User Manual

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AOS PROMON SCOPE G2 Manual Version 3.8

Content

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List of manual revisions

Rev	Date	Release notes
1	11.09.2015	First
1.1	23.09.2015	Added IO pinout
1.2	09.12.2015	Added Strobe Invert function

Congratulations! With purchase of an AOS Technologies AG PROMON camera system you have acquired a versatile, reliable product allowing you to monitoring your processes in a very convenient way. The advanced and self-contained digital camera system provides a maximum in user friendliness and assists you in getting the results while others try.

1 General description of *AOS PROMON SCOPE G2*

PROMON SCOPE G2 is a complete, ready-to-use camera system for industrial process monitoring. It contains the following components:

1. Display/Control Unit
2. Camera Module
3. Camera cable (Data-, Control- and Power lines)

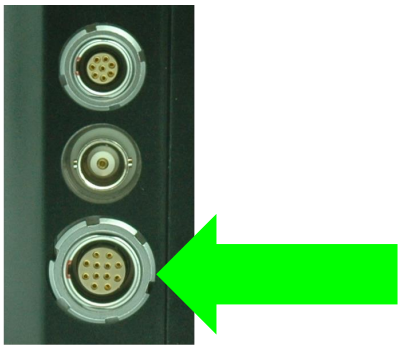
An accessory pack is available (please refer to chapter 20 for details).

2 Setting up your PROMON SCOPE G2

1 Unpack all system components
- Control/Display Unit
- Camera module
- camera cable
- power supply with power cord

2 Set the display/control unit safely to a level surface, laying flat or upright.
Use its bracket for a convenient angle of its display.
The bracket locks at various angles.

3 Connect the camera module to the Display/Control Unit via the included cable. Cable is a 1:1 type, so its direction does not matter



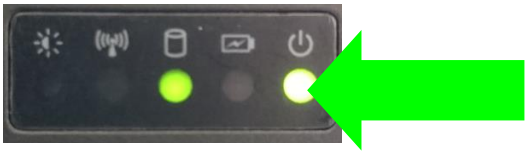
4 Connect the power supply to mains via the power cord.

For safety reason, make sure your mains voltage corresponds with the voltage indicated on the power supply

5 Connect the power supply to the 'DC IN' connector By remove the dust cap from the lower right compartment. ONLY USE THE POWER SUPPLY COMES WITH THE SYSTEM

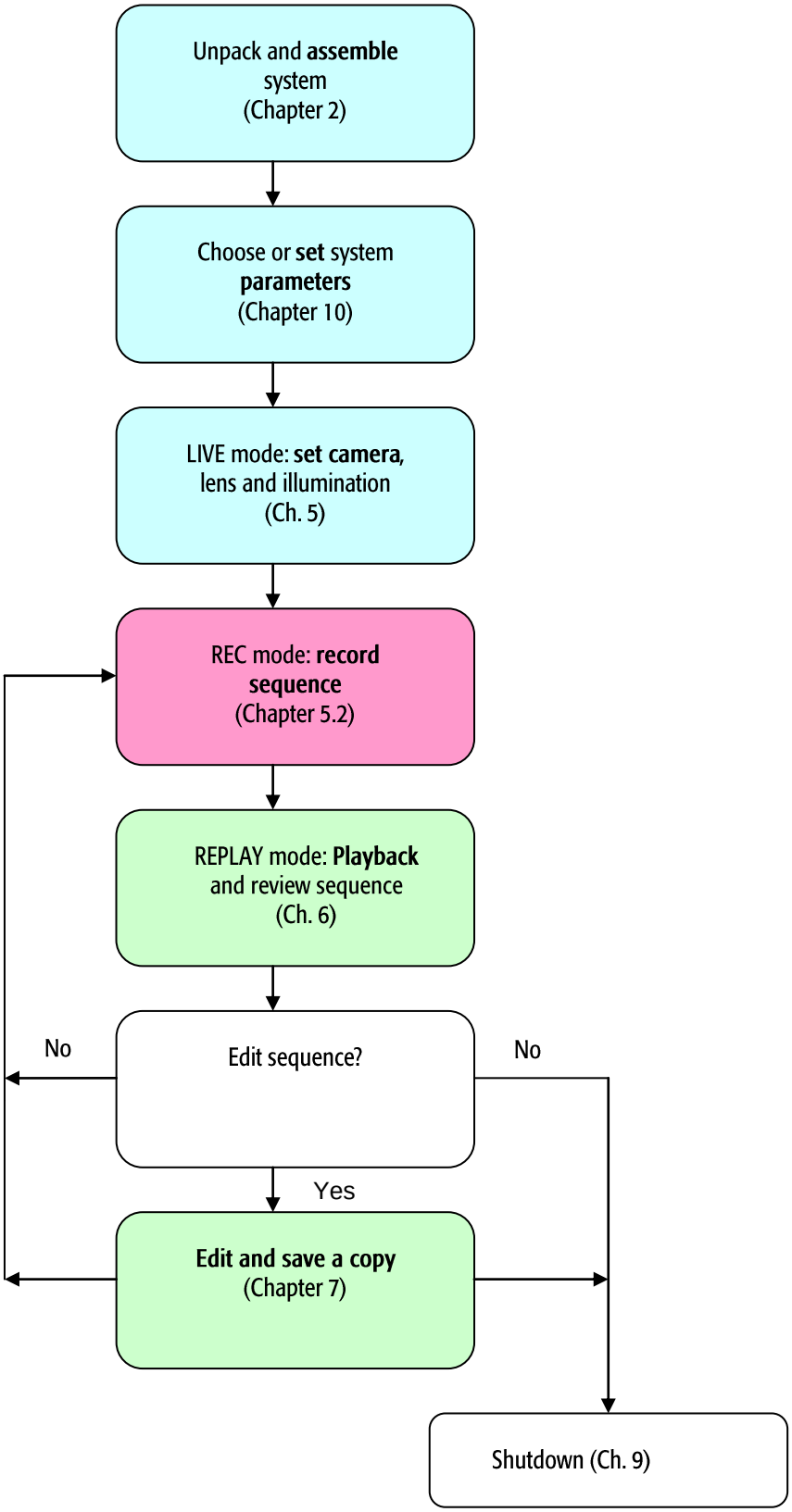
6 Press the 'POWER' button **for approx. 4 secs until the green LED lights up**. The system starts, and once the startup routine has been completed, the 'start screen' appears.

The battery capacity lasts for about 120 minutes when fully charged (chosen features like motion detection and AD values reduces battery time).



