



**SCALAR**  
INDOORS CORONA CAMERA



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## PLEASE NOTE

- ☞ Keep the lenses clean, use dry soft tissues or damped with analytic Ethanol
- ☞ Opening the housing will waiver the warranty
- ☞ The battery should not be detached while the camera is on
- ☞ To prevent electrical shock, do not expose the main adaptor to rain or moisture
- ☞ Do not expose the camera to extreme temperature, excessive moisture or shock beyond those mentioned in the specifications
- ☞ Camera should not be dropped

## BEFORE USING

### **Battery**

Ensure that the battery is fully charged. It takes approximately 6-8 hours. Never detach while camera is working

### **SD Card**

Ensure that the SD card in use has enough free space

### **Light Conditions**

Ensure there is no sunlight nor UV emitting bulbs

## FEA-

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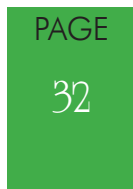
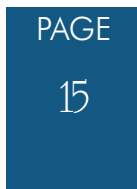
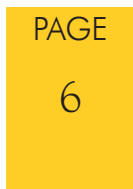
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## PACKAGE CONTENT

- |   |                                     |
|---|-------------------------------------|
| 1 | Scalar camera with SD card inserted |
| 2 | Shoulder strap                      |
| 3 | Battery                             |
| 4 | Electricity plug                    |
| 5 | USB wire                            |
| 6 | AC/DC power supplier                |
| 7 | Manual                              |
| 8 | Hard carrying case                  |




6

package content



## UPPER VIEW

1	LCD
2	Power On/Off
3	Stills capture
4	Video recording
5	Auto Focus refresh
6	Flashlight
7	Navigation arrows
8	Selector 
9	Alternating contextual button [Alt. 
10	Back/Esc
11	LED Indicator



7

front view



## SIDE VIEW

9	Inlets' cover
10	Aux   Temperature & Humidity [TRH]
11	AC/DC inlet
12	Mini USB



\* Contact Ofil to activate

8

left side view





## BOTTOM VIEW

- |    |                            |
|----|----------------------------|
| 13 | Battery slot and battery   |
| 14 | SD card slot               |
| 15 | Tripod mounting receptacle |



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bottom view



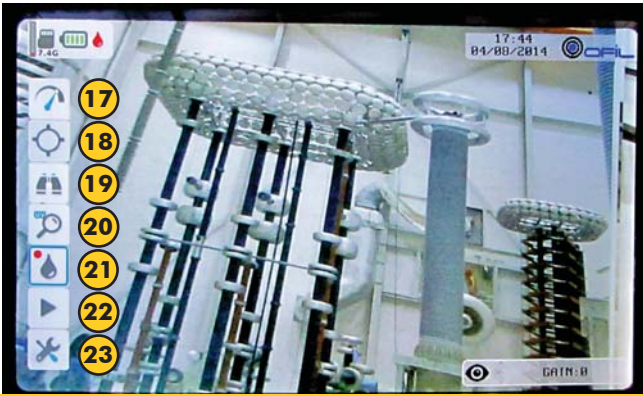
## FRONT VIEW

15	Lens
16	Flash light










10

front view



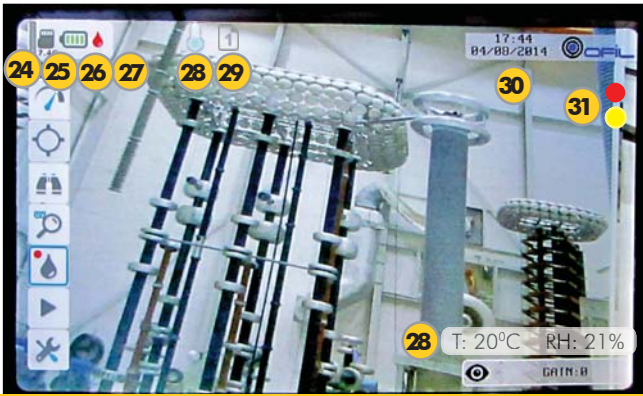
## O&D - MENU

### Controlled by the arrows

	17	Gain - P. 19
	18	UV Manual Focus - P. 20
	19	Visible zoom - P. 20
	20	UV zoom - P. 21
	21	Corona color - P. 22
	22	Playback - P. 24-27
	23	Tools - P. 32

