

ACTi Camera URL Commands

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Introduction

The communication language of ACTi cameras is very simple – it consists of clearly understandable text based commands. Since the receiver of the commands is usually the built-in web server within the camera, those texts are also called **URL commands**. By using URL commands it is possible to change the configuration of the camera, check the status of any of the services or alarms, request video or snapshots, and much more.

While the most common usage of URL commands is **ACTi camera integration with video management systems**, the simplicity of the commands allows them to be used in variety of practical applications even for those who have no previous experience in text-based camera control.

The most frequently used applications that can take a good use of URL commands are related to **event management** – by using the URL commands within the Event Handler system of the camera it is possible to change the system or video settings or change the PTZ position of the camera itself or any other ACTi camera upon triggered events.

That's not all – it is even possible to **integrate ACTi cameras with web applications** by using

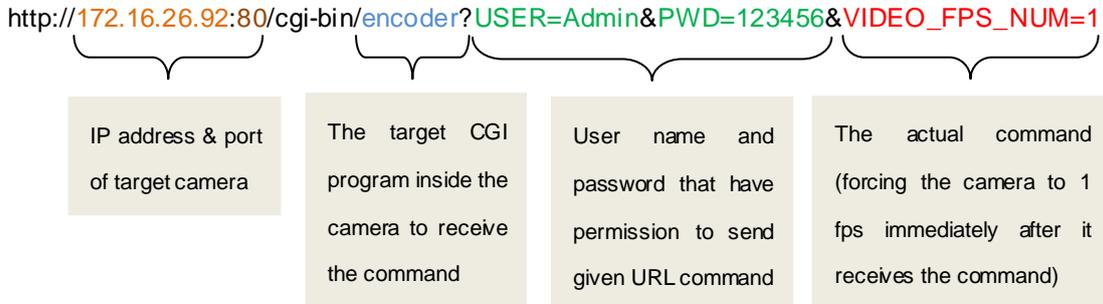
URL commands. You could easily create a web page by which you can display the list of camera events, snapshots or live video from the camera or change the camera settings by pressing the buttons on your custom made website.

Last, but not least – URL commands **help save lots of camera installation time**. Instead of repeating same configuration steps on multiple cameras, such as full-screen motion detection region setup, it is possible to take a good use of **ACTi IP Utility 4** that allows configuration of any parameters on multiple devices at the same time by using URL commands.

The following chapters are divided into two main parts – the **practical applications for the end user** daily surveillance purpose and **convenient installation tips for system integrators** using URL commands.

How Does URL Command Look Like

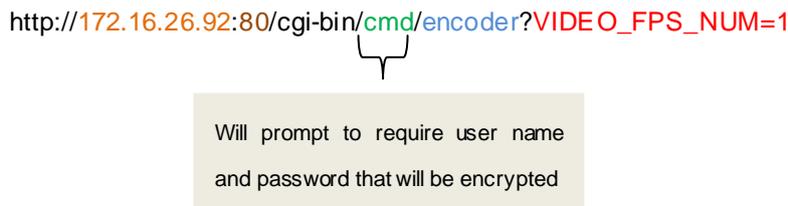
Before going into details of URL command applications, let's see how a typical URL command would look like. Below is the example of the URL command that changes the camera's frame rate to 1 fps.



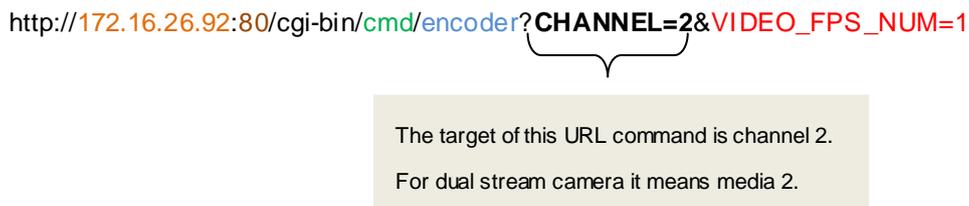
It is possible to send **multiple commands with one URL command line** by separating them with "&" symbol. For example, if the user wants to change both frame rate and bitrate at the same time, it is possible to write the ending of the URL command this way:

`...&VIDEO_FPS_NUM=1&VIDEO_BITRATE=500K`

If it is necessary to have **encrypted user name and password**, it is possible to use following URL command syntax:



If you are working with the **multi-channel device** (including multi-channel encoders, **dual stream** media 1 and media 2, KCM series **4VGA** and **6VGA**) the channel number has to be added. For channel 1, you may omit the channel command or have it as CHANNEL=1.



Camera Sending URL Commands to Itself

With the help of the Event Handler function inside the camera it is possible to change the camera settings or PTZ position automatically whenever the scheduled or alarm event is triggered. For example, the camera changes its frame rate from maximum to 1fps together with lowering the bitrate upon day to night switch, in order to save the recording storage space during night time.

Such changes are possible thanks to URL commands. When the URL command is written in the Event Handler rule, it will be executed when the event is triggered. The camera would then send the URL command to itself to force itself to take pre-defined actions. There are thousands of combinations of URL commands that can be used with Event Handler system.

Example 1: Use URL commands in Event Handler to set camera on 12 fps when there is a motion alarm and set it back to 2 fps when the event ends 30 seconds later.

The screenshot displays four panels from a camera's configuration interface:

- Motion Detection:** Shows a live video feed of a store interior. Below the feed, a table lists motion detection regions. Region 1 is highlighted with a red box, showing it is enabled with a sensitivity of 70, a trigger interval of 30 seconds, and a trigger threshold of 10%.

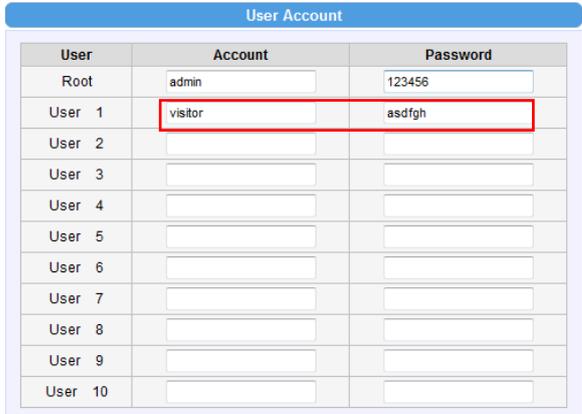
Region	Enabled	Sensitivity	Trigger Interval [s]	Trigger Threshold
1	<input checked="" type="checkbox"/>	70	30	10 %
2	<input type="checkbox"/>	70	1	10 %
3	<input type="checkbox"/>	70	1	10 %

- HTTP Server Configuration - 1:** Shows the configuration for the camera's HTTP server. The 'Enabled' checkbox is checked. The 'User Name' is 'Admin', 'User Password' is masked with dots, and 'Network Address' is '172.16.26.92'. The 'Network Port' is 80 and 'Max. Connection Time' is 10 seconds.
- Event List 1:** Shows the configuration for a specific event. The event is enabled and active on all days of the week. It is triggered by 'Motion' in 'Region 1'. The 'Response To' section has 'Send URL command' checked, with 'URL Command 1' selected.
- Send URL commands:** Shows the configuration for the URL commands. 'Send Command 1 to HTTP CGI 1' is set to the command `/cgi-bin/cmd/encoder?VIDEO_FPS_NUM=12`. 'Send Command 2 to HTTP CGI 1' is set to the command `/cgi-bin/cmd/encoder?VIDEO_FPS_NUM=2`.

