hielscher
Ultrasound Technology

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Operation Manual Web-Interface

Imprint

Operating manual for Web-Interface for Ultrasonic processor

The ultrasonic processor is for process optimization and for use in the industry.

Purpose and use

The operating instructions explain the operation of the web-interface of ultrasonic processor in connection with standard accessories for use in laboratories and the industry.

Please read especially the safety instructions for ultrasonic processors carefully and observe them all time.

The operating instructions should always be at hand, to help you to solve any questions and problems that may arise.

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The manual has been prepared with all due care, nevertheless faults and omissions cannot be fully precluded.

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The warranty does not cover any malfunctions, injuries and damages that result from such use or improper operation or use.

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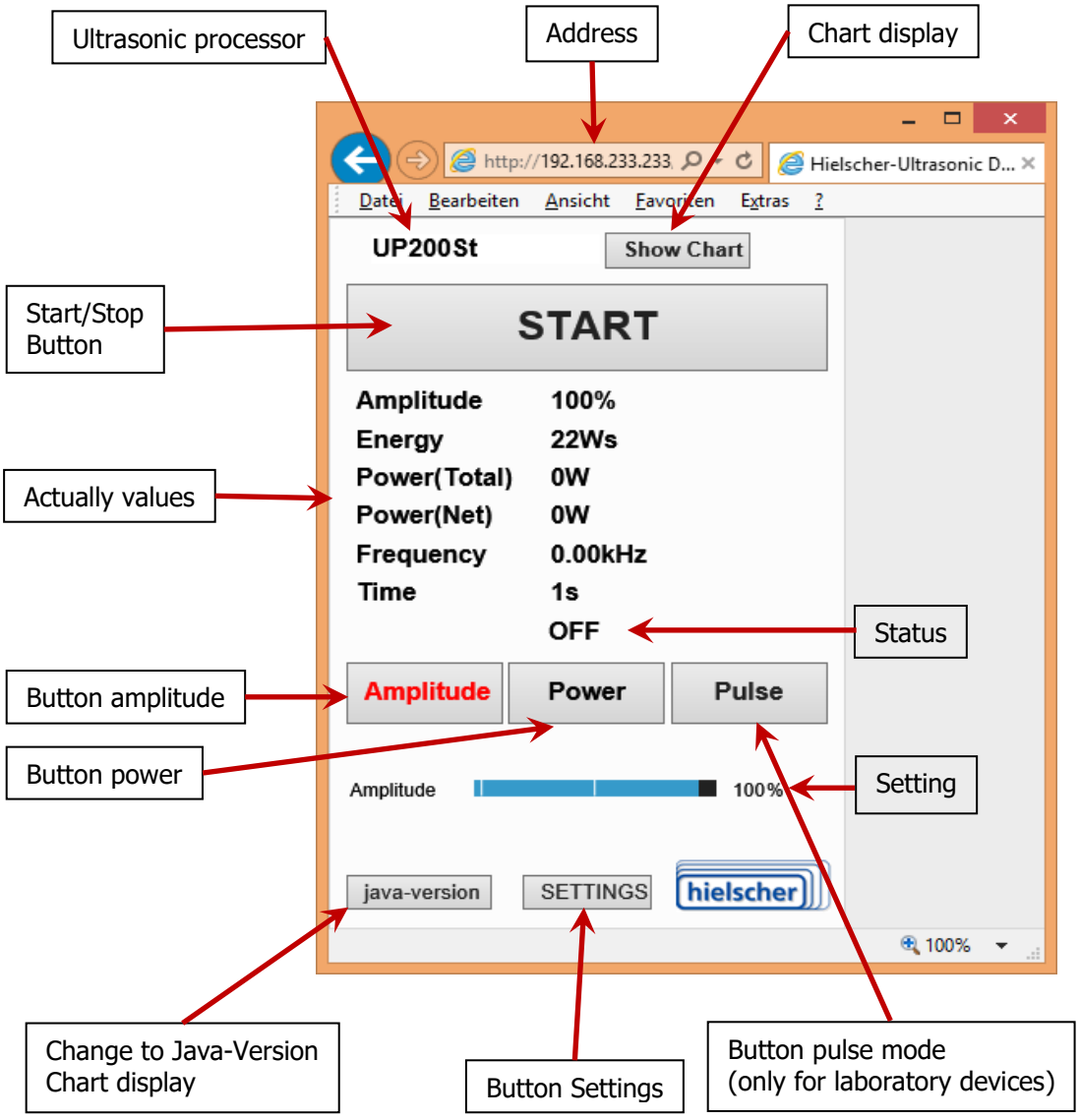
Content

