SENTECH

12MP CoaXPress Camera

Product Specifications

Features

- 12 MP Resolution
- Monochrome or Color Models
- High Speed CoaXPress Output
- 180 FPS

Product Precautions

- Handle the camera with care. Do not abuse the camera. Avoid striking or shaking it. Improper handling or storage could damage the camera.
- Do not pull or damage the camera cable.
- During camera use, do not wrap the unit in any material. This will cause the internal temperature of the unit to increase.
- Do not expose the camera to moisture, or do not try to operate it in wet areas.
- Do not operate the camera beyond its temperature, humidity and power source ratings.
- While the camera is not being used, keep the lens or lens cap on the camera to prevent dust or contamination from getting in the CCD or filter area and scratching or damaging this area.
- Do not keep the camera under the following conditions:
    - In wet, moist, and high humidity areas
    - Under hot direct sunlight
    - In high temperature areas
    - Near an object that releases a strong magnetic or electric field
    - Areas with strong vibrations
- Apply the power that satisfies the requirements specified in this document to the camera.
- Use a soft cloth to clean the camera. Use pressured air spray to clean the surface of the glass. DO not scratch the surface of the glass.
- The camera is a general-purpose electronic device; using the camera for the equipment that may threaten human life or cause dangers to human bodies directly in case of failure or malfunction of the camera is not guaranteed. Use the camera for special purposes at your own risk.

1 Overview

This document describes the specifications of the following cameras

STC-CMC120ACXP	(12MP Color)
STC-CMB120ACXP	(12MP Monochrome)

1.1 Features

- CMOS Sensor (Global Shutter)
- CoaXPress (CXP) Interface
- Maximum 180 fps on 12 megapixel (8bit)

