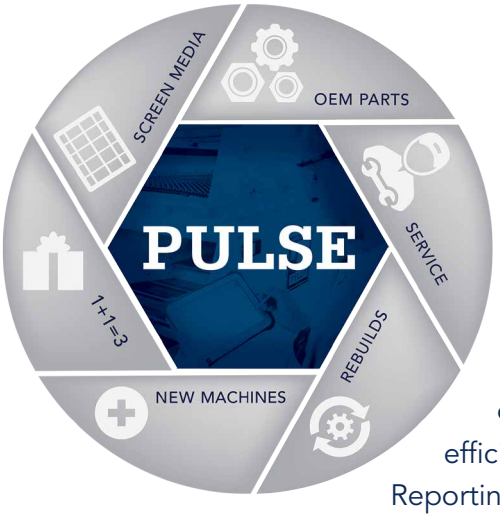
HAVER & BOECKER

PULSE VIBRATION ANALYSIS

WHAT IS PULSE?



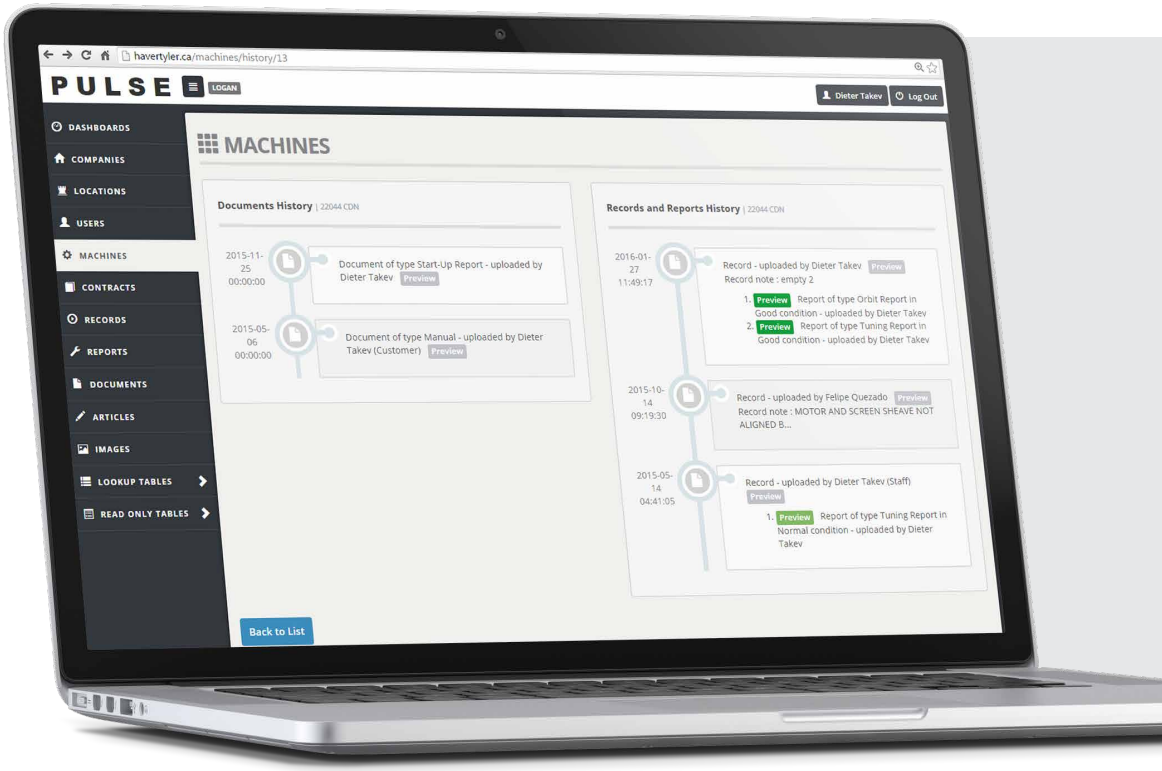
Pulse offers the key to running a balanced operation. Haver & Boecker designed Pulse, the newest innovation in vibration analysis technology, specifically to analyze the health of all brands of vibrating screens and their components. The vibration analysis software detects irregularities that could translate into diminished performance, decreased efficiency and increased operating costs. Reporting and a historical timeline of the machine's performance give you the information needed to minimize downtime and maximize productivity and profits.

