2M CMOS Camera

(Camera Link Full 10 Tap)

ID2MB-CLDIR (NIR)

Technical Manual

iDule Corporation

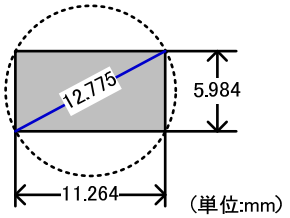
Table of Contents

PAGE

1. **Product Outline** 3
2. **Handling Precautions** 3
3. **Specification** 4
   - 3.1. General Specification 4
   - 3.2. Camera Output Signal Specification 5
   - 3.3. Spectral Response (Representative Value) 6
4. **Connector** 7
   - 4.1. Camera Link Connector 12226-1100-00PL (SUMITOMO 3M) 7
   - 4.2. Power LED 7
5. **Timing Chart** 8
   - 5.1. Horizontal Synchronous Signals Timing (10Tap Full Configuration : 337fps) 8
   - 5.2. Vertical Synchronous Signals Timing (10Tap FUll Configuration : 337fps) 8
   - 5.3. Video Output Format 9
   - 5.4. Fixed Trigger Shutter Mode 10
   - 5.5. Pulse Width Trigger Shutter Mode 11
6. **Partial Scan Mode** 12
7. **Remote Communication** 14
   - 8.1. Command Specifications 15
   - 8.2. Control Example 19
8. **Function Setting** U D W

3. **Specification**

3.1. General Specification

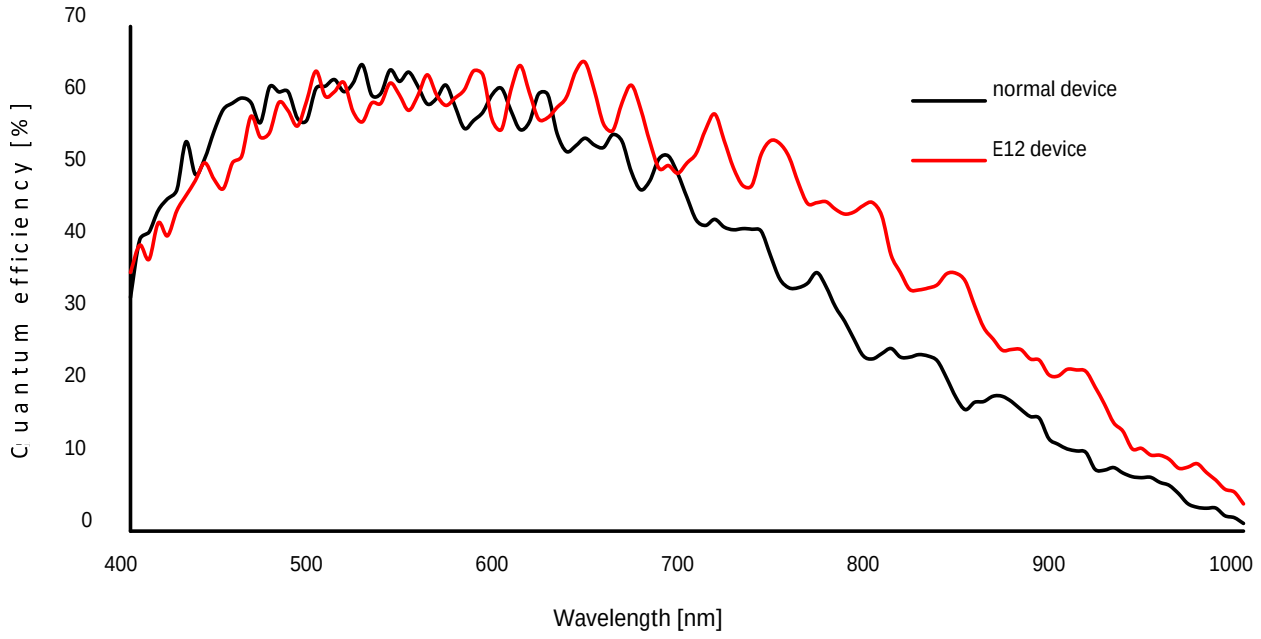
(1) Image Sensor	Type	Diagonal length 12.775mm, Global Shutter (CMOSIS CMV2000)	
	Effective Pixel Number	2048(H) x 1088(V)	
	Cell Size	5.5μm(H) x 5.5μm(V)	
	Image Circle	Φ12.775mm	
(2) Video Output Frequency	Pixel Clock	76.8MHz	
	Output Effective Pixel number	2040(H) x 1088(V)	
	10Tap Full Configuration	337fps 206 207(H) x 2064(V) wit	