1.2 Naming Method

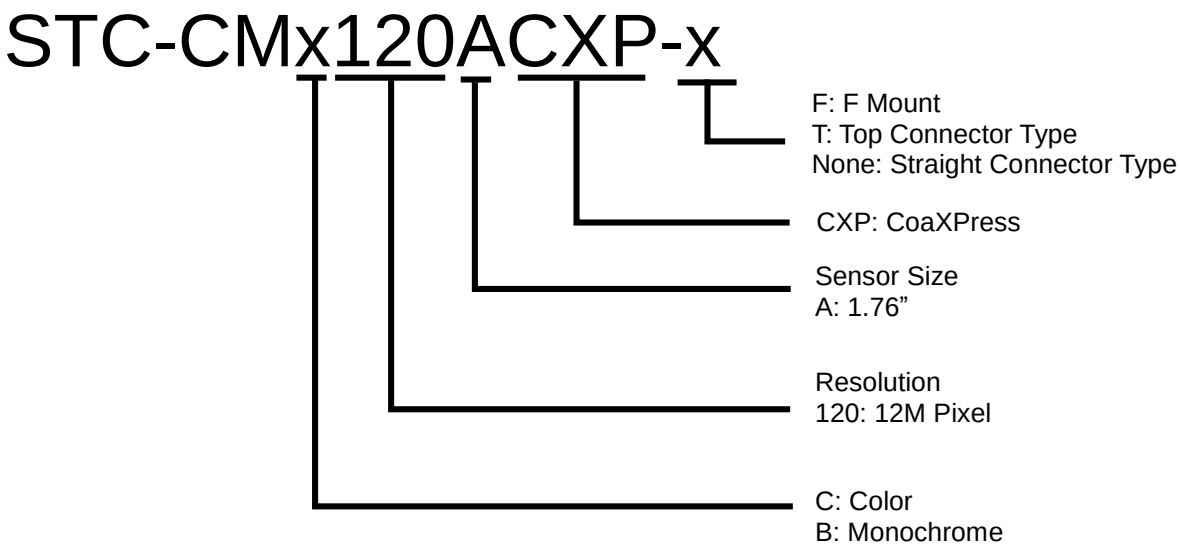


Figure 1. Naming Method

2 Specifications

2.1 Electronic specifications / Mechanical specifications / Environmental specifications

2.1.1 STC-CMC120ACXP (Color)/STC-CMB120ACXP (Monochrome)

Product			STC-CMC120ACXP	STC-CMB120ACXP
Electronic specifications	Imager		1.76 " Type 12Meg color progressive CMOS (CMOSIS: CMV12000)	1.76" Type 12Meg monochrome progressive CMOS (CMOSIS: CMV12000)
	Shutter		Global Shutter	
	Active picture elements		4096 (H) x 3072 (V)	
	Chip size		22.5 × 16.9 mm	
	Cell size		5.5 (H) x 5.5 (V) µm	
	Scanning system		Progressive	
	Scanning method		Full scanning, Variable ROI	
	Frame rate		180fps (8bit 4-Lane)	
	Video Output Interface		CXP-6(6.25Gbps) 4 Lane	
	Noise level	8bit	≤ TBD Digit (Gain 0 dB)	
	Minimum scene illumination		TBD Lux at F2.25	TBD Lux at F2.25
	Sync. System		Internal	
	Shutter speed		16[us] to 16[s]	
	Gain	Digital	1 to x5	
		Analog	x1,x2,x3	
	Trigger Mode		Free Run / Edge Preset Trigger / Pulse Width Trigger / CXP Tigger Packet	
	Communication		Protocol: CoaXPress Standard Version 1.1 Interface: GenIcam	
	ROI		Adjustable Steps for image size: 16 pixels in horizontal direction and 4 lines in vertical	
	I/O		3 GPIO	
	Binning		N/A	
	HDR		Support	
	Pixel Defect Correction		Support	
	Vertical Line Correction		Support	
	Power	Input Source	PoCXP, (IO connector CH1 Only) *1	
		Input voltage	TBD (18.5Vdc to 26Vdc (24V Nominal))	
		Consumptio	TBD	
Mechanical specifications	Dimensions		68 (W) x 68 (H) x 40 (D) mm (Excluding the connector)	
	Optical filter		No IR cut filter	
	Material		Aluminum alloy	
	Lens mount		M42×P1.0, FB = 10.0mm (in Air)	
	Interface connector		CXP connector (camera: DIN1.0/2.3, Jack x 4, 75Ω) Power/IO connector: HR10A-7R-6PB (Hirose) or equivalent	
	Weight		TBD	
Environmental specifications	Operational temperature		TBD (-5 to 40 deg. C)	
	Storage temperature		TBD (-30 to 65 deg. C)	
	Vibration		20Hz to 200Hz to 20Hz (5min./cycle), acceleration 10G, XYZ 3 directions 30 min.	
	Shock		Acceleration 38G, half amplitude 6ms, XYZ 3 directions 3times each	
	Standard compliancy		EMS: EN61000-6-2, EMI: EN55022 (Class B) (To be obtained)	
	RoHS		RoHS, REACH compliance	

Table 1. Specifications

*1: When CH1 is connected to a Frame Grabber, the Frame Grabber will provide power over CoaXPress. Certain Frame Grabbers will attempt to connect when CH1 is connected, occasionally the camera may not be recognized as a CXP-6(6.25Gbps) 4 Lane camera. In order to recognize the camera as CXP-6(6.25Gbps) 4 Lane camera, please connect CH1 after connecting CH2 – 4.

