IEEE 1394 DIGITAL PROGRESSIVE SCAN CCD CAMERA

MC-F Firewire Cameras

User's Manual

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Important information

Before using this camera, please carefully read User's Manual to use the product better. The product has been safely designed to prevent malfunctions and accidents. Please observe strictly the handling precautions below. If faults are suspected, consult the shop for IMI products nearest you without attempting to disassemble the camera yourself.

Warning

Do not remove screws or covers to prevent fire or electric shock.
Do not expose this camera to rain, directly to sunlight or moisture, nor try to operate it in wet areas.
Do not attempt to remove camera cover nor modify any unit.
Warranty will be voided against the damage caused by you or any other equipment.

Precautions

- Do not attempt to disassemble, modify, or repair the camera.
- Do not directly shoot sunlight or strong spotlight to the camera for a long period as it may cause CCD blooming and permanent damages.
- Do not operate the camera beyond the temperature range and avoid using the camera over 90% humidity.
- Do not use unregulated power supply source.
- Do not clean CCD faceplate with fingers or any hard objects other than Lens tissue or a cotton tipped applicator and ethanol.
- Do not use the strong or abrasive detergents when cleaning the camera body.

Limited Warranty

1STVISION warrants only the original components to be free from defects in material for one year from the purchase date. This warranty covers failures or damages due to defects in material, which would occur during normal use. It does not cover damages or failures, which result from shipment, mishandling, abuse, misuse, or modification.
Any damage caused by improper handling will not be repaired by 1STVISION.

A Return Material Authorization (RMA) number is required prior to returning any 1STVISION product for repair or replacement.

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COMPLIANCE STATEMENTS for CE, FCC, MIC

To meet EC requirements, shielded cables must be connected to other devices for these cameras. These cameras have been tested in the compliant environment of a typical class A. It is assumed that the camera has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide the reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation**.**

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1. Introduction

1.1 Overview

MCF camera series are an IEEE 1394 compliant (Firewire^{TM}) progressive area scan color or B/W CCD cameras designed for industrial imaging applications. MCF cameras use the IEEE 1394 digital interface to streaming real-time uncompressed color image sequences in high resolution. The IEEE 1394 interface supports camera power, camera control and image data through only single cable, so user can use these cameras with simple cable connections.

What is the IEEE 1394 ?
The IEEE 1394 is the international standard about serial bus for transfer digital data up to 400Mbps, 800Mbps and 1.6Gbps.
It is also capable of "Isochronous transmission" for transmits data real-time up to 64 channels

MCF camera family is a compact size, c-mount type and fully supports IEEE 1394-1995, IEEE 1394a-2000 and IIDC Spec. 1.30. MCF camera family consists of several models, which are equipped with high sensitivity progressive scan CCD and have very different imager sizes each of 1/4, 1/3, 1/2, 2/3 inches. MCF camera family also supports various resolution modes for CIF, VGA, SVGA, XGA, SXGA and UXGA for each B/W and color models.

1.2 Features

- Low smear and excellent anti-blooming
- Continuous variable shutter speed
- High sensitivity and low dark current
- High speed digital interface up to 400Mbps
- Supports external trigger and power for trigger models

1.3 Applications

IMI-FCams can be use in machine vision, stereo vision, inspection, character recognition, medical, biomedical imaging, microscopy, traffic control, surveillance, RFID and other scientific or industrial applications

1.4 Specifications

1.4.1 Color and non-External trigger (F) models

- Standard models : MC-F433

1.4.2 Color and External trigger(FT/MT) models

- Standard models :
- Double speed Models
- High MegaPixel Models :

1.4.3 Black/White (B/W) and External trigger(FT/MT) models

- Standard models
- Double speed Models :MC-F333MT
- High MegaPixel Models

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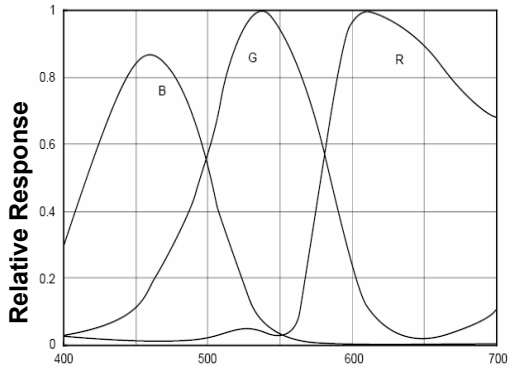
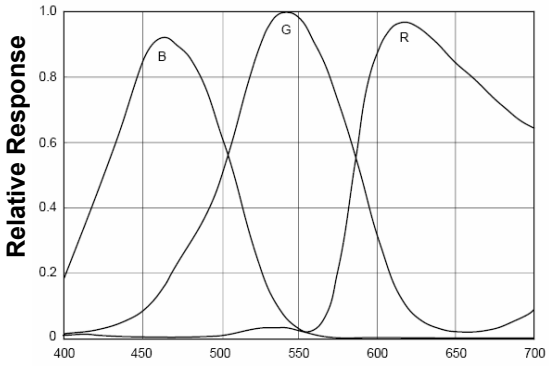
Table 1-1 Color and non-External trigger models

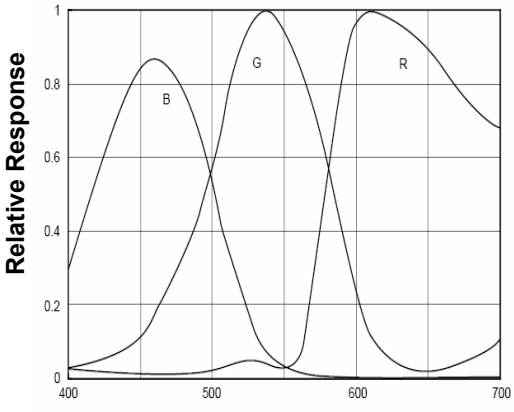
Features			MCF-433
Image Device	1/2-inch Interline Wfine CCD	1/3-inch Interline Wfine CCD	1/4-inch Interline Wfine CCD
Effective pixels	1,450,000 pixel 1392 (H) x 1040 (V)	800,000 pixel 1034 (H) x 779 (V)	330,000 pixel 659 (H) x 494 (V)
Picture Size, Resolution	SXGA, XGA SVGA, VGA	XGA, SVGA VGA	VGA, QVGA QCIF
Data Path	YUV422	YUV422	YUV411, RGB24
CELL size	4.65um x 4.65um	4.65um x 4.65um	5.60um x 5.60um
Scanning system	Progressive Scan		
Frame rate	7.5fps at full resolution	15 fps at full resolution	30 fps at full resolution
Synchronization	Internal		
Lens mount	C-mount		
Digital Interface	IEEE 1394 2(Two) Ports and IIDC V1.3		
Transfer Rate (fps)	400 Mbps/max		
Gain Control	AGC (0–18 dB), FIX (0dB), Manual (0-18dB)		Auto
White Balance	Auto or Manual		
Shutter Speed	1/20,000 ~ 2 sec		1/3,000 ~ 1/30 sec
Gamma	1.0 Approx		
Min. Illumination	22Lux at F1.4	15Lux at F2.0	20Lux at F2.0
S/N ratio	56dB or better		
Power supply voltage	12VDC from IEEE1394 Cable		
Power Consumption	3.5 W at 12VDC approx.		1 W at 12VDC
Weight	300gr. Approx.		200 gr. Approx.
External Dimensions	64 (W) x 64 (H) x 60 (D) mm		44(W)x32(H)x92(D)
Operation Temp.	-5 to + 45 ^{0}C		
Storage Temp.	-20 to + 60 ^{0}C		
Regulations	FCC, CE, MIC		
Supplied Accessories	Lens cover, OLPF, User's Manual		



Spectral Sensitivity for with only CCD



Spectral Sensitivity for MCF-433 with only CCD



Spectral Sensitivity for with only CCD

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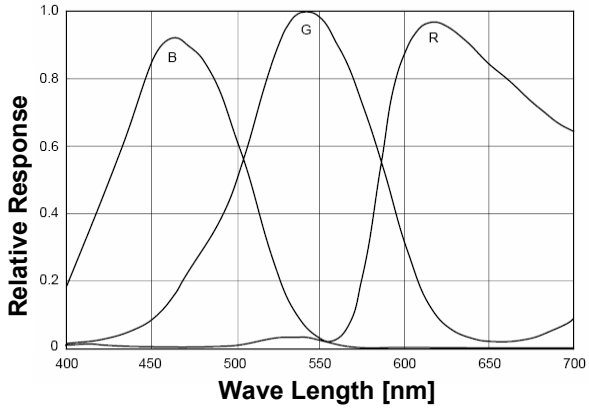
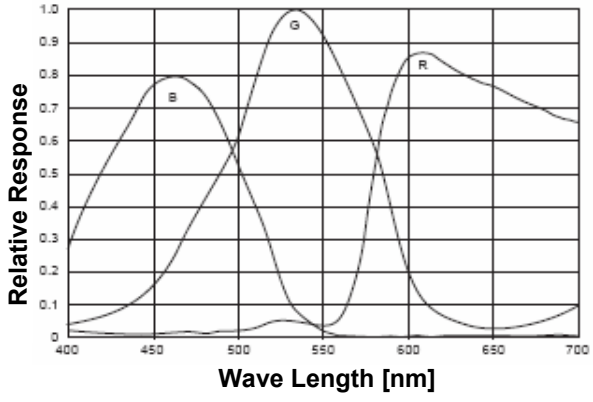
Table 1-2 Color and External trigger (FT/MT)

Features			
Image Device	1/3-inch Interline Wfine CCD	1/4-inch Interline Wfine CCD	
Effective pixels	330,000 pixel 659(H) x 494(V)		
Picture Size	640 x 480		
Data Path	8 bit Raw RGB		
CELL size	7.40 um x 7.40 um	5.60 um x 5.60 um	
Scanning system	Progressive Scan		
Frame rate	60, 30, 15, 7.5, 3.75,1.875		30, 15, 7.5, 3.75,1.875
Synchronization	External Trigger at falling edge or S/W Trigger		
Lens mount	C-mount		
Digital Interface	1(One) Port for IEEE 1394 6 pin and IIDC v1.30		
Transfer Rate (fps)	400 Mbps/max		
Gain Control	2 ~ 36 dB		
White Balance	Auto / Manual for only color processing		
Shutter Speed	1 usec ~ 65 sec		
Gamma	1.0 Approx		
Strobe Output Signal	Option		
S/N ratio	56 dB or better		
Power supply voltage	8 - 30VDC from IEEE1394 Camera Cable		
Power Consumption	2.8 W at 12VDC	2.7 W at 12VDC	2.2 W at 12VDC
Weight	300 gr. approx.		
External Dimensions	64 (W) x 64 (H) x 60 (D) mm		
Operation Temp.	-5 to + 45 ^{0}C		
Storage Temp.	-20 to + 60 ^{0}C		
Regulations	FCC, CE, MIC		
Supplied Accessories	Lens cover, User's Manual		



