

DCP-X04 Manual (VISCA™ PT-ZFI Camera Controller)

Art.-No. DCP-X04

X1 CAM POWER:

Pin	Name/Function
X1.1	+7...36V output 1A (switched*)
X1.2	+7...36V output 1A
X1.3	GND

* VISCA™ command *Cam_Power On/Off*
connector: JST-SHR-03V-S-B
flex: JST-SH3-SH3-28300

X2 MAIN I/O:

Pin	Name/Function
X2.1	+7...36V input (max. 3A)
X2.2	video output (connect. to X4.1)
X2.3	RS232 Rx/D input
X2.4	GND
X2.5	GND
X2.6	GND
X2.7	RS232 Tx/D output
X2.8	GND

connector: RJ-45 8/8
RS232: 9600 baud, 8 databits, no parity, 1 stopbit

X3 CAM CONTROL (EXT):

Pin	Name/Function
X3.1	connected to X5.1
X3.2	connected to X5.2
X3.3	connected to X5.3
X3.4	connected to X5.4
X3.5	connected to X5.5
X3.6	connected to X5.6

connector: RJ-12 6/6

X4 CAM VIDEO:

Pin	Name/Function
X4.1	video input (connected to X2.2)
X4.2	GND

connector: JST-SHR-02V-S-B
flex: JST-SH3-SH3-28300

X5 CAMERA CONTROL (INT):

Pin	Name/Function
X5.1	connected to X3.1
X5.2	connected to X3.2
X5.3	connected to X3.3
X5.4	connected to X3.4
X5.5	connected to X3.5
X5.6	connected to X3.6

connector: JST-SHR-06V-S-B
flex: JST-SH3-SH3-28300

X7 ZF-PRESETS:

Pin	Name/Function
X7.1	+3.3V output, ≤ 10mA
X7.2	GND
X7.3	ZOOM preset potentiometer
X7.4	FOCUS preset potentiometer

connector: JST-SHR-04V-S-B
flex: JST-SH3-SH3-28300

S1 ZFI-VOLTAGE:

Bridge	Name/Function
Open*	ZFI-MOTORS voltage = 3V
Closed	ZFI-MOTORS voltage = 6V

* default

S2 CONFIG:

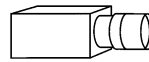
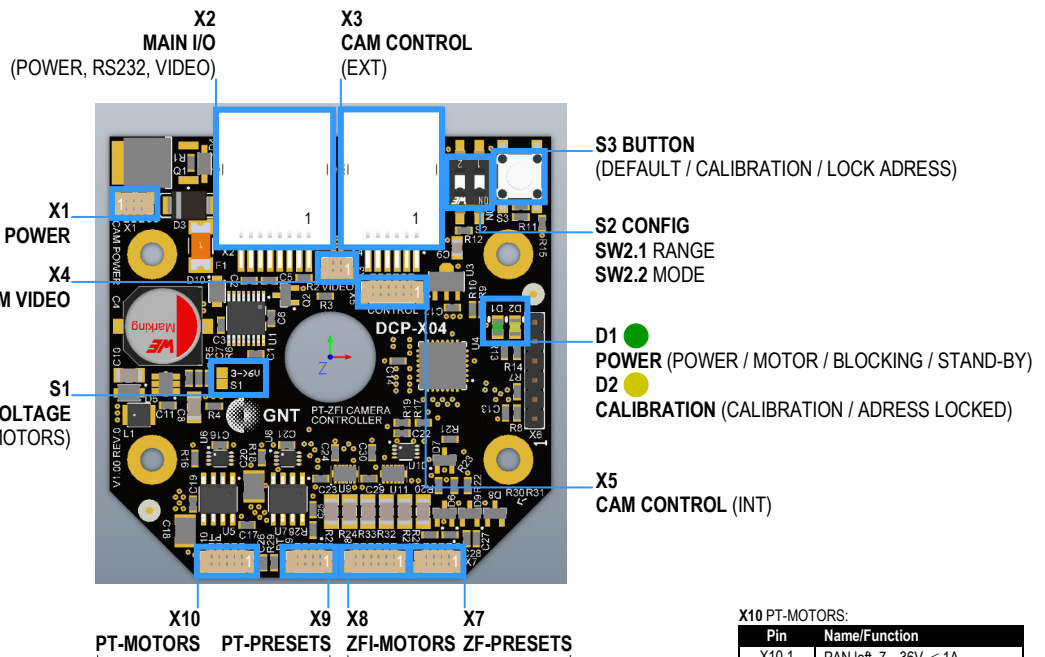
Switch	OPEN/CLOSED	Name/Function
SW2.1 (RANGE)	Open*	PAN-TILT angle congruently to SONY EVI-D31 angle zoom address range 0...1023 (03FFh)
	Closed	full PAN-TILT angle (360°/180°) with SONY EVI-D31 pt-address range zoom address range 0...16368 (3FF0h)
SW2.2 (MODE)	Open*	VISCA™ address +1: no external FCB-xxx camera connected
	Closed	VISCA™ address +0: FCB-xxx camera next in VISCA™ chain