2.2 Spectral Sensitivity Characteristics

2.2.1 STC-CMC120ACXP / STC-CMB120ACXP

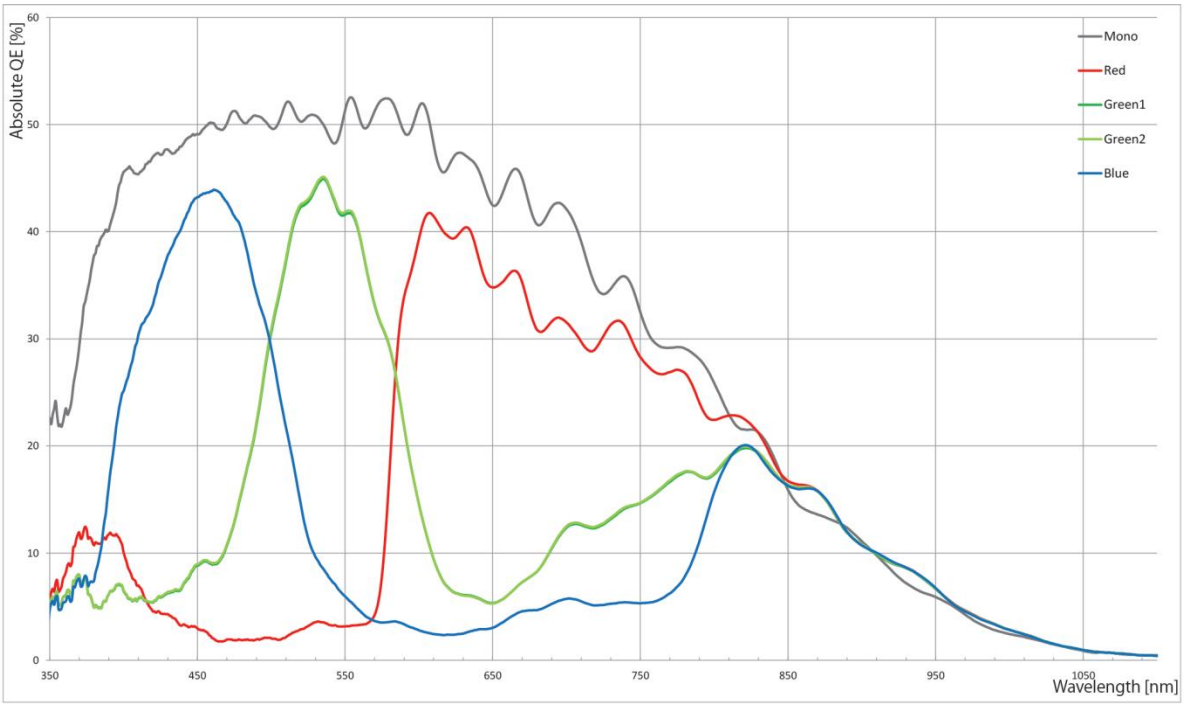


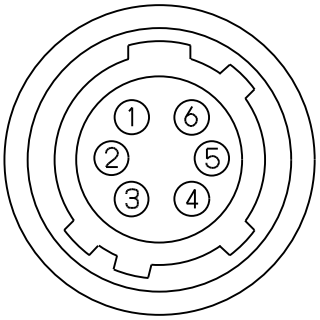
Figure 2. Spectral Sensitivity Characteristics

2.3 IO Connector

HR10A-7R-6PB (Hirose) or equivalent.
This connector is for input and output signals.
The trigger input and sync input /output signals can be assigned through the camera setting communication. As for the cable part (Female connector), HR10A-7P-6S (Hirose) or equivalent can be used.

2.3.1 Pin assignment

Pin No.	Signal Name	IN/OUT
1	GND	-
2	GPIO2	IN/OUT
3	GPIO1	IN/OUT
4	GPIO0	IN/OUT
5	NC	-
6	NC	-



*Possible Maximum Rated Voltage is +24V.on GPIO0, GPIO1 and GPIO2.
*Please set electrically “OPEN” on NC (Pin 6).

2.3.2 Input Output DC characteristics *1

Pin No.	Signal Name	Function	IN/OUT		Voltage		Current	Reference
					Low Voltage	High Voltage		
1	GND	GND	-				-	-
2	GPIO2	General Purpose Input Output	IN/OUT	IN	Less than+1.00V	+3.00 to +24V	4uA(typ.)	2
				OUT	0 to +2.20V	+3.00 to +24V	15mA (Max.)	3,4
3	GPIO1	General Purpose Input Output	IN/OUT	IN	Less than+1.00V	+3.00 to +24V	4uA(typ.)	2
				OUT	0 to +2.20V	+3.00 to +24V	15mA (Max.)	3,4
4	GPIO0	General Purpose Input Output	IN/OUT	IN	Less than+1.00V	+3.00 to +24V	4uA(typ.)	2
				OUT	0 to +2.20V	+3.00 to +24V	15mA (Max.)	3,4
5	N.C.	NC	-	-			-	-
6	N.C.	NC	-	-			-	-

*1) The values listed in the table are just for reference, please evaluate carefully when these IO are used.

2.3.3 Default Setting of Input Output

Pin No.	Signal Name	Default	
		IN/OUT	Setting
2	GPIO2	IN	Disable
3	GPIO1	IN	Disable
4	GPIO0	IN	Disable