1 Web-Interface

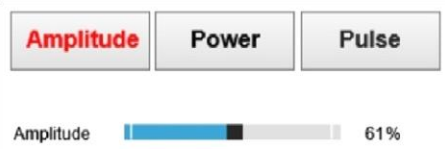
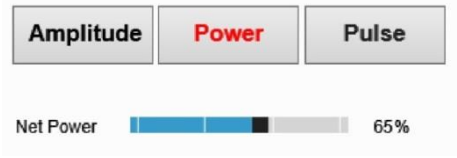
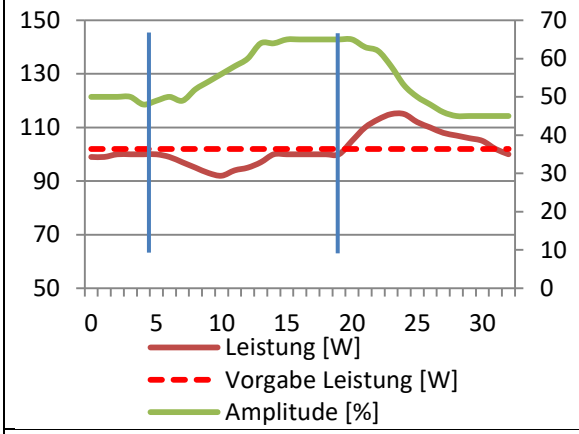
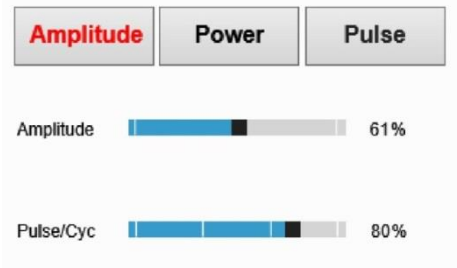
After setting up an Ethernet connection between the display device and ultrasonic processor of the preferred browser of the operating system is opened. Display devices can be PCs, laptops, tablets and mobile phones.

In the address bar of the browser to enter the destination address of the respective ultrasonic processor takes place. The ultrasonic processor then responds with the subordinate opening screen.

1.1 Start screen



1.2 Function of amplitude, power and pulse buttons

Amplitude control 	If you touch the button amplitude the ultrasonic processor switches to the mode amplitude control. With the control amplitude, the amplitude is given in percent of the maximum amplitude. It is kept constant within the working range. The maximum amplitude is different by the type of ultrasonic transducer, booster and sonotrode.
Power control  	If you touch the POWER button the ultrasonic processor switches to the mode of continuous operation with power control. The maximum power input to the medium is set with the POWER slider. *Working principle:* If the measured power is greater than the pre-task worth the working amplitude is gradually decreased until the set performance is achieved. If the minimum working amplitude is reached, the processor operates with the minimum amplitude, and further the entire system is outside the control range, that the output is then the default value. If the measured power is less than the set predetermined value, the amplitude is gradually increased to the set power is achieved. If the maximum amplitude reaches the ultrasonic processor works together with it and the whole system is outside the control range and the performance is then less than the specified value.
Pulse mode 	The clock ratio between pause and sound can be varied between 10% and 100% with the adjusting pulse. 10% means 0.1 second sound on and 0.9 second pause. 100% means continuous operation. This mode is only for laboratory equipment available. **Not available on all devices of industrial series.**

1.3 Function button Start/Stop

	Pressing the "Start" button triggers the sound process from the preset parameters started. Then the key will change the name and function to "Stop".

	With the "Stop" button, the sound process will be interrupted. Then the key will change the name and function to "Start".

1.4 Graph display

By pressing the "Show Chart" button in the opening screen the graph display appears.
By pressing the "Stop Chart" button is the graph display will disappears.