7 Follow the next chapters for operating instructions

3 Workflow – how to work with PROMON SCOPE G2

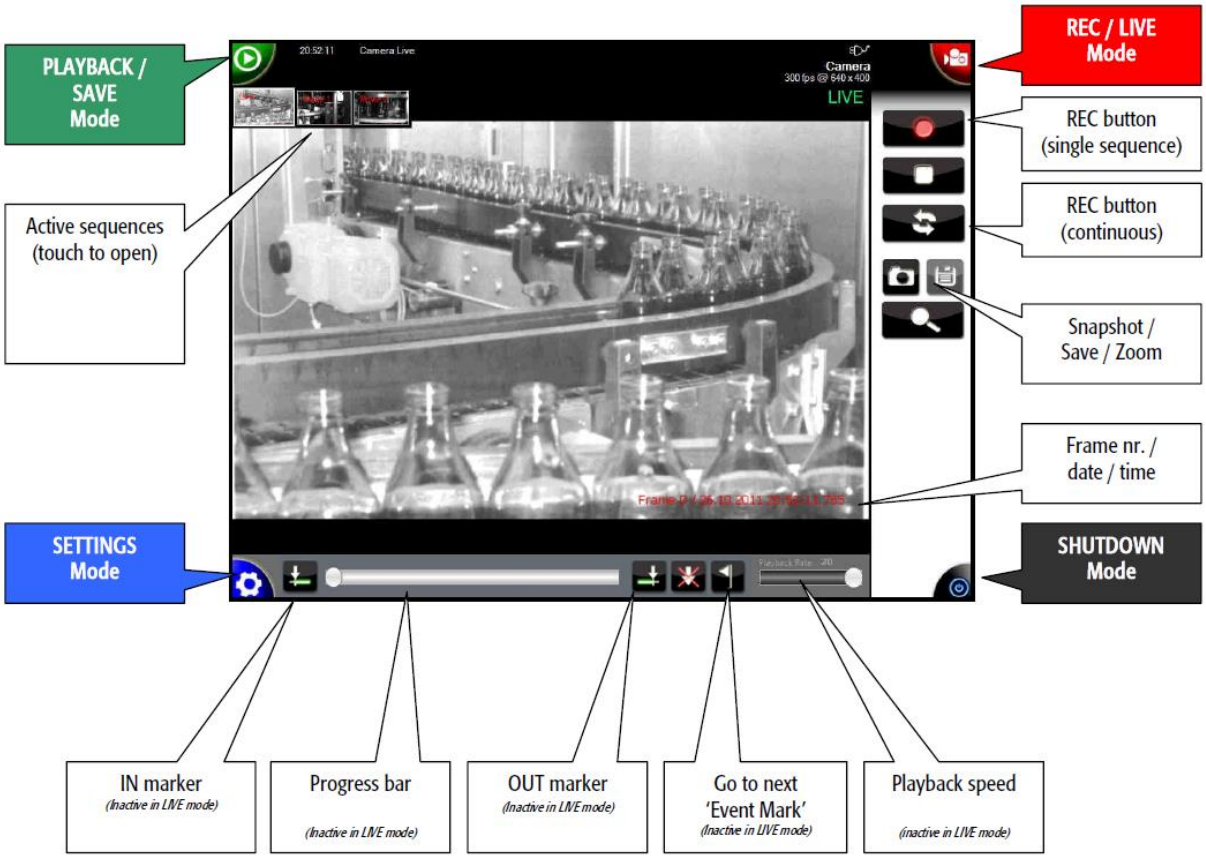


4 Start screen and front buttons

4.1 Start screen

After having PROMON SCOPE G2 up and running you will see the LIVE image of your camera. The system is not yet recording.

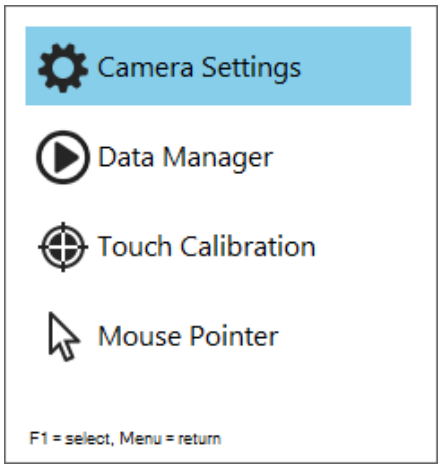
The software interface appears as follows, the functionality of the various 'buttons' on the screen is described like this:



4.2 Front buttons

To access some of the basic functions, use the easy accessible front buttons.

4.2.1 Menu button 

	Please use the arrow buttons and F1 to navigate in the MENU
	Camera Settings (Chapter Set parameters of the camera system)
	Data Manager (chapter Open sequences or movies from the hard disk)
	Touch screen calibration. In case your touchscreen needs to be recalibrated, you can start the calibration setup with the buttons. Please follow the instructions on the screen
	Mouse Pointer, enables the mouse pointer

4.2.2 Shutter 

Use the up- and down- button to adjust the shutter time

4.2.3 User preset 

Access your presets (Chapter Advanced settings)

5 Setting of a scene and start a recording

5.1 REC/LIVE Mode

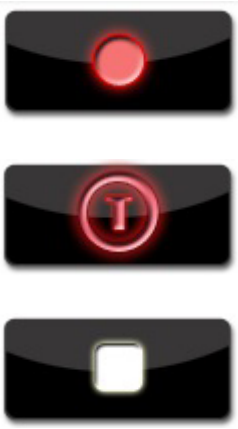
Choose the 'REC/LIVE' mode for recording sequences. Select this mode by clicking to its Mode button on the upper right hand corner.

The camera shows the live image.

5.2 REC Mode

Start recording, triggering

1- position camera and set the iris to get a well exposed image in LIVE mode
2- press 'record' button to start recording
3- complete a recording by either pressing the 'trigger' button (T) or by applying an external trigger signal (closing switch).
4- after having received the trigger signal, the system stops recording after the preset 'post trigger time'
5- the display turns automatically into the 'REPLAY Mode' (see following page)
6- recording sessions can be manually aborted with the 'stop' button

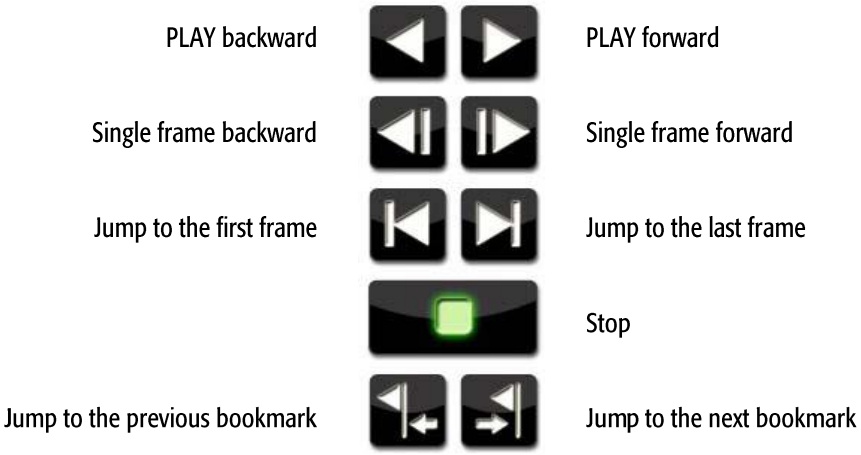


5.3 Using an external trigger signal

In addition to the software trigger any potential-free closing contact can be used to trigger the PROMON SCOPE. Alternatively, a TTL-signals, i.e. from a PLC, can also be used. The falling edge is triggering the system.

6 REPLAY Mode

The recorded sequence is automatically played back in the REPLAY mode. The playback can be controlled either by the buttons on the control bar, or by corresponding 'gestures' on the display.



6.1 Playback frame rate control

The playback speed can be controlled in two different ways:

The **playback 'skip' speed** can be INCREASED by clicking to the 'play forward' (or 'play backward') button several times. Using the play button once will playback every frame, using it twice will skip every second image etc.

note the playback skip indicator in the top info panel (▶) 1

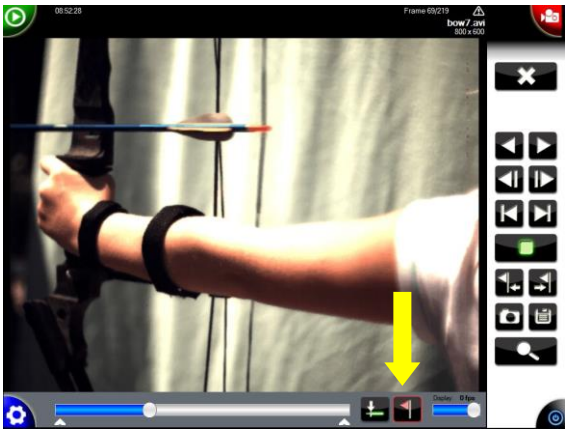
The **playback speed** (display frame rate) can be DECREASED by moving the slider to the left.

6.2 'Bookmarking' important frames in a sequence

Reviewing longer sequences can be time consuming, and directly addressing especially important frames is convenient for the next review, or when showing these frames to others.

