

Miramar Camera GenICam Interface

For firmware version ≥ 2.6 , FPGA version ≥ 1.6

Revision History

Date	Rev No.	Description	By
Sep 2023	1	Initial draft	Jeremy Hong
6/10/2024	2	Add register definitions	Bing Wen
6/12/2024	2.01	Add more register definitions	Bing Wen
6/14/2024	2.02	Add user data flash address	Bing Wen
6/18/2024	2.03	Add MCU 2.6 support	Bing Wen

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Introduction

Miramar cameras use Genicam protocol. This document will discuss implementation of writing and reading registers from the camera, and registers that control the camera behavior.

GeniCam Protocol

For details on how to format writes and reads for GeniCam protocol, please refer to the GeniCam document “GeniCam GenCP Generic Control Protocol Version 1.3”.

Hardware implementation

Miramar Cameras with USB_C connector implemented the GeniCam interface on serial ports using USB. The USB port has VID=0x1FC9 and PID=00A3. If the correct serial port is chosen, reading 64 bytes from address 0x08 will return “OBSIDIAN SENSORS INC.”.

Future Cameras with MIPI/GMSL connector will implement GeniCam protocol through I2C bus.

The existing communication buffer size is **4096** bytes. Do not send or request more than 4096 bytes data in each transaction

Register definitions

Adress	Length (bytes)	Read/Write	functions
0x020C	64	R	Firmware Version String (ASCII)
0x1000	1	R	Camera board temperature, in Centigrade
0x100E	1	R	shutter temperature = (value[0x100E]+256*value[0x100F])/100, in Centigrade
0x100F	1	R	
0x1010	1	R	FPGA Major version
0x1011	1	R	FPGA Minor version
0x1012	1	R	FPGA Sub Minor version
0x2001	1	R/W	0/1: Video stream disable/enable
0x2003	1	R/W	Bit 4:0: number of frames to collect during background accumulation
0x2005	1	R/W	0: shutter disabled 1: shutter enabled, odd polarity 2: shutter enabled, even polarity
0x2008	1	R/W	AGC 0: disable 1: linear 2: Histogram Equilibration
0x2009	1	R/W	Bit 0: 0/1 colormap off/on Bit 6: 0: black hot 1: white hot Bit 7: output 0: signed 1: unsigned integer
0x200A	1	R/W	Colormap index

0x200D	1	W	Write 1 to save current settings as default setting, which is loaded after every reboot
0x200F	1	R/W	Automatic shutter calibration 0: disable 1:enable
0x2010	1	W	Maximal number of minutes between shutter calibration
0x2011	1	R/W	Delay between shutter movement and background accumulation
0x2035	1	W	Write 1 to reboot immediately
0x2036	1	W	Perform background accumulation
0x919008	2	R/W	Global offset, output = (input – offset) X gain/64
0x91900A	2	R/W	Global gain, output = (input – offset) X gain/64
0x609D3000	2,650,11	R/W	0x609D3000 - 0x60c59FFF stores user defined data in flash. Users can use these registers to store data that needs to be preserved after power cycles. <ul style="list-style-type: none"> - Data is stored in sectors. Each sector is 4096 bytes in size. - The starting address must be dividable by 4096. The address should have format 0Xxxxx x000. User data should be saved when video stream is turned off

Example tasks

NUC using external shutter

Disable shutter, write 0 to 0x2005

Put blackbody in front of the lens, then write 1 to 0x2036

Output raw data

Disable AGC, write 0 to 0x2008

Set offset=0 gain=1, write 0x00004000 to 0x919008

Disable colormap, for signed integer output, write 0 to 0x2009, unsigned integer output write 0x80 to 0x2009.

Output YUYV data for operating system camera apps

Enable colormap, write 1 to 0x2009

Enable AGC, write 1 or 2 to 0x2008

Save Data to flash

Disable video stream, write 0 to 0x2001

Write data to address between 0x609D3000 and 0x60c59FFF in unit of sectors.