HEIMANN Sensor
HEIMANN SENSOR GMBH

Operating Manual for Heimann Sensor

ArraySoft v2

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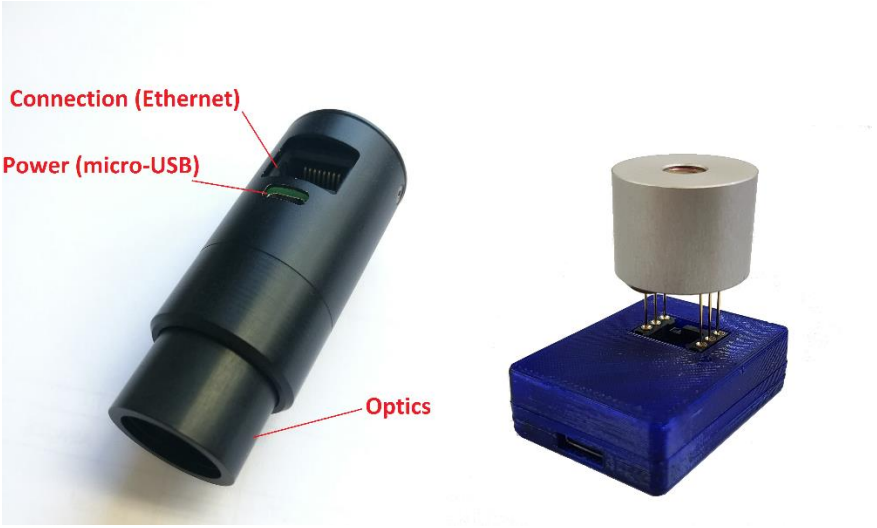
1 Accessories of the HTPAd device



1-1: Left: Application Set: Connection and Power Supply; Right: USB Application Set.

1.1 Optics

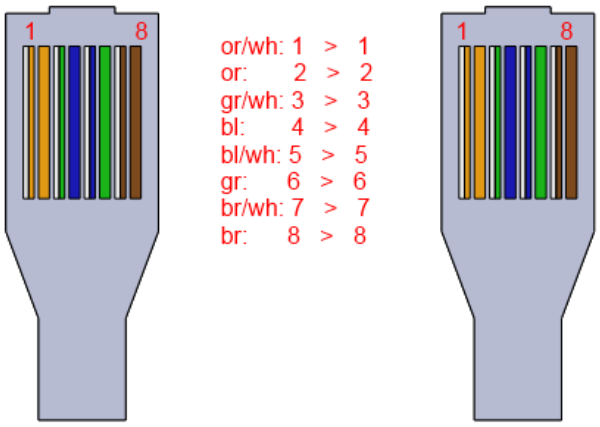
For the best optical performance of the HTPA device, it is necessary to keep the lens clean. Be aware that every cleaning carries a risk of damaging the lens or the coating of the lens. Scratches occur, when something harder than the optical coating is rubbed against the lens. Lens cleaning tissues (lint-free) and fluids are recommended for cleaning. Dust and other particles can scratch the lens when rubbing them off. Therefore, first remove the dust on the optical surface. This can be done by using compressed gas, a soft brush or a bellow. Organic dirt, such as fingerprints can be easily removed with special tissues and fluids. There are special fluids available on the market, but it is also possible to use a tissue with a few drops of ethanol or isopropyl alcohol.

Avoid intense rubbing on the lens! If fluids are used, they should not be applied directly on the surface of the lens. Always use a tissue additionally, which is only used once.

1.2 Connections

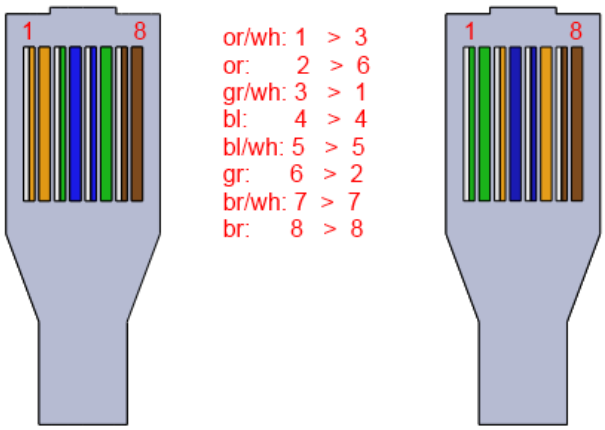
For a detailed description which cable should be used, see “3.2 Connect HTPA device”.

- Ethernet:
  - Standard ethernet cable



1-2: Standard ethernet cable.

  - Crossed ethernet cable



1-3: Crossed ethernet cable.

- Power supply :
  A 5 V USB port of a PC / Notebook or external power adapter is recommended.

2 ArraySoft v2 Program Features

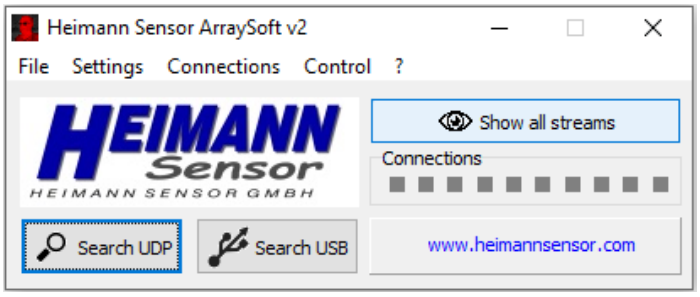
2.1 Key features of ArraySoft v2

- Up to 10 devices can stream at the same time
- Sensor type independent simultaneous streaming (8x8d, 16x16d, 32x32d, 60x40d, 80x64d, 84x60d, 120x84d)
- Up to 8x interpolation (bilinear and bicubic)
- Own color scales can be generated
- Automatic and 9 manual false color scaling modes
- Saving of incoming data in txt or binary data streams (*.bds):
    - Selection possible to record raw sensor data or the post processed data (including filters)
- Playing of recorded data streams (both *.txt and *.bds)
    - If post processed data stream is recorded even a second stage filtering can be applied
- User defined settings of all windows and configurations in every sensor slot can be saved (writing permission in the install folder is required)
- Master control panel allowing to change settings for each sensor at the same time.

2.2 Important information regarding 8x8d sensors

HTPA8x8d sensors with a delivery data before the 01.02.2019 do not function with the ArraySoft v2. For these sensors, please use ArraySoft v1. If this software is not on the delivered CD, please contact our customer support.

2.3 Main window after startup



2-1: Main frame.

The main window of the ArraySoft v2 contains the necessary features and buttons to bind a digital Heimann Sensor Array (HTPAd) to a PC. All analog devices are functioning only with the previous version (ArraySoft).

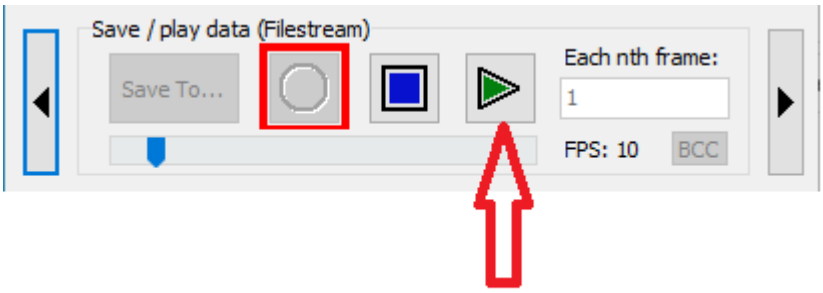
2.3.1 File

2.3.1.1 Play BDS/TXT

The dropdown menu “File” gives the opportunity to replay a BDS/TXT stream, which was recorded before. After pressing “Play BDS/TXT”, selecting the .bds or .txt file can be done in an open-dialog. For details on recording a stream, please refer to section 2.5.

2.3.1.2 Convert BDS to TXT

With the “Convert BDS to TXT” option it is possible to convert a previously saved .bds datastream into a .txt file. In first instance the .bds file has to be selected and opened. After this, a dialog opens where the .txt file should be specified. It is important to also select “txt” as the file extension. After this, it is necessary to replay the .bds file by clicking the green arrow in the “Save/play data” window. A window will open replay the datastream. Afterwards a pop-up indicates the successful conversion.



2-1: Converting .bds to .txt.

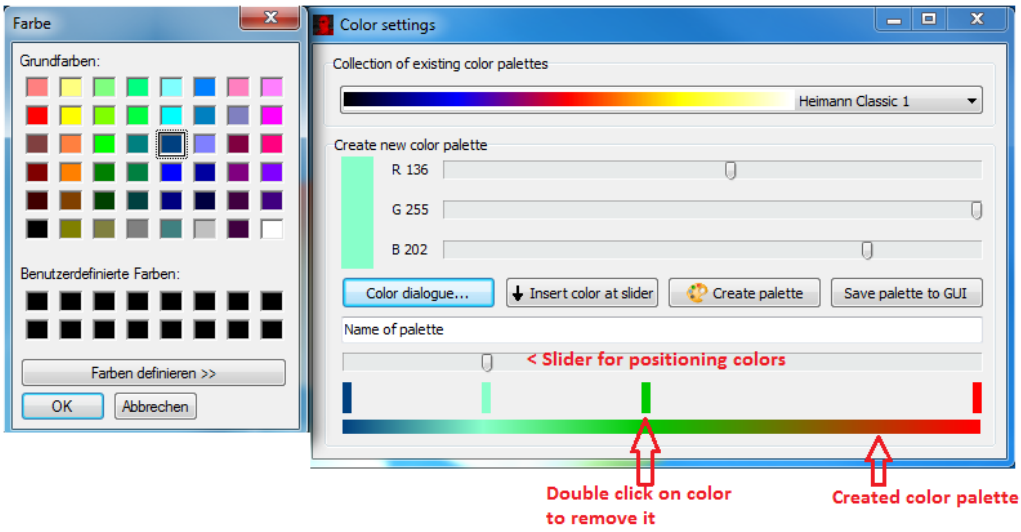
For a detailed description of the data sorting in the .txt file please see 2.5.