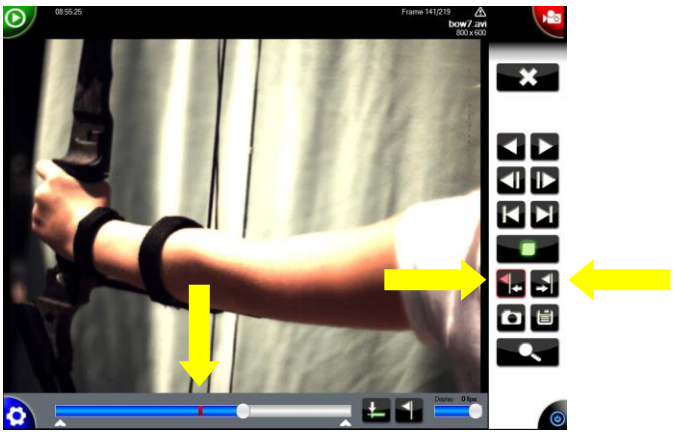
Setting bookmarks

- Play back the sequence
- Mark 'that' frame with the 'bookmark' icon. For a precise marking of the 1st interesting frame, use the 'stop', > and < buttons to get to that frame
- Bookmarks are indicated by red vertical lines on the playback progress bar
- Set as many bookmarks as you like



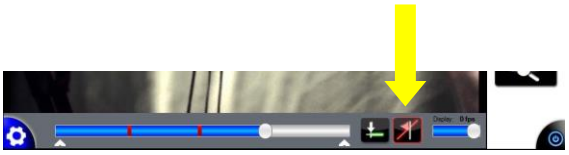
Address bookmarks during playback

- Play back the sequence
- 'Jump' to the next / previous bookmark by using the 'next' resp. 'previous' flag button
- Press > to start the playback from that bookmark, or use 'single frame forward/backward' buttons for a frame by frame review.



Delete bookmarks

- Jump to a bookmark
- The bookmark icon has changed his function to 'undo'. Press that button to delete a bookmark
- The bookmarks get automatically saved if you close a sequence, and appear again at the same place when the sequence is opened again



7 Editing, Storage and file setting

All sequences are stored on a non-volatile SSD (Solid State Disk), they don't need to be manually saved for future use. However, in most cases it is not necessary to keep all sequences, and not even complete sequences for archiving and later use. Manually saving the critical part of a sequence is an effective way to keep the amount of image data compact and simplifies data handling.

This is done by 'editing' a recorded sequence.

Set begin frame of edited sequence ('in' mark)

Set end frame of edited sequence ('out' mark)

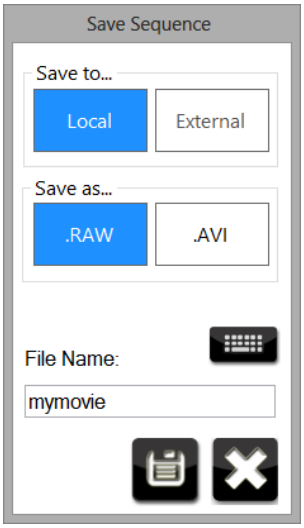
Undo: Reset begin frame and end frame to the first and last frame of the sequence

8 Saving and opening a sequence manually

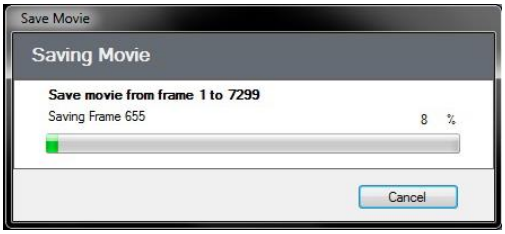
8.1 Saving

Sequences – at full length or just important parts of it – can be either downloaded to the hard disk drive in standard AVI format or exported to an USB-memory key or external hard disk drive

1. Press the 'SAVE' button



2. Select the target device:
   - Local: built-in drive
   - External: use SD-Card slot and USB 3.0, to access remove the dust cap of the right upper compartment
3. Select RAW or AVI data format
4. Type in a file name (the on-screen keyboard appears automatically, but can also be de-activated / re-activated by pressing the keyboard sign)
5. Press 'Save' to start the download process
6. To abort the save process, press 'cancel'



The saved sequence will be automatically displayed in the REPLAY mode

Note: Windows players can only execute AVI files not exceeding the size of 2GB. This limitation is set by Windows itself. Please pay caution when converting raw files into AVI.

If the sequence will be stored to an external device (e.g. USB memory key), we strongly recommend to use a new, 'clean' memory key and reserve it for this purpose. This will help to minimize the risk to import possible virus from unknown sources.

8.2 Open sequences or movies from the hard disk

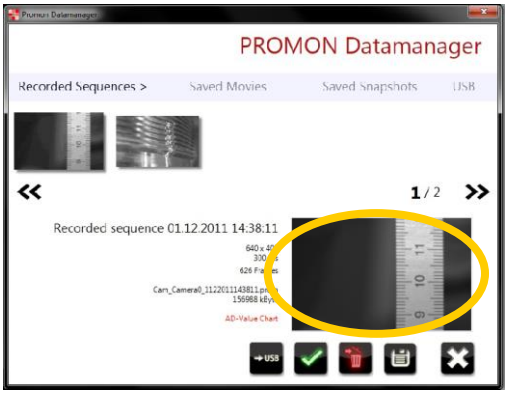
Once stored, sequences may be retrieved, played back, edited and stored again in the same or any other format.

1- Select the 'PLAYBACK' mode on the upper left hand corner

2- Select between 'sequences' and 'movies':

'sequences' = PROMONs original image data

'movies' = manually saved video files in standard AVI or RAW format



3- Select an appropriate video clip; it will be played back in the thumbnail preview. Select multiple files by using the check button.

4- Confirm and open this clip by clicking into the thumbnail preview window

5- Delete the video clip by clicking the paper bin symbol (Delete multiple files if any checked)

6- Save a video clip in RAW format as an AVI file by using the 'save' button

7- Export the video clip by clicking the 'USB' or 'Ext' symbol (export multiple files if any checked), see chapter 8.3.

8.3 Export 'Sequences' and 'Movies'

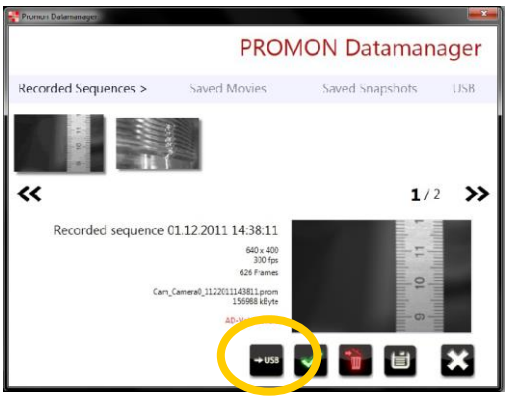
Sequences and Movies can be exported to any Windows-PC for further use by using an USB memory key or drive, or using the onboard SD-Card slot. To access the SD-Card slot and USB 3.0. remove the dust cap of the right upper compartment.

1- Select the 'PLAYBACK' mode on the upper left hand corner

2- Select between 'sequences' and 'movies':

'sequences' = PROMONs original image data

'movies' = manually saved video files in standard AVI or RAW format



3- Select an appropriate video clip; it will be played back in the thumbnail preview.

4- Click to the 'Export' (Ext or USB) button

5- Choose if just the selected or all files from this folder should be exported to the USB stick

6- Multiple files can be transferred by using the 'check' button. All checked files will be transferred, deleted or saved at once.

Note: Due to the high frame rate, the video files are quite big and need substantial free memory. To save space, cut the sequence(s) to the necessary part (see chapter 7)

9 Shutting down

The PROMON SCOPE G2 is shut down with the 'shut down button' on the tool bar.

Next, the 'clean disk before shutdown' appears, allowing to clean some or all files, or to shut down without deleting any sequence, or to return to PROMON SCOPE to continue working.

Delete recorded sequences	deletes all originally recorded PROMON files on the D: drive and shuts down
Delete all movies	deletes all RAW, AVI and BMP files on the D: drive and shuts down
Shutdown without deleting	keeps all files and shuts down
X	invalidates the shutdown command and returns to PROMON SCOPE to continue recording or play back

Note: we recommend to use the 'delete all files' whenever possible to make sure the Solid State Disk is offers its maximum capacity.

