



Ultrasound Technology

Certificated DIN EN ISO 9001

# Operation Manual Software

## Imprint

### Operation manual integrated software

Instructions for operating the software for ultrasonic processors

#### Purpose and use

The Operation manual explains operation of the ultrasonic processors software.

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

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

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## Content

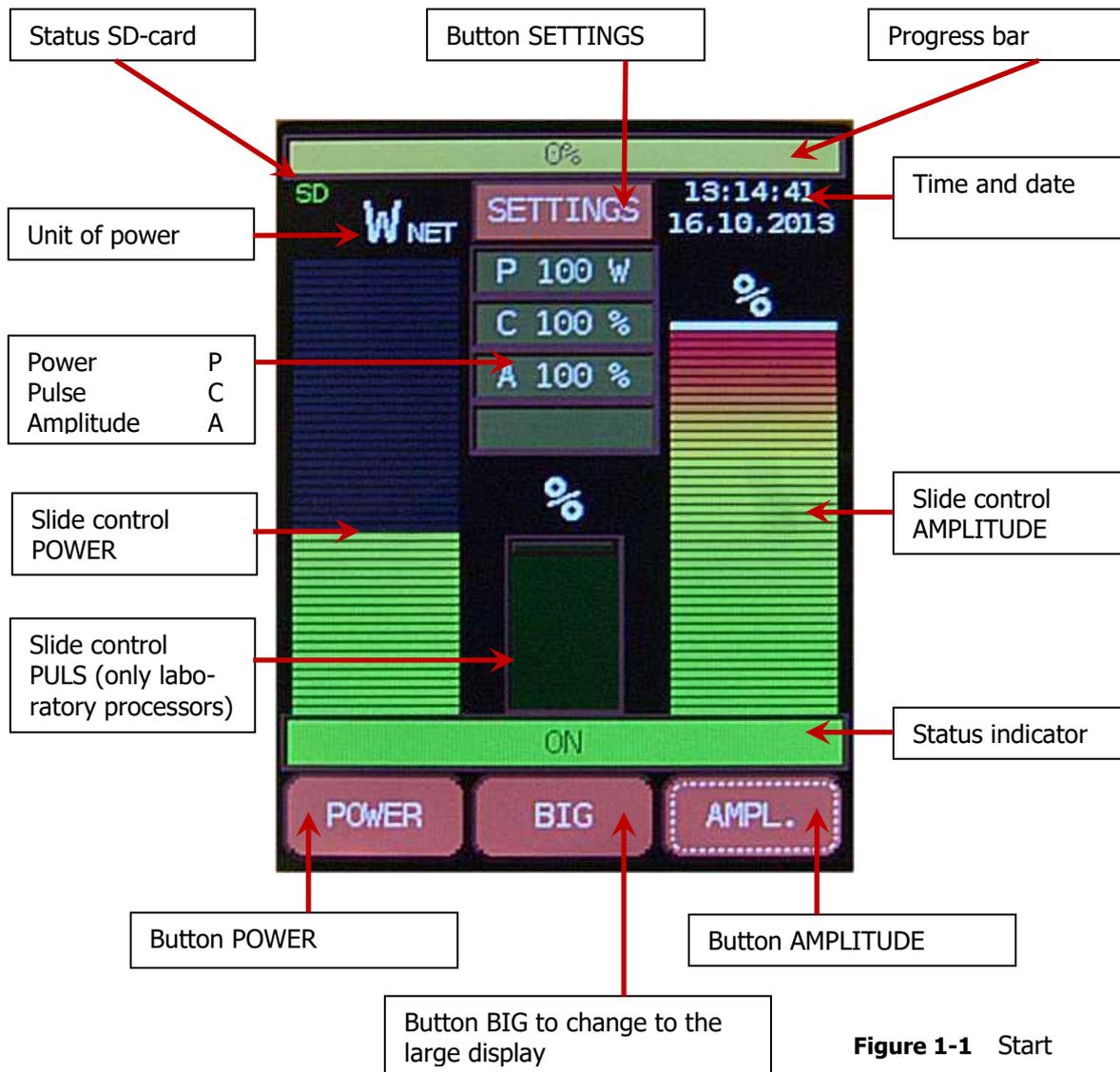
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# 1 Settings and menu structure of integrated software

In the following paragraph we will describe the menu structure of the integrated operation software. The button SETTINGS gives access to the settings menus. You can navigate through the submenus using the arrow buttons of the display.

