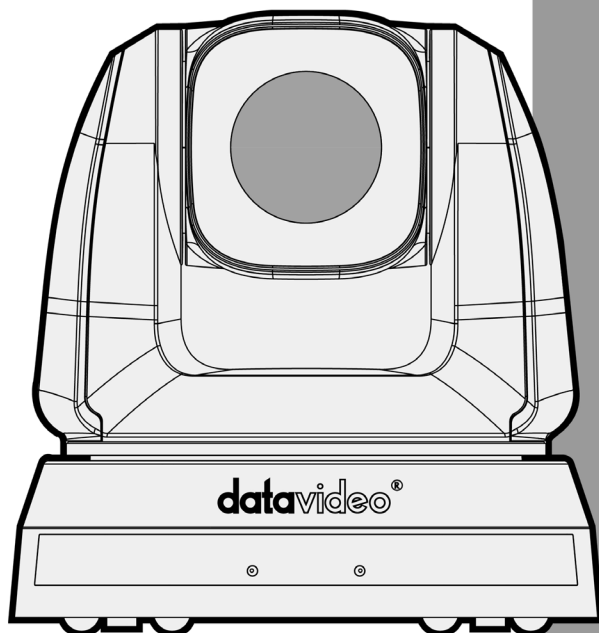


# datavideo®



**HD/SD PTZ CAMERA**

**PTC-120**

**Quick Start Guide**

[www.datavideo.com](http://www.datavideo.com)

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# Warnings and Precautions

1. Read all of these warnings and save them for later reference.
2. Follow all warnings and instructions marked on this unit.
3. Unplug this unit from the wall outlet before cleaning. Do not use liquid or aerosol cleaners. Use a damp cloth for cleaning.
4. Do not use this unit in or near water.
5. Do not place this unit on an unstable cart, stand, or table. The unit may fall, causing serious damage.
6. Slots and openings on the cabinet top, back, and bottom are provided for ventilation. To ensure safe and reliable operation of this unit, and to protect it from overheating, do not block or cover these openings. Do not place this unit on a bed, sofa, rug, or similar surface, as the ventilation openings on the bottom of the cabinet will be blocked. This unit should never be placed near or over a heat register or radiator. This unit should not be placed in a built-in installation unless proper ventilation is provided.
7. This product should only be operated from the type of power source indicated on the marking label of the AC adapter. If you are not sure of the type of power available, consult your Datavideo dealer or your local power company.
8. Do not allow anything to rest on the power cord. Do not locate this unit where the power cord will be walked on, rolled over, or otherwise stressed.
9. If an extension cord must be used with this unit, make sure that the total of the ampere ratings on the products plugged into the extension cord do not exceed the extension cord's rating.
10. Make sure that the total amperes of all the units that are plugged into a single wall outlet do not exceed 15 amperes.
11. Never push objects of any kind into this unit through the cabinet ventilation slots, as they may touch dangerous voltage points or short out parts that could result in risk of fire or electric shock. Never spill liquid of any kind onto or into this unit.
12. Except as specifically explained elsewhere in this manual, do not attempt to service this product yourself. Opening or removing covers that are marked "Do Not Remove" may expose you to dangerous voltage points or other risks, and will void your warranty. Refer all service issues to qualified service personnel.
13. Unplug this product from the wall outlet and refer to qualified service personnel under the following conditions:
  - a. When the power cord is damaged or frayed;
  - b. When liquid has spilled into the unit;
  - c. When the product has been exposed to rain or water;
  - d. When the product does not operate normally under normal operating conditions. Adjust only those controls that are covered

by the operating instructions in this manual; improper adjustment of other controls may result in damage to the unit and may often require extensive work by a qualified technician to restore the unit to normal operation;

e. When the product has been dropped or the cabinet has been damaged;

f. When the product exhibits a distinct change in performance, indicating a need for service.

## **Warranty**

### **Standard Warranty**

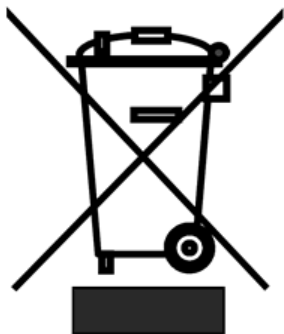
- Datavideo equipment is guaranteed against any manufacturing defects for one year from the date of purchase.
- The original purchase invoice or other documentary evidence should be supplied at the time of any request for repair under warranty.
- Damage caused by accident, misuse, unauthorized repairs, sand, grit or water is not covered by this warranty.
- All mail or transportation costs including insurance are at the expense of the owner.
- All other claims of any nature are not covered.
- Cables & batteries are not covered under warranty.
- Warranty only valid within the country or region of purchase.
- Your statutory rights are not affected.

### **Two Year Warranty**

- All Datavideo products purchased after 01-Oct.-2008 qualify for a free one year extension to the standard Warranty, providing the product is registered with Datavideo within 30 days of purchase. For information on how to register please visit [www.datavideo-tek.com](http://www.datavideo-tek.com) or contact your local Datavideo office or authorized Distributors
- Certain parts with limited lifetime expectancy such as LCD Panels, DVD Drives, Hard Drives are only covered for the first 10,000 hours, or 1 year (whichever comes first).

Any second year warranty claims must be made to your local Datavideo office or one of its authorized Distributors before the extended warranty expires.

## Disposal



### For EU Customers only - WEEE Marking

This symbol on the product indicates that it will not be treated as household waste. It must be handed over to the applicable take back scheme for the recycling of electrical and electronic equipment. For more detailed information about the

recycling of this product, please contact your local Datavideo office.

## Packing List

- 1 x PTC-120 PTZ Camera
- 1 x Accessory List
- 1 x PTC-120 Quick Start Guide

# 1. Product Overview

The Datavideo PTC-120 HD/SD Video Camera is a PTZ camera that can be mounted on a wall, ceiling, floor, or a tabletop, and comes with an IR remote control. The camera is equipped with

- 1/2.8 inch image sensor
- Full HD-1080p output resolution
- High dynamic image of up to 60 frames per second
- Superior 20x optical zoom lens
- Excellent white balance

Its exposure mode delivers a clear image even in a low light environment or under conditions of extreme light and dark contrast in a conference room.

The camera covers a wide shooting angle and utilizes the high efficiency servo-controlled DC motor to achieve instantaneous, quiet, and precise positioning, as well as smooth PTZ operations. PTC-120 supports 3G-SDI, DVI, component, and Composite Video interfaces to allow four simultaneous image outputs.

PTC-120 is compatible with all video equipment with up to 128 preset settings. A dedicated remote control is available. PTC-120 delivers a continuous, clear, and vivid live image without any distortions. It is ideally suited for lecture recording, video conferencing, and stage performance.

## 2. Features

- HD Resolution: 1/2.8" High Definition 2.0 M Pixels CMOS sensor
- 20x optical zoom; 12x digital zoom
- High definition formats supported: 1080/60p, 1080/50p, 1080/60i, 1080/50i, 1080/30p, 1080/25p, 720/60p, 720/50p, 720/30p, 720/25p
- 240 times variable zoom ratio (20x optical zoom with 12x digital zoom)
- Maximum horizontal/vertical speed of rotation: 300 degrees/sec
- Delivers a fast response with an extremely clear image
- Video Output: Simultaneous 3G-SDI, DVI, Component and CVBS image outputs
- SONY VISCA Protocol Keyboard supported

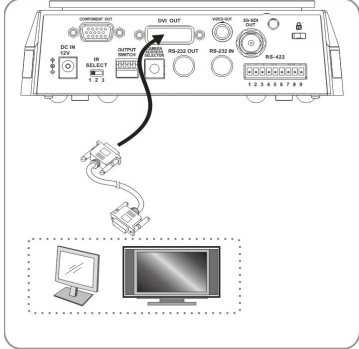
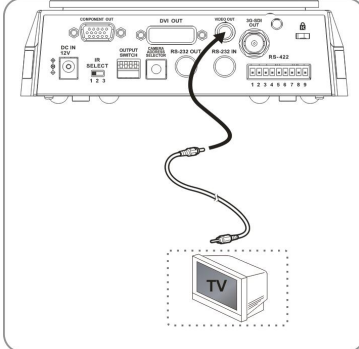
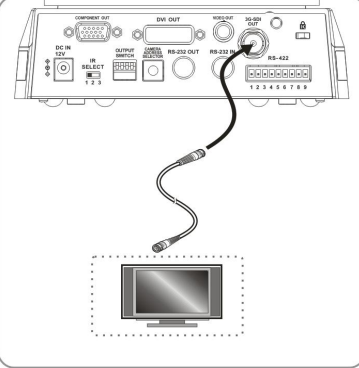
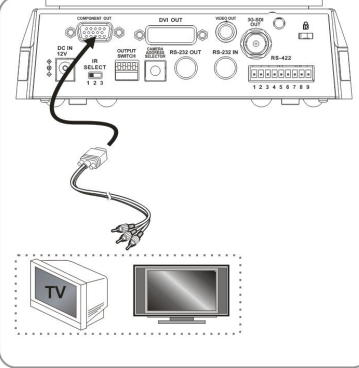
## 3. System Configuration

The PTC-120 PTZ Color Video Camera can be set up in various system configurations. This section describes how PTC-120 can be connected as a standalone device as well as cascade connection of multiple cameras.

