

PRESS RELEASE

IloT solution monitors paint booth online

EcoScreen Equipment Analytics Optimizes Plant Availability and Product Quality

Chennai, Feb. 19, 2019 – Dürr EcoScreen Equipment Analytics brings transparency and intelligence to paint shops processes. The newly developed solution for the Industrial Internet of Things (IloT) evaluates all robot and process data, traceable down to the millisecond, so that faults can be quickly identified and rectified. The technological highlight is a streaming analytics application for real-time data analysis.

What is happening in the painting cell and what is the condition of the technology? **EcoScreen** Equipment Analytics provides the answers. The software records and analyzes all relevant signals from the sensors and actuators integrated in Dürr painting robots. The application technology of the front robot arm, for example, provides data on the pressure regulators, metering pumps and color valves. Main needles, turbine speed, shaping air and air heaters from the electrostatic rotary atomizers are also connected to the data recorder. The software records the positions, torques, and temperatures of the painting and handling robots' individual axes. Data from the conveyor technology is collected for the positions of the bodies in the painting booth. This information is compared with data from the painting cells, such as start and end time of painting, or production data for individual bodies such as type and color code. All errors and warnings from the painting process are collected.

Visual representation creates transparency

In addition to the data recorder and database, the IloT solution comprises a visualization for the graphical representation and analysis of the results. "With

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the help of the Visual Analytics module we can precisely trace the data from the previous weeks with millisecond accuracy,” explains Dürr Systems AG President and CEO Dr. Lars Friedrich. “The detailed information helps to identify and eliminate faults quickly. The cross comparisons of different robots improve root cause analyses and help the plant operator to boost plant availability, increase the first-run rate, and improve the overall process sequence.” This creates transparency. For example, the signals collected from the metering pump together with flow rates, pressure regulators, and main needles of the atomizers can be displayed simultaneously on the control computer and correlations can be defined. The software can display these process signals in a 3D view together with the trajectories traveled by the robots and the exact position of the body and perform a comparison. By superimposing the signal curves, **EcoScreen Equipment Analytics** can compare bodies by type and color.

Algorithms calculate the ideal plant condition and show anomalies

The “Streaming Analytics” module goes one step further: it analyzes the data in real time. Using algorithms, it calculates patterns and correlations that describe the ideal plant condition from the data collected. Even the smallest anomalies within the plant and in the processes are identified. Employees can initiate corresponding service measures straight away and get to the bottom of the deviation before the body leaves the paint booth. **EcoScreen Equipment Analytics** uses software from the IIoT platform ADAMOS for the streaming analytics function. Dürr operates ADAMOS together with Software AG and several mechanical engineering companies.

Model-based plant monitoring

“Streaming Analytics” provides the plant operator with easy-to-use graphical interfaces that do not require any programming expertise to create analysis models. For this intuitive functionality Dürr developed a Model Editor that provides the user with a library of analysis modules. These can also be combined into new models

For example, the painting pressure data monitored during the application is displayed graphically on the screen. The operator can see that all values are

within tolerance. With Streaming Analytics, the expert can create an analysis model that automatically determines anomalies such as air bubbles in the paint from the characteristics of the signal curve. These possible applications make the Streaming Analytics solution a powerful tool since the software automates the plant operators' process knowledge using online analyses.

Integration of machine learning in the future

“In parallel with Streaming Analytics, Dürr is developing other modules for batch analytics applications that work on the basis of artificial neural networks. The software learns the optimal process condition automatically and registers every deviation. This means that the software will solve problems in the future through machine learning,” explains Dr. Friedrich. “If the self-learning modules detect trends, problems in the equipment can be identified in advance by specifying a forecast of the event time.”

A number of car manufacturers have been using the **EcoScreen** Equipment Analytics software since 2018. The additional module Streaming Analytics based on real-time data has been used for the first time in a complete production line since the fourth quarter of 2018. The Batch Analytics module, which uses artificial intelligence, is currently in the trial phase with a customer.

