

VD1010
Camera Module with 10x Optical Zoom

Product Description

The VD1010 is a block camera module with integrated 10x optical zoom lens, and supports FHD resolution up to 1080P (2 million pixels). It is designed for integration as a core unit in Dome-Type or PTZ Camera. It provides high resolution image with excellent color reproduction, and supports auto-focus and image details enhancement, ideally for airport surveillance, city safety, video conference, court and video security application where high image quality is necessarily requested.

Function Overview

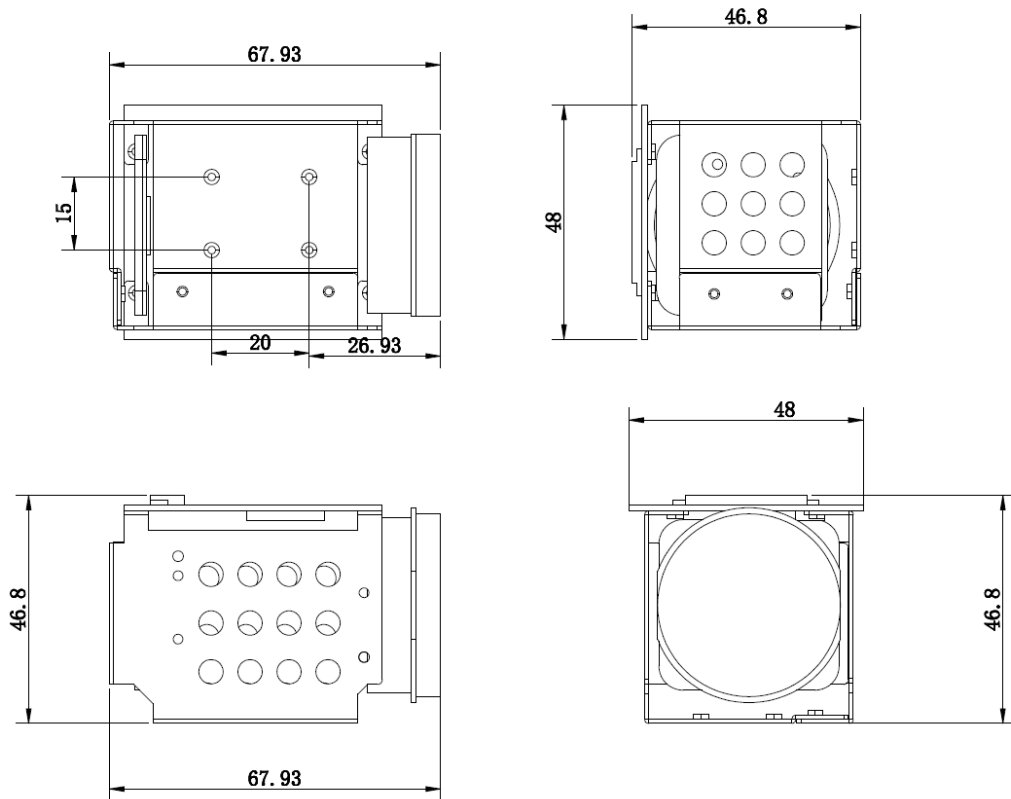
- Image Format
Supports high-resolution video format with 1920x1080 and 1280x720 with excellent image quality.
- Auto Exposure
Supports auto-exposure function to ensure best image capture under all light conditions.
- Back-light compensation
Ensures even, recognizable images with strong back light
- WDR Wide Dynamic Range
WDR image processing removes shadows and dark section, and produces clear image when operating under strongly differentiated light conditions (e.g. strong sun light or back light)
- Low-Light imaging
Integrated ICR (IR-Cut filter removal) mechanism can significantly improve camera sensitivity and reduces noises.
- DNR Digital Noise Reduction
Integrated Digital Noise Reduction algorithm filters image noises when operating under dark or low-light condition.
- Flexibility
Supports customized development.