3.2. Camera Output Signal Specification

(1)Video Output Data	Effective Video Output	2048(H) × 20
(2)Sync Signal Output	LVAL FVAL DVAL SP	Camera Link (
(3)Camera Control Signal Input	CC2 CC3CC2	

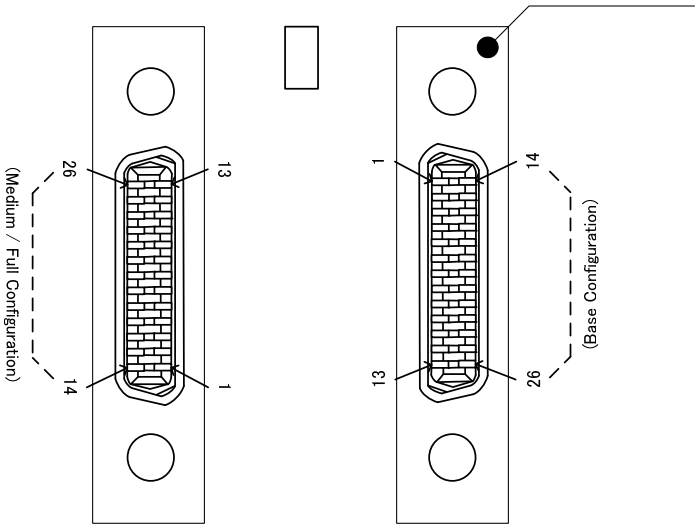
3.3. Spectral Response (Representative Value)

E12 device



4. **Connector**

4.1. Camera Link Connector 12226-1100-00PL (SUMITOMO 3M)



Connector (CN2)

Pin No		Pin No	
1	**NC**	14	**GND**
2	Y0-	15	Y0+
3	Y1-	16	Y1+
4	Y2-	17	Y2+
5	Yclk-	18	Yclk+
6	Y3-	19	Y3+
7	100Ω	20	Terminated
8	Z0-	21	Z0+
9	Z1-	22	Z1+
10	Z2-	23	Z2+
11	Zclk-	24	Zclk+
12	Z3-	25	Z3+
13	**GND**	26	**NC**

Connector (CN1)

Pin No		Pin No	
1	**+12V(PoCL)**	14	**GND**
2	X0-	15	X0+
3	X1-	16	X1+
4	X2-	17	X2+
5	Xclk-	18	Xclk+
6	X3-	19	X3+
7	SerTC+	20	SerTC-
8	SerTFG-	21	SerTFG+
9	CC1- (Trigger IN -)	22	CC1+ (Trigger IN +)
10	CC2+	23	CC2-
11	CC3-	24	CC3+
12	CC4+	25	CC4-
13	**GND**	26	**+12V(PoCL)**

4.2. Power LED

Camera turns on LED light, when it is supplied electricity from the frame Grabber board.

*Power feeding line of CN1 (on Base Configuration connector side) will be connected to the camera internal power input. At this time, power feeding line of CN2 (on Medium/Full Configuration connector side) shall be OPEN. Please contact the frame grabber board manufacturer to make sure that there would be no problem with the above connection.