The **EcoScreen** Equipment Analytics software was developed in Dürr's Digital Factory. In this competence center, founded in early 2018, around 100 software experts are working on solutions for the digitization of production processes.

About Dürr India

The Dürr Group has had a direct representation in India since 1997, and Schenck RoTec has since 1986. The Dürr Group currently employs around 590 staff there, offering the entire portfolio including sales and service: Dürr India, based in Chennai, offers painting, application, final assembly and energy efficiency technology products as well as exhaust-air purification systems. Since April 2015, Dürr India has also been offering on-the-job as well as classroom training in paint and application systems to customers at its new training center. Schenck RoTec India, in Noida, is responsible for balancing technology as well as for testing and

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filling technology. The HOMAG Group has a presence in Bangalore, where it operates a production site (HOMAG Machinery Bangalore) and sales and service company HOMAG India.

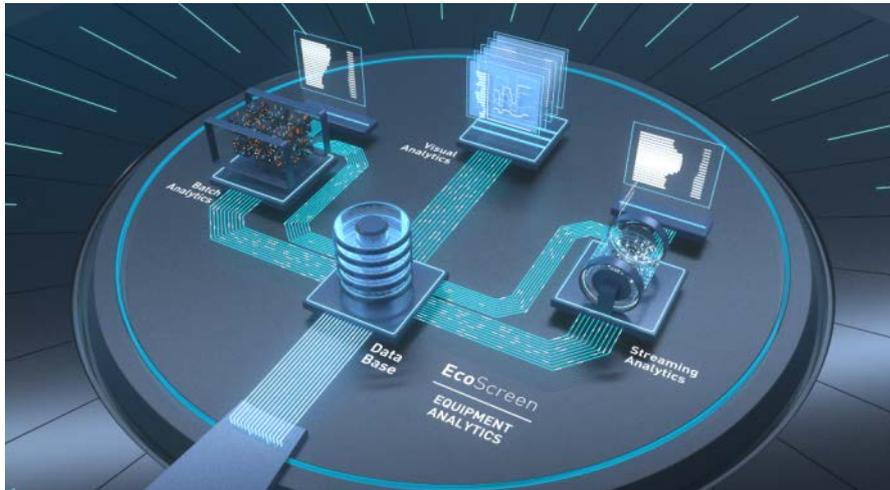
The Dürr Group is one of the world's leading mechanical and plant engineering firms with extensive expertise in automation and digitization/Industry 4.0. Products, systems and services offered by the Group enable highly efficient manufacturing processes in different industries. Dürr supplies sectors like the automotive industry, mechanical engineering, chemical, pharmaceutical and woodworking industries. The Group generated sales of € 3.71 billion in 2017. In October 2018, Dürr acquired the industrial environmental technology business of US-based company Babcock & Wilcox, comprising the MEGTEC and Universal brands. Since then, the company has over 16,000 employees and 108 business locations in 32 countries. The Group operates in the market with five divisions:

- ***Paint and Final Assembly Systems:*** *paint shops and final assembly systems for the automotive industry*
- ***Application Technology:*** *robot technologies for the automated application of paint, sealants and adhesives*
- ***Clean Technology Systems:*** *air pollution control systems and noise abatement systems*
- ***Measuring and Process Systems:*** *balancing equipment as well as assembly, testing and filling technology*
- ***Woodworking Machinery and Systems:*** *machinery and equipment for the woodworking industry*

Photos:

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EcoScreen Equipment Analytics is the latest product from Dürr's Digital Factory. The software continuously collects and analyzes data from the paint shop, making painting processes transparent and efficient.



Paint robots equipped with sensors enable the acquisition of large amounts of data - an important driver for applications in the Industrial Internet of Things.

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With the new Equipment Analytics software, the plant operator can monitor the condition in the painting cell.

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