



The serial port controls the command set

Version: VHD-QR-RD-005 V2.1

No	Function	Testing Item	Send Command	Instruction	Actual result	Remark
1	AddressSet	Broadcast	88 30 01 FF	Address setting	OK	
2	CAM_Power	On	81 01 04 00 02 FF	Power ON/OFF	OK	
		Off	81 01 04 00 03 FF		OK	
3	CAM_Zoom	Stop	81 01 04 07 00 FF	p = 0(low) - 7(high) pqrs: Zoom Position pqrs max value:4000	OK	
		Tele(Standard)	81 01 04 07 02 FF		OK	
		Wide(Standard)	81 01 04 07 03 FF		OK	
		Tele(Variable)	81 01 04 07 2p FF		OK	
		Wide(Variable)	81 01 04 07 3p FF		OK	
		Direct	81 01 04 47 0p 0q 0r 0s FF		OK	
4	CAM_Focus	Stop	81 01 04 08 00 FF	p = 0(low) - 7(high) pqrs: Focus Position	OK	
		Far(Standard)	81 01 04 08 02 FF		OK	
		Near(Standard)	81 01 04 08 03 FF		OK	
		Far(Variable)	81 01 04 08 2p FF		OK	
		Near(Variable)	81 01 04 08 3p FF		OK	
		Direct	81 01 04 48 0p 0q 0r 0s FF		OK	
		Auto Focus	81 01 04 38 02 FF		OK	
		Manual Focus	81 01 04 38 03 FF		OK	
5	CAM_WB(White balance)	Auto	81 01 04 35 00 FF	Normal Auto	OK	
		Indoor mode	81 01 04 35 01 FF	Indoor mode	OK	
		Outdoor mode	81 01 04 35 02 FF	Outdoor mode	OK	
		OnePush mode	81 01 04 35 03 FF	One Push WB mode	OK	
		Manual	81 01 04 35 05 FF	Manual Control mode	OK	
		OnePush trigger	81 01 04 10 05 FF	One Push WB Trigger	OK	
		VAR	81 01 04 35 20 FF		OK	
6	CAM_Rgain(Red gain)	Reset	81 01 04 03 00 FF	Manual Control of R Gain pq: R Gain	OK	
		Up	81 01 04 03 02 FF		OK	
		Down	81 01 04 03 03 FF		OK	
		Direct	81 01 04 43 00 00 0p 0q FF		OK	
7	CAM_Bgain(Blue gain)	Reset	81 01 04 04 00 FF	Manual Control of B Gain pq: B Gain	OK	
		Up	81 01 04 04 02 FF		OK	
		Down	81 01 04 04 03 FF		OK	
		Direct	81 01 04 44 00 00 0p 0q FF		OK	

8	CAM_AE(Exposure)	Full Auto	81 01 04 39 00 FF	Automatic Exposure mode	OK	
		Manual	81 01 04 39 03 FF	Manual Control mode	OK	
		Shutter priority	81 01 04 39 0A FF	Shutter Priority Automatic Exposure mode	OK	
		Iris priority	81 01 04 39 0B FF	Iris Priority Automatic Exposure mode	OK	
		Bright	81 01 04 39 0D FF	Bright Mode(Manual control)	OK	
		Cam SpotLight	81 01 04 39 10 FF	Spot light mode	OK	
9	CAM_MeteringMode (Metering Mode)	Average	81 01 04 3A 00 FF	Average Metering	OK	
		Center-weighted	81 01 04 3A 01 FF	Center-weighted Average Metering	OK	
		Smart	81 01 04 3A 02 FF		OK	
		Top	82 01 04 3A 03 FF		OK	
10	CAM_Shutter	Reset	81 01 04 0A 00 FF	Shutter Setting	OK	
		Up	81 01 04 0A 02 FF		OK	
		Down	81 01 04 0A 03 FF		OK	
		Direct	81 01 04 4A 00 00 0p 0q FF	pq: Shutter Position	OK	
11	CAM_Iris	Reset	81 01 04 0B 00 FF	Iris Setting	OK	
		Up	81 01 04 0B 02 FF		OK	
		Down	81 01 04 0B 03 FF		OK	
		Direct	81 01 04 4B 00 00 0p 0q FF	pq: Iris Position	OK	
12	CAM_Gain (Gain under manual exposure)	Reset	81 01 04 0C 00 FF	Gain Setting	OK	
		Up	81 01 04 0C 02 FF		OK	
		Down	81 01 04 0C 03 FF		OK	
		Direct	81 01 04 0C 00 00 0p 0q FF	pq: Gain Position	OK	
		Gain Limit	81 01 04 2C 0p FF	p: Gain Position	OK	
13	CAM_Bright	Reset	81 01 04 0D 00 FF	Bright Setting	OK	
		Up	81 01 04 0D 02 FF		OK	
		Down	81 01 04 0D 03 FF		OK	
		Direct	81 01 04 0D 00 00 0p 0q FF	pq: Bright Position	OK	
14	CAM_ExpComp	On	81 01 04 3E 02 FF	Exposure Compensation	OK	
		Off	81 01 04 3E 03 FF	On/Off	OK	
		Reset	81 01 04 0E 00 FF	Exposure Compensation Amount Setting	OK	
		Up	81 01 04 0E 02 FF		OK	
		Down	81 01 04 0E 03 FF		OK	
		Direct	81 01 04 4E 00 00 0p 0q FF	pq: ExpComp Position	OK	
15	CAM_BackLight	On	81 01 04 33 02 FF	Back Light Compensation	OK	
		Off	81 01 04 33 03 FF	On/Off	OK	
16	CAM_NR(2D)	-	81 01 04 53 0p FF	p: NR Setting (0: Off, level 1 to 5)	OK	