Specification

Model		VD1010		
Imager	Sensor	1/2.7 Inch Type EXMOR [®] CMOS sensor	Backlight Comp.	ON/OFF
	Eff. Pixel	Approx. 2 Million Pixels	WDR	ON/OFF
Resolution (H*V)		1920*1080、1280*720	Defog	ON/OFF
Lens		10X optical zoom	ICR	Auto/ON/OFF
		f=4.7mm(Wide)~47mm(Tele)	Iris Control	Auto
Digital Zoom		N/A	DNR	0-5 (6 Levels)
FOV Wide-End (HxV)		60.9°x 40.1°	Color Hue	-14°~14° (15 Levels)
FOV Tele-End (HxV)		6.43°x 4.1°	Color Gain	60%~200% (15 Levels)
Min. Focus Distance		0.5m	Sharpness	0-15 (16 Levels)
Min. Illumination		Color:1.0 Lux B/W :0.05Lux	Mirror	ON/OFF
S/N Ratio		>50db	FLIP	ON/OFF
Video Format	HD	1080P60/50,1080P30/25,	Slow Shutter	N/A
		1080i60/50,720P60/50	Key control	N/A
	SD	N/A	Image Stabilizer	N/A
Video Output		LVDS	Privacy Mask	N/A
Control Protocol		VISCA [®]	Motion Detection	N/A
Elect. Shutter		1/60~1/10000	Alarm	N/A
White Balance		Auto/Indoor/Outdoor/OPW/Atw/Manual	Storage Temp.	-40°C to 60°C
Digital Gain		6db~28db(12 Levels)	Storage Humid.	20%~95%
AE Control		Auto/Shutter/Iris/Manual	Operating Temp.	-20°C to 50°C
Focus Modes		Auto/OPT/Manual	Operating Humid.	20%~80%
Exposure Comp.		-9db~9db (13 Levels, OFF)	Input Voltage	DC 9-12V
Power consumption		Max. 4.5W	Weight	Approx. 150g
Dimension (W*H*D)		46.8mm*48.00mm*67.93mm		

Dimension Drawing

Outer Dimensions



Connector & Pin Description

No.	Description	I/O	Note
1	/		
2	/		
3	/		
4	/		
5	/		
6	/		
7	GND	Input	Ground
8	GND	Input	Ground
9	GND	Input	Ground
10	GND	Input	Ground
11	GND	Input	Ground
12	GND	Input	Ground
13	12V	Input	V-in
14	12V	Input	V-in
15	12V	Input	V-In

No.	Description	I/O	Note
16	12V	Input	V-in
17	12V	Input	V-in
18	RX	Input	RS232 (TTL3.3V)
19	TX	Output	RS232 (TTL3.3V)
20	GND	Input	Ground
21	TXOUT0-	Output	LVDS Out
22	TXOUT0+	Output	LVDS Out
23	TXOUT1-	Output	LVDS Out
24	TXOUT1+	Output	LVDS Out
25	TXOUT2-	Output	LVDS Out
26	TXOUT2+	Output	LVDS Out
27	TXCLKOUT-	Output	LVDS Out
28	TXCLKOUT+	Output	LVDS Out
29	TXOUT3-	Output	LVDS Out
30	TXOUT3+	Output	LVDS Out