# 3.1 Single Camera Connection

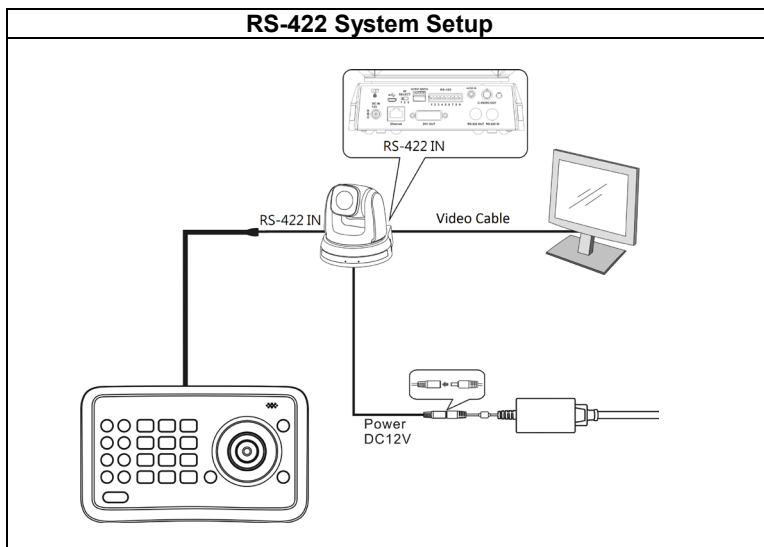
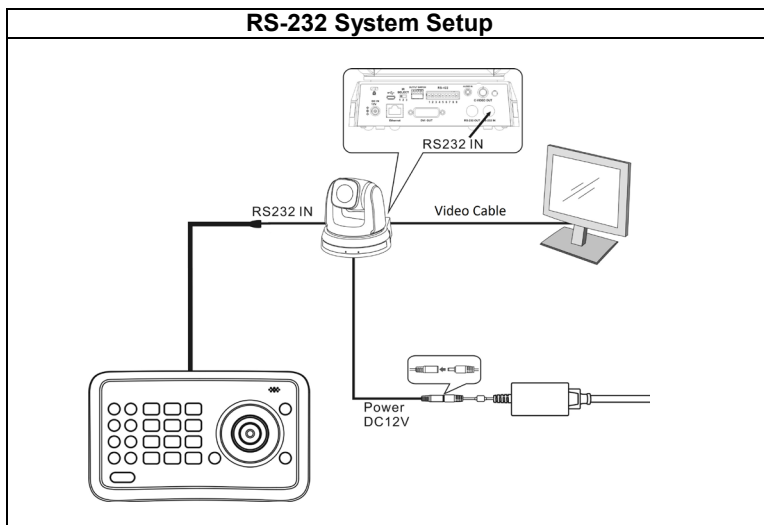
## IR Remote Control

This camera can be set up within a short distance by using the supplied IR remote control, see page 14. In this way the camera can be used a standalone device. The following video output connections are available from the rear of the camera, 3G-SDI, Component, DVI and CVBS. Below scenario diagrams show each of these connections in use with an appropriate cable and monitor/TV.

<p>PTC-120 to an HDTV or a computer monitor (DVI) (Cable Optional)</p>	<p>PTC-120 to a TV (Composite Video) (Cable Optional)</p>
	
<p>PTC-120 to a monitor (3G-SDI) (Cable Optional)</p>	<p>PTC-120 to an HDTV or a TV (Component) (Cable Optional)</p>
	

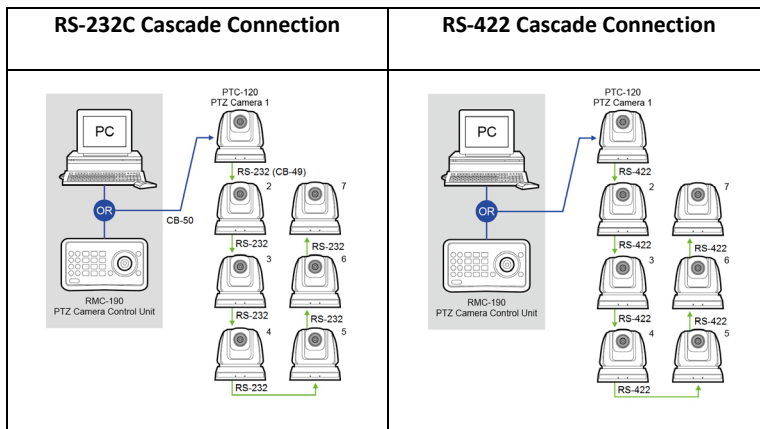
## SONY VISCA Compatible Controller

In addition to the supplied IR remote control, the PTC-120 camera can also be controlled remotely using a SONY VISCA compatible controller such as the Datavideo RMC-190 unit. This camera can be controlled over an RS-232C or RS-422 connection as shown in the diagrams below. The camera video output is connected to the monitor via one of the four available video interfaces.



## 3.2 Multiple Cameras Cascade

The PTC-120 camera can also be used in an environment where multiple cameras are required. With RS-232 INPUT/OUTPUT ports, the user is allowed to cascade up to seven cameras, which are subsequently controlled by either a computer (Please download a utility program first from <http://www.serialporttool.com/PTZ.htm> in case you need to control the camera via a PC) or a SONY VISCA compatible controller. RS-232C and RS-422 system setups for connection of multiple cameras are illustrated in the respective diagrams below.



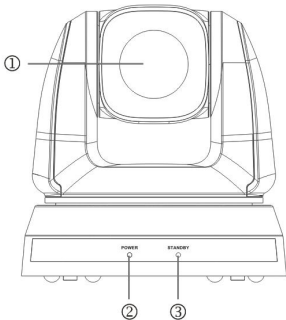
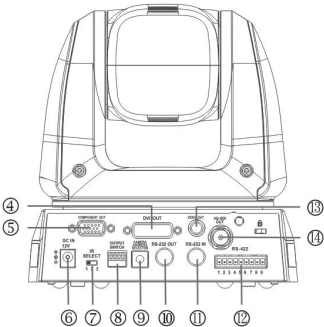
For wiring information, see page 45 for RS-232C and page 49 for RS-422.

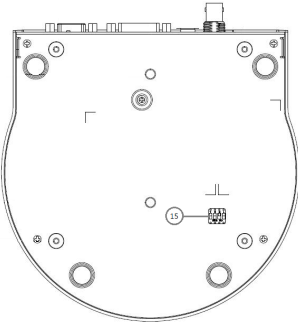
However, the connection will be broken if one unit is powered off. In other words, the cameras connected subsequent to the broken one will become uncontrollable by RMC-190. For example, in the above diagram, if cameras #2 and #3 are defective or powered off, all camera connections (4/5/6/7) after camera #3 will be cut off from the daisy chain and RMC-190 will not be able to control them even if the cameras are still operable.

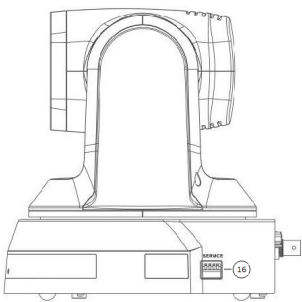
The cameras have to be at least in the standby mode for the entire daisy chain connection to stay controllable by RMC-190. In the above example, if cameras #2 and #3 are in standby mode, the user will still be able to control all cameras after camera #3 from RMC-190.

If the camera is powered off or defective, there will be no LED lighting in standby mode. The user should check the LED lighting first if the daisy chain is found to be broken.

## 4. Location and Function of Parts

Front of Camera		
 <p>The diagram shows the front view of the camera. A line labeled ① points to the camera lens. Below the lens, there are two small circular indicators: one labeled 'POWER' with a line pointing to it labeled ②, and another labeled 'STANDBY' with a line pointing to it labeled ③.</p>	1.	<p>Camera Lens</p> <p>20x Optical Zoom; 12x Digital Zoom</p>
	2.	<p>Power LED Indicator</p> <p>No Light: Power off</p> <p>Green: In use</p> <p>Flashing Green: Receiving signal from the remote control; the indicator flashes every 0.5 second</p>
	3.	<p>Standby LED Indicator</p> <p>Orange: Standby mode</p> <p>No Light: Power on</p>
Rear of Camera		
 <p>The diagram shows the rear view of the camera. Various ports and connectors are labeled with circled numbers ④ through ⑫. ④ points to the DVI port, ⑤ to the Component Video Output, ⑥ to the DC IN 12V Connector, ⑦ to the IR Select button, ⑧ to the AUDIO IN, ⑨ to the AUDIO OUT, ⑩ to the VIDEO IN, ⑪ to the VIDEO OUT, and ⑫ to the AUDIO OUT. There are also labels for 'DIRECT', 'RETRY', 'E-2', and 'E-3'.</p>	4.	<p>DVI Video Output</p> <p>Transfer of digital video content; A DVI to HDMI cable can be used.</p>
	5.	<p>Component Video Output</p> <p>Outputs camera images as analog component video standards.</p>
	6.	<p>DC IN 12V Connector</p> <p>Connect the supplied AC power adaptor.</p>
	7.	<p><a href="#">IR Select</a> (Page 41)</p> <p>Assigns the camera an identification number when you operate multiple cameras using the <a href="#">Remote Control</a> (Page 14).</p>

	8.	<a href="#">OUTPUT Switch</a> (Page 40) Set the output resolution.
	9.	<a href="#">Camera Address Selectors</a> (Page 41) Set the camera address.
	10.	RS-232C Output Connection of multiple cameras
	11.	RS-232C Input <a href="#">VISCA Control</a> (Page 52)
	12.	RS-422 I/O Connection <a href="#">VISCA Control</a> (Page 52) and Connection of multiple cameras
	13.	Composite VIDEO Output Analog Video Transmission
	14.	3G-SDI Output Video Streaming
<b>Bottom of Camera</b>		
	15.	<a href="#">System Switch</a> (Page 42) DIP 1 selects RS-232C or RS-422  DIP 2 turns ON/OFF IR Signal Output Switch  DIP 3 selects communication baud rate  DIP 4 is reserved
	<b>Side of Camera</b>	

	<p>16.</p>	<p><a href="#">Service Switch</a> (Page 43)</p> <p>Service switch is used to set the respective firmware upgrades.</p>
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# 5. Remote Control and On-Screen Menu

## 5.1 Remote Control Functions

Functions below are listed in alphabetical order.

