

Using Wireless Headphones with Bluetooth for the CSI 2140

Reliability engineers know that listening to bearings or gear-teeth during machine operation can help diagnose machine problems. Wearing headphones to listen to machine vibration through the accelerometer gives another dimension and sense to what is happening with the machine.

The CSI 2140 Machinery Health Analyzer offers a wireless headphone solution that takes advantage of Bluetooth technology. Even users in harsh industrial environments — where hearing protection and hardhats are required — can take advantage of this easily adaptable accessory.

Overview

Machines communicate information about their condition in many ways. No technician or analyst wants to miss those cues and overlook a machine fault or call one that does not exist. With the right equipment, you can truly listen to what machines are telling you. Every tool at your disposal can help when analyzing a machine.

A high-quality portable vibration analyzer, such as the CSI 2140, helps uncover machinery issues so they can be addressed before problems — and associated costs — impact production. Listening to vibration as data is gathered can add a level of confidence during diagnosis.

Reliability engineers know that listening to bearings or gear-teeth during machine operation can help diagnose machine problems. Wearing headphones to listen to machine vibration through the accelerometer gives another dimension and sense to what is happening with the machine. Because the headphone wire can be cumbersome and can pose a safety risk, technicians often ignore this analysis opportunity.

The CSI 2140 Machinery Health Analyzer offers a wireless headphone solution that takes advantage of Bluetooth technology. Even users in harsh industrial environments — where hearing protection and hardhats are required — can take advantage of this easily adaptable accessory.

Listen to What Your Machine is Telling You

Using headphones with the analyzer, a technician can listen to the vibration signal, look at the digital data as it is gathered, and make notes about the sounds and how they correlate to the data and vibration signature seen.

The technician can verify if something is heard and seen at that same time. For example, if the technician sees a vibration in low but doesn't hear any unusual noise, then he may assume the vibration is not an immediate concern. But if the technician sees a low-amplitude vibration and clearly hears an unusual sound, the machine might need to be examined more closely or monitored more frequently.

Not only can the technician listen live to the sounds, but he can also use AMS Machinery Manager Software to playback the waveforms as audio files for further analysis. The audio file playback can be correlated with the vibration waveform patterns to support diagnosis.

The benefits are many:

- *Certainty of connection.* Hearing the sound of vibration, the technician can be sure that the sensor is properly functioning and is mounted correctly on the machine being analyzed.
- *Obtaining better measurements.* If the technician hears an interesting vibration coming from the machine, he can obtain a better vibration measurement by:
 - Moving the sensor on the machine until he hears the sound much louder or clearer before collecting the vibration measurement.
 - Adjusting the maximum frequency setting on the vibration analyzer to make sure the sound he is hearing is captured in the vibration measurement.
- *Comparing good and bad.* To compare and assist with analysis, the technician can record waveforms from identical machines. For example, the technician can obtain a waveform recording from a machine with a good bearing and one with a bad bearing and replay those waveforms as audio files in AMS Machinery Manager for comparison.
- *Catching elusive issues.* The technician can listen for any transient noise, such as a single broken tooth, which might not appear or be easily seen on the waveform spectrum.

- *Focusing on the issue.* Headphones enable the technician to focus completely on the machine rather than muffle the machine by using earplugs.

There is no doubt that listening to vibration can add value to route-based analysis. But headphone cords that attach to a handheld analyzer can become a nuisance. Even more serious, however, cords can present a safety risk by catching on machinery and endangering both the technician and the process.

Emerson offers a solution that enables you to obtain all the benefits of headphones without the hazards.

Wireless Headphones

The CSI 2140 solves the headphone-cord problem by communicating via Bluetooth to wireless headphones. In many cases, industrial settings pose unique requirements for the use of headphones — all requirements are met by the CSI 2140 solution.

For example, many industrial environments demand that headphones:

- Protect hearing
- Be worn with a hardhat

In addition, to ensure that the complete range of machinery sounds can be heard (up through the 20000 Hz range), Emerson has chosen the A2DP Bluetooth profile for use with the CSI 2140.

Equipment to Fit Your Environment

Emerson provides the A647BT wireless Bluetooth headphones in association with CSI 2140 to offer the optimal experience when listening to asset vibration. These headphones are manufactured to meet industrial environment requirements and are designed for easy and comfortable use. The headphones can easily be worn over a hardhat and have a 23 dB noise reduction rating (accepted by industrial plants for hearing protection). The headphones also have up to 80 hours of continuous listening battery life for week long use.



CSI 2140 wireless headphones have industrial hearing protection and can be worn with a hardhat.

Start Listening and Start Improvements

When you begin your listening program associated with route-based analysis, you will find it becomes an essential part of your machinery health program.

As an Emerson customer recently mentioned to us...

“The fact is: Today, none of my vibration techs would do a route without headphones.”

NOTE: While Emerson has developed the CSI 2140 to comply with the A2DP format for Bluetooth audio transmission, we explicitly do not warrant compatibility between the CSI 2140 and any specific third-party audio device. The user should refer to instructions on how to pair devices to verify compatibility.

©2015, Emerson Process Management. All rights reserved.

The Emerson logo is a trademark and service mark of Emerson Electric Co. Machinery Health is a mark of one of the Emerson Process Management family of companies. All other marks are the property of their respective owners.

The contents of this publication are presented for informational purposes only, and while every effort has been made to ensure their accuracy, they are not to be construed as warranties or guarantees, express or implied, regarding the products or services described herein or their use or applicability. All sales are governed by our terms and conditions, which are available on request. We reserve the right to modify or improve the designs or specifications of our products at any time without notice.

**Emerson Process Management
Reliability Solutions**
835 Innovation Drive
Knoxville, TN 37932
T (865) 675-2400
www.assetweb.com/mhm