5. **Timing Chart**

5.1. Horizontal Synchronous Signals Timing (10Tap Full Configuration : 337fps)



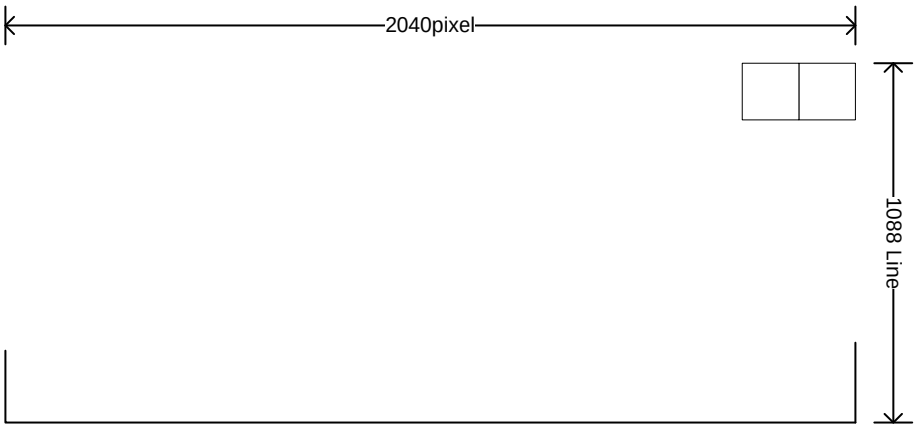
Camera Link Port C
Camera Link Port D

5.2. Vertical Synchronous Signals Timing (10Tap FUll Configuration : 337fps)

2048

5.3. Video Output Format

(1) 10Tap Full Configuration : 337fps



5.4. Fixed Trigger Shutter Mode

This is the mode to start exposu

5.5. Pulse Width Trigger Shutter Mode

This is the mode to start exposure with external input trigger signals, and set the exposure time with pulse width of the trigger signals.

Trigger operation is H Sync. V-Sync Rest.

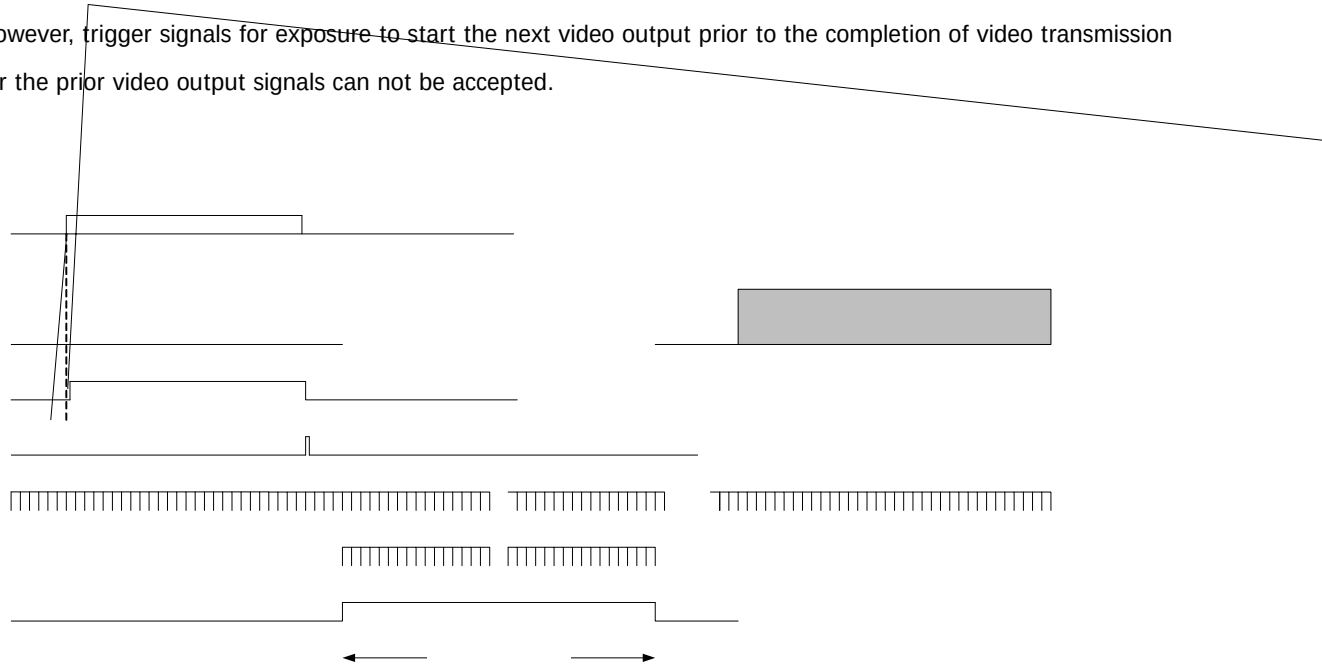
Delay time (Exposure Time Delay) from detecting trigger edge in the camera to starting exposure, and from detecting trigger end edge to completing exposure is max 1HD.

