



Operator Manual

ARRAYCAM 5420

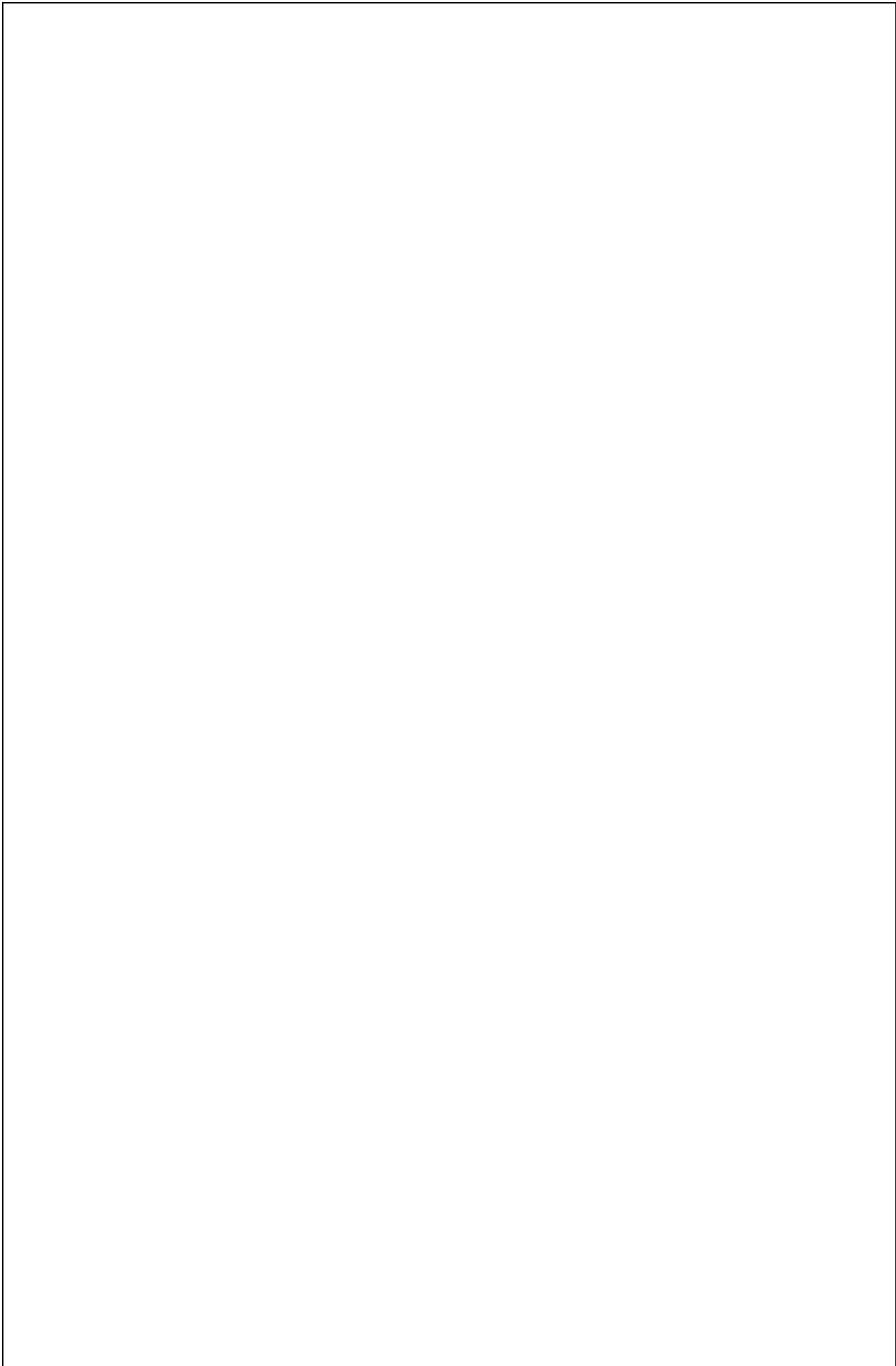
Web GUI

Software version control unit from xxxx
Software version base station from xxxx



PROTECHNA Herbst GmbH & Co. KG
Lilienthalstr. 9
85579 Neubiberg
Germany

Phone +49 (0)89 608 114-0
Fax +49 (0)89 608 114-48
Email info@protechna.de
Internet www.protechna.de



Copyright

This manual is protected by copyright. All rights reserved. This document must not be copied, reproduced, abbreviated, or translated in any form, wholly or in part, using either mechanical or electronic means without obtaining prior consent in writing from PROTECHNA Herbst GmbH & Co. KG

The information included in this manual has been checked thoroughly and found to be in order. PROTECHNA Herbst GmbH & Co. KG does not, however, accept any responsibility for any inaccuracies that may be found. Under no circumstances shall PROTECHNA Herbst GmbH & Co. KG be held liable for immediate, direct or unforeseeable damage resulting from errors or omissions in this manual, even if this possibility is pointed out.

In the interests of continuous product improvements, PROTECHNA Herbst GmbH & Co. KG reserves the right to make changes to this manual and to the products described therein at any time and without notice.

For more information, please contact:

PROTECHNA Herbst GmbH & Co. KG

Lilienthalstr. 9
85579 Neubiberg
Germany



Phone: +49 (0)89 608 114-0
Fax: +49 (0)89 608 114-48
Email: info@protechna.de
Internet: www.protechna.de

Contents

1	Safety instructions	5
2	Functional description	6
3	Connecting to the ARRAYCAMWLAN network	7
3.1	Connecting the mobile device to the ARRAYCAM master module	7
3.2	Accessing the ARRAYCAM homepage	7
4	General Web GUI configuration	8
5	Submenu - Overview	11
6	Submenu - Inspection range	13
7	Submenu - Settings	15
7.1	Common settings	15
7.2	Camera settings	17
7.3	Warp inspection	19
7.4	Weft inspection	21
7.5	Sensitivity wizard	22
7.6	Fault width wizard	23
8	Submenu - Data archive	26
9	Submenu - Diagnostics	28
9.1	Service	28
9.2	Recording data	29
9.3	Log files	31
9.4	Camera image	32
9.5	Evaluation	33
9.6	Brightness signal	35
9.7	Sensitivity levels	36
9.8	Camera modules	37
9.9	Exposure control	38
9.10	Miscellaneous	38
10	Submenu - Calibration report	40
11	Submenu - About	41
12	Submenu - Setting up the desktop app	43
12.1	Setting up the Chrome desktop app	43
12.2	Setting up the Edge desktop app	44
12.3	Setting up the Firefox desktop app	45
13	Notes	46

1 Safety instructions

- Always follow all warnings and information that is attached to the device itself or included in this manual.
- This device is sensitive to electrostatic discharge, which may cause damage to the interior of the device or affect its normal operation. Please observe the required precautions when handling components liable to damage as a result of electrostatic discharge.
- Always disconnect the device from the power supply before cleaning, or before removing or installing a device option.
- Do not use any liquid detergents or cleaning sprays for cleaning. Always use only a damp cloth for cleaning.
- Never operate the device in locations where there is a risk of water or other liquids entering the device.
- The place where the device is installed should be sufficiently stable, as the device can be severely damaged by strong impacts, e.g. as a result of it falling to the floor.
- Make sure that the power supply used matches the voltage values as specified for the device.
- Never attempt to insert objects into openings on the device, as short circuits or electric shock could result from the voltage present inside the device.
- Do not attempt to repair the device yourself. Only perform actions on the device as expressly instructed by the manual. Otherwise, you run the risk of touching dangerous live parts inside the device.
- All installation work must be carried out by PROTECHNA technicians or by professional machine technicians and electricians.



**All electrical connections must be completed by suitably-qualified personnel.
Before making any electrical connections, ensure that there is no risk of personnel coming into contact with live parts.**



Use only a dry cloth for cleaning the cameras on the ARRAYCAM 5420. To remove stubborn dirt, use **only isopropyl alcohol** as an additional agent.

2 Functional description

The ARRAYCAM has an integrated WiFi module which provides a WLAN network that can be connected to a laptop/tablet/smartphone. This gives you access to the integrated web server, which provides an HTML operating interface for operation of the ARRAYCAM as an alternative for operation with the control unit.

Service

Problems with setting up or handling the web GUI can be solved by phone or email.

For more information, please contact:

PROTECHNA Herbst GmbH & Co. KG

Lilienthalstr. 9
85579 Neubiberg
Germany



Phone: +49 (0)89 608 114-0
Fax: +49 (0)89 608 114-48
Email: info@protechna.de
Internet: www.protechna.de

3 Connection to the ARRAYCAM WLAN network

3.1 Connecting the mobile device to the ARRAYCAM master module

The WLAN network provided by the ARRAYCAM master module has a corresponding SSID, which comprises "ca-" and the suffix serial number of the control unit (e.g., ca-221). This SSID is also displayed in the "Info" menu for the relevant control unit. Open the dialogue box on your mobile device to connect to a WLAN network and select the relevant network for the ARRAYCAM if you are operating multiple ARRAYCAM 5420 devices, the list may contain multiple ARRAYCAM master module entries). The password for connecting to the network is "secret12".



