

# SV600 Series

Sonic Viewer



## Users Manual

## **Warranty**

The manufacturer warrants this instrument to be free from defects in material and workmanship under normal use and service for the period of two years from date of purchase. This warranty extends only to the original purchaser. This warranty shall not apply to fuses, batteries or any product which has been subject to misuse, neglect, accident, or abnormal conditions of operation.

In the event of failure of a product covered by this warranty, the manufacturer will repair the instrument when it is returned by the purchaser, freight prepaid, to an authorized Service Facility within the applicable warranty period, provided manufacturer's examination discloses to its satisfaction that the product was defective. The manufacturer may, at its option, replace the product in lieu of repair. With regard to any covered product returned within the applicable warranty period, repairs or replacement will be made without charge and with return freight paid by the manufacturer, unless the failure was caused by misuse, neglect, accident, or abnormal conditions of operation or storage, in which case repairs will be billed at a reasonable cost. In such a case, an estimate will be submitted before work is started, if requested.

The foregoing warranty is in lieu of all other warranties, expressed or implied, including but not limited to any implied warranty of merchantability, fitness, or adequacy for any particular purpose or use. The manufacturer shall not be liable for any special, incidental or consequential damages, whether in contract, tort, or otherwise.

This manual is available in different languages. In case of differences between the language versions, the English manual is binding.

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## Compliance Statement



The device complies with the requirements of the European Directives:

EC – Directive 2014/30/EU – for Electromagnetic compatibility directive (EMC)

- EN 61000-6-3:2007+A1:2011
- EN 61000-6-2:2005 + AC:2005

EC – Directive 2011/65/EU – RoHS3 Restriction of Hazardous Substances

- EU2011/65/EU RoHS2
- EU2015/863

## **Safety Information**

This document contains important information, which should be kept at all times with the instrument during its operational life. Other users of this instrument should be given these instructions with the instrument. Eventual updates to this information must be added to the original document. The instrument can only be operated by trained personnel in accordance with these instructions and local safety regulations.

### **Acceptable Operation**











This instrument is intended only for the measurement of acoustic signals. The instrument is appropriate for continuous use. The instrument operates reliably in demanding conditions as long as the documented technical specifications for all instrument components are adhered to. Compliance with the operating instructions is necessary to ensure the expected results.

### **Unacceptable Operation**

The instrument should not be used for medical diagnosis.

### **Replacement Parts and Accessories**

Use only original parts and accessories approved by the manufacturer. The use of other products can compromise the operation safety and functionality of the instrument.

Safety Symbol	Description
	Read all safety information before in the handbook
	Hazardous voltage. Risk of electrical shock.
	Warning. Risk of danger. Important information. See manual.
	Earth (ground) terminal
	Protective conductor terminal
	Switch or relay contact
	DC power supply
	Conforms to European Union directive.
	Disposal of old instruments should be handled according to professional and environmental regulations as electronic waste.
	International Ingress Protection Marking



**To prevent possible electrical shock, fire, or personal injury follow these guidelines:**

- Read all safety information before you use the product.
- Use the product only as specified, or the protection supplied by the product can be compromised.
- Do not use the product around explosive gases, vapor, or in damp or wet environments.
- Carefully read all instructions.
- Do not use and disable the product if it is damaged.
- Do not use the product if it operates incorrectly.
- Do not apply more than the rated voltage between the terminals or each terminal and earth ground.
- Incorrect wiring can damage the sensor and void the warranty. Before applying power, make sure all connections are correct and secure!
- To prevent possible electrical shock, fire, or personal injury make sure that metallic components are grounded before use.
- Have an approved technician repair the product.



## Contacts

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## 1 Description

The SV600 sonic viewer is the evolution in acoustic monitoring solutions. It combines the powerful use of acoustic imaging, detection of sound levels and accurate localization. The SV600 sonic viewer supports edge computing, all powered and connected with one single network cable.

The SV600 sonic viewer can be used in a variety of application fields: safety & security, mobility, environmental and machine maintenance. The acoustic monitors can be easily connected to cover larger areas with secure and GDPR proof data handling.

### 1.1 Features

- All in one acoustic monitoring
- Environmental noise monitoring
- Visual light camera integrated
- Sound intensity mapping

Figure 1-1: SV600 Sonic Viewer



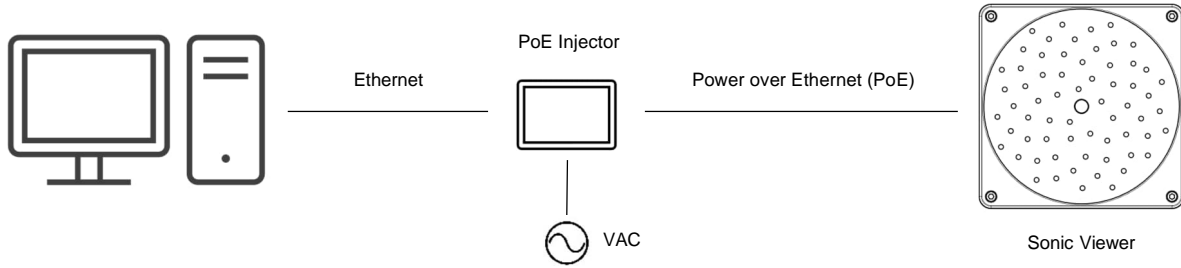
### 1.2 Available Models

SV600-1 providing:

- 64 MEMS microphones
- Sunflower Array
- Integrated VIS camera
- dB Values
- Localization

### 1.3 System Overview

Figure 1-2: System Overview



## 2 Technical Data

### 2.1 Physical Properties

Size (LxWxD)	170 x 170 x 65 mm
Weight	0.85 kg (1.8 lb)
Power	PoE+ port 100 – 240V AC, max 37 W, IEEE 802.3
Status LED	red, green

### 2.2 System Integration

API	HTTP REST, Modbus
Event Triggers	dB SPL or SoundMap threshold
Event Actions	Acoustic SoundMap overlay

### 2.3 Camera

Type	Integrated visible light
Resolution video	720 x 1280
Aspect ratio	4:3
Camera Resolution	720p at 30 fps

### 2.4 Microphones

Type	MEMS, Digital Bottom Port
SNR	64 dB for 94 dB SPL, @ 1kHz, (A-weighted, at 1 kHz)
Sensitivity	-26 dBFS ± 1.5 dB, at 1 kHz, 94 dB SPL
Acoustic Overload Point	120 dB SPL, at 1 kHz, <10% THD

### 2.5 General

Ingress Protection	IP54
Operating Temperatures	-20 to 50°C

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## **3 Environnement**

### **3.1 Ambient Temperature**

The SV600 is designed for ambient operating temperatures between -20 to 50°C. It is necessary to verify the environmental temperature and install the housing at the correct distance from the heating source. Note that too cold water can cause condensation, which can lead to damage in the device, the ambient operating relative humidity is between 10 – 100% RH (non-condensing).

### **3.2 Protection**

The SV600 complies with the international protection standard IP54. Please be aware that the SV600 is not watertight but splash-proof, the effectiveness against splashing under IP54 is possible only if the device is inspected periodically to all seals of the waterproof connectors.

## 4 Installation

The SV600 series is an IP based device. A good reliable network and power infrastructure is the backbone of every IP based solution, and the same applies to the SV600 acoustic monitor. In the installation you will first find the minimum requirements we prescribe to have the best operating experience with the SV600 acoustic monitor.

### 4.1 System Requirements

1. **Power:** The SV600 is powered via Power over Ethernet PoE+ (IEEE 802.3at-200). Only one Cat5e or Cat6 network cable is needed for connecting a listener. The SV600 uses around 20 W of power. The power can be provided either via a PoE switch or a separate PoE injector to the SV600.
2. **Connection (Wired):** The SV600 can be connected to the network via one Cat5e or Cat6 network cable. In case of a fiber optic network a fiber to copper converter needs to be used to connect the SV600 to the network.
3. **Connection (Wireless):** In case of a wireless network requirement, the SV600 can be connected to the network using a Wifi, 4G or 5G router.
4. **Throughput:** The SV600 uses about 7 MBit/s of data. (Note: the value is likely to be updated in the future)
5. **Internet:** The SV600 does not need an active internet connection to function.
6. **Stability:** SV600 device is able to recover from network failures. However, if a network is down for a longer time, data might get dropped. The SV600 buffers all data for at least 30 s. This data can retroactively be retrieved.
7. **Broadcast/Multicast messages:** The network on which the SV600 devices are connected, has to support (or not block) broadcast messages. Broadcast messages from the SV600 are used to find them (mDNS protocol, [zeroconf](#)). The ZeroConf uses the following IP address: [224.0.0.251](#). Alternatively, the user can configure static IP to reach the unit, mDNS is not required then.
8. **Used Ports:** Communication to a SV600 device is handled via ports 80, 443, 9011, 9012 and 9013.

### 4.2 Connecting a SV600

There are several modes in which you can connect a SV600:

1. Mode 1: Connect to a Network using DHCP
2. Mode 2: Connect directly to a PC/Laptop using Auto IP
3. Mode 3: Connect to a Network using Static IP
4. Mode 4: Connect directly to a PC/Laptop using Static IP

*Note*

*When you get a new SV600 device, it is configured so it can be connected in both mode 1 and 2 without any additional configuration.*

*If you want to configure the SV600 to connect it in mode 3 or 4, you will first need to connect it in mode 1 or 2 and change the configuration of the SV600 via the dashboard as explained in section 4.3 [Setting Up SV600](#), page 15.*

*Note*

*To power the SV600, you need a PoE injector or PoE capable switch. The PoE switch detects if a device needs PoE or not. The requirement is PoE+ for the SV600.*

#### 4.2.1 Mode 1: Connect to a Network using DHCP

In mode 1, connect the SV600 to a network which has a DHCP server available. Typically, the router of your network runs a DHCP server, but this can also run in a server computer. Contact your network administrator for more information about your particular network setup.