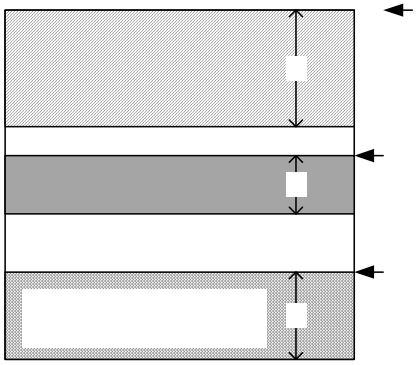
Pulse width is min. 1HD (min) to approx. 2 frames.

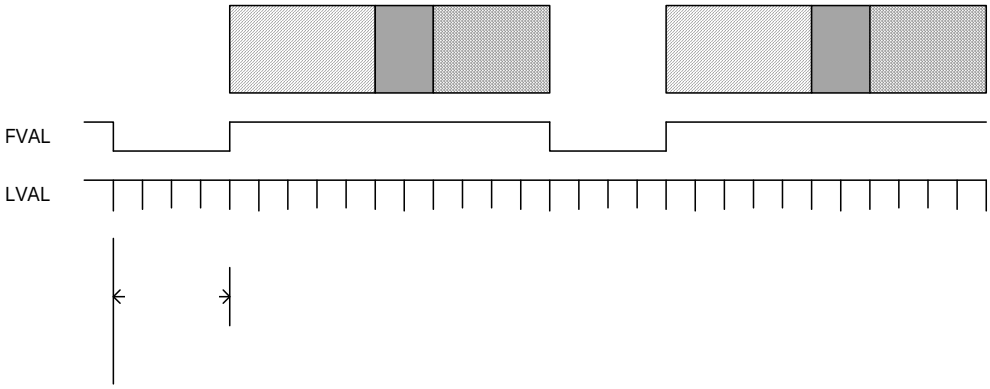
Functionally, there is no upper limitation, but noises such as dark noises and shadings may be noticeable at long time exposure.

Triggers can be accepted even when outputting video signals.

However, trigger signals for exposure to start the next video output prior to the completion of video transmission for the prior video output signals can not be accepted.






FVAL
LVAL

When setting several partial scan areas, please set the start position and effective lines trying not to overlap the areas.

When setting several areas, please set the areas in the numerial order of start position.

Entire frame line numbers = **V blanking line numbers (16H fixed)**

Partial effective lines 1 + Partial effective lines 2 + + Partial effective lines 8

Note that “Sum total of partial effective line numbers (expect V blanking lines) < **2048**” should be met.

Frame rate = 1 / (Entire frame line numbers × Time for 1 line)

Camera Mode	Time for 1 Line
10Tap Full Configuration	2.6875us

Example

	Effective Line Number	Frame Total Line Number	Frame Rate (Total Line)
1(Min:B&W)	1H	17H	21888fps
2(Min:Color)	2H	18H	20672fps
Vertical:VGA	480 H	496H	750fps
Vertical:XGA	768 H	784H	475fps
Vertical:SXGA	1024 H	1040H	358fps
1088 (Max)	1088 H	1104H	337fps

7. **Remote Communication**

Via camera link cable, the camera can be controlled.