2.3.4 GPIO Circuit (Input)

Input Signal Functions

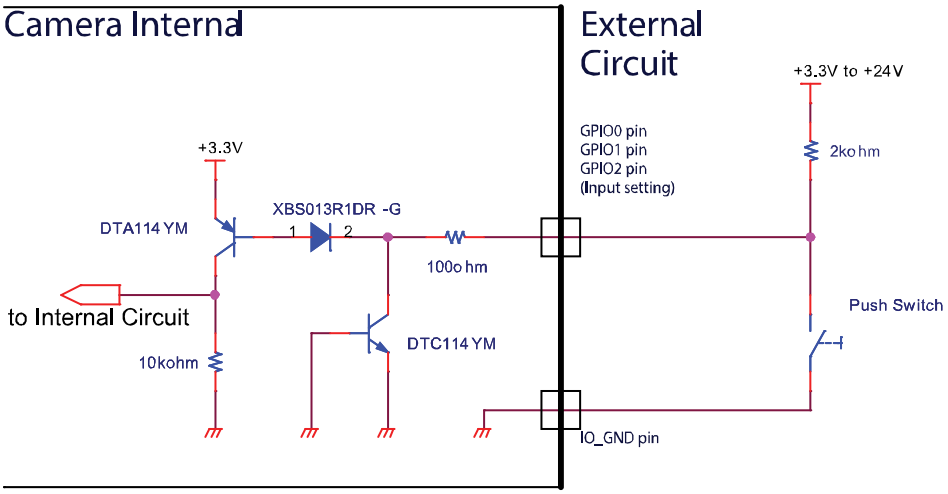
No.	Function	Polarity
1)	Disable (Default)	-
2)	General Input	-
3)	Trigger Input	Positive or Negative

1) Disable
This function should be set when no input signal is necessary.

2) General Input
This function can set high or low level and the user can use this to check the status on the software.

3) Trigger Input
This function is used for the trigger signal in the edge preset mode.

General Purpose Input (Reference 1)



Input Response Characteristics
TBD

2.3.5 GPIO Circuit (Output)

Output Signal Functions

No/	Function	Polarity
1)	Disable (Default)	-
2)	General Output(UserOutput0/1/2)	-
6)	Frame End	Positive or Negative
8)	Exposure Active	Positive or Negative

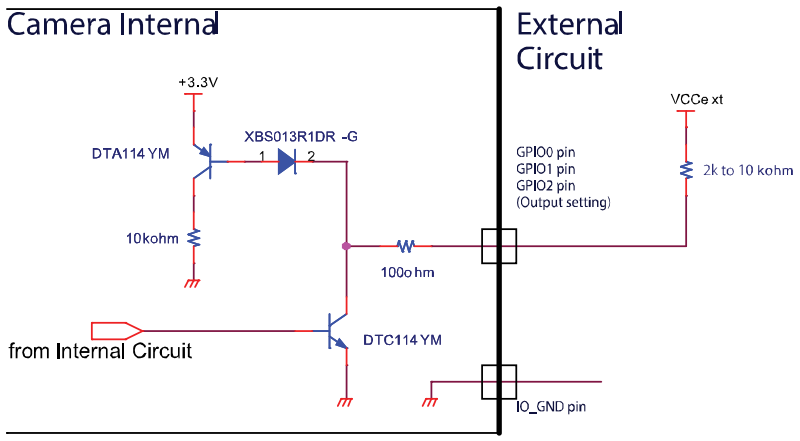
1) Disable
This function should be set when no output signal is necessary.

2) General Output
This function outputs high or low level signals set on the software.

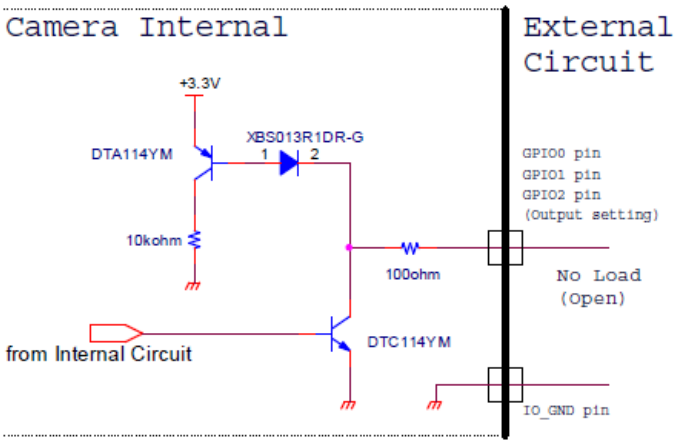
6) Frame End
This function outputs when exposure ends with the pulse delay setting and pulse duration applied.

8) Exposure Active
This function outputs the High or Low signal while in actual exposure time.

General Purpose Output (Reference 2)



General Purpose Output (Reference 3)

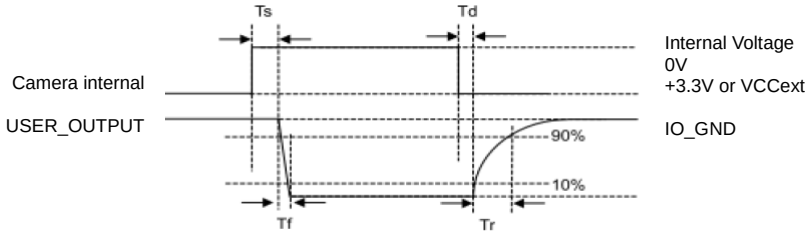


Characteristics of the output signals

Response characteristics of the General Purpose output (Reference 2), and General Purpose output (Reference 3) are shown in the diagram below. Pulse width is configurable through software.
Please refer to the following response timing table for further information.