Connection can be made in two ways:

1. Connect the SV600 directly to a suitable PoE capable switch that is connected to the network
2. Connect the SV600 via a suitable PoE injector to a non-PoE capable switch that is connected to the network

The DHCP server will then automatically provide an available IP address to the SV600 in the address range that the network administrator has configured. The devices that can communicate with the SV600 (e.g. your PC/Laptop) need to be connected to the same network, either via a wired connection or a wireless access point.

#### 4.2.2 Mode 2: Connect directly to a PC/Laptop using Auto IP

In mode 2, connect the SV600 directly to a PC or Laptop.

Since ethernet ports on a PC/Laptop are (almost) never PoE capable, you will require a suitable PoE injector. Connection can be made in two ways:

1. Connect the SV600 via a suitable PoE injector to a free ethernet port on your PC/Laptop
2. Connect the SV600 via a suitable PoE injector to an ethernet-usb dongle plugged into your PC/Laptop

The SV600 will assign itself an IP address in the 169.254.0.0/16 range, also known as the Auto IP range.

#### 4.2.3 Mode 3: Connect to a Network using Static IP

In mode 3, connect the SV600 to any network (with or without DHCP server).

Connection can be made in two ways:

1. Connect the SV600 directly to a suitable PoE capable switch that is connected to the network
2. Connect the SV600 via a suitable PoE injector to a non-PoE capable switch that is connected to the network

A manually determined, fixed IP address can be assigned to the SV600 via the Dashboard.

##### Note

*Manually setting a static IP Address wrongly can lead to the device becoming unreachable. Make sure you configure the device correctly or ask your network administrator for help.*

#### 4.2.4 Mode 4: Connect to a PC/Laptop using Static IP

Since ethernet ports on a PC/Laptop are (almost) never PoE capable, you will require a suitable PoE injector. Connection can be made in two ways (note '+' devices require PoE+):

1. Connect the SV600 via a suitable PoE injector to a free ethernet port on your PC/Laptop
2. Connect the SV600 via a suitable PoE injector to an ethernet-usb dongle plugged into your PC/Laptop

A manually determined, fixed IP address can be assigned to the SV600 via the Dashboard.

##### Note

*Manually setting a static IP Address wrongly can lead to the device becoming unreachable. Make sure you configure the device correctly or ask your network administrator for help.*

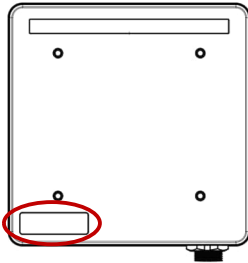
## 4.3 Setting Up SV600

### Before you start:

- Make sure the SV600 is connected with your PC/Laptop in either mode 1 or mode 2 as described in section 4.2 [Connecting a SV600](#), page 14.
- Wait until the indicator light (on the side of the SV600) becomes solid green.

**Step 1**

Keep the serial number of the SV600 ready. The serial number can be found on the back of the device at the bottom-left.



**Step 2**

Open your web browser (Chrome, Firefox, Edge, Safari).

**Step 3**

Type `http://<serial number>` in your address bar. E.g. `http://100110001`



If your network does not have DNS server or if you connected the device directly to your PC add `.local` at the end of the serial number address. e.g. `http:// 100110001.local`

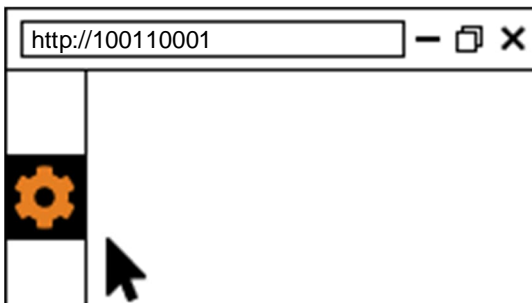
**Step 4**

Your browser will now show the device dashboard and prompt you to login. The default credentials are:

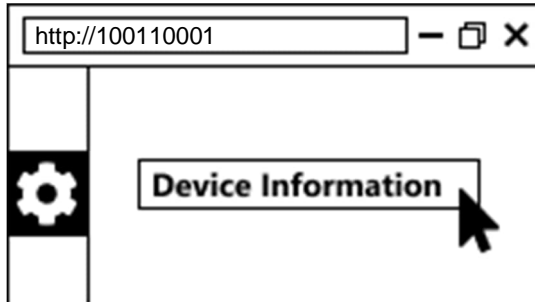
Username: admin
Password: admin

**Step 5**

In the device dashboard go to the "Device Configuration" page and click on Device Information

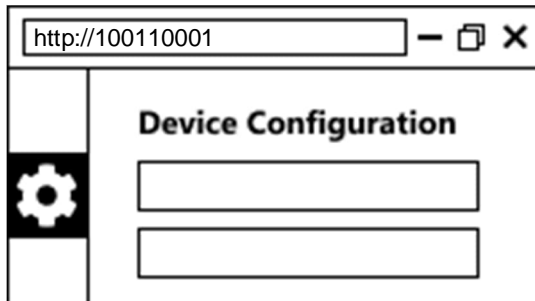






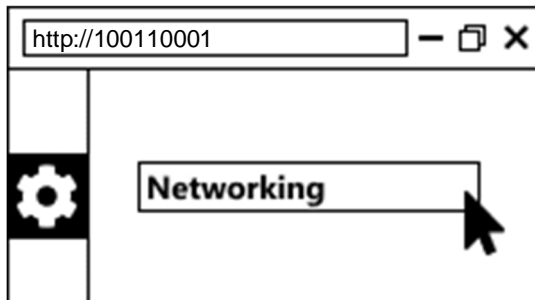
**Step 6**

Set the device coordinates and relevant installation information such as angles and target distances (if known)



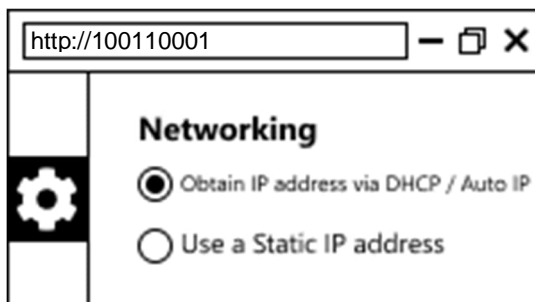
**Step 7**

Go back to the “Device Configuration” page and click on Networking.



**Step 8**

In the Network page set the preferred network settings according to your project.



Select “Obtain IP address via DHCP / Auto IP” (the default) if you want to run the SV600 in either mode 1 or 2 as described in section 4.2 [Connecting a SV600](#), page 14. No additional configuration is required.

Select "Use a Static IP address" if you want to run the SV600 in either mode 3 or 4 as described in section 4.2 [Connecting a SV600](#), page 14. You will need to specify the following:

- IP address: The static IP address that the SV600 should use
- Subnet mask: The subnet mask of the network the SV600 is (going to be) connected to
- Gateway: The gateway address of the network the SV600 is (going to be) connected to
- Primary and Secondary DNS Address: The IP addresses of the primary and secondary DNS server on the network.

After the device has been configured, you will need to reload your browser window since the IP address of the SV600 has changed. Depending on your network setup and the values you have entered, you might also need to change the configuration of your network adapter before you can reach the SV600 again. Ask your network administrator for assistance.

*Note*

*Currently all values need to be specified. If you do not need one of the values, just leave it at the default setting. If you don't know what these settings mean, contact your network administrator.*

*Note*

*Manually setting a static IP Address wrongly can lead to the device becoming unreachable. Make sure you configure the device correctly or ask your network administrator for help.*

