SMART PNEUMATICS ANALYZER
TURNING DATA INTO INFORMATION

Pneumatics
It’s that easy
The Smart Pneumatics Analyzer (SPA) analyzes and visualizes pneumatic installations and systems

Air consumption last day [Nm³/h]

Air consumption last week [Nm³/d]

Air Flow [NI/min]

Pressure [bar]

Analysis of pneumatic systems at a glance
The integrated IIoT Edge Gateway Smart Pneumatics Monitor (SPM) continually records the respective operating states. All of the sensor data from the pneumatic maintenance unit is digitized and turned into information using mathematical algorithms. Pneumatics specialist AVENTICS developed these algorithms based on decades of expertise in product engineering and application. The obtained information is then recorded and shown live in a dashboard. The SPA thus gives you more insight into the overall pneumatic system and opens up the world of IIoT-relevant applications, such as preventive maintenance and energy optimization.

- Visualization of live and historical data
- Demo mode with random data for demonstrations without air
- CSV Excel export of all sensor data
- Leakage detection by pressure drop test
- Electrically operated valve controllable via dashboard
- Time synchronization
- Visual comparison of consumption data from various measurement intervals

Integrated flow sensors show air consumption in NI/min. The displayed live value is supplemented by an average value and a maximum value. This lets you quickly detect trends and leakages.

Visualization of live data from the pressure sensors in bar. The orange line indicates the input pressure that is, for example, fed into the machine via the air supply. The blue line is the output pressure that is absorbed by the maintenance unit at the end.

Display of air consumption in Nm³ per hour for the last day (top). Display of air consumption in Nm³ per day for the last week (bottom).
Immediately integrate an Internet of Things Solution with the Smart Pneumatics Analyzer (SPA)

“How do I get started with IIoT and quickly create added value for my company?” We hear this question quite often and are happy to provide a convincing answer. With the SPA, we offer a mobile, easy-to-integrate solution.

IIoT comes to you – SPA for immediate use
Everyone talks about the Industrial Internet of Things or IIoT – but there are often problems in implementation. You can reach your goal quickly and easily with the SPA. By digitalizing the pneumatic environment, the SPA provides you with options to directly experience the benefits and potential of IIoT applications on your own machine. You can simply connect the SPA to an existing machine via the compressed air supply and have an instant analysis option for key machine characteristics, such as compressed air consumption and possible leakages.

There is a case for two application environments with AS2 (flow 7...1583 NL/min) and AS3 (flow 10...2500 NL/min) series maintenance units.

- Local preparation of data (edge computing)
- Local visualization of sensor data
- No additional software required (web browser)
- Measurement without overriding the PLC-controlled process
- Portable, can be used on different machines
- Includes all functions to start with IIoT

“The SPA lets you easily and directly start with IIoT. We thus assist our customers with their digitalization needs.”

Dr. Michael Britzger,
Senior Manager Digital Transformation at AVENTICS
Industrial Internet of Things (IIoT) for various applications

AVENTICS offers complete IIoT solutions for pneumatics or accommodates your own development. It includes many advantages, whether predictive maintenance with integrated diagnostics, energy efficiency thanks to improved use of compressed air, or maximum operating comfort thanks to a simple configuration.

Data analysis permits direct conclusions related to leakages and long-term flow behavior. Extended data analysis based on the system’s characteristic graphs also provides information on the overall state of the machine. The foundation for further process optimization is laid using models and trend analyses.

The position of a welding nozzle is monitored via distance measuring sensors on pneumatic cylinders. This allows you to determine the maximum possible welding quality. The required sensor data is read out via the AVENTICS fieldbus system (AES) and evaluated by the AVENTICS Edge Computing Gateway SPM. Then, the information is sent to the customer’s Cloud via an individual interface (here: Bosch PPM).

#1 Detect leakages and optimize consumption
- Data recording
- Visualization of air
- Evaluation of data (IIoT)
- Retrofit
- Plug-in and measure
- System analysis/comprehension
- Process optimization
- Efficiency improvement
- Energy efficiency

#2 Find problems during the welding process and integrate file
- Sensor data and pneumatics
- Fieldbus system
- Edge computing
- Private Cloud
- Quality optimization

- Machine
- SPA
- Dashboard
- CSV Excel export
- Leakage in components
- Machine
- SPA
- CSV Excel export
- Leakage in components

- Customer’s Cloud
- Bosch PPM
- AES + AV
- SPM
- Machine
- Pneumatic cylinders
- AES + AV
- SPM
- Machine
- Pneumatic cylinders
- AES + AV
- SPM
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- Pneumatic cylinders
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- SPM
The pneumatic system data is supplemented by case-specific sensor and ambient data, such as room temperature, humidity, and vibration. It is possible to use an expandable data model for process optimization within the AVENTICS Cloud. Monitoring of ambient conditions also allows you to trace the causes of wear.

Permanent monitoring of the pneumatic parameters by industrial systems through the installation of pressure and flow sensors. The sensor values are read out by the SPM via an IO assembly and visualized in a local dashboard, without the need for a server or Cloud. An alarm is thus sent via e-mail if certain measured values are exceeded.

The recorded pneumatic data is correlated with process-relevant system data from the machine control (PLC). This lets you draw conclusions on the cycle performance of the system and wear of individual components. The information generated from this data is sent to a Siemens MindSphere Cloud and visualized there.

Consolidation of data from a wide variety of stations in a system within a private Cloud. The Cloud allows you to visualize sensor data within the dashboard and also send alarm e-mails. With this solution, absolutely no data leaves the customer’s premises.
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