Control Command

Command Set	Command	Command Packet	Comments
AddressSet	Broadcast	88 30 01 FF	Address setting
IF_Clear	Broadcast	88 01 00 01 FF	I/F CleSr
CommandCancel	–	8x 2p FF	p: Socket No. (=1 or 2)
CAM_Power	On	8x 01 04 00 02 FF	Power ON/OFF
	Off (Standby)	8x 01 04 00 03 FF	
CAM_Zoom	Stop	8x 01 04 07 00 FF	
	Tele (Standard)	8x 01 04 07 02 FF	
	Wide (Standard)	8x 01 04 07 03 FF	
	Tele (Variable)	8x 01 04 07 2p FF	p=0 (Low) to 7 (High)
	Wide (Variable)	8x 01 04 07 3p FF	
	Direct	8x 01 04 47 0p 0q 0r 0s FF	pqrs: Zoom Position
CAM_Focus	Stop	8x 01 04 08 00 FF	
	Far (Standard)	8x 01 04 08 02 FF	
	Near (Standard)	8x 01 04 08 03 FF	
	Far (Variable)	8x 01 04 08 2p FF	p=0 (Low) to 7 (High)
	Near (Variable)	8x 01 04 08 3p FF	
	Direct	8x 01 04 48 0p 0q 0r 0s FF	pqrs: Focus Position
	Auto Focus	8x 01 04 38 02 FF	AF ON/OFF
	Manual Focus	8x 01 04 38 03 FF	
	Auto/Manual	8x 01 04 38 10 FF	
	One Push Trigger	8x 01 04 18 01 FF	One Push AF Trigger
AF Sensitivity	Normal	8x 01 04 58 02 FF	AF Sensitivity Normal/Low/High
	Low	8x 01 04 58 03 FF	
	High	8x 01 04 58 04 FF	
CAM_AFMode	Normal AF	8x 01 04 57 00 FF	AF Movement Mode
	Zoom Trigger AF	8x 01 04 57 02 FF	
CAM_ZoomFocus	Direct	8x 01 04 47 0p 0q 0r 0s 0t 0u 0v 0w FF	pqrs: Zoom Position tuv: Focus Position
CAM_Initialize	Lens	8x 01 04 19 01 FF	Lens Initialization Start
	Camera	8x 01 04 19 03 FF	Camera reset
CAM_WB	Auto	8x 01 04 35 00 FF	Normal Auto
	Indoor	8x 01 04 35 01 FF	Indoor mode
	Outdoor	8x 01 04 35 02 FF	Outdoor mode
	One Push WB	8x 01 04 35 03 FF	One Push WB mode
	ATW	8x 01 04 35 04 FF	Auto Tracing White Balance
	Manual	8x 01 04 35 05 FF	Manual Control mode
	One Push Trigger	8x 01 04 10 05 FF	One Push WB Trigger

Command Set	Command	Command Packet	Comments
CAM_RGain	Reset	8x 01 04 03 00 FF	Manual Control of R Gain
	Up	8x 01 04 03 02 FF	
	Down	8x 01 04 03 03 FF	
	Direct	8x 01 04 43 00 00 0p 0q FF	pq: R Gain
CAM_BGain	Reset	8x 01 04 04 00 FF	Manual Control of B Gain
	Up	8x 01 04 04 02 FF	
	Down	8x 01 04 04 03 FF	
	Direct	8x 01 04 44 00 00 0p 0q FF	pq: B Gain
CAM_AE	Full Auto	8x 01 04 39 00 FF	Automatic Exposure mode
	Manual	8x 01 04 39 03 FF	Manual Control mode
	Shutter Priority	8x 01 04 39 0A FF	Shutter Priority Automatic Exposure mode
CAM_Shutter	Reset	8x 01 04 0A 00 FF	Shutter Setting
	Up	8x 01 04 0A 02 FF	
	Down	8x 01 04 0A 03 FF	
	Direct	8x 01 04 4A 00 00 0p 0q FF	pq: Shutter Position
CAM_Gain	Reset	8x 01 04 0C 00 FF	Gain Setting
	Up	8x 01 04 0C 02 FF	
	Down	8x 01 04 0C 03 FF	
	Direct	8x 01 04 4C 00 00 0p 0q FF	pq: Gain Position
	Gain Limit	8x 01 04 2C 0p FF	p: Gain Position
CAM_ExpComp	On	8x 01 04 3E 02 FF	Exposure Compensation ON/OFF
	Off	8x 01 04 3E 03 FF	
	Reset	8x 01 04 0E 00 FF	Exposure Compensation Amount Setting
	Up	8x 01 04 0E 02 FF	
	Down	8x 01 04 0E 03 FF	
	Direct	8x 01 04 4E 00 00 0p 0q FF	pq: ExpComp Position
CAM_LightMode	BLC On	8x 01 04 33 02 FF	BackLight Compensation ON/OFF
	Off	8x 01 04 33 03 FF	DirectLight Compensation ON/OFF
CAM_WD	On	8x 01 04 3D 02 FF	Wide-D ON/OFF
	Off	8x 01 04 3D 03 FF	
CAM_Aperture	Reset	8x 01 04 02 00 FF	Aperture Control
	Up	8x 01 04 02 02 FF	
	Down	8x 01 04 02 03 FF	
	Direct	8x 01 04 42 00 00 0p 0q FF	pq: Aperture Gain
CAM_NR	—	8x 01 04 53 0p FF	p: NR Setting (0: OFF, level 1 to 5)
CAM_Gamma	—	8x 01 04 5B 0p FF	p: Gamma setting (0: Standard, 1 to 4)
CAM_LR_Reverse	On	8x 01 04 61 02 FF	Mirror Image ON/OFF
	Off	8x 01 04 61 03 FF	
*CAM_Freeze	On	8x 01 04 62 02 FF	Still Image ON/OFF
	Off	8x 01 04 62 03 FF	
CAM_PictureFlip	On	8x 01 04 66 02 FF	Picture flip ON/OFF
	Off	8x 01 04 66 03 FF	