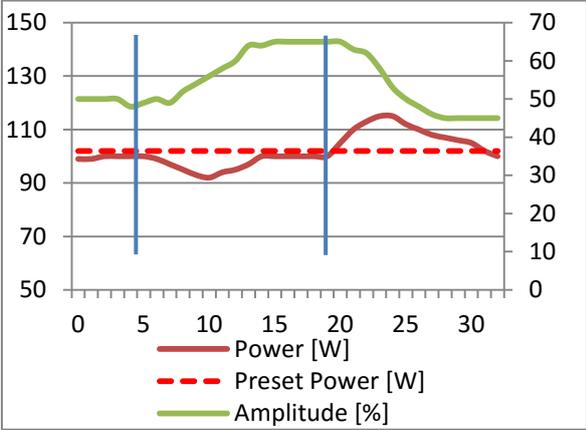
Some submenus show additional arrow buttons to be used for settings in the corresponding menu.

The BACK-button will always bring you back to the main menu.



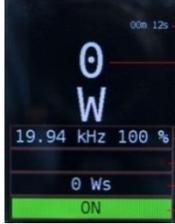
**Figure 1-1** Start

## 1.1 Operation modes

<p><b>Modes</b></p>	<p><b>Continuous operation</b> <b>Pulse operation</b></p>
<p><b>Continuous operation with amplitude control</b></p>	<p>If you touch the button AMPL the default amplitude ultrasonic processor switches to the mode amplitude control. Use the slider AMPL the amplitude is determined as a percentage of the maximum amplitude. It is kept constant within the working area. The POWER slider is used during operation to show the performance of the ultrasonic processor.</p>
<p><b>Continuous operation with power control</b></p> 	<p>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. <i>Working principle:</i> 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. The amplitude controller is used during operation to indicate the working amplitude of the ultrasonic processor.</p>
<p><b>Pulse operation</b></p>	<p>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. <b>Not available on all devices of industrial series.</b></p>
<p><b>SD-card</b></p> 	<p>With the SD card it is possible to record the amplitude, energy input, power and temperature into a text file (CSV-format) with selected time interval. This data can be evaluated for example in Excel. If an SD card is inserted in the device you see the SD icon. If the icon is green the parameters are recorded. If the icon is red you have to check the card (capacity, write protection).</p>

## 1.2 Large screen display of the measured values

Enable large-screen display

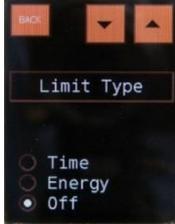
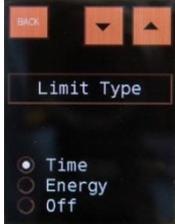
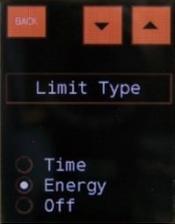
 <p>00m 12s — sonication time 0 W — power 19.94 kHz 100 % — frequency / amplitude 0 Ws — temperature ON — power input ON — status indicator</p>	<p>When touching the button BIG on the main picture screen the large screen display is activated</p> <p>Touching again the screen will take you back to the home screen.</p>
 <p>00m 33s — sonication time 0 W — power, currenty NET — net output min 0 W — minimum input max 0 W — maximum input avg 0 W — average input ON — status indicator</p>	<p>If the button BIG is pressed on the main screen for two seconds the minimum, maximum and average values are shown.</p> <p>Pressing the button BIG again for two seconds, you return to the standard large screen display.</p>
 <p>00m 22s 0 W NET 26.17 kHz 100 % 23 °C 5.0 barg 16 Ws ON</p>	<p>When connecting a temperature sensor PT100 and/or a pressure sensor the measured values in units selected are displayed on the large screen display.</p>

## 2 Menu structure

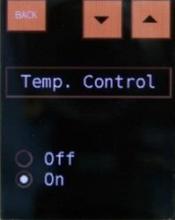
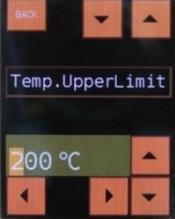
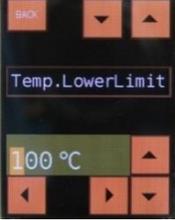
The menus are in the following table in the order in which they can be dialed described. The menu items can be accessed by pressing the arrow buttons at the top right. Possible entries are described under input parameters.