## **4.4 Performing a Firmware Update**

### **Before you start:**

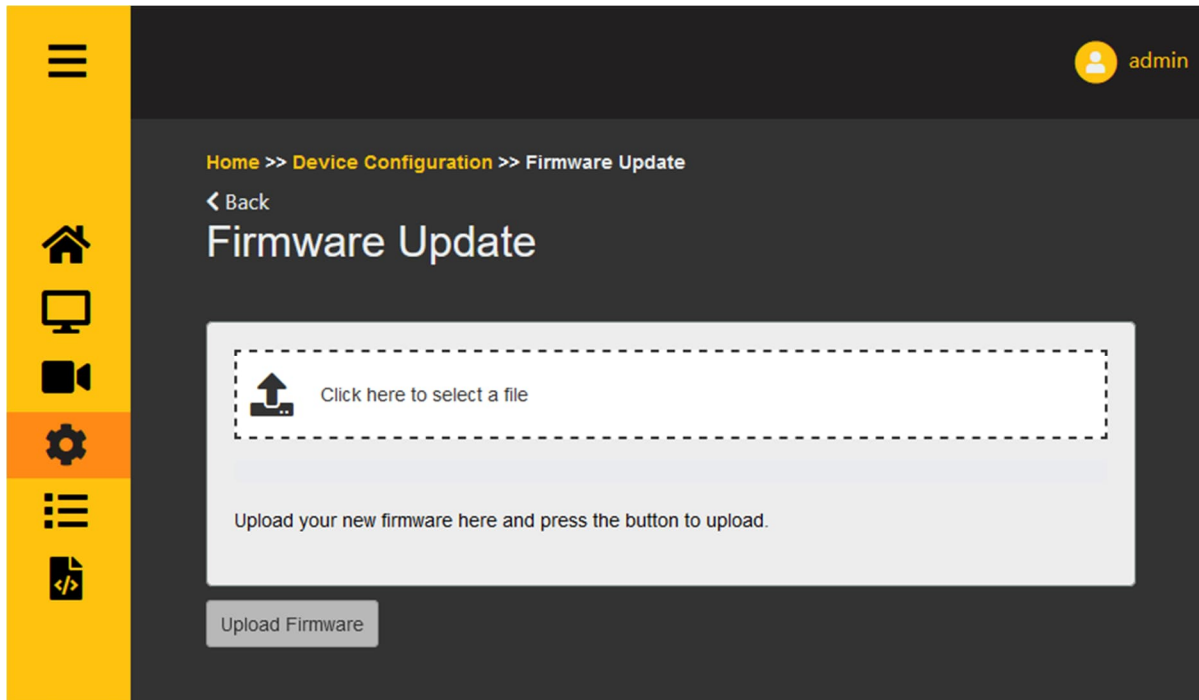
The following steps assume you have already completed the device setup as described in section 4.3 [Setting Up SV600](#), page 15, and can access the device dashboard.

### **Step 1**

In the device dashboard go to the "Device Configuration" page and click on Firmware Update.

### **Step 2**

On the Firmware Update page, click "Click here to select a file". A file selection menu will appear.



**Step 3**

Select the firmware file from the file selection menu and click “Open”.

**Step 4**

Click “Upload Firmware”. A popup window will appear asking you to confirm, click “OK”.

**Step 5**

First, the file will be uploaded to the device. The progress bar indicates the progress of the upload.

Second, the device will install the new firmware, this can take between 1 and 5 minutes. The progress bar will keep animating during this process.

When the firmware update is complete, the progress bar turns green. The device will now be reset. Wait until the LED on the device turns green again, then refresh the dashboard and you can start using the device with the new firmware. In rare cases, a firmware update might fail. If it still fails after a retry or two, contact your supplier.

**4.5 LED Indicator**

The LED indicator is a small semi-transparent dot (powered off) on the side of the device.

Colour:	state:	Function
Red	Solid	Starting or error state
Green	Solid	Ready

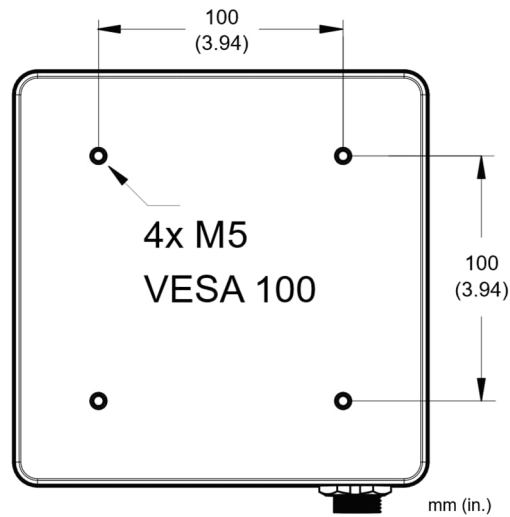
**4.6 Mounting**

SV600 has several ways to be placed in the environment.

### 4.6.1 VESA Mounting

SV600 provides a Vesa 100 mounting on the back of the unit.

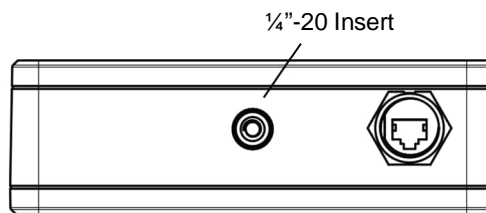
Figure 4-1: Vesa 100 Mounting



### 4.6.2 Tripod Mounting

SV600 provides a tripod mounting on the side of the unit.

Figure 4-2: Tripod Mounting



### 4.6.3 Mounting Distance

The mounting distance is depending on your situation and differs from area to area. In general, the distance to the area being measured should be:







- Minimum of 3 m (9.8 ft).
- Maximum of 15 m (49.2 ft).
- Outside of these bounds the system will not be able to properly monitor the whole area.
- Inside of these bounds, the area that can be monitored approximately equals twice the mounting distance.
  - Example: a SV600 mounted at 6 m (20 ft) high can cover an area of 12 x 12 m (40 x 40 ft).

*Note*

*No other holes should be drilled in the housing as this will affect the water-resistance capabilities of the device or worse damage the electrical components inside..*

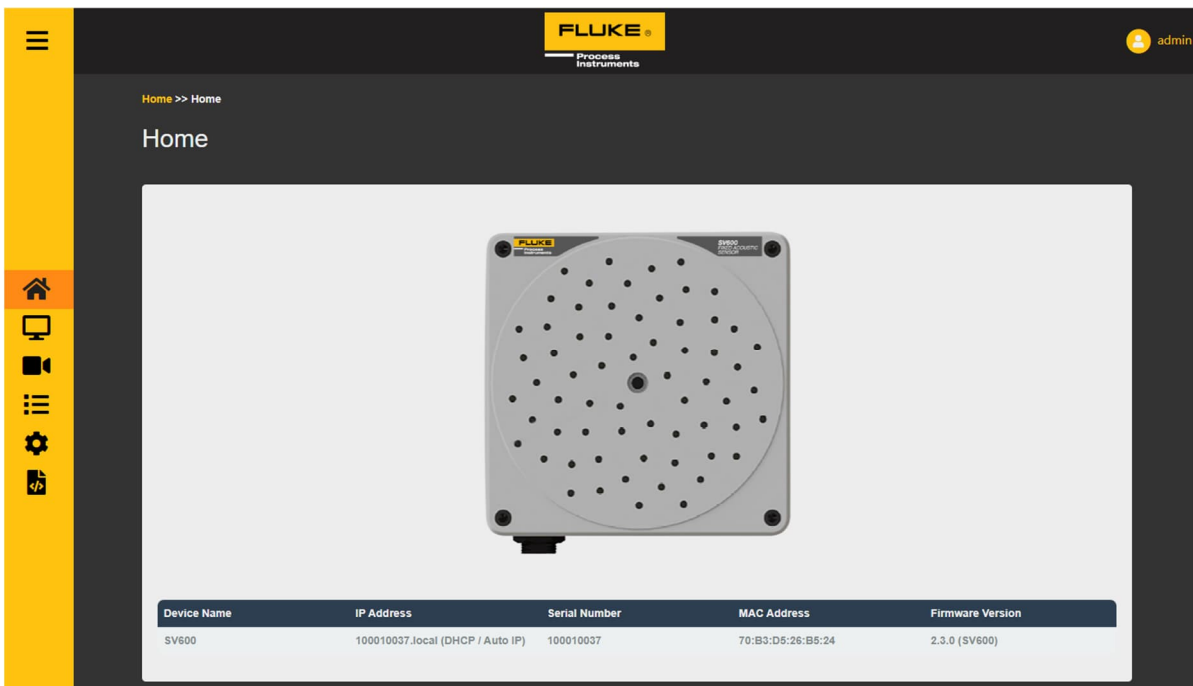
## 5 SV600 Dashboard

SV600 devices have (almost) all functionality visible on the dashboard. All functions provided via the dashboard are also available by directly using the API. Use the navigation menu to the left to go the following pages:

 Home	<ul style="list-style-type: none"> <li>• Home</li> </ul>
 Insight	<ul style="list-style-type: none"> <li>• Insight</li> </ul>
 Stream	<ul style="list-style-type: none"> <li>• Streaming</li> </ul>
 Device Configuration	<ul style="list-style-type: none"> <li>• Device Configuration</li> </ul>
 Manage	<ul style="list-style-type: none"> <li>• Management</li> </ul>
 Documentation	<ul style="list-style-type: none"> <li>• (API) Documentation</li> </ul>

### 5.1 Home Page

Providing the basic information of the selected device; name/tag, IP address, Serial number, MAC address and Firmware version.