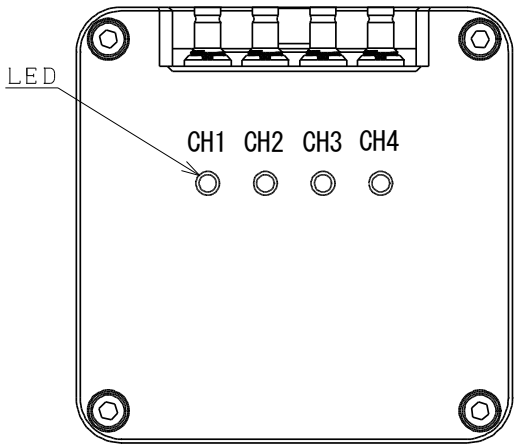
	VCCext			
	OPEN(*1)	5V (*2)	12V (*2)	24V (*2)
Td	1.82 usec	1.72 usec	1.77 usec	1.72 usec
Tr	8.58 usec	0.97 usec	0.91 usec	0.89 usec
Ts	0.11 usec	0.12 usec	0.14 usec	0.15 usec
Tf	0.10 usec	0.13 usec	0.23 usec	0.36 usec

*1: Reference 2. Measured on +1.8V internal Voltage.
*2: Reference 3



2.4 Connector indicator lamps

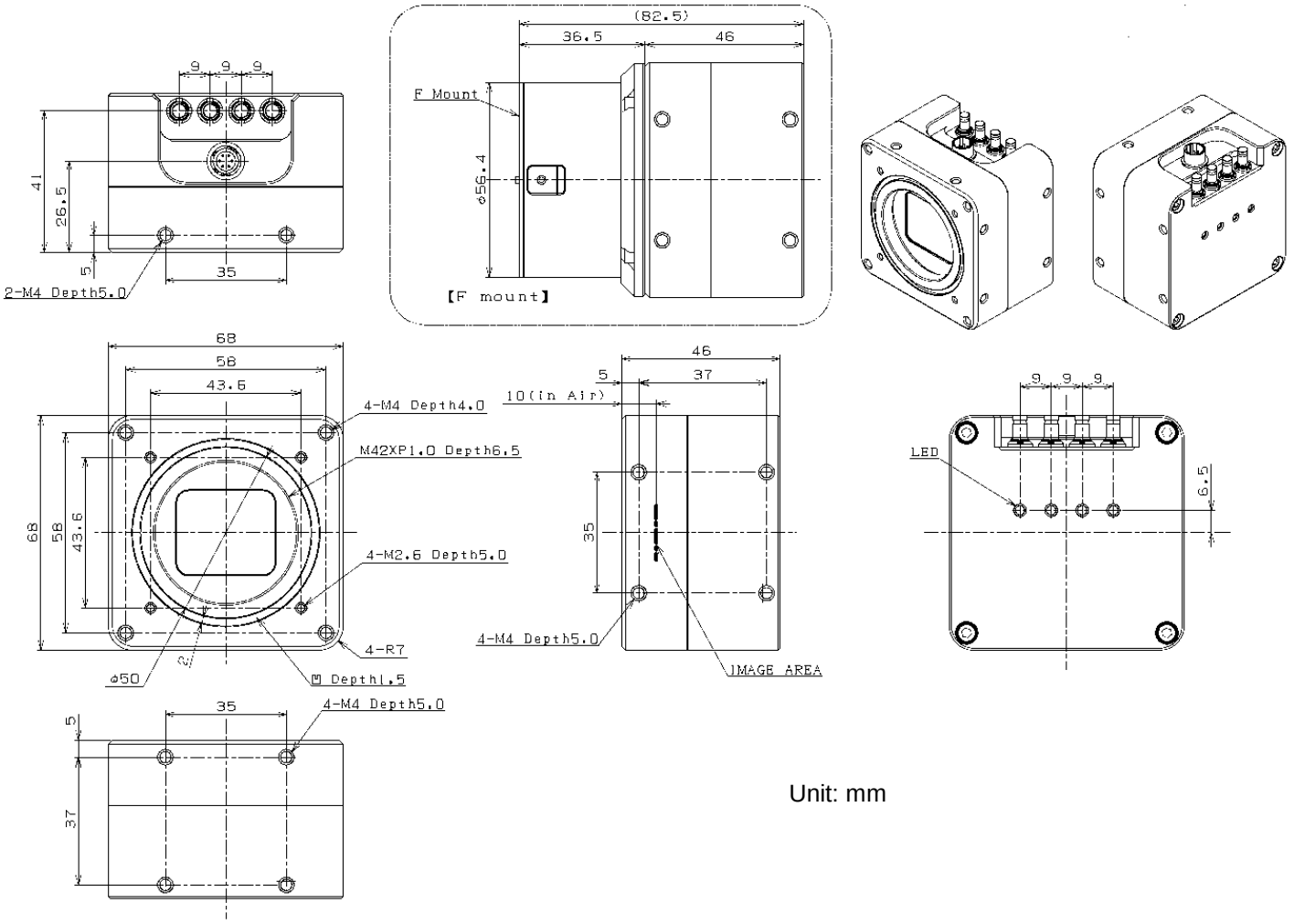
A connector indicator LED exists beside of each the DIN connectors.
Each LED informs the user of different statuses of communication. For further information on the details, please refer to the table below.