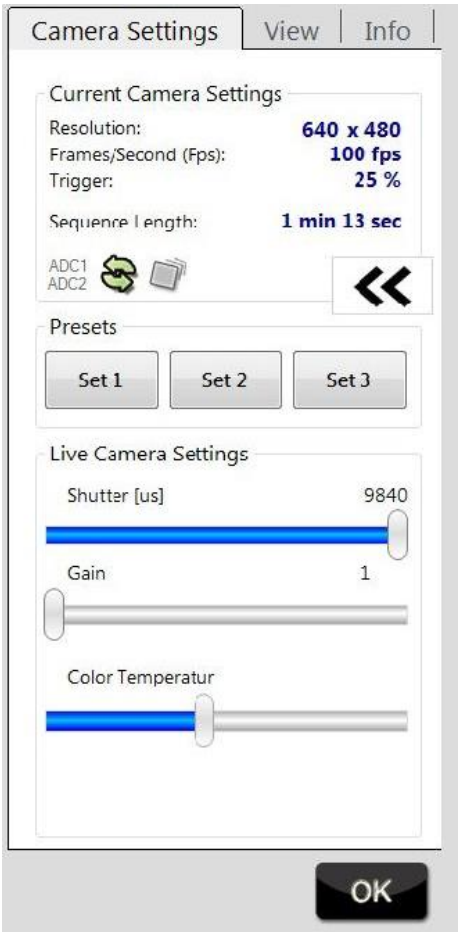
You can also turn off the PROMON SCOPE G2 by shortly pressing the hardware 'Start button' on the right hand side of the PROMON SCOPE. The shutdown dialog will not appear, PROMON SCOPE G2 will shut down immediately.

NEVER switch off the system by pressing the hardware 'Start button' at the front for longer than 3 seconds. This action will skip a proper shut down, severe damage to the system can occur.

10 Set parameters of the camera system

Choose the 'setting' mode by clicking to the blue button on the lower left hand side 

10.1 Quick settings:



Current Camera Settings (information only)

Resolution	Image resolution
Frames/Second (fps)	Indicates the time recorded prior the trigger
Trigger	Trigger position
Sequence length	Length of video 'clip'

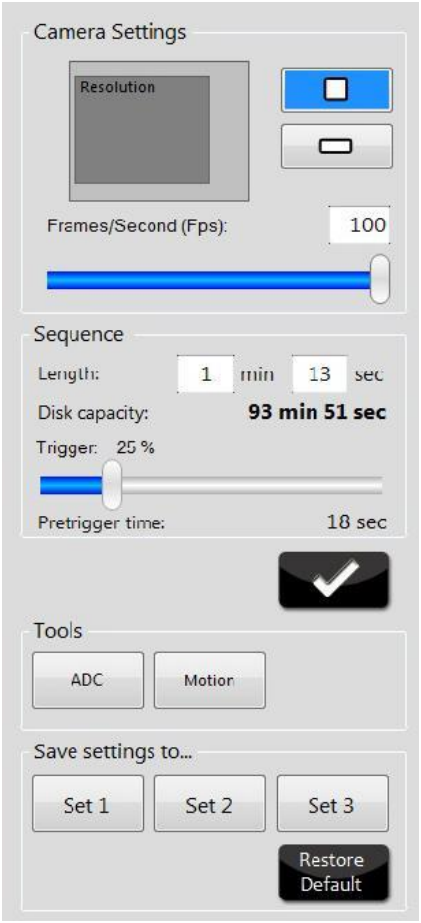
To change the camera settings, select a different preset ('set 1', 'set 2', 'set 3', or change the settings manually on the 2nd page of the settings (>>)

Live Camera Settings

Set 1, Set 2, Set 3	Select a different preset
Shutter	Move indicator to the LEFT for shorter shutter times (less motion blur but darker image), to the RIGHT for longer shutter times (brighter image, more blur)
Gain	Increase image brightness by moving indicator to the RIGHT
Color Temperature	Balance the color temperature for natural colors (for color cameras only)
OK	Confirm your settings with OK
>>	Change to the advanced settings

10.2 Advanced settings:

Extend the 'Quick Settings' tab by using 



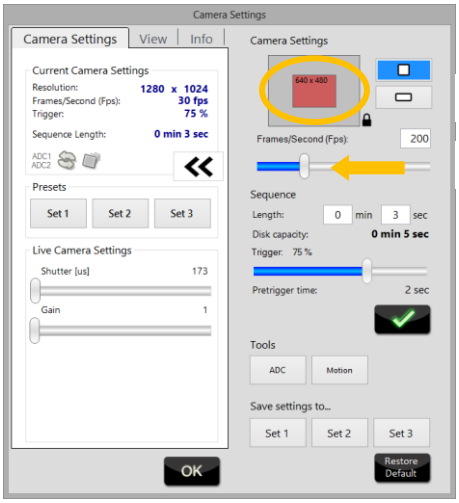
The parameters may be adjusted as follows:

Resolution	Image resolution, depending on the selected frame rate
Image format	Choose between the 'classic' and the 'wide screen' format
Frames/Second	Frame rate ('speed')
Sequence length	Click to the 'min' filed to set a different sequence length. A keypad will appear, type in the desired length, confirm with ENTER. Repeat the same for the 'sec'
Disk Capacity	Total available capacity to record (export or delete existing sequences and movies occasionally to create free disk space)
Trigger	Trigger settings. Refer to page 5 for a details explanation of the trigger function
Pretrigger time	Pretrigger time
Tools	Refer to chapter 13, 14 and 15 for these functions
Save settings to…	Overwrite existing presets with your new settings Press 'Restore Default' to restore the factory presets

Change the frame rate to set your desired 'recording speed'. The resolution will automatically be set to maximum possible size.
In certain cases (e.g. if you like to extend your recording time or keep the data amount as small as possible) it is not desired to have the maximum resolution set to a corresponding frame rate. If you like to keep the resolution small while you are decreasing the frame rate, proceed as follows:

1. Set your desired resolution by increasing the frame rate
2. Click the 'resolution rectangle' to lock the frame size. The rectangle will change its color to red
3. Set your desired frame rate. The frame size will remain locked (unless you will further increase the frame rate)

To unlock the resolution click the 'resolution rectangle' again.

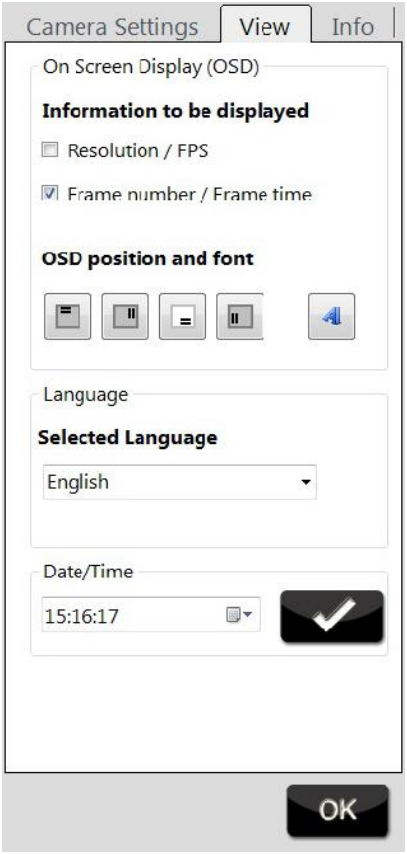


1.

2.

Confirm the new settings with the 'check' button; the settings will only be applied to the camera by confirming. The check button glows green if there are 'not applied' settings.

11 ‚VIEW' settings tab



The parameters may be adjusted as follows:

On Screen Display (OSD)	Select if and which information should be stamped to each image
Resolution / FPS	Image resolution and frame rate
Frame number / time	Frame number and date/time when the particular image was recorded. Important for later analysis.
OSD position	Select the position where the OSD information should be positioned
Language	Choose the language
Date/Time	Set the system date and time Confirm with the 'check' button

Confirm by pressing 'OK'

12 'Info' setting Tab

The 'Info' Tab does not allow any settings, it is for information only about the current conditions of your PROMON system.

Please let our support team know the model, Serial no. as well as firmware release to simplify assistance.

The 'available option' indicates which options are activated.