11

on screen menu

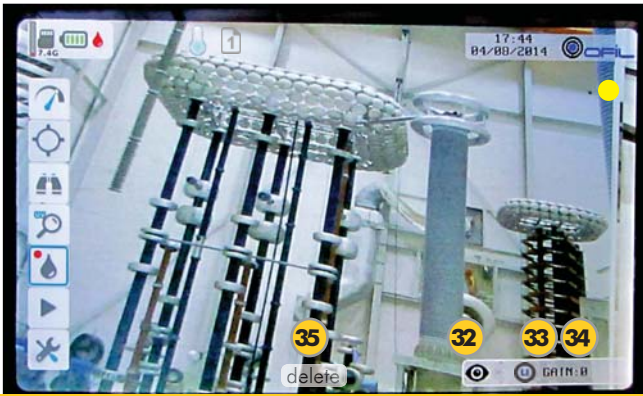


## TOP STATUS LINE


- 24 SD Card Free Space Bar
- 25 SD Card Indicator
- 26 Power Source - Battery or AC/DC
- 27 Corona Selected Color
- 28 TRH plug Indicator & Readings
- 29 Active profile - 1 | 2 | 3 | 4
- 30 Date & Time - Day: DD,MM,YYYY hh:mm
- 31 ●Video recording | ●Stills

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on screen top line

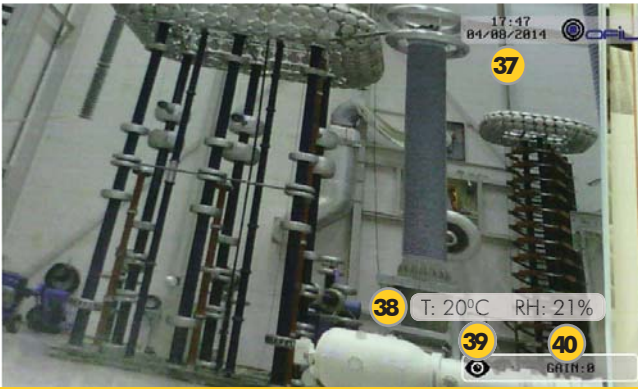


## BOTTOM STATUS LINE

- 32 Display Mode - Combine | Visible | UV
- 33 LI
- 34 Gain value
- 35  Alternating [Alt.]: Delete | Save | Edit | OK

13

on screen bottom line



## RECORDED STATUS ITEMS

TOP

37 Date & Time & Ofil logo

38 Temperature T:XX°C Humidity RH: XX%

BOTTOM



39 Mode: Combine | UV only | Visible only

40 Gain GXX

14

recorded status items

# GENERAL

1. 2 kinds of commands control Scalar:  
**Buttons** and an **On-Screen Menu**
2. Buttons:  
**Power** | **Video & Stills capture** |  
**Focus refresh** | **Flash light** |  
**Alternating Contextual command** | **Esc**
3. On-Screen Menu:  
**Gain** | **Visible Zoom** | **UV Zoom** | **Coro-**  
**na Color** | **UV Focus** | **Playback** | **Tools**
4. The on-screen-menu is permanently displayed
5. A selected menu item has a blue frame
6. A faded menu item is unavailable/inactive
7. Navigation is via the up/down arrows 
8. Selecting a function is via the selector
9. Exiting a function  going back is via the back/ESC button
10. Selected values are indicated on the status lines [P. 13]

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general



## OPERATION

1	Power	7	Playback
2	Gain	8	Snapshot - stills
3	UV Focus	9	Video recording
4	Visible Zoom	10	Flashlight
5	UV Zoom	11	TRH
6	Corona color	12	Tools

16

operation







## 1. POWER

- Short press on the power button to turn on, long press to turn off
- A blue LED turns on
- Start-up within 1 minute

### **POWER SOURCES:**

- Rechargeable battery 
- Power adaptor AC/DC input 9V 

17

power

# 1. POWER



## **AC/DC INPUT 9V:**

Plug the AC/DC adaptor to the camera [P. 8]