No.	Item	Description
1		PAN-TILT Buttons  Press the arrow buttons to pan and tilt the lens
2	Backlight	Turn on/off backlight compensation
3	Camera Select	Select PTC-120 Cameras 1-3
4	Focus – Far/Near/Manual	To adjust the focus manually, press the MANUAL button and adjust the focus with the FAR and NEAR buttons
5	Focus – Auto	Press the AUTO button to adjust the focus automatically
6	Freeze	Press Freeze button to freeze the current image on the display
7	Home – Enter	Go back to the main page/Execute
8	Info	Press Info button to display the current status information
9	L/R Direction	Set L/R Direction/OFF/Normal
10	Menu	Display OSD menu
11	Mirror	Rotate the image (Off/Mirror/Flip/Mirror+Flip)
12	Pan/Tilt Reset	Press the PAN/TILT Reset button to return the lens to its original position
13	Picture	Switch image effect (OFF/Neg/B&W)
14	Power	Power Switch

	15	Preset	Appoint an ID (0-9) to the current position
	16	Reset	Delete the current position data of the appointed ID (0-9)
	17	Zoom – Fast	Press fast to zoom quickly
	18	Zoom – Slow	Press slow to zoom slowly

## 5.2 Descriptions of Major Functions

### Switching between PTC-120 devices

Press **[Camera 1 ~ 3]** on the **remote control** to select the corresponding PTC-120 camera.

- Camera 1 ~ 3 is selected with [IR SELECT](#) (Page 41).

### Saving current lens position data

Press **[Preset + ID]** on the **remote control** to save the current position data.

- ID shall be a digit [0 ~ 9].
- [VISCA Command](#) (Page 52) can store up to 128 camera positions

### Clearing saved position data

Press **[Reset + ID]** on the **remote control** to clear the given position data.

- ID shall be a digit [0 ~ 9].
- Use [VISCA Command](#) (Page 52) to clear the position data of [0~127]

### Turning on backlight compensation function

Press **[Back Light]** on the **remote control** to turn on or turn off the back light compensation.

### Adjusting lens shooting angle

Press **[Tilt ▲]** or **[Tilt ▼]** on the **remote control** to adjust the lens shooting angle upward or downward.

Press **[Pan ►]** or **[Pan ◀]** on the **remote control** to adjust the lens shooting angle to right or left.

Press **[Pan - Tilt Reset]** on the **remote control** to reset the lens shooting angle to the center point.

## Zoom in/out images

Adjust image size

- Press **[Fast +]** on the **remote control** to zoom in images quickly.
- Press **[Fast -]** on the **remote control** to zoom out images quickly.

Fine-tune image size

- Press **[Slow +]** on the **remote control** to zoom in images slowly.
- Press **[Slow -]** on the **remote control** to zoom out images slowly.

## Adjusting focal length

Auto tune

- Press **[AF (Auto)]** on the **remote control** to adjust the focal length automatically.

Manual focus

- Press **[MF (Manual)]** on the **remote control** to turn on the manual focal length adjustment function.
- Press **[- (Far)]** or **[+ (Near)]** to adjust the focal length manually.

## Setting image mode

Press **[Picture]** on the **remote control** to switch between [Off/Neg/B&W].

## Freezing images

Press **[Freeze]** on the **remote control** to freeze the current image on the display.

## Rotating image

Press **[Mirror]** on the **remote control** to switch between [Off/Mirror/Flip/Mirror + Flip].

## Displaying current status

Press **[Info]** on the **remote control** to display the current status information.

## Changing camera direction

Press **[L/R Direction Set]** on the **remote control** to switch between [L/R Direction / Off / Normal].

## 5.3 On-Screen Menu

On-Screen Menu allows the user to change various camera settings such as shooting conditions and the system setup. Press **[Menu]** on the **remote control** to enter the on-screen menu as shown below.

On-Screen MENU
• Exposure
• White Balance
• Picture
• PAN/TILT Zoom
• D-Effect
• Auto Focus
• System
• Status

The following table lists all the sub-options of the options on the main menu.

Main Options	Exposure	White Balance	Picture	PAN/TILT Zoom	D-Effect	AUTO FOCUS	System	Status
Sub-Options	Mode	Mode	Picture Effect	PAN/TILT Limit	Mirror	AF Sensitivity	Composite Video	
	Exposure_Comp	One Push Trigger	Sharpness	PAN Right Limit		AF Speed	Video Type	
	Exposure_Comp Level		2D NR	PAN Left Limit		AF Frame	Prompt	
	Spot Light		3D NR	TILT UP Limit			IR Receive	
	Spot Light Position		Image Mode	TILT Down Limit			Language	
	Shutter Pri		Image Mode Load	D-Zoom Limit			Control Device	
	Manual Gain		Saturation	Preset Speed			Factory Reset	
	Manual Speed		Hue					

	Gain Limit		Gamma					
	WDR		Skin Tone					
			Brightness					
			Contrast					
			Black Level					

Details of all options in the on-screen menu are described in the table below. The **bold underlined** values are defaults.

First Level Main Options	Second Level Sub-Options	Third Level Parameters	Sub-Option Descriptions
Exposure	Mode (Exposure Mode)	<b>1. <u>Full Auto</u></b> 2. Shutter Pri 3. Manual 4. White Board	<p>FULL AUTO: The exposure is adjusted automatically using the sensitivity, electronic shutter speed and iris.</p> <p>Shutter Pri: Shutter Priority mode. The exposure is adjusted automatically using the sensitivity and iris. Adjust the electronic shutter speed (SPEED) manually.</p> <p>Manual: The sensitivity (GAIN), electronic shutter speed (SPEED) and iris (IRIS) are adjusted manually.</p> <p>White Board mode is turned on when the background is a white board in order to automatically adjust the brightness.</p>
	Exposure_Comp.	On/ <b>Off</b>	<p>ON: Enable exposure compensation</p> <p>OFF: Disable exposure compensation</p>
	Exposure_Comp. Level	-6~ <b>0</b> ~4	When exposure compensation is enabled, you can select the exposure compensation level from -

			6 – 4.  Setting Exposure_Comp.Level to 0 is equivalent to disabling exposure compensation.
	<b>Spot Light</b>	On/ <u>Off</u>	This function can be turned on only when the mode is set to <b>Full Auto</b> or <b>Shutter Pri.</b>
	<b>Spot Light Position</b>	X(0~8)Y(0~6)	The value can be adjusted only after <b>Spot Light</b> is enabled.
	<b>Shutter Pri</b>	<b>60/30 mode</b>	Shutter priority setting; fast shutter results in a darker image and slow shutter results in a bright image.
		1/10000	
		1/5000	
		1/3000	
		1/2500	
		1/2000	
		1/1500	
		1/1000	
		1/725	
		1/500	
		1/350	
		1/250	
		1/180	
		1/120	
		1/100	
		1/90	
		<b>50/25 mode</b>	
		1/10000	
		1/5000	
		1/3000	
		1/2500	
		1/1750	
		1/1250	
		1/1000	
		1/600	
		1/425	
		1/300	
		1/215	
		1/150	
		1/120	
		1/100	
		1/75	

		<u>1/60</u>	<u>1/50</u>	
		1/30	1/25	
		1/15	1/12	
		1/8	1/6	
		1/4	1/3	
		1/2	½	
		1/1	1/1	
	Manual Gain	1. <u>0 dB</u>	Manually select the gain from 0 dB to 30 dB. Greater gain results in brighter images.	
		2. 2 dB		
		3. 4 dB		
		4. 6 dB		
		5. 8 dB		
		6. 10 dB		
		7. 12 dB		
		8. 14 dB		
9. 16 dB				
10. 18 dB				
11. 20 dB				
12. 22 dB				
13. 24 dB				
14. 26 dB				
15. 28 dB				

	16. 30 dB		
Manual Speed	60/30 mode	50/25 mode	Manually select the electric shutter speed. Fast shutter results in a darker image and slow shutter results in a bright image.
	1/10000	1/10000	
	1/5000	1/5000	
	1/3000	1/3000	
	1/2500	1/2500	
	1/2000	1/1750	
	1/1500	1/1250	
	1/1000	1/1000	
	1/725	1/600	
	1/500	1/425	
	1/350	1/300	
	1/250	1/215	
	1/180	1/150	
	1/120	1/120	
	1/100	1/100	
	1/90	1/75	
	<u>1/60</u>	<u>1/50</u>	
	1/30	1/25	
	1/15	1/12	
	1/8	1/6	
	1/4	1/3	
	1/2	1/2	

		1/1	1/1	
	<b>Gain Limit</b>	1. 8 dB 2. 10 dB 3. 12 dB 4. 14 dB 5. 16 dB 6. 18 dB 7. 20 dB 8. 22 dB 9. 24 dB 10. 26 dB 11. 28 dB 12. <u>30 dB</u>		The maximum electric gain limit
	<b>Wide Dynamic Range (WDR)</b>	1. <u>Off</u> 2. 1 3. 2 4. 3 5. 4 6. 5		WDR Setting
<b>White Balance</b>	<b>Mode</b>	1. <u>Auto</u> 2. Indoor 3. Outdoor 4. One Push WB		Auto: Adjust the white balance automatically.  Select the color temperature mode.