Spectral Sensitivity for with only CCD



Spectral Sensitivity for with only CCD

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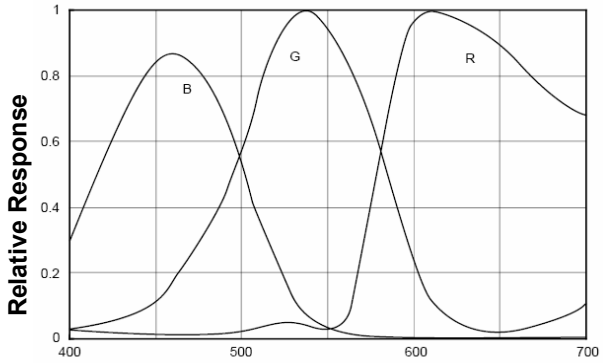
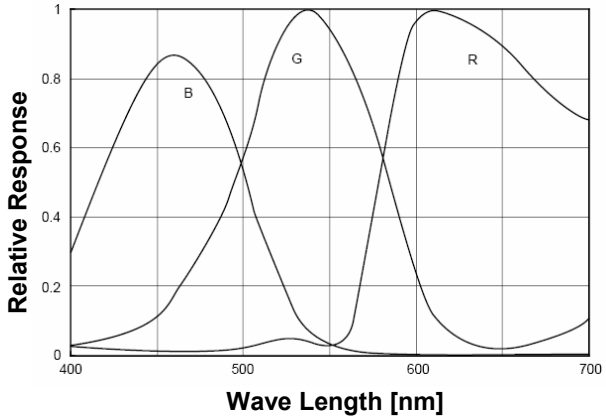
Features				
Image Device	1/2-inch Interline Wfine CCD		1/3-inch Interline Wfine CCD	
Effective pixels	1,450,000 pixel 1392(H) x 1040(V)		800,000 pixel 1034(H) x 779(V)	
Picture Size	1280 x 960, 1024 x 768, 800 x 600, 640 x 480		1024 x 768, 800 x 600, 640 x 480	
Data Path	8 bit or 10 bit Raw RGB			
CELL size	4.65um x 4.65um		4.65um x 4.65um	
Scanning system	Progressive Scan			
Frame rate	15, 7.5, 3.75, 1.875	7.5, 3.75, 1.875	30, 15, 7.5, 3.75,1.875	15, 7.5, 3.75, 1.875
Synchronization	External Trigger at falling edge and S/W Trigger			
Lens mount	C-mount			
Digital Interface	1(One) Port for IEEE 1394 6 pin and IIDC v1.30			
Transfer Rate (fps)	400 Mbps/max			
Gain Control	2 ~ 36 dB			
White Balance	Auto / Manual for only Color processing			
Shutter Speed	1 usec ~ 65 sec			
Gamma	0.4 ~ 2.5			
Strobe Output Signal	Option			
RS-232C comm..	Option			
S/N ratio	56 dB or better			
Power supply voltage	8 - 30VDC from IEEE1394 Camera Cable			
Power Consumption	2.8 W at 12VDC	2.4 W at 12VDC	2.6 W at 12VDC	2.4W at 12VDC
Weight	300 gr. approx.			
External Dimensions	64 (W) x 64 (H) x 60 (D) mm			
Operation Temp.	-5 to + 45 ^{0}C			
Storage Temp.	-20 to + 60 ^{0}C			
Regulations	FCC, CE, MIC			
Supplied Accessories	Lens cover, User's Manual			



Spectral Sensitivity for with only CCD



Spectral Sensitivity for with only CCD

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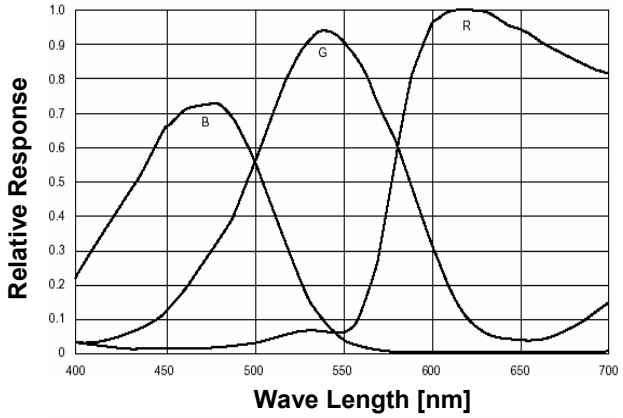
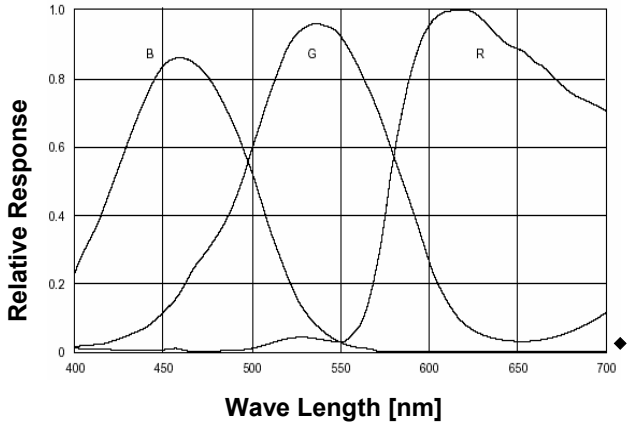
Features		
Image Device	1/1.8-inch Interline Wfine CCD	2/3-inch Interline Wfine CCD
Effective pixels	2,010,000 pixel 1628(H) x 1236(V)	1,450,000 pixel 1392(H) x 1040(V)
Picture Size	1600 x 1200, 1280 x 960, 1024 x 768, 800 x 600, 640 x 480	1280 x 960, 1024 x 768, 800 x 600, 640 x 480
Data Path	8 bit or 12 bit Raw RGB	8 bit or 12 bit Raw RGB
CELL size	4.40 um x 4.40 um	6.45 um x 6.45 um
Scanning system	Progressive Scan	
Frame rate (fps)	10, 5, 2.5, 1.25	15, 7.5, 3.75, 1.875
Synchronization	External Trigger at falling edge and S/W Trigger	
Lens mount	C-mount	
Digital Interface	1(One) Port for IEEE 1394 6 pin and IIDC v1.30	
Transfer Rate	400 Mbps/max	
Gain Control	2 ~ 36 dB	
White Balance	Auto / Manual for only Color processing	
Shutter Speed	1 usec ~ 65 sec	
Gamma	1.0 Approx	
Strobe Output Signal	Option	
RS-232C comm..	Option	
S/N ratio	56 dB or better	
Power supply voltage	8 - 30VDC from IEEE1394 Camera Cable	
Power Consumption	3.2 W at 12VDC	3.5 W at 12VDC
Weight	300 gr. approx.	
External Dimensions	64 (W) x 64 (H) x 60 (D) mm	
Operation Temp.	-5 to + 45 ^{0}C	
Storage Temp.	-20 to + 60 ^{0}C	
Regulations	FCC, CE, MIC	
Supplied Accessories	Lens cover, User's Manual	



Spectral Sensitivity for with only CCD



Spectral Sensitivity for with only CCD

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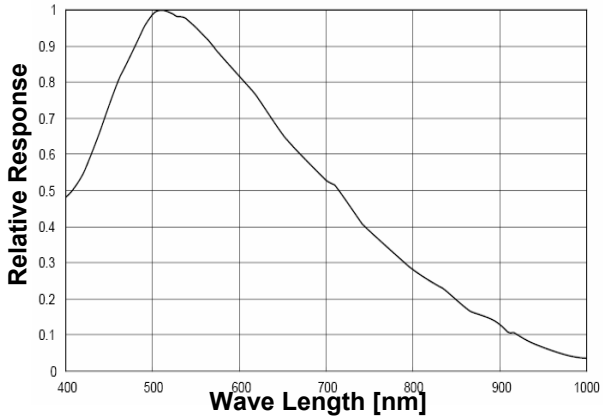
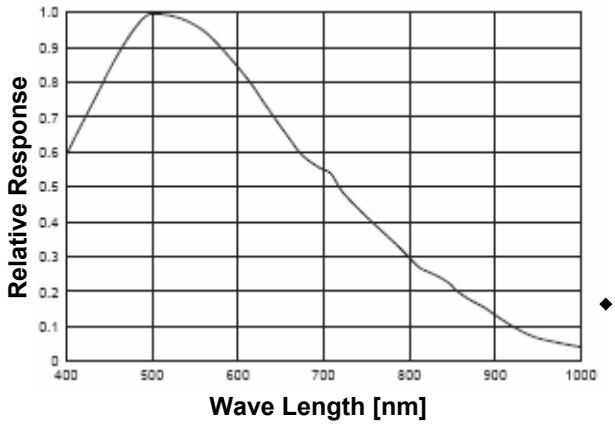
Table 1.3 B/W and External trigger (FT) models

Features	MC-F333MT		
Image Device	1/3-inch Interline Wfine CCD	1/4-inch Interline Wfine CCD	
Effective pixels	330,000 pixel 659(H) x 494(V)		
Picture Size	640 x 480		
Data Path	8 bit B/W		
CELL size	7.40 um x 7.40 um	5.60 um x 5.60 um	
Scanning system	Progressive Scan		
Frame rate (fps)	60, 30, 15, 7.5, 3.75,1.875		30, 15, 7.5, 3.75,1.875
Synchronization	External Trigger at falling edge or S/W Trigger		
Lens mount	C-mount		
Digital Interface	1(One) Port for IEEE 1394 6 pin and IIDC v1.30		
Transfer Rate	400 Mbps/max		
Gain Control	2 ~ 36 dB		
White Balance	Auto / Manual for only Color camera		
Shutter Speed	1 usec ~ 65 sec		
Gamma	1.0 Approx		
Strobe Output Signal	Option		
S/N ratio	56 dB or better		
Power supply voltage	8 - 30VDC from IEEE1394 Camera Cable		
Power Consumption	2.8 W at 12VDC	2.7 W at 12VDC	2.2 W at 12VDC
Weight	300 gr. approx.		
External Dimensions	64 (W) x 64 (H) x 60 (D) mm		
Operation Temp.	-5 to + 45 ^{0}C		
Storage Temp.	-20 to + 60 ^{0}C		
Regulations	FCC, CE, MIC		
Supplied Accessories	Lens cover, User's Manual		