17	CAM_NR(3D)	-	81 01 04 54 0p FF	p: NR Setting (0: Off, level 1 to 5)	OK	
18	CAM_Gamma	-	81 01 04 5B 0p FF	p: Gamma setting (0: Standard, 1 to 4) 0: default; 1:0.45; 2:0.5; 3:0.56; 4:0.63;	OK	
19	CAM_Flicker	-	81 01 04 23 0p FF	p: Flicker Settings (0: Off, 1: 50Hz, 2: 60Hz)	OK	
20	CAM_ApertureMode(Sharpness)	Auto	81 01 04 05 02 FF	Sharpness Auto	OK	
		Manual	81 01 04 05 03 FF	Sharpness Manual	OK	
21	CAM_Sharpness	Reset	81 01 04 02 00 FF	Aperture Control	OK	
		Up	81 01 04 02 02 FF		OK	
		Down	81 01 04 02 03 FF		OK	
		Direct	81 01 04 42 00 00 0p 0q FF	pg: Aperture Gain	OK	
22	CAM_PictureEffect	Off	81 01 04 63 00 FF	Picture Effect Setting	OK	
		B&W	81 01 04 63 04 FF		OK	
23	CAM_Memory(Preset)	Reset	81 01 04 3F 00 pp FF	pp: Memory Number(=0 to 254)	OK	
		Set	81 01 04 3F 01 pp FF		OK	
		Recall	81 01 04 3F 02 pp FF		OK	
24	CAM_LR_Reverse (Image Flip Horizontal)	On	81 01 04 61 02 FF	Image Flip Horizontal On/Off	OK	
		Off	81 01 04 61 03 FF		OK	
25	CAM_PictureFlip (Image Flip Vertical)	On	81 01 04 66 02 FF	Image Flip Vertical On/Off	OK	
		Off	81 01 04 66 03 FF		OK	
26	CAM_Saturation	Diret	81 01 04 49 00 00 00 0p FF	p: Color Gain setting 0h (60%) to Eh (200%)	OK	
27	Pan_tiltDrive	Up	81 01 06 01 VV WW 03 01 FF	VV: Pan speed 0x01 (low speed) to 0x18 (high speed) WW: Tilt speed 0x01 (low speed) to 0x14 (high speed) YYYY: Pan Position ZZZZ: Tilt Position	OK	
		Down	81 01 06 01 VV WW 03 02 FF		OK	
		Left	81 01 06 01 VV WW 01 03 FF		OK	
		Right	81 01 06 01 VV WW 02 03 FF		OK	
		Upleft	81 01 06 01 VV WW 01 01 FF		OK	
		Upright	81 01 06 01 VV WW 02 01 FF		OK	
		DownLeft	81 01 06 01 VV WW 01 02 FF		OK	
		DownRight	81 01 06 01 VV WW 02 02 FF		OK	
		Stop	81 01 06 01 VV WW 03 03 FF		OK	
		AbsolutePosition	81 01 06 02 VV WW 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF		OK	