		5. ATW 6. Sodium Lamp 7. 3000K 8. 4300K 9. 5000K 10. 6500K 11. 8300K 12. Wide Auto	
	One Push Trigger	<u>ENTER</u>	One push trigger
Picture	Picture effect	1. <u>Off</u> 2. Neg 3. B&W	Set the picture effect
	Sharpness	1~ <u>A</u> ~16	Adjust the <b>sharpness</b> of the image
	2D NR	1. <u>Auto</u> 2. Off 3. 1 4. 2 5. 3 6. 4 7. 5	Set 2D noise reduction
	3D NR	1. Off 2. <u>Low</u> 3. Typ	Set 3D dynamic noise reduction

		4. Max 5. Auto	
	<b>Image Mode</b>	1. Mode1 2. Mode2 3. Mode3 4. Mode4 5. <b><u>Mode5</u></b> 6. Mode6 7. Custom	“Image Mode” option allows the user to apply different image settings, such as saturation, hue, gamma, skin tone and etc, to the image. Modes 1-6 are fixed and cannot be changed. If the user would like to customize their own desired image mode, set the Image Mode to Custom and adjust the image parameters under “Image Mode Load” option.
	<b>Image Mode Load</b>	1. <b><u>Mode1</u></b> 2. Mode2 3. Mode3 4. Mode4 5. Mode5 6. Mode6	Adjustable when <b>Image Mode</b> is set to <b>Custom</b> . The user may load an Image Mode and apply it to Custom after adjustment.
	<b>Saturation</b>	0~ <b><u>A</u></b> ~25	Adjustable when <b>Image Mode</b> is set to Custom.
	<b>Hue</b>	0~ <b><u>A</u></b> ~14	Adjustable when <b>Image Mode</b> is set to Custom.
	<b>Gamma</b>	0~ <b><u>A</u></b> ~3	Adjustable when <b>Image Mode</b> is set to Custom.
	<b>Skin Tone</b>	1~ <b><u>A</u></b> ~5	Set skin tone, Adjustable when <b>Image Mode</b> is set to Custom.
	<b>Brightness</b>	0~ <b><u>A</u></b> ~14	Adjustable when <b>Image Mode</b> is set to Custom.
	<b>Contrast</b>	0~ <b><u>A</u></b> ~14	Adjust the contrast of the screen, Adjustable when <b>Image Mode</b> is set to

			Custom.
	<b>Black Level</b>	<u>Off</u> Type1 Type2 Type3	Adjust the shadow detail and transparency of the screen, Adjustable when <b>Image Mode</b> is set to Custom.
<b>PAN TILT ZOOM</b>	<b>PAN/TILT Limit</b>	ON/ <u>OFF</u>	Turn on/off the angle limit setting
	<b>PAN Right Limit</b>	0~ <u>170</u>	Limit the right angle
	<b>PAN Left Limit</b>	<u>-170</u> ~0	Limit the left angle
	<b>Tilt UP Limit</b>	0~ <u>90</u>	Limit the upward angle
	<b>Tilt Down Limit</b>	<u>-30</u> ~0	Limit the downward angle
	<b>D-Zoom Limit</b>	<u>x1</u> ~x12	Limit the D-Zoom multiple
	<b>Preset Speed</b>	<u>150 deg/sec</u> 250 deg/sec 350 deg/sec	Set the rotation speed of the cradle head when Preset is executed.
<b>D-Effect</b>	<b>Mirror</b>	<u>OFF</u> Mirror Flip Mirror + Flip	Set the mode at which the image is turned
<b>Auto Focus</b>	<b>AF Sensitivity</b>	Low <u>Middle</u> High	Select the AF triggering speed. The higher the AF sensitivity, the faster AF is triggered
	<b>AF Speed</b>	Fast/ <b>Normal</b>	Focus speed upon triggering AF
	<b>AF Frame</b>	<u>Full Frame</u> /Center	AF frame setting. When central area was set as AF

			frame, focusing will be on the center of the screen. When full area was set as AF frame, focusing will be calculated based on the full screen.
System	Composite Video (CVBS)	NTSC LB NTSC CP <u>NTSC SQ</u> PAL LB PAL CP PAL SQ	Image Mode
	Video Type	SDI <u>YPbPr/DVI</u>	Select output video type
	Prompt	ON/ <u>OFF</u>	Turn on/off the prompt information on the display
	IR Receive	<u>ON</u> /OFF	Turn on/off the infrared reception
	Language	<u>English</u> /Chinese	Language
	Control Device	<u>Encoder</u> /Controller	Set control device
	Factory Reset	ON/ <u>OFF</u>	Reset all configurations to factory default settings
Status			Display current setting status

### Example 1 - Adjusting Auto Focus Sensitivity

- AF triggering speed: The higher the AF sensitivity, the faster AF is triggered.
- To shoot fast-moving objects, AF can be set to **[High]** or **[Middle]**, which is applicable to instantaneous focus.
- When the environment is too dark to enable auto focus or fixed objects have to be shot in different brightness, AF can be

set to **[Low]**.

1. Press [MENU] to activate the on-screen menu.
2. Press [▶] or [◀] to select **[Auto Focus]**.
3. Press [ENTER] to activate.
4. Press [▲] or [▼] to select **[AF Sensitivity]**.
5. Press [ENTER] to activate.
6. Press [▶] or [◀] to select [High/Middle/Low].
7. Press [MENU] to exit.

## Example 2 - Adjust Auto Focus Speed

- The focus speed after AF is triggered:  
**[Normal]** (default): Image flickering may not occur.  
**[Fast]**: The focus speed is fast, but image flickering is more likely to occur.
  1. Press [MENU] to activate the on-screen menu.
  2. Press [▶] or [◀] to select **[Auto Focus]**.
  3. Press [ENTER] to activate.
  4. Press [▲] or [▼] to select [AF Speed].
  5. Press [ENTER] to activate.
  6. Press [▶] or [◀] to select [Normal/Fast].
  7. Press [MENU] to exit.

## 6. Instruction for installation

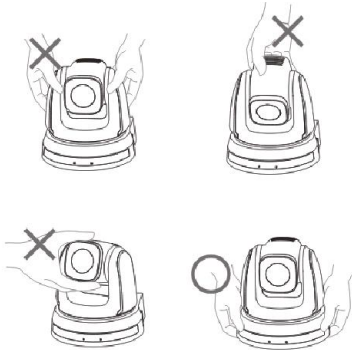
### 6.1 Preparation before Installation

To install PTC-120 by yourself, please follow the steps outlined below to ensure proper installation of the device. Make sure safety precautions are followed to avoid any accident.

- **Ensure the safety of an installation environment. Do not install the device on a shaky ceiling or in a place where the device is in danger of falling.**
- **Please check whether accessories in the box are complete. Please contact the supplier for any shortage, and make sure to keep the accessories in the box intact.**
- **Please choose a proper place for installation of PTC-120 beforehand. Please determine an installation location based on the following:**
  - Position of the object to be captured
  - PTC-120 placed at a proper distance from other light sources

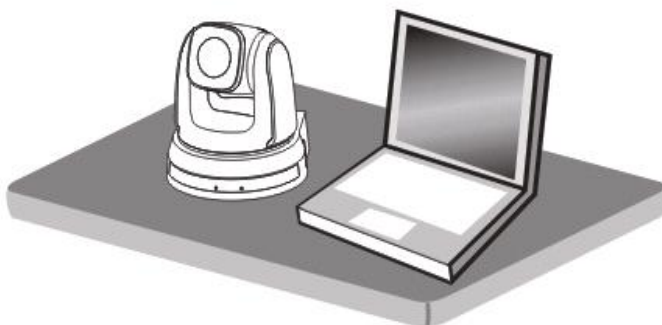
### 6.2 Installation of PTC-120 on the desk

- **Precautions for Installation**
  - Please install the device on a flat desk
  - Avoid touching the camera head when handling the device
  - Do not rotate the camera head by hand. Improper rotation may result in malfunction of the camera



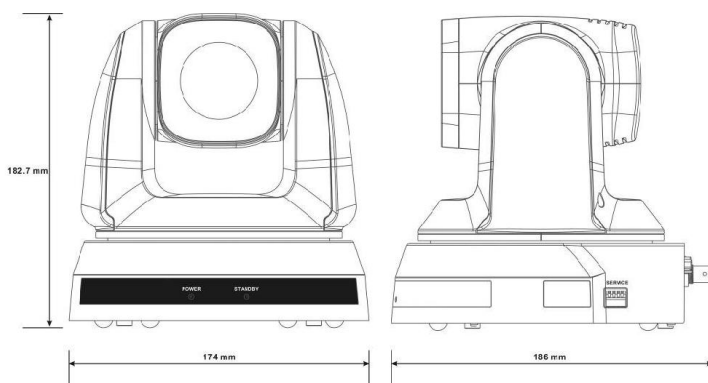
- **Installation steps**

- Please adjust DIP switch first prior to installation. **<Remark> Please refer to the [DIP Switch](#) section (page 40) for relevant descriptions of DIP switch.**
- Place the camera on a flat desk directly to ensure proper operation of the device in both vertical and horizontal orientations.