* default

power OFF → ON or send VISCA™ *Cam_Power On/Off* or *IF_Clear* command after change of switch position

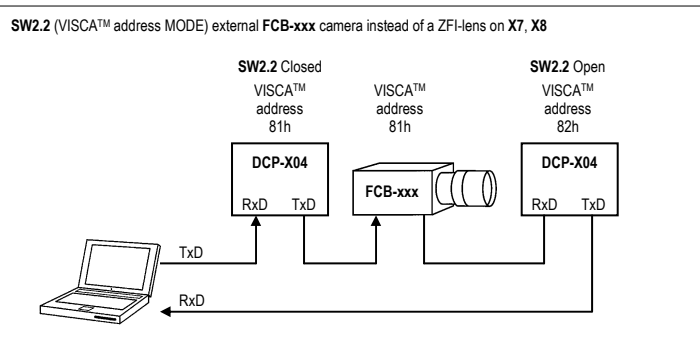
S3 BUTTON:

Condition	Action	Comment
press <u>before</u> and hold during power ON	reset to DEFAULTS (D1, D2 2s ON)	unlocks LOCKED VISCA™ address, resets PWM min. values for low speed (PT-ZF) and IRIS Timing
press (<10s) and send required VISCA™ address command within 10s while pressed	LOCK VISCA™ address (D2 flashing)	on every power ON the ext. connected FCB-xxx camera is addressed with the same VISCA™ address as the DCP-X04 address if SW2.2 is closed and the VISCA™ address is LOCKED (D2 flashing)
after power ON: press and hold for >10 seconds	CALIBRATION (D2 ON)	preset-potentiometers must be connected before CALIBRATION



RS232 VISCA™ system ID message at power ON (with locked VISCA™ address)

GNT 2018 DCP-X04 FW V1.0 ADR=81h(locked) www.gnt.biz



X10 PT-MOTORS:

Pin	Name/Function
X10.1	PAN left, 7...36V, ≤ 1A
X10.2	PAN right, 7...36V, ≤ 1A
X10.3	TILT down, 7...36V, ≤ 1A
X10.4	TILT up, 7...36V, ≤ 1A
X10.5	-

connector: JST-SHR-05V-S-B
flex: JST-SH3-SH3-28300

X9 PT-PRESETS:

Pin	Name/Function
X9.1	+3.3V output, ≤ 10mA
X9.2	GND
X9.3	PAN preset-potentiometer
X9.4	TILT preset-potentiometer

connector: JST-SHR-04V-S-B
flex: JST-SH3-SH3-28300

X8 ZFI-MOTORS:

Pin	Name/Function
X8.1	ZOOM wide, 3/6V*, ≤ 500mA
X8.2	ZOOM tele, 3/6V*, ≤ 500mA
X8.3	FOCUS near, 3/6V*, ≤ 500mA
X8.4	FOCUS far, 3/6V*, ≤ 500mA
X8.5	IRIS open, 3/6V*, ≤ 500mA
X8.6	IRIS close, 3/6V*, ≤ 500mA

