalled from the EEPROM.

The register can be restored from the EEPROM user settings by clicking the Reset Register button.

The register can be restored by selecting recover factory register settings.

This part of the GUI tool allow reading and writing to the camera's registers directly. For register description see the User Guide document.

When the GUI tool sliders or buttons are clicked the camera's registers are written to. The Register address and value applicable to the used control is immediately reflected in the Register Read/Write window; this makes it easy to link the GUI control to its register location.

Be aware that some registers are access protected for Videology only and may not be accessible to the user. Registers can be Read, Write or Read/Write protected. For details see the User Guide.



Contact Information

About Videology

For over 25 years, when you need an embedded camera, we have led the way.

We are an integral, trusted global supply OEM partner and have been since 1995. Our industrial cameras are designed and engineered into a wide variety of applications with partners ranging from the most inventive companies to industrial pioneers. Proudly built in the USA and the EU.

For technical assistance with this product, please contact the supplier from whom the product was purchased.



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