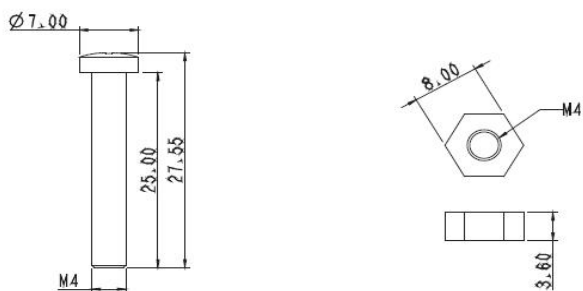
## 6.3 Installation of PTC-120 on the ceiling

- **Preparation of the parts and equipment required for installation**
  - Accessories of PTC-120 in the box (metal plates A, B and M3 screws)
  - Screw for locking on ceiling mounted hangers
  - Drilling machine, screw driver, ladder
- **Dimension**
  - Length x Width x Height: 174x186x182.7mm
  - Weight: 2.0Kg



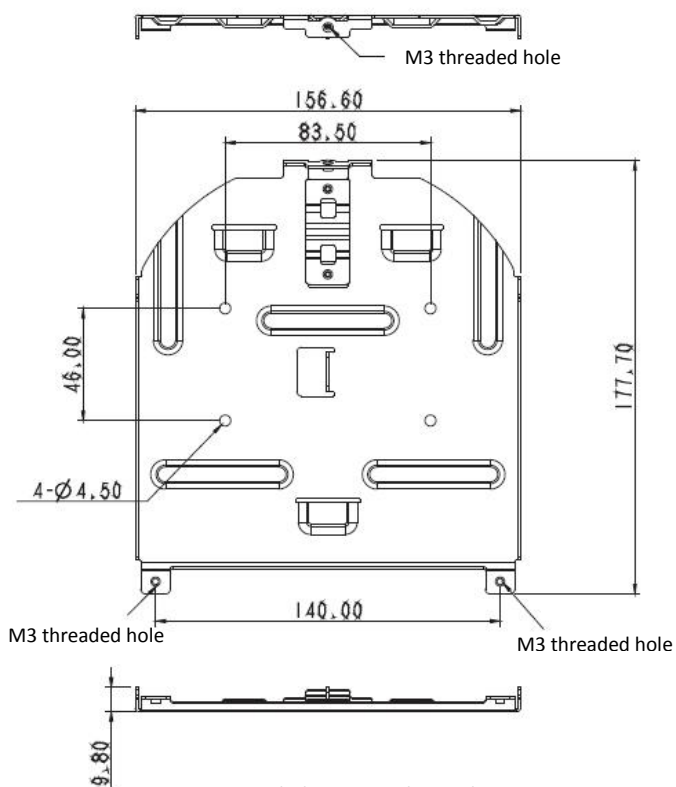
- **Size Diagram**

- Metal plate B - Ceiling Side



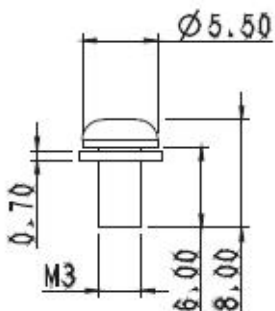
Metal plate B locking screw

Metal plate B locking bolt

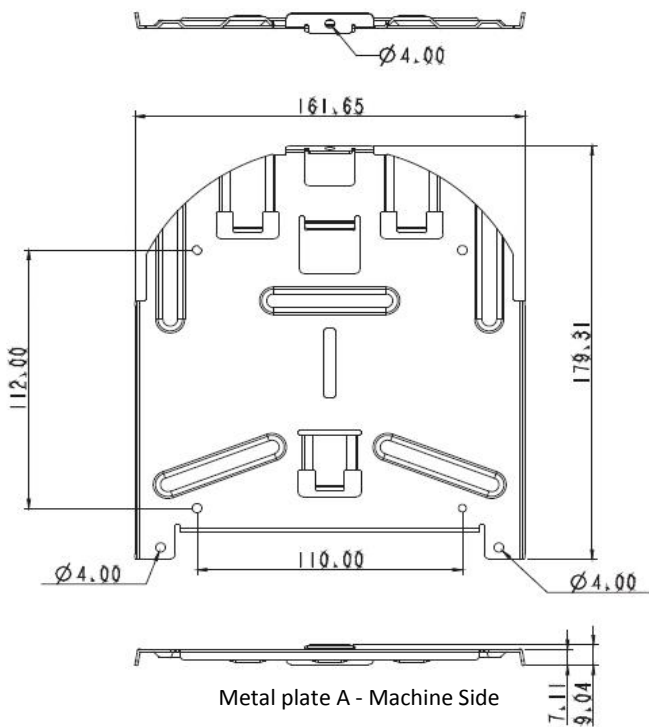


Metal plate B - Ceiling Side

➤ Metal plate A - Machine Side

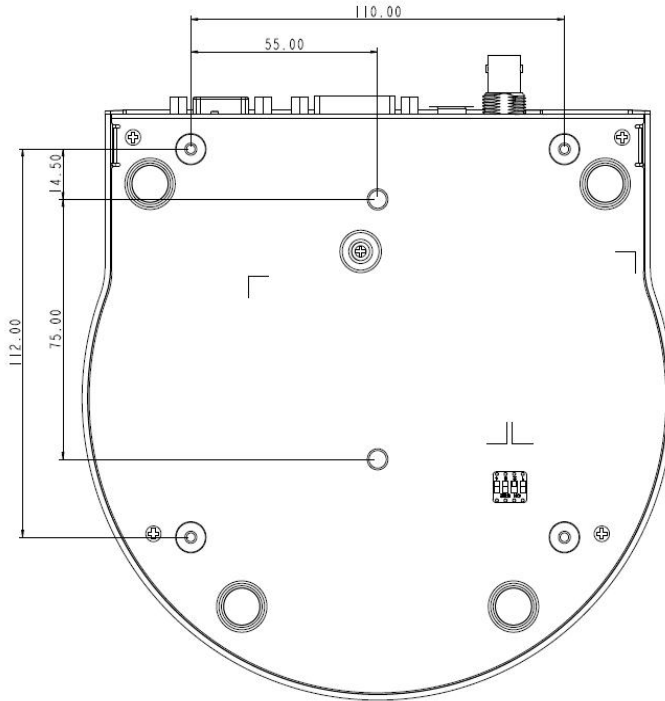


Metal plate A - Locking Screw



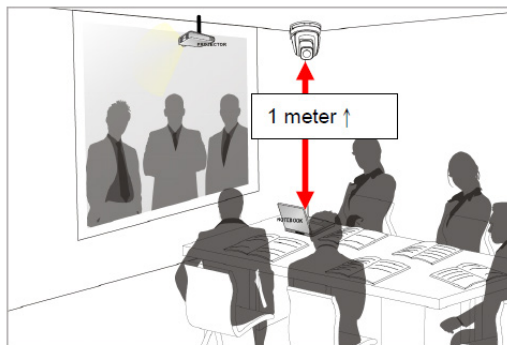
Metal plate A - Machine Side

➤ Bottom of Machine



- **Precautions for Installation**

- Before installation, please confirm the orientation of the device relative to the object to be captured.
- It is recommended that the device should be set at a distance of more than **1 meter** away from the object to be captured. Please adjust for the optimized distance according to the magnification ratio of the lens.



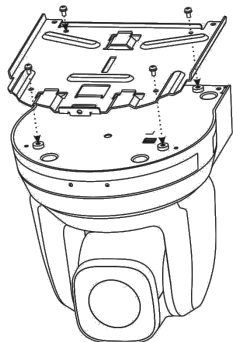
- The device (including metal plates) weighs approximately 2.5 kg. If it is to

be installed on the ceiling, please use the UL security certified hanger to prevent the device from falling.

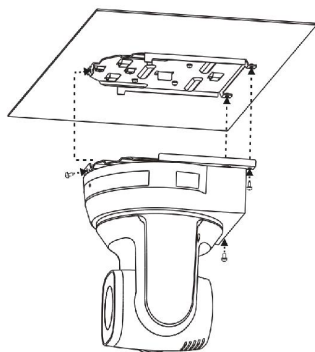
- Please check whether the camera is installed securely on a regular basis.

- **Installation Steps**

- Please configure the resolution by adjusting the DIP switch first (**Please refer to the [DIP Switch](#) section (Page 40) for the relevant descriptions of DIP switch**).
- Secure metal Plate A to the base of the camera using 4 M3 screws

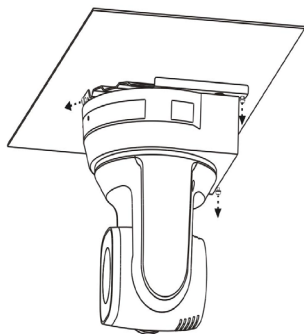


- Fix the metal Plate B to a secure ceiling position using 4 M3 screws  
※Caution:  
Please use the hanger that has obtained the UL security certification.  
Please reserve the hole for connecting wires of the camera.
- Mechanically slide metal plate A into metal plate B so they marry and latch together  
Secure using 3 M3 screws



- **How to Remove**

- Remove the connecting wires from the camera
- To uninstall the camera from the ceiling, loosen the three screws that fix metal plates A and B and then push the device to the left to remove



- Finally remove the screws on the hanger and the device

## 7. Frequently-Asked Questions

This section describes problems that you may encounter while using PTC-120. If you have questions, please refer to related sections and follow all the suggested solutions. If problem still exists, please contact your distributor or the service center.