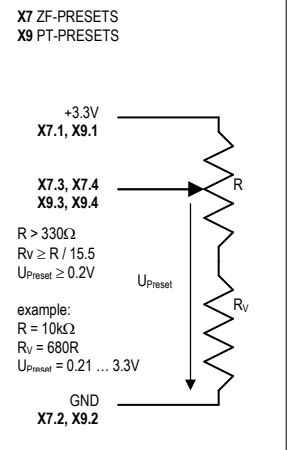
*S1 (OPEN=3V, CLOSE=6V)
connector: JST-SHR-06V-S-B
flex: JST-SH3-SH3-28300

D1 POWER (LED green):

ON	OFF	Name	Function
∞	0s	100% ON	Cam_Power ON
0.4s	0.4s	slow blinking	any MOTOR ON
0.1s	0.1s	fast blinking	any motor BLOCKING (only with presets)
50ms	2s	flashing	Cam_Power Off (stand-by)

D2 CALIBRATION (LED yellow):

ON	OFF	Name	Function
∞	0s	100% ON	CALIBRATION active
0.4s	0.4s	slow blinking	BUTTON pressed: counting 10s to start calibration!
0.1s	0.1s	fast blinking	-
50ms	2s	flashing	VISCA™ address LOCKED



VISCA™ Commands

VISCA™ Management

Packet (Hex)	Description
AddressSet 88 30 01 FF	DCP-X04 (VISCA™ network) replies with 88 30 0x FF if the VISCA™ address is <u>not</u> locked (D2 not flashing): SW2.2 Open: x = number of VISCA™ instances (max. 6) + 1 (i.e. 2, 3, 4, 5, 6, 7) SW2.2 Closed: x = number of VISCA™ instances (max. 7) + 0 (i.e. 1, 2, 3, 4, 5, 6, 7) if the VISCA™ address is locked (D2 flashing): SW2.2 Open: x = locked VISCA™ address – 80h + 1 (i.e. 2, 3, 4, 5, 6, 7) SW2.2 Closed: x = locked VISCA™ address – 80h + 0 (i.e. 1, 2, 3, 4, 5, 6, 7)
IF_Clear 8x 01 00 01 FF 88 01 00 01 FF (broadcast)	restart: system reset, VISCA™ interface reset (except VISCA™ address) and error status controller replies with X0 50 FF or 88 01 00 01 FF (broadcast) <u>note</u> : reply packet must be awaited before sending a new data packet

x = 1 to 8 (VISCA address)
X = 9 to F (VISCA address + 8)

Error Messages

Error Packet (Hex)	Type	Comments
X0 6Y 02 FF	Syntax Error	VISCA™ syntax error or function not supported by DCP-X04
X0 60 03 FF	Command Buffer Full	a) both command sockets full b) active calibration
X0 6Y 41 FF	Execution Error	a) preset-potentiometers not available for execution of command or relative positioning not available because absolute positioning is currently being executed b) VISCA™ (RS232): time between characters > 500ms c) zoom or focus commands cannot be send while pan or tilt motors are active and vice versa
X0 60 09 FF	Blocking Error	motor blocking detected (only available with preset-potentiometers)

X = 9 to F (VISCA address + 8)
Y = socket number (1 or 2)

Reply Messages

Reply Packet (Hex)	Note
Ack X0 4Y FF	Y = socket number (1 or 2)
Completion (Commands) X0 5Y FF	Y = socket number (1 or 2)
Information Return X0 50 ... FF	

X = 9 to F (VISCA address + 8)
Y = socket number (1 or 2)