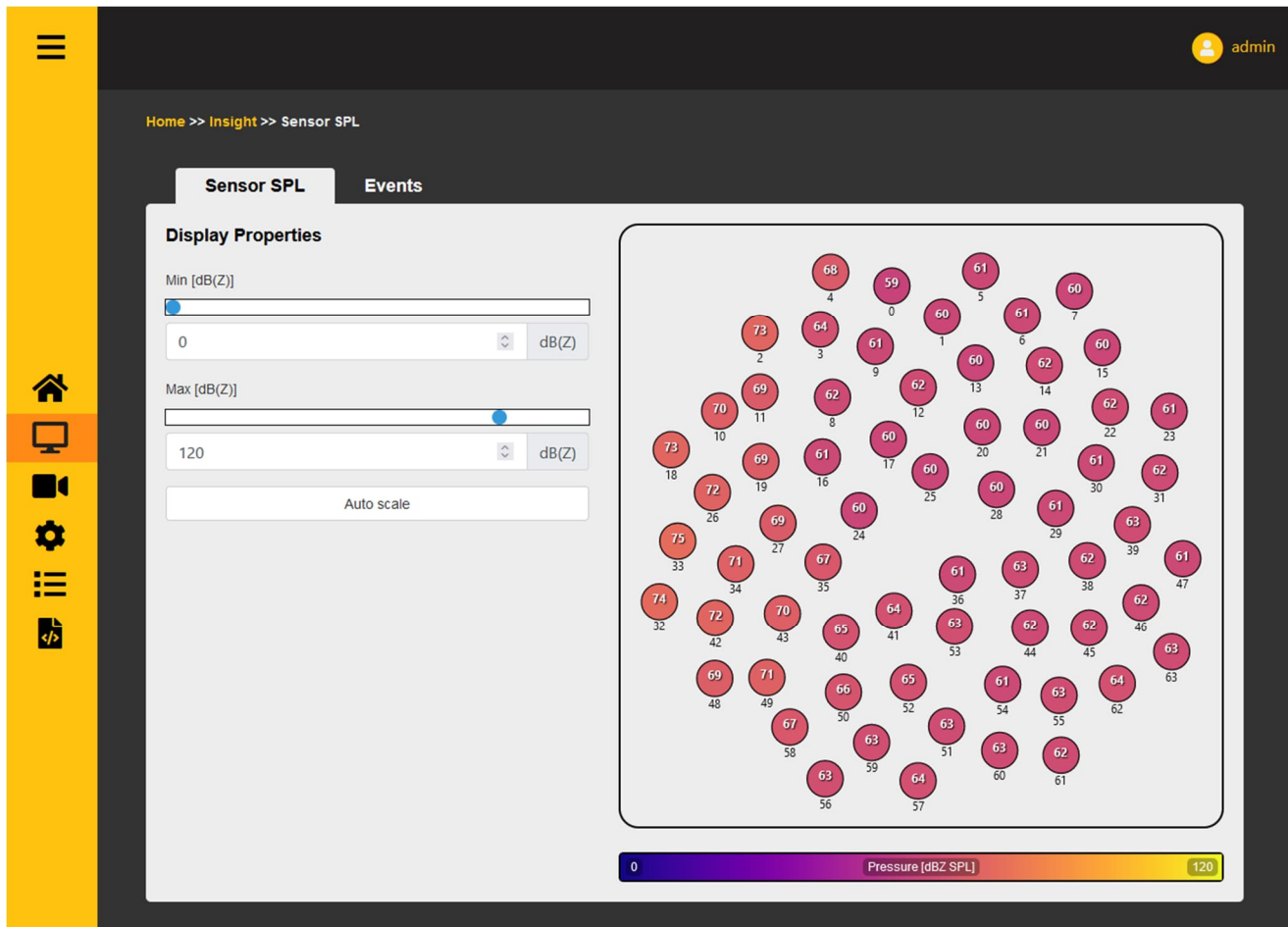


Device Name	IP Address	Serial Number	MAC Address	Firmware Version
SV600	100010037.local (DHCP / Auto IP)	100010037	70:B3:D5:26:B5:24	2.3.0 (SV600)

## 5.2 Insight Pages

### 5.2.1 Sensor SPL

Out of the box, on this page the sound pressure level of every single channel is measured in dB(Z) and displayed respectively. You can easily check if there is any abnormality coming from any of the microphone channels using this page. If one or a few microphones always display different values, they might be faulty.



- Use the Min slider or input box to set a minimum value. Any value below this value will be colored dark purple
- Use the Max slider or input box to set a maximum value. Any value above this value will be colored bright yellow
- Auto scale will reset the min/max values to scale with the data coming from the device at the moment the button is pressed

### 5.2.2 Events

Events are triggers that can be set to an SPL threshold or classification/anomaly detection. This page will log and display when this occurred.

A list of events is displayed accompanied by their respective timestamps, event name, name of the input measurement, trigger conditions and result of the event. This list can be shown in Multiple Mode, showing all triggered events, or Single Mode, which displays only the last occurrence of each different event. The difference is shown below.

Time Stamp	Event Name	Input Name	Event Trigger	Result
2022-06-02 11:30:36	Threshold 60	long SPL measurement	Threshold : Above 60	Max: 62.24
2022-06-02 11:30:16	Threshold 60	long SPL measurement	Threshold : Above 60	Max: 62.13
2022-06-02 11:30:06	Threshold 70 dB	short SPL measurement	Threshold : Above 70	Max: 74.36
2022-06-02 11:30:06	Threshold 60	long SPL measurement	Threshold : Above 60	Max: 71.20
2022-06-02 11:30:06	Threshold 70 dB	short SPL measurement	Threshold : Above 70	Max: 72.10
2022-06-02 11:30:04	Threshold 70 dB	short SPL measurement	Threshold : Above 70	Max: 75.85
2022-06-02 11:30:03	Threshold 70 dB	short SPL measurement	Threshold : Above 70	Max: 76.19
2022-06-02 11:29:56	Threshold 60	long SPL measurement	Threshold : Above 60	Max: 63.60
2022-06-02 11:29:54	Threshold 70 dB	short SPL measurement	Threshold : Above 70	Max: 72.23
2022-06-02 11:28:06	Threshold 70 dB	short SPL measurement	Threshold : Above 70	Max: 70.56
2022-06-02 11:27:56	Threshold 60	long SPL measurement	Threshold : Above 60	Max: 66.45
2022-06-02 11:27:46	Threshold 60	long SPL measurement	Threshold : Above 60	Max: 68.26

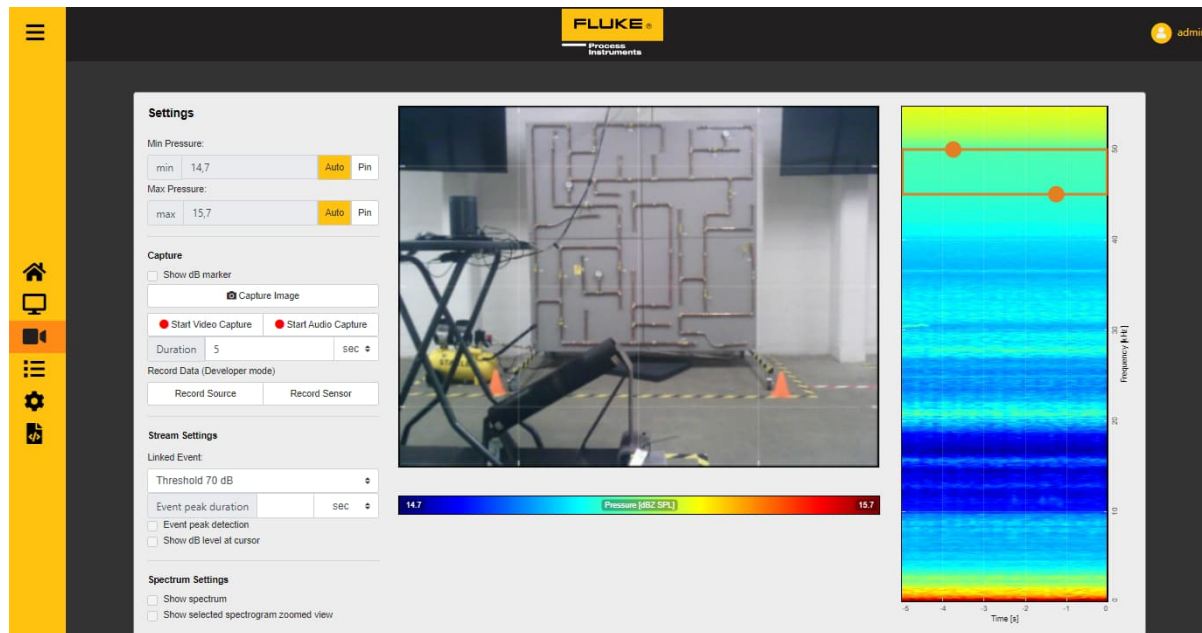
Time Stamp	Event Name	Input Name	Event Trigger	Result
2022-06-02 11:34:15	Threshold 70 dB	short SPL measurement	Threshold : Above 70	Max: 71.21
2022-06-02 11:36:06	Threshold 60	long SPL measurement	Threshold : Above 60	Max: 60.80

- Use the Log Size Limit input box to set how many event to display on the right.
- Use the CSV button export to export the events in “.csv” format or the TXT button for “.txt” format. The number of events is the Log Size.



## 5.3 Streaming Page

Using the spectrogram live feed (to the right on the image below), a user can see in which frequency bands the most sound is detected. Red colors represent high intensity, blue colors represent low intensity.