Command Set	Command	Command Packet	Comments
CAM_Defog	On	8x 01 04 37 02 00 FF	Defog ON/OFF
	Off	8x 01 04 37 03 00 FF	
CAM_ICR	On	8x 01 04 01 02 FF	Infrared Mode ON/OFF
	Off	8x 01 04 01 03 FF	
CAM_AutoICR	On	8x 01 04 51 02 FF	Auto dark-field mode On/Off
	Off	8x 01 04 51 03 FF	
CAM_Memory	Reset	8x 01 04 3F 00 0p FF	p: Memory Number (=0 to 5)
	Set	8x 01 04 3F 01 0p FF	
	Recall	8x 01 04 3F 02 0p FF	
CAM_CUSTOM	Reset	8x 01 04 3F 00 7F FF	Starts up in this mode when the power is turned on.
	Set	8x 01 04 3F 01 7F FF	
	Recall	8x 01 04 3F 02 7F FF	
CAM_MemSave	Write	8x 01 04 23 0X 0p 0p 0q 0q FF	X: 00 to 07 (Address), total 16 byte ppqq: 0x0000 to 0xFFFF (Data)
CAM_MultiLineTitle	Title Set1	8x 01 04 73 1L 00 nn pp	L: Line Number, nn: H-position pp: Color, qq: Blink
		qq 00 00 00 00 00 FF	
	Title Set2	8x 01 04 73 2L mm nn pp qq rr ss tt uu vv ww FF	L: Line Number, mnpqrstuvw: Setting of characters (1 to 10)
		8x 01 04 73 3L mm nn pp qq rr ss tt uu vv ww FF	L: Line Number, mnpqrstuvw: Setting of characters (11 to 20)
	Title Clear	8x 01 04 74 1p FF	Title Setting clear (p: 0 to a, f= all lines)
	On	8x 01 04 74 2p FF	Title display On/Off (0 to a, f= all lines)
	Off	8x 01 04 74 3p FF	
CAM_RegisterValue	—	8x 01 04 24 mm 0p 0p FF	mm: Register No. (=00-7F) pp: Register Value (=00-7F)
CAM_ColorGain	Direct	8x 01 04 49 00 00 00 0p FF	p: Color Gain setting 0h (60%) to Eh (200%)
CAM_ColorHue	Direct	8x 01 04 4F 00 00 00 0p FF	p: Color Hue setting 0h (- 14 dgree) to Eh (+14 degrees)