System

Command Set	Command	VISCA Packet (Hex)	Comments
Cam_Custom	Reset	8x 01 04 3F 00 7F FF	Stores and recalls current <i>Cam_Power On/Off</i> status in internal EEPROM. Status is recalled when DCP-X04 is connected to power source can be reset to defaults with S3 (press and hold during power ON); default state: <i>Cam_Power : On</i>
	Set	8x 01 04 3F 01 7F FF	
	Recall	8x 01 04 3F 02 7F FF	
Cam_Power	On	8x 01 04 00 02 FF	X1.1 On (7...36V)
	Off	8x 01 04 00 03 FF	X1.1 Off, pan-, tilt-, zoom-, focus- and iris-motor stop (stand-by)
Cam_Preset	Reset	8x 01 04 3F 00 0Z FF	Z: 0...B saves, resets and recalls pan-, tilt-, zoom- and focus-position for axes where preset-potentiometers are available (external FCB-xxx camera Z: only 0..5)
	Set	8x 01 04 3F 01 0Z FF	
	Recall	8x 01 04 3F 02 0Z FF	

x = 1 to 8 (VISCA address)

Commands PT-Head

Command Set	Command	VISCA Packet (Hex)	Comments
Pan-tilt_Drive	Up	8x 01 06 01 VV WW 03 01 FF	VV : pan speed 01h...18h
	Down	8x 01 06 01 VV WW 03 02 FF	WW : tilt speed 01h...14h
	Left	8x 01 06 01 VV WW 01 03 FF	
	Right	8x 01 06 01 VV WW 02 03 FF	
	UpLeft	8x 01 06 01 VV WW 01 01 FF	
	UpRight	8x 01 06 01 VV WW 02 01 FF	
	DownLeft	8x 01 06 01 VV WW 01 02 FF	
	DownRight	8x 01 06 01 VV WW 02 02 FF	
	Stop	8x 01 06 01 VV WW 03 03 FF	Stop halts pan- and tilt axes. (by way of derogation from emulated EVI-D30/31 camera).
	Home*	8x 01 06 04 FF	pan: middle-position tilt: middle-position
Reset**	8x 01 06 05 FF	restart with <i>Cam_Custom</i> settings (except for <i>Cam_Power</i> : always On) and calibration of all axes (pan, tilt, zoom, focus) with preset-potentiometers * ** <u>note</u> : voltage on preset-pins must be > 0.2V for preset-potentiometer detection	
RelativePosition*	8x 01 06 03 VV WW 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF	YYYY : pan axis: relative distance to current pan position 0000h : no change F3A0h...0C60h (-360°...+360°) ZZZZ : tilt axis: relative distance to current tilt position 0000h : no change F790h...0870h (-180°...+180°)	
AbsolutePosition*	8x 01 06 02 VV WW 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF	SW2.1 Open: YYYY : pan position 0000h : center F9D0h...0630h (-180°...+180°) ZZZZ : tilt position 0000h : center FBC8h...0438h (-90°...+90°) SW2.1 Closed: YYYY : pan position 0000 : center FC90h...0370h (-180°...+180°) ZZZZ : tilt position 0000 : center FED4h...012Ch (-90°...+90°)	
PhysicalPosition*	8x 01 06 08 VV WW 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF	YYYY : pan position 0000h...03FFh ZZZZ : tilt position 0000h...03FFh	
Pan-tilt_PwmMin	Set	8x 01 05 03 VV WW YY ZZ FF	VV : pan left min. PWM 00h...64h WW : pan right min. PWM 00h...64h (PWM: 0...100% pulse width) YY : tilt down min. PWM 00h...64h ZZ : tilt up min. PWM 00h...64h (PWM: 0...100% pulse width) <i>Pan-tilt_PwmMin</i> is automatically stored in internal EEPROM of DCP-X04 when set can be reset to defaults with S3 (press and hold during power ON): VV : 10h (16%), WW : 10h (16%) YY : 13h (19%), ZZ : 13h (19%)

x = 1...8 (VISCA™ address – see VISCA™ Management)