Close this Tab with the OK button

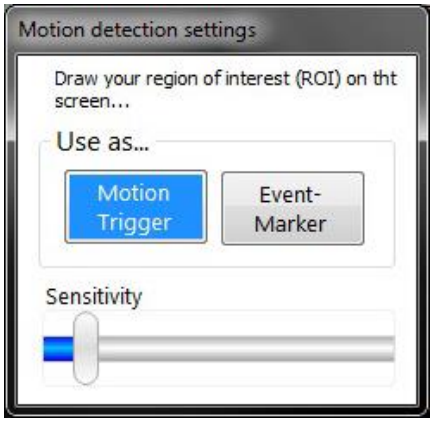
13 Motion Detection

Motion Detection is a convenient feature for automatic triggering or marking specific events of your sequence for fast access.

13.1 Image Trigger

'Image trigger' is the possibility to trigger the camera system automatically

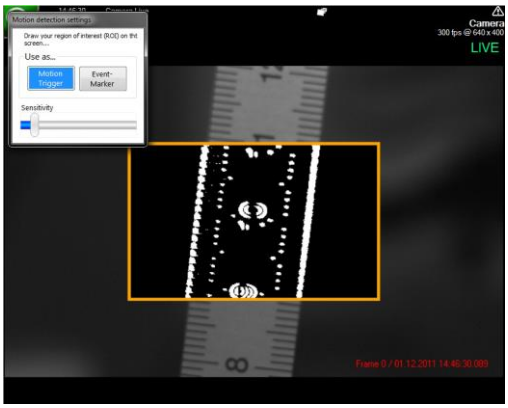
Image Trigger

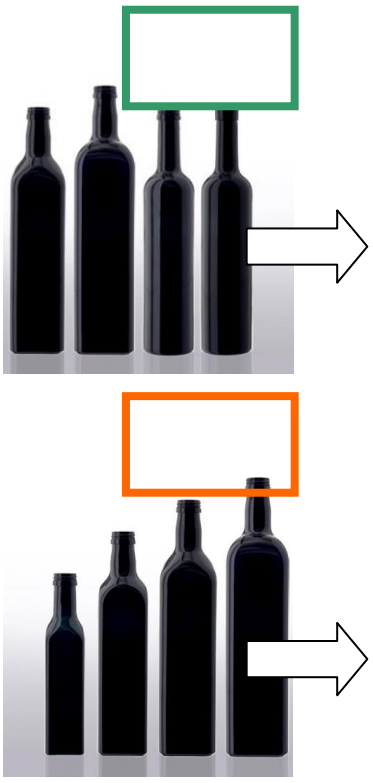


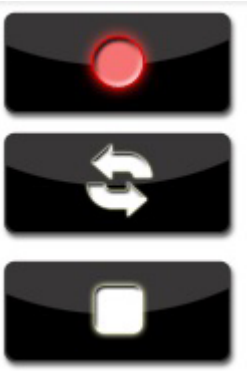
1. Select the 'setting' mode, change to the 'advanced settings'
2. Select 'Motion' in the tools box
3. Select 'Motion Trigger'
4. a green ROI (= region of interest' appears
5. Place this ROI to the appropriate position
6. set the 'sensitivity' to a level so the ROI frame is green when not activated, and changing to orange when the object gets into the ROI
7. Start recording by using the 'rec' button
8. when the object activates the ROI, the system triggers automatically and the sequence is being played back.

Example:

The camera system triggers automatically when the tallest bottle is detected





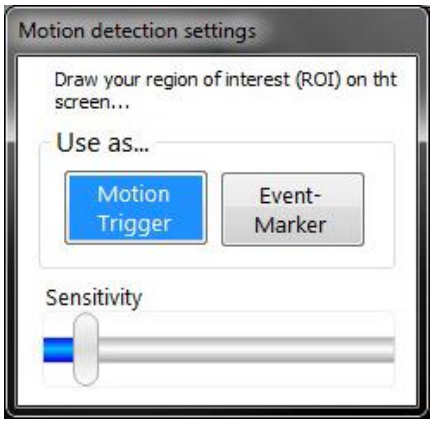


13.2 Event Marking

Events can be automatically marked by one or multiple ROI's. Marked events can be directly accessed without time consuming reviewing.

Event Marking

1. Select the Motion Detection in the Settings Mode, advanced settings, tools
2. Choose 'Event Marker' from the 'use as' selection
3. a green ROI (= region of interest' appears)
4. Place this ROI to the appropriate position
5. set the 'sensitivity' to a level so the ROI frame is green when not activated, and changing to orange when the object gets into the ROI
6. Start recording by using the 'rec' button. If the content inside a ROI changes, the ROI will issue a marker
7. Trigger the system as usual with a software- or external trigger
8. In REPLAY mode, the 'events' can be directly addressed, using the 'next event' and 'previous event' buttons on the tool bar



jump to next event:

jump back to previous event:

Note: The ROI are only visible in the LIVE mode, but NOT in the REC mode

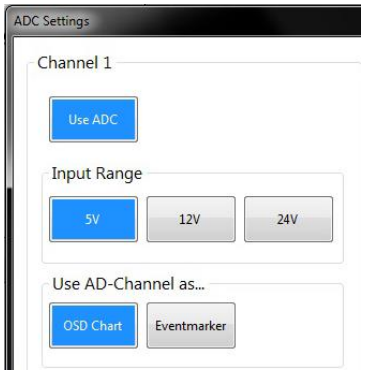
14 Integration of external signals

14.1 Integration of external signals – recording analogue data together with images

PROMON SCOPE G2 offers 2 AD-channel to integrate external signal from the appliance, i.e. voltage, temperature, pressure as well as status signal like 'open', 'closed', with the image sequence to provide additional information.
The integration of external signals turns the PROMON SCOPE G2 into a simple data recorder or data logger.

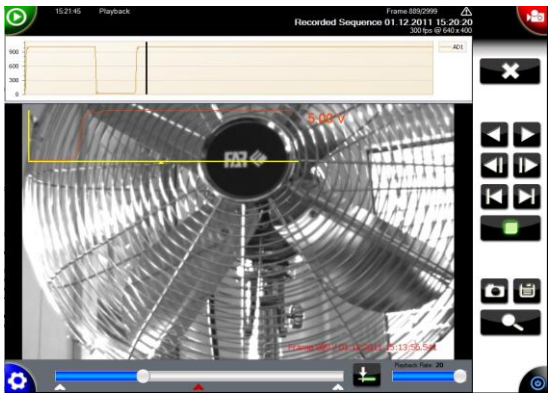
O/I Cable it's not part of the scope of supply and can be ordered as accessory.

1. Select the 'setting' mode, change to the 'advanced settings'
2. Select 'ADC' in the tool box
3. Activate Channel 1 by clicking to 'Use ADC'
4. Choose the appropriate Input Voltage Range, depending on your sensor
5. Choose 'OSD Chart'



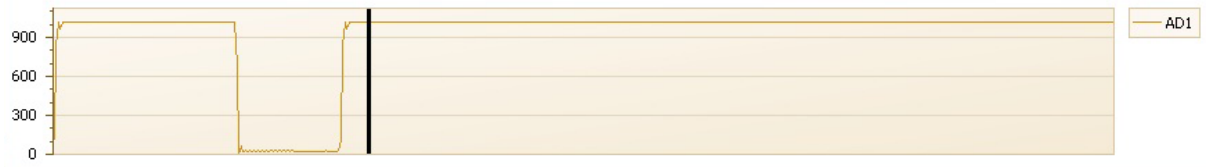
6. Connect an appropriate sensor to 'CH1 or CH2 on the cable (or check technical specification on chapter 21 for connector pinout)
7. Record a sequence ('rec' + 'trigger')

8. The sequence is automatically played back; the chart with the measured signal is displayed on top of the sequence

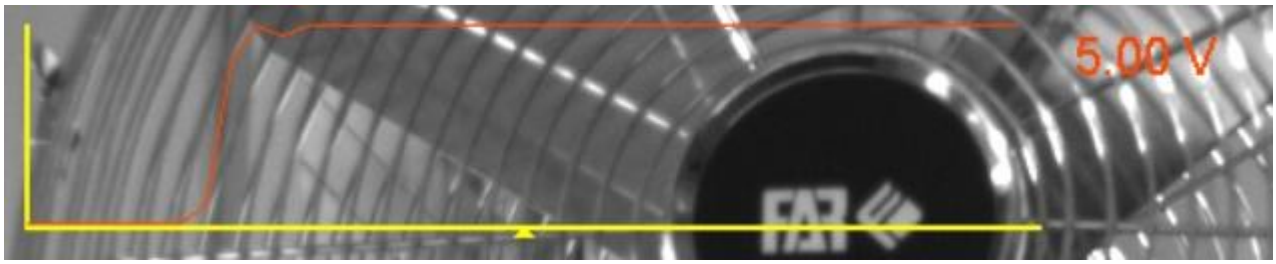


Note: The ADC input of the PROMON SCOPE G2 only accepts voltage-based sensors. Passive sensors, where a changing resistance represents the measured value (i.e. NTC or PTC temperature sensors) will NOT work.