	<b>Menu page</b>	<b>Input parameters</b>
	Main screen	
	Settings	
2.1	Limit Type	[Time, Energy, OFF]
2.2	Calibration	[Start]
2.3	Stop Mode	[Reset, Pause]
2.4	Units	[°C barg, °F psig]
2.5	Temp. Control	[ON, OFF]
2.6	Light Mode	[immediate delay off]
2.7	Adjustment Snap	[1%, 5%, 10%]
2.8	Analog Input	[OFF, ADC Value, PS7, PS70 PS140]
2.9	Press. Control	[Off, On, Min., Max.]
2.10	Remote Control	[Off, Amplitude %, Start/Stop, Burst]
2.11	SD Interval	[0.1s / 1s, 1s / 10s, 5s / 60s]
2.12	Period Clock	[ON, OFF]
2.13	IP Address	[network address]
2.14	DHCP Server	[ON, OFF]
2.15	DHCP Client	[ON, OFF]
2.16	Clock Setting	[Time]
2.17	Date Setting	[Date]
2.18	Info	-

**Table 2-1** Menu structure

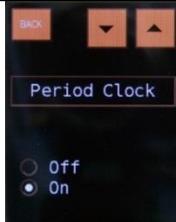
<b>2.1 Limit Type</b>		
<b>Limit Type OFF</b>		
		The sonication duration is unlimited
<b>Limit Type TIME</b>		
		After selecting a limit, a progress bar appears on the main screen and the large screen display. The sonication is terminated by a timer. After activating the Time button use the arrow down button for setting the sonication time. The maximum time for sonication is 99d: 23h: 59min: 59,9sec.
		
		
<b>Limit Type Energy</b>		
		The sonication will be terminated if the preset value of energy is reached. After activating the function Energy use the arrow down button for setting the amount of energy.
		

<h2>2.2 Calibration</h2>	
	<p>During the calibration the power consumption of the ultrasonic processor is determined at different amplitudes to be irradiated without medium. (Calibration with mounted sonotrode)</p> <p>During the sonication process, this value is deducted from the gross power consumption.</p> <p>Before</p> <p>By pressing the START button the calibration is started. The Main screen appears with a moving amplitude slider indicating the current amplitude.</p> <p>After the calibration is completed the calibration data will be stored in the system. The screen now shows the net performance that means the idle power is subtracted from the total power consumption. In addition to the performance the Index NET appears. Without calibration the total power consumption will be displayed.</p> <p>By pressing the button RESET the calibration will be reset. In this case the indicated power correspond the gross power consumption.</p>
<h2>2.3 Stop Mode</h2>	
	<p>In the "Reset" mode energy and time are set to zero when switching on the ultrasound.</p> <p>In the "Pause" mode, the values of the time counter and the energy input at the resumption of the sonication processes will be continued.</p>
<h2>2.4 Units</h2>	
	<p>Select the unit of temperature and pressure if the sensors are connected.</p> <p>°Celsius and barg or °Fahrenheit and psig</p>

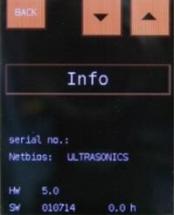
<h2>2.5 Temperature Control</h2>	
	<p>Activation temperature control.          After activation temperature monitoring the parameters can be set.</p>
<h3>Temperature Upper Limit</h3>	
	<p>When the set limit temperature is exceeded, the sonication is finished in Stop Mode "Reset" and will be stopped in Stop Mode "Pause".</p>
<h3>Temperature Lower Limit</h3>	
	<p>The sonication starts at the set limit temperature is exceeded. Falls below this temperature in stop mode "reset" the sonication is terminated.          In Stop Mode "Pause" sonication is only interrupted.</p>
<h3>Temperature Delta</h3>	
	<p>After the upper temperature limit is exceeded the sonication in stop mode "Pause" is interrupted until the temperature has fallen by the value "Tem. Delta".          Then the sonication will resume.</p>
<h2>2.6 Light Mode</h2>	
	<p>Setting the working mode of the sample illumination (only for laboratory ultrasonic processors with integrated sample illumination)          Immediate – illumination synchronal with ultrasound          Delay – Sample illumination is switched off delayed with five seconds          Off – no sample illumination</p>