Status	LED Flicker Pattern
No power	Off
System booting	Solid orange
Powered, but nothing connected (not applicable to a Device reliant on PoCXP power)	Slow pulse red
Connection detection in progress, PoCXP active	Fast flash alternate green / orange Shown for a minimum of 1s even if the connection detection is faster
Connection detection in progress, PoCXP not in use	Fast flash orange / Shown for a minimum of 1s even if the connection detection is faster
Device / Host connected, but no data being transferred	Solid green
Device / Host incompatible, PoCXP active	Slow flash alternate red / green
Device / Host incompatible, PoCXP not in use	Slow flash alternate red / orange
Device / Host connected, waiting for event (e.g. trigger, exposure pulse)	Slow pulse orange
Device / Host connected, data being transferred	Fast flash green.
Data Transfer Error	Red LED ON (500msec)
System Error	Red LED flicker fast

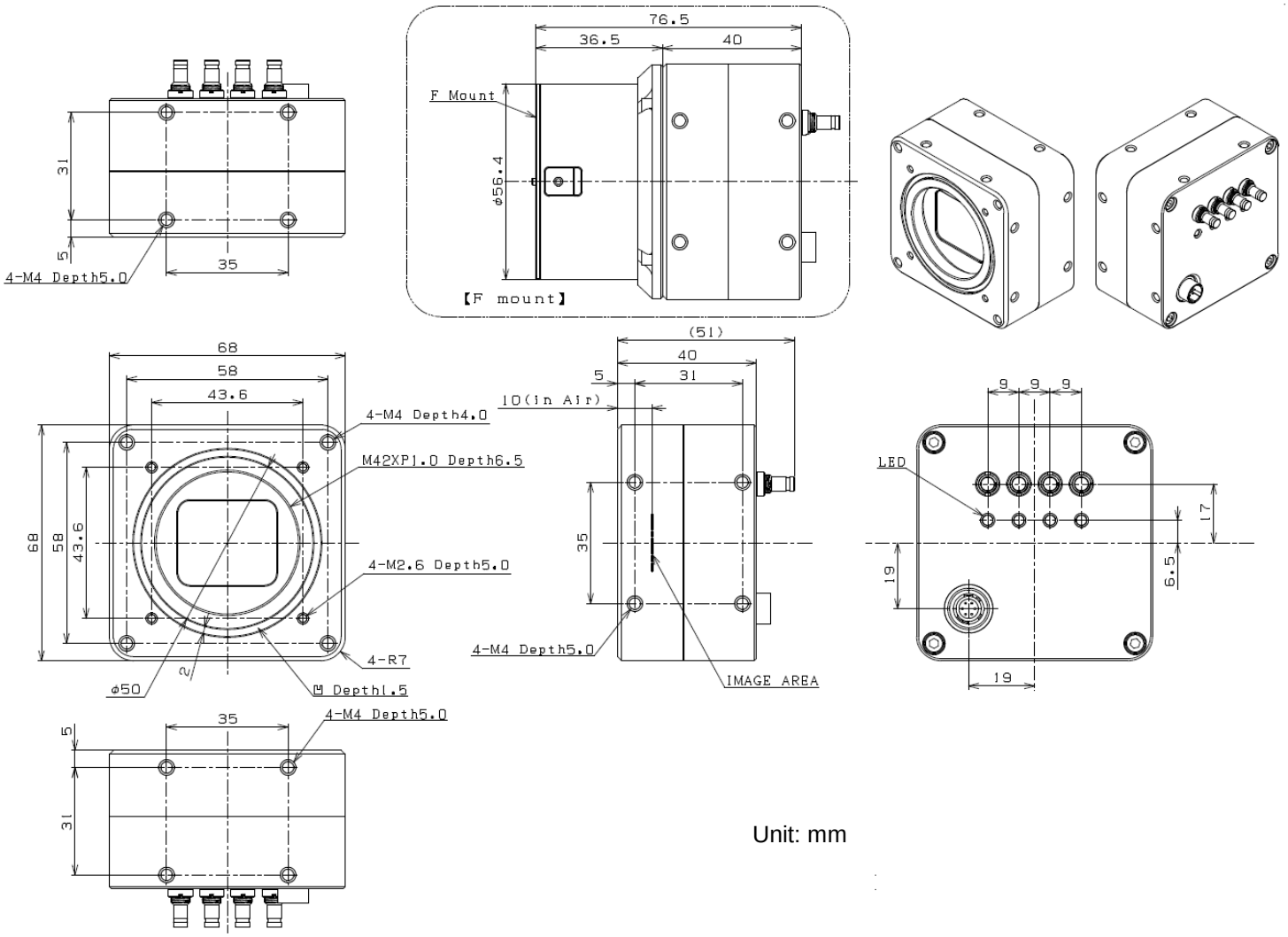
3 Dimensions

3.1 Top Connector Model



Unit: mm

3.2 Straight Connector Model



Unit: mm

4 Camera Operation

4.1 GenICam Command Reference Table

GenICam command	Function
Width	4096 (pixel)
Height	3072 (pixel)
PixelFormat	Format of the pixels provided by the device
ExposureMode	Sets the operation mode of the Exposure (or shutter)
ExposureTime	Sets the Exposure time
TriggerDelay	Specifies the delay in microseconds (us) to apply after the trigger reception before activating it
TriggerSelector	Selects the type of trigger to configure
TriggerSource	Specifies the internal signal or physical input Line to use as the trigger source
TriggerSoftware	Generates an internal trigger
TriggerMode	Controls if the selected trigger is active
LineDebounceTime	Sets the value of the input line debouncer time
LineSelector	Selects the physical line (or pin) of the external device connector to configure
