

# INTOVA

*Born in Hawaii – Built for the World*

## ***EDGE X***

***Waterproof HD Video Sports Camera***



## User's Manual

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# PREFACE

Thank you for purchasing the Intova EDGE X waterproof sports camera! The rugged, durable and waterproof EDGE X will help you capture high quality video and photos in many different venues and environments. Visit [www.intova.net](http://www.intova.net) to view the wide range of mount and system options available. Enjoy!!

## Main features:

- Video Resolution:  
1080p@60fps, 1080p@48fps, 1080p@30fps, 1080p@24fps  
1200p@60fps, 1200p@48fps, 1200p@30fps, 1200p@24fps  
960p@60fps, 960p@48fps, 960p@30fps, 960p@24fps,  
720p@120fps, 720p@60fps, 720p@48fps, 720p@30fps, 720p@24fps,  
(VGA) 848x480p@240fps, 848x480p@120fps, 848x480p@60fps, 848x480p@48fps,  
848x480p@30fps, 848x480p@24fps  
VGAp@240fps, VGAp@120fps, VGA Full (60fps), VGAp@48fps, VGA (30 fps), VGAp@24fps
- Photo Resolution:  
12MP, 10MP, 8MP and 5MP
- Rubber armored housing
- Waterproof to 200 feet / 60M
- Flat optical-glass lens port with water-repellant & anti-reflection coating
- Super-wide-angle lens at 160 degrees
- Digital Zoom: 60x, 16x, 10x and 4x
- Uses same filters and lenses as CONNEX and NOVA HD
- WiFi: remote operation and viewfinder, wireless file transfer on smartphone with WiFi app
- WiFi remote controller (optional accessory)
- 1.5" / 3.8cm TFT-LCD 480x240
- Rechargeable/Removable Li-ion battery 1150mAh
- Battery life: 1.5 hrs (LCD on), 1.5 hrs (WiFi on), 2 hrs (LCD off)
- Slave strobe function
- Removable LCD glare hood
- Diving Mode
- Motion Detection Mode
- Time Lapse mode
- Self-capture mode
- Burst Mode: 3, 5, 10, 20 and 30 photos
- Video Rotation Mode (rotate video 180° when camera is mounted upside down)
- Manual White Balance
- Picture in Video
- Dual stream mode
- LED indicator- Visual Record Alert front and back
- Audible record alert
- Float Strap
- High Definition TV output
- Video format: H.264 / Photo format: JPEG
- Supports Micro SD Card up to 64GB (class 10 required for HD video recording)

## Important notice:

- Do not attempt to take apart the camera as there are high voltage parts and dangerous electric shock can occur.
- If the camera is dropped or smashed and internal parts are exposed, do not touch as there is a danger of electric shock.
- Do not leave the camera in direct sunlight or near heat sources as these can damage the camera.
- If camera becomes hot during use, turn off the power immediately.
- For storage, remove the memory card and keep camera in a cool, dry place with housing door slightly open.
- Before each use, clean and maintain O-ring by removing any dirt, sand and other debris and lightly lubricating with silicone grease to prevent drying and cracking.
- Use float strap as extra precaution for water use.

## System requirements for 1080P 30fps HD video (minimum)

PC	Mac
Windows® 7, 8	Mac OS X 10.6.3 or later
Intel® Core 2 Duo™ or faster	Intel® Core 2 Duo™ or faster
DirectX 10.0 or later	
Minimum 2GB of system RAM Recommended: 4GB	Minimum 2GB of system RAM Recommended: 4GB
Video card with minimum 256MB of RAM	Video card with minimum 256MB of RAM
Recommended screen resolution 1920x1080 (minimum 1024x768)	Recommended screen resolution 1920x1080 (minimum 1024x768)