2.3.2 Settings

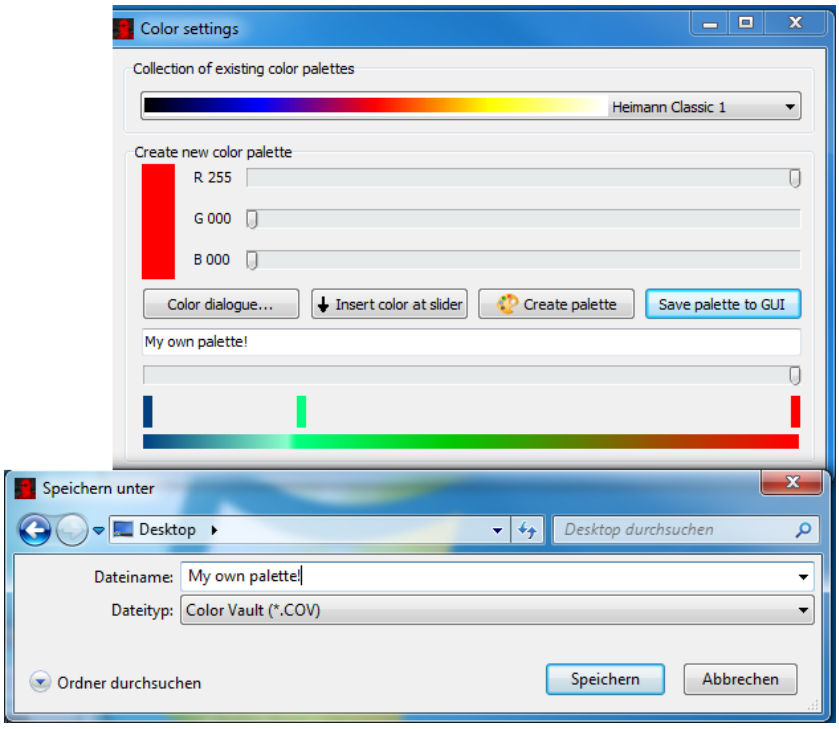
2.3.2.1 Color Settings

The color settings window gives an overview about all false color palettes, which are preinstalled and which were self-generated. There are a couple of default color bars and it is possible to generate customized ones. To do so, the RGB values can be set to the desired values or the “Color dialogue…” can be opened. The lower slide gives the position where the color can be placed with the “Insert color at slider” button. The left side represents the low temperatures and the right side the high temperatures, which will be calculated. At least two different colors must be placed at the left and the right border of the slider to generate a color palette. If a color is inserted at the wrong place or has the wrong color, it can be simply deleted by double clicking the color representation above the slider. The color palette can be created by pressing “Create palette”. To use the color scheme, it needs to be saved. For saving, simply set a name in the associated text field and save it via the save dialog. On saving, a *.COV file will be created, which is required to be present in the application path (the same directory as the exe file). If there are any *.COV files present, they will be imported on the next startup of the GUI. It is possible to save multiple color palettes to one COV file, or to generate single files for each palette. This can be used for removing/adding required palettes just as the user wishes.

Created palettes will be available on next start of the program and can be used with the bound sensor. By doing so, it is possible to adjust the colors of the application to get a better contrast or a focus at required temperatures.



2-2: Color settings and creation of an own palette.



2-3: Saving a color palette.

2.3.2.2 Temperature unit conversion

The calculated temperatures can be displayed in °C (degrees Celsius), Kelvin and °F (degrees Fahrenheit). To select, the desired unit needs to be checked.

2.3.2.3 GUI settings

Checking “Record RAW data” will record data in .bds or.txt files without any filtering or interpolation. If it is unchecked, the GUI is able to record values with enabled filters (FIR/IIR/Median/Adaptive Averaging) and interpolation. With activated interpolation, the file will need more storage space because interpolated pixels will be saved as well.

Checking “Save user settings” will save each user specified settings, so that the GUI will be in the desired configuration after a restart. Windows will be at the same place and position in the screen and specific sensor settings, such as operation mode, color scale, framestacks, etc, will be saved slot specific as in the last session. If the option “Save user settings” is unchecked, changes to any setting will be not overwritten.

Example:

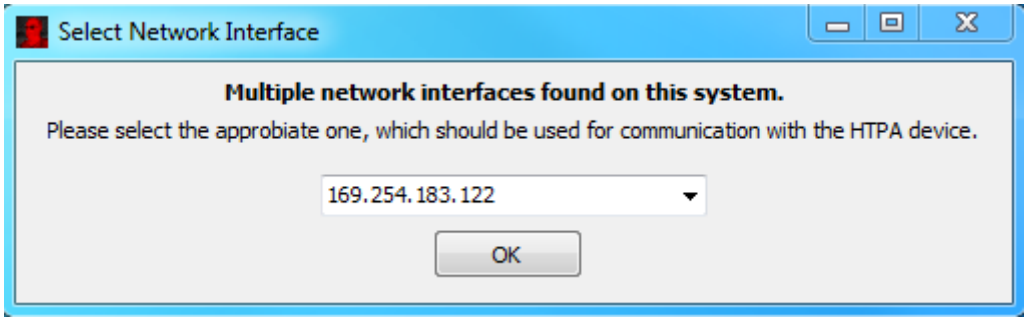
2 sensors were bound to the GUI and configured separately in each slot. The configuration is saved slot specific and not sensor specific. That means, that if disconnecting the sensors and connecting them again, it is possible that the slot position switched. The configuration did not switch and as a result, sensor 1 and sensor 2 switch the configurations.

For further information regarding the slots, please see the **“Search camera”** feature below. Please take care that you have writing permissions in the folder, where the GUI is installed or placed. The user defined settings will be saved in an extra file.

Reset user settings to default:

This button will reset every previous saved user setting by the default settings.

2.3.3 Search UDP



2-4: Select Network Interface.

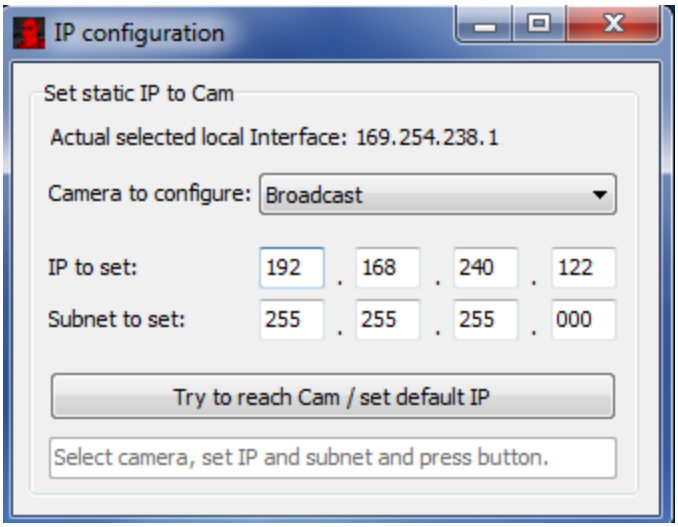
By pressing the **“Search UDP”** button, a broadcast is sent to find devices in the network. If the PC and the camera are not in the same network and no IP was given by a DHCP, you have to configure the IP of the camera via the **“IP settings”** button. If several devices could be found, a new slot for each sensor occurs under the main window. If there is more than one network available (e.g. if two network interfaces are installed or WLAN activated), you have to choose the network in which the camera is actually installed. With the dropdown menu, it is possible to choose the desired network. By selecting the network, ensure that the camera has the matching subnet / IP configuration.

2.3.4 Search USB

By pressing the **“Search USB”** button, a connected USB Application set can be bound to the GUI.

2.3.5 Connection

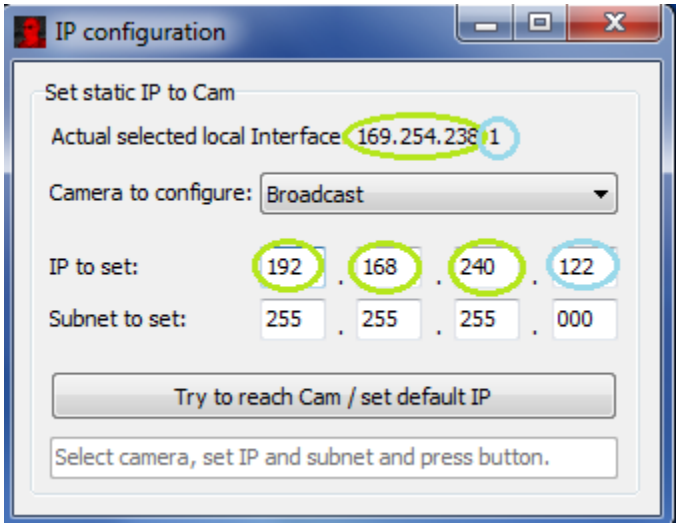
2.3.5.1 IP Settings



2-5: IP configuration.