<h2>2.7 Adjustment Snap</h2>	
	<p>Setting the step width of the amplitude control in 1% -5% or 10% increments.</p>
<h2>2.8 Analog Input</h2>	
	<p>The secondary analog input of the unit is deactivating.</p> <p>The secondary analog input is connected with one input voltage in the range from +0.0 V to +3.3 V</p> <p>The secondary analog input is connected with one optional pressure sensor.</p> <p>PS7      range 0 barg to 7 barg          PS70    range 0 barg to 70 barg          PS140   range 0 barg to 140 barg</p>

<h2>2.9 Pressure Control</h2>	
<h3>Press. Control ON</h3>	
	<p>Activation pressure control.          After activation pressure control the minimum and maximum pressure limits can be set.</p>
<h3>Minimal Pressure Limit</h3>	
	<p>When the measured pressure falls below the minimum limit the sonication is stopped. The sonication needs to be restarted manually when the pressure returns to the normal range.</p>
<h3>Maximal Pressure Limit</h3>	
	<p>When the measured pressure is exceeding the maximal limit set, the sonication is stopped. The sonication needs to be restarted manually when the pressure returns to the normal range.</p>

<h2>2.10 Remote Control</h2>	
	<p>The following functions are available to choose from the contact 5 of the LAN jack:</p> <p>The contact 5 of the LAN jack is deactivated.</p> <p>Amplitude value specified by an external voltage or Ultrasound on or off by using an optional footswitch          Amplitude: Setting the amplitude of a voltage of 0,6-3,3V (0,6V=50% 3,3V=100% amplitude)          When to Contact 5 the threshold of 0.6V is exceeded, the amplitude can be adjusted no longer on the screen or in the browser!</p> <p>Start/Stop: On or off the ultrasound about a foot switches by briefly pressing.</p> <p>Burst: Switching on the ultrasound while the foot switch is pressed.</p>
<h2>2.11 SD-Intervals</h2>	
	<p>Recording interval</p>
<h2>2.12 Period Clock</h2>	
	<p>Periodic switching on and off          After activation ON the parameters can be changed</p>

<p><b>On Time</b></p>	
	<p>Setting the time interval of sonication ON</p>
<p><b>Off Time</b></p>	
	<p>Setting the time interval sonication OFF</p>
<p><b>2.13 Network Settings</b></p>	
<p><b>IP Address</b></p>	
	<p>By default, the network address 192.168.233.233 is set. When the unit is connected to a network in which a DHCP server automatically assigns the addresses, and DHCP Client is enabled in the device, here the assigned address will appear.</p>
<p><b>Subnet Mask</b></p>	
	<p>Setting the subnet mask                  Factory setting is 255.255.255.0</p>
<p><b>2.14 DHCP Server</b></p>	
	<p>If DHCP server is enabled, the device operates as a DHCP server.                  If a computer (only one computer possible) directly connected to the device and the computer is the "Setting IP address automatically activated is assigned an IP address to the computer from the device.                  Factory setting is ON</p>

<p><b>2.15 DHCP Client</b></p>	
	<p>When the machine to a network connected is where a DHCP server assigns addresses, and DHCP Client is enabled in the device, the device is assigned an address that is displayed in the menu under IP address.</p> <p>Factory setting is ON</p>
<p><b>2.16 Clock Setting</b></p>	
	<p>Setting the time</p>
<p><b>2.17 Date Setting</b></p>	
	<p>Setting the date</p>
<p><b>2.18 Info</b></p>	
	<p>Device information:          Serial number          NetBIOS: Factory setting is                    ULTRASONICS          HW: Hardware version          SW: Software version          Operating hours counter</p>

## 2.19 Device Standby

In case ultrasound treatment is not activated within 10 min., the device goes in standby mode, which is ended by activating the "ON/OFF" button. The status indicator shows "Ready". This working mode is only valid for laboratory processors.