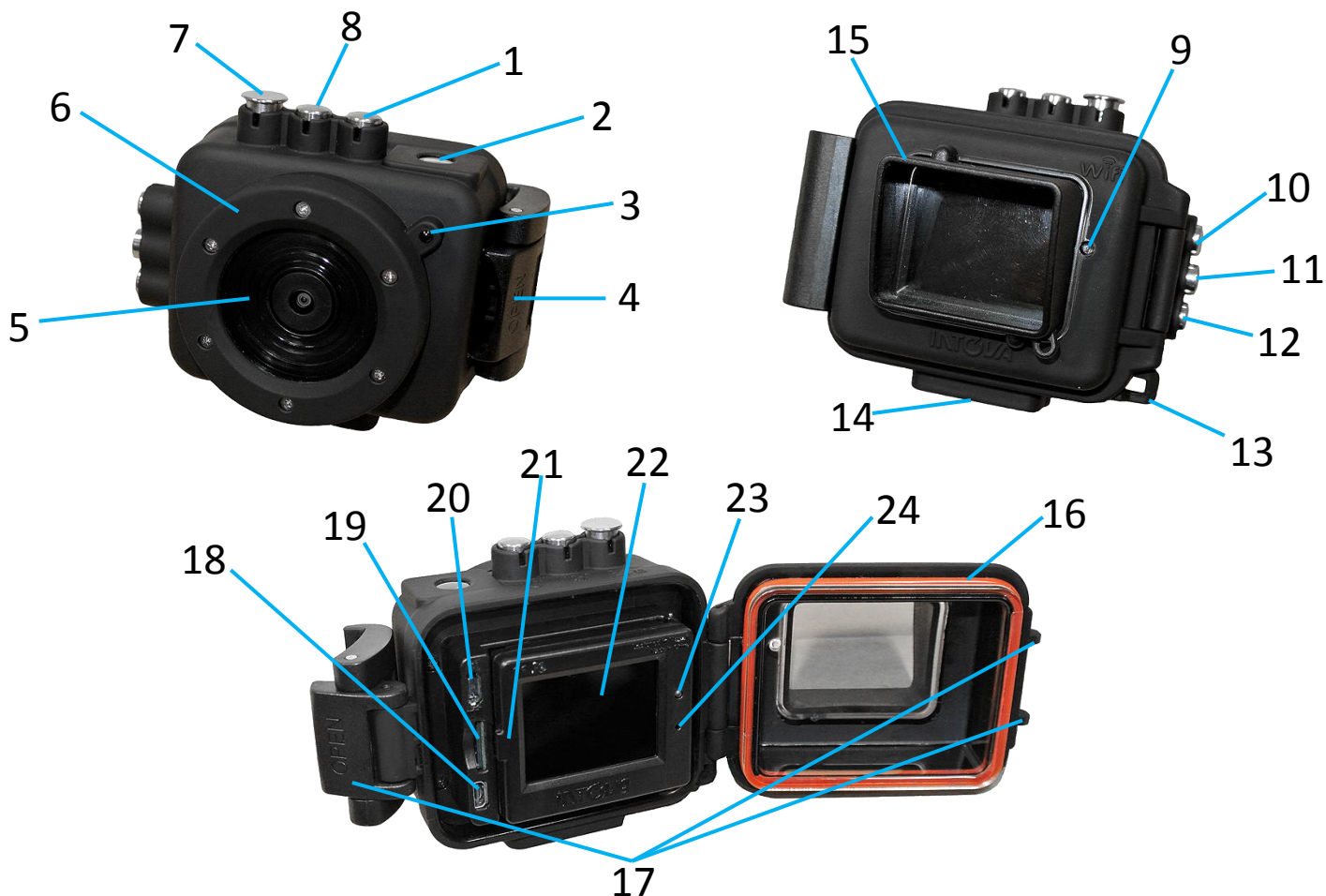
### IMPORTANT NOTE REGARDING CHOPPY OR BROKEN UP PLAYBACK:

HD video files contain very large amounts of data. When recording 1080p video, it is important to use memory cards that are rated at class 10. 1080p 60fps is too much data for many computers to process. Most common computers cannot process more than 30fps. We recommend using 30fps for most users and applications. If 60fps is required, make sure your computer has AT LEAST 3.0-3.7 GHz third generation Core based processors or equivalent, 4GB RAM and a graphics card that compares to an NVIDIA GeForce GT650M or better.

### Included Accessories:

User's manual mini CD, lithium ion battery, USB cable, float strap, lens cap, anti-glare hood, silicone grease, Quick Start Guide, Optional Accessory brochure.

# GETTING TO KNOW YOUR CAMERA



ITEM	FUNCTION	ITEM	FUNCTION
1	POWER ON/OFF, MODE, MENU SCROLLING button	13	Float strap attachment point
2	Slave strobe sync light	14	Tripod mount
3	Video recording in progress light	15	Removable anti-glare LCD hood
4	Lock latch	16	O-ring
5	Water repellent glass lens port	17	Thumb press backdoor opening system in case of vacuum; see page 5.
6	Lens port ring	18	High Definition TV output port
7	SHUTTER button	19	Micro SD card port
8	MENU, WiFi ON/OFF, DELETE button	20	USB port
9	Port for rear video recording in progress light	21	Li-ion battery cover; lift to open
10	UP, ZOOM IN button	22	LCD screen
11	OK, Picture in video( take photos while video recording) button	23	Rear video recording in progress indicator light
12	DOWN, ZOOM OUT, LCD ON/OFF button	24	Microphone

## GETTING STARTED

### Opening the housing:

Follow the steps below to open the housing. Sometimes a vacuum seal may occur, use thumb press system to open.

STEP 1



STEP 2



STEP 3



STEP 4



**IMPORTANT: Before each use, clean and maintain O-ring by removing any dirt, sand and other debris and lightly lubricating with silicone grease to prevent drying and cracking.**

### Inserting the Micro SD card:

Make sure that camera is turned OFF when inserting or removing Micro SD card. Locate Micro SD card port on your camera (refer to page 4). Insert card with gold contacts facing towards LCD screen. Push down until card clicks into place. To remove, press down on inserted card to click and then release. EDGE X uses Micro SD card up to 64 GB. For HD video, speed class 10 is required.



1. **The camera cannot record video or take photos without a properly inserted memory card.**
2. Format the Micro SD card before use.
3. If the card does not work with the camera, please try another card.
4. When recording video in 1080p, or using WiFi, card speed class 10 is required.

## Rechargeable / removable Li-ion Polymer battery:

1) The included lithium-ion battery comes partially charged.

2) To fully charge, connect the included USB cable to the camera and a power source such as a computer or Intova Universal USB charger/AC adapter. Please note: no damage will occur to the camera or battery if used prior to a full charge. **Important: DO NOT allow Li-ion battery to become fully discharged.** If not using camera for a prolonged period, recharge every 3 months to prevent battery from becoming fully discharged.

3) If camera stops responding to button controls, reset camera by removing and reinserting battery. To remove, lift LCD screen, pull battery tag and lift out carefully.

## USB charging and transferring:

Connect your computer to EDGE X with USB cable. After connection, camera will turn on, use UP / DOWN buttons to select MSDC / CHARGE / OPEN.



**MSDC:** Enter to download video or image files. When this choice is selected, the screen shown below will appear and EDGE X will be detected by computer and files can be transferred by dragging and dropping.



**CHARGE:** Recharge the Li-ion battery power. Full charging time is around 6 hours. When this choice is selected, LCD will turn off.