LineSource	Selects which internal acquisition or I/O source signal to output on the selected Line
UserOutputValue	Sets the value of the bit selected by UserOutputSelector
LineInverter	Controls the inversion of the signal of the selected input or output Line
UseroutputSelector	Selects which bit of the User Output register will be set by UserOutputValue
TriggerOutOnTime	Duration of TriggerOut signal when LineSource is set to TriggerOut(us)
TriggerOutDelay	Delay of TriggerOut signal when LineSource is set to TriggerOut(us)
StrobeOutDelay	Delay of StrobeOut signal when LineSource is set to StrobeOut(us)
GainSelector	Selects which Gain is controlled by the various Gain features
Gain	Controls the selected gain as an absolute physical value
BlackLevel	Controls the black level as an absolute physical value
DeviceSerialNumber	Device's serial number
DeviceTemperature	Device temperature in degrees Celsius (C)
HDRMode	Sets the HDR mode
HDRSlope	HDR mode can choose 1slope,2slope or 3slope mode
HDRKnee1	The parameter sets it in % for the ExposureTime
HDRKnee2	The parameter sets it in % for the ExposureTime
HDRVlow1	Set the voltage of HDRVlow1 for the HDR saturation level
HDRVlow2	Set the voltage of HDRVlow2 for the HDR saturation level
Cxp Link Configuration	CXP6_X4

GenICam command	Function
Device Tap Geometry	Geometry_1X_1Y
UserSetSelector	Selects the feature User Set to load, save or configure
UserSetLoad	Loads the User Set specified by UserSetSelector to the device and makes it active
UserSetSave	Save the User Set specified by UserSetSelector to the non-volatile memory of the device
UserSetDefault	Selects the feature User Set to load and make active by default when the device is reset

4.2 Saving and Loading a data

This camera can save and load the camera parameters. The user is also able to restore the camera to the factory defaults.There are two kinds of data that exist within the camera.