Spectral Sensitivity for with only CCD



Spectral Sensitivity for MC-F333MT with only CCD

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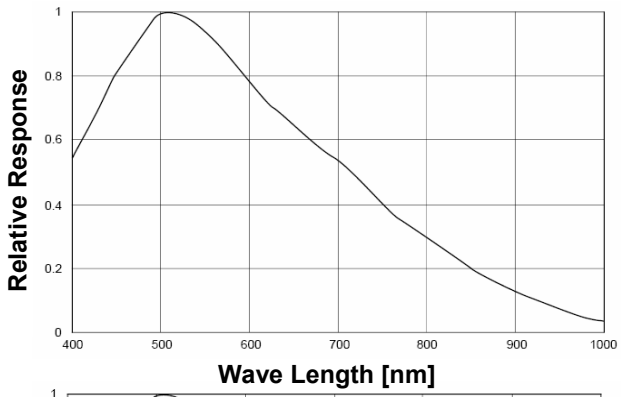
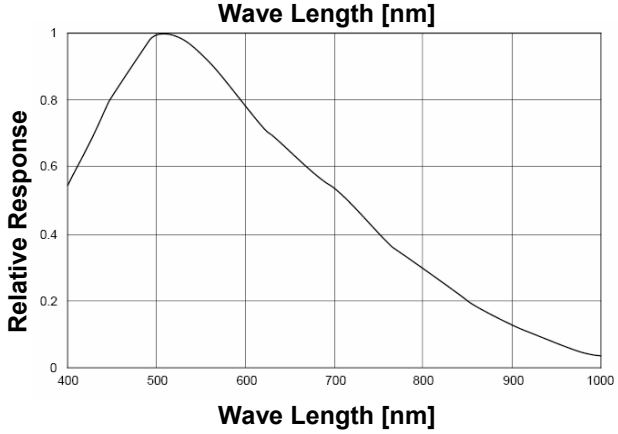
Features				
Image Device	1/2-inch Interline Wfine CCD		1/3-inch Interline Wfine CCD	
Effective pixels	1,450,000 pixel 1392(H) x 1040(V)		800,000 pixel 1034(H) x 779(V)	
Picture Size	1280 x 960, 1024 x 768, 800 x 600, 640 x 480		1024 x 768, 800 x 600, 640 x 480	
Data Path	8 bit or 10 bit B/W			
CELL size	4.65um x 4.65um		4.65um x 4.65um	
Scanning system	Progressive Scan			
Frame rate (fps)	15, 7.5, 3.75, 1.875	7.5, 3.75, 1.875	30, 15, 7.5, 3.75,1.875	15, 7.5, 3.75, 1.875
Synchronization	External Trigger at falling edge or S/W Trigger			
Lens mount	C-mount			
Digital Interface	1(One) Port for IEEE 1394 6 pin and IIDC v1.30			
Transfer Rate	400 Mbps/max			
Gain Control	2 ~ 36 dB			
White Balance	Auto / Manual for only Color camera			
Shutter Speed	1 usec ~ 65 sec			
Gamma	0.4 ~ 2.5			
Strobe Output Signal	Option			
RS-232C comm..	Option			
S/N ratio	56 dB or better			
Power supply voltage	8 - 30VDC from IEEE1394 Camera Cable			
Power Consumption	2.7 W at 12VDC	2.3 W at 12VDC	2.5 W at 12VDC	2.2W at 12VDC
Weight	300 gr. approx.			
External Dimensions	64 (W) x 64 (H) x 60 (D) mm			
Operation Temp.	-5 to + 45 ^{0}C			
Storage Temp.	-20 to + 60 ^{0}C			
Regulations	FCC, CE, MIC			
Supplied Accessories	Lens cover, User's Manual			



Spectral Sensitivity for IMB-80FT and IMB-81FT with only



Spectral Sensitivity for IMB-140FT and IMB-141FT with only CCD

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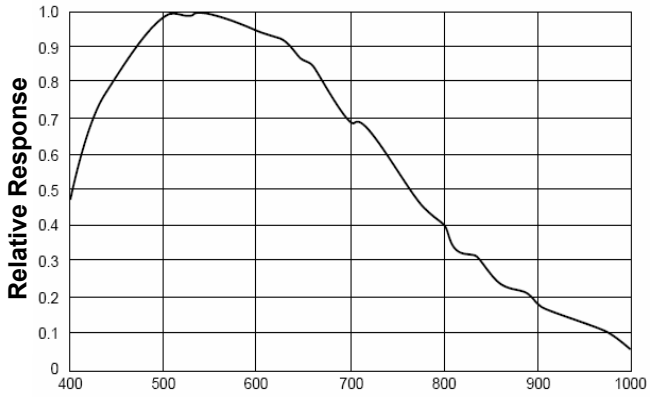
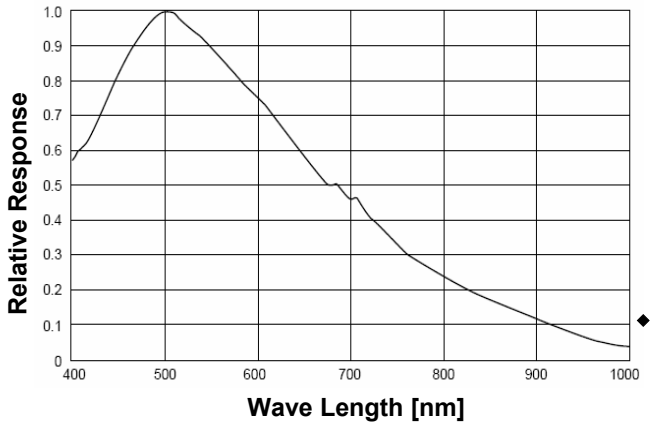
Features		
Image Device	1/1.8-inch Interline Wfine CCD	2/3-inch Interline Wfine CCD
Effective pixels	2,010,000 pixel 1628(H) x 1236(V)	1,450,000 pixel 1392(H) x 1040(V)
Picture Size	1600 x 1200, 1280 x 960, 1024 x 768, 800 x 600, 640 x 480	1280 x 960, 1024 x 768, 800 x 600, 640 x 480
Data Path	8 bit or 12 bit B/W	8 bit or 12 bit B/W
CELL size	4.40 um x 4.40 um	6.45 um x 6.45 um
Scanning system	Progressive Scan	
Frame rate (FPS)	10, 5, 2.5, 1.25	15, 7.5, 3.75, 1.875
Synchronization	External Trigger at falling edge and S/W Trigger	
Lens mount	C-mount	
Digital Interface	1(One) Port for IEEE 1394 6 pin and IIDC v1.30	
Transfer Rate	400 Mbps/max	
Gain Control	2 ~ 36 dB	
White Balance	Auto / Manual for only Color processing	
Shutter Speed	1 usec ~ 65 sec	
Gamma	1.0 Approx	
Strobe Output Signal	Option	
RS-232C comm..	Option	
S/N ratio	56 dB or better	
Power supply voltage	8 - 30VDC from IEEE1394 Camera Cable	
Power Consumption	2.9 W at 12VDC	3.2 W at 12VDC
Weight	300 gr. approx.	
External Dimensions	64 (W) x 64 (H) x 60 (D) mm	
Operation Temp.	-5 to + 45 ^{0}C	
Storage Temp.	-20 to + 60 ^{0}C	
Regulations	FCC, CE, MIC	
Supplied Accessories	Lens cover, User's Manual	



Spectral Sensitivity for IMB-145FT with only CCD



Spectral Sensitivity for IMB-200FT with only CCD

◆ **Specifications are subject to change without notice**

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2. Hardware Setup

2.1 Components of the camera shipment packaging

Camera, downloadable driver, optional API

2.2 Accessories for setup

2.2.1 IEEE 1394 Cable

Should be the flexible twisted pair and overall shielded cable
For notebook PC or tablet PC, it is used with 4p-to-6p IEEE1394 cable
On the other environment, there will be almost connected camera to PC with use 6p-to-6p cable

2.2.2 IEEE 1394 PCI OHCI Card

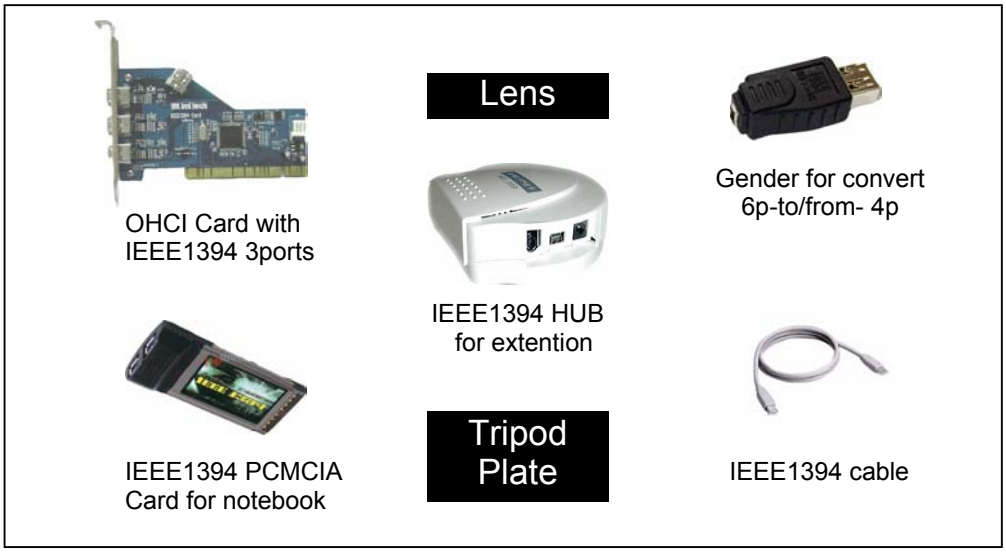
If you have already IEEE1394 port on your main board, then IEEE1394 OHCI card do not need.

2.2.3 Lens

C-mount

2.2.4 Tripod Mount Plate

If you need this plate, please contact your dealer.



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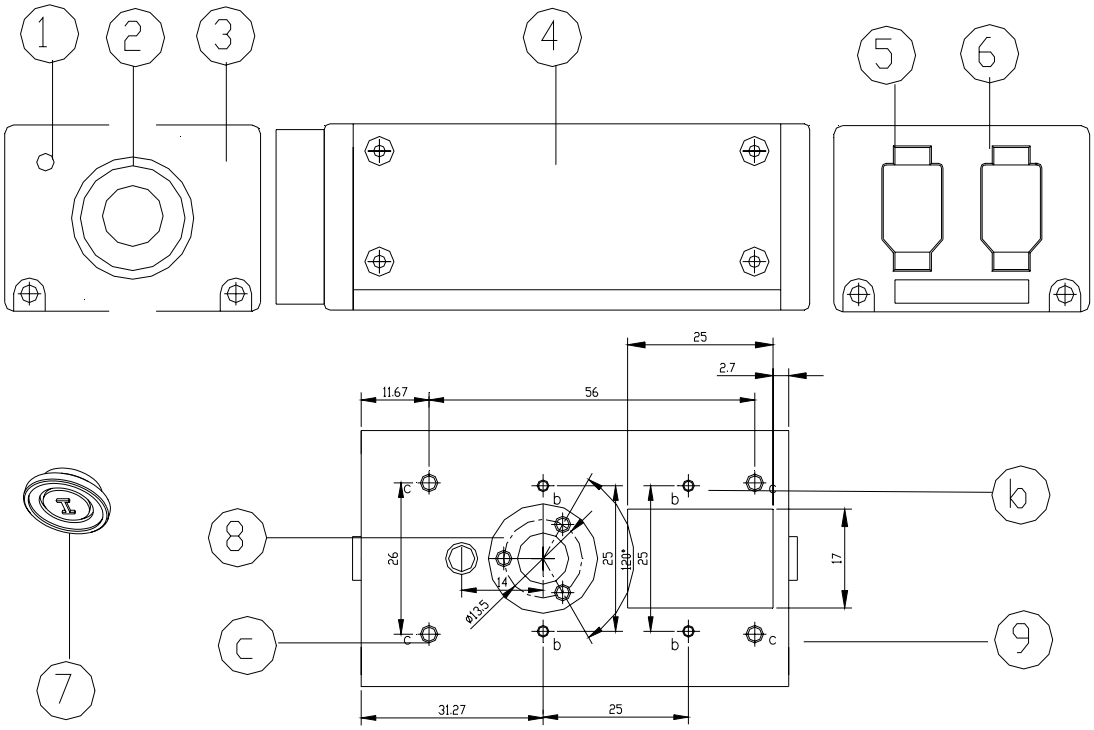
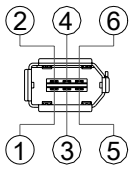
2.3 External Description