* only with preset-potentiometer

** no VISCA™ commands are accepted during calibration

Commands ZFI-Lens

Command Set	Command	VISCA Packet	Comments
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 2Z FF	
	Wide (Variable)	8x 01 04 07 3Z FF	Z: 0 (low speed) to 7 (high speed)
	Direct*	8x 01 04 47 0Z 0Z 0Z 0Z FF	SW2.1 Open: ZZZ: 0000 (wide) to 03FF (tele) SW2.1 Closed: ZZZ: 0000 (wide) to 3FF0 (tele) SW2.2 Closed: ZZZ: : to FCB-xxx camera is rescaled (03FF → 3FF0)
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 2Z FF	
	Near (Variable)	8x 01 04 08 3Z FF	Z: 0 (low speed) to 7 (high speed)
	Direct*	8x 01 04 48 0Z 0Z 0Z 0Z FF	ZZZZ: 0000 to FFFF
Cam_Iris	Reset	8x 01 04 0B 00 FF	iris full open (ZFI_PwmMin WW x 10ms x 18 steps)
	Up	8x 01 04 0B 02 FF	+1 step open (1 step = ZFI_PwmMin WW x 10ms)
	Down	8x 01 04 0B 03 FF	-1 step close (1 step = ZFI_PwmMin WW x 10ms)
Pan-tilt_Drive	Reset* **	8x 01 06 05 FF	restart with Cam_Custom settings and calibration of all axes (pan, tilt, zoom, focus) with preset-potentiometers * ** <u>note:</u> voltage on preset-pins must be > 0.2V for preset-potentiometer detection
ZFI_PwmMin	Set	8x 01 05 07 UU VV WW FF	UU: zoom min. PWM 00h...64h VV: focus min. PWM 00h...64h (PWM: 0...100% Pulse Width) WW: iris time for ±1 step open/close in 10ms steps 00h...64h = 0...100 x 10ms = 0...1000ms (default: 300ms) ZFI_PwmMin is automatically stored in internal EEPROM of DCP-X04 when set can be reset to defaults with S3 (press and hold during power ON): UU: 4Ah (74%), VV: 38h (56%) WW: 1Eh (30 x 10ms = 300ms)

x = 1...8 (VISCA™ address – see VISCA™ Management)

* only with preset-potentiometer

** no VISCA™ commands are accepted during calibration

VISCA™ Inquiries

Inquiries System

Inquiry	Packet Inquiry (Hex)	Packet Reply (Hex)	Description
Cam_VersionInq	8x 09 00 02 FF	X0 50 ij kl mn pq rs tu vw FF	ijkl: 0F0Fh (Vendor ID = GNT); mnpq: 0402h (Model = SONY EVI-D31); rstu: 0100h (DCP-X04 FW Vers. = 1.0); vw: 01h (Socket Number = 01);
Cam_PowerInq	8x 09 04 00 FF	X0 50 0Y FF	Y: power status 2 = power ON 3 = power OFF