**OPEN:** Recharge the battery power and operate the camera at the same time. When this choice is selected, LCD will show live view.

If none of the above choices is selected, the camera will automatically go to MSDC mode after 20 seconds and the USB CONNECTED screen will appear.

Status Indicator Lights when camera is charging will show:

- Status Indicator Lights are ON when charging.
- Status Indicator Lights are OFF when charging is complete.

# USING EDGE X

Insert Micro SD memory card (class 10 required for HD video) before turning on. **EDGE X cannot be used if a properly inserted Micro SD card is not present.**

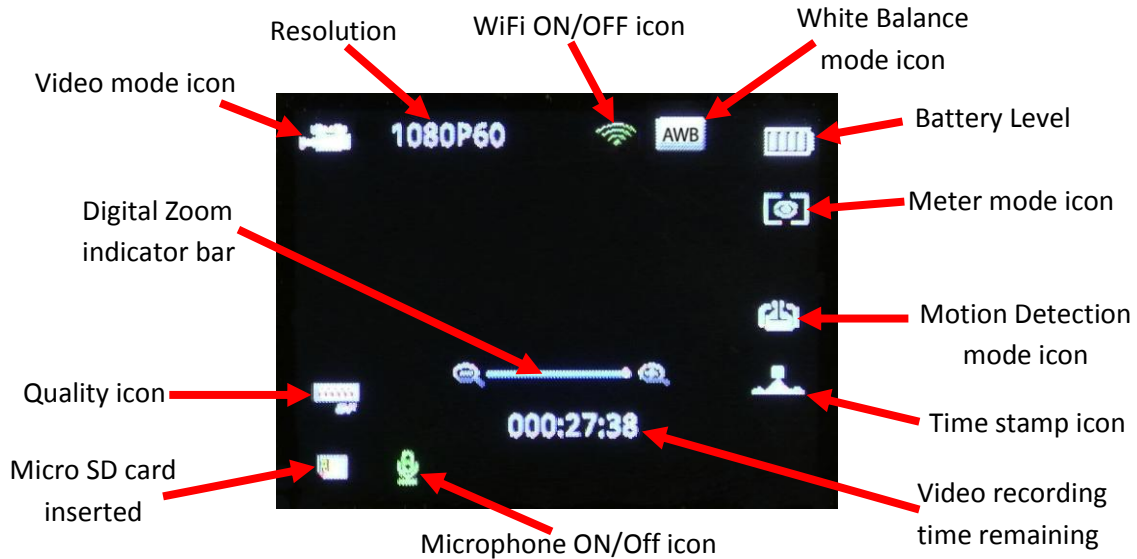
To turn camera on, press and hold power ON/OFF button for 2 seconds and then release (if camera is in sleep mode, short press once to waken)

Camera Default Settings: The EDGE X camera powers up with the following default settings:

- Video Resolution 1080p@60fps
- Photo Resolution 12 MP (megapixels)
- Wi-Fi OFF

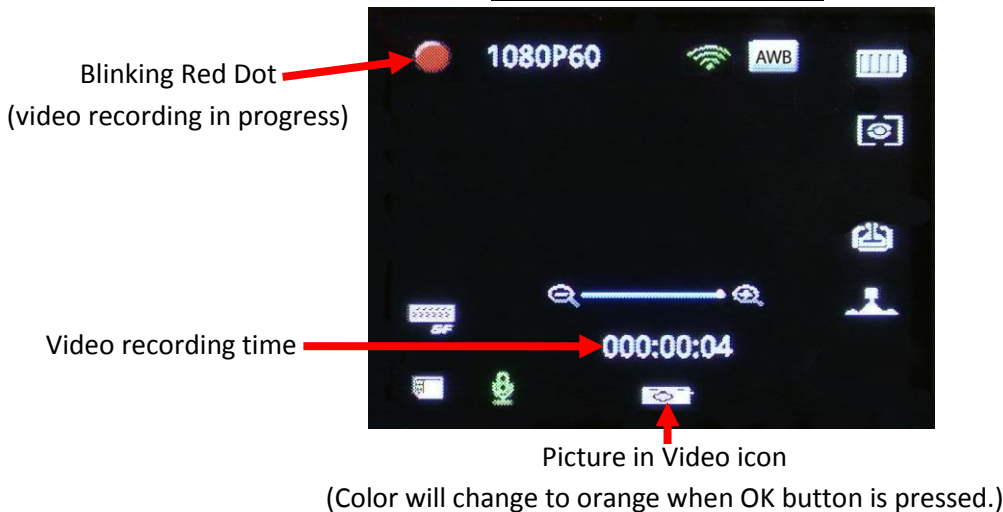
## Video Mode LCD Monitor Display

### Video mode idle screen



To start video recording, press the shutter button while in video mode. To take a photo while recording video (picture in video), press OK button (color of icon will change to orange).