2.3.1 Description for MCF-433



Point No.	Name	Descriptions		Remark
□	Power LED	Power On is Red, Run mode is Green		
□	C-Mount Holder	Adjust camera focus. To be suitable for focus and various C-mount lens, it can be rotated by loosing the hexagonal screws.		M3:Dia, 1.5mm
□	Cover Front	Front Case		
□	Cover Top	Top Case		
□	IEEE 1394 Connector		1	VP
			2	VG (Ground)
			3	TPB-
			4	TPB+
			5	TPA-
			6	TPB+
⑥	Cover Rear	Rear Case		
⑦	Lens Fixture	Lens cap. NBR black or ABS		
⑧	Tripod Adapter	For TRIPOD		
⑨	Cover Base	Base Plate	ⓑ	M2, Depth 4mm
			ⓒ	M3, Depth 4mm

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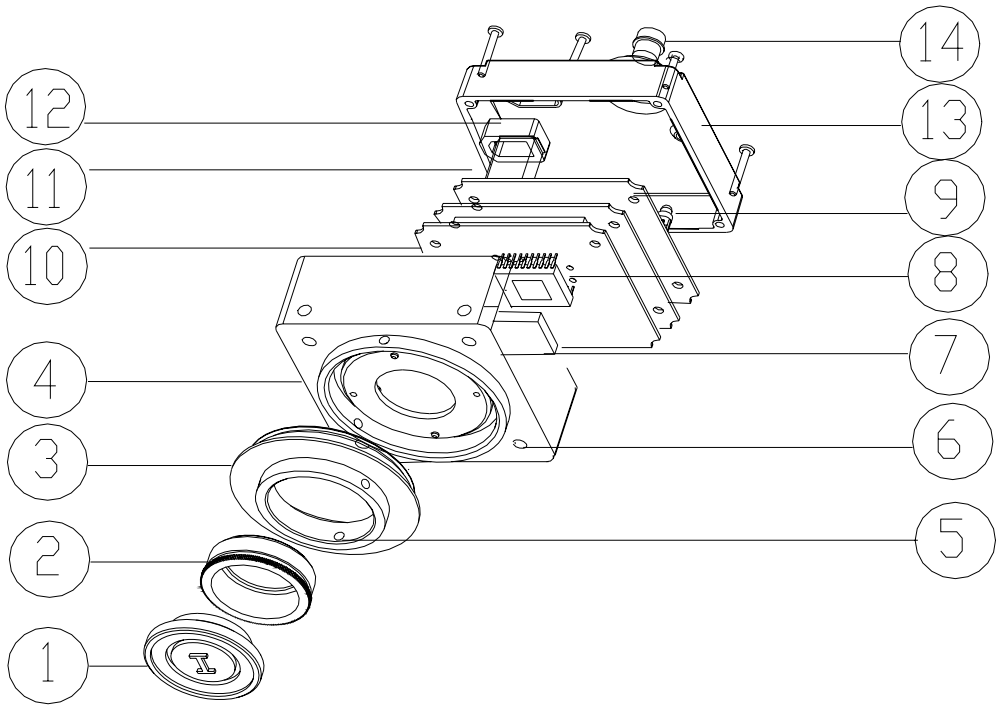
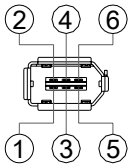
2.3.3 Description for All Trigger(FT/MT) Models



Point No.	Name	Descriptions		Remark
□	Lens Fixture	Lens cap. NBR black or ABS		
□	Adapter Ring	Adjust camera focus To be suitable for focus and various C- mount lens, it can be rotated by loosing the hexagonal screws.		M3:Dia, 1.5mm
□	Lens Mount Ring	Mounts adapter ring		
□	Cover Front	Front Case		
□	Lens Mount Hole	M3x3 : Dia 1.5mm		
□	Camera Mount Hole	M4x6, Depth 5mm		
□	OLPF	Optical Low Pass Filter		Only Color
□	CCD sensor	Sony Wfine CCD		
□	Power LED	Power On is Red, Run mode is Green		
□	PCB	Camera PCB set		
□	IEEE 1394 Connector		1	VP
			2	VG (Ground)
			3	TPB-
			4	TPB+
			5	TPA-
			6	TPB+
□	Rubber packing	NBR black		
□	Cover Rear	Rear Case		

			Pin	Signal	Pin	Signal
□	External Trigger Connector		1	Power GND	7	NC
			2	+12V	8	GND
			3	GND	9	NC
			4	NC	10	Ext. Trigger
	Camera Side: Hirose HR10A Series		5	GND	11	NC
	Cable Side : HR10A-10P-12S		6	NC	12	GND

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2.4 System Environment

MC-FCams works with other windows application such as "amcap.exe" in DirectX SDK™, XP capture application in XP default, TWAIN interface, WDM stream an so on.

the camera also works with all IIDC (formerly DCAM) compatible IEEE 1394 program and image processing libraries such as IMAQ and MIL 7.5 or higher.

2.4.1 System Requirements

- IEEE 1394 OHCI Card or PCMCIA adapter
- Windows 2000 / XP
- IEEE 1394 Cable with 6p-to-6p or 4p-to-6p
- One or more MC-FCams Camera
- DirectX 9.0 or higher
  In Windows XP Environment, we strongly recommend DirectX 9.0b or higher
- Video Adapter supports 24bit color and 1280x1024 resolution or higher
- CPU with 1.5GHz or more
- 128MByte or more System Memory

2.4.2 Demo Application - ImCam

The Demo Application only works for the camera included MC-FCams driver.
Please refer to the Demo Application Manual included in the downloaded SW(in Application Directory)

2.5 Multiple Camera Connections

If you have two or more IEEE 1394 cameras, you can connect these cameras to the PC simultaneously. In this situation, you can run cameras at the same time while you maintaining the total IEEE 1394 bandwidth for all cameras below the amount defined in IEEE 1394 specification.

The bandwidth of a camera can be calculated by multiplexing the data bits of a format, image resolution and frame rates. For example if you run with 800x600 @fps resolution, the bandwidth is 800x600x16x15 = 115Mbps.

3. Camera Functions

3.1 IEEE1394 DCAM Spec 1.30

MC-F digital cameras fully support IIDC Specification 1.30 which describes the standard definition for IEEE 1394 compliant digital cameras. The recommend specification supplied by 1394TA(www.1394ta.org) defines camera registers, fields within those registers, video formats, modes of operation, and controls for each.

Please refer to the IIDC Specification for detail register space.

3.2 Initialize

You can initialize the camera to factory default state by writing "1" to the following register.

Address	Name	Field	Bit	Description
FFFF F0F0 0000	INITIALIZE	Initialize	0	If assert this bit, Camera will re-set to initial (factory setting value) sate.

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3.2.1 User Defined 1394 Address for CR on Power Reset

Address	Description	Read/Write
0xF2F10100 **(Only for FT/MT Models)**	**Power on reset condition control register** If bit value is 1, the current register value is saved as default or reset value. (Self cleared) At the next power on, this saving value is default/reset value. Bit 0 : Auto Exposure Bit 1 : Shutter Speed Bit 2 : Gain Bit 3 : Brightness Bit 4 : Sharpness Bit 5 : Gamma Bit 19 ~ Bit 6 : Reserved Bit 20 : Auto shutter-speed maximum/minimum value register Bit 21 : Auto gain maximum/minimum value register Bit 22 : Trigger control register Bit 23 : Strobe control register	Read/Write

3.3 Brightness

The brightness of images can be controlled by changing the black level setting. Adjust the brightness if the appropriate gradation cannot be obtained due to the blurring of the black portions of the image.

Address	Name	Field	Bit	Description
F0F00500	BRIGHTNESS_INQ	Presence_Inq	0	Presence of this feature
		Abs_Control_Inq	1	Capability of control with absolute value
		-	2	Reserved
		One_Push_Inq	3	One push auto mode(Controlled automatically by camera only once)
		ReadOut_Inq	4	Capability of reading the value of this feature
		On/Off_Inq	5	Capability of switching this feature On and OFF
		Auto_Inq	6	Auto mode(Controlled automatically by camera)
		Manual_Inq	7	Manual mode(Controlled by user)
		Min_Value	[8..19]	Minimum value for this feature control
		Max_Value	[20..31]	Maximum value for this feature control
F0F00800	BRIGHTNESS	Presence_Inq	0	Presence of this feature 0:N/A 1:Available
		Abs_Control	1	Absolute value control 0: Control with value in the Value field 1: Control with value in the Absolute value CSR If this bit = 1, value in the Value field is ignored.
		-	[2..4]	Reserved
		One_Push	5	Write '1' :begin to work(Self cleared after operation) Read: Value='1' in operation Value='0' not in operation If A_M_Mode =1, this bit is ignored
		ON_OFF	6	Write: ON or OFF this feature, Read: read a status 0:OFF, 1:ON If this bit=0, other fields will be read only.
		A_M_Mode	7	Write: set the mode, Read: read a current mode 0: Manual, 1:Auto
		-	[8..19]	Reserved
		Value	[20..31]	Value. Write the value in Auto mode, this filed is ignored. If "ReadOut" capability is not available, read value Has no meaning

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3.4 Sharpness

3.4.1 F-Models

The sharpness procedure may be used to compensate low-pass effects caused for instance by the spatial color interpolation. If you prefer not to apply this kind of signal manipulation you should switch it off.

3.4.2 FT/MT-Models

Increase or decrease contrast. Increasing contrast increases the apparent difference in lightness between lighter and darker pixels. For FT/MT cameras, Contrast is mapping in feature

Address	Name	Field	Bit	Description
F0F0 0508	SHARPNESS_INQ	Presence_Inq	0	Presence of this feature
		Abs_Control_Inq	1	Capability of control with absolute value
		-	2	Reserved
		One_Push_Inq	3	One push auto mode(Controlled automatically by camera only once)
		ReadOut_Inq	4	Capability of reading the value of this feature
		On/Off_Inq	5	Capability of switching this feature On and OFF
		Auto_Inq	6	Auto mode(Controlled automatically by camera)
		Manual_Inq	7	Manual mode(Controlled by user)
		Min_Value	[8..19]	Minimum value for this feature control
		Max_Value	[20..31]	Maximum value for this feature control
F0F0 0808	SHARPNESS	Presence_Inq	0	Presence of this feature 0:N/A 1:Available
		Abs_Control	1	Absolute value control 0: Control with value in the Value field 1: Control with value in the Absolute value CSR If this bit = 1, value in the Value field is ignored.
		-	[2..4]	Reserved
		One_Push	5	Write '1' :begin to work(Self cleared after operation) Read: Value='1' in operation Value='0' not in operation If A_M_Mode =1, this bit is ignored
		ON_OFF	6	Write: ON or OFF this feature, Read: read a status 0:OFF, 1:ON If this bit=0, other fields will be read only.
		A_M_Mode	7	Write: set the mode, Read: read a current mode 0: Manual, 1:Auto
		-	[8..19]	Reserved
		Value	[20..31]	Value. Write the value in Auto mode, this filed is ignored. If "ReadOut" capability is not available, read value Has no meaning

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3.5 Gamma

If the gamma correction is on, the camera outputs gray levels adapted to the nonlinear behaviour of cathode ray tube(CRT).

