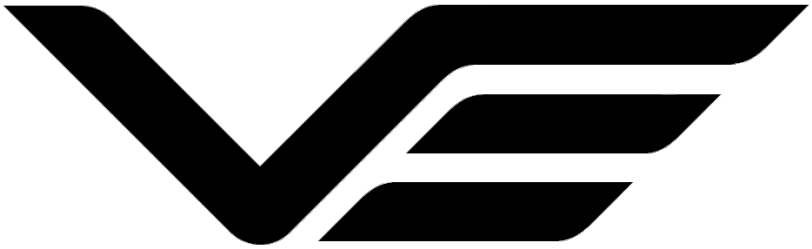
API Camera Control Protocol



Description for the TCP/IP Control of VE IP Cameras

Table of Contents

Change History

Version	Date	Change Summary
v1.00	28/5/2018	Initial Draft From Archive Documents
v1.01	15/11/2018	'jres' Command Added
v1.02	31/10/2019	'leds' Command Added
v1.03	01/04/2020	'erec' Command Added
v1.04	16/09/2020	'leds' edit and Command Links
v1.05	21/09/2020	'leds' Command Edit
v1.06	07/01/2025	'ptto' Command Added

Introduction

The VE range of IP cameras may be controlled via their web interface or by sending commands over a TCP/IP connection.

This document describes the required settings, the format of the messages and lists all the commands that are currently supported.

Additionally, depending on model type PTZ control can be sent either directly to the camera or through the serial transparent comms bridge to connected auxiliary cameras.

Command Message Format

Commands are sent to the IP camera by making a TCP connection using the camera's **IP address** (default: **192.168.1.195**) and using **Port: 9992**

The command structure is described in the following table.

Mnemonic	Description	Length	Value
STX	Start of Message	1 Byte	0x02
RW	Read/Write	1 Byte	'r' or 'w'
CMD	Command	4 Bytes	ASCII Chars
DAT	Data String	Variable	ASCII Chars
DEL	Delimiter	1 Byte	';'
CS	Checksum | 0x80	1 Byte	0x80 to 0xFF
ETX	End of Message	1 Byte	0x03

Checksum is the sum of all bytes from the byte following STX up to and including DEL. The lower 8 bits of the checksum is taken and bitwise ORed with 0x80 to avoid STX and ETX.

Response Message Format

For each command there will be a response from the IP camera. For a read command, the response will contain the data requested.

The response message structure is described in the following table.

Mnemonic	Description	Length	Value
STX	Start of Message	1 Byte	0x02
STAT	Status	1 Byte	'A' or 'E'
CMD	Command	4 Bytes	ASCII Chars
DAT	Data String	Variable	ASCII Chars
DEL	Delimiter	1 Byte	';'
CS	Checksum | 0x80	1 Byte	0x80 to 0xFF
ETX	End of Message	1 Byte	0x03

Checksum is the sum of all bytes from the byte following STX up to and including DEL. The lower 8 bits of the checksum is taken and bitwise ORed with 0x80 to avoid STX and ETX.

A Status of:

- 'A' will be returned to acknowledge the command if the command is recognised, correctly formatted and has a correct checksum.
- 'E' will be returned if the command is unrecognised or badly formatted but is bound by STX and ETX.
- If the command is not bound by STX and ETX then there will be no response.

The CMD field in the response matches the sent CMD field.

The DAT field contains the written data.

Command List

The following table describes the commands that are currently supported.

Command	Description	Length	Type	Read/Write	Response Length	Response Type
ipad	IP Address	Variable	String	R/W	Variable	String
sbmk	Subnet Mask	Variable	String	R/W	Variable	String
gtwy	Gateway Address	Variable	String	R/W	Variable	String
dhcp	DHCP Enable	1 Byte	Integer	R/W	1 Byte	Integer
vbit	H.264 Video Bitrate	1 or 2 Bytes	Integer	R/W	1 Byte	Integer
vres	H.264 Video Resolution	1 Byte	Integer	R/W	1 Byte	Integer
jres	MJPEG Video Resolution	1 Byte	Integer	R/W	1 Byte	Integer
vfrm	H.264 Video Framerate	1 Byte	Integer	R/W	1 Byte	Integer
vflp	Video Flip	1 Byte	Integer	R/W	1 Byte	Integer
vrev	Video Reverse	1 Byte	Integer	R/W	1 Byte	Integer
tdur	Alarm Duration	1 Byte	Integer	R/W	1 Byte	Integer
leds	LED Control	1 Byte	Integer	R/W	1 Byte	Integer
erec	Recording Enable	1Byte	Integer	R/W	1 Byte	Integer
ptto	PTZ Timeout	3 to 5 Bytes	String	R/W	1 Byte	Integer
stat	Status	0 Byte	None	R	12 Bytes	String