3.2 Accessing the ARRAYCAM homepage

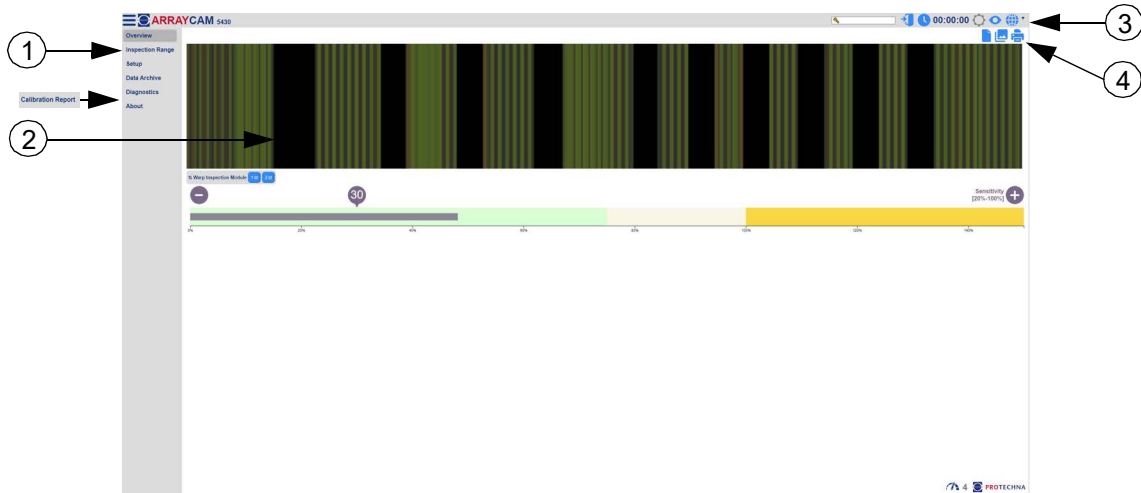
Once you are connected to the ARRAYCAM master module network, open the browser on your mobile device and enter the URL shown below. Press the ENTER button to call up the ARRAYCAM 5420 web GUI.

Web link URL

<http://192.168.3.11:8080>

4 General Web GUI configuration

The web GUI for the ARRAYCAM 5420 is divided into four sections to access all functions of the operating interface.



(1) Menu bar

The menu bar allows you to access the key areas of the web GUI at any time:

- **Overview**

The overview page provides all important status information for the ARRAYCAM 5420.

- **Inspection range**

Here you can set the inspection range and hide all cameras.

- **Settings**

Here, you can change the key parameters for the correct functioning of the ARRAYCAM 5420.

- **Archive**

All fault messages are stored in the archive.

- **Diagnostics**

Here you can record, adjust, and analyse the data.

- **Calibration report (only visible after login)**

The calibration reports of the cameras are displayed here.

- **About**

This page provides various information about the current software version running on the ARRAYCAM

- **(2) Detailed view**

The detailed view contains the relevant information for the selected menu entry (see "Menu bar"), which is represented either as a chart or a table. The details of the individual menu sections are explained on the following pages of the operating manual.

- **(3) Header**

The header provides access to some global functions and information that are always available.

- **Live mode**

The web GUI gives you access to the current ARRAYCAM data, but can also be used to open and view archived data from the data archive. The web GUI is in live mode by default.

- **Password entry**

Some web GUI functions can only be accessed by entering a password.



To log in, enter the relevant password in this field and press the ENTER button to confirm.



No user is currently logged in. By entering a valid password, you can log into the system.



At the moment, a user is logged into the system. By clicking on the button, the current user is logged out again.

The password is preset at the factory to "85521" and cannot be changed.



- **Operating mode selection**

This button is used to switch the web GUI operating mode.



The ARRAYCAM web GUI is currently in live mode. Click on the button to switch to the simulation mode.



The ARRAYCAM is currently in the simulation mode. Clicking on the  button starts the simulation. Clicking on the  button stops the simulation.

- **Test mode**

Use this button to activate ARRAYCAM test mode. The fault detection of the cameras is working normally. Although detected defects are displayed, they will not cause a machine stop. This makes it easier to optimise inspection parameters during the running process.



The ARRAYCAM 5420 web GUI is in so-called live mode, i.e., the inspection values for the current order/beam are displayed and visualised.



The ARRAYCAM 5420 web GUI is in test mode.

- **Language selection**

This button can be used to change the web GUI interface language.



Clicking on the globe opens a menu with the available interface languages.

- **Machine running time**



This display shows the machine running time after the machine has been started. After a machine stop, the time is reset.

- **Machine status**

This display shows the status of the machine.



The machine is not running.

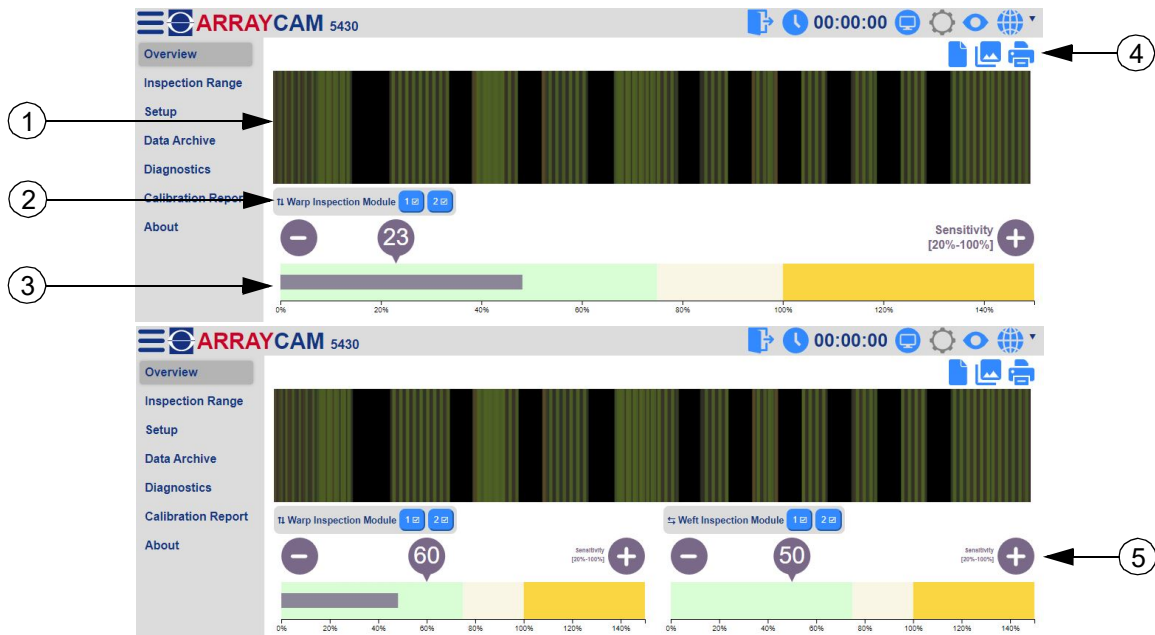


The machine is running.

(4) Toolbar

The toolbar contains specific functions for the relevant detailed view that are explained on the following pages.

5 Submenu - Overview



The "Overview" area provides an overview of the article currently running on the machine and the associated inspection data. These are shown on a false-colour image (1).

By clicking on the button (2) you can activate and deactivate the configured camera evaluation signals of the inspection modules warp 1 and 2.

The signal height display (3) shows the common status of the activated inspection modules. The black bar should preferably be in the green area (fabric is in good order). It can also be in the yellow area (fabric is critical). If an error is detected, the bar remains in the red area. The machine is stopped unless it is operated in test mode. Click on + and - buttons and drag the displayed sensitivity number to adjust the sensitivity. If weft inspection is activated in the "Settings" area, another diagram (5) appears on the screen.

The relevant toolbar (4) contains the functions described below.

- **Sensitivity of inspection modules (%)**

Here you can set the sensitivity for the two inspection types, bright and dark, combined or separately, for each inspection module.



Currently, the combined sensitivity can be set for the two inspection types, bright and dark.



Currently, the sensitivity for the two inspection types, bright and dark, can be set separately.

- **False-colour image active/inactive**

The false-colour image can be hidden if required.



The false-colour image is displayed. Clicking on the symbol hides the diagram.



The false-colour image is not displayed. Clicking on the symbol shows the diagram.

- **Print**

The inspection data is printed out. Using a PDF printer driver, you can print them to a PDF file.



The printout of the inspection data starts.

6 Submenu - Inspection range

	Start / mm	End / mm	Active
Maximum Inspection Range	3618	-94	/
Inspection Range	3201	166	/
Blind Range 1	1944	1831	✓
Blind Range 2	2890	2729	✓
Blind Range 3	2498	2398	✓
Blind Range 4	2221	2115	✓
Blind Range 5	1581	1481	✓
Blind Range 6	1381	1281	✓
Blind Range 7	1181	1081	✓
Blind Range 8	981	881	✓
Blind Range 9	781	681	✓
Blind Range 10	581	481	✓

In this submenu, the complete viewing area of the camera is displayed. You can set the inspection range and the blind ranges here. The values for the positions of all ranges are measured from the zero point, i.e., from the right end of the guide bar (zero point).