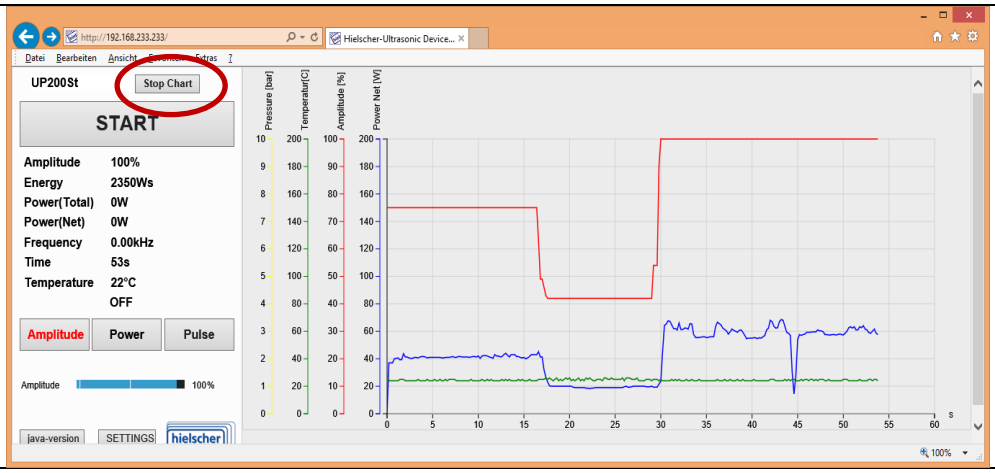


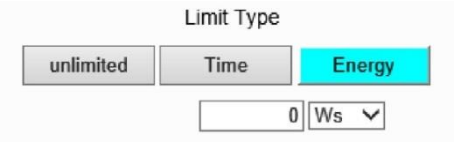
Diagram with pressure, temperature, amplitude and power (Net)

2 SETTINGS

By pressing the "SETTINGS" button in the opening display the default display is selected. There is here the input and selection of different sound parameters.

2.1 Limit Type

In this menu the end of the sound can be predefined.

Limit Type OFF	
	The sonication time is **unlimited**. An automatic limitation of the sound is off.
Limit Type TIME	
	The sonication is terminated by a timer. After selecting a limit, a progress bar will appear on the home screen and in the large display. After pressing the button "time" the period of sonication can be selected in the pulldown menu. The maximum sonication time is 99d:23h:59min:59.9 sec.
Limit Type Energie	
	The sonication will be stopped if the input energy is reached. After pressing the button "energy" the maximum energy input can be selected in the pulldown menu.

2.2 Calibration

In this menu the entire ultrasound system with mounted tools will be calibrated.

Before start the calibration it is necessary to mount the booster (if necessary) and sonotrode at the transducer. The calibration will be started without medium!! (Sonotrode in air or in the mounted state in the blank flow cell)

During calibration, the power consumption of the entire ultrasonic processor with different amplitude values is determined without the medium to be irradiated.

During the sonication process, the assessed value is then subtracted from the gross power consumption and thus determines the effective power that is transmitted into the medium.

By pressing the "Calibration" button and confirmed by the "OK" button calibration is started.

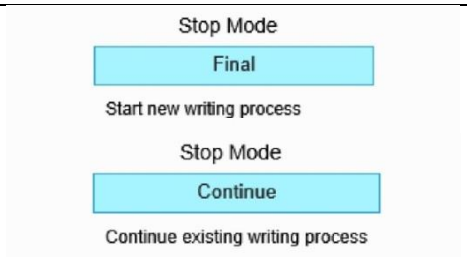
If de calibration process is completed the determined calibration data are stored in the system. The device now shows the Net Power at the display means the idle power is subtracted from the total power consumption.

The index **NET** will appear next to the power unit in the display. Without calibration, the total power consumption is displayed.

In your browser, both values are displayed (in the diagram showing the net power).

2.3 Stop Mode

In this menu a forced interruption of the sonication can be set.

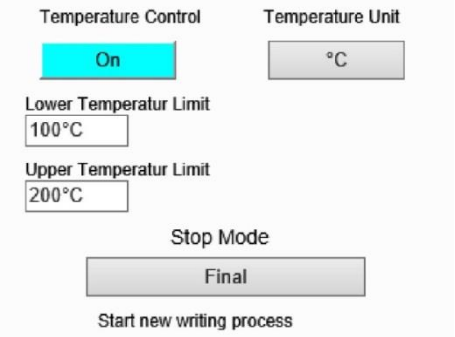


In stop mode Final (reset) energy and time is set to zero at the next start of the ultrasound.

In stop mode Continue (Pause) the values of the time counter and the energy input will be continued at the next start of sonication.

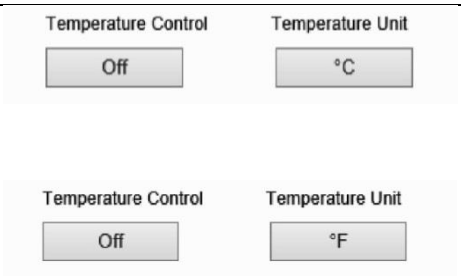
2.4 Temperature control

In the processing of samples that react critically to temperature increases or where the sonication must take place in a specific predetermined temperature window there is a way to monitor the sample temperature with connected temperature sensor PT100.