IP Address

Command ipad
DAT consists of the decimal IP address. eg 192.168.1.195

Subnet Mask

Command sbmk
DAT consists of the subnet mask. eg 255.255.255.0

Gateway Address

Command gtwy
DAT consists of the decimal gateway address. eg 192.168.1.1

DHCP Enable

Command dhcp
DAT 0 = DHCP Disabled 1 = DHCP Enabled

Video Bitrate

Command vbit		
DAT Byte 1	DAT Byte 2	Bitrate
0	n.a	10Mbit/s
1	n.a	9Mbit/s
2	n.a	8Mbit/s
3	n.a	7Mbit/s
4	n.a	6Mbit/s
5	n.a	5Mbit/s
6	n.a	4Mbit/s
7	n.a	3Mbit/s
8	n.a	2Mbit/s
9	n.a	1.5Mbit/s
1	0	1Mbit/s
1	1	512Kbit/s
1	2	256Kbit/s
1	3	128Kbit/s

Video Resolution

Command vres & jres	
DAT	Bitrate
0	1920x1080
1	1280x720
2	800x600
3	640x480
4	320x240

Video Framerate

Command vfrm	
DAT	Bitrate
0	30fps
1	15fps
2	10fps
3	6fps
4	5fps
5	3fps
6	2fps
7	1fps

Video Flip

Command vflp
DAT 0 = Normal 1 = Flip 2 = Toggle current state

Video Reverse

Command vrev
DAT 0 = Normal 1 = Reverse 2 = Toggle current state

Alarm Duration

Command tdur
DAT = Alarm duration in seconds

LED Control

Command leds
DAT 0 = LEDs Off 1 = Auto IR or IR On * 2 = Auto White or White On *

* Direct On or Auto LED switching is dependant on the camera hardware configuration.

Recording Enable

Command erec
DAT 0 = Disable Recording 1 = Enable Recording

PTZ Timeout

The PTZ Timeout is started when a PTZ enabled camera receives a movement command. If the camera does not receive a stop command before the PTZ Timeout has expired it will then automatically stop any camera movement.

Command ptto					
DAT consists of the PTZ Timeout in mSecs *					
Example Values					
DAT Byte 1	DAT Byte 2	DAT Byte 3	DAT Byte 4	DAT Byte 5	Timeout Value
2	5	0	n.a	n.a	250 mSecs
3	8	0	0	n.a	3.8 Secs
1	2	0	0	0	12 Secs

* Allowed values range from 100 mSecs to 30 Secs

Status

There is no data in the command but the DAT in the response has the following fields.

Command stat	
Byte	**Value**
0	Trigger 1
1	Trigger 2
2	Motion Trigger
3	Light Trigger
4-6	Battery Percent *
7-10	Battery Minutes Remaining *
11	Recording

* Only on battery powered units featuring a gas gauge.

Example - Video Flip

Command

Byte	Mnemonic	Hex	ASCII
0	STX	0x02	
1	R/W	0x77	w
2	CMD	0x76	v
3	CMD	0x66	f
4	CMD	0x6C	l
5	CMD	0x70	p
6	DAT	0x31	1
7	DEL	0x3B	;
8	CS	0x9B	
9	ETX	0x03	

Response

Byte	Mnemonic	Hex	ASCII
0	STX	0x02	
1	STAT	0x41	A
2	CMD	0x76	v
3	CMD	0x66	f
4	CMD	0x6C	l
5	CMD	0x70	p
6	DAT	0x31	1
7	DEL	0x3B	;
8	CS	0xE5	
9	ETX	0x03	

Example - Read Status

Command

Byte	Mnemonic	Hex	ASCII
0	STX	0x02	
1	R/W	0x72	r
2	CMD	0x73	s
3	CMD	0x74	t
4	CMD	0x61	a
5	CMD	0x74	t
6	DEL	0x3B	;
7	CS	0xE9	;
8	ETX	0x03	

Response

Byte	Mnemonic	Hex	ASCII
0	STX	0x02	
1	R/W	0x41	A
2	CMD	0x73	s
3	CMD	0x74	t
4	CMD	0x61	a
5	CMD	0x74	t
6	DAT	0x30	0
7	DAT	0x30	0
8	DAT	0x30	0
9	DAT	0x30	0
10	DAT	0x31	1
11	DAT	0x30	0
12	DAT	0x30	0
13	DAT	0x39	9
14	DAT	0x39	9
15	DAT	0x39	9
16	DAT	0x39	9
17	DAT	0x30	0
18	DEL	0x3B	;
19	CS	0x9D	
20	ETX	0x03	

PTZ Control

For cameras with the appropriate hardware, PTZ control can be achieved by making a TCP/IP connection to the camera on the PTZ port number.

By default the camera's **IP address is 192.168.1.195** and the **PTZ port number is 9991**

Depending on model type the sent packets will either communicate directly with the camera's hardware or will pass through the transparent serial comms bridge to auxiliary connected cameras.

The table below describes what protocol to adopt for the supported range of VE products.

Model	Protocol
SWZ HD camera	VISCA
MFR camera	As set in the MFR camera
PAL/NTSC Encoder (Through comms)	To suit the connected camera