Example 2: Allow access for certain user only for a limited period of time. If you wish a certain user to have a visitor access to your camera every Wednesday between 2p.m.-3p.m. then you can first create the user account and then manage its password by event handler. Then, notify the user of the name and password that is activated during given period of time.

It is a secure method because the user itself will not be able to access the setup page of the camera to do any Event Handler configurations. Only Admin account can do it.

Please note that in this case, the **system** cgi is used as a target of URL command instead of encoder cgi, as it changes the system settings, not video settings.



User	Account	Password
Root	admin	123456
User 1	visitor	asdfgh
User 2		
User 3		
User 4		
User 5		
User 6		
User 7		
User 8		
User 9		
User 10		



Enabled

User Name: Admin

User Password:

Network Address: 172.16.26.92

Network Port: 80

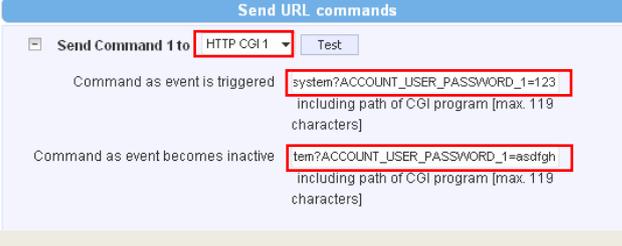
Max. Connection Time: 10 sec. (0~60 sec)

Apply Reset

Prepare the following URL commands to change User 1 password:

```
/cgi-bin/cmd/system?ACCOUNT_USER_PASSWORD_1=123
```

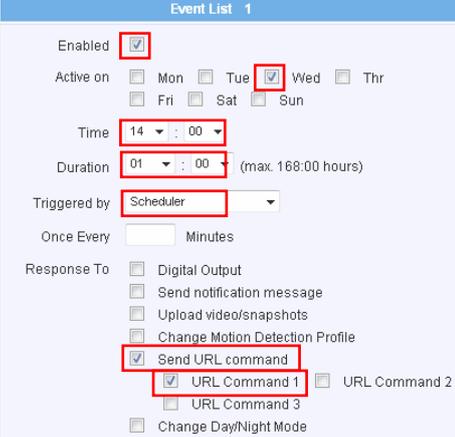
```
/cgi-bin/cmd/system?ACCOUNT_USER_PASSWORD_1=asdfgh
```



Send Command 1 to: HTTP CGI 1 Test

Command as event is triggered: system?ACCOUNT_USER_PASSWORD_1=123
including path of CGI program [max. 119 characters]

Command as event becomes inactive: tem?ACCOUNT_USER_PASSWORD_1=asdfgh
including path of CGI program [max. 119 characters]



Event List 1

Enabled

Active on: Mon Tue Wed Thr Fri Sat Sun

Time: 14 : 00

Duration: 01 : 00 (max. 168:00 hours)

Triggered by: Scheduler

Once Every: Minutes

Response To: Digital Output Send notification message Upload video/snapshots Change Motion Detection Profile Send URL command URL Command 1 URL Command 2 URL Command 3 Change Day/Night Mode

With these settings, the user can login using the name “visitor” and password “123” on Wednesdays between 2p.m.-3p.m.

Do you want to check which names and passwords exist in the camera system?

Simply type the following URL to browser’s address bar (using your camera IP instead):

<http://172.16.26.92:80/cgi-bin/cmd/system?ACCOUNT>

Example 3: Show alarm message as text overlay when digital input is triggered.

It would be useful to display the alarms of digital input as text overlay – this way the exact moment of the event trigger will be recorded as a visual evidence right within the video clip.



The instruction below explains how to take a good use of URL commands to display “ALARM1-ON” text on video for 5 seconds whenever digital input 1 is triggered. It is especially useful for the cases when the third party VMS does not support the event management of digital inputs of the camera.

	<p>Prepare the following URL commands to turn on and off the text overlay:</p> <pre>/cgi-bin/cmd/encoder?OSD_FORMAT=1,1,ffffff,100,TOP;%U,ALARM1-ON</pre> <pre>/cgi-bin/cmd/encoder?OSD_FORMAT=1,0,ffffff,100,TOP;%U,ALARM1-ON</pre>
<p>Set DI 1 interval as 5 seconds. This is how long the DI event will be active.</p>	

For the detailed explanation of the URL commands used in this example, please refer to the list of URL commands at the end of this chapter.

FREQUENTLY USED URL COMMANDS

Video Settings			
Objective	Receiver cgi program	Command with example parameters	Allowed parameters
Change the video resolution	encoder	VIDEO_RESOLUTION=N 1280x1024	One of the resolutions of the camera**
Change the frame rate	encoder	VIDEO_FPS_NUM=15	One of the frame rates of the camera**
Change the (average) bitrate for H.264 or MPEG-4 (for CBR*)	encoder	VIDEO_BITRATE=2M	One of the bitrates of the camera between 28K and 6M, or UNLIMITED**
Change the maximum bitrate for H.264 or MPEG-4 (for CBR*)	encoder	VIDEO_MAX_BITRATE=2M	One of the bitrates of the camera between 28K and 6M, or UNLIMITED**
Change the video quality (bitrate) for MJPEG	encoder	VIDEO_MJPEG_QUALITY=60	1~100
Change the video quality (bitrate) for MPEG-4 (for VBR*)	encoder	VIDEO_MPEG4_QUALITY=HIGH	HIGH, MIDDLE, LOW, NONE (if NONE, then the average or max bitrate is used instead = CBR*)
Change the video quality (bitrate) for H.264 (for VBR*)	encoder	VIDEO_H264_QUALITY=HIGH	HIGH, MIDDLE, LOW, NONE (if NONE, then the average or max bitrate is used instead = CBR*)
Change the GOP length for MPEG-4 or H.264 (for VBR*)	encoder	VIDEO_GOP=5	0~60 (0 means GOP length = current frame rate)
Change the compression	encoder	VIDEO_ENCODER=MPEG4	MJPEG, MPEG4, H264
Change the streaming mode	encoder	VIDEO_STREAM=DUAL	SINGLE, DUAL, EPTZ, MD_PRESET, 4VGA, 6VGA, SEQUENTIAL, QUAD
Change video settings of other channels	encoder	CHANNEL=2&.... (include any command from above)	One of the supported channel numbers of the device

