

FAQs SoundCTRL Questions

1. What is the SoundCTRL System?

SoundCTRL is a handheld equipment analysis system that includes a fully functional Pocket PC (hp iPAQ h5450) and software for both Pocket PC and Desktop PC. The system connects directly to the CTRL UL101 ultrasonic sensor (the key device in CTRL's product line) for an easy one-step inspection-collection process. SoundCTRL recognizes the ultrasonic signals received by the CTRL UL101 during equipment inspection and *immediately* allows the user to record, play back, compare, and analyze audio and visual wave files of these signals. It also provides the user with the ability to maintain a database of this information, and to print files for reporting and trending purposes. This system, coupled with the CTRL UL101, provides the most accurate and convenient solution available for equipment condition diagnostics and failure prevention.

2. What applications are ideal for SoundCTRL?

SoundCTRL is designed for use with the UL101 and Solid Probe attachments for the diagnosis of mechanical equipment. The functions and features of SoundCTRL provide the ability to record and playback the sounds of mechanical equipment and its components. Specific applications include determination of proper lubrication of bearings, bearing wear, proper operation of gearboxes, valves, cylinders, fuel injectors, etc.

3. How many recordings can I make at a time with the SoundCTRL?

As shipped, the HP iPAQ h5450 has enough built-in memory to store approximately 100 individual 20-second long ultrasound recordings. These recordings can then be easily transferred to and catalogued on a Desktop PC, freeing up space for more recordings on the Pocket PC. Additional memory modules are also available, which can increase the number of recordings capable of being stored on the Pocket PC.

4. What is RMS?

RMS is the abbreviation for Root Mean Square. The RMS value is a measure of the average magnitude of a component's ultrasonic signal or average input signal level. Each time a recording is made with the SoundCTRL System, the RMS value is automatically calculated and displayed on the screen.

5. What is fine and coarse crackle?

Crackles are intermittent explosive sounds that have been described as being similar to the crackling sound heard as wood burns. Crackles appear in the time domain as intermittent spike-like deflections. They can be seen in the unexpanded display but are usually seen more readily in the expanded display. Crackles are divided into two types, fine and coarse, by their acoustic properties. Audibly, fine crackles are in general higher pitched, less intense and of shorter duration than coarse crackles. Crackle waveform features such as initial deflection width, largest cycle deflection, number of zero crossings, etc. have been used to separate fine and coarse crackles objectively. These characteristics are measured and utilized by the SoundCTRL software, allowing automatic detection, counting and classification during inspection. Each time a recording is made with the SoundCTRL System, both a fine and coarse crackle count is automatically calculated and displayed on the screen. Additionally, each crackle is marked on the waveform by a green "ticker" for fine crackle, a blue "ticker" for coarse crackle.

6. How can I use SoundCTRL to determine when a component is bad?

The first step in detecting deterioration of or damage to a component with SoundCTRL is to compare the current recording against past recordings and to look for any noticeable audible and visual changes in the signal. Additionally, each component has a normal operating condition, which includes a baseline RMS and fine/course crackle count level. Significant deviations from the normal levels or changes in the signal indicate a potential problem. For example, the RMS can be used to determine if a bearing is properly lubricated. A significantly heightened RMS reading of a bearing indicates that lubrication might be necessary to decrease the friction of the components. A heightened crackle count can indicate certain events such as scratches on the race of a bearing or the firing of spark plugs. (These events will also be easily recognized when replaying recordings from the UL101 Receiver.) If a bearing produces a lot of crackles in the recording, then this is an indication of wear and an early indication of component failure. If a spark plug does not produce regular crackles, then it may be misfiring at times and require replacement. These characteristics can be trended to build a history of the components and provide support for repairs.

7. Does the presence of a fine and/or coarse crackle indicate an imminent failure?

In many cases, the presence of fine and/or coarse crackle count does indicate imminent failure; however, there are many variables to remember when analyzing a component's condition. Each component has a normal operating condition, which includes a baseline count of fine and coarse crackle. The presence of crackle in some components, such as a spark plug, reflects normal operation; therefore, the absence of crackle indicates a problem. In the case of a bearing, a normal bearing will have a baseline level of crackle and a significant increase in crackle count will indicate damage. The key to diagnosis is being familiar with the normal operation of each component and being able to recognize changes in the ultrasonic signal, both audibly and visually, which indicate potential faults. Equally important, testing should be performed with the UL101 under the same conditions and settings each time as changes (such as change to Potentiometer setting or change in RPM speed) can also produce deviation in the signal.

8. What are the hardware requirements for SoundCTRL?

The SoundCTRL Desktop PC software requires a Pentium 200 with 64 MB of memory and a 10 GB hard disk running Microsoft Windows 98/ME/NT/2000/XP. The Pocket PC SoundCTRL software is shipped with an HP iPAQ h5450 and requires nothing more.

9. Can I buy only the PC or Pocket PC version of SoundCTRL?

The SoundCTRL System consists of the SoundCTRL software for PC, and Pocket PC, and an HP iPAQ h5450. The individual software for PC and Pocket PC is not separately available.

10. If I already have a UL101, why do I need SoundCTRL?

The SoundCTRL System was designed to help users of the UL101 capture, preserve, visualize, and compare ultrasound produced by critical components. It allows the user to playback the ultrasound that a particular component produced last week, last month or last year and to compare it to the ultrasound that is produced today. With this system, the capability and ease of building a component history, training others in inspection, sharing equipment information, and reporting is dramatically improved.

11. If I already have a Pocket PC device, can I use it to run SoundCTRL?

Currently, the SoundCTRL software is officially supported only on the HP iPAQ h5450. Each purchase of the SoundCTRL System includes an HP iPAQ h5450.