(1) Blind ranges

If there are separating gaps or other areas in the produced fabric that are not to be monitored, these areas must be excluded from the inspection using blind ranges. You can store up to 10 blind ranges and display them in different colours. The blind ranges can be activated/deactivated individually.

(2) Camera image with manual setting option

This camera image shows the activated blind ranges. These can be moved, enlarged, or reduced manually using the mouse. You can also set the position of the blinding (start/end). You can use the zoom function with the help of the mouse wheel.

(3) Complete camera image

The complete camera image cannot be edited and only serves as an overview of the set blind ranges.

(4) Value table

The table contains a row with dimensions for the maximum inspection range, the current inspection range, and each blind range. Click on the respective column to enter exact values in millimetres for the start and end points of a range. The maximum inspection range cannot be edited and only serves as an overview of the set dimensions. You can also activate or deactivate each blind range in the "Archive" column.

(5) Toolbars

The relevant toolbar (5) contains the functions described below.

- **Camera image active/inactive**

The camera image can be hidden if required.



The camera image is displayed. Clicking on the icon hides the camera image.



The camera image is not displayed. Clicking on the icon shows the camera image.

- **Print**

The inspection data is printed out. Using a PDF printer driver, you can print them to a PDF file.



The printout of the inspection data starts.

7 Submenu - Settings

The "Settings" area shows the key parameters that can be used to adjust the functions of the ARRAYCAM 5420 to the current article and parameters that determine the general function of the ARRAYCAM 5420. The parameters can be entered directly and are active immediately after they have been entered. However, certain settings are only accessible to the authorised user (when logged in).

All parameters are explained below.

7.1 General settings

Common Settings			
Data	New Order		+
	Order Name	new order	
	Piece Number	1	+
Status	Test Mode	X	
	Start Delay [s]	5	
	Total Sensitivity [%]	60.0	
	Machine Run State	Stopped	▼
Exposure Control	Automatic Exposure Mode	On, Gain and Exposure	▼
	Exposure Time [ms]	10.00	
Calibration	Gauge [Needles/inch]	36	
	Light Configuration	Direct Incident	▼
	Type of Fabric	Transparent	▼
	Distance to the Needle Bar [Pixel]	20	
Weft Inspection	Vanishing Point Direction	below	▼
	Active	✓	
	Height of the Weft ROI [Pixel]	160	
	Weft Threads per Inch	3	
	Revolutions per Weft Thread	1	
	Suggested Weft ROI Height [Pixel]	170	
	Pixel Per Second [1/s]	359	
	Per Column Logging	faults	▼
Drag Indicator Duration [s]	10		

(1) Production data

Here the details (new order/order name/piece number) of the current order can be adjusted.

New order

To create a new order, enter a name and apply with "+". If an order is already stored, another order can only be created when the machine is stopped or the order name is changed.

Order name

You can change the name of the order directly here. Changing the order name does not trigger an order change. This must be entered separately.

Piece number

Shows the number of the produced piece.

(2) System status**Test mode**

Activate/deactivate the test mode.

Start delay [s]

For manually changing the start delay.

Sensitivity [%]

For manually changing the sensitivity.

Machine status

This parameter provides information about the current machine status.

(3) Exposure control**Automatic exposure mode**

Here you can set the automatic exposure control.

Exposure time [ms]

For manually changing the exposure time (only when exposure control is deactivated).

(4) Calibration**Gauge [needles/inch]**

For manually changing the gauge.

Light configuration

To set the light configuration, you can choose between "Direct incident", "Indirect backlight" and "Direct backlight".

Type of fabric

To adjust the type of fabric, you can choose between "Opaque" and "Transparent".

Distance to the needle bar [pixel]

For manually changing the camera viewing distance.

(5) Weft inspection**Active**

Activate/deactivate weft inspection.

Height of the weft ROI [pixel]

For manually changing the height of the weft ROI used.

Weft threads per inch

For manually changing the weft thread density.

Revolutions per weft thread

For manually changing revolutions of the machine main shaft per weft thread.

Suggested weft ROI height [pixel]

This parameter provides information on the recommended weft ROI height.

Pixel per second [1/s]

This parameter provides information on pixels per second.

Per column logging

To set logging per column, choose between "off", "faults", and "threshold value exceeded".

Drag indicator duration [s]

For manually changing the duration of the drag indicator.

(6) Toolbars

The relevant toolbar (6) contains the functions described below. These functions are the same in all tabs of this submenu.

- **Export to Excel**

The currently displayed settings are exported to an Excel file.



Clicking on the icon starts the export to an Excel file.

- **Print**

The currently displayed settings are printed out. Using a PDF printer driver, you can print them to a PDF file.



The printout of the currently displayed settings starts.

7.2 Camera settings

Camera Settings		
Camera Selector	Camera	Camera 1
	Ignore	✓
Camera Image	Use ROI	Use Settings
	Distance to the Needle Bar [Pixel]	20
	Height of the Evaluate ROI [Pixel]	10
Evaluate	Height of the Idle ROI [Pixel]	1000
	Perspective Correction	✓
	Vanishing Point for Image Correction (X / in Pixel)	1319
	Vanishing Point for Image Correction (Y / in Pixel)	19328

(1) Camera selector

Camera

Here you can select which camera is to be set. You can select a single camera or all cameras.

Ignore

Use this setting to deactivate/activate the corresponding camera.

(2) Camera image

Use ROI

Here you can choose to view the entire camera image "Maximum image size" or only a small area of the camera "Use ROI" for fault detection.

Distance to the needle bar [pixel]

For manually setting the distance to the needle bar.

Height of the Evaluate ROI [pixel]

For manually setting the height of the Evaluate ROI.

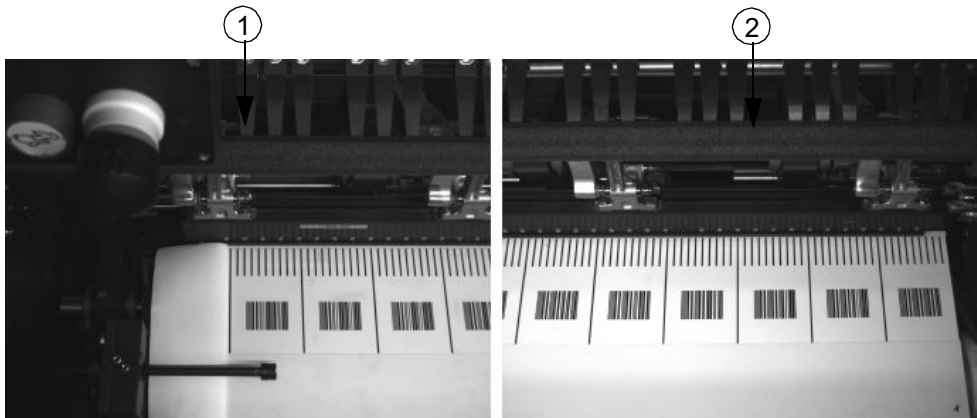
Height of Idle ROI [pixel]

For manually setting the height of the Idle ROI (full image).

(3) Evaluate

Perspective correction

Activate (1)/deactivate (2) perspective correction.



Vanishing point for image correction (X/in pixel)

For manually setting the vanishing point for image correction in the X direction.

Vanishing point for image correction (Y/in pixel)

For manually setting the vanishing point for image correction in the Y direction.

7.3 Warp inspection

Evaluation Parameters			
	Inspection Module	1	2
Inspection Modules	Active	X	✓
Common	Sensitivity Bright [%]	57.0	57.0
	Sensitivity Dark [%]	60.0	57.0
	Signal Averaging Counts	Many	Many
	Few	20	20
	Medium	65	65
	Many	200	200
	Minimum Fault Width [Needles]	2.0	2.0
	Maximum Fault Width [Needles]	20.0	20.0
	Fault Counter	2	2
	Evaluate Confidence	0.5	0.5
	Action in case of a Fabric Fault	log & stop	log & stop
Signal	Scaling	On, Coefficient Once	On, Coefficient Once
	Boundary [Pixel]	10	10
Envelope	Envelope Mode	Factor	Factor
	Accuracy of the Inspection	32	32
	Signal-to-Envelope Ratio	150	150
Oil Spot Detection	Active	✓	X
	Sensitivity [%]	70	70
	Minimum Width [mm]	2	3
	Maximum Width [mm]	30	30
	Tolerance Width [mm]	10	10

(1) Inspection modules

Active

The warp inspection modules can be switched on or off here.

(2) Common

Sensitivity bright [%]

The sensitivity for the inspection type bright can be set here.

Sensitivity dark [%]

The sensitivity for the inspection type dark can be set here.

Signal averaging counts

Manual selection of signal averaging counts between "Few", "Medium", and "Many".

Here, you can manually set the signal averaging count for each selection.

The higher the signal averaging count is set, the fewer signal fluctuations are measured.

Minimum fault width [needles]

For manually changing the minimum fault width.

Maximum fault width [needles]

For manually changing the maximum fault width.

Fault counter

For manually changing the fault counter.

Evaluate confidence

For manually changing the confidence evaluation.