* CBR = constant bitrate mode; VBR = variable bitrate mode

** You may use [system?SYSTEM_INFO](#) URL command to find out all available parameters for given function

Audio Settings			
Objective	Receiver cgi program	Command with example parameters	Allowed parameters
Enable Audio-in	system	V2_AUDIO_ENABLED=1	1 (enabled), 0 (disabled)
Audio-in sensitivity	system	AUDIO_IN_SENSITIVITY=HIGH	LOW (0dB boost), HIGH (20dB)
Audio-in format	system	AUDIO_IN_FORMAT=PCM	PCM, G711A, G711U
Audio-out volume	system	AUDIO_OUT_VOLUME=50	0~100

Image Settings			
Objective	Receiver cgi program	Command with example parameters	Allowed parameters
Brightness	encoder	VIDEO_BRIGHTNESS=60	1~100
Contrast	encoder	VIDEO_CONTRAST=60	1~100
Saturation	encoder	VIDEO_SATURATION=60	1~100
White Balance Mode	encoder	VIDEO_WB_MODE=AUTO	AUTO, INDOOR1, INDOOR2, OUTDOOR1, OUTDOOR2, HOLD, MANUAL
Manual White Balance Settings	encoder	VIDEO_WB_GAIN=128,128	1. R-Gain 1~255 2. B-Gain 1~255
Exposure Mode	encoder	VIDEO_EXPOSURE_MODE=AUTO	AUTO, MANUAL, IRIS_PRIORITY, SHUTTER_PRIORITY
Shutter Mode	encoder	VIDEO_SHUTTER_MODE=AUTO	AUTO, MANUAL
Exposure Reference Target	encoder	VIDEO_EXPOSURE_GAIN=128	1~255
Shutter Speed for Manual Mode	encoder	VIDEO_SHUTTER_SPEED=60 (it means 1/60s)	13, 15, 30, 60, 120, 25, 50, 100, 250, 500, 1000, 2000, 5000, 10000
Slowest Shutter Speed Limit for Auto Mode	encoder	VIDEO_MAX_SHUTTER=4	Settings of CMOS ; CCD 0: sensor's default setting 1: 1/60 or 1/50 s ; 1/500s 2: 1/30s or 1/25s ; 1/250s 3: 1/10s ; 1/120s or 1/100s 4: 1/5s ; 1/60s or 1/50s 5: 1/120 or 1/100 ; 1/30 or 1/25 6: 1/250s ; 1/15 or 1/10s 7: 1/500 ; 1/5 8: 1/1000 ; 1 9: 1/2000 ; 2 10: 1 ; 3 11: 2 ; 4 12: 3 ; N/A 13: 4 ; N/A 14: 1/15 or 1/13 ; N/A
AGC Target Gain	encoder	VIDEO_AGC_GAIN=55	1~255
Iris Mode for Auto Iris	encoder	VIDEO_IRIS_MODE=AUTO	AUTO, MANUAL
Set DC level for DC iris lens	encoder	VIDEO_DC_LEVEL=123	The range depends on the camera type
Set specific F-number for DC iris that has controllable F-stops	encoder	VIDEO_IRIS=F40 (means F4.0)	F220 (means F22.0), F190, F160, F140, F110, F96, F80, F68, F56, F48, F40, F34, F28, F24, F20, F18, F16, F14, F10
P-Iris	encoder	PIRIS_OPTION=1	1 (enabled), 0 (disabled)
BLC	encoder	VIDEO_BLC_MODE=1	1 (enabled), 0 (disabled)
Mirror	encoder	VIDEO_MIRROR_MODE=1	1 (enabled), 0 (disabled)
Flip	encoder	VIDEO_FLIP_MODE=1	1 (enabled), 0 (disabled)
2D DNR	encoder	VIDEO_DNR=1	KCM C1 ISP: 1 (enabled), 0 (disabled) KCM C2 or C3 ISP: 1~4 (levels), 0 (disabled)
3D DNR	encoder	VIDEO_3DNR=1	1 (enabled), 0 (disabled)
Defogging	encoder	VIDEO_DEFOG=2	1~4 (levels), 0 (disabled)
WDR / ExDR	encoder	VIDEO_WDR=AUTO,120,0	1. AUTO, ON, OFF 2. 0~255 (day level) 3. 0 (night level)
Sharpness	encoder	VIDEO_SHARPNESS=192	1~255
KCM image settings reset to factory default	encoder	IMAGE_QUALITY_RESET	-

OSD & Motion Detection Settings			
Objective	Receiver cgi program	Command with example parameters	Allowed parameters
Manage the On-Screen Text	encoder	OSD_FORMAT=1,1,ffffff,0,TOP,%U,test	<ol style="list-style-type: none"> Region: 1~4 State 0,1 (disable, enable) Color: 000000~ffffff Transparency: 0~100 Position: TOP, BOTTOM Format: %U is user's text String: Content of text
Manage the Privacy Masks	encoder	PRIVACY_REGION=1,1,ffdcaa,100,100,300,400 (using URL command, any color is selectable, while UI only has 4 colors)	<ol style="list-style-type: none"> Region: 1~4 State 0,1 (disable, enable) Color: 000000~ffffff Coordinates (pixels)
Motion Detection System Activation	encoder	MOTION_ENABLED=0x01	<ol style="list-style-type: none"> Disable: 0x00 Enable: 0x01
Motion Detection Region Management	encoder	MOTION_CONFIG=1,1,0,0,1279,959,70,5,10 (MOTION_ENABLED has to be 0x01 in order to have regions take effect)	<ol style="list-style-type: none"> Region: 1~3 State 0,1 (disable, enable) Coordinates (pixels) Sensitivity: 0~100 Timer: 0~300 Threshold: 0~100