With **"IP settings"** it is possible to set the default IP of the device. IP and subnet should be typed into the boxes and confirmed by clicking "Try to reach Cam". It is important, that the PC and the camera are in the same network. The IP of the local PC is shown in the top of the window. Only the device, which IP should be changed, must be powered, connected and selected (**"Camera to configure"**) if available. If there are no devices shown, select broadcast, all devices, which receive the message will change their IP to the requested value. Therefore, only select "Broadcast" if you have connected only one camera. Multiple devices with the same IP in the same subnet will cause packet collisions. The given IP will be used in the active session. On delivery, each application set has the default IP 192.168.240.122. Nevertheless, selecting **"Search camera"** in the Interface-Box is necessary again. When a reset occurs (for example by a power event) the device tries to get an IP via DHCP. If no DHCP is present, the given default IP will be used. How to establish a connection between camera and GUI is shown below:

1. Connect the module via USB and Ethernet to your PC / network.
2. Start "ArraySoftv2".
3. Choose "Search camera".
4. If no device is found, Click "Connections→IP settings"
5. If there is no DHCP in the network, we can now change the default IP of the camera.
6. Set all values, which are associated to a subnet of 255 to exact the same value as your local IP. The other values should differ from your local IP. Example:

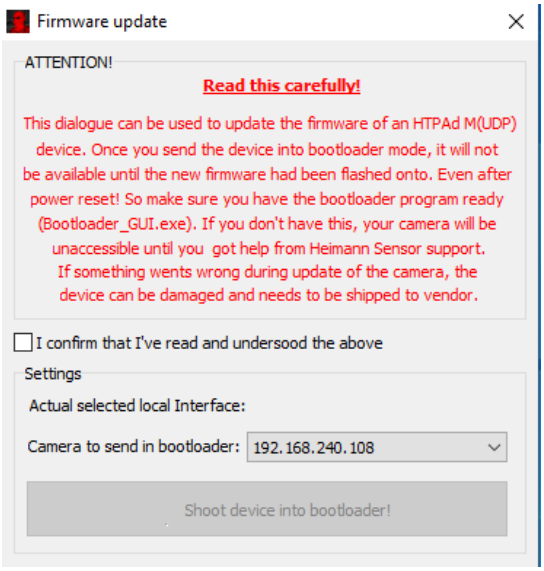


2-6: Network configuration.

The green values should be the same, the blue value MUST differ.

7. After that, press the “Try to reach Cam / set default IP” button, close the window and search the camera again.
8. If you now find two cameras you can decouple the device with the previous IP. The device with the new IP will now be ready to stream data.

2.3.5.2 Bootloader

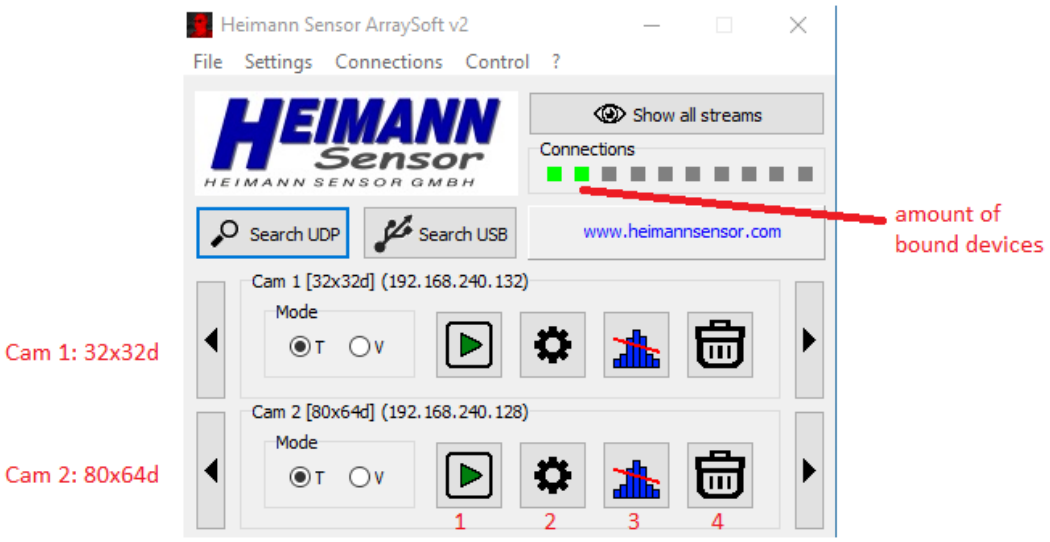


2-7: Bootloader menu

This dialogue can be used to update the firmware of an HTPAdM(UDP) device. Once the module is sent into bootloader mode, it will not be available until the new firmware had been flashed onto. For flashing, the Bootloader_GUI.exe will be necessary which can be requested from the Heimann Sensor support. It is possible to manipulate or damage the device, if the program is not flashed correctly, so it will be necessary to send the module back to the vendor. The camera which should be send in boot-mode can be selected with the drop down menu via the specified IP address. For a guideline how to use the Bootloader_GUI.exe, please contact the Heimann Sensor support.

2.3.6 Show all streams

Each stream will be shown in the foreground.



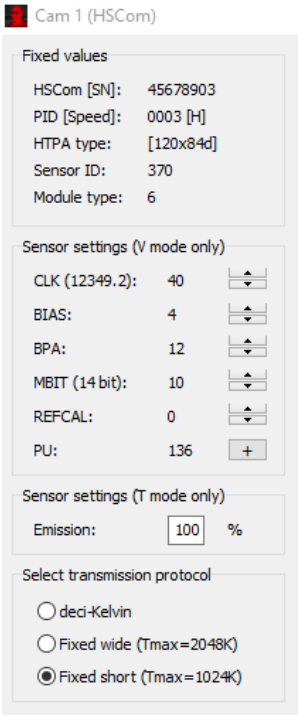
2-8: Main frame with bound sensors.

The streams for each sensor can be configured by clicking left or right through the popped up window. The information bar “Connections” signals yellow for devices which are not bound or experiencing packet loss during streaming, and green for bound devices, which are streaming. For each sensor, the operation mode can be switched between temperatures (“T”) and voltages (“V”). It is recommended to stop data capturing before changing the mode.

2.3.7 (1) Stop/Start streaming

This button starts the data stream in either temperatures or voltages. By pressing the button, a new window pops up with the actual graphical representation. This window can be moved and changed in its size as required.

2.3.8 (2) Device dependent settings



2-9: Device settings.

Device dependent settings will be displayed in this menu. The IP, MAC-ID of the application set, sensor type and sensor ID are shown in the upper part. Below, the sensor settings can be changed in the voltage mode. For detailed information about these settings, please see the corresponding datasheet of the sensor or the “TRIM_Register_Settings.pdf” document. Additionally, the emission coefficient can be changed for the required measurement in the temperature operation. The default value is 100%. A reduced emission coefficient will result in higher calculated temperatures. By typing into the emission coefficient field, the figures will turn red. When pressing the enter button the typed in value will be sent to the camera. If the camera confirms, the figures should turn green. This is the confirmation, that the application set has acknowledged the emission setting.

2.3.9 Protocol types

Several devices allow to send temperature data in finer resolutions as deci-Kelvin. If the device supports multiple protocols, you will find the Groupbox “Select transmission protocol” in the settings dialogue enabled.
Here you can select

- The standard deci-Kelvin protocol (supported by all devices)
- a transmission protocol with a wide object temperature range from 0 to 2048K (-273.2 to 1774.8°C). Resolution is 31.23474mK.
- a transmission protocol with a short object temperature range from 0 to 1024K (-273.2 to 750.8°C). Resolution is 15.60974mK.

If a txt file is recorded with one of the fixed range protocols, the content of the txt file needs to be scaled to Kelvin to get human readable.

The header of a txt-stream will look like this:

```
ARRAYTYPE=12MBIT=10REFCAL=0T=YProtocolType=1(fixWR)
09430 09444 09401 09386 09432 09428 09403 09430 09431 09416 09458 09
09442 09376 09390 09427 09402 09456 09429 09456 09397 09416 09435 09
09442 09422 09401 09427 09412 09428 09429 09447 09414 09448 09404 09
09418 09444 09411 09397 09423 09409 09411 09422 09414 09440 09427 09
09405 09433 09379 09397 09402 09400 09421 09456 09414 09440 09435 09
```

2-10: Txt snippet temperature stream.