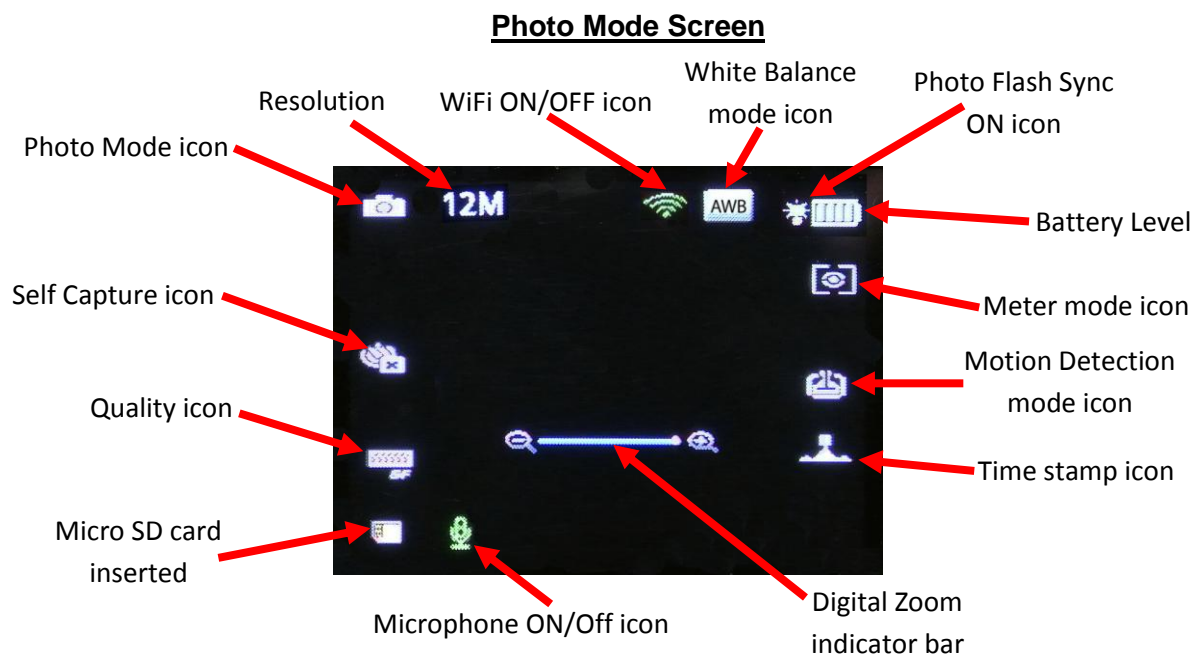
### Recording video screen





## Photo Mode LCD Monitor Display

To switch to photo mode, press and quickly release MODE - Power ON/OFF button. To take a photo, hold camera steady while pressing and releasing SHUTTER button.

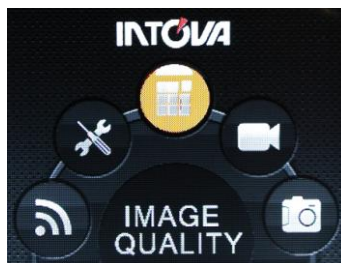
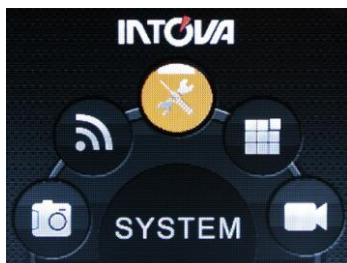
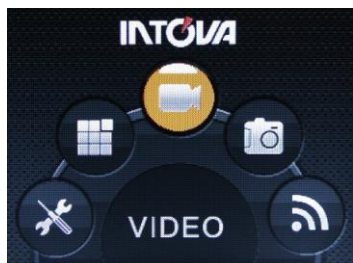


## Basic Operations of EDGE X camera

BUTTON	BASIC OPERATION PROCEDURES
POWER, VIDEO/PHOTO/ FILE VIEWING modes, MENU SCROLLING button	<ol style="list-style-type: none"> <li>1) Press and hold for 2 seconds and release button to turn on or turn off camera.</li> <li>2) Quickly press button to switch between Video, Photo, and File Viewing modes.</li> <li>3) In either Video or Photo mode, press MENU and OK buttons. Quickly press button to scroll through MENU.</li> </ol>
MENU, WiFi ON/OFF, DELETE button	<ol style="list-style-type: none"> <li>1) To bring up MENU, quickly press and release button.</li> <li>2) To turn WiFi ON or OFF, press and hold button for 3 seconds and release.</li> <li>3) While in File Viewing mode, press button to DELETE single or all files.</li> </ol>
SHUTTER button	Press "SHUTTER" button to start and stop video recording or to take a photo.
UP, ZOOM IN button	<ol style="list-style-type: none"> <li>1) Press button to scroll up through sub-menu selections.</li> <li>2) Press and hold to ZOOM IN when digital zoom mode is activated.</li> </ol>
OK button	<ol style="list-style-type: none"> <li>1) Press button to confirm menu selection</li> <li>2) During video recording, press button to take a photo (Picture in Video)</li> </ol>
DOWN, ZOOM OUT, LCD ON/OFF button	<ol style="list-style-type: none"> <li>1) Press button to scroll down through sub-menu selections.</li> <li>2) Press and hold to ZOOM OUT when digital zoom mode is activated.</li> <li>3) Press button to turn LCD ON/OFF.</li> </ol>

# CAMERA SETTINGS

To access camera settings, press the MENU button and press UP or DOWN button to scroll through main menu selections and press OK button to enter sub-menu selections. Shown below are the five main menu selections screens.



## Video Menu:

With VIDEO menu icon highlighted, press OK button to enter video settings sub-menu. Use the UP or DOWN button to scroll through the sub-menu and press OK button to select from RESOLUTION, VIDEO QUALITY, MOTION DETECTION, LOOP VIDEO, MUTE, DUAL STREAM, VIDEO STAMP and TIME LAPSE V. After selecting sub-menu, use UP or DOWN to scroll through choices, press OK button to select and press MENU button to go back to main screen.

1) **RESOLUTION:** Setting sub-menu choices are explained in chart below.