Communication Settings	
Baud Rate	9600bps (Initial Setting)
Data	8bit
Stop bit	1bit

8.1. Command Specifications

1) Set some values of resister

Command Set Resister

STX	S	R	(a)	(a)	(d)	(d)		ETX
			Address		Data		Variable-length	max 16 address

Return Value

Succeed	ACK
Fail	NAK

2) Get some value of resister

Command Get Resister

STX	G	R	(a)	(a)	(d)	ETX
			Address		Number of data acquisition	optional

Return value

Succeed

STX	A	R	(d)	(d)		ETX
			Data	Data length depends on the number of acquisitions		

Fail

NAK

Remarks

The command gets some value of register of the specified address. The number of the acquisition is between '0' and 'F' Hexadecimal .

If appoint '0' at the address, the command send data of 16 address. If the command is omitted at the address, the command send an address.

3) Set User's data

Command Set User's data

STX	S	U	(n)			ETX

Table No. (0~3)

User's data (fixed length :16byte)

Return Value

Succeed	ACK
Fail	NAK

Remarks

The commands, sets free data on the specified register, and can use 4 tables (1 table : 16 characters).

4) Get User's data

Command Get User's data

STX	G	U	0	ETX

Table No. (0~3)

Response

Succeed

STX	A	U	(d)	(d)	ETX

User's data (fixed length : 16byte)

Fail

NAK

5) Save all configurations

Command	Configuration	Save
STX	C	S	ETX

Return Value

Succeed	ACK
Fail	NAK

6) Restore all configurations

Command	Configuration	Restore
STX	C	R	ETX

Return Value

Succeed	ACK
Fail	NAK

7) Get a model name

Command	Query	Model name
STX	Q	M	ETX

Return Value

Succeed STX R M D ' (d) (d)