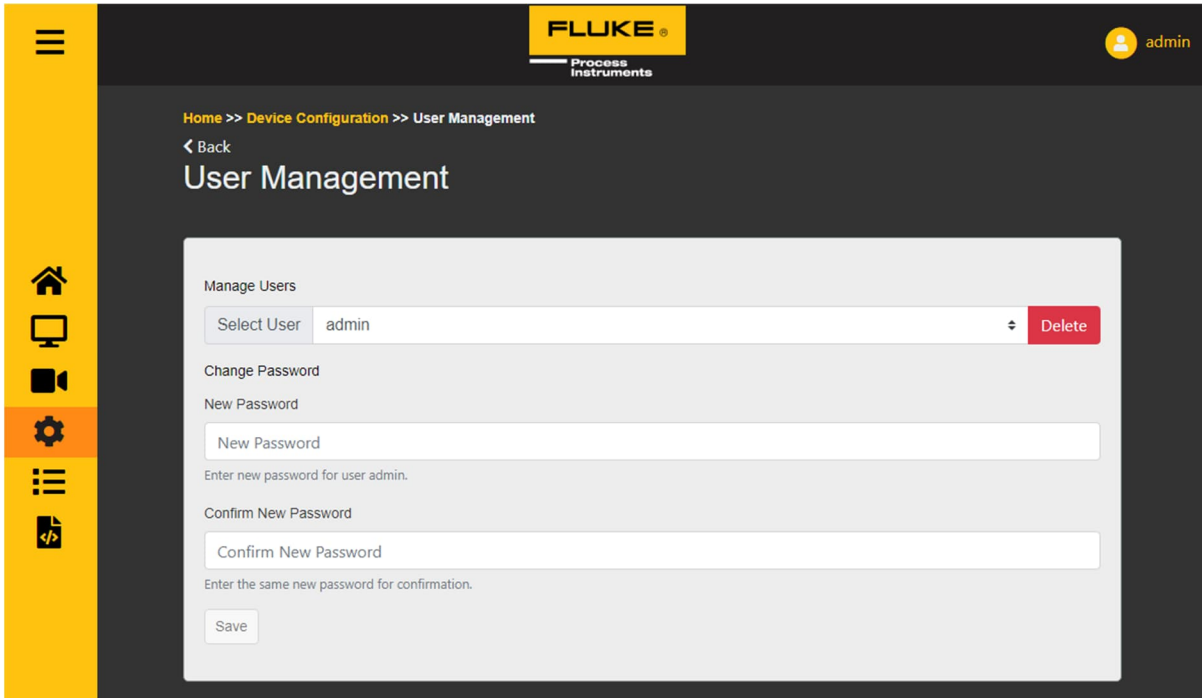


- The user can drag the frequency band to use a different band or make it smaller/larger by dragging the orange circles. The minimum frequency range is 2000 Hz wide and the maximum frequency selection is 8000 Hz wide.
- The min/max values can be pinned by clicking “Pin”. They can then be set by the user
- The min/max values can be automatically rescaled by clicking “Auto”. They will then rescale automatically to best visualize the sound sources
- Capture Image: will capture an image of the current SoundSurface™ including min/max values and spectrogram.
- Start Video Capture: will start recording a video from the video stream. The video will stop when the specified duration is over, or the “Stop Video Capture” button is pressed.
- Start Audio Capture: will start a full range recording from the audio stream. The recording will stop when the specified duration is over, or the “Stop Audio Capture” button is pressed.
- Linked Event and peak detection: Will indicate the location of an acoustic peak when the input event is triggered. More on events on the management page.
- Show dB level at cursor: will show the decibel level of the beamforming point when the cursor hovers above it.
- Show Spectrum: will change the time based spectrogram to a Realtime spectrum plot.
- Show selected spectrogram zoomed view: will show a more zoomed in visualization of the selected frequency range.

**Example:** The colors of the sound image and the streaming video represent sound intensity. **Blue** is low intensity; **red** is high intensity. The **red** spots on the image are the locations where the device detects the most sound coming from.

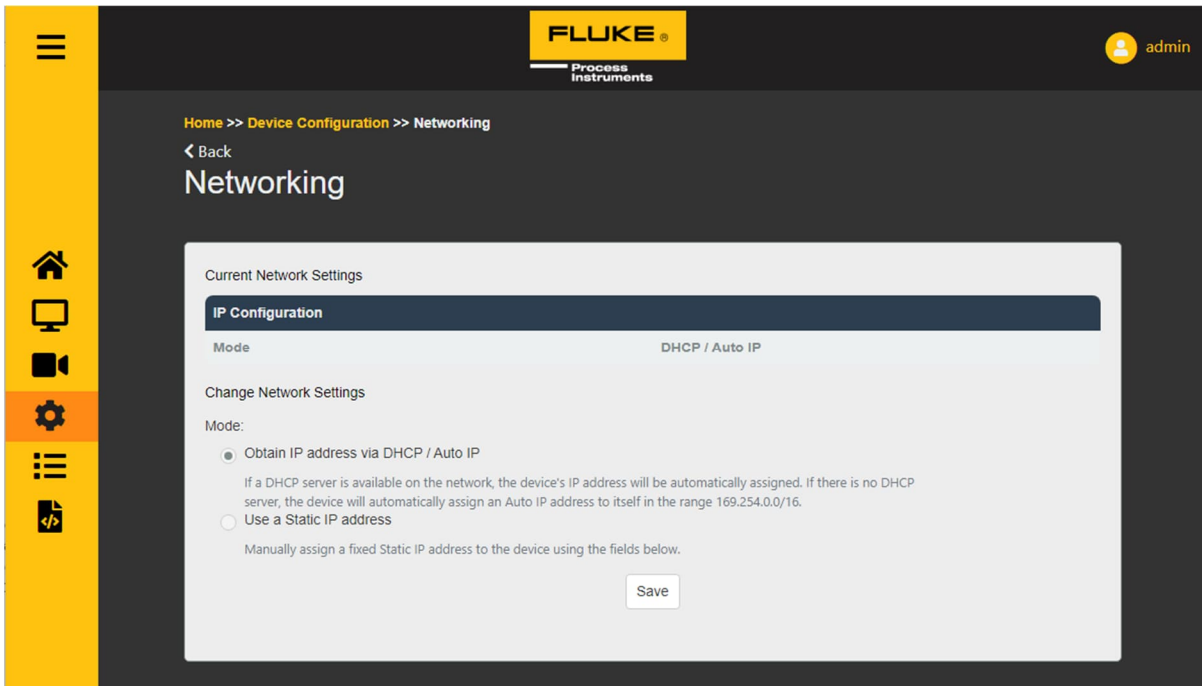
## 5.4 Device Configuration Pages

### 5.4.1 User Management



- Delete: deletes the selected user account
- Use “new password” and “confirm new password” to set the password of the selected user

### 5.4.2 Networking



- Swap network settings by choosing between automatic or static IP
- Only use the static IP configuration if you know what you are doing. Check “SETTING UP A SV600” for further information

### 5.4.3 Date and Time

The screenshot displays the 'Date and Time' configuration page in the FLUKE SV600 dashboard. The page is titled 'Date and Time' and shows the following configuration details:

Current Date and Time Settings	
<b>Device Date/Time</b>	
Mode	NTP
Local Date and Time (Europe/Berlin)	2021-08-31 16:43:44 +02:00
Universal Date and Time (UTC)	2021-08-31 14:43:44 +00:00

**Date and Time Configuration**

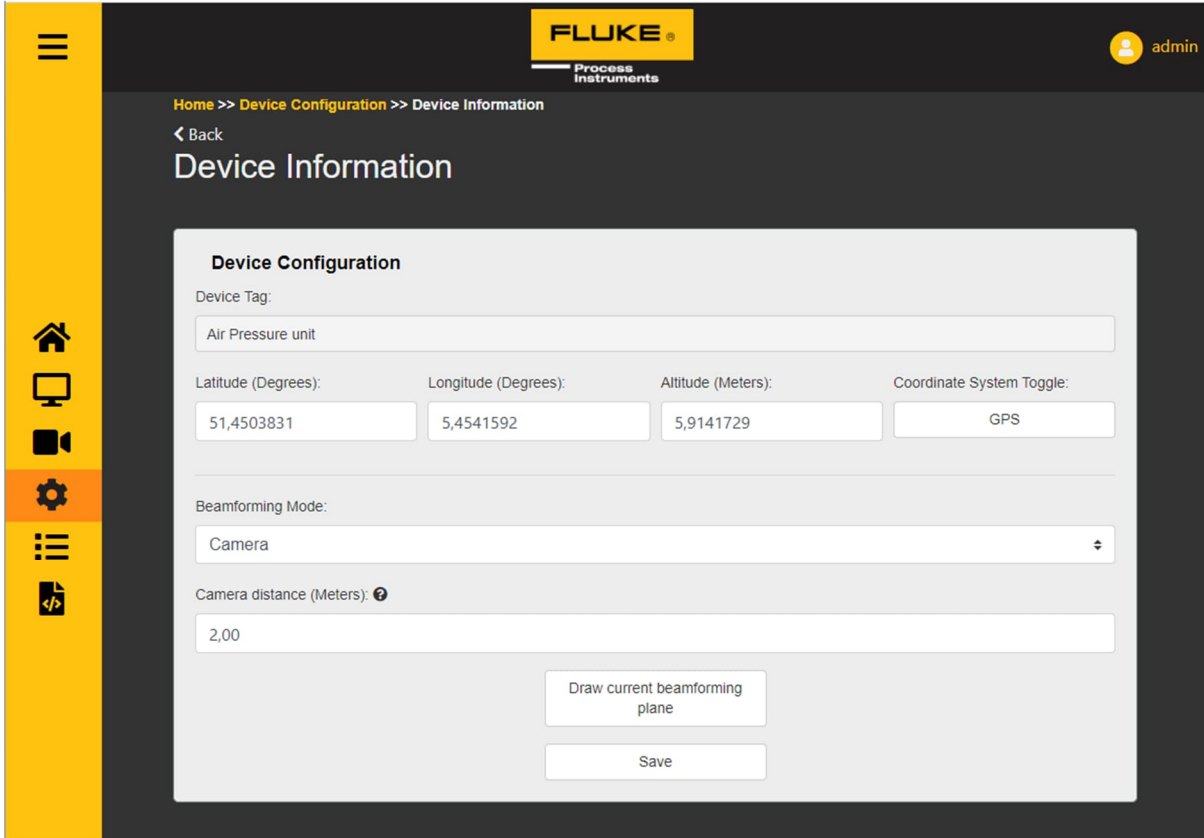
Mode:

- Use NTP Synchronization  
Have the device automatically synchronize using NTP (Network Time Protocol). Note: This requires that the device has an active internet connection. If the device does not have an active internet connection, select one of the options below.
- Manual  
Sets the time of the device to the time specified in the field below.