TCM Series Night Profile Video Settings			
Objective	Receiver cgi program	Command with example parameters	Same parameter range as ...
Adjust the video settings of the night profile of TCM series cameras	encoder	NIGHT_MPEG4_QUALITY=...	VIDEO_MPEG4_QUALITY
	encoder	NIGHT_H264_QUALITY=...	VIDEO_H264_QUALITY
	encoder	NIGHT_MJPEG_QUALITY=...	VIDEO_MJPEG_QUALITY
	encoder	NIGHT_BITRATE=...	VIDEO_BITRATE
	encoder	NIGHT_MAX_BITRATE=...	VIDEO_MAX_BITRATE
	encoder	NIGHT_GOP=...	VIDEO_GOP
	encoder	NIGHT_FPS_NUM=...	VIDEO_FPS_NUM
	encoder	NIGHT_WB_MODE=...	VIDEO_WB_MODE
	encoder	NIGHT_WB_GAIN=...	VIDEO_WB_GAIN
	encoder	NIGHT_EXPOSURE_MODE=...	VIDEO_EXPOSURE_MODE
	encoder	NIGHT_EXPOSURE_MODE=...	VIDEO_EXPOSURE_GAIN
	encoder	NIGHT_AGC_GAIN=...	VIDEO_AGC_GAIN
	encoder	NIGHT_SHUTTER_MODE=...	VIDEO_SHUTTER_MODE
	encoder	NIGHT_SHUTTER_SPEED=...	VIDEO_SHUTTER_SPEED
	encoder	NIGHT_MAX_SHUTTER=...	MAX_AUTO_SHUTTER
	encoder	NIGHT_IRIS=...	VIDEO_IRIS
	encoder	NIGHT_IRIS_MODE=...	VIDEO_IRIS_MODE
	encoder	NIGHT_DC_LEVEL=...	VIDEO_DC_LEVEL
encoder	NIGHT_SHARPNESS=...	VIDEO_SHARPNESS	
encoder	NIGHT_BRIGHTNESS=...	VIDEO_BRIGHTNESS	
encoder	NIGHT_CONTRAST=...	VIDEO_CONTRAST	
encoder	NIGHT_SATURATION=...	VIDEO_SATURATION	

Day and Night Control			
Objective	Receiver cgi program	Command with example parameters	Allowed parameters
Day & Night Mode	encoder	VIDEO_DAYNIGHT_MODE= <i>AUTO</i>	AUTO, DAY, NIGHT
Day to Night switch threshold	encoder	NIGHT_GAIN_THD= <i>90</i> <i>(only works in AUTO mode)</i>	0~100
Night to Day switch threshold	encoder	DAY_GAIN_THD= <i>75</i> <i>(only works in AUTO mode)</i>	0~100
IR LED control	encoder	VIDEO_DN_IRLED= <i>1</i>	1 (IR LED follows D/N switches) 0 (IR LED will not be controlled upon D/N switches)
Timer to avoid false day & night switches	encoder	VIDEO_DN_TIMER= <i>10, 10</i>	1. Night-to-day timer (0~255s) 2. Day-to-night timer (0~255s)
Set the day & night detection source	encoder	VIDEO_DN_TYPE= <i>CDS</i>	CDS, DSP

PTZ and Focus			
Objective	Receiver cgi program	Command with example parameters	Allowed parameters
Continuous Zoom	encoder	ZOOM= <i>DIRECT,300</i> or ZOOM= <i>TELE,6</i> or ZOOM= <i>STOPS</i> <i>(KCM-5211 zoom range is 30-2520)</i> <i>(Check range by ZOOM_CAP_GET)</i> <i>(Current pos by ZOOM_POSITION)</i>	Exact positioning: DIRECT,n (n is a decimal for zoom position) Zooming in: TELE,n (n is the zoom speed between 2~7) Zooming out: WIDE,n (n is the zoom speed between 2~7) Stop zooming: STOP
Stepped Zoom	encoder	STEPPED_ZOOM= <i>TELE, 100</i>	1. TELE, WIDE (direction) 2. 1~255 (step size)
Stepped Focus	encoder	STEPPED_FOCUS= <i>NEAR, 10</i>	1. NEAR, FAR (direction) 2. 1~255 (step size)
Focus	encoder	FOCUS= <i>DIRECT,800</i> <i>(focus has to be in MANUAL mode for this command)</i> <i>(KCM-5211 focus range is 1029~221)</i> <i>(Check range by FOCUS_CAP_GET)</i> <i>(Current pos by FOCUS_POSITION)</i>	STOP (stop focus action) FAR (shift focus to far) NEAR (shift focus to near) AUTO (adjust focus all the time) MANUAL (manual focus mode) ZOOM_AF (refocus when zoom) REFOCUS (refocus w/o zoom), DIRECT,n (exact focus location; n is a decimal for focus position)
Pan and Tilt Move	encoder	MOVE= <i>UPLEFT,5,5</i>	UP,n (n is tilt speed 1~5) DOWN,n LEFT,m (m is pan speed 1~5) RIGHT,m UPLEFT,m,n UPRIGHT,m,n DOWNLEFT,m,n DOWNRIGHT,m,n STOP HOME

PTZ and Focus			
Pan and Tilt Go to Specific Location	encoder	POSITION=ABSOLUTE,100,100,5,5 <i>(Current pos by XYZ_POSITION_GET as decimal, or POSITION_GET as hexadecimal)</i>	<ol style="list-style-type: none"> 1. ABSOLUTE, RELATE 2. -32767~32767 (ACM,KCM) or 0~32767 (TCM) (pan position) 3. -32767~32767 (ACM,KCM) or 0~32767 (TCM) (tilt position) 4. 1~5 (pan speed) 5. 1~5 (tilt speed)
PTZ Home Position	encoder	HOME_POS=1	<ol style="list-style-type: none"> 1 (set current position as home) 0 (clear the home position)
Set PTZ Preset Point	encoder	PTZ_PRESET_SET=1,1,100,100,100,3 5,5,7,10,Door1 <i>(Check existing PTZ preset points by PTZ_PRESET_GET)</i>	<ol style="list-style-type: none"> 1. 1~32 (ACM), 1~64 (others) (ID of preset point) 2. 1 (create), 0 (delete) 3. Decimal pan position 4. Decimal tilt position 5. 0~65535 (zoom position) 6. 5 (fixed max pan speed) 7. 5 (fixed max tilt speed) 8. 7 (fixed max zoom speed) 9. 10 (fixed dwell time, unused by system) 10. Name of preset point (maximum length 31)
Go to PTZ Preset Point	encoder	PTZ_PRESET_GO=1	1~32 (ACM), 1~64 (others) (ID of preset point)
Set Zoom Preset Point	encoder	ZOOM_PRESET_SET=1,1,1,30,306 <i>(Check existing Zoom preset points by ZOOM_PRESET_GET)</i> <i>(For cameras with zoom lens)</i>	<ol style="list-style-type: none"> 1. 1~64 (ID of preset point) 2. 1 (enabled), 0 (disabled) 3. 1 (use current zoom and focus as preset position), 0 (use the focus and zoom position defined by following 2 parameters) 4. 0~65535 (absolute position of zoom) 5. 0~65535 (absolute position of focus)
Go to Zoom Preset Point	encoder	ZOOM_PRESET_GO=1 <i>(For cameras with zoom lens)</i>	1~64 (ID of zoom preset point)
Set Scanning Tour (Auto-pan)	encoder	PTZ_TOUR_SCAN=1,0,-32767,32767	<ol style="list-style-type: none"> 1. 1~5 (pan speed) 2. 1 (counter-clockwise), 0 (clockwise). Non-endless pan cameras ignore this. 3. -32767~32767 (left limit. If value is bigger than camera limit, maximum camera left pan is used) 4. -32767~32767 (right limit. If value is bigger than camera limit, maximum camera right pan is used)