Command Query

9) Get a firmware version

Command Query Version

STX	Q	V	ETX

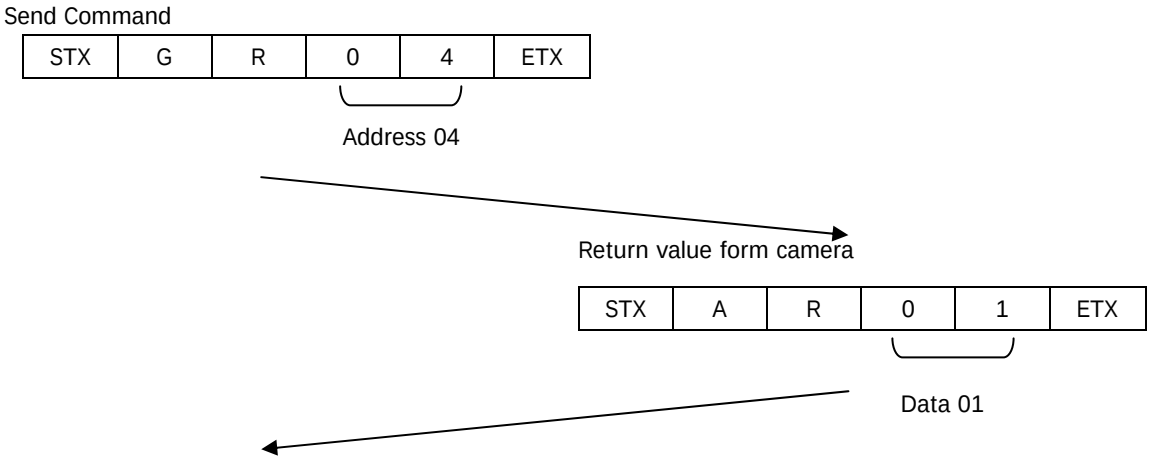
Return Value

Succeed

STX	R	V	(d)	(d)	ETX

8.2. Control Example

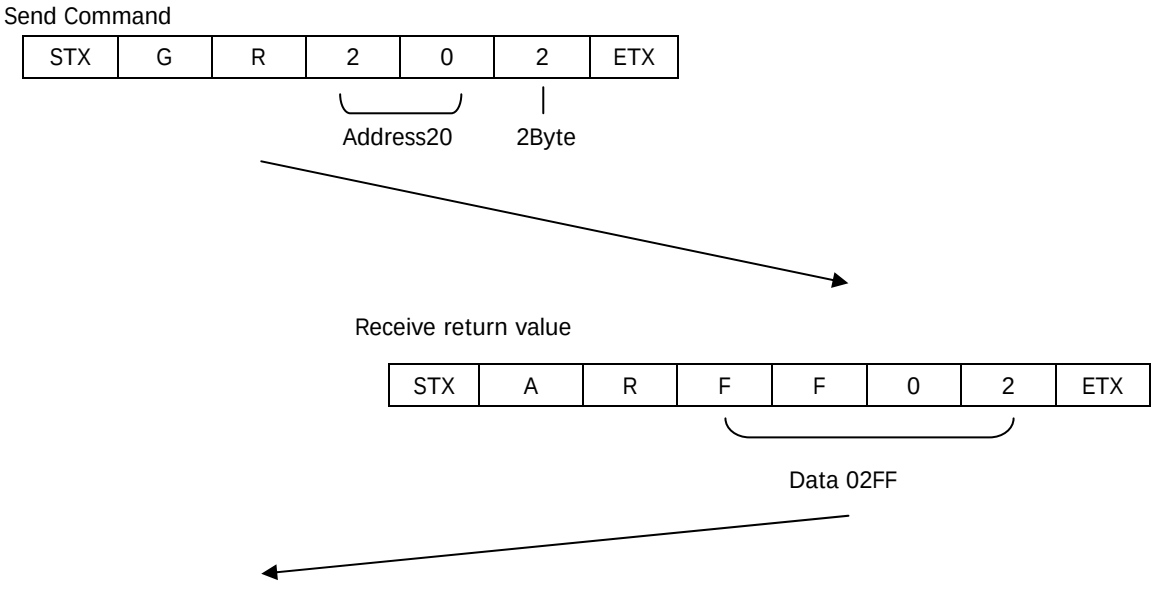
1) How to check trigger shutter mode. (The command gets a value from address 04)



Receive Return Value

The camera is working with a trigger shutter mode, because the command received a 01 from the camera.

2) How to check trigger shutter mode. (The command gets consecutive 2 bytes values from address 20)



Receive return value

The shutter mode of camera is working +12dB, because the command received a 02FF(767) from the camera.

3) How to set partial scan mode. (The command sets 01 for address 08)

Send Command

STX	S	R	0	8	0	1	ETX

Address 08 Data 01

Return value form camera

Receive Return Value

The command finished normally, because the command received ACK from the camera.

4) How to Send Command for manua Ä M ت t ³ How ¥ ” ʌ þ ẇ l Ə

STX S R 0 H Addr

5) How to save configurations of a camera. (The command send CS)

Function	Address(Hex)	Data(Hex)