Default: The factory default data
UserSet1: User accessible data for saving

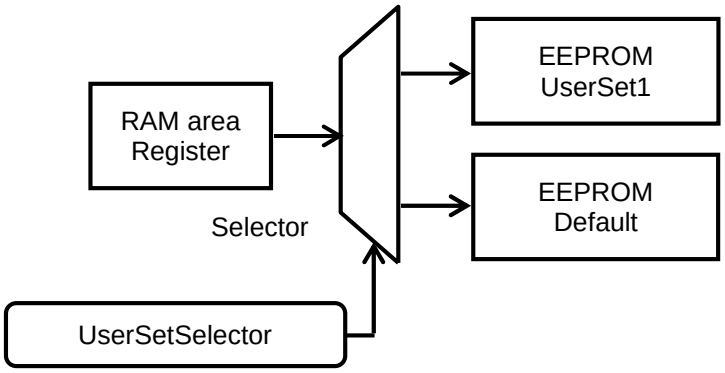
The data is loaded and written into the register on the RAM of camera.
These functions can be accessed through the parameters (UserSetSelector, UserSetDefault) and commands (UserSetLoad, UserSetSave) on the UserSetControl category of GenICam.

For the full descriptions of the parameters and commands, please see the table below.

GenICam Parameters

UserSetSelector	Enumeration	Selects the feature User Set to load from “Default”, “UserSet1”
UserSetDefault	Enumeration	Selects the feature User Set to load and make active by default “Default”,” UserSet1” from when the device is reset
UserSetLoad	Command	Loads the User Set specified by UserSetSelector to the device and makes it active
UserSetSave	Command	Save the User Set specified by UserSetSelector to the non-volatile memory of the device

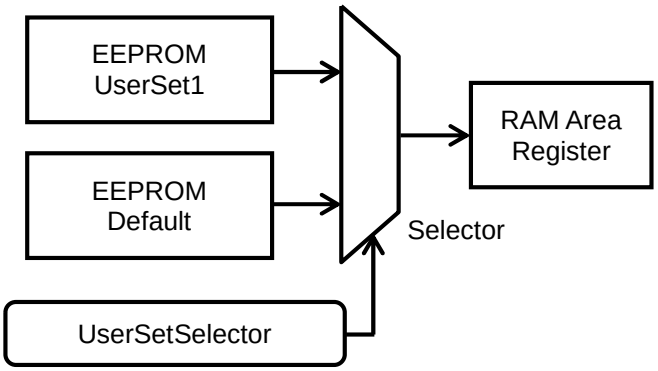
4.2.1 Save Setting



When executing UserSetSave, write the camera setting information from the RAM into the memory area that was selected on the UserSetSelector.
Note: UserSetSave is not available when Default on UserSetSelector was selected.

Setting Procedure
1. Set UserSet1 on the UserSetSelector
2. Execute UserSetSave

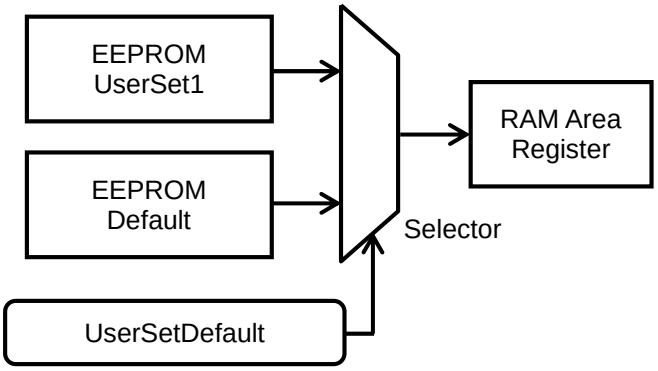
4.2.2 Load Setting



When executing UserSetLoad, write the camera setting information from the RAM into the memory area that was selected on the UserSetSelector.

Setting Procedure
1. Set UserSet1 or Default on UserSetSelector
2. Execute UserSetLoad

4.2.3 Camera startup



When powering on the camera, the camera setting information is written from the RAM memory area.

Setting Procedure
1. Set UserSet1 or Default on UserSetDefault

4.2.4 Camera initialization

In order to initialize camera setting, please follow the procedure shown below.
Write Default into UserSet1.

Setting Procedure
1. Set Default on UserSetSelector
2. Execute UserSetLoad
3. Set UserSet1 on UserSetSelector
4. Execute UserSetSave

5 Revision History

Rev	Date	Changes	Note
00	2015/06/04	● Released: Production model	
01	2015/08/17	● Revised Shutter Speed, ROI	