RESOLUTION	NTSC/PAL fps	DESCRIPTION
1080P60	60/50	Highest resolution 16:9 HD video @ 1920x1080 pixels. 60/50 frames per second rate for both action and better slow motion effect*.
1080P30	30/25	Highest resolution 16:9 HD video @ 1920x1080 pixels. 30/25 frames per second rate for both action and when mounted on stable object.
1080P48	48/48	Highest resolution 16:9 HD video @ 1920x1080 pixels. 48/48 frames per second rate for both action and better slow motion effect*.
1080P24	24/24	Highest resolution 16:9 HD video @ 1920x1080 pixels. 24/24 frames per second rate for both action and when mounted on stable object.
1200P60	60/50	High resolution 16:10 HD video @ 1920x1200 pixels. 60/50 frames per second rate for both action and better slow motion effect*.
1200P30	30/25	High resolution 16:10 HD video @ 1920x1200 pixels. 30/25 frames per second rate for both action and when mounted on stable object.
1200P48	48/48	High resolution 16:10 HD video @ 1920x1200 pixels. 48/48 frames per second rate for both action and better slow motion effect*.
1200P24	24/24	High resolution 16:10 HD video @ 1920x1200 pixels. 24/24 frames per second rate for both action and when mounted on stable object.

960P60	60/50	High resolution 4:3 video @ 1280x960 pixels produces largest vertical viewing area. 60/50 frames per second rate for action shooting and better slow motion effect*.
960P30	30/25	High resolution 4:3 video @ 1280x960 pixels produces largest vertical viewing area. 30/25 frames per second rate for action shooting, when mounted on stable object and for lower light conditions.
960P48	48/48	High resolution 4:3 video @ 1280x960 pixels produces largest vertical viewing area. 48 frames per second rate for action shooting and better slow motion effect*.
960P24	24/24	High resolution 4:3 video @ 1280x960 pixels produces largest vertical viewing area. 24/24 frames per second rate for action shooting, when mounted on stable object and for lower light conditions.
720P60	60/50	High resolution 16:9 HD video @ 1280x720 pixels. 60/50 frames per second rate for hand held, action shooting and good slow motion effect*. Produces larger file size than 30/25 fps selection below.
720P30	30/25	High resolution 16:9 HD video @ 1280x720 pixels. 30/25 frames per second rate for action shooting, when mounted on stable object and for lower light conditions. Produces smaller file size than 60/50 fps.
720P48	48/48	High resolution 16:9 HD video @ 1280x720 pixels. 48/48 frames per second rate for action shooting and for slow motion effect*. Produces smaller file size than 60/50 fps.
720P24	24/24	High resolution 16:9 HD video @ 1280x720 pixels. 24/24 frames per second rate for action shooting, when mounted on stable object and for lower light conditions. Produces smaller file size than 48/48 fps.
720P120	120/100	High resolution 16:9 HD video @ 1280x720 pixels. 30/25 frames per second rate for action shooting and for super slow motion effect*. Produces larger file size than 60/50 fps.
848x480/60F (WVGA)	60/50	Wide standard resolution 16:9 video @ 848x480 pixels produces small file size. 60/50 frames per second rate for hand held, action shooting and slow motion effect*.
848x480/30F (WVGA)	30/25	Wide standard resolution 16:9 video @ 848x480 pixels produces small file size. 30/25 frames per second rate for hand held, action shooting.
848x480/48F (WVGA)	48/48	Wide standard resolution 16:9 video @ 848x480 pixels produces small file size. 48/48 frames per second rate for hand held, action shooting and for slow motion effect*.
848x480/24F (WVGA)	24/24	Wide standard resolution 16:9 video @ 848x480 pixels produces small file size. 24/24 frames per second rate for hand held, action shooting.
848x480/120F (WVGA)	120/100	Wide standard resolution 16:9 video @ 848x480 pixels produces small file size. 120/100 frames per second rate for hand held, action shooting and for super slow motion effect*.
848x480/240F (WVGA)	240/200	Wide standard resolution 16:9 video @ 848x480 pixels produces small file size. 240/200 frames per second rate for hand held, action shooting and for super slow motion effect*.

VGA FULL	60/50	Standard resolution 4:3 video @ 640x480 pixels produces small file size. 60/50 frames per second rate for hand held, action shooting and for slow motion effect*.
VGA	30/25	Standard resolution 4:3 video @ 640x480 pixels produces small file size. 30/25 frames per second rate for hand held, action shooting.
VGAP48	48/48	Standard resolution 4:3 video @ 640x480 pixels produces small file size. 48/48 frames per second rate for hand held, action shooting and for slow motion effect*.
VGAP24	24/24	Standard resolution 4:3 video @ 640x480 pixels produces small file size. 24/24 frames per second rate for hand held, action shooting.
VGAP120	120/100	Standard resolution 4:3 video @ 640x480 pixels produces small file size. 120/100 frames per second rate for hand held, action shooting and for super slow motion effect*.
VGAP240	240/200	Standard resolution 4:3 video @ 640x480 pixels produces small file size. 240/200 frames per second rate for hand held, action shooting and for super slow motion effect*.
*Slow motion effect is produced in video editing software which includes that feature.		

**2) VIDEO QUALITY:** Setting sub-menu choices are explained in chart below.

SETTING	DESCRIPTION
Super Fine	Produces best quality video for selected resolution.
Fine	Produces good quality video for selected resolution.
Normal	Produces regular quality video for selected resolution.

**3) MOTION DETECTION:** Video will start recording automatically when motion is detected in field of view. Video will be recorded for 5 seconds and stop if no other motion is detected. Setting choices are ON or OFF.

**4) VIDEO DURATION:** Allows the camera to record a video clip for a selected time length in minutes and to continue recording video clips of the same time length one after another unless operator stops recording manually by pressing SHUTTER button. Setting choices are OFF, 1 minute, 3 minutes, 5 minutes and 10 minutes.