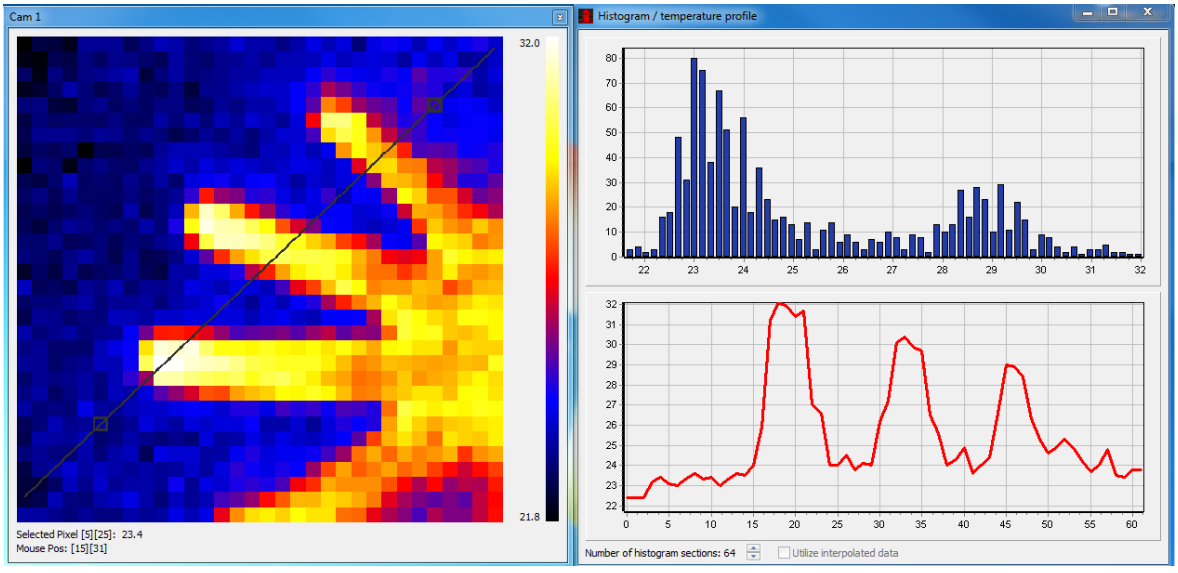
ProtocolType refers to the used protocol.

- ProtocolType 0: deci-Kelvin is used
- ProtocolType 1: Fixed wide range is used. Content of the txt file needs to be divided by 32 to get a Kelvin-reading.
- ProtocolType 2: Fixed short range is used. Content of the txt file needs to be divided by 64 to get a Kelvin-reading.

In above example the first pixel has a reading of 9430 digits and fixed wide range is used. The conversion result is 9430/32=294.6875K.

2.3.10 (3) Histogram/Temperature profile

The Histogram shows the distribution of the voltage / temperature in a separate window. The histogram shows the amount of pixels with a given value in dependency of voltage or temperature. This distribution is calculated for all sensitive pixels.
It is also possible to draw a profile line with the mouse (drag, move and drop) into the image, which shows the pixel value in dependency of the pixel coordinate. Every pixel, which is cross sectioned by the line will be shown in the histogram. The selected cutting edge is shown in the pixel screen and the temperature profile shows the temperature / voltage in dependency of the position. The amount of histogram sections can be varied with the up/down buttons.

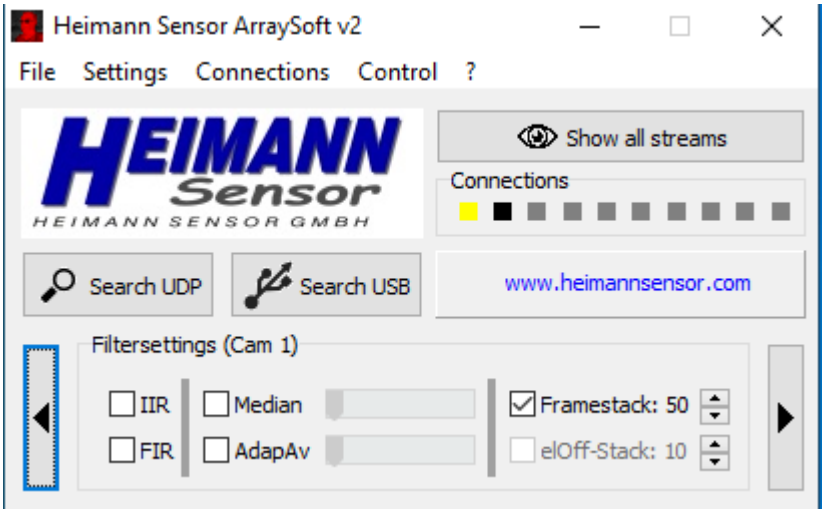


2-11: Histogramm and profile.

2.3.11 (4) Remove device

The device will be decoupled from the ArraySoft by clicking the trash button. The device with this IP will not be shown anymore in this session of the application.

2.4 Filter settings



2-12: Filtersettings.

In the screen **„Filter settings“** different image processing filters can be added and configured to the stream.

2.4.1 IIR/FIR

The infinite impulse response filter and finite impulse response filter are both 2nd order low-pass Bessel filters and work in voltage- and temperature mode to reduce noise. They have a cut-off frequency of 3 Hz. The group delay of the FIR filter is 300 ms and of the IIR filter is between 60 ms and 130 ms.

2.4.2 Adaptive Average Filter

The scrollbar below the IIR/FIR filter sets a noise reducing adaptive average filter. It is only available in temperature mode. Is the temperature difference of the corresponded pixel to the last value larger than the defined threshold, the filter has no effect. If it is lower, then the value of the pixel is calculated as an average of the last 4 pictures. Therefore, noise of static scenery can be reduced. If the threshold is set too high, image artefacts can occure.

2.4.3 Median Filter

This filter helps to reduce “salt and pepper noise” in order to get a homogeneous image. It sorts the voltage- or temperature values of each neighbour pixel and writes the median value of this group of pixels.

The threshold, which can be set by the scrollbar, defines at which quotient (in voltage mode) or difference (in temperature mode) the filter has no effect. This is useful to exclude edges of the image of the median filter function.

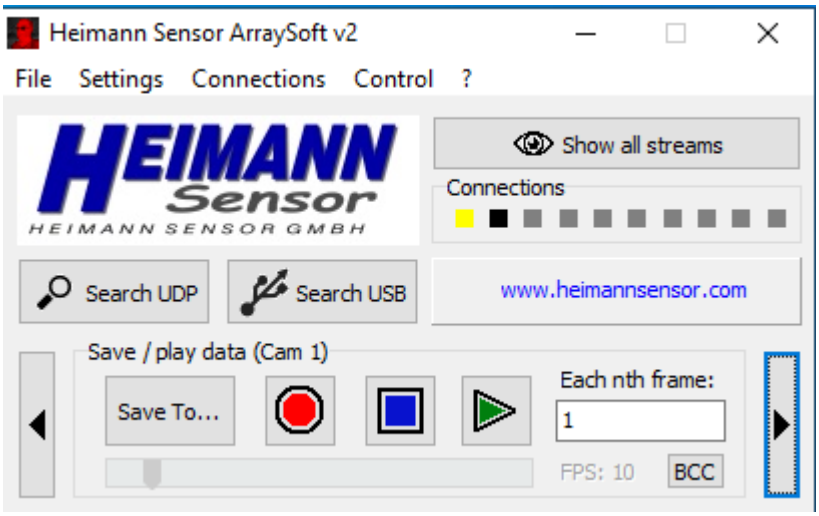
2.4.4 Framestack

The “Framestack” allows a moving average over multiple pictures for better SNR since the larger bandwidth will decrease noise. The frame stack can get a size between 1 and 300. It can be changed by using the up and down buttons.

2.4.5 El. Offset Stack

The “Electrical Offset Stack” builds an average value from multiple frames for each amplifiers operating point. The value determines how many frames are used for averaging. The stack size can be changed between 1 and 300 by using the buttons. It has only effect in voltage mode.

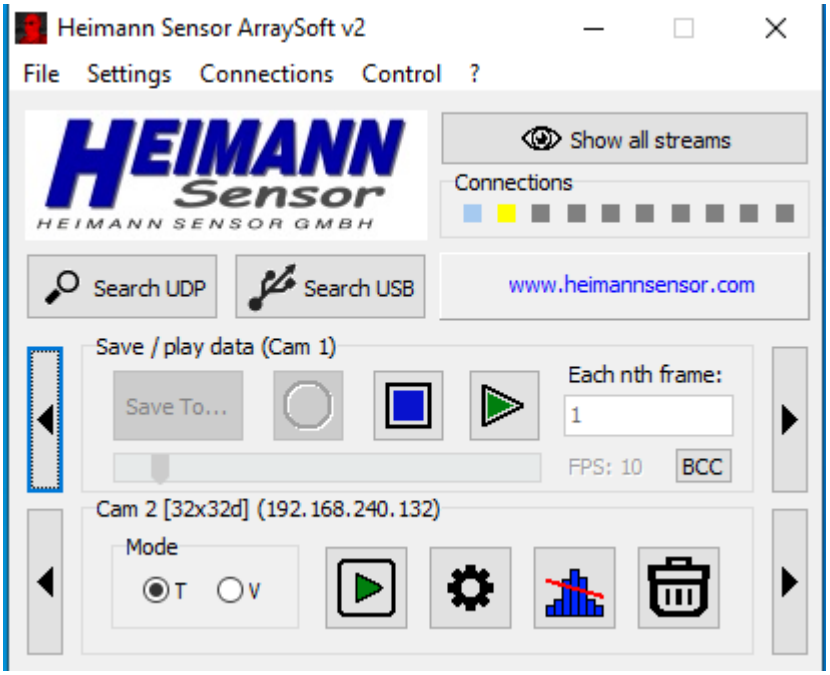
2.5 Save/play data



2-13: Save / play data frame.

The data stream can be saved in a binary-, text- or .avi file by pressing the “Save To…” button. For analyzing, the **text files** are easier to handle. The BDS format shows a much better compression than txt and is useful, if the data shall be played multiple times from the GUI. Clicking “Save To…” and entering a file name, file type and destination generates an corresponding file.

Data capturing starts by clicking the red “Rec” button in the Save/play data frame. The button is framed red as long as data capturing is done. By pressing “Stop” in the Save to File box the record stops and the file is saved. For playing the recorded stream (.bds), **“File”** and **“Play BDS/TXT”** must be clicked. A new slot appears. By pressing the **“Play”** button in the “Save / play data” frame the stream is replayed.