Save

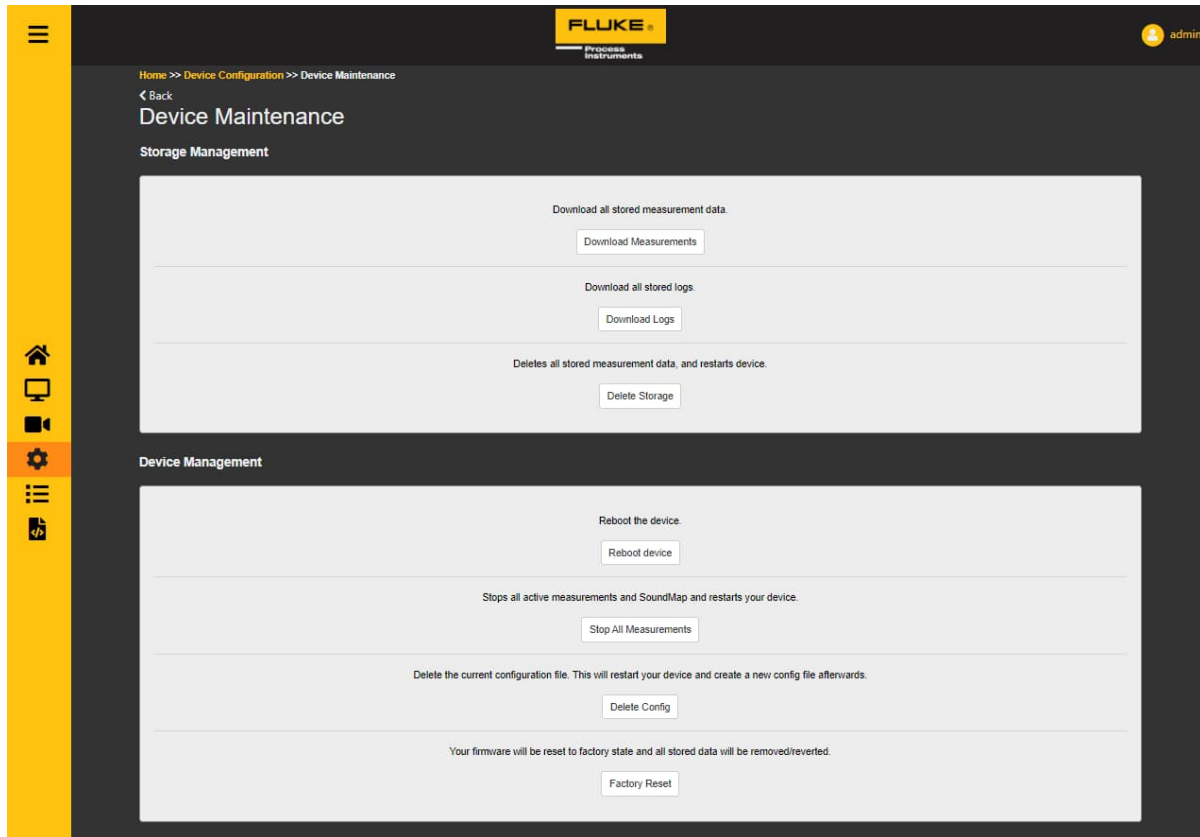
- NTP is the default synchronization method. It uses the router/modem in the network or the Google NTP server.
- You can also set the time manually. Use the “sync with computer time” flag to automatically fill in your device’s time or fill in a time manually.

5.4.4 Device Information



- Device Tag: A user settable name for this device
- Latitude/Longitude/Altitude or X/Y/Z: Set the (GPS) location for this device.
- Beamforming mode: By default Camera mode
- Camera Distance: Configure the distance between the device and the target (e.g. Leak or machine)

## 5.4.5 Device Maintenance



- “Download Measurements”: Download the data of all measurements that are stored on the device.
- “Download Logs”: Download the data of all logs that are stored on the device.
- “Delete Storage”: Deletes all stored measurement data, and restarts device
- “Reboot Device”: Give the device a reboot.
- “Stop All Measurements”: Stops all active Measurements and SoundMaps and restarts device.
- “Delete Config”: Deletes the current configuration file. This will restart your device and create a new config file afterwards.
- “Factory Reset”: Your firmware will be reset to factory state and all stored data will be removed/reverted.

## 5.5 Management Pages

In the management pages, a user can see which entities are running and active on the device. There are tabs for different groups of entities. Certain entities are made by the dashboard. They have a visible tag and a flag indicating this.

### 5.5.1 Measurements

The screenshot shows the FLUKE Process Instruments web interface. The top navigation bar includes the FLUKE logo and a user profile for 'admin'. The breadcrumb trail is 'Home >> Manage >> Measurements'. Below the breadcrumb are several tabs: 'Measurements', 'SoundMap', 'Events', 'Inputs/Outputs', and 'Subscriptions'. The 'Measurements' tab is selected and shows a table of active measurements. The table has columns for 'Tag', 'Id', and an eye icon. The rows include 'DASHBOARD\_LEQ\_EVENTS' (Id: 11), 'DASHBOARD\_LEQ\_SENSO...' (Id: 10), 'DASHBOARD\_LEQ\_PLOT2' (Id: 3), 'DASHBOARD\_Spectrum' (Id: 1), 'DASHBOARD\_LEQ\_PLOT1' (Id: 2), and 'New Measurement 1' (Id: 12). Below the table is a 'New Measurement' button. To the right of the table is a 'Measurement Configuration' panel. This panel has a 'Tag' field with the value 'New Measurement 2'. It includes dropdown menus for 'Measurement Type' (set to 'Leq') and 'Channel Handling' (set to 'Combined'). There are also fields for 'Weighting' (set to 'Z (flat response)') and 'Reporting Interval' (set to '1000 ms'). A 'Frequency Ranges' section contains a text input with '20 - 20000', an 'Add Range' button, and a 'Remove Range' button. At the bottom of the configuration panel are 'Add' and 'Cancel' buttons.

- To the left is a list of all active measurements on the device.
  - “Tag” is a human readable name of a measurement
  - “Id” is the unique number assigned to each measurement. Ids are always unique; tags don’t have to be.
  - An open eye in the last column shows that a measurement is created by the front-end. A closed eye means a measurement is created by a user.
  - “New Measurement” can be clicked to start adding a new measurement. The settings to the right should then be filled in.
- To the right the settings of a selected or new measurement can be seen
  - “Tag” is the name of the measurement
  - “Measurement Type” is the type of measurement. Examples are Leq, Spectrum, or Classification
    - When selecting Classification, anomaly detection can be selected. When this measurement will be saved, the Anomaly Detector will train to the surrounding sound for 60 seconds. After this training period, the Anomaly Detector will trigger on any sound that is different from what it trained to.
    - A PD (Partial Discharge) classification measurement will trigger when PD sounds are recognised by the device.
  - “Channel Handling” tells is the measurement will **combine** the 64 channels or gives back **separate** results.
  - “Weighting” can be used to apply a certain pre-defined acoustic weighting to results
  - “Reporting Interval” is how often the measurement will produce a result. Audio is averaged over this duration.
  - “frequency ranges” can be selected and edited, added or removed.

## 5.5.2 SoundMap

The screenshot displays the FLUKE SV600 Dashboard interface for managing SoundMaps. The top navigation bar includes the FLUKE logo, 'Process Instruments', and a user profile for 'admin'. The breadcrumb trail is 'Home >> Manage >> SoundMap'. Below the breadcrumb are several tabs: 'Measurements Actions', 'SoundMap', 'Events', 'Inputs/Outputs', and 'Subscriptions'. The main content area is divided into two sections. On the left is a table listing active SoundMaps:

Tag	Id	Actions
DASHBOARD_BEAMFORMI...	3	
New SoundMap		

On the right is the 'SoundMap Configuration' panel for the selected SoundMap. It includes the following fields and controls:

- Tag:** DASHBOARD\_BEAMFORMING\_STREAM
- SoundMap Type:** Data
- Weighting:** Z
- Reporting Interval:** 112 ms
- Frequency Ranges:** 16220 - 18910
- Buttons:** Add Range, Remove Range, Update, Delete

- To the left is a list of all active SoundMaps on the device.
  - “Tag” is a human readable name of a SoundMap
  - “Id” is the unique number assigned to each SoundMap. Ids are always unique; tags don’t have to be.
  - An open eye in the last column shows that a SoundMap is created by the front-end. A closed eye means a SoundMap is created by a user.
  - “New SoundMap” can be clicked to start adding a new SoundMap. The settings to the right should then be filled in.
- To the right the settings of a selected or new SoundMap can be seen
  - “Tag” is the name of the SoundMap
  - “SoundMap Type” is the type of SoundMap. Examples are “Data” or “Image”.
  - “Weighting” can be used to apply a certain pre-defined acoustic weighting to results
  - “Reporting Interval” is how often the SoundMap will produce a result. Audio is averaged over this duration.
  - “frequency ranges” can be selected and edited, added or removed. Note that there is a maximum total range the device can analyse. In this release this is 8000Hz.