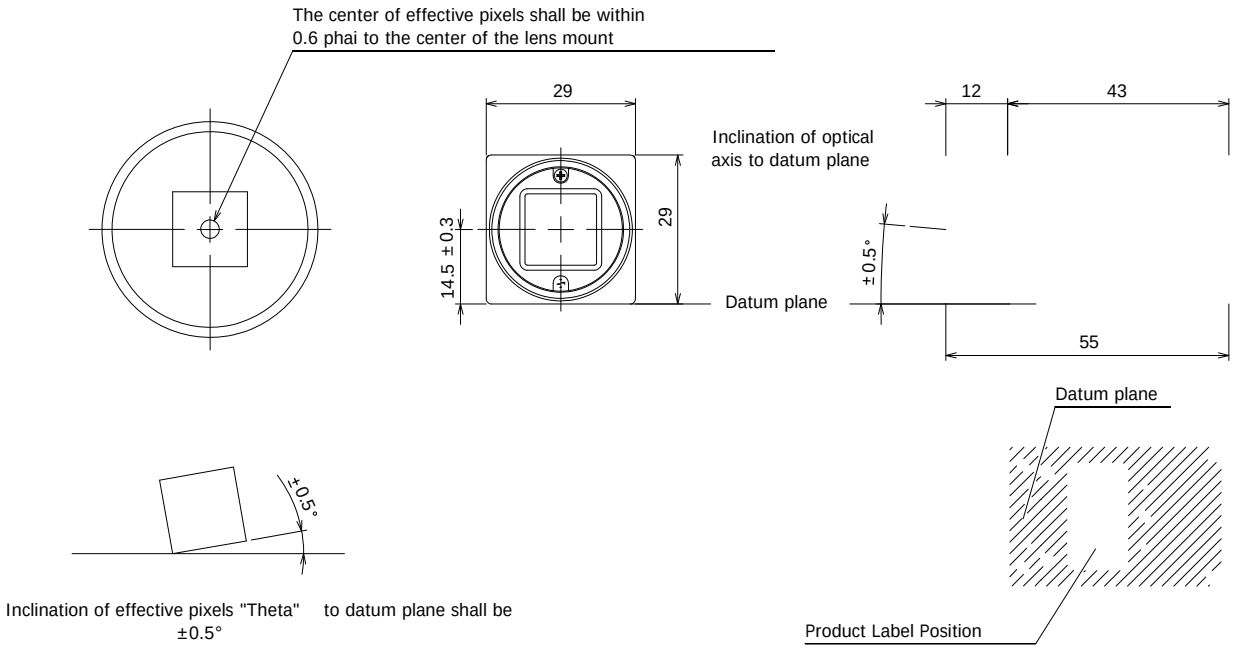
Function	Address(Hex)	Data(Hex)	
Cursor Position X Coordinate	3C-3D	LLHH:	min:0(0H) – max:1087(43FH)
Cursor Position Y Coordinate	3E-3F	LLHH:	min:0(0H) - max:1086(43EH)
Partial Scan Start Position 1	40-41	LLHH:	min:0(0H) - max:1087(43FH) *ID2MC-CLD : Color Camera Start Position Setting -> Only even number *If you not use partial scan function, you need to set "start position 1~8=0".
Start Position 2	42-43		
Start Position 3	44-45		
Start Position 4	46-47		
Start Position 5	48-49		
Start Position 6	4A-4B		
Start Position 7	4C-4D		
Start Position 8	4E-4F		
Partial Scan Effective Line 1	50-51	LLHH:	min:1(1H) - max:1088(440H) *ID2MC-CLD : Color Camera Effective Line Setting -> Only even number *If you not use partial scan function, you need to set "effective line 1=1088(440H),2~8=0(0H)".
Effective Line 2	52-53		
Effective Line 3	54-55		
Effective Line 4	56-57		
Effective Line 5	58-59		
Effective Line 6	5A-5B		
Effective Line 7	5C-5D		
Effective Line 8	5E-5F		

LLHH : The data set with 2 Byte shall be set with Low Byte first, then set with High Byte.