		RelativePosition	81 01 06 03 VV WW 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF		OK	
		Home	81 01 06 04 FF		OK	
		Reset	81 01 06 05 FF		OK	
28	Pan_tiltLimitSet	LimitSet	81 01 06 07 00 0W 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF	W: 1 UpRight 0: DownLeft YYYY: Pan Limit Position	OK	
		LimitClear	81 01 06 07 01 0W 07 0F 0F 0F 07 0F 0F 0F FF	ZZZZ: Tilt Position	OK	
29	CAM_AFSensitivity	High	81 01 04 58 01 FF	AF Sensitivity	OK	
		Normal	81 01 04 58 02 FF	High/Normal/Low	OK	
		Low	81 01 04 58 03 FF		OK	
30	CAM_SettingReset	Reset	81 01 04 A0 10 FF	Reset Factory Setting	OK	
31	CAM_Brightness	Direct	81 01 04 A1 00 00 0p 0q FF	pq: Brightness Position	OK	
32	CAM_Contrast	Direct	81 01 04 A2 00 00 0p 0q FF	pq: Contrast Position	OK	
33	CAM_Flip	Off	81 01 04 A4 00 FF	Single Command For Video Flip	OK	
		Flip-H	81 01 04 A4 01 FF		OK	
		Flip-V	81 01 04 A4 02 FF		OK	
		Flip-HV	81 01 04 A4 03 FF		OK	
34	CAM_SettingSave)	Save	81 01 04 A5 10 FF	Save Current Setting	OK	
35	CAM_AWBSensitivity	High	81 01 04 A9 00 FF	High	OK	
		Normal	81 01 04 A9 01 FF	Normal	OK	
		Low	81 01 04 A9 02 FF	Low	OK	
36	CAM_AFZone	Top	81 01 04 AA 00 FF	AF Zone weight select	OK	
		Center	81 01 04 AA 01 FF		OK	
		Bottom	81 01 04 AA 02 FF		OK	
37	CAM_DVIMode	HDMI	81 01 04 AB 02 FF	DVI output mode, default:	OK	
		DVI	81 01 04 AB 03 FF	HDMI	OK	
38	CAM_ColorHue	Direct	81 01 04 4F 00 00 00 0p FF	p: Color Hue setting 0h (- 7 degrees) to Eh (+7 degrees)	OK	
39	Infrared	ON	81 01 06 08 02 FF		OK	
		OFF	81 01 06 08 03 FF		OK	