1. Connect to a power source
2. Turn on the camera



extended battery and charger

## **LED COLORS**

Blue - Camera is initiating

Red - Battery is charging

Green - Battery is full

## **BATTERY:**

1. Plug in the AC/DC [P. 8]
2. Full charge is achieved over night
3. A full battery can last approximately 4 hours
4. A full extended battery [optional accessory] lasts approximately 7 hours
5. Charging the extended battery is through a battery charger unit

Note: if both the battery & AC/DC are plugged DC is used by default

## 2. GAIN



- Gain controls the sensitivity to UV, and it affects the size & number of displayed UV spots



- With a higher gain it is easier to notice existing corona. With a lower gain the emitting source is better conceived




- Gain range is 0 to 150 [default=70]



- **Move the blue frame to the Gain icon**





- **Push  to activate the Gain Function**



- **Use the UP/DOWN arrows to change the gain values**



- **Use the  to save and exit, or the  to exit without any change**

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gain

## 3. UV FOCUS




- UV focus manages the UV channel only





- Use it to focus a de-focused hollow corona and make it sharper

- **Move the blue frame to UV FOCUS**



- Use  to activate the UV FOCUS
- Use the RIGHT/LEFT arrows to control the UV focus

















- Use  to save and exit  to exit without saving



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UV focus

## 4. VISIBLE ZOOM

-  • Visible zoom affects the visible image
-  • Zooming in/out changes the size of the inspected object and the field of view
-  • By default, the camera is in maximum zoom
-  • While zooming out the camera is in VISIBLE-MODE [no UV displayed] 
-  • When max zoom is attained, COMBINE-MODE is active 
-  • **Move the blue frame to the visible zoom icon**
-  • **Push  to activate the visible zoom**
-  • **Use the UP/DOWN arrows to zoom in and out to change values**
-  • Use  to save, or  to exit with-

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visible zoom

## 5. UV ZOOM



- UV Zoom magnifies digitally the UV signals



- Effective only in combine and in UV modes  

- 3 levels of magnification





- **Move the blue frame to UV ZOOM**

- Use  to activate the function



- Use the UP/DOWN arrows to zoom in/out



- Use  to save and exit,  to exit without saving



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UV zoom

## 6. CORONA COLOR



- Select from a palette of 9 colors to make the corona signals conspicuous



- Move the blue frame to the palette



- A sub menu with 9 color swatches appears



CORONA  
Colors




- Use the UP/DOWN arrows to get to a preferred color



- Use the  to save and exit or the  to exit without saving



- The selected color is displayed on the top status line  and on the left menu



23

corona color

## 7. PLAYBACK




- Review pictures [P. 28] and video clips [P. 29] stored on the inserted SD card [P. 9]




- Move the blue frame to **PLAYBACK** and use  to activate the function



- Use  to set number of skipped rows



- Media is stored chronologically
- Use **RIGHT**/ **LEFT** arrows to change tabs



### **PLAYBACK: PICTURE TAB**



- A preview window shows highlighted picture & subtitles with index, name, date



- To delete a picture use the **Alt. command** [P. 7]
- Use  to see a full frame picture

24

playback pictures



## 7. PLAYBACK



### PLAYBACK: VIDEO TAB



- Video clips are sorted chronologically. Use **UP/DOWN** arrows to browse



- A preview window shows each highlighted video with subtitles that include: video name, date, index



- Use **⊙** to select a video



- To preview a video use the following commands

Run = **⊙**

Restart = **▲**

Move forward = **▶**

Move back = **◀**



- To delete a movie use the Alt. command **[F7]**



- Use the **⏪** to exit

## 7. PLAYBACK



### PLAYBACK: SEARCH



- Search videos and images that are stored on the inserted SD card by: **PROFILE** | **YEAR** | **MONTH** | **DATE**. Select at least one criterion.



- Use the **UP/DOWN** arrows to move the blue frame to a criterion and the **RIGHT/LEFT** to change it's values.



- Move the blue frame to **APPLY** to keep the criteria or to **DISCARD** to clear all criteria, and click on the selector



- To see results click and move to **videos/pictures**. The number of found elements is displayed on each tab.