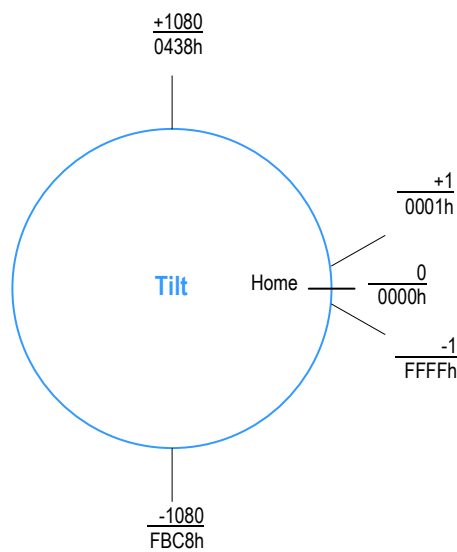
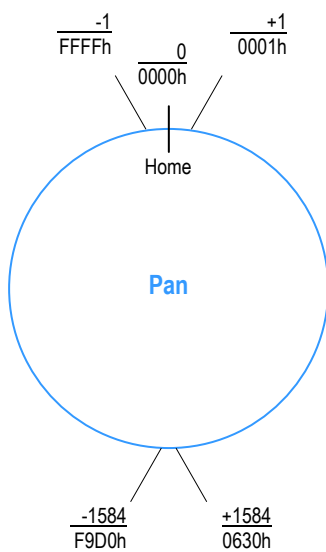
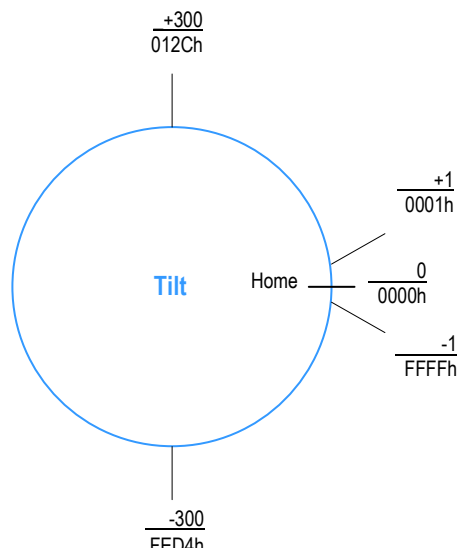
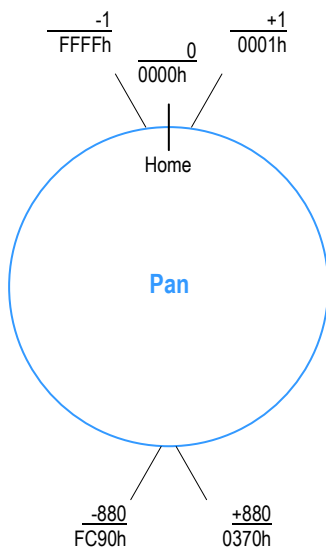
x = 1 to 8 (VISCA address)

X = 9 to F (VISCA address + 8)

Inquiries PT-Head

Inquiry	Packet Inquiry (Hex)	Packet Reply (Hex)	Description
<i>Pan-tiltPosInq</i>	8x 09 06 12 FF	X0 50 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF	YYYY : pan position 0000h : center SW2.1 Open : F9D0h...0630h (-360°...+360°) SW2.1 Closed : FC90h...0370h (-360°...+360°) ZZZZ : tilt position 0000h : center SW2.1 Open : FBC8h...0438h (-180°...+180°) SW2.1 Closed : FED4h...012C. (-180°...+180°)
<i>Pan-tiltPhyPosInq</i>	8x 09 06 15 FF	X0 50 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF	YYYY : pan position 0000h...03FFh ZZZZ : tilt position 0000h...03FFh
<i>Pan-tilt_ErrInq</i>	8x 09 05 05 FF	X0 50 0Y 0Z FF	Y : 0000...1100; <i>Pan-tilt_Err</i> O.K.=0, Error=1 Bit2=pan blocking Bit3=tilt blocking; Bit2 and Bit3 are reset to 0 after register reading Z : 0000; <i>ErrorLink</i> OFF=0, ON=1;
<i>Pan-tilt_PwmMinInq</i>	8x 09 05 03 FF	X0 50 VV WW YY ZZ FF	VV : pan left min. PWM 00h...64h WW : pan right min. PWM 00h...64h; (PWM: 0...100% pulse width) YY : tilt down min. PWM 00h...64h ZZ : tilt up min. PWM 00h...64h; (PWM: 0...100% pulse width)

x = 1 to 8 (VISCA address)
 X = 9 to F (VISCA address + 8)