Address	Name	Field	Bit	Description
F0F0 0518	GAMMA_INQ	Presence_Inq	0	Presence of this feature
		Abs_Control_Inq	1	Capability of control with absolute value
		-	2	Reserved
		One_Push_Inq	3	One push auto mode(Controlled automatically by camera only once)
		ReadOut_Inq	4	Capability of reading the value of this feature
		On/Off_Inq	5	Capability of switching this feature On and OFF
		Auto_Inq	6	Auto mode(Controlled automatically by camera)
		Manual_Inq	7	Manual mode(Controlled by user)
		Min_Value	[8..19]	Minimum value for this feature control
		Max_Value	[20..31]	Maximum value for this feature control
F0F0 0818	GAMMA	Presence_Inq	0	Presence of this feature 0:N/A 1:Available
		Abs_Control	1	Absolute value control 0: Control with value in the Value field 1: Control with value in the Absolute value CSR If this bit = 1, value in the Value field is ignored.
		-	[2..4]	Reserved
		One_Push	5	Write '1' :begin to work(Self cleared after operation) Read: Value='1' in operation Value='0' not in operation If A_M_Mode =1, this bit is ignored
		ON_OFF	6	Write: ON or OFF this feature, Read: read a status 0:OFF, 1:ON If this bit=0, other fields will be read only.
		A_M_Mode	7	Write: set the mode, Read: read a current mode 0: Manual, 1:Auto
		-	[8..19]	Reserved
		Value	[20..31]	Value. Write the value in Auto mode, this filed is ignored. If "ReadOut" capability is not available, read value Has no meaning

GAMMA Value	4	5	6	7	8	9	10	11	12	13	14
GAMMA	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4

GAMMA Value	15	16	17	18	19	20	21	22	23	24	25
GAMMA	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5

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3.6 Saturation

The saturation control allows you to manually adjust the level of color in the digital image from zero (black and white) to many colors. If you prefer not to apply this kind of signal manipulation, you can switch it off. The saturation is applied only to F-Models such as MCF-433.

Address	Name	Field	Bit	Description
F0F0 0514	SATURATION_INQ	Presence_Inq	0	Presence of this feature
		Abs_Control_Inq	1	Capability of control with absolute value
		-	2	Reserved
		One_Push_Inq	3	One push auto mode(Controlled automatically by camera only once)
		ReadOut_Inq	4	Capability of reading the value of this feature
		On/Off_Inq	5	Capability of switching this feature On and OFF
		Auto_Inq	6	Auto mode(Controlled automatically by camera)
		Manual_Inq	7	Manual mode(Controlled by user)
		Min_Value	[8..19]	Minimum value for this feature control
		Max_Value	[20..31]	Maximum value for this feature control
F0F0 0814	SATURATION	Presence_Inq	0	Presence of this feature 0:N/A 1:Available
		Abs_Control	1	Absolute value control 0: Control with value in the Value field 1: Control with value in the Absolute value CSR If this bit = 1, value in the Value field is ignored.
		-	[2..4]	Reserved
		One_Push	5	Write '1' :begin to work(Self cleared after operation) Read: Value='1' in operation Value='0' not in operation If A_M_Mode =1, this bit is ignored
		ON_OFF	6	Write: ON or OFF this feature, Read: read a status 0:OFF, 1:ON If this bit=0, other fields will be read only.
		A_M_Mode	7	Write: set the mode, Read: read a current mode 0: Manual, 1:Auto
		-	[8..19]	Reserved
		Value	[20..31]	Value. Write the value in Auto mode, this filed is ignored. If "ReadOut" capability is not available, read value Has no meaning

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3.7 White Balance

U/R(red/green) and V/B(green/blue) controls alter the degree to which red and blue CCD component pixels are weighted to form composite pixels. White balance can be controlled manually or automatically. In manual mode, you can change both parameters.

This helps you to initially set the camera as quickly as possible. Some adjustment may be necessary, depending on current illumination. For this purpose, parameter changing has to be inactive.

The automatic white balance feature offers two operation modes. If "Auto" is checked, the balancing algorithms affect the video stream continuously.

Furthermore, the "One Push" white balance option can be used for a one-push (non-iterative) calibration of the white balance values.
However, if you prefer not to apply this kind of signal manipulation at all, you can switch if off.
The White Balance is applied only to F-Models such as MCF-433.

Address	Name	Field	Bit	Description
F0F0 050C	WHITE _BAL_I NQ	Presence_Inq	0	Presence of this feature
		Abs_Control_Inq	1	Capability of control with absolute value
		-	2	Reserved
		One_Push_Inq	3	One push auto mode(Controlled automatically by camera only once)
		ReadOut_Inq	4	Capability of reading the value of this feature
		On/Off_Inq	5	Capability of switching this feature On and OFF
		Auto_Inq	6	Auto mode(Controlled automatically by camera)
		Manual_Inq	7	Manual mode(Controlled by user)
		Min_Value	[8..19]	Minimum value for this feature control
		Max_Value	[20..31]	Maximum value for this feature control
F0F0 080C	WHITE _BALA NCE	Presence_Inq	0	Presence of this feature. 0:N/A 1:Available
		Abs_Control	1	Absolute value control 0: Control with value in the Value field 1: Control with value in the Absolute value CSR If this bit = 1, value in the Value field is ignored.
		-	[2..4]	Reserved
		One_Push	5	Write '1' :begin to work(Self cleared after operation) Read: Value='1' in operation Value='0' not in operation If A_M_Mode =1, this bit is ignored
		ON_OFF	6	Write: ON or OFF this feature, Read: read a status 0:OFF, 1:ON If this bit=0, other fields will be read only.
		A_M_Mode	7	Write: set the mode, Read: read a current mode 0: Manual, 1:Auto
		U/B_Value	[8..19]	U Value / B_Value. Write the value in AUTO mode, this field is ignored. If "ReadOut" capability is not available,, read value has no mean
		V/R_Value	[20..31]	V Value / R_Value Write the value in AUTO mode, this field is ignored. If"ReadOut" capability is not available, read value has no mean

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3.8 Shutter

The shutter control allows the CCD image integration time to be set. This parameter can be configured manually or automatically (together with gain) using an internal feedback loop.

Address	Name	Field	Bit	Description
F0F0 051C	SHUTTER _INQ	Presence_Inq	0	Presence of this feature
		Abs_Control_Inq	1	Capability of control with absolute value
		-	2	Reserved
		One_Push_Inq	3	One push auto mode(Controlled automatically by camera only once)
		ReadOut_Inq	4	Capability of reading the value of this feature
		On/Off_Inq	5	Capability of switching this feature On and OFF
		Auto_Inq	6	Auto mode(Controlled automatically by camera)
		Manual_Inq	7	Manual mode(Controlled by user)
		Min_Value	[8..19]	Minimum value for this feature control
		Max_Value	[20..31]	Maximum value for this feature control
F0F0 081C	SHUTTER	Presence_Inq	0	Presence of this feature 0:N/A 1:Available
		Abs_Control	1	Absolute value control 0: Control with value in the Value field 1: Control with value in the Absolute value CSR If this bit = 1, value in the Value field is ignored.
		-	[2..4]	Reserved
		One_Push	5	Write '1' :begin to work(Self cleared after operation) Read: Value='1' in operation Value='0' not in operation If A_M_Mode =1, this bit is ignored
		ON_OFF	6	Write: ON or OFF this feature, Read: read a status 0:OFF, 1:ON If this bit=0, other fields will be read only.
		A_M_Mode	7	Write: set the mode, Read: read a current mode 0: Manual, 1:Auto
		-	[8..19]	Reserved
		Value	[20..31]	Value. Write the value in Auto mode, this filed is ignored. If "ReadOut" capability is not available, read value Has no meaning

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3.8.1 Shutter Speed for MCF-433

Exposure Time	Exposure Value
1/30 Sec	~511(max)
1/60 Sec	386
1/120 Sec	256
1/500 Sec	108
1/1000 Sec	45
1/2000 Sec	13
1/3000 Sec	2
1/3424 Sec	0(min)

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3.8.4 Shutter Speed for All Trigger Cameras

1394 Shutter Value (Y)	Increment Step	Shutter Speed Time : T	
		Exposure Time	Range
1~500	1us	T= Y us	1us ~ 500us
501~1000	10us	T= (Y-500)*10+500 us	510us ~ 5500us
1001~1705	100us	T= (Y-1000)*100+5500 us	5.6ms ~ 76ms
1706 ~ 2399	1ms	T= (Y-1705)+76 ms	77ms ~ 770ms
2400~2902	10ms	T= (Y-2399)*10+770 ms	780ms ~ 5800ms
2903~3304	100ms	T= (Y-2902)*100+5800 ms	5.9s ~ 46s
3305~3323	1s	T= (Y-3304)*1000+46000 ms	47s ~ 65s

Example Shutter Speed Table			
1394 Shutter	Exposure Time	1394 Shutter	Exposure Time
1	1us	1729	100ms
10	10us	1829	200ms
100	100us	2129	500ms
500	500us	2422	1s
	1ms	2522	2s
650	2ms	2822	
950	5ms		
1045	10ms		20s
	20ms		60s
1445	50ms	3323	65s

3.8.5 User Defined 1394 Address for Auto Shutter Speed

Address	Description	Read/Write
0xF2F10004 **(Only for FT/MT Models)**	**Auto shutter-speed maximum/minimum value register.*(32bit)** **At auto shutter mode, shutter speed value is checked between auto shutter-speed maximum value and minimum value.** 31 16 15 0 Auto shutter-speed **Maximum** value | Auto shutter-speed **Minimum** value	**Read/Write**

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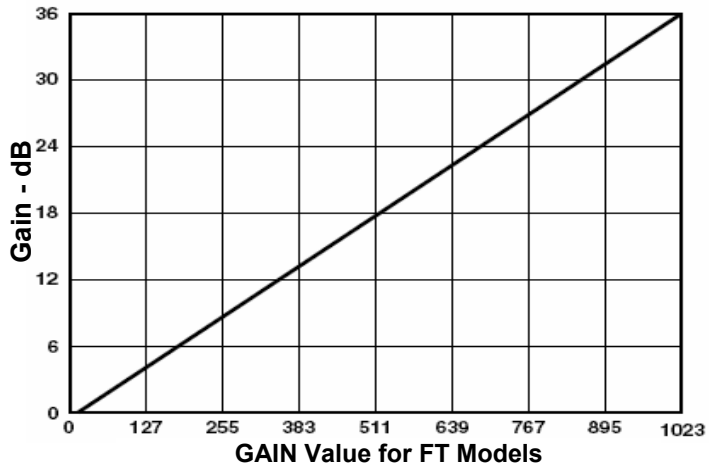
3.9 Gain

Gain refers to the amount of amplification of the CCD's output signal. Gain and Shutter have a similar effect on the image. MC-140F and 80F cameras can be set gain value from 0 to 18dB and this range is divided into 98 steps for detailed control.