The top 'AD chart' shows the external signal as received by the AD channel 1 for the total length of the sequence.



The 'AD close up diagram' integrated to the image shows the external signal for the previous 20 and the next 20 frames.



The 'AD value' shows the external signal as a numeric figure. The AD chart can also be used to quickly find an event by clicking to spot where the external signal changes rapidly.
AD-channel 1 is displayed with a green line, its AD value with green letters, the AD-channel 2 is displayed with a red line, its AD value with red letters.

For advanced and specific AD settings, press the 'calibrate ADC' button

1. Type in your preferred unit to the 'units' field (i.e. 'V' for volts, 'DEG C' for temperature etc.)
2. Type in the minimal value to the 'Zero' field. If your sensor provides 0 volts, that signal will be displayed as '0'
3. Type in the range value to the 'Span' field
4. press 'OK' to get to the LIVE or REC mode

Note: the advanced settings are just set for the actual session and are not stored permanently.

Example:
Sensor: Temperature sensor 50…200 degrees C, 0…12V

- Select '12V' on the 'Input Settings'
- Press 'Calibrate'
- Type 'CELSIUS' into the 'Unit' field
- Type '50' into the 'Zero' field
- Type '200' into the 'Span' field
- Confirm with 'OK'

The AD charts and values displayed on the PROMON SCOPE G2 are not ultra-precise values as measured with a dedicated meter or data logger. It should merely provide additional information

about conditions at the time an event occurred and has been recorded.
If precise measurements need to be taken we recommend using dedicated measuring tools.

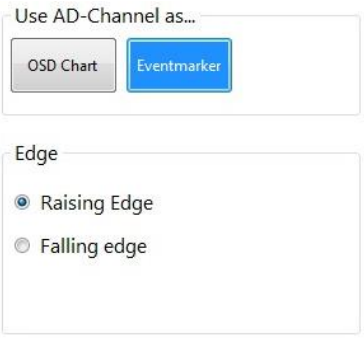
14.2 Event marking with external signals

Beside 'event markers' created by the motion detection function (see chapter 13.2), events can be marked in a similar way by using external signals connected to ADC 1 resp. ADC 2. Each input signal will mark an event if a threshold of 75% of the selected input range is exceeded.

Event Marking

1. Select the 'setting' mode, change to the 'advanced settings'
2. Select 'ADC' in the tool box
3. Activate Channel 1 by clicking to 'Use ADC'
4. Choose the appropriate Input Voltage Range, depending on your sensor
5. Choose 'Eventmarker'
6. Connect an appropriate sensor to 'CH1'
7. Record a sequence ('rec' + 'trigger')
8. The sequence is automatically played back; the 'events' can be directly addressed, using the 'next event' and 'previous event' buttons on the tool bar

O/I Cable it's not part of the scope of supply and can be ordered as accessory.



jump to next event:

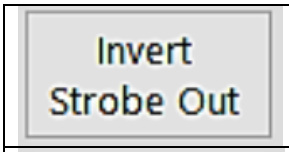
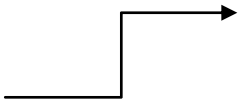
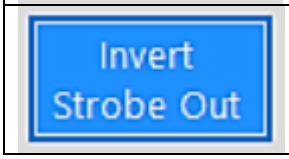
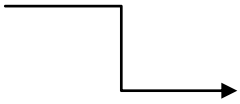
jump back to previous event:

Note: The ADC inputs of the PROMON SCOPE G2 only accept voltage-based sensors. Passive sensors, where a changing resistance represents the measured value (i.e. NTC or PTC temperature sensors) will NOT work.

15 Using a strobe synch signal

In order to control an external strobe light or to synchronize additional equipment (like other cameras, data logger.. etc.), PROMON SCOPE G2 offers a Strobe out signal. It's a TTL based signal (frame integration starts at rising / falling edge of the signal).

To work with different types of lightings or DAQ System, it's possible to invert the Strobe signals according the needs:

	Normal Low Signal High Rising Edge 
	Normal High Signal Low Falling Edge 

* Signal period length equal sensor integration time (Shutter time)

O/I Cable it's not part of the scope of supply and can be ordered as accessory.

16 Playback-while-recording

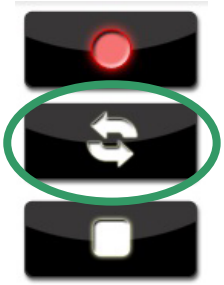
PROMON SCOPE offers the possibility to playback recently recorded events while the system continues recording. This function is very helpful for an automated process monitoring. The system is continuously recording, and every time it is triggered (automatically via an Image Trigger (see chapter 13.1), externally from i.e. a PLC or vision system status line or by a manual trigger), it stores a 'sequence' on the SSD and rearms the recording again. Any of these sequences can be opened while the system continues to record and is waiting for the next trigger signal.

This is the ideal setting for an unmanned process monitoring, i.e. during a night shift.

Analysing the time stamp of a ‚sequence' gives an indication whether the failures have been detected in the same time frame as other events or if they have become a trend.

Playback-while-recording

1. In the 'REC/LIVE' mode, activate the 'continuous' button
2. start recording by clicking the REC button
3. trigger as usual
4. the message 'n new sequence available' appears in the lower left hand corner, indicating that a sequence has been completed and can be played back
5. open this sequence (playback mode / data manager, newest sequence is the last sequence is visible in the thumbnail preview, click to the thumbnail preview to open the sequence)
6. while the sequence is played back, the system continuous to record, waiting for the next trigger signal
7. End the recording session by clicking the 'stop' button



17 Other functions

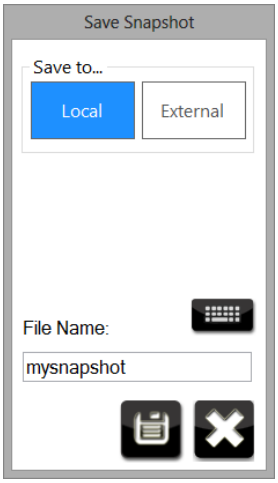
17.1 Magnifying glass ('zoom in')

1. To better see small details, click to the 'loupe' icon
2. The image gets smaller (actual size)
3. Click to any place in the image, and it will enlarge
4. Repeat clicking until the desired magnification is reached
5. Switch-off the 'zoom' mode by clicking again to the 'loupe' icon
6. You can also use the displayed picture tracker window to navigate through the image by moving the red rectangle on the thumbnail picture.

17.2 Capture a single image

With the "Capture an Image" button a single image can be stored ('snapshot', ideal to illustrate reports).

