

CameraPro NET Edition for Nokia Symbian

Manual
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Introduction

CameraPro NET Edition supports remote control of camera features over WiFi and Bluetooth turning your smartphone into a powerful camera controlled from web browsers, microelectronic boards (such as Arduino), and other Bluetooth and WiFi enabled devices.

Example use cases are:

- Entry control systems triggered by external sensors, like movement, temperature, or light sensors attached to an Arduino board.
- Trigger multiple CameraPro instances on different smartphones at almost the same time.
- Trigger image capture from a remote distance (for instance a group photo where the smartphone is 10 meters away).
- ...

Bluetooth Mode

The following steps are necessary to control CameraPro over Bluetooth:

1. Each Bluetooth device has to be paired with the smartphone in the smartphone Bluetooth settings. This is only required once for each Bluetooth device.
On Symbian this setting can be found in “Settings” – “Connections” – “Bluetooth”.
2. In the CameraPro Settings turn on “Bluetooth” and select the device from which commands will be received.

WiFi Mode

The following steps are necessary to control CameraPro over WiFi:

1. Connect the smartphone to a WiFi network. If the smartphone can act as a WiFi access point then this works as well.
2. Enable “WiFi” mode in the CameraPro Settings. Optionally the port number can be changed.
3. Note down the IP address displayed in the CameraPro Settings. This address is used to send commands.

Sending Commands

CameraPro can be controlled by sending integer style command/value pairs over Bluetooth or WiFi. The following table shows the supported commands. The corresponding values are described later in this document.

Command name	Command integer value
CAMERAPRO_COMMAND_OK	20
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Bluetooth Mode

In Bluetooth mode each command sent to CameraPro consists of 7 bytes:

Byte	Value	Description
0	0x06	Header
1	0x85	Header
2	0-255	Payload size
3	0-255	Command
4+5	-32767 to 32767	Value of type int16
6	0-255	CRC value by XOR over the payload bytes 3-5.

CameraPro can send back status messages with the following format:

Byte	Value	Description
0	0x06	Header
1	0x85	Header
2	0-255	Payload size
3	0-255	Status / command
4	0-255	CRC value by XOR over the payload byte 3.

WiFi Mode

CameraPro is controlled by sending GET requests to the smartphone IP address:

http://<IP>:30000?k=command_value&v=value

“command_value” is an integer from the commands table and “value” is an integer representing a parameter.

For instance the following command triggers the image capturing button:

http://<IP>:30000?k=23&v=0

Hint: Some smartphones disconnect the WiFi connection after some idle time. To prevent this, regular “CAMERAPRO_COMMAND_OK” commands with an arbitrary value can be send to CameraPro.

Parameters

This Section describes supported command/value pairs.

Camera Control

Command: CAMERAPRO_CAMERA_CONTROL

Possible values (device dependent):

Value	Description
0	Trigger capture button
1	Focus
2	Pause (video)

Camera Mode

Command: CAMERAPRO_CAMERA_MODE

Possible values (device dependent):

Value	Description
51	Still images
52	Video
53	Time-lapse
54	Self-timer
55	Bracketing
56	Anti-shake
57	Burst

Captured preview image (WiFi only)

Command: CAMERAPRO_GET_CAPTURED_IMAGE

This command requests the captured image (only in WiFi mode) in jpeg format. If no preview image is available then an empty message is returned.

Effect Mode

Command: CAMERAPRO_EFFECT_MODE

Possible values (device dependent):

Value	Description
0	None

1	Negative
2	Monochrome
8	Sepia
64	Vivid
512	Natural

Exposure Compensation

Command: CAMERAPRO_EXPOSURE_COMPENSATION

Possible values (device dependent):

Value	Description
0 to x	The index of the exposure compensation value starting with 0. For instance on the Nokia 808 the index "12" equals the exposure compensation of "0" and the index "0" equals the exposure compensation of "-4".

Exposure Mode

Command: CAMERAPRO_EXPOSURE_MODE

Possible values (device dependent):

Value	Description
0	Auto
1	Night
2	Backlight
4	Center
8	Sports
16	Very long

Flash Mode

Command: CAMERAPRO_FLASH_MODE

Possible values (device dependent):

Value	Description
0	Off
1	Auto
2	On
8	Red eye reduction
128	Video light / torch mode

Focus Mode

Command: CAMERAPRO_FOCUS_MODE

Possible values (device dependent):

Value	Description
0	Fixed
1	Auto
2	Macro
3	Continuous
4	Continuous Macro
5	Infinity
6	Hyperfocal

Change focus rectangle position

Command: CAMERAPRO_FOCUS_POSITION_X

Command: CAMERAPRO_FOCUS_POSITION_Y

The focus rectangle position can be changed by sending two separate x/y commands where x and y hold the center position coordinates of the target focus rectangle position.

After setting the position, re-focusing has to be manually triggered using the Camera Control command.

Image Controls: Brightness, Contrast, Saturation, Sharpness

Command: CAMERAPRO_IMAGECONTROLS_BRIGHTNESS

Command: CAMERAPRO_IMAGECONTROLS_CONTRAST

Command: CAMERAPRO_IMAGECONTROLS_SATURATION

Command: CAMERAPRO_IMAGECONTROLS_SHARPNESS

Possible values (device dependent):

Value	Description
-x to x	The adjustment index "x" of the image control setting. For most devices the valid range is between -100 and 100.

ISO Value

Command: CAMERAPRO_ISO_VALUE

Possible values (device dependent):

Value	Description
-10000	Auto
x	The ISO value "x". For instance "x=50" sets the ISO to 50. Supported values (device dependent) are: 50, 100, 200, 400, 800, 1600.

ND Filter Mode

Command: CAMERAPRO_NDFILTER_MODE

Possible values (device dependent):

Value	Description
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0	None
1	Auto
2	Off
32	On

Resolution

Command: CAMERAPRO_RESOLUTION

Possible values (device dependent):

Value	Description
0-x	The index of the resolution, starting with 0 and ending with x = number of resolutions – 1. Changing resolution works only for still image modes and not for video recording.

Switch between front and back camera

Command: CAMERAPRO_SWITCH_CAMERA

Possible values (device dependent):

Value	Description
0	Back camera
1	Front camera

White balance Mode

Command: CAMERAPRO_WHITEBALANCE_MODE

Possible values (device dependent):

Value	Description
0	Auto
1	Sunlight
2	Cloudy
4	Tungsten
8	Fluorescent

Zoom Control

Command: CAMERAPRO_ZOOM

Possible values (device dependent):

Value	Description
0-x	The zoom index starting with 0.