	Activating the temperature monitoring by pressing the "Temperature Control" to "ON" After activation temperature monitoring temperature limits can be set. *Lower Temperature Limit (lower fluid temperature)* The temperature falls below the set limit: **End** of the sonication **with** additional activation of the Stop Mode "Reset" **or** **Interruption** of sonication upon activation of the Stop Mode "Continue" (pause) The sonication will be **automatically restarted** when the limit is exceeded. *Upper Temperature Limit (upper fluid temperature)* When **exceeding** the set limit temperature: **End** of sonication **with** additional activation of the Stop Mode "Reset" **or** **Interruption** of sonication upon activation of the Stop Mode "Continue" (pause). The sonication is started again when the temperature is falling below the limit, plus the delta value set on the device, **automatically**.

2.5 Temperature Unit

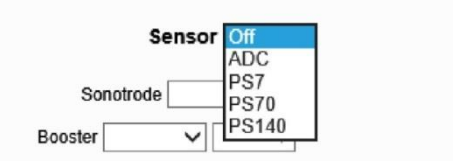
In this Menu can set the units for display of temperature and pressure.

	Determining the temperature unit with connected temperature sensor PT100 or pressure unit of the selected pressure sensor. There are the units of °C and barg or °Fahrenheit psig available. Needs the Ethernet switch to be delivered optionally pressure sensor.

2.6 Select sensor

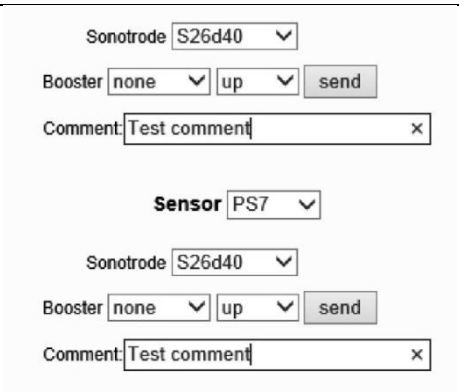
In this menu can select the optional pressure sensor. The sensors are in the areas of:

PS7- up to 7barg
PS70 up to 70barg
PS140 up to 140barg

	Off Additional analog input is not displayed. ADC Input signal 0 V to 3.3 V is 10bit deep converted and displayed PS7, PS70, PS140; **Optionally** available as an accessory pressure sensors with Ethernet switch are displayed according to the chosen unit and the values are recorded during sonication.

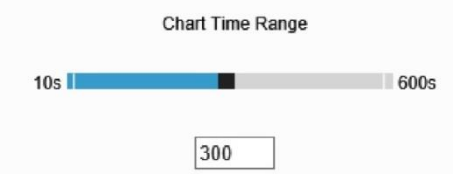
2.7 Information for SD-protocol

In this Menu you can enter additional information.

	Information about sonotrode, booster and comment with and without pressure sensor are saved when you next start the ultrasound in the report header.

2.8 Time interval of the graph display

In this Menu you can set the recording interval of the chart display.

	Determining the time interval of the graph display

2.9 Display of operating instructions and control the device via the browser

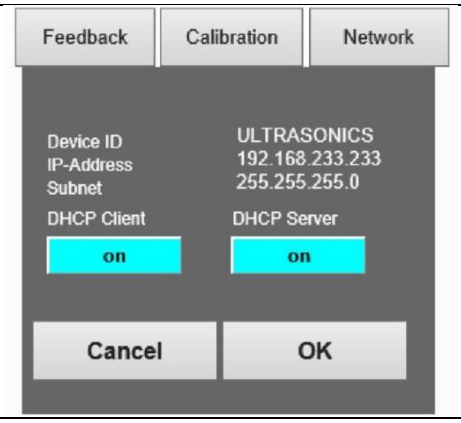
With this menu you can display the operating instructions and commands in XML format to control the device by entering the command line in the browser. With the help of a script and these commands the device can be controlled without a menu (see 3.2 Device control using Ethernet / xml – files).

- Start - mOn.xml
- Stop - mOff.xml
- Data - mdata.xml
- Values of amplitude - setP.xml
- Temperature control on - tctrlOn.xml
- Temperature control off – tctrlOff.xml

	By pressing the "xml info" button information to control the device via XML files are opened. By pressing the "instruction" button the user manual is opened.

2.10 Network settings

In this menu you set the network settings.

	By pressing the "Network" button the network settings are displayed and can now be changed. Press the OK button the settings are sent to the device. By pressing the "Cancel" button to discard the changes and hidden network settings again.

2.11 Feedback – Form

With this Menu you can create a feedback form.