**5) LOOP VIDEO:** Allows camera to continue capturing video after memory card has become full by recording over previous video files from the beginning. Setting choices are ON or OFF.

**6) MUTE:** This feature allows audio recording to be turned off. Select ON to mute audio and select OFF to restore audio recording.

**7) DUAL STREAM:** Allows camera to simultaneously record another video clip in QVGA size in addition to the selected regular resolution. For 1080p, 720p and 480p; the additional clip is 432x240 pixels. For 960p; the additional clip is 320x240 pixels.

**8) VIDEO STAMP:** This feature places the date only, time only or both date and time on the video clip which is visible during playback. Setting choices are OFF, DATE, TIME, or DATE and TIME

**9) TIME LAPSE V:** Allows the camera to record video clips with delays between each clip corresponding to selected time interval in seconds. This produces a high quality time lapse effect. Setting choices are OFF, 1 sec, 2 sec, 3 sec, 5 sec, 10 sec, 30 sec and 60 sec.

## Photo Menu:

With PHOTO menu icon highlighted, press OK button to enter photo settings sub-menu. Use the UP or DOWN button to scroll through the sub-menu and press OK button to select from SIZE, PHOTO QUALITY, PHOTO BURST, PHOTO FLASH, SELF CAPTURE, TIME LAPSE P and PHOTO STAMP. After selecting sub-menu, use UP or DOWN to scroll through choices, press OK button to select and press MENU button to go back to main screen.

**1) SIZE:** Setting sub-menu choices are explained in chart below.

PHOTO FILE SIZE	PIXEL DIMENSIONS	DESCRIPTION
12MP	4000 x 3000	Largest file size (true)
10MP	3648 x 2736	Large file size (true)
8MP	3264 x 2448	Medium file size (true)
5MP	2592 x 1944	Small file size (true)

**2) PHOTO QUALITY:** Setting sub-menu choices are explained in chart below.

SETTING	DESCRIPTION
Super Fine	Produces best quality photo for selected size.
Fine	Produces good quality photo for selected size.
Normal	Produces regular quality photo for selected size.

**3) PHOTO BURST:** This feature allows 3, 5, 10, 20 and 30 “burst” photos per shutter button press.

**4) PHOTO FLASH:** This sets the slave strobe sync light to ON or OFF. EDGE X is the only “point of view” camera that allows flash photography.

**5) SELF CAPTURE:** Allows time delay in seconds between pressing of SHUTTER button and taking of photo. The setting choices are OFF, 3 sec, 5 sec, and 10 sec.

**6) TIME LAPSE P:** Allows the camera to continually take a photo with delays between each photo corresponding to selected time interval in seconds. This produces a high quality time lapse effect. Setting choices are OFF, 1 sec, 2 sec, 3 sec, 5 sec, 10 sec, 30 sec and 60 sec.

**7) PHOTO STAMP:** This feature places the date only, time only or both date and time on the photo file which is visible viewed or printed. Setting choices are OFF, DATE, TIME, or DATE and TIME.

## WiFi Menu:

This feature allows camera to be connected to an iOS or Android wireless device such as smart phone or tablet for remote operation, live viewing and file transferring. Highlight WiFi menu icon and press OK button to enter WiFi settings sub-menu. Press the UP or DOWN then press OK button to start WiFi. LCD will go back to main screen and WiFi will be on when icon becomes green. WiFi can also be turned ON or OFF by pressing and holding MENU / WIFI / DELETE button for 3 seconds.

**1) WiFi App:** The Intova WiFi App allows remote control of your camera via smartphone or tablet.

Features include camera control, live preview, playback and transfer files. Follow these steps to install and use the Intova EDGE X App:

- a) Go to either the Apple Store or Google Play and type “Intova EDGE X” in search to find and install the app on your smartphone or tablet.
- b) After app has been installed to your smartphone or tablet, turn on WiFi in the camera as explained in WiFi Menu section.
- c) In your smartphone or tablet WiFi network setting, turn on and connect to camera’s WiFi network. The default network name is “INTOVA EDGE X”.
- d) Enter the password “1234567890”.
- e) Open the Intova EDGE X App on your smartphone or tablet. You will now be able to control the camera with your smartphone or tablet plus view, playback and transfer files.

**\*Notice: For some Android phone models, “AUTO CONNECT” function in WiFi advanced menu needs to be disabled.**

**2) Changing WiFi network name and password:** When connecting to more than one camera at the same time, it is necessary to change the network names and passwords on the other camera(s). Follow these steps to change network ID and password:

- a) Turn on the camera WiFi.
- b) Connect the camera to a computer via the supplied USB cable.
- c) Select “MDSC”.
- d) Open “MISC” folder.
- e) Open the “wifi.conf” file using either WordPad (PC) or TextEdit (Mac).
- f) Find the section “SoftAP configuration”. (Caution: do not change configuration file other than as explained below.)
- g) Find the default network name “INTOVA EDGE X” highlighted in the example below and type in a new name.
- h) Find the default password “1234567890” highlighted in the example below and type in a new password.
- i) Save the configuration file.
- j) Now you can control the second EDGE X camera using a second smartphone or tablet.

```
##### SoftAP configuration #####
# SSID (1 ~ 32 characters)
AP_SSID=INTOVA_EDGE_X
# IP address
LOCAL_IP=192.168.42.1
# IP subnet mask
LOCAL_NETMASK=255.255.255.0
# IP pool starting address of DHCP server
DHCP_IP_START=192.168.42.2
# IP pool end address of DHCP server
DHCP_IP_END=192.168.42.6
# Wifi channel number, set 0 to use Auto Channel Selection
AP_CHANNEL=0
```

```
# Maximum number of stations allowed in station table
AP_MAXSTA=5
# If you say yes here, all WPA/WEP settings will be ignored
AP_PUBLIC=no
# WPA Passphrase (8 ~ 63 characters)
AP_PASSWD=1234567890
```