Address	Name	Field	Bit	Description
F0F0 0520	GAIN_INQ	Presence_Inq	0	Presence of this feature
		Abs_Control_Inq	1	Capability of control with absolute value
		-	2	Reserved
		One_Push_Inq	3	One push auto mode(Controlled automatically by camera only once)
		ReadOut_Inq	4	Capability of reading the value of this feature
		On/Off_Inq	5	Capability of switching this feature On and OFF
		Auto_Inq	6	Auto mode(Controlled automatically by camera)
		Manual_Inq	7	Manual mode(Controlled by user)
		Min_Value	[8..19]	Minimum value for this feature control
		Max_Value	[20..31]	Maximum value for this feature control
F0F0 0820	GAIN	Presence_Inq	0	Presence of this feature 0:N/A 1:Available
		Abs_Control	1	Absolute value control 0: Control with value in the Value field 1: Control with value in the Absolute value CSR If this bit = 1, value in the Value field is ignored.
		-	[2..4]	Reserved
		One_Push	5	Write '1' :begin to work(Self cleared after operation) Read: Value='1' in operation Value='0' not in operation If A_M_Mode =1, this bit is ignored
		ON_OFF	6	Write: ON or OFF this feature, Read: read a status 0:OFF, 1:ON If this bit=0, other fields will be read only.
		A_M_Mode	7	Write: set the mode, Read: read a current mode 0: Manual, 1:Auto
		-	[8..19]	Reserved
		Value	[20..31]	Value. Write the value in Auto mode, this filed is ignored. If "ReadOut" capability is not available, read value Has no meaning



(NOTE 1)
This gain curve is valid only for Trigger Cameras (FT/MT Models).

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3.9.1 User Defined Address for Auto Gain only for FT/MT Models

Address	Description	Read/Write
0xF2F10000	**A/D bit resolution** Bit 3~Bit0 : A/D bit resolution	Read only
0xF2F10008	**Auto gain maximum/minimum value register**.*(32bit) At auto gain mode, gain value is checked between auto gain maximum value and minimum value. 31 16 15 0 Auto gain **Maximum** value | Auto gain **Minimum** value	Read/Write

3.10 Auto Exposure

The automatic shutter/gain mode is based on a feedback loop which calculates the average pixel luminance. This average is then compared with the exposure reference value, adjusting shutter and gain accordingly.
As of now, for the cameras, Auto Exposure value is used as the main value to AE algorithm.

Address	Name	Field	Bit	Description
F0F00504	AUTO_EXPOSURE_INQ	Presence_Inq	0	Presence of this feature
		Abs_Control_Inq	1	Capability of control with absolute value
		-	2	Reserved
		One_Push_Inq	3	One push auto mode(Controlled automatically by camera only once)
		ReadOut_Inq	4	Capability of reading the value of this feature
		On/Off_Inq	5	Capability of switching this feature On and OFF
		Auto_Inq	6	Auto mode(Controlled automatically by camera)
		Manual_Inq	7	Manual mode(Controlled by user)
		Min_Value	[8..19]	Minimum value for this feature control
		Max_Value	[20..31]	Maximum value for this feature control
F0F00804	AUTO_EXPOSURE	Presence_Inq	0	Presence of this feature 0:N/A 1:Available
		Abs_Control	1	Absolute value control 0: Control with value in the Value field 1: Control with value in the Absolute value CSR If this bit = 1, value in the Value field is ignored.
		-	[2..4]	Reserved
		One_Push	5	Write '1' :begin to work(Self cleared after operation) Read: Value='1' in operation Value='0' not in operation If A_M_Mode =1, this bit is ignored
		ON_OFF	6	Write: ON or OFF this feature, Read: read a status 0:OFF, 1:ON If this bit=0, other fields will be read only.
		A_M_Mode	7	Write: set the mode, Read: read a current mode 0: Manual, 1:Auto
		-	[8..19]	Reserved
		Value	[20..31]	Value. Write the value in Auto mode, this filed is ignored. If "ReadOut" capability is not available, read value Has no meaning

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3.11 Optical Filter

MC-FCams support 3200K and 5100K as color temperature.
The Optical Filter is applied only to F-Models such as MCF-433,MC-80F,MC-140F.

Address	Name	Field	Bit	Description
F0F0 0580	OPTICAL_ FILTER__I NQ	Presence_Inq	0	Presence of this feature
		Abs_Control_Inq	1	Capability of control with absolute value
			2	Reserved
		One_Push_Inq	3	One push auto mode(Controlled automatically by camera only once)
		ReadOut_Inq	4	Capability of reading the value of this feature
		On/Off_Inq	5	Capability of switching this feature On and OFF
		Auto_Inq	6	Auto mode(Controlled automatically by camera)
		Manual_Inq	7	Manual mode(Controlled by user)
		Min_Value	[8..19]	Minimum value for this feature control
		Max_Value	[20..31]	Max Value for this feature control
F0F0 0880	OPTICAL_ FILTER	Presence_Inq	0	Presence of this feature 0:N/A 1:Available
		Abs_Control	1	Absolute value control 0: Control with value in the Value field 1: Control with value in the Absolute value CSR If this bit = 1, value in the Value field is ignored.
			[2..4]	Reserved
		One_Push	5	Write '1' :begin to work(Self cleared after operation) Read: Value='1' in operation Value='0' not in operation If A_M_Mode =1, this bit is ignored
		ON_OFF	6	Write: ON or OFF this feature, Read: read a status 0:OFF, 1:ON If this bit=0, other fields will be read only.
		A_M_Mode	7	Write: set the mode, Read: read a current mode 0: Manual, 1:Auto
		-	[8..19]	Reserved
		Value	[20..31]	Value. Write the value in Auto mode, this filed is ignored. If "ReadOut" capability is not available, read value Has no meaning

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3.12 Trigger

The functions of external trigger is supported only for FT/MT cameras.

Address	Name	Field	Bit	Description
F0F0 0530	TRIGGER _INQ	Presence_Inq	0	Presence of this feature
		Abs_Control_Inq	1	Capability of control with absolute value
		-	[2..3]	Reserved
		ReadOut_Inq	4	Capability of reading the value of this feature
		On/Off_Inq	5	Capability of switching this feature On and OFF
		Polarity_Inq	6	Capability of changing polarity of trigger input
			[7..15]	Reserved
		Trigger_Mode0_Inq	16	Presence of Trigger Mode0
		Trigger_Mode1_Inq	17	Presence of Trigger Mode1
		Trigger_Mode2_Inq	18	Presence of Trigger Mode2
		Trigger_Mode3_Inq	19	Presence of Trigger Mode3
			[20..31]	Reserved
F0F0 0830	TRIGGER _MODE	Presence_Inq	0	Presence of this feature 0:N/A 1:Available
		Abs_Control	1	Absolute value control 0: Control with value in the Value field 1: Control with value in the Absolute value CSR If this bit = 1, value in the Value field is ignored.
		-	[2..5]	Reserved
		ON_OFF	6	Write: ON or OFF this feature Read: read a status 0: OFF, 1: ON If this bit=0, other fields will be read only.
		Trigger_Polarity	7	If Polarity_Inq is "1", Write to change polarity of the trigger input Read to get polarity of trigger input If Polarity_Inq is "0", Read only. (0: Low active input, 1: High active input)
			[8..11]	Reserved
		Trigger_Mode	[12..15]	Trigger mode.(Trigger_Mode_0-15)
			[16..19]	Reserved
		Parameter	[20..31]	Parameter for trigger function, if required.(Optional)

3.12.1 User Defined 1394 Address for Trigger Features

Address	Description	Read/Write
0xF2F10104	**Trigger control register** Bit 0 : External trigger active edge (0:falling edge, 1:rising edge) Bit 1 : Software trigger enable (0: external trigger mode, 1: software trigger mode) Bit 2 : Trigger delay enable (0: disable, 1:enable) If trigger delay enable bit is 0, trigger delay is 2 usec. Bit 3 : Trigger delay unit (0: 1usec, 1: 1msec) Bit 13~ Bit 4 :Trigger delay (D: 0 ~ 1023) : delay time range : 3.5usec ~ 1023msec If trigger delay unit is 0, trigger delay time = (D + 3.5) usec If trigger delay unit is 1, trigger delay time = D msec + 3.5usec	Read/Write

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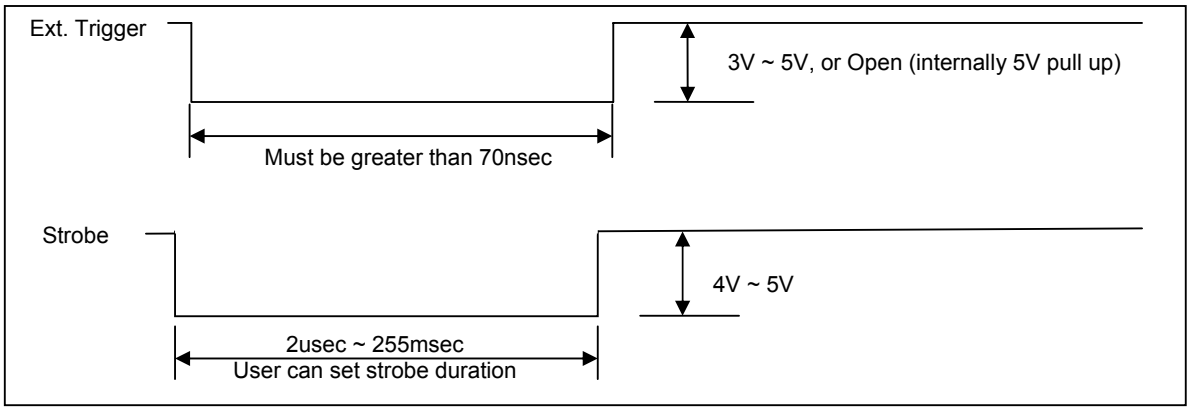
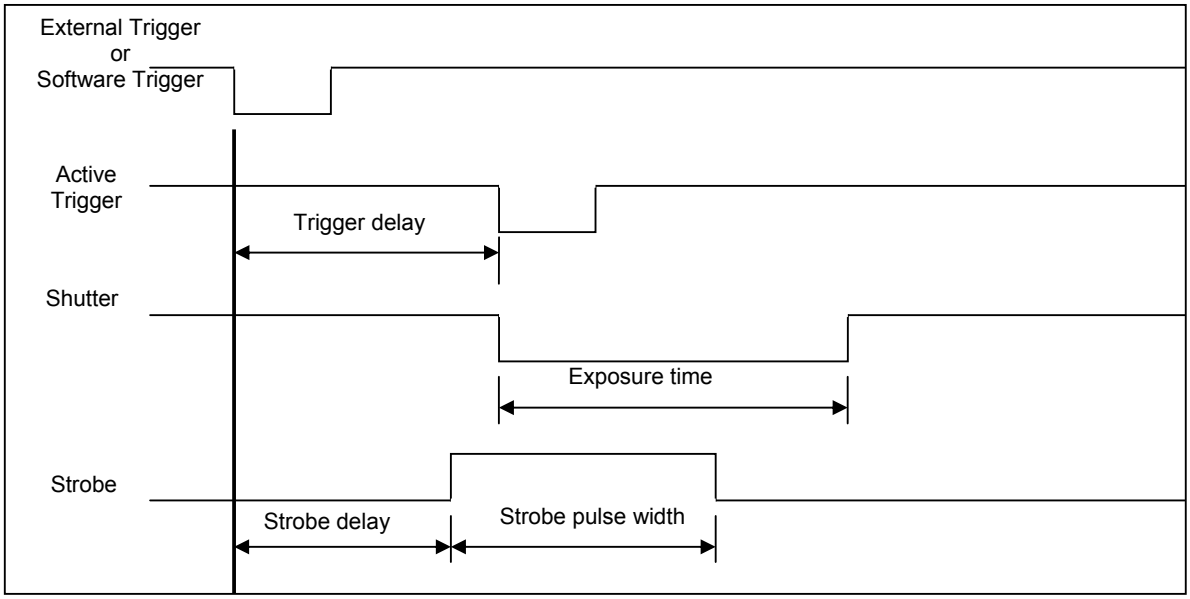
Address	Description	Read/Write
0xF2F10108	**Software trigger** Whenever this address is accessed, one trigger pulse is generated. The read value means software trigger count from starting time of trigger mode	Read Only
0xF2F1010C	**Strobe Control Register**. Bit 0 : Strobe enable (0: disable, 1: enable) Bit 1 : Strobe active (0: active low, 1: active high) Bit 2 : Strobe delay unit (0: 1usec, 1: 250usec) Bit 3 : Strobe pulse width unit (0: 1usec, 1: 250usec) Bit 13 ~ Bit 4 : Strobe delay (D: 0 ~ 1023) : delay time range : 1usec ~ 255msec If strobe delay unit is 0, strobe delay time = (D + 0.3) usec If strobe delay unit is 1, strobe delay time = (D * 250) usec Bit 23 ~ Bit 16 : Strobe pulse width (D: 0 ~ 255) : width range : 1usec ~ 64msec If strobe pulse width unit is 0, strobe duration time = (D+1) usec If strobe pulse width unit is 1, strobe duration time = (D+1)*250 usec	Read/Write

