

Honeywell's State-of-the-Art Shock and Vibration Reduction (SaVR™) Technology

Providing reliable protection of mobile surveillance equipment – Honeywell's broad range

of mobile video security products can be effectively used in any vehicle that needs surveillance—including subways, light rails, transit buses, taxis and ferries. More specifically, Honeywell's mobile solutions are ideally suited for the unique needs of the school transportation market. School buses need reliable recording options because the cargo they transport is precious and irreplaceable. In response to this need, Honeywell strives to produce reliable video surveillance equipment that performs reliably under the severe conditions that occur naturally in mobile environments.

Honeywell's Digital Video Recorders Designed with SaVR™



The most sensitive component in a mobile surveillance system is its hard drive.

Honeywell's digital video recorders are subjected to the rigorous research and testing that differentiate us from the competition.



**HTRD400 Series
Mobile Digital
Data Recorder**

**HTRD100 Series
Mobile Digital
Video Recorder**



The majority of mobile digital recorders available today store data such as video and audio information on a hard drive. At the heart of the digital video recorder system, the hard drive is the most sensitive component in a mobile surveillance system, and is the most prone to intermittent malfunction or failure. Sensitive to even small changes in environmental conditions, the hard drive requires special consideration to avoid lost portions of data, complete loss of all video or audio clips, or even permanent damage to the unit.

Honeywell responds to threats to electronic systems in harsh mobile environments by engaging in thorough research and design, and our Quality Assurance personnel physically test our products in the environment in which it will be used.

Honeywell's unique patented¹ Shock and Vibration Reduction (SaVR™) technology is the result of extensive product research, development and testing that we have conducted continuously over the past 15 years (pronounced "saver").

The hard drive SaVR technology is employed in the HTRD400 and HTRD100 Series of digital video recorders designed specifically for the mobile video surveillance market.

¹USPTO 7,079,380

Hard Drive Shock and Vibration Reduction Technology



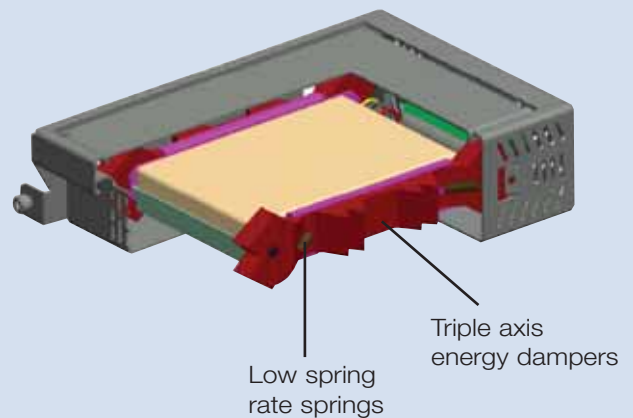
The SaVR technology reduces road and vibration disturbances.

The purpose of the hard drive SaVR is to protect the hard drive from shock and vibration to minimize the loss of video clips.



In our Testing, Research & Development laboratory, Honeywell Quality Assurance personnel subject digital mobile recorders to sustained vibration and shock.

The isolation assembly of the hard drive SaVR is composed of a hard drive suspended on four springs that possess a very low spring rate to minimize vibration. Highly specialized triple-axis energy dampers made of energy absorbing material minimize shock and movement. The low spring rate of the four springs, in combination with the mass of the hard drive, forms a dampening system which prevents excessive shock and vibration to the hard drive.



Cutaway view of the SaVR patented hard drive isolation assembly that prevents excessive shock and vibration to the hard drive.

Accelerated Life Testing

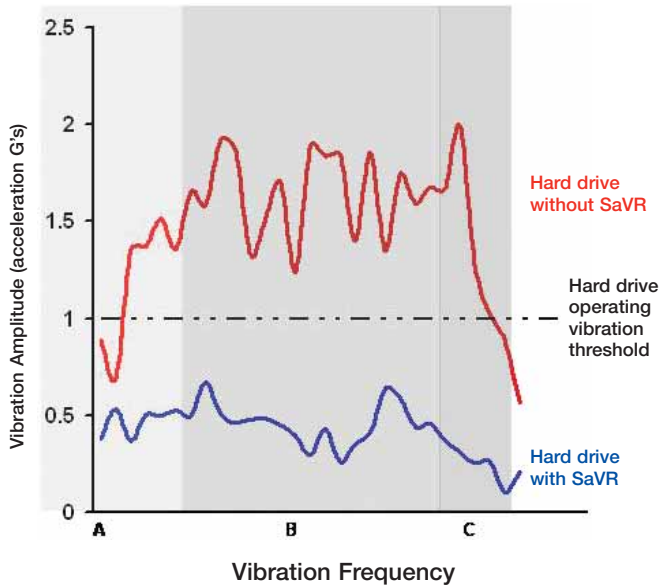


The mobile environment is unforgiving and unpredictable.

Video surveillance equipment used in mobile applications is regularly subjected to vibration, shock, dust, temperature extremes, and fluctuating humidity levels.

In order to design mobile products that withstand harsh climates, we needed to understand the elements that mobile video surveillance systems face. Then, to successfully isolate these disruptions from sensitive electronic equipment, it was crucial to first understand the varying degrees to which they occur in the natural mobile environment. Shock and vibration is produced when a vehicle travels over a road surface, but they also emanate from the vehicle engine itself. As road conditions and engine types vary, the frequency and severity of shock and vibration over a period of time will also fluctuate.

We have invested in a sophisticated shock and vibration analysis system to closely replicate mobile environments in our own laboratories. The components of our mobile DVRs are rigorously tested at all frequencies that could possibly occur in the mobile environment. Over a very brief period, we generate stress that would normally be experienced by a product during a full decade of regular use. Using a variety of vibration source simulations such as uneven road conditions, pot holes, and engine vibration, the results of all possible external disturbances are evaluated and addressed.



Frequency Regions: A. Potholes, gravel roads
B. Various engine vibration
C. Fans, loud speakers, AM/FM Radio

Customer Benefits of SaVR Technology:

- **Trustworthy**—protects from loss of video clips
- **Reliability**—evidence clips are there when you need them
- **Investment protection**—extends product life to reduce cost of ownership

Reliable Equipment, Powerful Assurance

The SaVR technology provides passengers and drivers with a sense of security by assuring them that a reliable video system is at work.

Hard drive SaVR technology ensures all data clips are reliably captured and safely stored.

The SaVR design reduces the mechanical stress on sensitive hard drives to extend their lifecycle and reduce the overall cost of equipment ownership.

Each application and installation is unique, so our mobile equipment utilizing the SaVR technology is designed to be mounted in any orientation.



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Conclusion

Organizations of all sizes trust Honeywell for video surveillance solutions that protect people and property all over the world. Honeywell expands that protection beyond buildings and site perimeters by offering a broad range of mobile video security products to reinforce security in vehicles that transport people to and from these facilities.

We are committed to manufacturing reliable products that operate reliably and accurately under widely varied conditions, and our mobile surveillance systems are specifically designed to protect people and secure property on the move. We continually strive to develop and refine the technology that will protect mobile operators and their passengers.

For more information:

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