1. In PLAYBACK (or REC) mode, stop the playback at the appropriate position and press the 'snapshot' button
2. Select 'Local' (built-in solid state disk) or an 'External' storage device (e.g. USB key) as the target device and type in a file name and press 'OK'
3. If stored to an USB memory stick, remove the stick, insert it to your Windows PC and import the BMP-Image to your document of choice



Note:

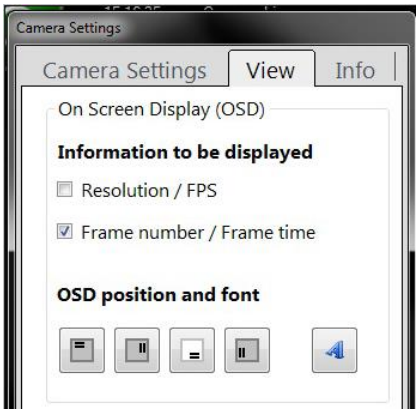
Single images are always stored in standard BMP file format

The snapshot can be reviewed by using the 'PROMON Datamanager'

17.3 Show the OSD (On Screen Display)

AOS *PROMON SCOPE* provides an option for displaying setup information and system time information with multiple location choices on the image

1. Select the VIEW TAB in the Setting TAB
2. Use the check box to display the camera setup and the system time in the sequence. As a default, the 'Frame number / Frame time' is activated.
3. Select the orientation using the OSD orientation buttons
4. Select the font and size of the text with 
5. Confirm with 'OK'



17.4 Change language

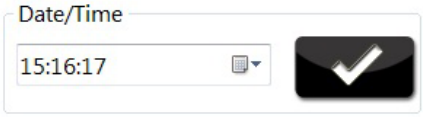
AOS *PROMON SCOPE* offers various user languages to simplify the use of the system

1. Select the VIEW TAB in the Setting TAB
2. Use the pull-down menu to select other languages than the active one
3. Confirm with 'OK'

17.5 Setting date and time

Matching image sequences with the real time of day or with PLC logs, an accurate Real-Time-Clock of the AOS *PROMON SCOPE* is essential. To change the preset date and time, use the following steps:

1. Select the VIEW TAB in the Setting TAB
2. Click to the pulldown icon to open a calendar and numeric key pad. Select todays date from the calendar, and type in the actual time using the numeric key pad
3. Confirm the setting with the 'check' icon
4. Confirm with 'OK'
5. Verify the correct date and time setting by checking the OSD in LIVE mode

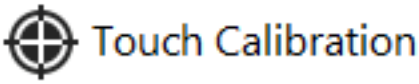


17.6 Touchscreen re-calibration

In case your fingertip or pen does not precisely 'hit' the tick-boxes, a 're-calibration' of the touch screen display is necessary.

1. Push the MENU Button

2. Use the up and down arrows to highlight Touch Calibration



3. Press F1 to select Touch Calibration
4. Use a pen (or similar device with a sharp tip) to touch the center of each crosshair marker. Apply pressure as long as the marker is blinking
5. repeat step 3 for the other 3 crosshair markers (appearing automatically one after the other)
6. Your touchscreen display is now re-calibrated, and the system returns automatically to the PROMON application

18 Battery operation / battery care / battery replacement

The PROMON SCOPE G2 features a built-in rechargeable battery for true mobile operation.

Battery charges for about 2.5-3 hours (if completely drained), orange led turns off when charging is completed

You can use the system while charging the battery, but this will take longer to fully load the battery and may case more heat development of the system. We recommend loading an empty battery while the system is not in use.

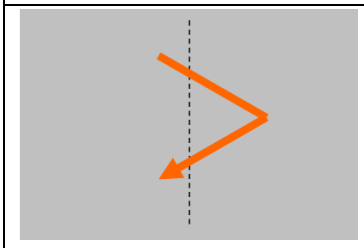
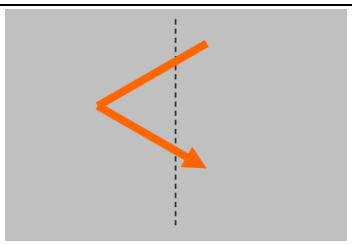
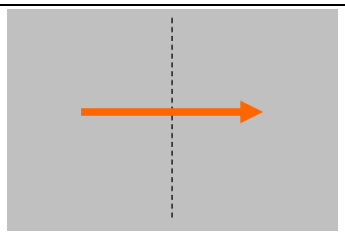
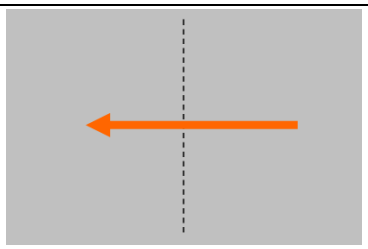
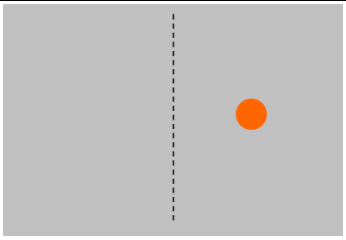
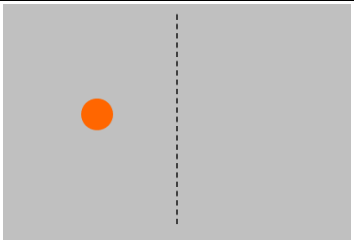
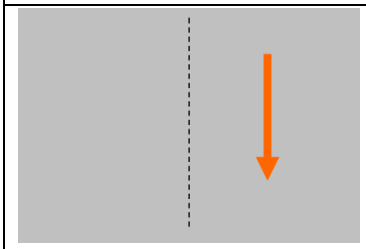
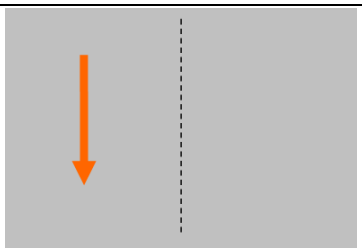
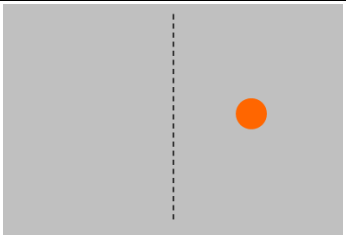
System can be used on battery only; its capacity is good for about 120 minutes.

To replace the battery, make sure your system is shot down and turned off before you starting to change the battery. To change the battery, simply unscrew the four battery screws and replace the battery with another one. Please fully load the battery before you switch on the system

19 Gestures

The playback of a sequence or movie can be controlled either by the playback button or by corresponding 'gestures' on the display.

Use moderate pressure and your finger only (or any non-scratching device) to operate the touch screen display – otherwise damages of the sensitive surface may occur

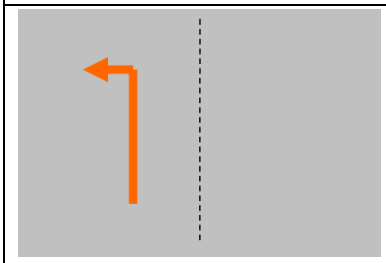
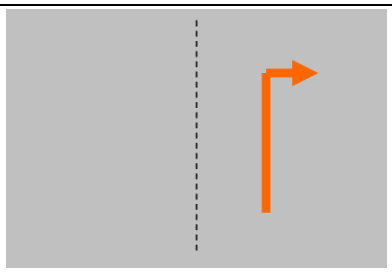
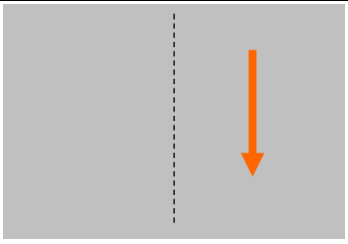
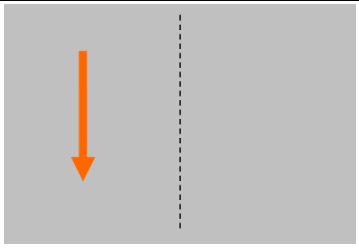
Gesture	Button	Gesture	Button
 Playback continuous forward		 Playback continuous backward	
 Fast forward		 Fast backward	
 Next frame (+1)		 Previous frame (-1)	
 Jump to the last frame / 'out' mark		 Jump to the first frame / 'in' mark	
 Stopp			

Playback control

The playback speed can be controlled like this:

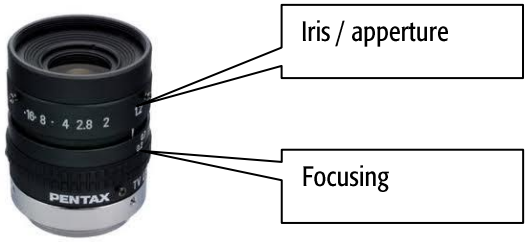
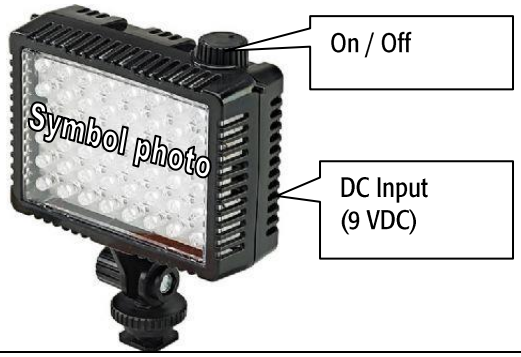
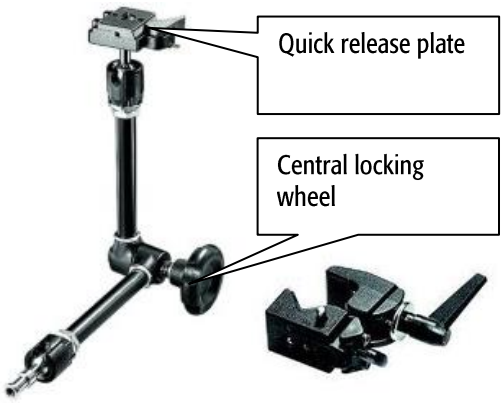
Decreasing playback speed			
Increasing playback speed (skipped frames)			Each time you use the 'play' button or gesture, the playback speed doubles

An increased playback speed is achieved by skipping frames, which may result that very short events will not be displayed. Use therefore the 'skip frame' function carefully.