Action in case of a fabric fault

Here you can set the action in case of a fabric fault. You can choose between "Nothing", "Log", and "Log & stop".

3) Signal**Scaling**

Here you can set the scaling. You can choose between "Off", "On, coefficient once", "On, coefficient always", and "Differential".

Boundary

You can set the boundary manually.

4) Envelope**Envelope mode**

Here you can set the envelope mode. You can choose between "Factor", "Offset", and "Threshold".

Accuracy of the inspection

For manually changing the inspection accuracy.

Signal-to-envelope ratio

For manually changing the signal-to-envelope ratio.

5) Oil spot detection**Active**

Here you can activate/deactivate oil spot detection.

Sensitivity [%]

Manual entry of sensitivity.

Minimum width [mm]

For manually changing the minimum width.

Maximum width [mm]

For manually changing the maximum width.

Tolerance width [mm]

For manually changing the tolerated width.

7.4 Weft inspection

Evaluation Parameters			
	Inspection Module	1	2
Inspection Modules	Active	✓	✗
Common	Sensitivity Bright [%]	50.00	50.00
	Sensitivity Dark [%]	50.00	50.00
	Signal Averaging Counts	6	6
	Action in case of a Fabric Fault	log	log
Signal	Column Width [Pixel]	64	64
	Min Width [%]	50	50
Auto Filter	Active	✓	✓
	Filter Length	100	100
	Lower Frequency (Hz)	0.0012	0.0012
	Upper Frequency (Hz)	0.0093	0.0093

1) Inspection modules

Active

Here you can switch inspection modules on or off.

2) Common

Sensitivity bright [%]

The sensitivity for the inspection type bright can be set here.

Sensitivity dark [%]

The sensitivity for the inspection type dark can be set here.

Signal averaging counts

For manually changing the signal averaging counts.

The higher the signal averaging count is set, the more signal fluctuations are suppressed.

Action in case of a fabric fault

Here you can set the action in case of a fabric fault. You can choose between "Nothing", "Log", and "Log & stop".

3) Signal

Column width [pixels]

For manually setting the column width.

Min. width [%]

Here you can change the minimum width manually.

4) Auto filter

Active

Here you can switch the automatic filter on or off.
This filter is used for smoothing the signal.

Filter length

For manually setting the filter length.

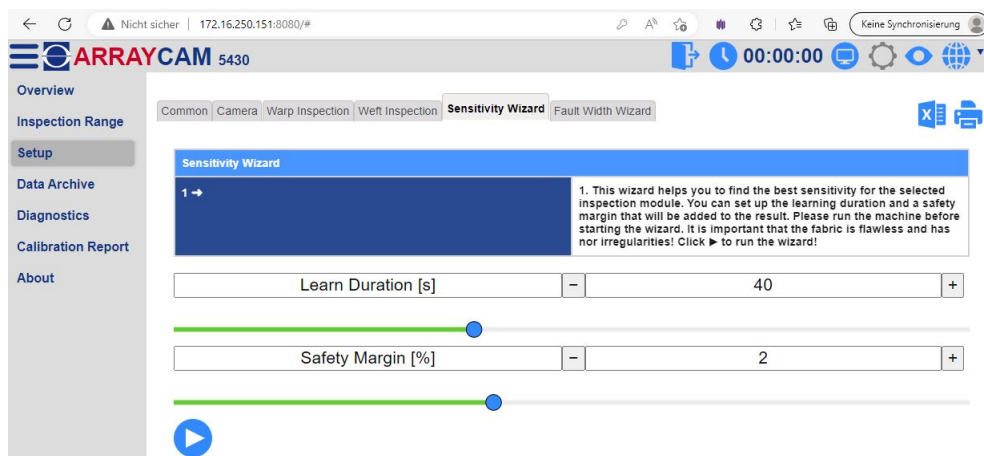
Lower frequency [Hz]

For setting the lower frequency.

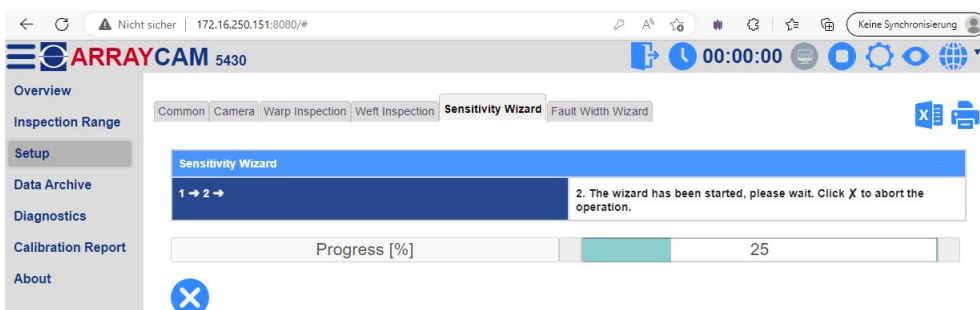
Upper frequency [Hz]

For setting the upper frequency.

7.5 Sensitivity wizard



The wizard helps you find the best sensitivity for the selected inspection module. You can set up the learning duration and a safety margin that will be added to the result. Run the machine before starting the wizard. It is important that the fabric is flawless and free from irregularities. Click on ▶ to run the wizard.



The wizard has been started, please wait. Click on X to abort the wizard.



The sensitivity wizard has been completed. Click on  to apply the results.

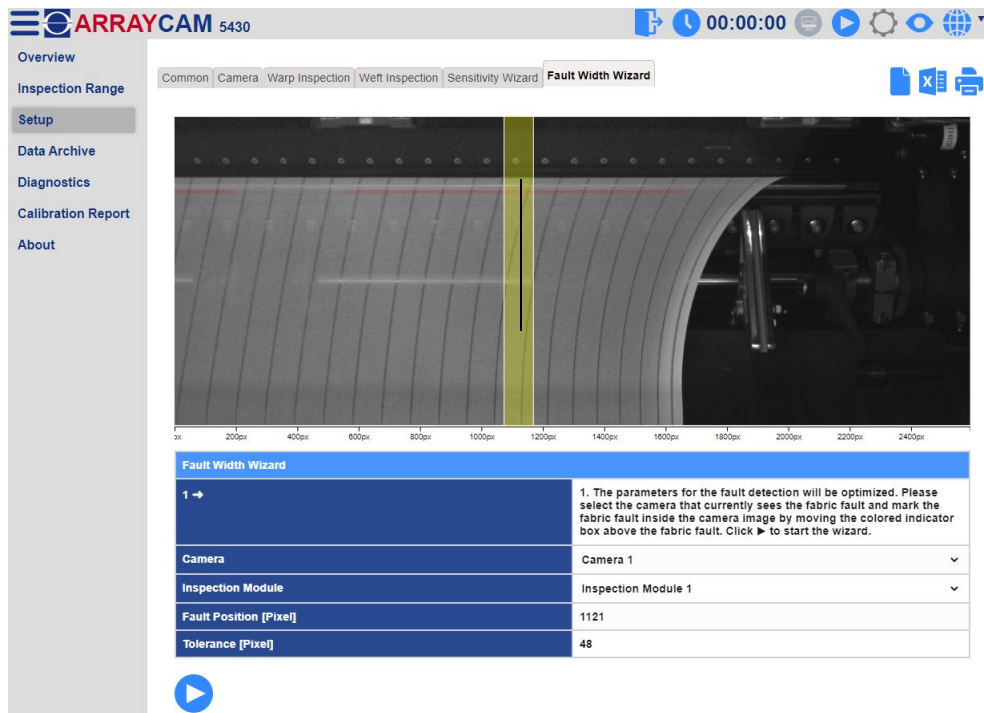


The optimisation results have been applied. Click on  to repeat the process.

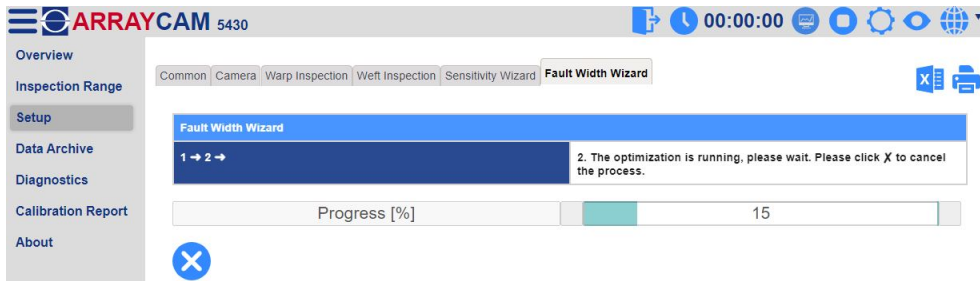
7.6 Fault width wizard



The wizard helps you find the best settings for detecting a given fabric fault. Before starting the wizard, you need to create a typical fabric fault first and to stop the machine.



The parameters for the fault detection will be optimised. Select the camera that sees the fabric fault and mark the fabric fault inside the camera image by moving the coloured indicator box above the fabric fault. Enter the inspection module and the tolerance. Click ▶ to start the wizard.



The optimisation is running, please wait. Click on X to abort the process.