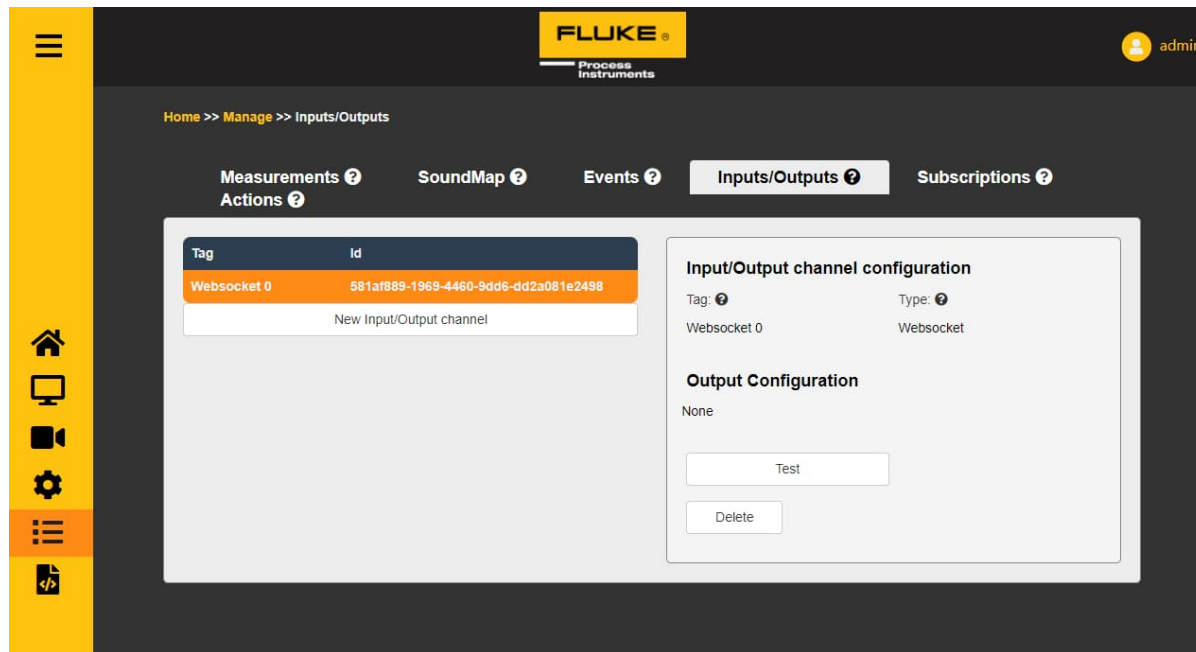
## 5.5.3 Events

The screenshot displays the FLUKE Process Instruments web interface. At the top, the FLUKE logo and 'Process Instruments' are visible. The user is logged in as 'admin'. The navigation bar includes 'Measurements', 'SoundMap', 'Events' (selected), 'Inputs/Outputs', and 'Subscriptions'. Below the navigation bar, there are tabs for 'Actions', 'Measurements', 'SoundMap', 'Events', 'Inputs/Outputs', and 'Subscriptions'. The main content area shows a breadcrumb 'Home >> Manage >> Events'. On the left, there is a table of active events with columns 'Tag', 'Id', and an eye icon. The table contains one entry: 'DASHBOARD\_EVENTS' with 'Id' '1'. Below the table is a 'New Event' button. On the right, the 'Event Configuration' form is shown, with fields for 'Tag' (New Event), 'Input' (New Measurement 1), 'Event Type' (Threshold), 'Threshold type' (Above), and 'Threshold' (60). There are 'Add' and 'Cancel' buttons at the bottom of the form.

- To the left is a list of all active events on the device.
  - “Tag” is a human readable name of an event
  - “Id” is the unique number assigned to each event. Ids are always unique; tags don’t have to be.
  - An open eye in the last column shows that an event is created by the front-end. A closed eye means an event is created by a user.
  - “New Event” can be clicked to start adding a new event. The settings to the right should then be filled in.
- To the right the settings of a selected or new event can be seen
  - “Tag” is the name of the event
  - “Input” is the entity this event is added to. This can be a measurement or a SoundMap
    - If an Anomaly Detector is wanted as an input measurement, the event type should first be set to Classification.
  - “Event Type” is the type of event. Examples are Threshold Range or Classification. If classification is selected, the event will trigger when an anomaly has been detected.
  - Depending on the “Event Type” there are other settings available which tell the system when to trigger this event. For example “Threshold Above 60dB”

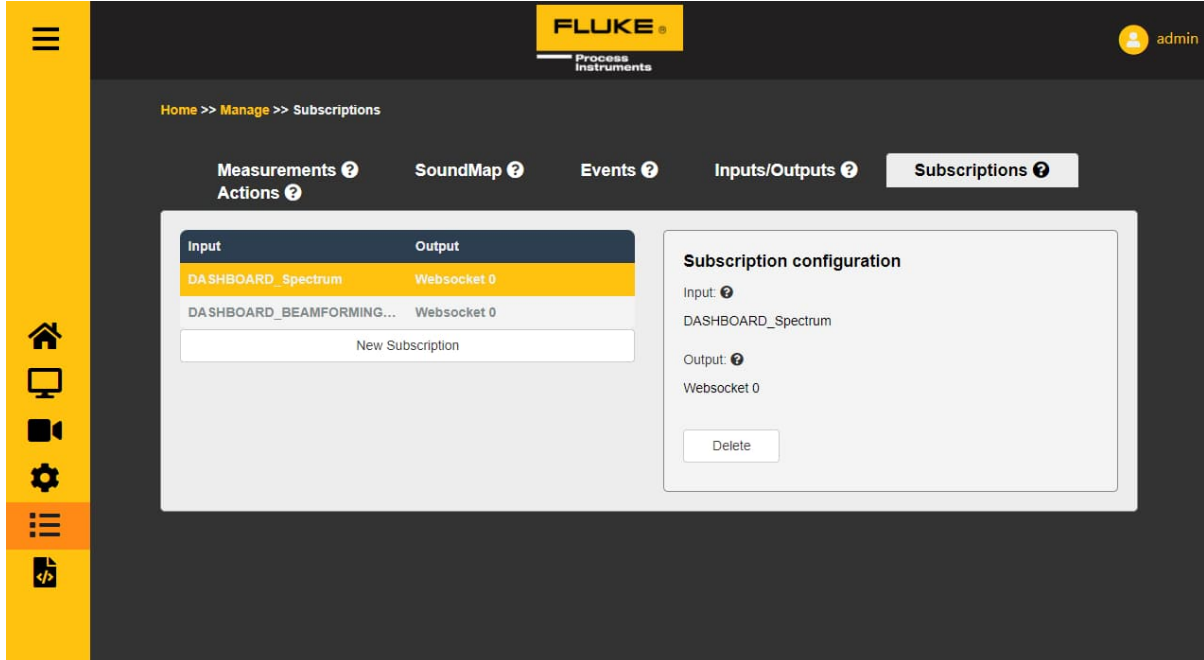


### 5.5.4 Inputs/Outputs



- To the left is a list of all active Input/Output channels on the device
  - “Tag” is a human readable name of a Input/Output channel
  - “Id” is the unique GUID assigned to each Input/Output channel. Ids are always unique; tags don’t have to be.
  - An open eye in the last column shows that an Input/Output channel is created by the front-end. A closed eye means an Input/Output channel is created by a user.
  - “New Input/Output Channel” can be clicked to start adding an Input/Output channel. The settings to the right should then be filled in.
- To the right the settings of a selected or new Input/Output channel can be seen
  - “Tag” is the name of the Input/Output channel
  - “Type” is the type of Input/Output channel. Current types are Websocket and “ModbusTCP”
    - When “ModbusTCP” is selected these options are available
      - “IP Address” the IP address of the Modbus device
      - “Port” the port number of the Modbus device
      - “Register Type” the type of register the SV600 should control
      - “Address” is the address number of the register
      - “Value” is the value the SV600 should if we trigger this Modbus connection
      - See “SETTING UP A SOUNDMAP EVENT TRIGGER ON A WAGO UNIT” for more information
  - “Test” can be used to test if the Input/Output channel is reachable. If clicked and successful the button turns green, red if it could not reach it.

## 5.5.5 Subscriptions



- To the left is a list of all active subscriptions on the device.
  - “Input” is the input of a subscription
  - “Output” is the name of the Output channel this subscription is sending its results to
  - “New Subscription” can be clicked to start adding a new subscription. The settings to the right should then be filled in.
- To the right the settings of a selected or new subscription can be seen
  - “Input” is the entity which provides data for this subscription.
  - “Output Channel” is the callback channel this subscription sends the data, provided by the input, to.

### 5.5.6 Actions

The screenshot displays the 'Actions' configuration interface. On the left, a table lists active actions:

Tag	Id
Action0	0

On the right, the 'Action configuration' panel is shown with the following settings:

- Trigger: DASHBOARD\_EVENTS
- Action Type: Event with LeakQ Measurement
- Frequency Ranges: (empty field with 'Add Range' and 'Remove Range' buttons)
- Event trigger: DASHBOARD\_EVENTS
- Output Channel: Websocket 0
- Status: Inactive (with 'Start' and 'Stopped' buttons)

- To the left is a list of all active actions on the device. The system currently only supports one action, which can be activated by the user.
  - “Tag” is a human readable name of an action.
  - “Id” is a unique id the system assigned to this action.
- To the right are the settings of the selected action.
  - “Trigger” which entity triggers (enables) this action.
  - “Action type” which action to perform when a trigger is received.
  - “Frequency ranges” can be selected and edited, added or removed. Note that there is a maximum total range the device can analyze. In this release this is 8000Hz.
  - EventWithAS2 only settings.
    - “Event trigger” while active, which input will trigger this action’s action
    - “Output Channel” to which output channel any received inputs are forwarded to.