When the following conditions last over 10 minutes the display is toned down:

- No LAN-connection
- Ultrasound OFF or No inputs through the display

The display is reactivated by using the "ON/OFF" button.

Device standby with contemporaneous toning-down of the display can be forced by pressing the "ON/OFF" button for 5 seconds.

## 2.20 Resetting to device factory settings

Before resetting to factory settings, please note down your personal settings.

Subsequently press the Start button for 20 sec. The device must be power-connected.

### 3 Information, warning and error messages in the display

Due to its numerous safety and monitoring functions, ultrasonic processor is secured against many possible disorders.

In the following overview you will find all status and error messages concerning the device, which may be shown on the main screen as well as on the BIG screen. In case of malfunctions possible causes are indicated by brief descriptions.

The following table lists status and error messages that are shown on the main screen and in the BIG screen button.

Message	Description	Type
READY	The device is in READY mode when the ultrasonic processor has been connected to power	Information
ON	The device is operating and generates ultrasound oscillations through the horn of the transducer and the sonotrode connected	Information
OFF	The transducer does not oscillate	Information
Time Limit	The device has reached the pre-set time interval	Information
Energy Limit	The device has reached the pre-set energy input	Information
Temperature Limit	The temperature of the treated medium exceeds the set temperature range and operation is interrupted.	Information
Pressure Limit	The pressure of the treated medium exceeds the set pressure range and operation is interrupted.	Information
STANDBY	The device is in Ready mode but is not yet oscillating.	Information
Temp generator	The ultrasonic processor is still working. Please cool down the generator (e.g. check fan cover).	Warning
Overload	The working load of the ultrasonic processor is to verify.	Warning
Maladaptation	The working load in combination with the system amplitude is to check.	Warning
Period Off	During the period switching mode the ultrasonic processor is in the "Off" – interval.	Warning
Temperature Limit	During the temperature control mode the temperature measured is outside of the working interval.	Warning
Frequency Low	The working frequency of the unit is too low, but he is still working. (e.g. check sonotrode and/or working conditions)	Warning
Frequency High	The working frequency of the unit is too high, but he is still working. (e.g. check sonotrode and/or working conditions)	Warning
Overload	Operation has been stopped as the device was overloaded. The ultrasonic processor is still working. Please cool down the generator (e.g. check fan cover) or the working load on the sonotrode (e.g. reducing the immersion depth) Restart.	Error

Message	Description	Type
Power Limit	Operation has been stopped as the device was overloaded. Lower the working load on the sonotrode (e.g. reducing Restart).	Error
Frequency Down	The processor's operation frequency is under the set lower limit value. Sonotrode and medium temperature too high. Let cool down and restart.	Error
Frequency Up	The operation frequency of the unit is above the set upper limit value. Exchange sonotrode. Restart.	Error
Overtemperature	The internal temperature of the unit is above the upper limit value. Switch off the device and let it cool down. Restart.	Error
Overscan	At the start of ultrasound generation no mechanic resonance of the oscillation system has been registered. Remove sonotrode from medium and restart the processor in free air. Else exchange the sonotrode. Restart	Error
No Feedback	The oscillation amplitude of the transducer falls below a device limit value. Restart.	Error
Ready after OT	The temperature of the unit is cooled down. You can restart the ultrasonic processor.	Error
<b>Table 3-1</b>	Information, warning and error messages	

In case the information given does not help to solve the error, please contact our technical support service on the following address.

### 3.1 Service address and telephone

In case of complications our team can be reached during office hours. Mo. – Fri. from 08.30am to 05.30pm at the service telephone:

Hielscher Ultrasonics GmbH	Telephone	+49 (0) 33 28 / 437 3
Oderstrasse 53	Fax	+49 (0) 33 28 / 437 444
D-14513 Teltow	Email	<a href="mailto:service@hielscher.com">service@hielscher.com</a>
Germany		

### 3.2 List of Tables

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## **4 Notes**