PTZ and Focus			
Add PTZ Preset Point into Tour	encoder	PTZ_TOUR_SET=2,30,1,1,10,30,5,5,7	<ol style="list-style-type: none"> 1~10 (ID of tour) 1~32 (ACM), 1~64 (others) (ID of preset point slot within tour), 0 (delete all the preset points from given tour) 1 (enable tour), 0 (delete tour) 1~32 (ACM), 1~64 (others) (ID of preset point defined by PTZ_PRESET_SET) 1~128 (dwell time, sec) Sequence ID. Not used. Keep it same as 2nd parameter. 1~5 (pan speed) 1~5 (tilt speed) 2~7 (zoom speed)
Set name of the PTZ Tour	encoder	PTZ_TOUR_NAME=1,daytour	<ol style="list-style-type: none"> 1~10 (tour ID) Tour name
Start or Stop the Tour	encoder	PTZ_TOUR_STATE=TOUR1	DISABLE, TOUR1, TOUR2, TOUR3, TOUR4, TOUR5, TOUR6, TOUR7, TOUR8, TOUR9, TOUR10, SCAN
Auto speed for Pan and Tilt according to Zoom position	encoder	PTZ_AUTO_SPEED=1	1 (enabled), 0 (disabled)

Alarm			
Objective	Receiver cgi program	Command with example parameters	Allowed parameters
Activate Digital Output	encoder	SET_DO=1,1	<ol style="list-style-type: none"> 1 or 2 (DO1 or DO2) 1 (high), 0 (low)

Account Management			
Objective	Receiver cgi program	Command with example parameters	Allowed parameters
Change the root account & password	system	ACCOUNT_ROOT=Admin,123	Type any name and password
Change the user 1 account & password	system	ACCOUNT_USER_1=visitor,123	Type any name and password

HANDS-ON PRACTICE

TASK 1

Normally there are **beige color privacy masks** covering the discreet items in the office, such as the computer screen, etc. When the **panic button is pressed** by the user at the camera site, **all the privacy masks are removed** for capturing the evidence of the intrusion until the panic button is released. How to set it all up?

TASK 2

I want the **motion detection regions** to be in **different locations** for daytime and night time. How to do that?

TASK 3

I have a cube camera with built-in microphone. Although I wish to have video stream from the camera to VMS 24 hours a day, **I don't want the conversations to be listened and recorded during office hours** for privacy reasons. However, **during night time and weekends, the audio-in should be enabled** to capture the sounds of potential intruders. How to do that?

TASK 4

I have an optical zoom camera. When the door is opened across the corridor, the **digital input** of the camera will get the alarm signal and the camera **zooms in** to the door area in order to capture clear details of the intruder. How do set it up?

TASK 5

I have a PTZ camera. During **office hours**, I want the camera to **run the tour between three important locations**. The rest of the time, the camera should be pointed at location 1 only.

Camera Sending URL Commands to another Camera

The beauty of Event Handler and URL commands is the possibility of managing not only the camera that is the source of the event, but in fact any ACTi camera within the network. When there is an intrusion in the camera site, we might want all the neighboring cameras within the site have certain response – either letting them have more advanced streaming settings for better video quality, or requesting nearby PTZ cameras to point towards the region of intrusion automatically.

Since **all the URL commands that can be used for communication between two cameras have already been listed in previous chapter**, we will only list one example here for your reference, to get the idea how easy it is to set it up.

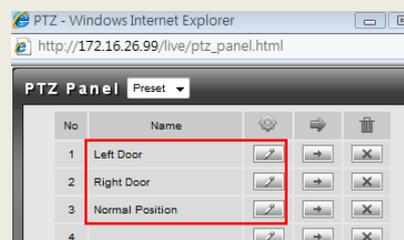
Compared to camera sending URL commands to itself, sending URL commands to other cameras has only 1 slight difference – instead of using camera's own IP as the target, the other camera's IP will be used instead. The rest is exactly the same.

Example 1: Command the PTZ camera to turn towards the region of intrusion (“Left Door”) when the fixed camera of that region has detected motion. When event ends, go back to “Normal Position”.

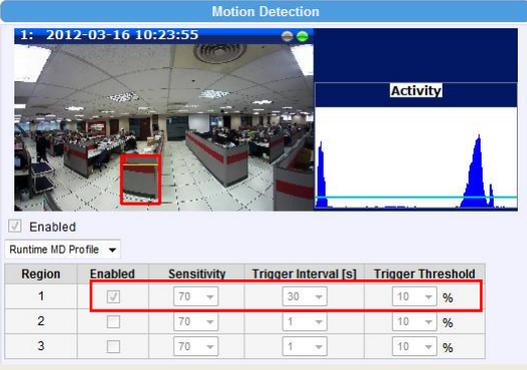
PTZ Camera Settings (to be the receiver of commands later)

The PTZ camera in our example has an IP address 172.16.26.99.

First, create preset points. The camera will be normally staying at “Normal Position” preset point when there is no event.