SW2.1 (RANGE) Open:
 $\frac{\text{dec}}{\text{hex}}$

SW2.1 (RANGE) Closed:
 $\frac{\text{dec}}{\text{hex}}$


Inquiries ZFI-Lens

Inquiry	Packet Inquiry (Hex)	Packet Reply (Hex)	Description
Cam_ZoomPosInq	8x 09 04 47 FF	Y0 50 0Z 0Z 0Z 0Z FF	SW2.1 Open: ZZZZ : 0000 (wide) to 03FF (tele) SW2.1 Closed: ZZZZ : 0000 (wide) to 3FF0 (tele) SW2.2 Closed: ZZZZ : last received zoom position (in VISCA™ command)
Cam_FocusPosInq	8x 09 04 48 FF	Y0 50 0Z 0Z 0Z 0Z FF	ZZZZ : 0000 to FFFF
ZFI_ErrInq	8x 09 05 05 FF	X0 50 VV 00 FF	VV : 0000 0000...0000 0011; <i>ZFI_Err</i> O.K.=0, Error=1 Bit0=zoom blocking Bit1=focus blocking; Bit0...Bit1 are reset to 0 after register reading
ZFI_PwmMinInq	8x 09 05 07 FF	X0 50 UU VV WW FF	UU : zoom min. PWM 00h...64h VV : focus min. PWM 00h...64h WW : iris time for ±1 step open/close in 10ms steps 00h...64h = 0...100 x 10ms = 0...1000ms

x = 1 to 8 (VISCA address)
X = 9 to F (VISCA address + 8)

Specifications

General

Dimensions	58 x 58 x 14 mm
Mounting	4x 3.2mm hole
Operating temperature/humidity	-25°C to +50°C, 20% to 75% relative humidity
Weight	100g

Power (X2.1)

Supply voltage	7 ... 36V DC
Current min.	~2mA (<i>Cam_Power Off</i>)
Current max. (all motors off)	~25mA (<i>Cam_Power On</i>)
Current max. (motors on)	3A (fused – non-resettable)



The current of all outputs in total (pt-head, zfi-lens and camera) must not exceed 3A. The DCP-X04 controller has a non-resettable 3A (fast blowing) input fuse for protection.

Camera Power Output (X1.1)

Camera supply voltage	7 ... 36V DC (corresponding to voltage on X2.1)
Camera current max.	1A (power ON)
Short-circuit protection	no (3A non-resettable input fuse)

VISCA™ RS232 Interface

Speed	9600 Baud
Startbits	1
Databits	8
Stopbits	1
Parity	no
Handshake	no
Timeout	500ms

A/D-Converter (Pan, Tilt, Zoom, Focus)

Input voltage	0.2 ... 3.3V
Resolution	10 Bit
Measurement error	± 1 LSB
Input resistance	<100kΩ
Recommended	1 ... 10kΩ
Preset-potentiometer	

PT-Head Motors

Pan current max.	1A
Pan switch-on time limitation	360s (without preset-potentiometer)
Tilt current max.	1A
Tilt switch-on time limitation	360s (without preset-potentiometer)
PWM frequency	20kHz
Overcurrent protection	yes
Short-circuit protection	yes
Undervoltage lockout	yes
Overtemperature protection	yes

Recommended PT-Head

Current	≤1A/axis
End stops	necessary for calibration procedure with preset-potentiometers
Preset-potentiometers	free accessible 3-pin connection or max. 3.3V output

ZFI-Lens Motors

Zoom current max.	500mA (S1 : open=3V; closed=6V)
Zoom switch-on time limitation	30s (without preset-potentiometer)
Focus current max.	500mA (S1 : open=3V; closed=6V)
Focus switch-on time limitation	30s (without preset-potentiometer)
Iris current max.	500mA (S1 : open=3V; closed=6V)
Iris switch-on time limitation	18s
PWM frequency	20kHz
Overcurrent protection	yes
Short-circuit protection	yes
Undervoltage lockout	yes
Overtemperature protection	yes

If driving more than one lens-motor at the same time, the current of all active motors in total must not exceed 500mA. VISCA™ preset commands must not be used if two or three motors in total draw a current of more than 500mA.

Recommended ZFI-Lens

Current	≤500mA/axis and in total (zoom and focus)
End stops	necessary for calibration procedure with preset-potentiometers
Preset-potentiometers	free accessible 3-pin connection or max. 3.3V output

Dimensions