ARRAYCAM 5430

00:00:00

Overview

Inspection Range

Common | Camera | Warp Inspection | Weft Inspection | Sensitivity Wizard | **Fault Width Wizard**

Setup

Data Archive

Diagnostics

Calibration Report

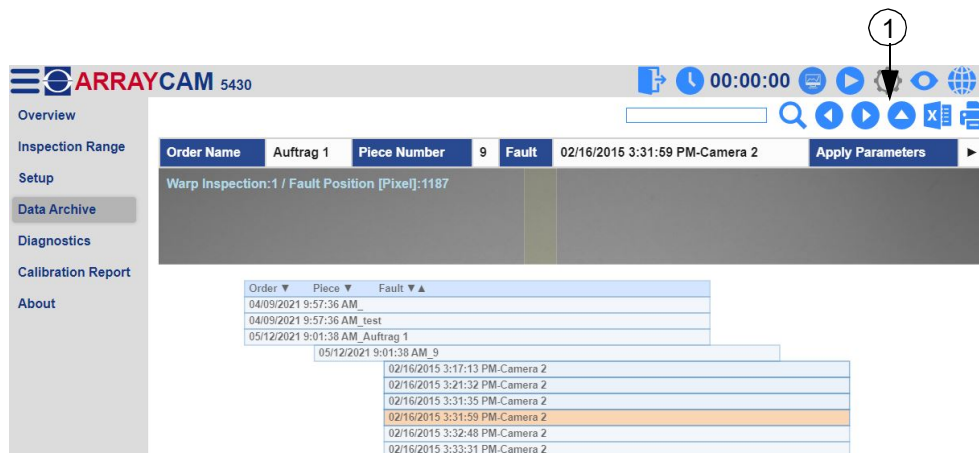
About

Fault Width Wizard	
1 → 2 → 3 (Results)	3. The wizard could not find valid results. To start the wizards again, click ▶.
Inspection Module	Inspection Module 1
Signal to Noise Ratio	0.00
Minimum Fault Width [Needles]	0.00
Maximum Fault Width [Needles]	0.00

▶

The wizard for optimising the parameters for fault detection has been completed. Please find the results below. Click on ▶ to apply the results.

8 Submenu - Data archive



In the "Archive" area you can see a list of all archived orders and the associated piece numbers/fabric faults in chronological order. You can select the desired order with the mouse to display the corresponding archived piece numbers and, ultimately, the detected faults. These are marked in colour in the image. Click on the "Apply parameters" button to apply the associated archived settings automatically.



Attention:

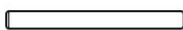
The "Apply parameters" action overwrites the current settings.

(1) Toolbars

The relevant toolbar (1) contains the functions described below.

- **Search**

You can search for orders and filter them via the search field.



You can enter the order name here.



Click on the magnifying glass icon to start the search.

- **Scroll boxes**



You can navigate through the archive using scroll boxes.

- **Download in Excel format**



Here you can download all archive data to an Excel file.

- **Print**

The archive data are printed. Using a PDF printer driver, you can print them to a PDF file.



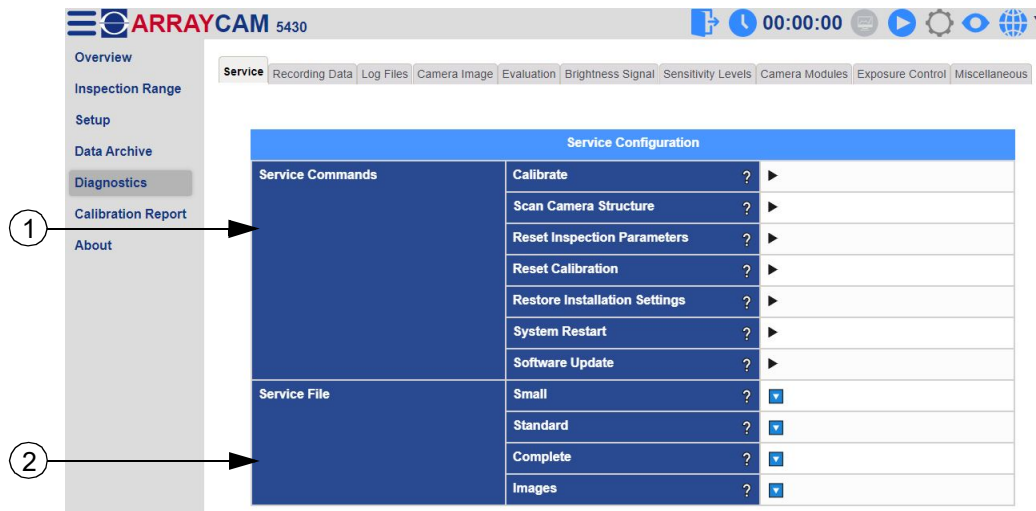
The printout of the archive data starts.

9 Submenu - Diagnostics

In the "Diagnostics" section, you will find other important functions, setting options, and diagrams that monitor and diagnose the functionality of the ARRAYCAM. The functions can be entered directly and are active immediately after they have been entered.

The available functions, setting options, and diagrams are explained below.

9.1 Service



(1) Service commands

Various system and software commands can be executed here.

Calibrate

Click on ▶ to start the calibration.

The geometric relationship of the fabric to the camera is determined here.

Scan camera structure

Click on ▶ to re-scan the camera structure.

Electrical connections of the cameras are checked. The number of cameras stored in the config file will be replaced by the number of actual cameras.

Reset inspection parameters

Click on ▶ to reset the inspection parameters to factory defaults.

Reset calibration

Click on ▶ to reset the calibration to factory defaults.

Restore installation settings

Click on ▶ to restore the installation settings to the state after the calibration.

System restart

Click on ▶ to restart the system.


Software update

After uploading a new software version, the camera is not accessible for a few minutes during the installation.


(2) Service file

Service files can be created here. These are used for troubleshooting and diagnostics.
For more information on saving service files, see the operating instructions in chapter 9.3.


Small

Click on  to download the small service file.

Standard

Click on  to download the default service file.

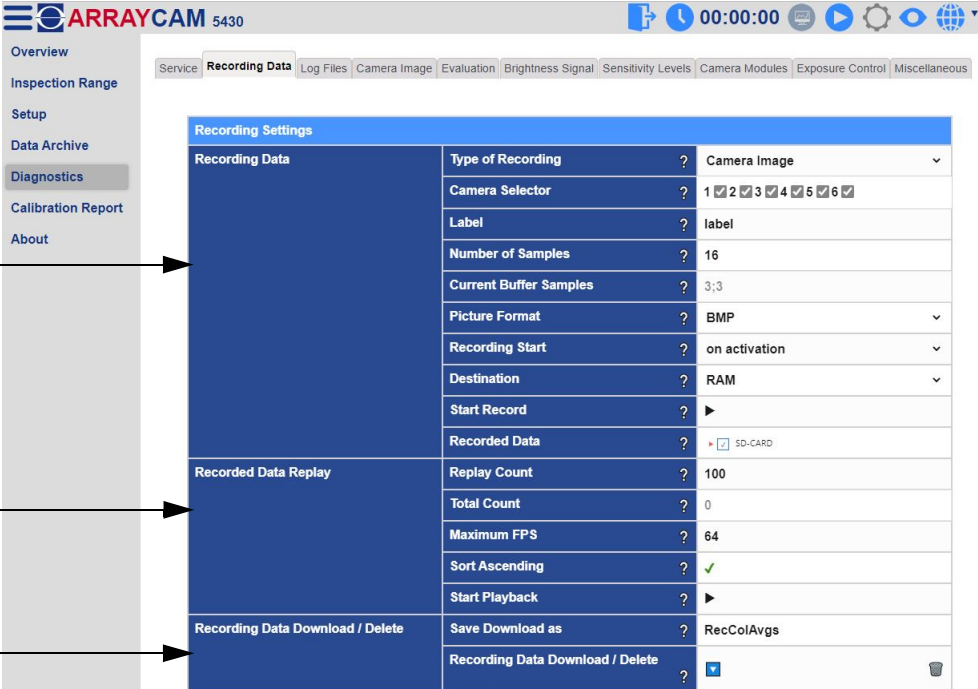
Complete

Click on  to download the complete service file.


Images

Click on  to download the images.

9.2 Recording data



The screenshot shows the ARRAYCAM 5430 web interface. The top navigation bar includes 'Service', 'Recording Data', 'Log Files', 'Camera Image', 'Evaluation', 'Brightness Signal', 'Sensitivity Levels', 'Camera Modules', 'Exposure Control', and 'Miscellaneous'. The left sidebar contains 'Overview', 'Inspection Range', 'Setup', 'Data Archive', 'Diagnostics', 'Calibration Report', and 'About'. The main content area is titled 'Recording Settings' and is divided into three sections:

- Recording Data** (Callout 1):
 - Type of Recording: Camera Image
 - Camera Selector: 1, 2, 3, 4, 5, 6 (all checked)
 - Label: label
 - Number of Samples: 16
 - Current Buffer Samples: 3;3
 - Picture Format: BMP
 - Recording Start: on activation
 - Destination: RAM
 - Start Record: ▶
 - Recorded Data: + SD-CARD
- Recorded Data Replay** (Callout 2):
 - Replay Count: 100
 - Total Count: 0
 - Maximum FPS: 64
 - Sort Ascending: ✓
 - Start Playback: ▶
- Recording Data Download / Delete** (Callout 3):
 - Save Download as: RecColAVgs
 - Recording Data Download / Delete: 

(1) Recording data

Here you can set parameters for recording data with the camera. You can also start the data recording here.