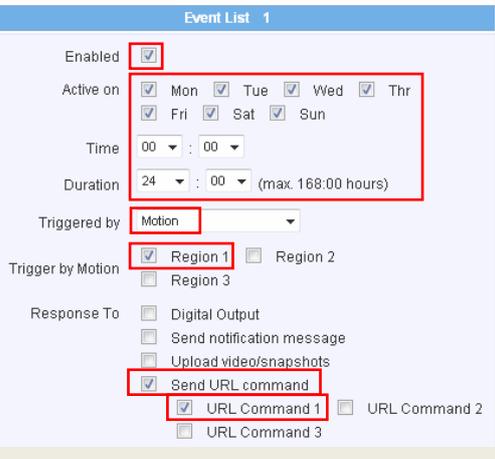
Fixed Camera Settings (to be the one to detect motion and send commands)



Region	Enabled	Sensitivity	Trigger Interval [s]	Trigger Threshold
1	<input checked="" type="checkbox"/>	70	30	10 %
2	<input type="checkbox"/>	70	1	10 %
3	<input type="checkbox"/>	70	1	10 %

Set the IP of PTZ camera as a target IP in Event Handler of the fixed camera.

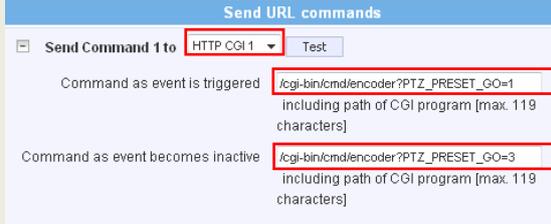




Prepare the following URL commands to control the PTZ preset points of the other camera:

```
/cgi-bin/cmd/encoder?PTZ_PRESET_GO=1
```

```
/cgi-bin/cmd/encoder?PTZ_PRESET_GO=3
```



HANDS-ON PRACTICE

TASK 1

We would like to have all the lights turned on for better exposure of the intruder whenever there is motion detected at night. Technically, it is possible to control the lights system of the area through the digital output of the cameras. For the convenience of installation, we would like to do the wiring of the digital output using the closest camera to the lights system switches. However, that camera is not necessarily the one to detect the intrusions. Therefore, we might have the situations where one camera would detect motion, and then command the other camera that is connected to the lights system by digital output to turn on all the lights in the area. **How to set up the system so that whenever one camera detects the motion, it can activate the digital output of the other camera?**

Interaction between Camera and Website over WAN

Since the IP cameras are pure network devices, just like any other computers online, it is really easy to integrate them with FTP, mail or web servers. The possibility to integrate with web servers gives the whole new range of useful applications.

There are three kinds of interactions between camera and Web server:

1. Camera sends data (event information) to Web server upon camera events. Web server might store the retrieved data.
2. Web server or client requests data (snapshots, system status) from the camera either periodically or by user's request. Web server might store the retrieved data.
3. Web server or client commands the camera to take certain actions or change settings

At the same time, we should keep in mind that the camera itself should not be treated as a multi-user server – in ideal concept there should be only one session between Web server and the camera. It is strongly advised not to get multiple video streams from the camera – it is best to get just 1 video stream from the camera and then manage the video distribution on web server side.

Example 1: Turn on the lights by pressing the button on the Web page. Having the digital output of the camera connected to lights system, it is possible to turn the lights on or off remotely. To do that, we have to prepare two URL commands – one for turning on the lights, and the other one for turning off the lights.

To turn on the lights (set digital output 1 as “high”):

http://172.16.26.127/cgi-bin/encoder?USER=Admin&PWD=123456&SET_DO=1,1

To turn off the lights (set digital output 1 as “low”):

http://172.16.26.127/cgi-bin/encoder?USER=Admin&PWD=123456&SET_DO=1,0

There are many ways to implement these URL commands within the web page either by using pure HTML code only, or more advanced methods, such as Ajax. The example code below is quite simple to have your first lights controller ready.

```
<html>
<head>
<title>Lights Control</title>
<script language="Javascript">
function switcher(st) {
var a="http://172.16.26.127/cgi-bin/encoder?USER=Admin&PWD=123456&SET_DO=1," + st;
window.urltarget.location=a;
}
</script>
</head>
<body>
<button OnClick="switcher(1);">Lights ON</button>
<button OnClick="switcher(0);">Lights OFF</button>
<iframe name="urltarget" width="0" height="0" frameborder="0"></iframe>
</body>
</html>
```

Example 2: Get snapshots from the camera and show directly within the web page. It is possible to define the quality and resolution of the snapshot. When the specific resolution of the snapshot is requested, it has to be one of the supported resolutions of the camera; otherwise the snapshot request will be ignored by the camera.

In this example, we are using 1.3-Megapixel camera which supports following resolutions: 1280x1024, 640x480, 320x240, 160x112. Our aim is to get the snapshot with the VGA resolution (640x480) with the best possible quality (100).

We will prepare the following URL command:

<http://172.16.26.127/cgi-bin/encoder?USER=Admin&PWD=123456&SNAPSHOT=N640x480,100&DUMMY=n>

, where n will be a different number each time, to force browser to get a snapshot from the camera instead of using browser's own cache. The **DUMMY** command is specially designed command for such purposes – the camera will accept it and ignore its parameters.

```
<html>
<head>
<title>Snapshot</title>
<script language="Javascript">
var counter=0;
function snapshot() {
var a="http://172.16.26.127/cgi-bin/encoder?USER=Admin&PWD=123456&SNAPSHOT=N640x480,100&DUMMY=" +
counter;
document.images.img.src=a;
counter++;
}
</script>
</head>
<body>
<button OnClick="snapshot();">Get a Snapshot</button><br/>

</body>
</html>
```

Example 3: Show live video from the camera right within the browser without any ActiveX controls or other plug-ins. Several browsers (Firefox, Chrome, Safari) are able to decode MJPEG video without requiring any plug-ins. Please note that the video has to be clean sequence of JPEG images without any additional information. To achieve that, there are 3 settings to be adjusted:

1. **Set the compression type to MJPEG** (VIDEO_ENCODER=MJPEG)
2. **Disable audio-in** (V2_AUDIO_ENABLED=0)
3. **Disable B2 frames** (ACTi proprietary protocol, RTP_B2=1)

After these 3 steps, it is possible to get video stream from the camera with a single URL command. It is also possible to make further adjustments before starting the video streaming, such as choosing specific resolution (VIDEO_RESOLUTION) or frame rate (VIDEO_FPS_NUM). Make sure that you only use supported resolution and frame rate.

With the implementation of <iframe> tag in the html code, it is possible to see camera responses upon successful changes of settings.