2-14: Replay slot added by replaying a recorded stream.

It is also possible to reduce the size of the file by setting the figure in the **"Each nth frame"**-field to a different amount. When it is set to 6, for example, then only each sixth frame is recorded. The "Each nth frame" value takes only effect for recording streams, not for playing them.

The slider below (FPS/ Frames Per Second) can be used to adjust the speed of the played datastream.

By choosing an .avi file and pressing "Rec", several codecs may be available for selection. This depends on the codecs, which are installed on your machine, the GUI comes without codecs. The compression causes less storage consumption of the the .avi file, but will come with the disadvantage of less quality. These files can be replayed e.g. with Windows Media Player or comparable programs.

The .txt file is formatted in the following way:

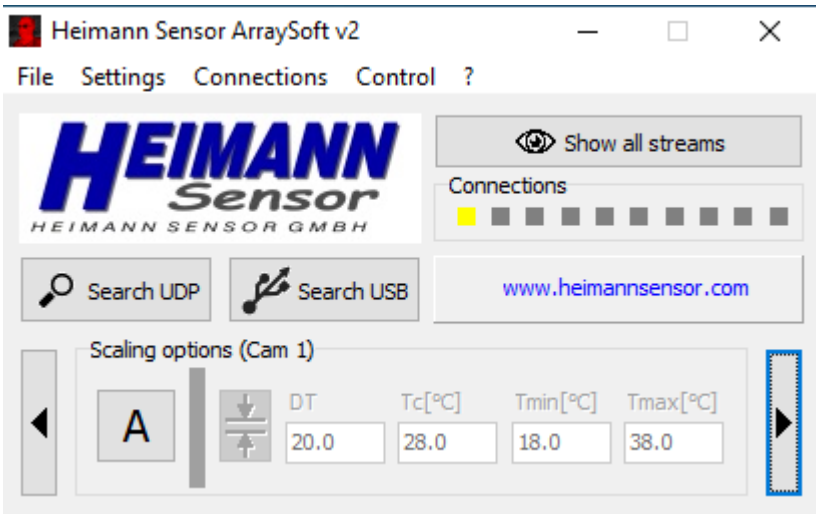
- Each line represents one frame containing all relevant pixel information
- From first to last pixel (for a 32x32d sensor 1024 pixel values), followed by the electrical offset values (for a 32x32d sensor 256 values)
    i. Units: pixel data in dK (deci-Kelvin); °C = (dK -2732)/10
    ii. Units: electrical offsets: digits
- One VDDmeasure value (voltage in digits, which measures the sensor by itself)
    i. Units: VDDmeasure: digits
- One ambient temperature (TA) value
    i. Units: TA in dK (deci-Kelvin); °C = (dK -2732)/10

- PTAT values (1 value for 8x8d, 4 values for 16x16d, 8 values for 32x32d, 8 values for 80x64d)
    i. Units: PTAT: digits
- One ongoing time value (e.g. to calculate the frame rate)
    i. Units: s (seconds)

BCC:

The **"BCC"** button allows saving the EEPROM content of a sensor as a hex file. In order of issues, it is necessary that Heimann gets information about the sensor. With this button, the customer is able to deliver these information without returning the sensor.

2.6 Scaling options



2-15: Scaling options.

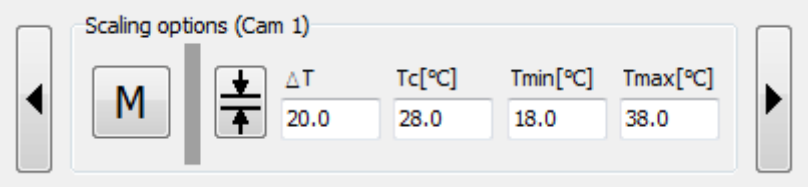
2.6.1 Auto (A)

This function searches for the minimum and maximum voltage / temperature value in each frame and sets these values as the limits of the false color scale. Therefore, in this mode the min and max values are dynamic and allow a maximum contrast of the selected color scheme.

2.6.2 Manual (M)

In this mode, it is possible to fix the min and max values of the false color scale to any temperature or voltage value. It is also useful to set the range manually to eliminate ambient noise. By pressing the button next to the **"Manual / Automatic"** button, you can select between different configuration modes for the manual scaling.

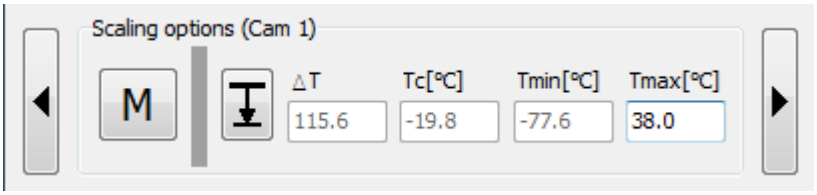
2.6.3 Fixed scaling limits



2-16: Fixed scaling limits.

This is the standard manual scaling mode, which can fix the absolute “min” and “max” values of the false color scale either in temperature or in voltage mode.
To set the desired range changing of ΔT(ΔV), Tcentre (Vcentre) , or Tmin (Vmin) and Tmax (Vmax) can be done by typing the value into the boxes. ΔT (ΔV) is the difference between Tmax (Vmax) and Tmin (Vmin), Tcentre (Vcentre) is the middle of ΔT (ΔV).

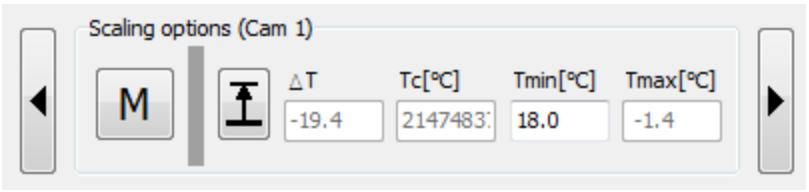
2.6.4 Upper scaling limit fixed, lower limit auto



2-17: Upper scaling limit fixed, lower limit auto.

Tmin (Vmin) is an auto scaled value, Tmax (Vmax) can be selected by a manual value.

2.6.5 Upper limit autoscaled, lower limit fixed



2-18: Upper limit autoscaled, lower limit fixed.

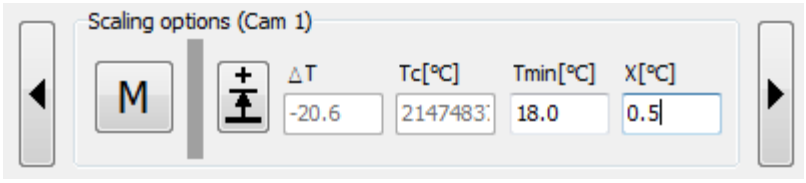
Tmax (Vmax) is an auto scaled value, Tmin (Vmin) can be selected by a manual value.

2.6.6 Upper scaling limit fixed, lower limit autoscaled with additional offset X

2-19: Upper scaling limit fixed, lower limit autoscaled with additional offset X.

In this mode changing the Tmax (Vmax) value and adding an offset to Tmin (Vmin) (which is auto scaled), called X, is possible.

2.6.7 Upper scaling limit autoscaled with additional offset X, lower limit fixed



2-20: Upper scaling limit autoscaled with additional offset X, lower limit fixed.

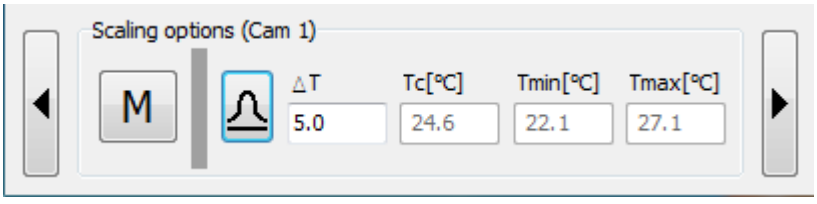
Tmin (Vmin) is changeable and an offset, called X, can be added to Tmax (Vmax) (which is auto scaled).

2.6.8 Both scaling limits autoscaled with an additional offset Omax / Omin

2-21: Both scaling limits autoscaled with an additional offset Omax / Omin.

In this mode, Tmin (Vmin) and Tmax (Vmax) values auto scaled and additionally the offsets Omin to the Tmin (Vmin) and Omax to the Tmax (Vmax) can be added.

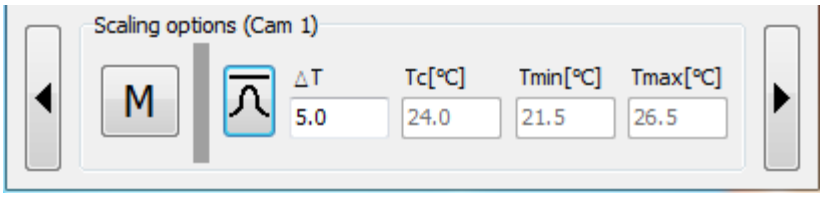
2.6.9 Bandpass, follows the minimum value in the frame



2-22: Bandpass, follows the minimum value in the frame.

In this mode, the span of the bandpass scaling can be set to a desired value. The bandpass follows the minimum value in the frame. Disturbing high temperature readings can be eliminated in order to get a good contrast.