Serial port query command set

Version: VHD-QR-RD-005 V2.1

No.	Command	Command Package	Return Package	Instruction	Actual results	Remark
1	CAM_PowerInq	81 09 04 00 FF	y0 50 02 FF	On	OK	
			y0 50 03 FF	Off(Standby)	OK	
2	CAM_ZoomPosInq	81 09 04 47 FF	y0 50 0p 0q 0r 0s FF	pqrs: Zoom Position	OK	
3	CAM_FocusAFModelInq	81 09 04 38 FF	y0 50 02 FF	Auto Focus	OK	
			y0 50 03 FF	Manual Focus	OK	
4	CAM_FocusPosInq	81 09 04 48 FF	y0 50 0p 0q 0r 0s FF	pqrs: Focus Position	OK	
5	CAM_WBModelInq	81 09 04 35 FF	y0 50 00 FF	Auto	OK	
			y0 50 01 FF	Indoor mode	OK	
			y0 50 02 FF	Outdoor mode	OK	
			y0 50 03 FF	OnePush mode	OK	
			y0 50 05 FF	Manual	OK	
			y0 50 20 FF	VAR	OK	
6	CAM_RGainInq	81 09 04 43 FF	y0 50 00 00 0p 0q FF	pq: R Gain	OK	
7	CAM_BGainInq	81 09 04 44 FF	y0 50 00 00 0p 0q FF	pq: B Gain	OK	
8	CAM_AEModelInq	81 09 04 39 FF	y0 50 00 FF	Full Auto	OK	
			y0 50 03 FF	Manual	OK	
			y0 50 0A FF	Shutter priority	OK	
			y0 50 0B FF	Iris priority	OK	
			y0 50 0D FF	Bright	OK	
9	CAM_ShutterPosInq	81 09 04 4A FF	y0 50 00 00 0p 0q FF	pq: Shutter Position	OK	
10	CAM_IrisPosInq	81 09 04 4B FF	y0 50 00 00 0p 0q FF	pq: Iris Position	OK	
11	CAM_GainPosInq	81 09 04 4C FF	y0 50 00 00 0p 0q FF	pq: Gain Position	OK	
12	CAM_BrightPosInq	81 09 04 4D FF	y0 50 00 00 0p 0q FF	pq: Bright Position	OK	
13	CAM_ExpCompModelInq	81 09 04 3E FF	y0 50 02 FF	On	OK	
			y0 50 03 FF	Off	OK	
14	CAM_ExpCompPosInq	81 09 04 4E FF	y0 50 00 00 0p 0q FF	pq: ExpComp Position	OK	
15	CAM_BacklightModelInq	81 09 04 33 FF	y0 50 02 FF	On	OK	
			y0 50 03 FF	Off	OK	
16	CAM_Noise2DModelInq	81 09 04 53 FF	y0 50 0p FF	Noise Reduction (2D) p: 0 to 5	OK	
17	CAM_Noise3DModelInq	81 09 04 54 FF	y0 50 0p FF	Noise Reduction (3D) p: 0 to 5	OK	
18	CAM_FlickerModelInq	81 09 04 55 FF	y0 50 0p FF	p: Flicker Settings(0: OFF, 1: 50Hz, 2: 60Hz)	OK	
19	CAM_ApertureInq	81 09 04 42 FF	y0 50 00 00 0p 0q FF	pq: Aperture Gain	OK	
20	CAM_PictureEffectModelInq	81 09 04 63 FF	y0 50 02 FF	Off	OK	
			y0 50 03 FF	Neg.Art	OK	
			y0 50 04 FF	B&W	OK	

21	CAM_MemoryInq	81 09 04 3F FF	y0 50 0p FF	p: Memory number last operated.	OK	
22	SYS_MenuModelInq	81 09 06 06 FF	y0 50 02 FF	On	OK	
			y0 50 03 FF	Off	OK	
23	CAM_LR_ReverseInq	81 09 04 61 FF	y0 50 02 FF	On	OK	
			y0 50 03 FF	Off	OK	
24	CAM_PictureFlipInq	81 09 04 66 FF	y0 50 02 FF	On	OK	
			y0 50 03 FF	Off	OK	
25	CAM_IDInq	81 09 04 22 FF	y0 50 0p 0q 0r 0s FF	pqrs: Camera ID	OK	
26	CAM_VersionInq	81 09 00 02 FF	y0 50 ab cd mn pq rs tu vw FF	ab: Factory Code(00: VHD, 01:MR, 08:T) cd: Hardware Version mnpq: ARM Version rstu: FPGA Version vw: Camera model 01: C Type 02: M Type 03: S Type	OK	
27	Pan-tiltMaxSpeedInq	81 09 06 11 FF	y0 50 ww zz FF	ww: Pan Max Speed zz: Tilt Max Speed	OK	
28	Pan-tiltPosInq	81 09 06 12 FF	y0 50 0w 0w 0w 0w 0z 0z 0z 0z FF	www: Pan Position zzzz: Tilt Position	OK	
29	CAM_DateInq	81 09 00 04 FF	y0 50 0r ss uu vv ww 0D FF	Version date r: Big Version Number ss: Little Version Number uuuu: Year vv: Month ww: Day	OK	
30	CAM_ModelInq	81 09 04 A6 FF	y0 50 00 FF	Mode0	OK	
			y0 50 02 FF	Mode2	OK	
31	CAM_MeteringModelInq	81 09 04 3A FF	y0 50 00 FF	Average Metering	OK	
			y0 50 01 FF	Center-weighted Average Metering	OK	
			y0 50 02 FF	Smart	OK	
			y0 50 03 FF	Top	OK	
32	CAM_GainLimitInq	81 09 04 2C FF	y0 50 0q FF	p: Gain Limit	OK	
33	CAM_DHotPixelInq	81 09 04 56 FF	y0 50 0q FF	p: Dynamic Hot Pixel Setting (0: Off, level 1 to 5)	OK	
34	CAM_AFSensitivityInq	81 09 04 58 FF	y0 50 01 FF	High	OK	
			y0 50 02 FF	Normal	OK	
			y0 50 03 FF	Low	OK	
35	CAM_BrightnessInq	81 09 04 A1 FF	y0 50 00 00 0p 0q FF	pq: Brightness Position	OK	
36	CAM_ContrastInq	81 09 04 A2 FF	y0 50 00 00 0p 0q FF	pq: Contrast Position	OK	