3.12.2 Electrical Specification for Ext. Trigger and Strobe signal



3.12.3 Trigger & Strobe signal relation



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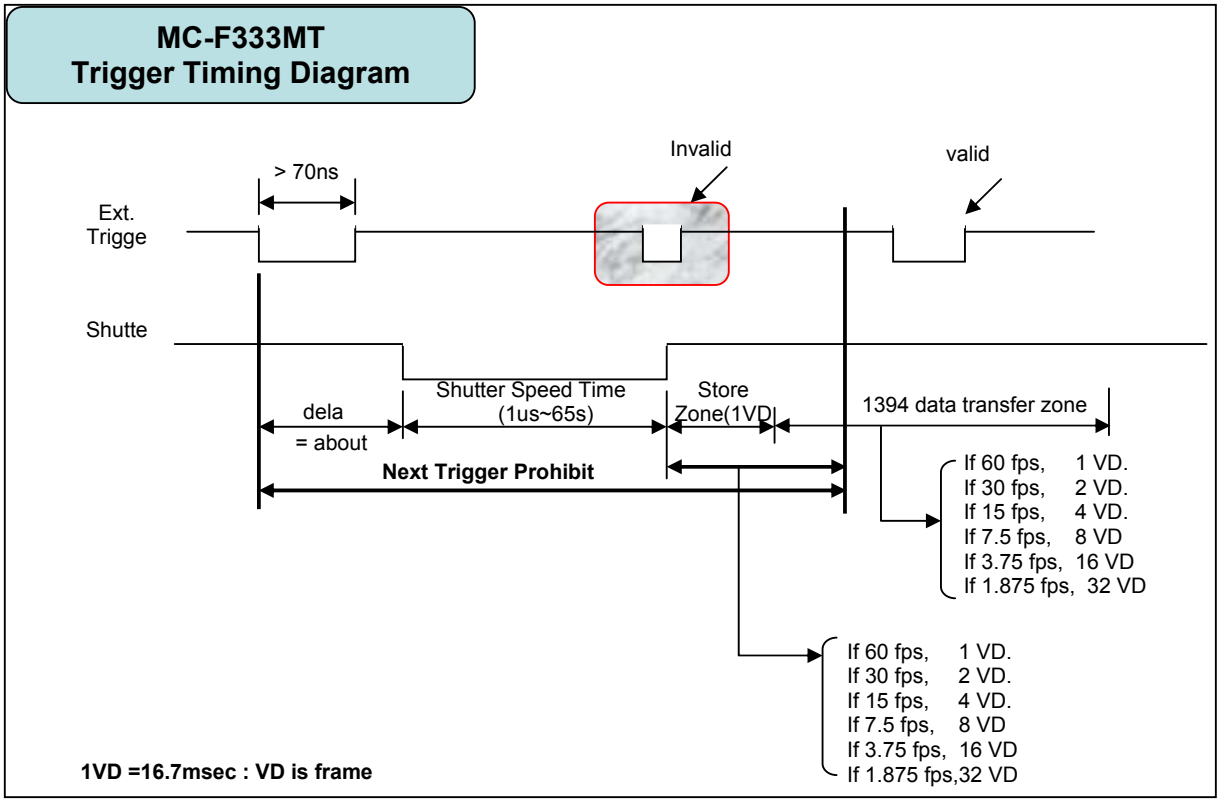
3.12.4 Trigger Timing Diagram



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3.13 Available Video Formats, Modes, & Frame Rates

3.13.1 Standards for MCF-433 Color Camera

The following standard video formats, modes, and frame rates are available on the MCF-433 color camera

Format_0, Mode_0	FrameRate_2	(YUV 4:4:4, 24 bits/pixel, 160 x 120 pixels at 7.5 fps)
Format_0, Mode_0	FrameRate_3	(YUV 4:4:4, 24 bits/pixel, 160 x 120 pixels at 15 fps);
Format_0, Mode_0	FrameRate_4	(YUV 4:4:4, 24 bits/pixel, 160 x 120 pixels at 30 fps)
Format_0, Mode_1	FrameRate_1	(YUV 4:2:2, 16 bits/pixel, 320 x 240 pixels at 3.75 fps)
Format_0, Mode_1	FrameRate_2	(YUV 4:2:2, 16 bits/pixel, 320 x 240 pixels at 7.5 fps)
Format_0, Mode_1	FrameRate_3	(YUV 4:2:2, 16 bits/pixel, 320 x 240 pixels at 15 fps)
Format_0, Mode_1	FrameRate_4	(YUV 4:2:2, 16 bits/pixel, 320 x 240 pixels at 30 fps)
Format_0, Mode_2	FrameRate_1	(YUV 4:1:1, 12 bits/pixel, 640 x 480 pixels at 3.75 fps)
Format_0, Mode_2	FrameRate_2	(YUV 4:1:1, 12 bits/pixel, 640 x 480 pixels at 7.5 fps)
Format_0, Mode_2	FrameRate_3	(YUV 4:1:1, 12 bits/pixel, 640 x 480 pixels at 15 fps)
Format_0, Mode_2	FrameRate_4	(YUV 4:1:1, 12 bits/pixel, 640 x 480 pixels at 30 fps)
Format_0, Mode_3	FrameRate_1	(YUV 4:2:2, 16 bits/pixel, 640 x 480 pixels at 3.75 fps)
Format_0, Mode_3	FrameRate_2	(YUV 4:2:2, 16 bits/pixel, 640 x 480 pixels at 7.5 fps)
Format_0, Mode_3	FrameRate_3	(YUV 4:2:2, 16 bits/pixel, 640 x 480 pixels at 15 fps)
Format_0, Mode_4	FrameRate_1	(RGB24, 24 bits/pixel, 640 x 480 pixels at 3.75 fps)
Format_0, Mode_4	FrameRate_2	(RGB24, 24 bits/pixel, 640 x 480 pixels at 7.5 fps)
Format_0, Mode_4	FrameRate_3	(RGB24, 24 bits/pixel, 640 x 480 pixels at 15 fps)
Format_0, Mode_5	FrameRate_1	(Mono, 8 bits/pixel, 640 x 480 pixels at 3.75 fps)
Format_0, Mode_5	FrameRate_2	(Mono, 8 bits/pixel, 640 x 480 pixels at 7.5 fps)
Format_0, Mode_5	FrameRate_3	(Mono, 8 bits/pixel, 640 x 480 pixels at 15 fps)
Format_0, Mode_5	FrameRate_4	(Mono, 8 bits/pixel, 640 x 480 pixels at 30 fps)

3.13.4 Standards for MC-333MT

Format0_Mode5	FrameRate_1	Mono, 8 bits/pixel, 640 x 480 pixels at 3.75 fps
Format0_Mode5	FrameRate_2	Mono, 8 bits/pixel, 640 x 480 pixels at 7.5 fps
Format0_Mode5	FrameRate_3	Mono, 8 bits/pixel, 640 x 480 pixels at 15 fps
Format0_Mode5	FrameRate_4	Mono, 8 bits/pixel, 640 x 480 pixels at 30 fps
Format0_Mode5,	FrameRate_5	Mono, 8 bits/pixel, 640 x 480 pixels at 60 fps

*

Format0_Mode6	FrameRate_1	Mono, 16 bits/pixel, 640 x480 pixels at 3.75 fps
Format0_Mode6	FrameRate_2	Mono, 16 bits/pixel, 640 x480 pixels at 7.5 fps
Format0_Mode6	FrameRate_3	Mono, 16 bits/pixel, 640 x480 pixels at 15 fps
Format0_Mode6	FrameRate_4	Mono, 16 bits/pixel, 640 x480 pixels at 30 fps

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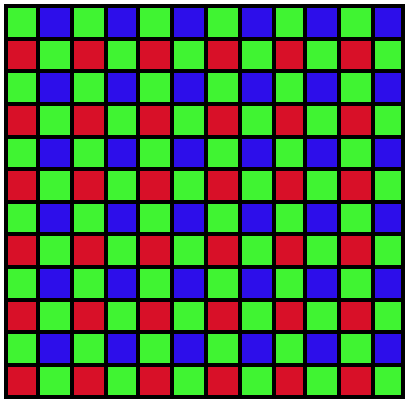
3.14 Output Data Format for color cameras

The data format of color cameras is outputting as Bayer RGB data format and the form of the data transmitted from is as follows.