	Create a customer message

3 Device control using the LAN interface

3.1 Pin assignment of the RJ45 Ethernet socket at the generator

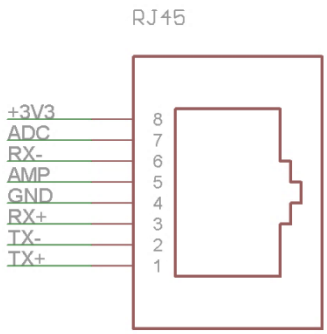


Figure 3-1 LAN-Interface

Use an Ethernet splitter to separate pins 1, 2, 3 and 6 (used for Ethernet) from pins 4, 5, 7 and 8.

Pin 4 GND	ground
Pin 5 AMP	analog input 0…+3.3V for amplitude (+0.6V = 20%, +3.3V = 100%) or for remote ON/OFF (connect to+3.3V for ON) Select in Display/Settings/Remote Control
Pin 7 ADC	analog input 0...+3.3V (e.g. for pressure sensor PSx) Select in Display/Settings/Analog Input
Pin 8 +3.3V	+3.3V supply

Attention! +3.3V must not be exceeded on pin 5 and 7!

3.2 Device control using Ethernet / xml – files

Switch on the device by calling the "mOn.xml" file.

(e.g. http://192.168.233.233/mOn.xml) *Note uppercase and lowercase letters!*

The device responds with:

```
<response>
<running>off</running>     State of the device before the command
<mon>on</mon>
</response>
```

To ensure that the command was executed, the node <mon> must be evaluated.

```
If „on"- device is switched on
If „off"- device isn't switched on
If „I2CError"-internal communication error, device don´t switch on
```

Switch off the device by calling the „mOff.xml"-file.

(e.g. http://192.168.233.233/mOff.xml) *Note uppercase and lowercase letters!*

The device responds with:

```
<response>
<running>on</running>      State of the device before the command
<moff>off</moff>
</response>
```

To ensure that the command was executed, the node `<moff>` must be evaluated.

```
If „off"- device is switched off -   o.k.
If „on"- device isn´t switched off
If „I2CError"internal communication error, device don´t switch off
```

Get the current data by calling „mdata.xml"-file.

(e.g. http://192.168.233.233/mdata.xml)

The device responds with:

```
<data>
<running>on</running>    device is on
<mdata>2;80;80;1000;4.7000e+01;10170;26007;2480;58;1;0;2000;1000</mdata>
</data>
```

The node <mdata> contains the values in the following order:

```
<mdata> Status; Gross Power x 10(W); Net output x 10(W); Amplitude x 10(%);
Energy (Ws); AN12 X 10; Frequency (Hz); Temperature x 10(°C); Time (100ms);
</mdata>
```

Transfer the default values by calling the "setP.xml"-file.

(e.g. http://192.168.233.233/setP.xml?ts1=a&ampl=600 Amplitude 60 %
http://192.168.233.233/setP.xml?ts1=a&ampl=1000 Amplitude 100 %
http://192.168.233.233/setP.xml?ts1=a&ampl=1000&cc=500 Amplitude 100 % Puls 50%
http://192.168.233.233/setP.xml?lTL=1000&uTL=2000 lTL (lowerTemperatureLimit)
= 100°C uTL (upperTemperaturLimit) = 200°C)

The device responds with:

```
<paramsset>done</paramsset>
```

Switching on the temperature control by calling the "tctrlOn.xml"-file.

(e.g. http://192.168.233.233/tctrlOn.xml)

Switching off the temperature control by calling the „tctrlOff.xml"-file.

(e.g. http://192.168.233.233/tctrlOff.xml)

3.3 Table of status messages

Number	Meaning
1	**READY**
2	**ON**
3	**OFF**
4	**OVERLOAD**
5	**FREQUENCE DOWN**
6	**FREQUENCE UP**
7	**READY AFTER OVERTEMPERATURE**
8	**OVERSCAN**

10	**TIME LIMIT**
11	**ENERGY LIMIT**
12	**OVERTEMPERATURE**
14	**POWER LIMIT**
15	**OVERTEMPERATURE TRANSDUCER**
20	**TEMPERATURE LIMIT**
104	**Warning Temperature Generator high**
105	**Warning Overload**
106	**Warning Maladaptation**
107	**Period off**
108	**Temperature Limit**
111	**Warning Frequency low**
112	**Warning Frequency high**

3.4 Service Address and Telephone

In case of any trouble the service team will assist you. Please contact our team during the opening times Monday - Friday from 08.30am to 05.30pm at the service telephone.

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