37	CAM_FlipInq	81 09 04 A4 FF	y0 50 00 FF	Off	OK
			y0 50 01 FF	Flip-H	OK
			y0 50 02 FF	Flip-V	OK
			y0 50 03 FF	Flip-HV	OK
38	CAM_IridixInq	81 09 04 A7 FF	y0 50 00 00 0p 0q FF	pq: Iridix Position	OK
39	Color System Inq	81 09 04 A8 FF	y0 50 02 FF	VGA Mode On	OK
			y0 50 03 FF	VGA Mode Off	OK
40	CAM_AFZone	81 09 04 AA FF	y0 50 00 FF	Top	OK
			y0 50 01 FF	Center	OK
			y0 50 02 FF	Bottom	OK
41	CAM_DVIModeInq	81 09 04 AB FF	y0 50 02 FF	DVI Mode:HDMI	OK
			y0 50 03 FF	DVI Mode:DVI	OK
42	CAM_ColorHueInq	81 09 04 4F FF	y0 50 00 00 00 0p FF	p: Color Hue setting 0h (- 14 dgree) to Eh (+14 degrees)	OK
43	CAM_AWBSensitivityInq	81 09 04 A9 FF	y0 50 00 FF	High	OK
			y0 50 01 FF	Normal	OK
			y0 50 02 FF	Low	OK
44	CAM_LensBlockInq	81 09 7E 7E 00 FF	y0 50 0u 0u 0u 0u 00 00 0v 0v 0v 0v 00 0w 00 FF	uuuu: Zoom Position vvvv: Focus Position w.bit0: Focus Mode 1: Auto 0: Manual	OK
45	CAM_CameraBlockInq	81 09 7E 7E 01 FF	y0 50 0p 0p 0q 0q 0r 0s tt 0u vv ww 00 xx 0z FF	pp: R_Gain qq: B_Gain r: WB Mode s: Aperture tt: AE Mode u.bit2: Back Light u.bit1: Exposure Comp. vv: Shutter Position ww: Iris Position xx: Bright Position z: Exposure Comp. Position	OK
46	CAM_EnlargementBlockInq	81 09 7E 7E 03 FF	y0 50 00 00 00 00 00 00 0p 0q rr 0s 0t 0u FF	p: AF sensitivity q.bit0: Picture flip(1:On, 0:Off) rr.bit6~3: Color Gain(0h(60%) to Eh(200%)) s: Flip(0: Off, 1:Flip-H, 2:Flip-V, 3:Flip-HV) t.bit2~0: NR2D Level u: Gain Limit	OK

Visca return commands

No.	Command	Function	Command	Instruction		Remark
1	ACK/Completion Messages	ACK	z0 4y FF (y: Socket No.)	Return when the command is accepted.	OK	
		Completion	z0 5y FF (y: Socket No.)	Return when the command has been executed.	OK	
2	Error Messages	Syntax Error	z0 60 02 FF	Returned when the command format is different or when a command with illegal command parameters is accepted.	OK	
		Command Buffer Full	z0 60 03 FF	Indicates that two sockets are already being used(executing two commands) and the command could not be accepted when received.	OK	
		Command Canceled	z0 6y 04 FF (y: Socket No.)	Returned when a command which is being executed in a socket specified by the cancel command is canceled. The completion message for the command is not returned.	OK	
		No Socket	z0 6y 05 FF (y: Socket No.)	Returned when no command is executed in a socket specifild by the cancel command, or when an invalid socket number is specified.	OK	
		Command Not Executable	z0 6y 41 FF (y: Execution command Socket No. Inquiry command: 0)	Returned when a command cannot be executed due to current conditions.For example, when commands controlling the focus manually are received during auto focus.	OK	