Note: **NONE** means no criterion

## 7. DOWNLOAD



### DOWNLOAD & PLAYBACK: VIA USB

- Attach a mini USB to the inlet [P. 8]



- While the USB is plugged in the camera is on hold



- Attach the USB to a PC. The SD card content can be found in the Removable Disk that appears



- Movies are stored in the "Videos" folder; pictures are stored in the "Pictures" folder




**Note:** It is recommended to download the SD card content

## 8. SNAPSHOT - STILL



**ENSURE SD CARD IS INSERTED** 

**DO NOT EJECT SD CARD WHEN THE CAMERA IS ON**

- To capture a still picture push the **PICTURE** button
- During capture a yellow circle appears on the right top corner of the display
- Within 3 seconds after capture, it is possible to delete the picture. Use the Alt. command [P. 7] 
- Pictures can be captured during video recording
- The picture format is “bmp”
- Pictures are stored on the SD card
- To preview a stored picture go to **PLAYBACK** [P. 24]

## 9. VIDEO RECORDING



**ENSURE SD CARD IS INSERTED** 

**DO NOT EJECT SD CARD WHEN THE CAMERA IS ON**

- To record video clips, MP4, push the **RECORDING** button. To stop recording click again on that button
- During recording a red circle and a timer appear on the top right corner of the display
- Wait 2 seconds before recording the next clip
- Video clips are stored on the SD card
- During recording system settings and profiles settings are inactive
- To preview a clip use **PLAYBACK** [P. 25]




**Note:** The information displayed in the status lines: temp & humidity

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video recording

## 10. FLASHLIGHT



- Flashlight is useful when inspecting dark cabinets and enclosed apparatuses
- Led flashlight does not affect the mission of detecting ultraviolet radiation
- There are 3 circular options: low  | high  | off
- **Push the  button [P.7] to turn on the light**
- **Push again to raise the intensity of the light**
- **Push again to turn off**

30

flash light

# 11. TEMP & HUMIDITY




## Optional Accessory



- Use temperature & relative humidity [TRH] meter to obtain data on the current environmental condition. Ambient conditions should be noted since they influence the corona phenomenon inception and intensity
  - When TRH is plugged in it is automatically recognized [plug and play]
  - An on-screen icon appears
- TRH readings are displayed on the the top status line [P.12]

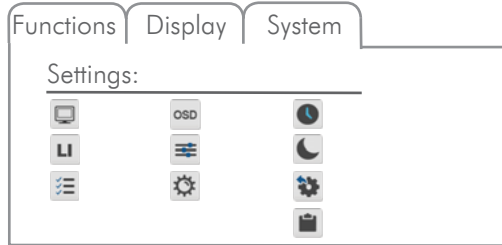
## 12. TOOLS





- Move the blue frame to **TOOLS**
- Click on  to open a sub menu



- Tools main window:



### General directions

- Use the **LEFT/RIGHT** arrows to change tabs
- Use the **UP/DOWN** arrows to get to a feature
- Use the  to activate a feature and to save changes
- Use  to step back or to exit without saving



32

tools - general




# TOOLS: FUNCTIONS




DISPLAY MODE  | LI  | PROFILES 

## Display Mode




-  **COMBINED** UV+Visible: UV signals are superimposed on the visible image. To see & record corona you need to be in combined mode [or UV only]





-  **VISIBLE** image only. Corona will not be displayed nor recorded. Handy to see the fault that emits corona



-  **UV** channel enabled, visible channel disabled. Handy to ensure corona presence



- **Move to the desired mode and click on  to save, or on  to leave**



**Note: during visible zoom the camera is in **VISIBLE** mode**

# TOOLS: FUNCTIONS



DISPLAY MODE | LI | PROFILES

## Long Integration [LI]



LI assists displaying a weak corona signal stronger and more conspicuous by integrating frames.



The available options: Enabled, Disabled & LI on snapshot only



- **To disable:** Uncheck **ENABLE LI**, if it is checked. LI is disabled by default
- **To enable:** select **ENABLE LI** using  the and select an integration rate:



2 frames | 3 frames | 4 frames



The frame integration will be both seen on screen and recorded



- **LI on snapshot only:** when checked affects the recording
- The bottom status line displays when it is active

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tools - functions - LI

# TOOLS: FUNCTIONS



DISPLAY MODE  | LI  | PROFILES 

## Working Profiles [P. 12]



- A working profile stores a set of selected setting values. There are 4 profiles.