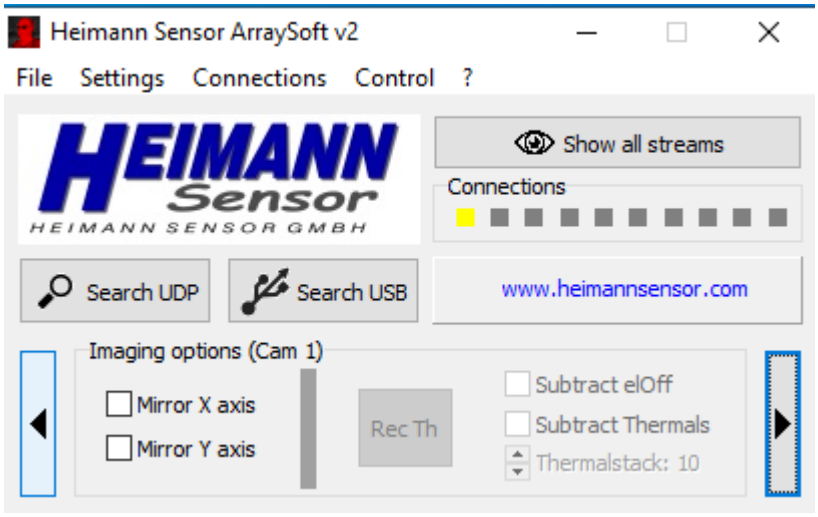
2.6.10 Bandpass, follows the maximum value in the frame



2-23: Bandpass, follows the maximum value in the frame.

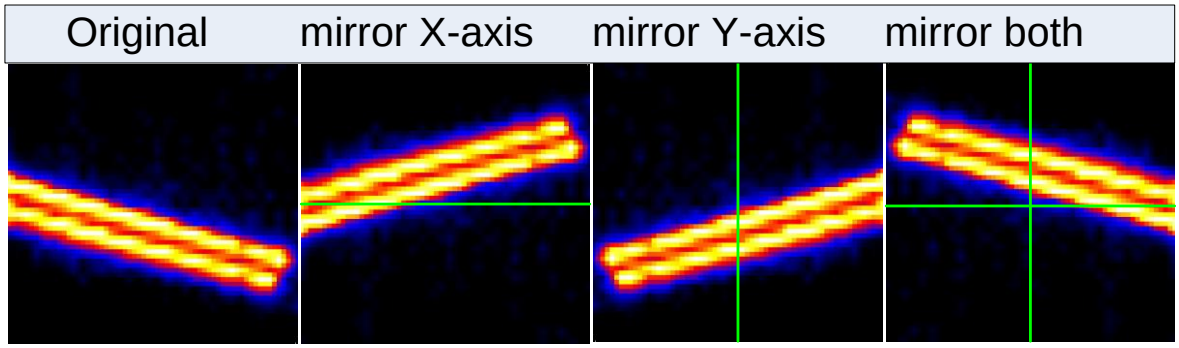
In this mode the span of the bandpass scaling can be set to a desired value. The bandpass follows the maximum value in the frame. Disturbing low temperature readings can be eliminated in order to get a good contrast.

2.7 Imaging options



2-24: Imaging options frame.

The **„Imaging options“** frame allows to mirror the image in x, y and both directions.

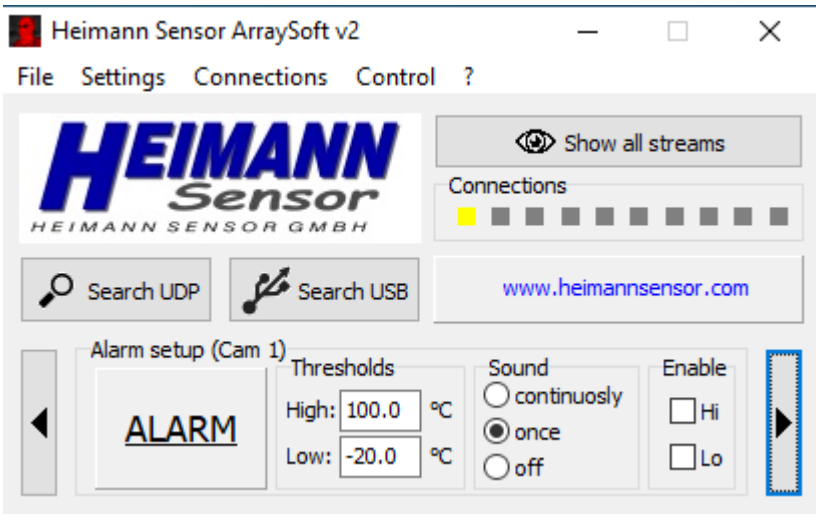


2-25: Mirror feature in different directions.

In voltage mode, it is possible to capture thermal offsets. For this, it is necessary to cover the lens with a homogenous tempered object with a high absorption coefficient during the process (as long as the button is highlighted red). In voltage mode, it is recommended to record the thermals. The voltages of each pixel in relation to the used object is set to zero.

Additionally, it is possible to subtract electrical offsets. The checkbox **Subtract Thermals"** subtracts only the thermal offsets. The checkbox **"Subtract elOff"** subtracts the operating point of the amplifiers. This is also only possible in voltage mode. The size of the thermalstack can be selected. The stack size of the electrical offsets can be set in the **"Filtersettings"** screen A thermal stack of, for example, 10 averages the next 10 incoming frames by clicking the button **"Rec Th".** If the box "Subtract thermals" is checked, the thermal offsets are subtracted from the image.

2.8 Alarm setup



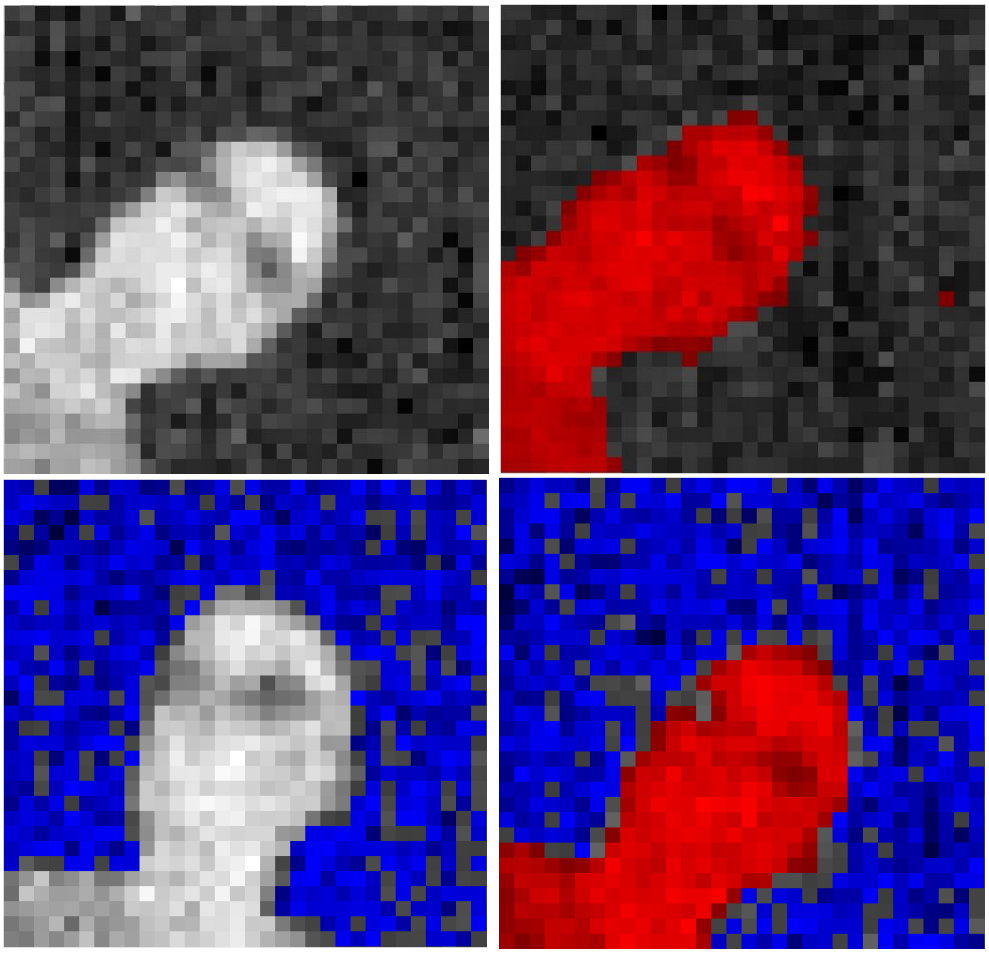
2-26: Alarm setup frame.

By activating the alarms using the „**Enable Hi/Low"** checkbox, pixels in the image can be highlighted, when they are below the threshold (Alarm Lo) or above the threshold (Alarm Hi). This can be done by changing the values of **"Thresholds: High"** and **"Thresholds: Low"**. The alarm occurs if the minimum or maximum or both values are exceeded. Besides this, it is possible to get a sound alarm. This can be a continuously alarm or an alarm, which only occurs once.

In addition, the "ALARM" box is highlighted red if a maximum alarm occurs. If a minimum alarm occurs, this field will be displayed blue. If both occur, then the ALARM is highlighted purple.