Pulse is available for purchase or lease with both basic and professional levels to fit small and large operations. Both programs include an industrial-grade tablet computer, eight tri-axial sensors, a monthly maintenance package and optional expert analysis reports.

WHAT COMES WITH PULSE?

DAQ System

Incorporates industrial tablet, eight Pulse Wi-Fi tri-axial acceleration sensors, router, repeater and DAQ software.



Maintenance Package
Includes the Pulse Information Portal, software upgrades and technical support for both hardware and software via email. The portal can be accessed via a web application for uploading, downloading and viewing vibration records for registered machines as well as accessing historical timeline documents.

Vibration Analysis Reports
Features orbit summary and single-point report with orbit, waveform, FFT plots, RPM, acceleration main and x-y-z, stroke x-y-z and phase x/y. Also includes tuning report with deviations, maximum and average acceleration, stroke and balancing.

Expert Analysis Reports
Includes a detailed examination of vibration analysis reports by a Haver & Boecker service technician to identify critical values, gather additional information and provide recommendations and equipment ratings, from good to critical.

HOW PULSE WORKS

Eight tri-axial sensors attach
to key places on the vibrating screen and send up to 24 channels of data to the tablet, which immediately illustrates the machine's orbit, acceleration, speed and more. The sensors record a 10-second set of vibration analysis (VA) data and write to the hard drive.

A data acquisition (DAQ) system
retrieves acceleration data from the sensors, displays a live view and stores raw data.

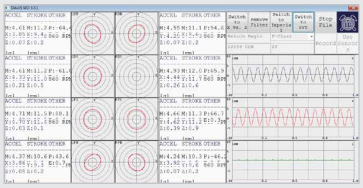
Login and upload
the VA record to the database via the Pulse Information Portal. Through the portal you can view the record and decide if a vibration analysis report or expert analysis report is required.

Expert analysis reports
are interpreted by a Haver & Boecker service technician who provides recommendations for optimum screening and machine performance.

Through the portal
customers can view the machine's historical information, such as vibration analysis records, reports and documents, and schedule the next vibration analysis.

PULSE TECHNICAL SPECIFICATIONS

DAQ System



- Windows 7/8, Wi-Fi sensor communication, sensor discovery, sensor configuration (position and location) and sensor connection
- Real-Time Views: On-screen display of 8 orbits simultaneously and individual selection of 1 magnified sensor orbit; numerical display of x-y-z- acceleration and speed, x/y phase angle and speed
- Easy Information Access: Switch between orbit, wave form and FFT; switch between filtered and unfiltered; switch between imperial and metric
- Quick Captures: Save 10 seconds of raw data to disk (maximum 8X3 channels)

DAQ Sensor

- Accelerometer: ±11g Three Axis Low-g MMA
- Communication: WiFly GSX 802.11 b/g wireless LAN module
- Power: 9-volt PP3 battery sustaining as much as 360 records or 10 hours of continuous operation
- Enclosure: ABS plastic with integrated vibration proof on/off switch, status LEDs, 9-volt battery compartment and 3-point magnet mount

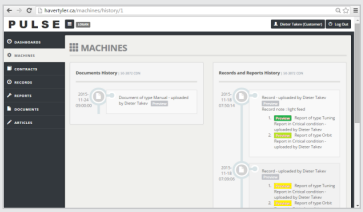
DAQ Communication Device

- Battery-operated Wi-Fi router and battery-operated Wi-Fi repeater

DAQ Tablet

- Model: Panasonic Toughpad FZ-G1
- Hardware and Software: Windows 7 or 8 Pro 64-bit, Intel® Core™ i5vPro™ processor
- Durability: MIL-STD-810G; four-foot drop and all-weather IP65 rating; dust and water resistant
- Display: 10.1-inch, HD, daylight-readable, 10-point, gloved multitouch screen
- Interface and Expansion: USB 3.0 port, HDMI ports, 11 optional configurations
- Wireless: Wi-Fi 802.11a/b/g/n/ac, Bluetooth® plus optional configurations
- Weight: 2.4 lbs. (standard battery)

Pulse Information Portal



- Web application runs on Internet Explorer, Safari, Firefox or Chrome
- Secure user login
- Access to vibrating screen machine information, vibration analysis (VA) records and PDF documents stored in a database
- Chronological records and documents display
- Upload/download VA records and other documents, preview VA orbits, wave form plots, acceleration and machine speed
- Access to VA reports generated by Haver Service

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