- **Naming a profile - move the blue frame to the profile title and click on the selector. A virtual keyboard appears. Use the arrows and the selector to type. Use the Alt. to**



**click OK.** The name will be saved. Alternatively, Connect the scalar to a PC via mini USB. Open [PROFILE NAME.TXT](#) edit and save. [RESTART](#) the camera.



- **Creating profiles: move the blue frame to a profile line and select it. Use the arrows to get to an item and change its values. Save by pushing the Alt.**



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**Changing profiles: move to a pro-**  
**tools - functions -**


# TOOLS: DISPLAY



OSD  | COLOR ADJUSTMENT  | EXPOSURE 

## OSD



Affects the display of Top and Bottom status lines and the backlight of the keypad. Selection is done through the 

### Values:



Bottom OSD On/Off  
Top OSD On/Off  
Keypad backlight On/Off




## Color adjustments

The following features change the visual settings of the display and of the captured pictures/videos:



BRIGHTNESS | CONTRAST | SATURATION | EV



- Use the up/down arrows to get to a feature
- Use the right/left arrows to slide the bar
- Save the changes by clicking on 



**Exposure** [not operable]


# TOOLS: SYSTEM

DATE  | SLEEP  | FACTORY SETTING  | INFO 



## Date & Time



The camera is already tuned to the local time zone. After resetting the date & time click on  to save and implement changes





## Sleep Mode



After a selected time the camera enters automatically into sleep mode. Any button wakes the camera. Blue [or purple] LED indicates sleep mode



Options: NEVER, AFTER 1, 5, 15 MINUTES

- Use the up/down arrows to get to the desired value 
- Click on  to save and implement



## System Info

Information about the camera's firmware & hardware versions

# TOOLS - SETTINGS

DATE  | SLEEP  | FACTORY RESE  | INFO 



## Factory Reset:



Original factory setting can be restored to a current profile or to all profiles. To reset click on the selector



## FACTORY SETTINGS



Gain	70
------	----

Vis Zoom	-2 [Max]
----------	----------

UV Zoom	0
---------	---



Corona Color	Red
--------------	-----

UV focus	Manual
----------	--------







Mode	Combined
------	----------










LI	OFF
----	-----





Sleep mode	5 minutes
------------	-----------

# TOOLS - SETTINGS

DATE  | SLEEP  | FACTORY SETTING  | INFO 

	Brightness	25%
	Contrast	16%
	Saturation	16%
	EV	66%
	OSD Top	On
	OSD Bottom	On
	Backlight	On
	Date & Time	Preset to match locality
	Exposure	9%





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tools - settings - fac-

# SPECIFICATIONS

Ultra Violet (UV) - Optical Properties	
Minimum PD Detection	15 pC @ 1 meters
RIV	43.9 dB $\mu$ V@1MHz
Spectral Range	310-320nm
Variable UV Gain	15 Steps
Field of View H x V	15° x 11°
Detector Life Span	No degradation
Focus Distance	0.5 to infinity
UV Zoom	Digital, 3 steps
Visible - Optical Configuration	
UV/Visible Overlay Accuracy	Better than 1 miliradian
Minimum Visible Light Sensitivity	0 Lux
Resolution	800 x 480
Visible Zoom	Digital, 3 steps



# SPECIFICATIONS

## Display

Type	High acutance color LCD
Brightness	600 cd/m <sup>2</sup> reflective
Resolution	800 x 480 pixels
Size	4.3"

## Connectors

Inlets	Power, mini USB, Aux
Communication	RS232

## Media

Video Format	MPEG4
Image Format	BMP

## Physical Characteristics & Power

Storage & operation Temp	-20°C up to +55°C
Encapsulation	IP5
Mounting Point	Standard 1/4" thread
Nominal Power Consumption	9V DC, 9 Watts

## TROUBLESHOOTING

- No corona - check display mode [p. 33]. The camera should be in **COMBINED MODE** and exit visible zoom
- The screen is dark - restart
- SD card is stuck - push and let the card jump out
- Need to format SD card? Use Fat 32
- The camera is flushed with UV - turn off lights, because some bulbs emit extensive UV. Close window panes, use curtains or blinds
- Quality of recorded images - in dark conditions use the LED flashlight to improve the quality of the display and the recorded data
- The camera uses WYSIWYG - what you see is what you get. Changing the camera display features affects the recordings
- What happens to configurations after restarting the camera? the last working configuration is resumed

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