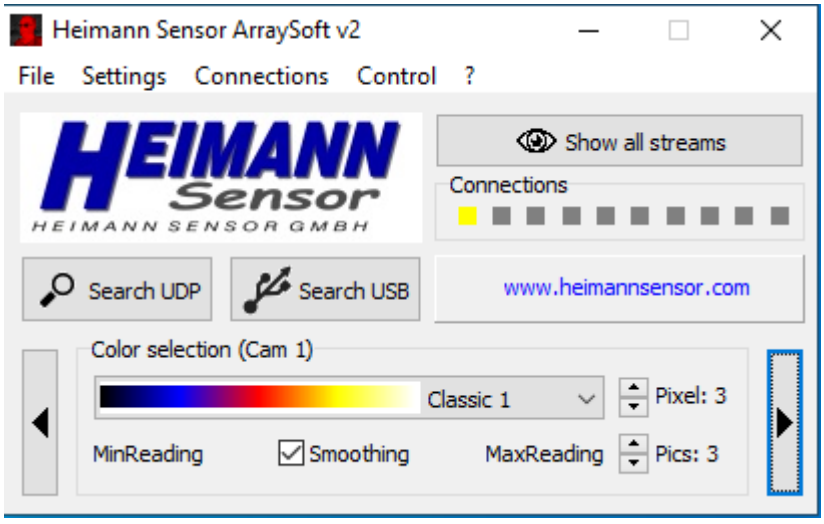
The alarm is available in temperature mode only.

By using the alarm feature, the color scale will change to the grey-scaled color scheme. Pixel readings above the maximum threshold will be displayed red, pixel below the minimum threshold will be displayed blue.



2-27: Different demonstrations for the alarm feature.

2.9 Color selection



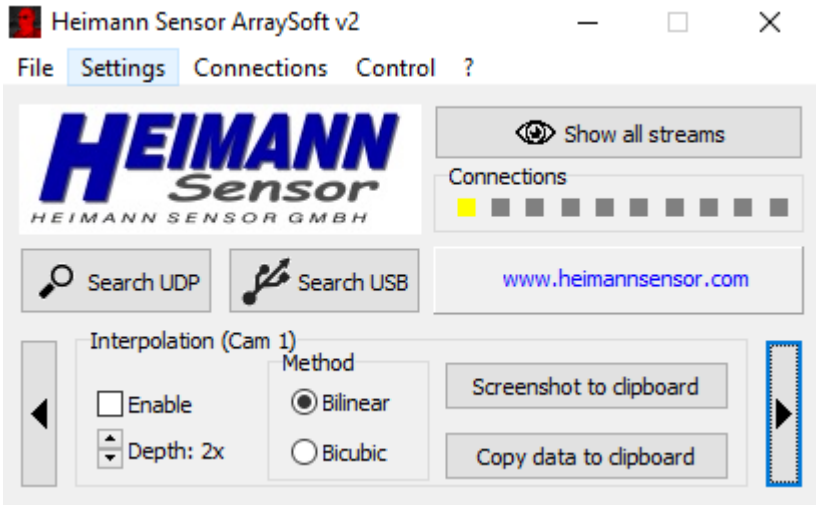
2-28: Color selectrion frame.

All color scaling bars, which are already implemented in the software, and those, which were self-generated, can be selected in the **"Color selection"** frame. Below the color bar, the minimum pixel value (left side) and maximum pixel value (right side) are displayed. In between, a checkbox called **"Smoothing"** can be activated if desired. If there are pixels, with increased noise (e.g. corner pixels with low signal for ultra-wide field of view optics), they will influence the scaling of the color bar and can be smoothed in that way that the whole stream is more homogeneous. **"Pics"** represents the amount of frames for averaging the minimum and maximum value for the color scaling. **"Pixel"** represents the amount of pixels, which should be considered for the smoothing algorithm.

Example: **"Pixel"** = 3 and **"Pics"** = 5

The algorithm searches for the 3 pixel with the highest readings and the 3 pixels with the lowest reading and calculates a consecutive average of these. Furthermore, these values are averaged over time, in the example over 5 frames. This will lead into a more stable scaling and the image seems to be more homogeneous and less flickering.

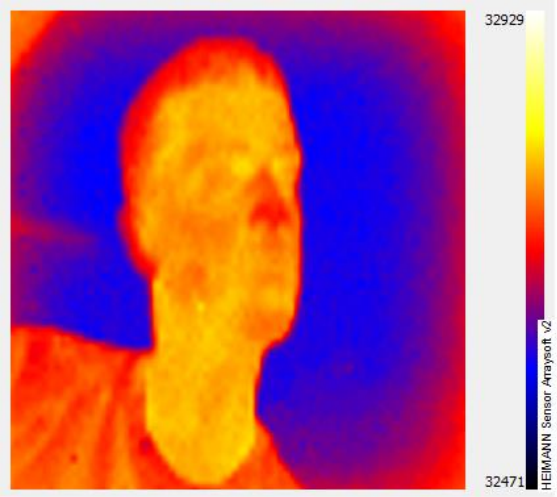
2.10 Interpolation



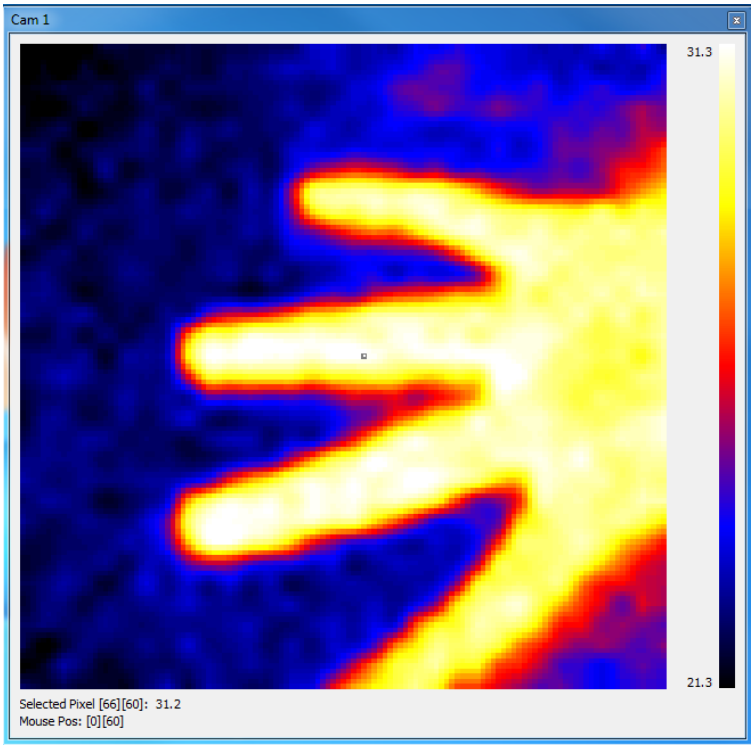
2-29: Interpolation frame.

The interpolation function allows a simulation of a higher resolution with a factor of 2*n-1 up to 8*n-1, where n is the number of pixels per line or column. For example will a 32x32 array have 63x63 interpolated pixels with an interpolation depth of 2x. The interpolation method can be chosen between **"Bilinear"** and **"Bicubic"**. When recording .bds or.txt streams, the interpolated pixels will be recorded as well.

With **"Screenshot to clipboard"** a screenshot of the actual streaming frame, including the color scale will be copied to the clipboard and can be saved as an image file. **"Copy data to clipboard"** will copy the pixel values, either in temperatures or in voltages, to the clipboard. A post processing of this data in other calculation programs (e.g. Excel) is possible.

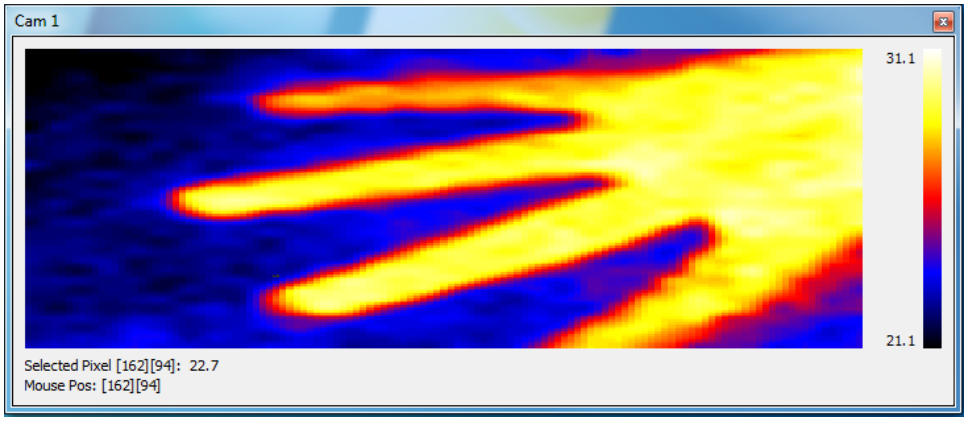


2-30: 8x interpolation with an 80x64d.



2-31: Interpolation: Selected pixel and mouse position.