No.	Problems	Solutions
1.	Boot without power signal	<ol style="list-style-type: none"> <li>1. Make sure you have plugged in the power cord.</li> <li>2. Make sure the Service DIP switch is OFF.</li> </ol>
2.	No image output from the PTC-120	<ol style="list-style-type: none"> <li>1. Check the power.</li> <li>2. Check if DIP switch is properly set. Refer to the <a href="#">DIP Switch</a> section (page 40) for related settings.</li> <li>3. Make sure the display supports the output resolution; in general, the resolution should be 1080p60(50)/1080i60(50)/720p60(50).</li> <li>4. Replace the cables and make sure they are not faulty.</li> </ol>
3.	PTC-120 image is severely delayed	Please use 1080p or 720p 60/50 Hz signals rather than 25/30 Hz signals.
4.	Not working after changing DIP Switch setting	After configuring DIP Switch Setting, unplug and reconnect the power cord and turn on the machine to change the setting.
5.	PTC-120 cannot be operated by remote control	<ol style="list-style-type: none"> <li>1. Please confirm if the Camera Select on the remote control can be used together with the <a href="#">IR Select</a> (page 41) on PTC-120.</li> <li>2. Please prevent PTC-120 from direct sunlight.</li> <li>3. Make sure the energy-saving bulb and the IR touch screen are placed as far as possible from each other in order to avoid interference.</li> <li>4. When several PTC-120s are connected in the same area, the operation of two remote controls at the same time may result in signal interference. It is</li> </ol>

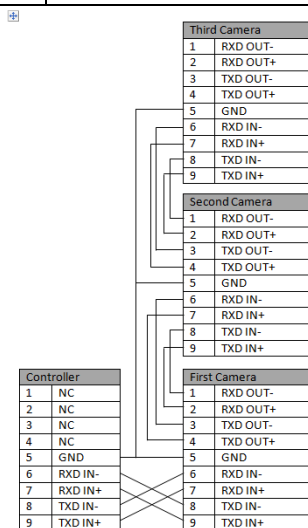
		recommended to use one remote control only.
<b>6</b>	<b>The device cannot be controlled with CODEC</b>	<p>1. Please consult the distributor to make sure the firmware version is the latest one. The steps to check the version is as follows:</p> <p>1.1 Press [MENU] on the remote control</p> <p>1.2 Select [Status]</p> <p>1.3 Go to Page 5 of [System]</p> <p>1.4 Make sure the firmware version is correct</p>
<b>7.</b>	<b>The device cannot be controlled with RS-232/RS422</b>	<p>1. Make sure the connection is correct (RS-232/422 Input).</p> <p>2. Make sure <a href="#">System Switch</a> (Page 42) DIP1 and DIP3 are correct.</p>
<b>8.</b>	<b>R/B Gain and L/R Direction are not functional when controlling PTC-120 with SONY's RM-BR300 Keyboard Controller</b>	<p>1. R/B Gain is not an available function on PTC-120.</p> <p>2. Commands of L/R Direction differ from PTC-120 thus L/R Direction is not functional.</p>
<b>9.</b>	<b>PTC-120 Cabling</b>	<p>1. For RS-422, if CAT-6 is used, transmission will be able to reach 100M.</p> <p>2. 22AWG twisted cable is recommended.</p>
<b>10.</b>	<b>Resolution 1080p59.94 is not supported</b>	The connected switcher should use the resolution 1080p60 to prevent excessive noise or jitter.
<b>11.</b>	<b>How to control PTC-120 using SONY's RM-BR300 Keyboard Controller via RS-422 interface?</b>	PTC-120 can also be controlled using a SONY RM-BR300 Keyboard Controller via the RS-422 interface. The RS-422 wiring of the SONY's RM-BR300 Keyboard Controller is however different from those of other models. The wiring diagram is illustrated in the diagram below.

SONY RM-BR300		Datavideo PTC-120	
1	NC	1	RXD OUT-
2	NC	2	RXD OUT+
3	NC	3	TXD OUT-
4	NC	4	TXD OUT+
5	GND	5	GND
6	RXD IN-	6	RXD IN-
7	RXD IN+	7	RXD IN+
8	TXD IN-	8	TXD IN-
9	TXD IN+	9	TXD IN+

**12**

**How to control multiple PTC-120 cameras using SONY RM-BR300 Keyboard Controller via RS-422 interface?**

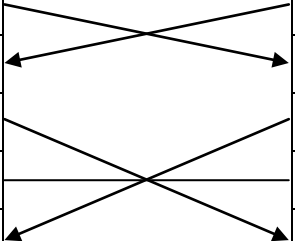
Multiple PTC-120 cameras can also be connected in a daisy chain fashion. The following diagram shows the user how to cascade multiple PTC-120 cameras with SONY RM-BR300 Keyboard Controller via RS-422 interface.



13

Control of PTC-120 using SONY's RM-BR300 Keyboard Controller on RS-232 interface

The diagram below shows the user how they can connect SONY's RM-BR300 Keyboard Controller to the PTC-120 camera via RS-232 interface.

Camera RS-232C Terminal				SONY RM-BR300	
1	DTR			1	DTR
2	DSR			2	DSR
3	TXD			3	TXD
4	GND			4	GND
5	RXD			5	RXD
6	GND			6	GND
7	IR OUT			7	OPEN
8	N.C.			8	OPEN

## 8. Specification

Video	
Image Pickup Element	1/2.8 type CMOS sensor
Effective Picture Elements	Approx. 2.0 Mega pixels
Resolution	HD / FHD
Signal System	1080/ 60p , 1080/ 50p , 1080/ 60i, 1080/ 50i, 1080/ 30p, 1080/ 25p, 720/ 60p, 720/ 50p, 720/ 30p , 720/25p
S/N Ratio	50dB
Electric Shutter	1/1 ~ 1/10,000 sec
Electric Sensitivity UP	N/A
Gamma	Yes, 4 modes
Iris Control	Auto
Digital Noise Reductions	2D & 3D
On-Screen Display (OSD)	English / Simplified Chinese
OSD Control	IR Controller & Remote controller
White Balance	Auto, indoor, outdoor, one-push, manual
AGC / Gain Control	Auto / Manual
Zoom Ratio	20x Optical zoom; 12x Digital zoom
Mirror	Mirror / Flip
Focus Mode	Auto / Manual
Day & Night (IR)	Color / Grey / Invert
Pan / Tilt / Zoom	
Pan/Tilt Range	Pan: 340° , Tilt: +90° to -30°

Pan/Tilt Speed	Pan & Tilt : 300°/sec
Initialization Time	13 sec
Preset	128 Position
Coordinate Report	N/A
Camera ID	1~7 (VISCA)
Camera Title	N/A
<b>Lens</b>	
Lens Type	20x Optical Zoom, 12x Digital Zoom
Focal Length	f = 4.7 ~ 94 mm
Angle of View (Horizontal)	63°
<b>Video Output</b>	
Video Output	3G-SDI x 1 DVI-D x 1 Component x 1 CVBS x 1
Video Format Output	1 V p-p / 75 Ohms.
<b>Control</b>	
Protocol	SONY VISCA
Baud Rate	9600 / 38400 bps
Remote Control	RS-232 & RS-422
Remote Controller	RMC-190
F/W Update	By RS-232
DVIP	N/A
IR Receiver	5 IR Receivers

IR Control	One IR controller
<b>Others</b>	
Moving Noise while Tilt (Average)	<=30dB
Moving Noise while Pan (Average)	<=30dB
Position Coordination Report	Yes
Operating Temperature	0°C ~ 45°C
Storage Temperature	-10°C ~ 60°C
Operating Humidity:	20 % to 80 % (no condensation)
Certifications	CE / FCC Class A
Dimensions (W x H x D):	6.9" x 7.3" x 7.2" (174 x 186 x 182.7 mm) (W x D x H)
Weight	4.4 lbs (2.0 kg)
Accessories	IR Controller Mounting Bracket (for table or ceiling) Mounting Bracket (for main unit) Mounting Screws DC In Power Adaptor Power Cord

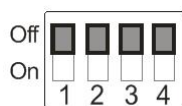
## 9. DIP Switch

PTC-120 offers the user four types of DIP Switch and prior to installation of the device, the user must first configure these DIP switch settings. Please turn off the machine before changing DIP switch setting. The four types of DIP switch are,

1. Output Switch
2. IR Select
3. Camera Address Selector
4. System Switch

### 9.1 OUTPUT Switch

Output switch sets the output resolution. The supported resolutions are listed in the table below.

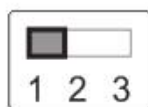


Output Resolution	Setting	Output Resolution	Setting
1920x1080/60p		1920x1080/50p	
1920x1080/30p		1920x1080/25p	
1920x1080/60i		1920x1080/50i	
1280x720/60p		1280x720/50p	
1280x720/30p		1280x720/25p	

1920x1080/59.94p		1920x1080/59.94i	
1920x1080/29.97p		1280x720/59.94p	
1920x720/29.97p			

## 9.2 IR SELECT

IR Select assigns the camera an identification number when the user desires to operate multiple cameras using the [Remote Control](#) (Page 14).



ID	Setting
1	
2	
3	

## 9.3 Camera Address Selector

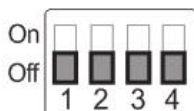
Camera Address Selector sets the camera address used in the cascade connection scenario. The user is allowed to cascade up to 7 cameras, which are controlled via either RS-232C interface or RS-422 interface.



Setting	Function Descriptions
0	Addresses are assigned to the cameras automatically in the power-on order.
1-7	Camera Address 1-7
8-9	Reserved

## 9.4 System Switch

System switch adjusts the basic system settings, such as communication protocol, IR signal, and communication baud rate.

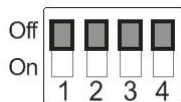


Setting	Function Descriptions
DIP 1	RS-232C/RS-422 Selector  OFF: RS-232C  ON: RS-422
DIP 2	Infrared Signal Output Switch  OFF: OFF  ON: ON (When turned on, CODEC, installed inside the machine, is required)
DIP 3	Communication Baud Rate Selector  OFF: 9600  ON: 38400
DIP 4	Reserved

## 9.5 Service Switch

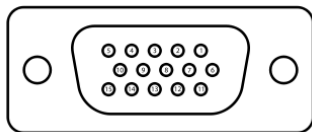
There are three firmware download modes. PAN motor firmware and TILT motor firmware are to be upgraded separately. The corresponding DIP switch configurations are listed in the table below. Before Firmware upgrade, please make sure

1. DIP 1 of the System Switch is set to OFF.
2. Camera Address Selector is set to zero.



Setting	Function Descriptions
	OFF (Default)  Upgrade of Camera DSP FW/Camera Protocol FW/M3 Control FW
	PAN Motor Firmware Upgrade  N.B. Please contact Datavideo's technical team for firmware upgrade SOP.
	TILT Motor Firmware Upgrade

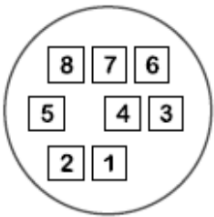
## 10. Component Video Output – DSub PIN Assignments