Type of recording

Select the recording type (camera signals or camera images).

Camera selector

Select the cameras for recording.

Label

Edit the directory name for the recording data.

Number of samples

Enter the maximum number of records for data recording.

Current buffer samples (only with the "camera image" recording mode)

Enter the current buffer size per channel (number of images during recording).

Picture format (only with "camera image" recording mode)

Select the recording format. Here you can choose between "BMP" and "PNG".

Recording start

Select the recording start type. You can choose between "at the end of the start-up delay" and "on activation (the machine must be running)".

Destination

Here you can select the recording destination (RAM or SD card).

Start record

Click on ► to start the recording.

Recorded data

Select one or more records to download/delete and double click on the empty field to update the records.

(2) Recorded data replay

Here you can make settings for replaying the recorded data.

Replay count

Here you can set the number of repetitions for the replay.

Total count (only with the "camera image" recording mode)

The number of total samples is counted here.

Maximum FPS (only with "camera image" recording mode)

This value defines the maximum playback images per second.

Sort ascending

Here you can activate or deactivate playback of the recorded data in ascending order.

Start playback

Click on ► to start playback of the recorded data.

(3) Recording data download/delete

Here you can make settings for downloading or deleting the recorded data.

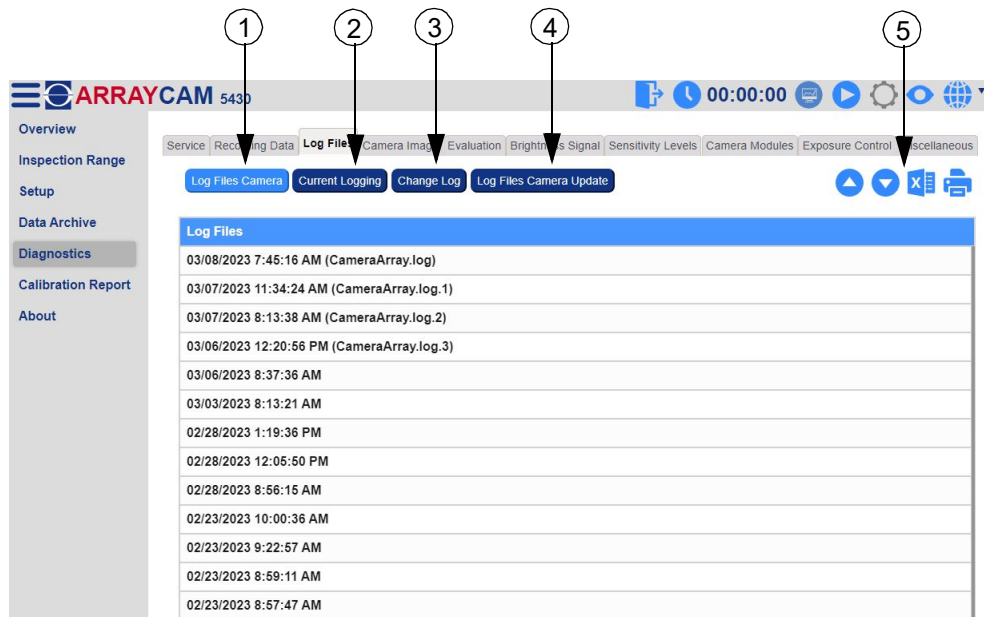
Save download as

Enter the name of the download file [.tar.gz].

Recording data download/delete

Click on ▼ to download the selected data or on 🗑 to delete the selected data.

9.3 Log files



(1) Log files camera

The log files of the camera system are listed here in chronological order. Clicking on a log file to open it.

(2) Current logging

Displays the current log file.

(3) Change log

All software versions are listed here chronologically with the respective changes.

(4) Log files camera update

Displays the log file of the most recent update.

(5) Toolbars

The relevant toolbar (5) contains the functions described below.

- **Scroll boxes**



You can navigate through the log files by clicking on the scroll fields.

- **Download in Excel format**



Start downloading all log files to an Excel file.

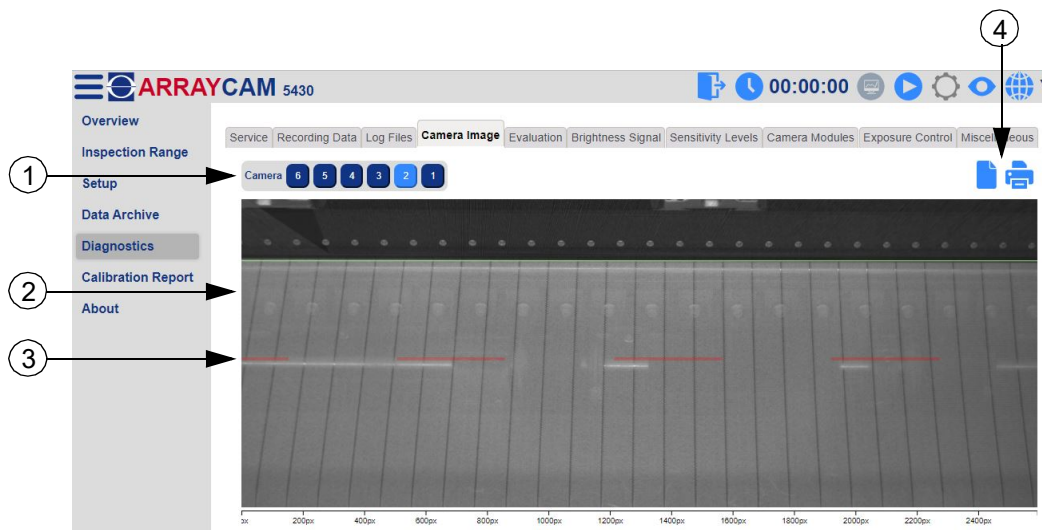
- **Print**

The log files are printed. Using a PDF printer driver, you can print them to a PDF file.



The printout of the log file starts.

9.4 Camera image



The current camera image (2) is displayed in the "Camera image" area. You can display the selected camera image by clicking on the respective cameras (1). Use your mouse to set the inspection range (3) as required.

(4) Toolbars

The relevant toolbar (4) contains the functions described below.

- **Print**

The camera image is printed. Using a PDF printer driver, you can print them to a PDF file.



The printout of the camera image starts.

9.5 Evaluation



The current camera signal (2) is displayed in the "Evaluation" area. You can select the corresponding camera signal by clicking on the respective camera (1).

(3) Signal

Selection of different signal types.

Average signal

Displays the error frequency found in the raw signal.

Upper envelope

If the filtered signal exceeds the upper error cut-off threshold, a defect is reported.

Filtered signal

Frequency-filtered raw signal evaluating the mesh frequency.

Lower envelope

If the filtered signal exceeds the lower error cut-off threshold, a defect is reported.

Raw signal

Local brightness of the camera image.

Median signal

Special mean value of the signals.

Inspection mask

The inspection starts if the values are not equal to "zero".

(4) Toolbars

The relevant toolbar (4) contains the functions described below.

- **Inspection module**



By clicking on the buttons you can switch between the two inspection modules warp 1 and 2.

- **Camera image (5) active/inactive**

The camera image (5) can be hidden if required.



The camera image (5) is displayed. Clicking on the icon hides the image.



The camera image (5) is not displayed. Clicking on the icon shows the image.

- **Evaluation in live mode/archive**



Evaluation in live mode.



Evaluation of an archived file.

These are status indicators that do not trigger any action.

9.6 Brightness signal



This diagram (1) shows the brightness values of the different camera areas.

(2) Toolbars

The relevant toolbar (2) contains the functions described below.

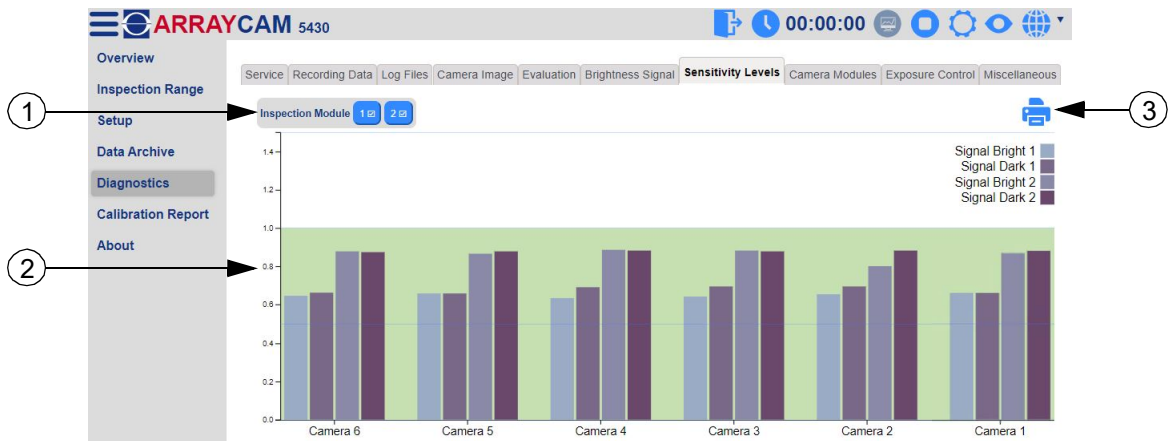
- **Print**

The brightness signal is printed. Using a PDF printer driver, you can print them to a PDF file.