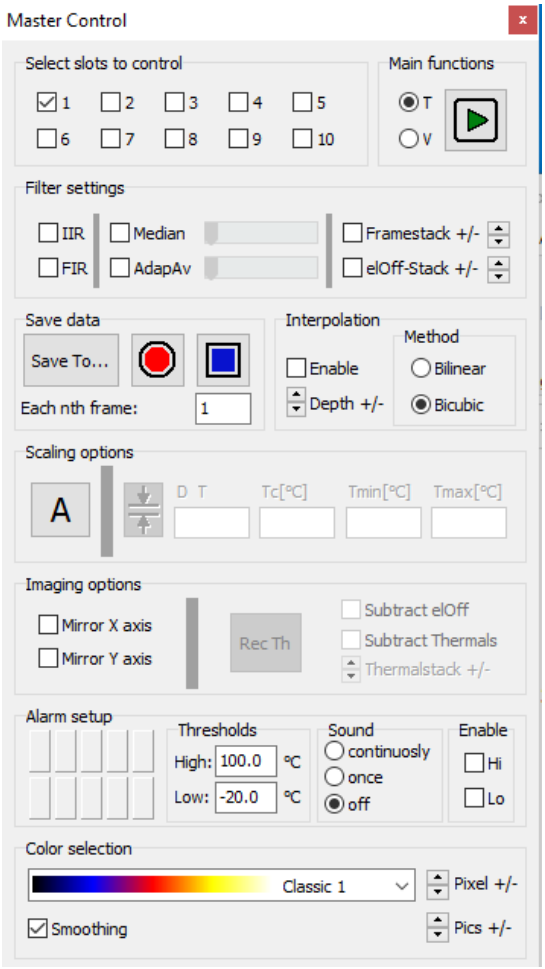
It is possible to select a pixel by clicking on it. The temperature of this pixel is displayed below the image. Additionally, the actual mouse position is shown. Whenever the image was changed in its size and the relation between width and height does not fit to the original pixel relation it can be reset by double clicking on the image.



2-32: 32x32d sensor with not fitting width/height relation. Doubleclick will reset the aspect ratio.

2.11 Master control

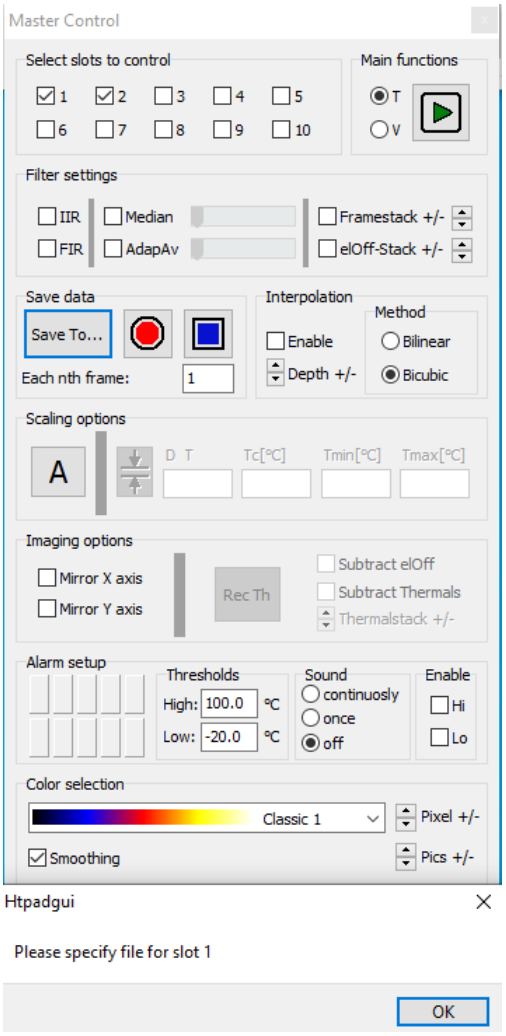
The dropdown menu “Control” allows to open the “Master control” panel. With this panel it is possible to change GUI settings for more than one sensor (a maximum of 10) at the same time. Independent from this panel, it is still possible to change the GUI settings for each sensor individually by using the popup slots on the main frame.



2-33: Master control panel.

The checkboxes “Select slots to control” give the opportunity to choose the sensors which should be controlled via the Master control. In the frame “Main functions” the stream can be started either in temperature mode (“T”) or in voltage mode (“V”).

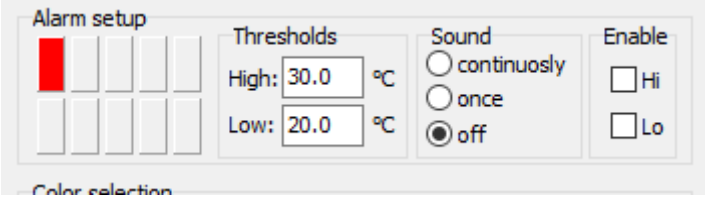
The frame “filter settings” works as described in 2.4. The only difference is that the chosen settings will be applied to each selected sensor. By changing the framestack or electrical offset stack, the actual setting can be seen in the common sensor slot frame in the main frame of the GUI. Also, if the framestack settings are different for each sensor, the Master control will increase or decrease the original setting. To get the stacks equal for each sensor, the stack has to be decreased as long until every sensor has a framestack of 1. The other possibility is to change the number of the framestack individually by using the sensor slots.



2-34: Master control, Save data.

A data stream can be saved for one sensor after another. A popup window will occur, which asks to choose the file for slot 1. After confirmation the file for slot 2 can be specified. This procedure will proceed for each checked sensor bound to the GUI.

The interpolation and its depth can be enabled and adjusted by using either the “arrow up” or the “arrow down” buttons.



2-35: Master control, Alarm.

In the “Alarm setup” a display has been implemented showing which of the maximum of 10 sensors trigger an alarm either for high and/or low threshold. The alarm is shown visually by coloring the sensor’s slot and can also trigger the alarm sound. By using the alarm feature, the color scale will automatically change into grey for each stream.

The false colors can be selected by using the dropdown menu and the smoothing algorithm can be enabled by checking the box.

3 Getting started

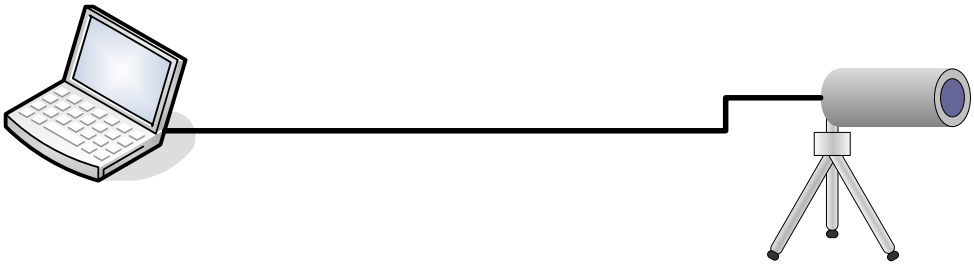
3.1 Install software

The Software for the HTPA device is on a CD, which is generally included in Application sets or can be downloaded from our homepage http://www.heimannsensor.com/.

Install the Arraysoft v2 by executing the “SetupHTPAdGUIv2.exe”. The copy destination should be in a folder with write access (This means NOT “C:\Program Files\”, best thing is to use the suggested installation path. If a previous version of ArraySoftv2 was installed it is necessary to start HTPA_Unwise.bat for once first.

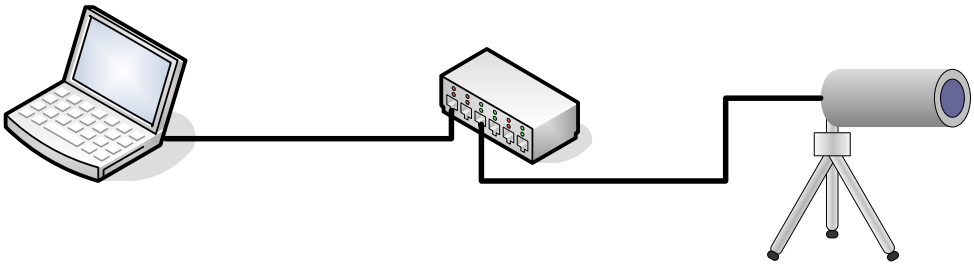
3.2 Connect HTPA device

- Communication
  - Direct connection (crossed connection) to PC:
    For this type of connection a crossed ethernet cable is needed (A crossed ethernet cable is generally included in application sets).



3-1: Direct connection to the PC.

  - Connection via Switch/Hub
    This Connection needs a normal/standard ethernet cable.



3-2: Connection via switch/hub to the PC.

- Power supply
  The digital HTPA devices should only be used with 5V DC power via USB, otherwise the HTPA device might be damaged.

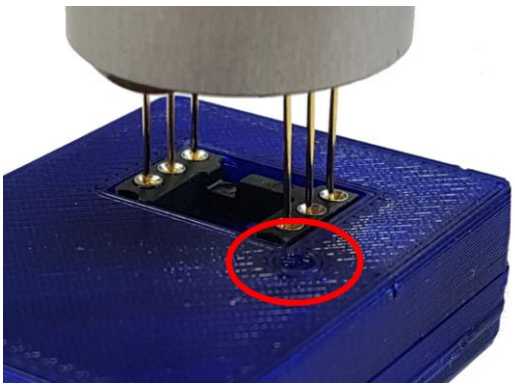
  Events on power up:

  If a DHCP is present in the network, the device will get his IP via the DHCP. In this case no further steps are required. If no DHCP is present (usually when the device is directly connected to a computer or Laptop) the device tries 10 seconds to reach the DHCP. If

this time expires, the device tries to recover an IP and subnet mask, which was set in a previous session by user. If no IP was set by user the device uses the **default IP 192.168.240.122.** The subnet mask is in this case 255.255.255.000.

3.3 Connect USB HTPA device

- Insert sensor into socket of the application set. Check orientation by the markings / index tap on sensor and application set housing:



3-3: Correct orientation of sensor in USB Application Set.

- Please be aware that a false orientation can lead to several damages, even including your computer.
- Connect the application set with the USB cable to your PC. The LED of the Application Set will first show for a short time a red indication; after successful configuration it will turn green.
- Start HTPAdGUI.exe on your local drive
- Press “Search USB”. A slot for the Application Set will appear, allowing controlling the device.