PIN No.	PIN Name	Signals
1	RED	Red Video
2	GREEN	Green Video
3	BLUE	Blue Video
4	ID2/RES	Reserved
5	GND	Ground (HSync)
6	RED_RTN	Red return
7	GREEN_RTN	Green return
8	BLUE_RTN	Blue return
9	KEY/PWR	+5V DC
10	GND	Ground (VSync)
11	ID0/RES	Reserved
12	ID1/SDA	I <sup>2</sup> C Data
13	HSync	Horizontal sync
14	VSync	Vertical sync
15	ID3/SCL	I <sup>2</sup> C Clock

# 11. RS-232 PIN Assignments

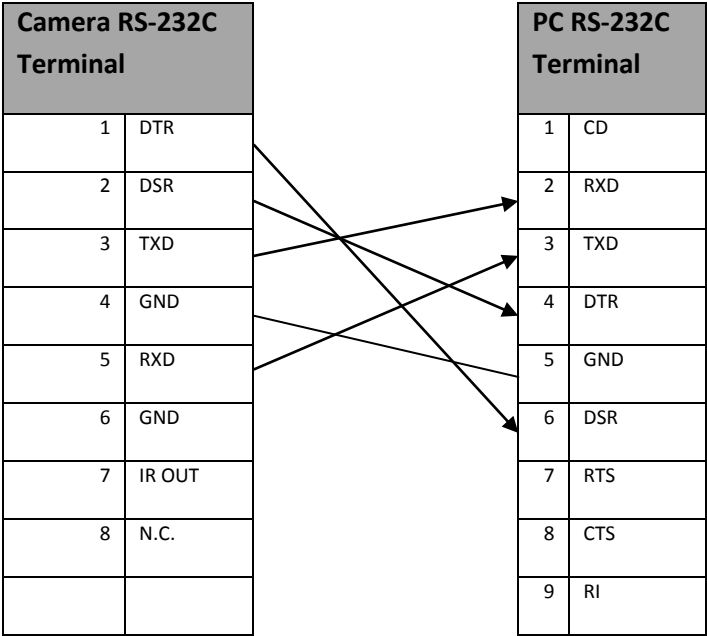
## 11.1 PIN Descriptions



PIN No.	PIN Name	Signals
1	DTR	Data Transmission Read (Output)
2	DSR	Data Set Read (Input)
3	TXD	Transmit Data (Output)
4	GND	Ground
5	RXD	Receive Data (Input)
6	GND	Ground
7	IR OUT	IR Commander Signal (Output)
8	N.C.	No Connection

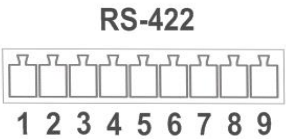
# 11.2 Wiring Diagrams

With RS-232 interface, PTC-120 can be controlled using a home PC. The diagram below shows the connection in a PC-controlled scenario.



# 12. RS-422 PIN Assignments

## 12.1 PIN Descriptions

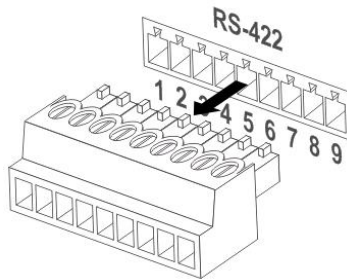


PIN No.	Function
1	RXD OUT-
2	RXD OUT+

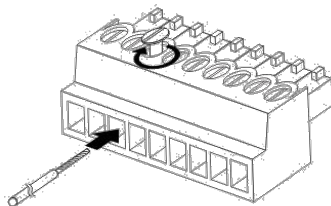
3	TXD OUT-
4	TXD OUT+
5	GND
6	RXD IN-
7	RXD IN+
8	TXD IN-
9	TXD IN+

## 12.2 Physical Connection

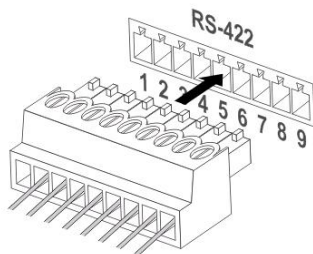
1. Hold the two sides of RS-422 connector and pull out in the direction indicated by the arrow in the figure below



2. Peel off a section of copper wire (AWG Nos.28 to18) and insert it into the connector hole; use a flat head screwdriver to fix the copper wire in the connector hole with a slotted screw.



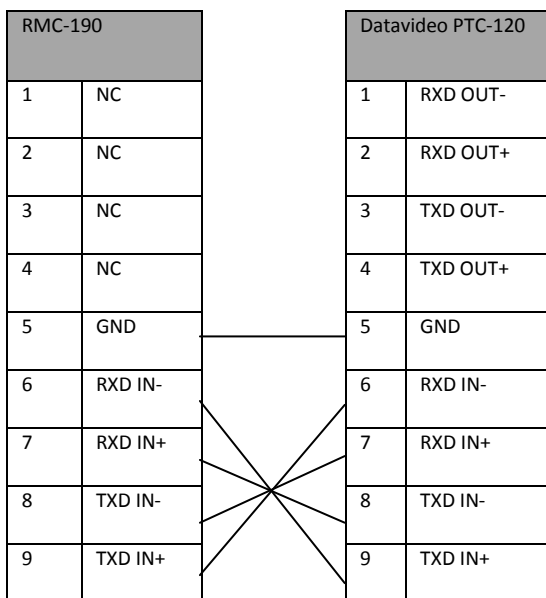
3. Insert the wired RS-422 connector back into the camera to complete the connection.



**<Note>** When RS-422 connection is being used; do not use RS-232C connection.

## 12.3 Wiring Diagrams

To control PTC-120 with an external keyboard controller, establish RS-422 interface connections between PTC-120 and RMC-190 keyboard controller as shown below.



## 13. VISCA Commands

Command Set	Command	Command Packet	Comments
AddressSet	Broadcast	88 30 01 FF	Address setting
IF_Clear	Broadcast	88 01 00 01 FF	I/F Clear
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_AutoPowerOff	Direct	8x 01 04 40 0p 0q 0r 0s FF	<p>The power automatically turns off if the camera does not receive any VISCA commands or any signals from the Remote Control for the duration you set in the timer.</p> <p>Auto Power Off pqrs: 0000 to FFFF</p> <p>Power Off Timer pqrs: 0000 (Timer Off) to FFFF (65535min) Initial value: 0000</p>
CAM_Zoom	Stop	8x 01 04 07 00 FF	Zoom Position: 0~0x4000
	Tele (Standard)	8x 01 04 07 02 FF	
	Wide (Standard)	8x 01 04 07 03 FF	
	Tele Step	8x 01 04 07 04 FF	
	Wide Step	8x 01 04 07 05 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	<p>pqrs: Zoom Position(0x0000~0x4000)</p> <p>Note: Optical Zoom Tele max position: 0x4000</p>
	Direct (Speed Variable)	8x 01 04 47 0p 0q 0r 0s 0t FF	<p>pqrs: Zoom Position(0x0000~0x4000)</p> <p>Note: Optical Zoom Tele max position: 0x4000</p> <p>t: 0~7 (0 :Low, 7:High)</p>
CAM_DZoom	On	8x 01 04 06 02 FF	Digital zoom ON/OFF (Not used in separate mode)
	Off	8x 01 04 06 03 FF	