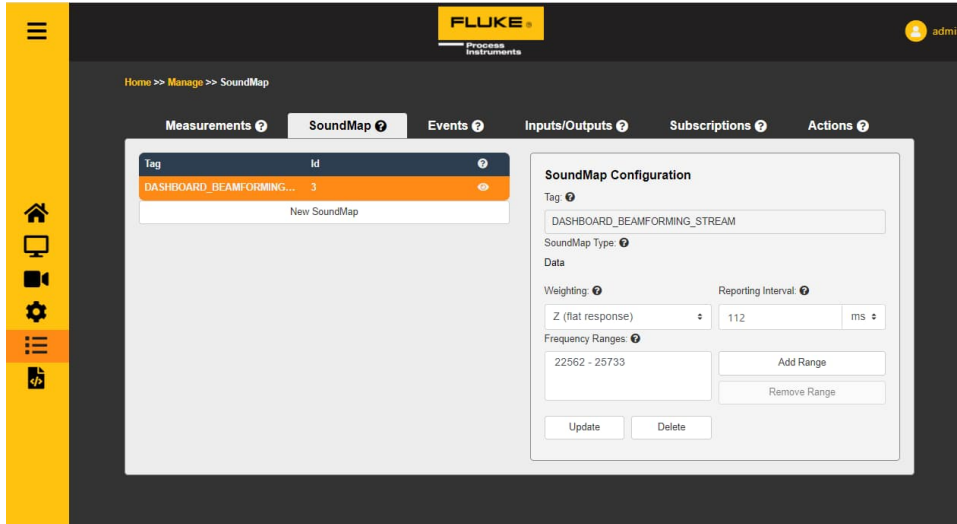
## 5.6 API Documentation

This page contains documentation on the SV600 device. The API is based on a HTTP REST API. All calls are communicated via HTTP or WebSocket. The API protocol is split in three levels. The device hosts the following documents:

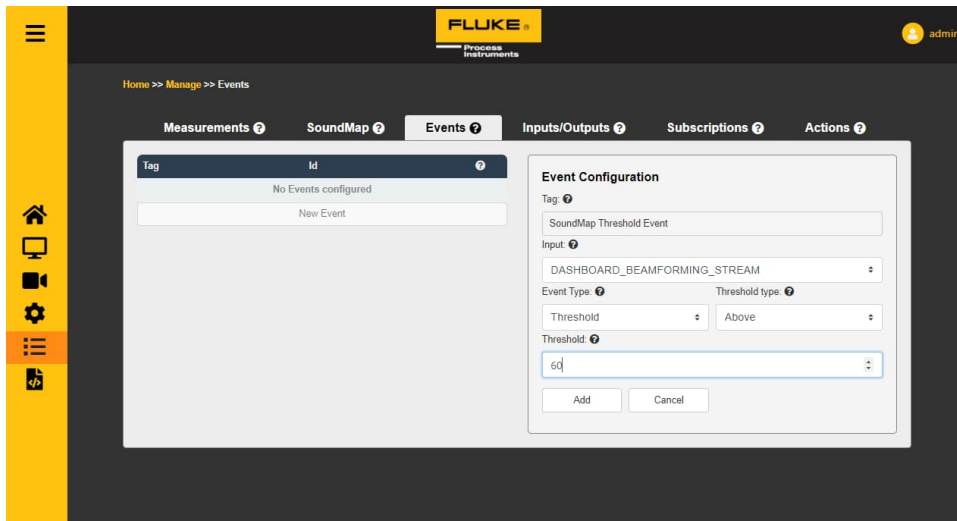
1. Sound Source Detection API
2. Authentication API
3. Device manager
4. Quick Start Guide PDF
5. User manual PDF

## 5.7 Setting up a SoundMap Event Trigger on a Wago Unit

First go to the management page and check if a valid SoundMap is running. If no SoundMap is running either create a new one or go to the streaming page to generate one.



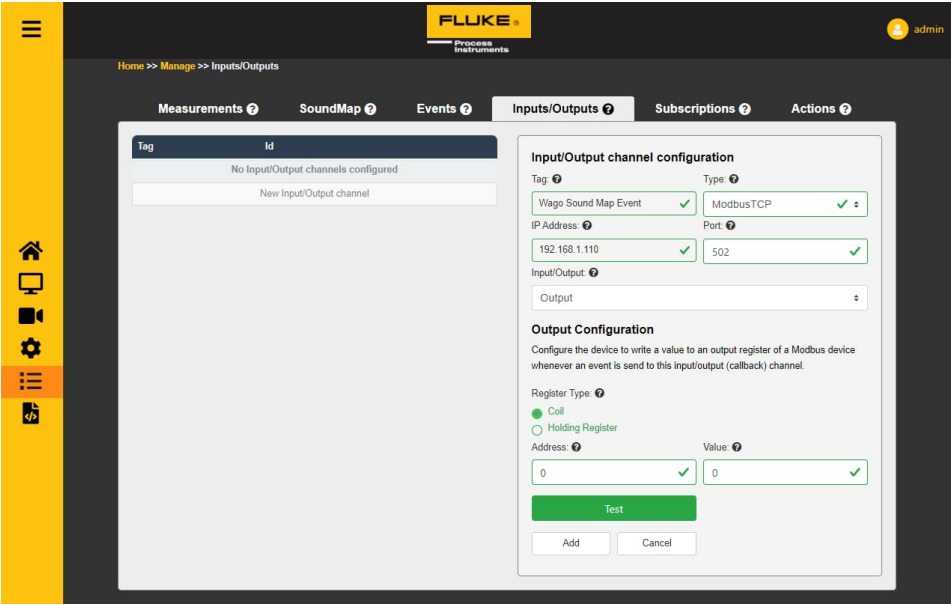
Next go to the event tab and create a new event with the SoundMap measurement as an input, and a recognizable tag.



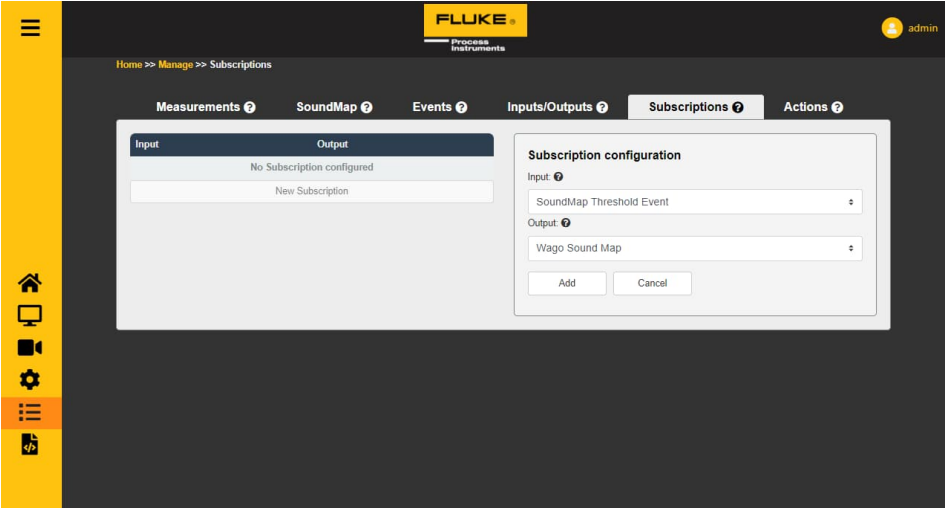
Then go to the inputs/outputs tab, and create a new WAGO Output channel.

Fill in the required fields and test your callback by pressing the test button to validate it is set up correctly.

If your settings are correct this should send the signal you have set up to the WAGO unit.



For the final step go to the subscription tab to create a new subscription.  
Choose your created event as an input and your WAGO unit as an output channel.  
Once this is submitted the set-up signal will be sent to the WAGO unit every time the linked event is triggered.



## 6 Troubleshooting

### 6.1 How to check device health / when to request a new device, since too broken?

Microphone health can be monitored on the sensor SPL page of the device. A microphone is faulty, when it is stuck on a single value or when its value is very dissimilar to the values of the other microphones. A good rule of thumb is: replace the device when more than 30 microphones display these kinds of symptoms.

When using our plain API: use the output of a measurement with as type Leq and as channels Separate. You would have to analyze those results to figure out if one or more microphones show signs of failure.

### 6.2 Stream page does not show SoundMap overlay or spectrum

It is possible that there is a large difference between the time the SV600 thinks it is and between what your PC thinks it is. To resolve this, you can set the device time to match your PC's time. Check section 5.4.3 [Date and Time](#), page 27 on how to do this.

### 6.3 I set a certain reporting interval, but data is returned at a slower rate

It is possible that a selection of measurements and SoundMap is selected which the device is not able to run live. Usually this happens if 2 "Data" SoundMaps are active. Remove one of them and give the device a restart. If it still persists, also remove some measurements and reboot the device.

### 6.4 How do I restart my device without removing power

Via the API, you can do a reboot call, check the device manager API documentation for that. For front-end users, the easiest way is to go to Device Information and press save without changing anything. This will reboot the device.