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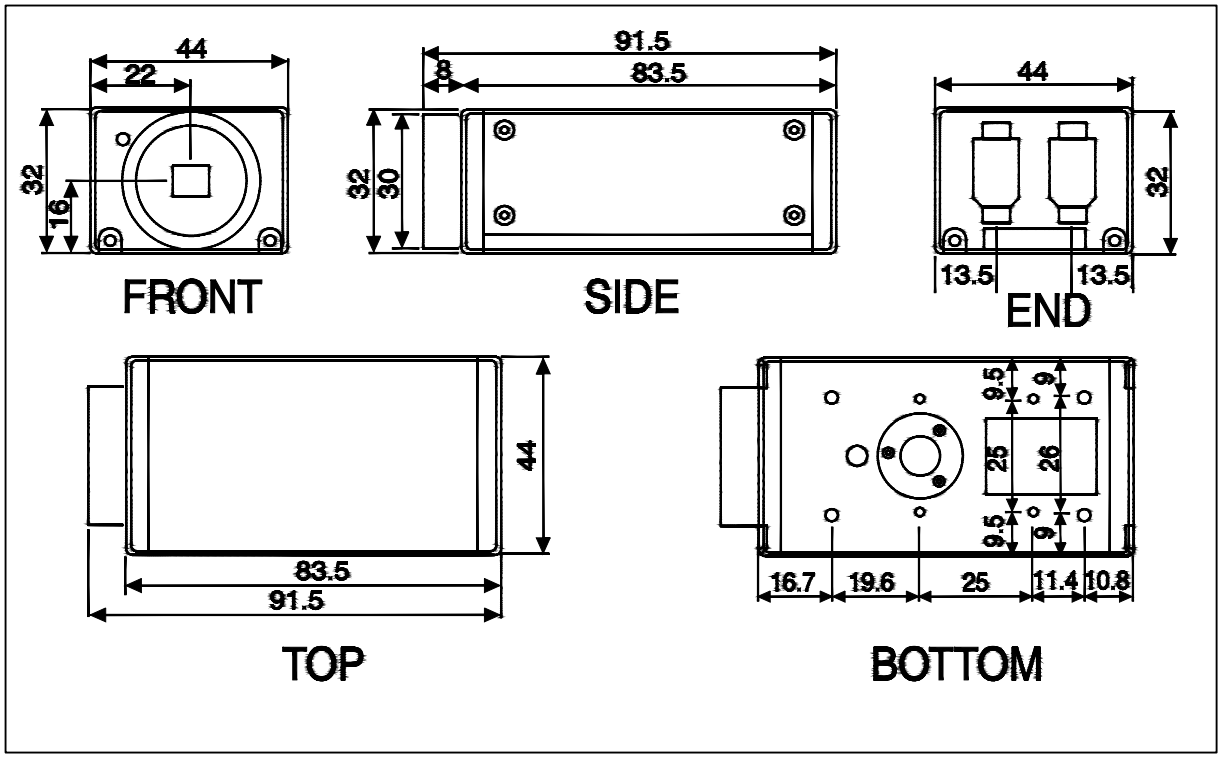
4. Camera Dimensions

4.1 MCF-433



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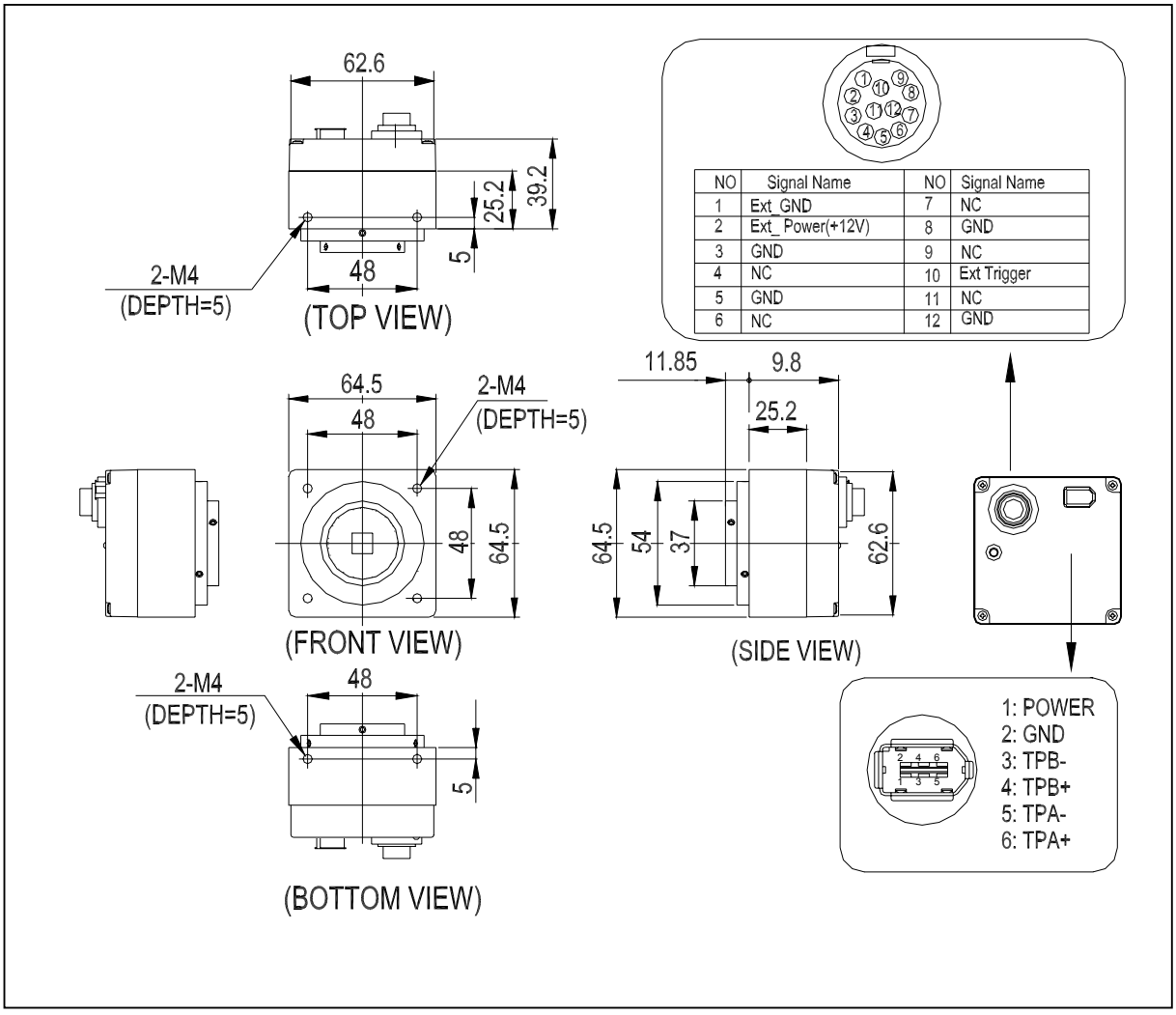
4.3 Trigger Models : MC-FyyyX (x = B/W or Color, yyy = Resoltion Size)



NO	Signal Name	NO	Signal Name
1	Ext_GND	7	NC
2	Ext_ Power(+12V)	8	GND
3	GND	9	NC
4	NC	10	Ext Trigger
5	GND	11	NC
6	NC	12	GND

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5. Troubleshooting

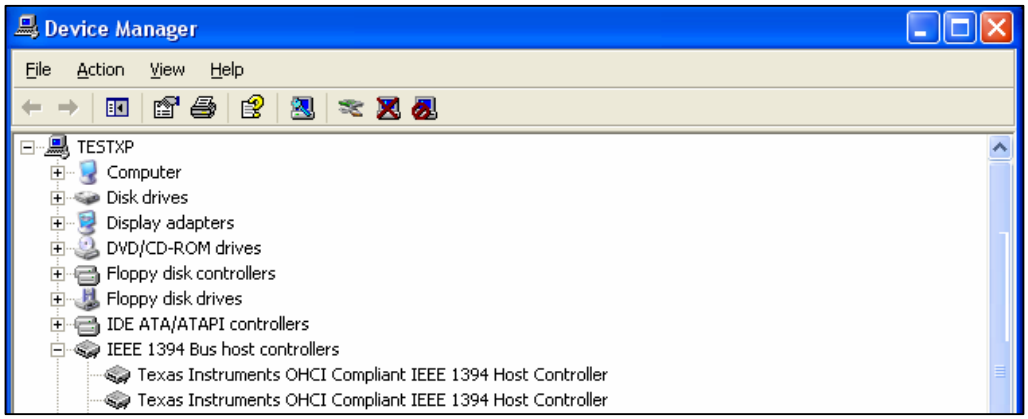
5.1 Fault Checking Using the Camera LED

5.1.1 Fault Checking Using the Camera LED

When you connect the camera with the PC through the IEEE 1394 cable, the LED in the back panel of the camera should be switched to Red color. If you cannot see this color, check the following items:

• Check the OHCI card driver is installed properly

• Check the OHCI card driver is installed by clicking the right button on the "MyComputer" and select "Property". When the property window shown, select "Hardware" tab and select "Device Manager" button at the page. In this dialog you can check whether the card driver is installed correctly or not like as follows.



• Check the IEEE 1394 Cable is working

5.1.2 Green LED

When you run the camera, the LED in the back panel should turn into green color. If the LED doesn't change the color, camera may not be working properly and you may not receive the camera data. In this situation, plug off the camera after exiting application and re-connect the camera and run again.

If you cannot see green color still, contact the technical support.

5.2 Error Messages while running the DEMO Application

5.2.1 "Can not Find the 1394 Camera"

If the dialog saying that "Con not Find the 1394 Camera" when you run the demo application, check the device driver for camera is installed properly. You can check the device driver by clicking the right button of the mouse on the "MyComputer" and selecting the "Property". When the property dialog shown, select the "Hardware" tab and push the "Device Manager" button. In this dialog you should see "imaging device" list item, and you can see the camera lists if you expand the "image device" item like as follows.

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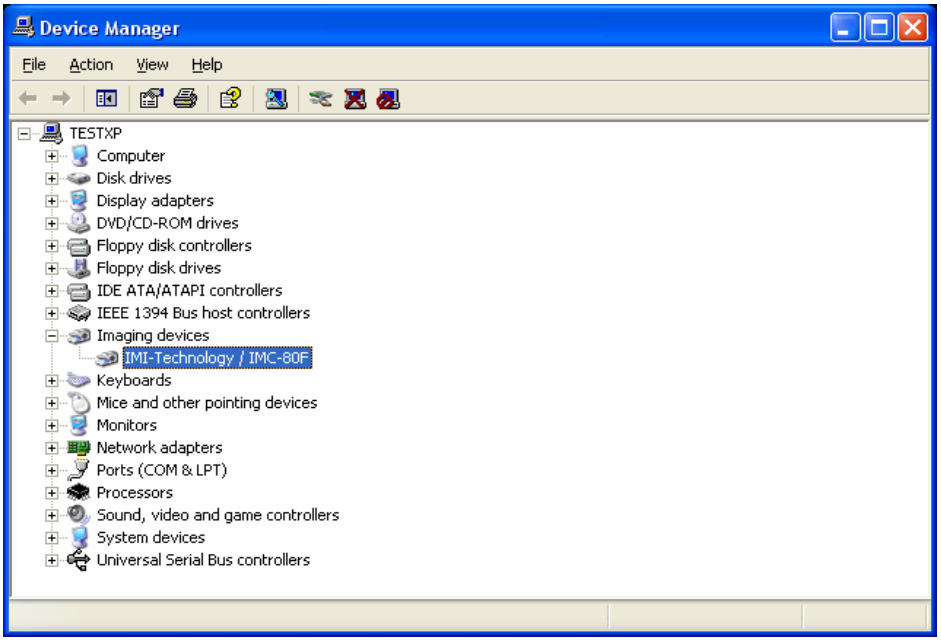

5.2.2 "Can not Find the 1394

The following information can help you solve problems that may occur during the setup of your camera. Make sure that the camera is part of the entire acquisition system.

You may have to troubleshoot any or all of the following.

- Power supplies
- Framegrabbers H/W and S/W
- light source
- operation environment
- cabling
- host computer
- optics

5.2.3 Common Solutions

The first step in troubleshooting is verify that your camera has all the correct connections regarding Power supply, Data cables, etc.

6. Technical Support Information

For technical assistance, contact 1stVision Support or Application Engineer.

Phone : 978-474-0044
Fax : 978-623-7260
Email : info@1stVision.com

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