The printout of the brightness levels starts.

9.7 Sensitivity levels



This diagram (2) shows the evaluation values of the individual cameras.

By clicking on the button (1) you can activate and deactivate the configured camera evaluation signals of the inspection modules warp 1 and 2.

(3) Toolbars

The relevant toolbar (3) contains the functions described below.

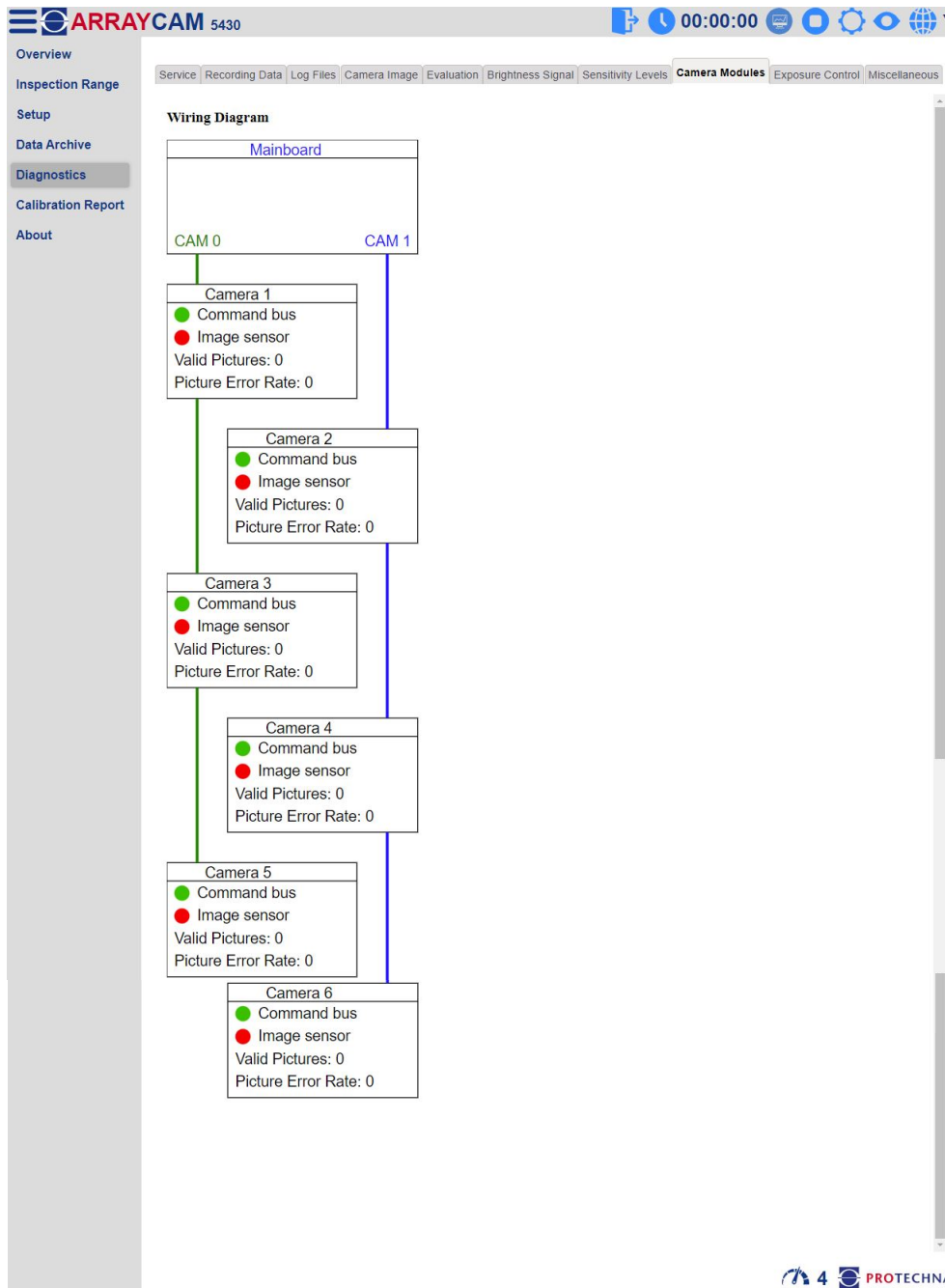
- **Print**

The sensitivity diagram will be printed. Using a PDF printer driver, you can print them to a PDF file.



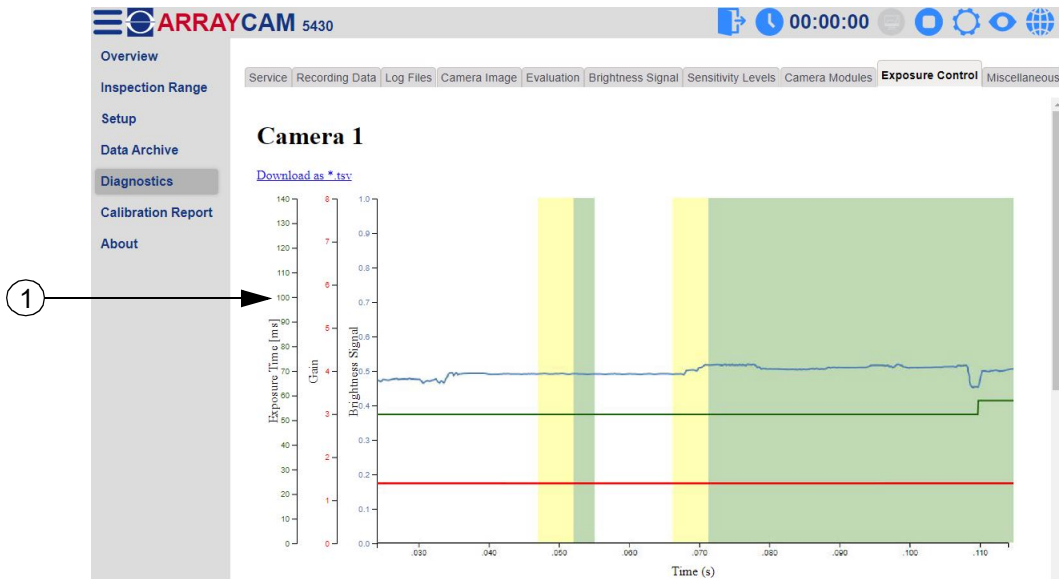
The printout of the sensitivity levels starts.

9.8 Camera modules



"Camera modules" show the structure of the camera system. The number of valid images and image error rates are displayed under the respective cameras.

9.9 Exposure control



This diagram (1) shows the time course of the exposure control parameters. Exposure time, gain, and brightness level of the ARRAYCAM are shown. The white field in the diagram indicates that the machine stops. Yellow stands for the start delay and green for the "machine running signal".

9.10 Miscellaneous

Parameter list

Index	Name	Min-Max	Choice	Value	Description	Path
0:W	GlobalParams				Parameter; die Applikationsglobal gelten.	
0:W@	Systemparameter					
0:W@-0002	Betriebsart				Access level for parameters	
0:W@-0002	Betriebsart	0 - 3	Wirken; Eingabe; Einrichten; Service;	3		/GlobalParams/Systemparameter/Betriebsart/Betriebsart

The parameter list shows all the parameters stored in the control unit. Enter a parameter in the search bar to search for it.

(1) Toolbars

The relevant toolbar (1) contains the functions described below.

- **Download in Excel format**



Here you can download all parameters to an Excel file.

- **Download to text file**



Here you can download all parameters to a text file.

- **Print**

The parameter list is printed. Using a PDF printer driver, you can print them to a PDF file.



The printout of the parameter list starts.

Language list and update language list

The screenshot shows the ARRAYCAM 5430 software interface. The top toolbar includes buttons for 'Parameter List', 'Language List', and 'Update Language List'. A circled '1' points to the 'Language List' button. Below the toolbar is a table with columns for various languages and rows for different terms.

English	Deutsch	中文	Español	Italiano	한국어	Türkçe	日本語	Français	Portugués	Polski
_raw_roi _@Camera ROI	Kamera ROI	原始相机 图片	Camera ROI	Camera ROI	Camera ROI	Camera ROI	Camera ROI	Camera ROI	Camera ROI	Camera ROI
About	Über	关于	About	About	About	About	About	About	About	About
above	oben	上方	above	above	above	above	above	above	above	above
Accurac y of the I nspectio n	Genauig keit der Auswert ung	评估粒度	Accurac y of the I nspectio n	Accurac y of the I nspectio n	Accurac y of the I nspectio n	Accurac y of the I nspectio n	Accurac y of the I nspectio n	Accurac y of the I nspectio n	Accurac y of the I nspectio n	Accurac y of the I nspectio n

The language list shows all terms used by the web GUI and their respective translations.