Inquiry Commands

Inquiry Command	Command Packet	Inquiry Packet	Comments
CAM_PowerInq	8x 09 04 00 FF	y0 50 02 FF	On
		y0 50 03 FF	Off (Standby)
CAM_ZoomPosInq	8x 09 04 47 FF	y0 50 0p 0q 0r 0s FF	pqrs: Zoom Position
CAM_FocusModelInq	8x 09 04 38 FF	y0 50 02 FF	Auto Focus
		y0 50 03 FF	Manual Focus
CAM_FocusPosInq	8x 09 04 48 FF	y0 50 0p 0q 0r 0s FF	pqrs: Focus Position
CAM_AFSensitivityInq	8x 09 04 58 FF	y0 50 02 FF	AF Sensitivity Normal
		y0 50 03 FF	AF Sensitivity Low
		y0 50 04 FF	AF Sensitivity High
CAM_AFModelInq	8x 09 04 57 FF	y0 50 00 FF	Normal AF
		y0 50 02 FF	Zoom Trigger AF
CAM_WBModelInq	8x 09 04 35 FF	y0 50 00 FF	Auto
		y0 50 01 FF	In Door
		y0 50 02 FF	Out Door
		y0 50 03 FF	One Push WB
		y0 50 04 FF	ATW
		y0 50 05 FF	Manual
CAM_RGainInq	8x 09 04 43 FF	y0 50 00 00 0p 0q FF	pq: R Gain
CAM_BGainInq	8x 09 04 44 FF	y0 50 00 00 0p 0q FF	pq: B Gain
CAM_AEModelInq	8x 09 04 39 FF	y0 50 00 FF	Full Auto
		y0 50 03 FF	Manual
		y0 50 0A FF	Shutter Priority
		y0 50 0B FF	Iris Priority
CAM_ShutterPosInq	8x 09 04 4A FF	y0 50 00 00 0p 0q FF	pq: Shutter Position
CAM_GainPosInq	8x 09 04 4C FF	y0 50 00 00 0p 0q FF	pq: Gain Position
CAM_GainLimitInq	8x 09 04 2C FF	y0 50 0q FF	p: Gain Limit
CAM_ExpCompModelInq	8x 09 04 3E FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_ExpCompPosInq	8x 09 04 4E FF	y0 50 00 00 0p 0q FF	pq: ExpComp Position
CAM_LightModelInq	8x 09 04 33 FF	y0 50 02 FF	BLC On
		y0 50 03 FF	Off
CAM_WDModelInq	8x 09 04 3D FF	y0 50 02 FF	On Wide-D
		y0 50 03 FF	Off
CAM_ApertureInq	8x 09 04 42 FF	y0 50 00 00 0p 0q FF	pq: Aperture Gain
CAM_NRModelInq	8x 09 04 53 FF	y0 50 0p FF	Noise Reduction p: 0 to 5
CAM_GammaInq	8x 09 04 5B FF	y0 50 0p FF	Gamma p: 0 to 4
CAM_LR_ReverseModelInq	8x 09 04 61 FF	y0 50 02 FF	On

Inquiry Command	Command Packet	Inquiry Packet	Comments
		y0 50 03 FF	Off
*CAM_FreezeModelInq	8x 09 04 62 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_PictureEffectModelInq	8x 09 04 63 FF	y0 50 00 FF	Off
		y0 50 04 FF	B&W
CAM_PictureFlipModelInq	8x 09 04 66 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_ICRModelInq	8x 09 04 01 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_AutoICRModelInq	8x 09 04 51 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_AutoICRArmReplyInq	8x 09 04 31 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_MemoryInq	8x 09 04 3F FF	y0 50 pp FF	pp: Memory number recalled last
CAM_MemSaveInq	8x 09 04 23 0X FF	y0 50 0p 0p 0q 0q FF	X: 00 to 07 (Address) ppqq: 0x0000 to 0xFFFF (Data)
CAM_DisplayModelInq	8x 09 04 15 FF	y0 50 02 FF	On
	(8x 09 06 06 FF)	y0 50 03 FF	Off
CAM_TitleDisplayModelInq	8x 09 04 74 FF	y0 50 02 FF	On
	(8x 09 06 06 FF)	y0 50 03 FF	Off
CAM_VersionInq	8x 09 00 02 FF	y0 50 00 20	mnpq: Model Code (04xx) rstu: ROM version
		mn pq rs tu vw FF	vw: Socket Number (=02)
CAM_ReplyIntervalTimeInq	8x 09 04 6A FF	y0 50 00 00 0p 0p FF	pp: Interval Time
CAM_RegisterValueInq	8x 09 04 24 mm FF	y0 50 0p 0p ff	mm: Register No. (00 to 7F) pp: Register Value (00 to FF)
CAM_ColorGainInq	8x 09 04 49 FF	y0 50 00 00 00 0p FF	p: Color Gain setting 0h (60%) to Eh (200%)
CAM_ColorHueInq	8x 09 04 4F FF	y0 50 00 00 00 0p FF	p: Color Hue setting 0h (- 14 degrees) to Eh (+ 14 degrees)