Gesture	Button	Gesture	Button
 **Set 'in' mark**		 **Set 'out' mark**	
 **Jump to the last frame / 'out' mark**		 **Jump to the first frame / 'in' mark**	

20 Accessory kit (optional)

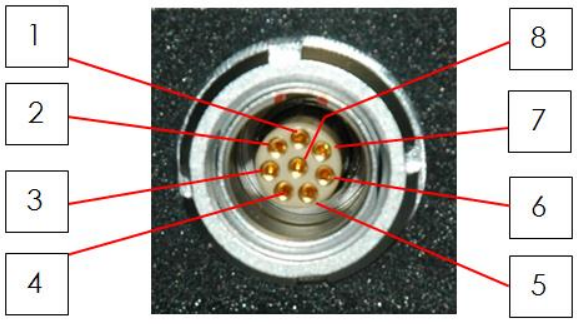
AOS offers an accessory kit with carefully selected components for an immediate use of your PROMON SCOPE system.

Item	Description	Picture
1	Case Heavy duty transport case for the complete system, incl. magic arm. We recommend using a robust cardboard box with extra padding around the transport case for shipping. A dedicated 'transport trolley' is available on request from AOS	
2	Lens 'all-round' lens for a wide range of applications. - manual focusing - manual iris For specific applications, other CCTV lenses can be directly attached: - c-mount lens thread - 2/3" image size	
3	LED light Battery powered LED light, mounted on an easy to install clamp. The robust ballhead allows a fast fine-positioning of the light head. The LED light can be externally powered with a power supply providing 5..12VDC (not included)	
4	Camera fixture Magic arm camera fixture, incl. quick release plate and Super Clamp. The single locking wheel allows a fast camera positioning; fine positioning can be done with the locking wheel halfway tightened. Install the dovetail plate at the camera permanently for a convenient fixture.	

21 Technical specifications

Image resolution and Frame rate (standard)	**Camera dependant:** PROMON 500: 100 fps (1280 x 1024 pixels), 500 fps (640 x 480), 2000 fps max. (544 x 120) PROMON 501: 90 fps (1280 x 1024 pixels), 560 fps (640 x 480[1]), 3000 fps max. (320 x 96 pixels)
Recording capacity	40 minutes (or longer at reduced frame rate and resolution) (Optional upgrade to 80 min available)
Data export	USB3.0 (USB-stick) or SD-Card
AD input (1 channel standard, 2nd channel optional)	5, 12 or 24VDC, 1 sample/image, 10 bit
Size and weight (control/display unit)	266 x 220 x 50.5 mm/ 2.8kg
Size and weight (camera modul)	45 x 55 x 100mm / 0.4kg
Battery capacity	Approx. 120 minutes
Battery charging time	Approx. 2.5-3 hours

21.1 Pinout AOS PROMON Scope G2 I/O



PROMON Scope connector

Cable side: Front view

Pinout

Pin	I/O	PROMON Scope	Signal	Function
1	-	GND	Ground	Ground
2	Output	Strobe	TTL	Strobe out for strobe lights
3	Input	AD 2	Analog	Analog signal measurement
4	Input	AD 1	Analog	Analog signal measurement
5	N.C	-	-	-
6	N.C	-	-	-
7	N.C	-	-	-
8	N.C	-	-	-

[1] 'PROMON 501'- mode. Camera needs to be skip 90°

22 Technical support

- For questions about the PROMON SCOPE G2 functions and how to use them, please contact your AOS partner who sold the system
- In the unlikely case the PROMON SCOPE G2 does not start, or stops operating for other reasons than a discharged battery, please contact our support team for assistance (support@aostechnologies.com).

23 Limited Warranty

LIMITED WARRANTY
(For New Products)

AOS Technologies AG, a Swiss Corporation ("AOS") warrants each product manufactured by it ("the product") to be free from defects in material and workmanship for one (1) year from the date of shipment of such Product. The benefits of this limited warranty extend only to the Purchaser.

Items not covered by this warranty and considered 'wear and tear' parts are:
- Rechargeable battery
- Image data storage device (Solid State Disk / SSD)

The warranty will become void and AOS shall have no obligation pursuant to it if (i) the Product has been modified or repaired in any manner not previously authorized by AOS in writing; (ii) the identification markings on the Product have been removed, defaced, or altered; (iii) the Product was subject to accident, abuse, or improper use: (iv) the Product was not installed or configured as specified in the accompanying instructions, or (v) the Product was subjected to operating conditions more sever than those specified in the accompanying instructions.

Assuming the Purchase is eligible to utilize this warranty, then, in the event that the product should prove defective, the Purchaser must (a) notify AOS in writing promptly upon discovery of the defects with a detailed description of such defects, (b) obtain a Return Materials Authorization ("RMA") Number from AOS, which AOS agrees to provide promptly upon request, and (c) return the Product to AOS (together with both proof of purchase and the name and mailing address of the Purchaser) properly packaged to avoid further damage, addressed to "AOS, Täfernstrasse 20, CH-5405, Baden-Daettwill, Switzerland, with transportation and other applicable charges prepaid by the Purchaser.

The liability of AOS under the foregoing warranty is limited, at AOS Technologies option, solely to repair or replacement with an equivalent Product (which may include a refurbished or previously-owned Product), within a reasonable time from the receipt of the Product by AOS. All repaired or replaced Products shall be warranted for the remainder of the original warranty period or, if longer, for three (3) months from shipment back to the purchaser.

OTHER THAN THE LIMITED WARRANTY SET FORTH ABOVE, AOS TECHNOLOGIES MAKES NO OTHER AWARRANTY OR CONDITION, EXPRESS OR IMPLIED, WITH RESPECT TO THE PRODUCT. No AOS Technologies dealer, agent, or employee is authorized to make any modification, extension, or addition to this warranty. Unless unenforceable or unlawful under applicable law, AOS TECHNOLOGIES DISCLAIMS ALL IMPLIED WARRANTIES AND CONDITIONS, INCLUDING ANY IMPLIED WARRANTIES OR CONDITIONS OF MECHANTABLILITY, NON-INFRIGNEMENT, AND FITNESS FOR A PARTICULAR PURPOSE, AND THE LIABILITY OF AOS, IF ANY, FOR DAMAGES RELATING TO OR RESULTING FROM ANY PRODUCT OR ITS USE, WHETHER ALLEGEDLY DEFECTIVE OR OTHERWISE (INCLUDING WITHOUT LIMITATION A CLAIM FOR LOSS OF USE OR LOSS OF DATA) SHALL UNDER ANY TORT, CONTRACT, OR OTHER LEGAL THEORY BE LIMITED TO THE ACTUAL PRICE PAID FOR SUCH PRODUCT AND SHALL IN NO EVENT INCLUDE INCIDENTAL, CONSEQUENTIAL, SPECIAL OR INDIRECT DAMAGES OF ANY KIND, EVEN IF AOS IS AWARE OF THE POSSIBLITY OF SUCH DAMAGES.

24 Notes