10 Submenu - Calibration report

ARRAYCAM 5430 00:00:00

Overview
Inspection Range
Setup
Data Archive
Diagnostics
Calibration Report
About

Calibration Report generated 2/8/2023, 2:15:35 PM

Common Camera 1 Camera 2 Camera 3 Camera 4 Camera 5 Camera 6

Schematic View

3618 mm -94 mm

Camera Settings

Camera	Range Start [Pixel]	Range End [Pixel]	Range Start [mm]	Range End [mm]	Scale [pixel/mm]
Camera 1	126	2258	600	0	3.5533
Camera 2	86	2207	1200	600	3.5350
Camera 3	107	2587	1800	1100	3.5429
Camera 4	92	2572	2400	1700	3.5429
Camera 5	76	2544	3000	2300	3.5257
Camera 6	65	2525	3600	2900	3.5143

In the "Calibration report" section you will find all important information about the current calibration of the ARRAYCAM. This information can be displayed for all cameras in general or for each individual camera. This area appears after login.

11 Submenu - About

The screenshot displays the 'About' page of the ARRAYCAM 6430. The page is divided into several sections, each with a blue header. The 'Software' section contains the following data:

Software	
Software Revision	v4.2.02-270-gfbd811b4
Version Date	230223T093108_lc@tensoscan-ic:/opt/git/camera_array_g2
Serial Number	
WLAN-SSID	
WLAN-PASS	secret12
Operating System	Linux 4.15.0-200-generic
Build Image	
PIC Software Revision	
EtherCAT Software Revision	
Copyright	(c) 2023, Protechna Herbst GmbH & Co KG

The 'Mainboard' section contains:

Mainboard	
Revision	
Serial Number	
Production Date	

The 'Camera System' section contains:

Camera System	
Article Number	
Article Description	
Version Number	
Serial Number	
Production Date	

The 'Libraries' section contains:

Libraries	
WebSocket++	(c) 2014, Peter Thorson
CTML	(c) 2015 Maxwell Flynn
D3.js	(c) 2010-2020 Mike Bostock

The 'Camera Modules' section is a table with 7 columns (Camera 6 to Camera 1) and 4 rows (Name, Revision, Serial Number, Production Date).

The toolbar at the top right includes a clock showing 00:00:00, a search icon, a settings gear, a refresh icon, and an 'Export to Excel' icon (labeled 2). The 'About' menu item in the left sidebar is highlighted.

(1) Information

This page provides various system information (1) about the current software version running on the ARRAYCAM, the motherboard, the camera system, the libraries, and the camera modules.

Toolbar (2)

The relevant toolbar (2) contains the functions described below.

- **Export to Excel**

The current system information is exported to an Excel file.



Clicking on the icon starts the export to an Excel file.

- Export to Excel

The current system information is printed out. Using a PDF printer driver, you can print them to a PDF file.

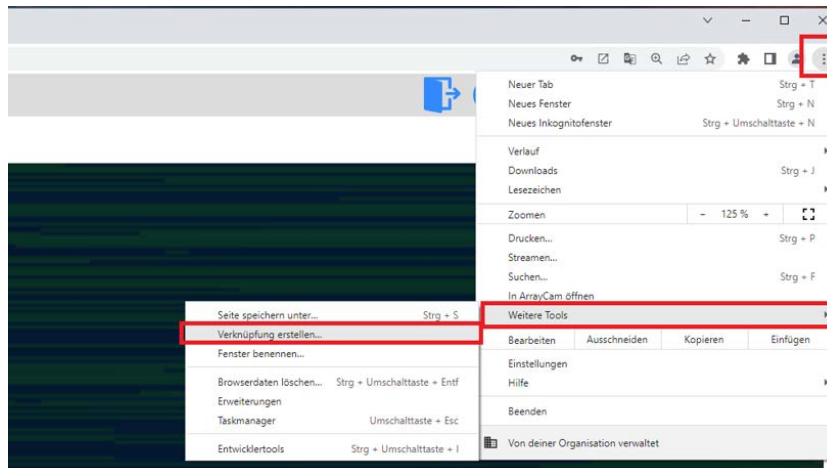


The printout of the system information starts.

12 Submenu - Setting up the desktop app

A desktop app can be set up for faster access to the web GUI.

12.1 Setting up the Chrome desktop app



To set up the Chrome desktop app, click the switch icon in the web GUI Submenu - Overview. Then go to "Create shortcut" via "More tools".

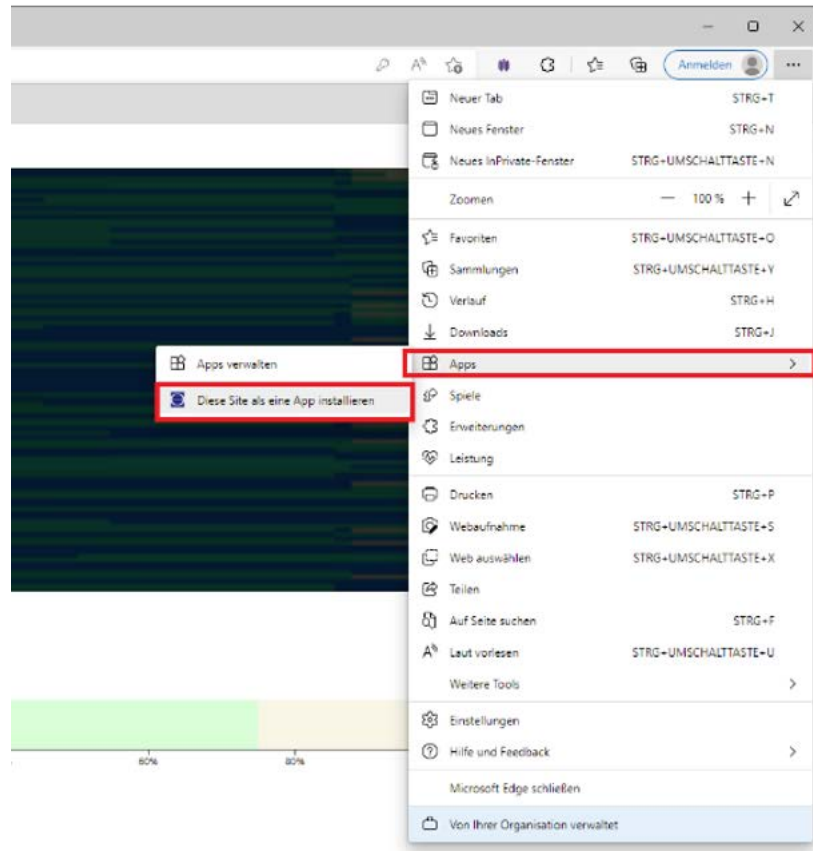


The "Create shortcut" window opens. You need to select an app name here. You need to set a check mark for "Open in new window". Click the "Create" button to install the app on the desktop screen and use it.

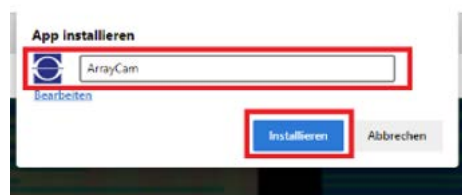
"http" warning is displayed

To remove the "http" warning for Chrome, replace the path "--app-url=xxxx" with "--app=http://192.168.9.1:8080".

12.2 Setting up the Edge desktop app



To set up the Edge desktop app, click the switch icon in the web GUI Submenu - Overview. Then go to "Install this site as an app" via "Apps".

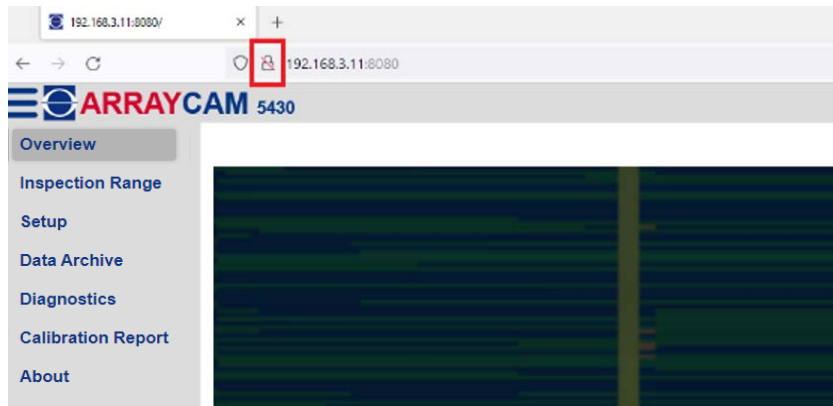


The "Install app" window opens. You need to select an app name here. Click the "Install" button to install the app on the desktop screen and use it.

"http" warning is displayed

To remove the "http" warning for Edge, replace the path "--app-url=xxxx" with "--app=http://192.168.9.1:8080".

12.3 Setting up the Firefox desktop app



To set up the Firefox desktop app, drag the icon to the desktop in the web GUI Submenu - Overview. This installs the app on the desktop screen. The app can now be used.

13 Notes