CAM_Focus	Stop	8x 01 04 08 00 FF	* Enabled during Manual Mode p=0 (Low) to 7 (High)
	Far (Standard)	8x 01 04 08 02 FF	
	Near (Standard)	8x 01 04 08 03 FF	
	Far Step	8x 01 04 08 04 FF	
	Near Step	8x 01 04 08 05 FF	
	Far (Variable)	8x 01 04 08 2p FF	
	Near (Variable)	8x 01 04 08 3p FF	
	Direct	8x 01 04 48 0p 0q 0r 0s FF	Focus Position pqrs: pqrs parameters are in the General Zoom Focus Table from 0x00~0x1C6
	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	*Enabled during manual mode One Push AF Trigger
CAM_ZoomFocus	Direct	8x 01 04 47 0p 0q 0r 0s 0t 0u 0v 0w FF	pqrs: Zoom Position (0x0000~0x4000) tuvw: Focus Position (0x00~0x1C6)
CAM_Initialize	Lens	8x 01 04 19 01 FF	Lens Initialization Start
	Camera	8x 01 04 19 03 FF	Camera reset
Resolution Setting		8x 01 06 35 00 0p FF	p: 0x00:1080p-60 0x01:1080p-50 0x02:1080p-30 0x03:1080p-25 0x04:1080i-60 0x05:1080i-50 0x06:720p-60 0x07:720p-50 0x08:720p-30 0x09:720p-25 0x0A:1080p-5994 0x0B:1080i-5994 0x0C:1080p-2997 0x0D:720p-5994 0x0E:720p-2997
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
	Sodium Lamp	8x 01 04 35 05 FF	Sodium lamp source fixed mode
	3000K	8x 01 04 35 06 FF	Color temperature fixed at 3000K mode
	4300K	8x 01 04 35 07 FF	Color temperature fixed at 4300K mode
	5000K	8x 01 04 35 08 FF	Color temperature fixed at 5000K mode
	6500K	8x 01 04 35 09 FF	Color temperature fixed at 6500K mode
	8300K	8x 01 04 35 0A FF	Color temperature fixed at 8300K mode
	Wide Auto	8x 01 04 35 0B FF	Wide Auto
	One Push Trigger	8x 01 04 10 05 FF	*Enabled during one push WB mode One push WB trigger
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
	White Board	8x 01 04 39 5F FF	White board mode
CAM_Shutter	Reset	8x 01 04 0A 00 FF	Shutter Setting * Enabled in Shutter Priority/Manual Mode
	Up	8x 01 04 0A 02 FF	
	Down	8x 01 04 0A 03 FF	
	Direct	8x 01 04 4A 00 00 0p 0q FF	Shutter Position pq: 00 To 15
CAM_Gain	Reset	8x 01 04 0C 00 FF	Gain Setting *Enabled in manual mode
	Up	8x 01 04 0C 02 FF	
	Down	8x 01 04 0C 03 FF	
	Direct	8x 01 04 4C 00 00 0p 0q FF	Gain Position, pq: 00 to 0F
	Gain Limit	8x 01 04 2C 0p FF	Gain Position, p: 4 to F
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	ExpComp Position, pq: 00 To 0A
CAM_BackLight	On	8x 01 04 33 02 FF	Back Light Compensation ON/OFF *Enabled in AE Full Auto Mode
	Off	8x 01 04 33 03 FF	
CAM_SpotAE	On	8x 01 04 59 02 FF	Automatic Spot Exposure Setting *Enabled in AE Auto mode
	Off	8x 01 04 59 03 FF	
	Position	8x 01 04 29 0p 0q 0r 0s FF	pq: X (00 To 08) rs: Y (00 To 06)
CAM_WD	Set Parameter	8x 01 04 2D 0p FF	p: 0 ~ 5 0: Off 1~5: mode 1~5
CAM_Aperture (Sharpness)	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	Aperture Gain pq: 00 to 0F
CAM_HR	On	8x 01 04 52 02 FF	High Resolution Mode ON/OFF
	Off	8x 01 04 52 03 FF	
CAM_2DNR		8x 01 04 53 0p FF	NR Setting p: 0 to 6 0: OFF 5: Max 6: Auto
CAM_2DNR		8x 01 04 54 0p FF	NR Setting p: 0 to 4: 0: Off 1: Low 2: Typ 3: Max 4: Auto
CAM_Gamma		8x 01 04 5B 0p FF	Gamma Setting p: 0 to 3
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_PictureEffect	Off	8x 01 04 63 00 FF	Picture Effect Setting
	Neg.Art	8x 01 04 63 02 FF	
	B&W	8x 01 04 63 04 FF	
CAM_PictureFlip	On	8x 01 04 66 02 FF	Picture flip ON/OFF
	Off	8x 01 04 66 03 FF	
CAM_ICR	On	8x 01 04 01 02 FF	IR Mode ON/OFF
	Off	8x 01 04 01 03 FF	
CAM_Memory (Preset)	Reset	8x 01 04 3F 00 pp FF	Memory Number pp: 0x00 to 0x7F
	Set	8x 01 04 3F 01 pp FF	
	Recall	8x 01 04 3F 02 pp FF	
CAM_Mute	On	8x 01 04 75 02 FF	Muting ON/OFF
	Off	8x 01 04 75 03 FF	
	On/Off	8x 01 04 75 10 FF	
CAM_IDWrite		8x 01 04 22 0p 0q 0r 0s FF	Camera ID pqrs: 0000 to FFFF
CAM_Day&Night Mode	On	8x 01 04 6B 02 FF	Alarm ON/OFF
	Off	8x 01 04 6B 03 FF	
	SetDayNighLevel	8x 01 04 6D 0p 0p 0p 0q 0q 0q FF	Day judgment level setting ppp: 000 to FFF  Night judgment level setting qqq: 000 to FFF
	Alarm(Reply)	y0 07 04 6B 01 FF	Detection level "Low" -> "High" y = camera address + 8
		y0 07 04 6B 00 FF	Detection level "High" -> "Low" y = camera address + 8
CAM_ReplyIntervalTimeSet	Message reply time during day and night	8x 01 04 6A 00 00 0p 0p FF	Interval Time [Vertical timing] pp: 0x01~0xFF
CAM_ChromaSuppre ss		8x 01 04 5F pp FF	Chroma Suppression setting pp:00 to 03 00: OFF 01 to 03: ON (3 levels)

			Suppression increases as the level number increases.
CAM_ColorGain (Saturation)	Direct	8x 01 04 49 00 00 00 pq FF	pq:0x00~0x19
CAM_ColorHue	Direct	8x 01 04 4F 00 00 00 Op FF	p: 0x00~0x0E
IR_Receive	On	8x 01 06 08 02 FF	IR (remote control) receive ON/OFF
	Off	8x 01 06 08 03 FF	
	On/Off	8x 01 06 08 10 FF	
IR_ReceiveReturn	On	8x 01 7D 01 03 00 00 FF	IR (remote control) receiving message via VISCA communication ON/OFF
	Off	8x 01 7D 01 13 00 00 FF	
Pan-tiltDrive	Up 3)	8x 01 06 01 VV WW 03 01 FF	Pan speed VV: 0x01 (low speed) to 0x18 (high speed)
	Down 3)	8x 01 06 01 VV WW 03 02 FF	
	Left 3)	8x 01 06 01 VV WW 01 03 FF	Tilt Speed WW: 0x01 (low speed) to 0x18 (high speed)
	Right 3)	8x 01 06 01 VV WW 02 03 FF	VV: 0x01 to 0x18 WW: 0x01 to 0x18
	UpLeft 3)	8x 01 06 01 VV WW 01 01 FF	Pan Position YYYY: 0000 to 0AD4 & F52C to FFFF (center 0000)
	UpRight 3)	8x 01 06 01 VV WW 02 01 FF	
	DownLeft 3)	8x 01 06 01 VV WW 01 02 FF	Tilt Position ZZZZ: 0000 to 05C1 & FE1B to FFFF (center 0000)
	DownRight 3)	8x 01 06 01 VV WW 02 02 FF	
	Stop 3)	8x 01 06 01 VV WW 03 03 FF	
	AbsolutePosition	8x 01 06 02 VV WW 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF	
	RelativePosition	8x 01 06 03 VV WW 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF	
	Home	8x 01 06 04 FF	
	Reset	8x 01 06 05 FF	
Pan-tiltLimitSet	LimitSet	8x 01 06 07 00 0W 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF	UpRight W: 1  Pan Limit Position YYYY: 0000~0AD4  Tilt Limit Position ZZZZ: 0000~05C1

			DownLeft W: 0  Pan Limit Position YYYY: FFFF~F52C  Tilt Limit Position ZZZZ: FFFF~FE1B
	LimitClear	8x 01 06 07 01 0W 07 0F 0F 0F 07 0F 0F 0F FF	
Firmware	Firmware version	8x 01 02 03 FF	
Error Code	Read Error Code	8x 01 01 01 FF	
	Clear Error Code Record	8x 02 02 02 FF	
Factory Reset	System Factory Reset	8x 01 04 3F 03 00 FF	
CAM_Image_Mode	Select CAM Image Mode	8x 01 04 3F 04 0p FF	p: 0~6 0: Custom mode
Output Video Type	Select the output Video type	8x 01 04 3F 05 0p FF	p: 0~1 0: SDI 1: YPbPr/DVI
Preset Speed	Set Preset Speed	8x 01 06 20 0p FF	p: 0 to 2 0: 150 degree/second 1: 250 degree/second 2: 300 degree/second
Motor Table Select	Select Motor Speed Table	8x 01 06 20 30 40 0p FF	p = Table number 0: Default mode 1: Engineer mode
CAM Prompt	Set Prompt On/Off	8x 01 04 07 00 0p FF	p: 2 to 3 2: Prompt On 3: Prompt Off
CAM_MemSave	Write Mem Data	8x 01 04 23 0X 0p 0p 0q 0q FF	Address X: 00 to 07 (total 16 bytes)  Data ppqq: 0x0000 to 0xFFFF
CAM Model ID	Set Camera model ID	8x 01 04 23 pp qq rr ss FF	ppqq: Vendor ID rrss: Model ID
CAM_SERIAL_NINE	Serial Number With 9 ascii codes	8x 02 18 aabbccddeeffgghhiif F	Serial Number aabbccddeeffgghhii: 9 ASCII codes
CAM_AF_SPEED	Normal	8x 01 04 56 02 FF	AF speed: Normal/Fast
	Fast	8x 01 04 56 03 FF	
	Normal / Fast	8x 01 04 56 10 FF	
CAM_AF_SENSITIVE		8x 01 04 58 0p FF	p: 1 to 3 1: High 2: Middle 3: Low

CAM_AF_FRAME	Full Frame	8x 01 04 5C 02 FF	Set AF frame: Full Frame / Center
	Center	8x 01 04 5C 03 FF	
	Full Frame / Center	8x 01 04 5C 10 FF	
CAM_ImageModeBrightness	Set Brightness	8x 01 04 75 67 0p FF	p: 0x0~0xE
CAM_ImageModeContrast	Set Contrast	8x 01 04 75 68 0p FF	p: 0x0~0xE
CAM_Skin_Tone	select red level	8x 01 04 75 06 0p FF	p: 0~4
Black Level	Black Level	8x 01 04 75 69 0p FF	p: 0 to 3 0:Off 1:Type 1 2:Type 2 3:Type 3
Power_LoadState	Load Preset 0 when power on and reset Pan/tilt	8x 01 04 75 6A 02 FF	Load preset 0 when power on
		8x 01 04 75 6A 03 FF	Load last status when power on
SYS_Menu	On	8x 01 06 06 02 FF	turn on the menu screen
	Off	8x 01 06 06 03 FF	turn off the menu screen
	On/Off	8x 01 06 06 10 FF	turn on/off the menu screen
CAM_AE_Bright_Ctrl	Reset	8x 01 04 0D 00 FF	AE Bright Control (Using EV)
	Up	8x 01 04 0D 02 FF	
	Down	8x 01 04 0D 03 FF	

## 14. Optional Accessory Cables

PTC-120 HD/SD PTZ Camera		
No	Cable Item	Description
1	CB-49	Daisy Chain VISCA / RS-232C male to male control cable 15M
2	CB-50	Daisy Chain VISCA / RS-232C male to female control cable 15M
3	CB-51	RS-232 TO PC D-Sub 15M

## Service & Support

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