VISCA Command Parameters

1. Exposure control

	60/30 mode	50/25 mode	
Shutter Speed	15	1/10000	1/10000
	14	1/6000	1/6000
	13	1/4000	1/3500
	12	1/3000	1/2500
	11	1/2000	1/1750
	10	1/1500	1/1250
	0F	1/1000	1/1000
	0E	1/725	1/600
	0D	1/500	1/425
	0C	1/350	1/300
	0B	1/250	1/215
	0A	1/180	1/150
	9	1/125	1/120
	8	1/100	1/100
	7	1/90	1/75
	6	1/60	1/50
	5	1/30 (P30)	1/25 (P25)
	*1/30 or 1/25 Only Set in P30 or P25 Mode		
Gain	0F	+28 dB	
	0E	+26 dB	
	0D	+24 dB	
	0C	+22 dB	
	0B	+20 dB	
	0A	+18 dB	
	09	+16 dB	
	08	+14 dB	
	07	+12 dB	
	06	+10 dB	
	05	+8 dB	
	04	+6 dB	
	03	+4 dB	
	02	+2 dB	
	01	0 dB	
Gain Limit	0F	+28 dB	
	0E	+26 dB	
	0D	+24 dB	
	0C	+22 dB	
	0B	+20 dB	
	0A	+18 dB	
	09	+16 dB	
	08	+14 dB	
	07	+12 dB	
	06	+10 dB	
	05	+8 dB	
	04	+6 dB	

Exposure Comp.	0D	+6	+9 dB
	0C	+5	+7.5 dB
	0B	+4	+6 dB
	0A	+3	+4.5 dB
	09	+2	+3 dB
	08	+1	+1.5 dB
	07	0	0 dB
	06	-1	-1.5 dB
	05	-2	-3 dB
	04	-3	-4.5 dB
	03	-4	-6 dB
	02	-5	-7.5 dB
	01	-6	-9 dB

Zoom Ratio and Zoom Position (for reference)

Zoom Ratio ×10 Lens	Optical Zoom Positon Data		
×1	0000		
×2	1a48		
×3	2590		
×4	2c82		
×5	3192		
×6	35a4		
×7	3914		
×8	3bf7		
×9	3e45		
×10	4000		

Title setting

Line number	00 to 0A
H-position	00 to 1F
Blink	00: Dose not blink
	01: Blinks

00	01	02	03	04	05	06	07
A	B	C	D	E	F	G	H
08	09	0a	0b	0c	0d	0e	0f
I	J	K	L	M	N	O	P
10	11	12	13	14	15	16	17
Q	R	S	T	U	V	W	X
18	19	1a	1b	1c	1d	1e	1f
Y	Z	&	Space	?	!	1	2
20	21	22	23	24	25	26	27
3	4	5	6	7	8	9	0
49	4a	4c	4d	4e	4f	50	
"	:	.	,	/	-	*	

4.Register Setting

The register settings are enabled when the power is turned off and then back on again. After turning the power back on again, verify that the mode settings have been changed.

	Register No.	Value	
VISCA Baud Rate	0	0 (Default value)	9600 bps
Monitoring Mode	72	1 (Default value)	1080i/60 (Frame out: 30PsF)
		4	1080i/50 (Frame out: 25PsF)
			1080p/30
			1080p/25
			720p/60
			720p/50
			720p/30
			6
		8	1080p/60
		9	1080p/50
		0C	
		0E	
		11	
13			
14			

5.Others

R Gain	0	to	FF
B Gain	0	to	FF
Aperture Level	0	to	0F
Color Gain setting level	0	to	0E
Color Hue setting level	0	to	0E