< Example > Manual Shutter(Address 24-25) ->6671(1A0FH)

STX SR 24 0F 1A ETX

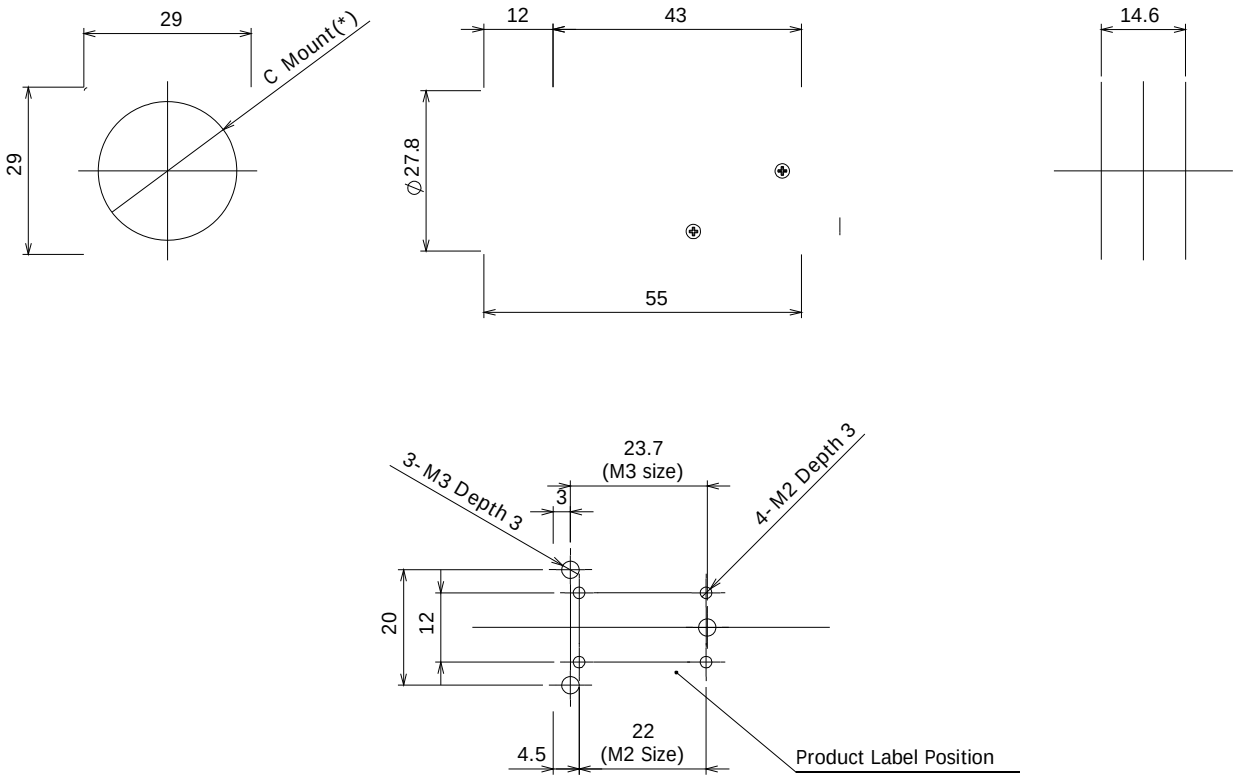
9. **CMOS Optical Axis Accuracy**



10. **Dimensions**

*1) Screw length from the lens mount surface shall be under 6mm.
And protruding portion shall be less than 10mm.

*2) C mount screws comply with ANSI/ASME B1.1,1-32UN(2B).



11. **Initial Setting**

12. **Cases for Indemnity (Limited Warranty)**

We shall be exempted from taking responsibility and held harmless for damage or losses incurred by the user in the following cases.

In case damage or losses are caused by fire, earthquake, or other acts of God, acts by third party, deliberate or accidental misuse by the user, or use under extreme operating conditions.

In case indirect, additional, consequential damages (loss of business interests, suspension of business activities) are incurred as result of malfunction or non-function of the equipment, we shall be exempted from responsibility for such damages.

In case damage or losses are caused by failure to observe the information contained in the instructions in this product specification & operation manual.

In case damage or losses are caused by use contrary to the instructions in this product specification & operation manual.

In case damage or losses are caused by malfunction or other problems resulting from use of equipment or software that is not specified.

In case damage or losses are caused by rep l M E ion ! v