## System Menu:

With SYSTEM menu icon highlighted, press OK button to enter system settings sub-menu. Use the UP or DOWN button to scroll through the sub-menu and press OK button to select from TV SYSTEM, VIDEO ROTATION, DIGITAL ZOOM, AUTO LCD OFF, VOLUME, LANGUAGE, FIRMWARE VERSION, TIME SETUP, FORMAT, DEFAULT SETTING, and AUTO POWER OFF. After selecting sub-menu, use UP or DOWN to scroll through choices, press OK button to select and press MENU button to go back to main screen.

- 1) TV SYSTEM:** This setting configures the video file for playback on either an NTSC or PAL system device.
- 2) VIDEO ROTATION:** This setting allows video to be played back in correct orientation for videos that are recorded with camera mounted upside down. Setting choices are ON to activate and OFF to deactivate feature.
- 3) DIGITAL ZOOM:** This setting allows digital zoom feature for either video or photo mode to be activated. When digital zoom is activated, use the UP button to zoom in and the DOWN button to zoom out. The setting choices are OFF, 4X, 10X, 16X and 60X.
- 4) AUTO LCD OFF:** This setting allows LCD to stay on or turn off after a specified time; 30 seconds, 1 minute, or 3 minutes. Use this feature to conserve battery power. Select OFF to disable function and leave screen turned ON.
- 5) VOLUME:** This setting allows beep sound volume to be turned OFF or adjusted from level 1 through 5.
- 6) LANGUAGE:** This setting allows MENU language to be selected between English, Chinese (Traditional), Chinese (simplified), Japanese, French, German, Dutch, Portuguese, Spanish, Korean and Italian.
- 7) FIRMWARE VERSION:** This indicates installed firmware version. Please note when updating firmware in order to confirm new firmware has been installed.
- 8) TIME SETUP:** This setting allows current date and time to be set. With sub-menu item highlighted, press OK button to enter setting. Press UP or DOWN button to change number and press MODE button to scroll to next. When done, press OK button to confirm and go back to sub-menu.
- 9) FORMAT:** This feature allows Micro SD card to be formatted. **WARNING, formatting card will erase all data!** Press OK to enter function. Press UP or DOWN button to highlight YES and press OK to select. Press UP or DOWN button again to highlight YES and press OK to execute format.
- 10) DEFAULT SETTING:** This feature allows camera settings to be reset to factory default.
- 11) AUTO POWER OFF:** This setting allows camera to stay on (when OFF is selected) or turns camera off when 30 sec, 3 minutes or 5 minutes is selected. Use this feature to conserve battery power.

## Image Quality Menu:

With IMAGE QUALITY menu icon highlighted, press OK button to enter photo settings sub-menu. Use the UP or DOWN button to scroll through the sub-menu and press OK button to select from FLICKER, SCENE MODE, WHITE BALANCE, IMAGE EFFECTS, CONTRAST, SHARPNESS, METER, ISO, and EXPOSURE. After selecting sub-menu, use UP or DOWN to scroll through choices, press OK button to select and press MENU button to go back to main screen.

**1) FLICKER:** This setting allows the camera to be adjusted to AUTO, 60Hz or 50Hz to prevent video flickering caused by fluorescent lights. For USA, the setting is 60Hz.

**2) SCENE MODE:** This setting selects the below scene modes.

SCENE MODE	DESCRIPTION
OFF	Scene Mode is OFF
NIGHT SCENE	For video/photography in low light and at night. Due to slower shutter speed, mounting on stable object such as a tripod is recommended.
DIVING	Activates an electronic red filter to add back warm colors while diving at depths below 20 feet / 6 meters in salt water.
SPORTS	For video/photography of fast moving subjects or during action activities. Camera uses faster shutter speeds to improve imagery.
LANDSCAPE	For video/photography of distant subjects such as mountains, cityscape, etc.
SUNSET	For video/photography of scenes that include sunrise or sunset in the background. Camera uses faster shutter speed to improve imagery.
SAND & SNOW	For video/photography where bright background causes subject to appear dark (silhouetted). Camera uses slower shutter speed to improve imagery.

**3) WHITE BALANCE:** This setting improves color accuracy when the ambient light is either too cool (blue or green) or too warm (yellow/orange). Examples of cool lighting situations are cloudy day, diving at depths below 20 feet / 6 meters in either fresh or salt water, fluorescent light, or scenes in shade. Examples of warm lighting situations are candlelight and tungsten light. Setting choices are AUTO, MANUAL, SUNNY (daylight situations), CLOUDY (cool light situations), FLUORESCENT (under fluorescent lighting), and INCANDESCENT (under filament lamp lighting). To use MANUAL white balance setting:

1. Select MANUAL and press OK button to activate, then press MENU button to go to main screen.
2. Press MENU button to go to main screen. The manual white balance icon will be blinking at the top of the LCD screen.
3. Aim camera at white balance board or a white object and press SHUTTER button. White balance is now set to current ambient light.
4. To reset manual white balance for a new ambient light situation, turn camera off and on to reactivate blinking manual white balance icon and repeat step 2.