When everything is done, you may use GET_STREAM command to start video streaming.

```
<html>
<head>
  <title>Video Streaming</title>
</head>
<body>
  <button
OnClick="window.urltarget.location='http://172.16.26.127/cgi-bin/system?USER=Admin&PWD=123456&V2_AUDIO_ENABLED=0';">
Disable Audio </button>
  <button OnClick="window.urltarget.location='http://172.16.26.127/cgi-bin/system?USER=Admin&PWD=123456&RTP_B2=1';">
Disable B2 Frames </button>
  <button
OnClick="window.urltarget.location='http://172.16.26.127/cgi-bin/encoder?USER=Admin&PWD=123456&VIDEO_ENCODER=MJPEG';">
Set MJPEG Compression </button>
  <button
OnClick="window.urltarget.location='http://172.16.26.127/cgi-bin/encoder?USER=Admin&PWD=123456&VIDEO_RESOLUTION=N640x480';"> Set VGA Resolution </button>
  <button
OnClick="window.urltarget.location='http://172.16.26.127/cgi-bin/encoder?USER=Admin&PWD=123456&VIDEO_FPS_NUM=2';"> Set 2
fps </button>
  <button
OnClick="window.videotarget.location='http://172.16.26.127/cgi-bin/encoder?USER=Admin&PWD=123456&GET_STREAM';"> START
VIDEO STREAMING </button>
  <br/>
  <iframe name="urltarget" width="300" height="50" frameborder="0"></i>iframe>
  </br/>
  <iframe name="videotarget" width="660" height="500" frameborder="0"></i>iframe>
</body>
</html>
```

Example 4: Camera sends intrusion alarms to web server and web server logs all the events into database and lists the reports to web users whenever they open the web page. This application does not require any specific ACTi URL commands since the receiver of the messages is the web server, not the camera. The developer of the web page can freely decide the format of the message and how it will be handled by the web server.

Let's say that you have a web hosting service (for example with IP 123.123.123.123) that supports php and mysql database. You could then create a php that writes a record into a mysql database each time it is called. In order to be more specific, the query would contain a variable with some text, describing the nature of the event. For example, we have a php file that accepts a variable name "event" within the query string. When camera detects the motion, it would send out following query (the text MD1_triggered is chosen freely):

http://123.123.123.123/event.php?event=MD1_triggered

And when the event ends, the camera would send another query to the web server:

http://123.123.123.123/event.php?event=MD1_end

When the server receives the query, it would write it into the database together with current date and time of the server. There will also be a specific web page that would list the report of all the events, retrieved from the database. It might look something like this:

2425	2012-03-15 10:36:51	MD2_end
2424	2012-03-15 10:36:47	MD1_end
2423	2012-03-15 10:36:46	MD2_triggered
2422	2012-03-15 10:36:42	MD1_triggered
2421	2012-03-15 10:35:47	MD2_end
2420	2012-03-15 10:35:43	MD1_end
2419	2012-03-15 10:35:42	MD2_triggered
2418	2012-03-15 10:35:38	MD1_triggered
2417	2012-03-15 10:35:10	MD1_end
2416	2012-03-15 10:35:08	MD2_end
2415	2012-03-15 10:35:05	MD1_triggered
2414	2012-03-15 10:35:03	MD2_triggered

Having prepared everything on the web server side, it is time to configure the Event Handler of the camera to send out the above listed commands whenever motion is detected.

Motion Detection

1: 2012-03-16 10:23:55



Enabled

Runtime MD Profile ▾

Region	Enabled	Sensitivity	Trigger Interval [s]	Trigger Threshold
1	<input checked="" type="checkbox"/>	70 ▾	30 ▾	10 ▾ %
2	<input type="checkbox"/>	70 ▾	1 ▾	10 ▾ %
3	<input type="checkbox"/>	70 ▾	1 ▾	10 ▾ %

HTTP Server Configuration - 1

Enabled

User Name

User Password

Network Address

Network Port

Max. Connection Time sec. (0~60 sec)

Event List 1

Enabled

Active on Mon Tue Wed Thr
 Fri Sat Sun

Time :

Duration : (max. 168:00 hours)

Triggered by

Trigger by Motion Region 1 Region 2
 Region 3

Response To Digital Output
 Send notification message
 Upload video/snapshots
 Send URL command

URL Command 1 URL Command 2
 URL Command 3

Send URL commands

Send Command 1 to

Command as event is triggered
including path of CGI program [max. 119 characters]

Command as event becomes inactive
including path of CGI program [max. 119 characters]

Send Command 2 to

Send Command 3 to

FREQUENTLY USED URL COMMANDS

Most of the frequently used URL commands have already been introduced in the chapter “**Camera Sending URL Commands to Itself**”. Here we will only list the URL commands that are specifically used for web integration.

Video and Audio			
Objective	Receiver cgi program	Command with example parameters	Allowed parameters
Get live video or audio stream	encoder	GET_STREAM=VIDEO	Can be without parameters, or: VIDEO, AUDIO
Check the status of digital input	encoder	GET_DI_STATE	-
Request camera to send the notification of DIs, motion, video loss and serial output data to the remote host	encoder	GET_CTRL_MSG	-
Get a snapshot	encoder	SNAPSHOT=N640x480,100	Can be without parameters (in which case it follows camera's MJPEG codec settings), or: 1. One of the supported resolutions preceded by N 2. 1~100 (picture quality)
A dummy command without any action	encoder	DUMMY=123	Any parameter, text or numbers

System			
Enable or disable Power LED	system	POWER_LED=0	1 (enabled), 0 (disabled)
Enable or disable ONVIF compliance	system	ONVIF_STATE=1	1 (enabled), 0 (disabled)
Enable or disable PSIA compliance	system	PSIA_STATE=1	1 (enabled), 0 (disabled)
System information in XML format	system	SYSTEM_INFO_XML	-
Get date and time settings of the camera	system	DATE	-
Get the WAN port runtime status	system	WAN_STATUS	-
Get the WAN port configuration	system	WAN	-
Get the host name	system	LAN	-
A dummy command without any action	system	DUMMY=123	Any parameter, text or numbers
The full report including system info, WAN status, system log, parameters.	system	SERVER_REPORT	-