**4) IMAGE EFFECTS:** This setting allows selection of image altering effects as shown below.

<b>EFFECT</b>	<b>DESCRIPTION</b>
ART	Changes background sharpness and contrast
SEPIA	Adds yellow-brown tint to video/photo.
NEGATIVE	Reverses imagery to make it appear like a film negative.
BLACK & WHITE	Removes color to create a monochrome video/photo.
VIVID	Enhances colors

**5) CONTRAST:** This setting increases or reduces the difference between dark and light areas. The default setting is STANDARD. To make dark areas blacker and light areas brighter in videos/photos, select ENHANCE. To make dark areas less black and light areas darker, select LOW.

**6) SHARPNESS:** This setting increases or decreases video/photo sharpness. The default setting is STANDARD. Select HARD to sharpen or SOFT to blur.

**7) METER:** This feature selects the general area in a scene that the camera uses when calculating image exposure. Selecting CENTER will decrease this area towards the middle of the scene. Selecting AVERAGE causes camera to adjust exposure to light coming from the overall area as viewed in LCD. Selecting SPOT will cause camera to adjust exposure based on light coming from a very concentrated area in the middle of the scene.

**8) ISO:** This setting adjusts the camera's sensitivity to light. The default setting is AUTO. A higher ISO value will result in a lighter video/photo and is useful in low light conditions. The choices are AUTO, 100, 200, 400, and 800.

**9) EV SETTING:** This setting adjusts the brightness or darkness of the video/photo between  $\pm 2$  f stops. Setting to positive values will brighten imagery, while negative values will darken imagery.

## VIEW PHOTOS OR PLAYBACK VIDEOS

### Using LCD screen to view photos or playback videos:

1. Go to View Files mode by pressing MODE button twice if in Video mode or once if in Photo mode.
2. Press the OK button to enlarge thumbnails. Press OK button again to return to thumbnail view.
3. Press UP or DOWN button to scroll through files.
4. To playback a video file, press the OK button to start video and press OK button to stop and return to thumbnail view. Pressing UP arrow button will slow down video during playback and pressing DOWN arrow button will speed up video playback.

## Playback using High Definition TV Output:

To view HD videos on a High Definition TV, use a mini High Definition TV cable (not included) to connect camera to the TV. Plug the High Definition mini plug into the camera's HD output port and the other end with USB plug into the HDTV. Turn camera on and press MODE button twice to get to the file viewing mode. Use UP or DOWN buttons to scroll through thumbnail images and press OK button to select a video file. Press OK button again to begin playback and view on HDTV.

## DELETING FILES

To delete a single file:

1. Go to View Files mode by pressing MODE button twice if in Video mode or once if in Photo mode.
2. Press UP or DOWN button to select a file and then press the MENU button.
3. Press the OK button twice, then press the UP or DOWN button to highlight circle.
4. Press OK to execute deletion.

To delete all files:

1. Go to View Files mode by pressing MODE button twice if in Video mode or once if in Photo mode.
2. Press UP or DOWN button to select a file and then press the MENU button.
3. Press to OK button once then press the DOWN button to select "all".
4. Press the OK button then press the UP or DOWN button to highlight circle.
5. Press OK to execute deletion of all files.

## SPECIFICATIONS

Effective Sensor	1/ 2.3 " 12MP CMOS SENSOR
LCD Screen	Built in 1.5" TFT-LCD 480*240 resolution
Photo Resolution & approximate number of shots using a 64GB Micro SD card	12M 4000x3000 JPG approx 15000 photos/64GB
	10M 3648x2736 JPG approx 18000 photos/64GB
	8M 3200x2400 JPG approx 22000 photos/64GB
	5M 2592x1944 JPG approx 36000 photos/64GB

Video Resolution & approximate possible video recording time using a 64 GB Micro SD card class 10 (quality set at super fine)	1080P60	256 min
	1080P30	384 min
	1080P48	384 min
	1080P24	384 min
	1200P60	256 min
	1200P30	384 min
	1200P48	384 min
	1200P24	384 min
	960P60	256 min
	960P30	384 min
	960P48	384 min
	960P24	384 min
	720P60	570 min
	720P30	960 min
	720P48	960 min
	720P24	960 min
	720P120	330 min
	848x480/60F (WVGA)	960 min
	848x480/30F (WVGA)	1920 min
	848x480/48F (WVGA)	1920 min
	848x480/24F (WVGA)	1920 min
848x480/120F (WVGA)	570 min	
848x480/240F (WVGA)	330 min	
Possible recording times for VGA is similar to WVGA		
Lens specification	F/2.8 f=3.5 mm 160° wide angle	
Built-in microphone	Yes	
Operation Tone	Available	
Battery capacity	3.7V/ 1150mAh	
Power consumption	1.9W	

Continuous recording	About 1.5 hrs (LCD on and WiFi off), 1.5 hrs (WiFi on and LCD off), and 2 hrs (LCD off and WiFi off)
Charging spec.	DC5V about 780mA
Charging time	About 6 hrs
USB port	USB 2.0 High Speed
High Definition TV output port	Built in
Type of memory card	Micro SD card (class 10 required for HD video)
Capacity of memory card	4GB-64GB
WiFi	Built in
Depth rating	Waterproof to 200 ft / 60M
Weight	201 grams
Dimension	(2.8x3.3x2.4)in / (84 x 70 x 60)mm
Standard Accessories	User's manual mini CD, lithium ion battery, USB cable, float strap, lens cap, anti-glare hood, silicone grease

NOTE: As a result of continual improvements, the design and specifications of the product within may differ slightly to the unit illustrated on the packaging.

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1100 Alakea St., 18th Floor Honolulu, Hawaii 96813 USA  
[www.intova.net](http://www.intova.net)