Local Storage of the Camera			
Get the recorded files list	system	DISK_FILE_LIST	-
Get the recorded file	system	DISK_GET_FILE= <i>[filename.raw]</i>	Any file name from the file list
Delete the recorded file	system	DISK_REMOVE_FILE= <i>[filename.raw]</i>	Any file name from the file list
Get the status of local storage	system	DISK_INFO	-
Mount or unmount the disk	system	DISK_STATE= <i>MOUNT</i>	MOUNT, UNMOUNT
Format the local storage	system	DISK_FORMAT	-
Check the report of disk format	system	DISK_FORMAT_LOG	-
Remove older files from local storage	system	DISK_REMOVE_OLD_FILES= <i>0</i>	The number represents the amount of oldest files to be deleted. 0 means deleting all files.
Set date and time filter for local storage file search	system	DISK_FILE_SEARCH_TIME= <i>1,2011,09,23,13,40,30,60</i>	<ol style="list-style-type: none"> 1. 1 (use time filter), 0 (not use time filter) 2. 4 digits for year 3. 2 digits for month 4. 2 digits for day 5. 2 digits for hours 6. 2 digits for minutes 7. 2 digits for seconds 8. 1-60 (time period in minutes, defines the end time of search range)
Search for event related recordings	system	DISK_FILE_SEARCH_EVENT= <i>D11,D12</i>	NONE, D11, D12, MD1, MD2, MD3, PIR, SCH (scheduled recording), READY (continuous recording)
Scan the disk for possible errors	system	DISK_SCAN	-
Check the report of the disk scan	system	DISK_SCAN_LOG	-
Set overwrite parameters and low disk warning rule	system	DISK_CONFIG= <i>1,5</i>	<ol style="list-style-type: none"> 1. 0 (not allow overwriting), 1 (allow overwriting of oldest files) 2. 1-50 (% of remaining storage at which camera sends warning message)

Convenient Installation & Configuration using URL Commands

When you are installing and configuring just one camera, it is reasonable to use the Web Configurator of the camera to set up everything. However, if you are installing tens of cameras, you might need more efficient methods to save the labor cost of installers.

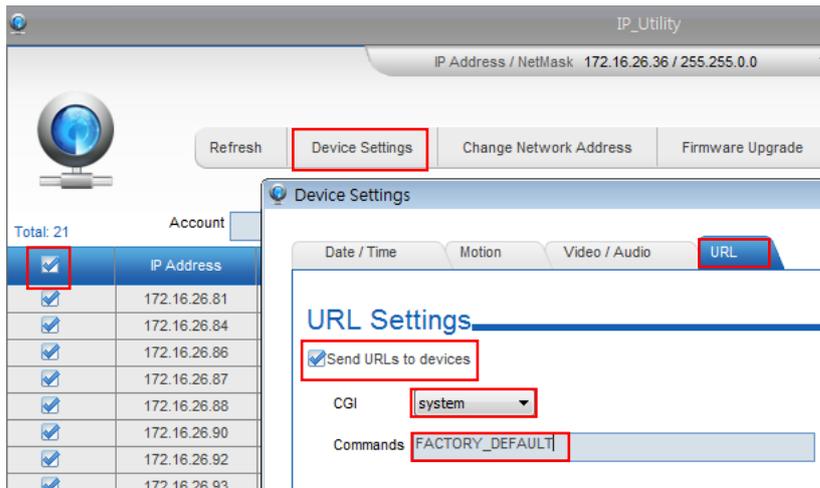
ACTi IP Utility 4 is a powerful tool that provides several convenient functions for one-to-many configurations. It can be downloaded here:

http://www.acti.com/IP_utility

Although several frequently used settings can be directly managed by special buttons of IP Utility 4 (such as full screen motion detection region setup of multiple cameras), there are still several commands that do not have their own buttons in IP Utility. For such cases, it is possible to take a good use of the possibility to enter **URL Commands** into IP Utility so that the utility could then deliver these commands to multiple cameras at the same time.

Example 1: After all the tests, I want to reset all the cameras back to factory default settings. How to do it by using IP Utility 4 and URL commands?

It is very easy to do it. Just select “system” cgi and type the FACTORY_DEFAULT into URL section of IP Utility. After pressing “Apply”, all the checked devices will be reset to factory default at the same time. More than one hour of labor has been saved with this simple operation!



FREQUENTLY USED URL COMMANDS

System Settings			
Reset all settings to factory default	system	FACTORY_DEFAULT	-
Reset settings to factory default except IP settings	system	CONFIG_RESET	-
Save settings and restart the camera	system	SAVE_REBOOT	-
Change the root account & password	system	ACCOUNT_ROOT= <i>Admin,123</i>	Type any name and password
Set the date and time	system	DATE_CONFIG= 1,010100002004,00:00:00,+00 (<i>manual</i>) or DATE_CONFIG= 2,192.168.0.2,86400,+00 (<i>SNTP synchronization</i>)	<ol style="list-style-type: none"> 1 (manual date), 2 (SNTP synchronization) Date as mmdd0000yyyy (if manual), IP of SNTP server (if SNTP) Time as hh:mm:ss (if manual), update interval in seconds (if SNTP) Time zone setting
Set daylight saving configuration	system	DAYLIGHT_SAVING_CONFIG= 0,1,7,1,2:45,7,2,3,5,2:45	a,b1,c1,d1,e1,f1,b2,c2,d2,e2,f2 where a: 1 (enabled), 0 (disabled) b1/b2: 1,2 (input argument type) c1/c2: 1~12 (month) d1/d2: (if b1/b2=1): 1,2,3,4 (order of weeks in a month) d1/d2: (if b1/b2=2): 1~31 (day of month) e1/e2: hh:mm f1/f2: (if b1/b2=1): 1~7 (day of the week, 7=Monday) f1/f2: (if b1/b2=2): (empty)

Network Settings			
UPnP configuration	system	UPNP_CONFIG=1,IPCAM-00001	1. 1 (enabled), 0 (disabled) 2. Friendly name (max 31)
Bonjour configuration	system	BONJOUR_CONFIG=1,IPCAM-00001	1. 1 (enabled), 0 (disabled) 2. Friendly name (max 31)
Set IEEE 802.1X authentication config.	system	8021X=0,2,,	1. 1 (enabled), 0 (disabled) 2. 1 (ver 1.0), 2 (ver 2.0) 3. User name (0-16 symbols) 4. Password (0-16 symbols)
Change HTTP port	system	PORT_HTTP=80	port number
Change HTTPS port	system	PORT_HTTPS=443	port number
Change streaming port	system	PORT_VIDEO=6002	port number
Change control port	system	PORT_CONTROL=6001	port number
Change multicast port	system	PORT_MULTICAST=5000	port number
Set primary DNS	system	DNS_PRIMARY=168.95.1.1	IPv4 address
Set secondary DNS	system	DNS_SECONDARY=168.95.1.1	IPv4 address
Set IP	system	WAN_IP=192.168.0.100	IPv4 address
Set network mask	system	WAN_NETMASK=255.255.255.0	IPv4 mask
Set gateway	system	WAN_GATEWAY=192.168.0.254	IPv4 address

HANDS-ON PRACTICE

TASK 1

Change streaming ports of all the cameras from 6002 to another value.

TASK 2

Set all the cameras to have current date and time.

TASK 3

Change the password of “Admin” account of all the cameras to be other than 123456.