Only measurable things are avoidable:
Measurement technology for clean air

Kirsten Controlsystems, a leading developer in environmental measurement technology, uses Delphi and the Visual Component Library (VCL) for its Trendows software.

The company was founded in 1988 and specializes in the development of advanced measurement technologies. Trendows offers a comprehensive solution for measuring, controlling, and regulating environmental and production processes. The application is now used by several hundred customers, including leading measurement institutes, to carry out legally required emission measurements, among other things.

In 2024, Kirsten Controlsystems was acquired by the deep-tech start-up MeiLuft GmbH und Co. KG, which is now driving innovation in software and hardware.

APPLICATION

Trendows

COMPANY

Kirsten Controlsystems by MeiLuft GmbH und Co. KG

GENRE

Environmental measurement technology

TOOLS USED

Delphi

CHALLENGE

Without even questioning it, every day we breathe in air that other people have breathed out before us—along with all the invisible particles it contains. Added to this are tiny pollutants from the environment and industry, such as ultrafine particulate emissions.

We are more demanding when it comes to drinking water. It should be clean and free of impurities, straight from the spring or tap. But whether and how many tiny plastic particles, so-called nanoplastics, enter our bodies unnoticed remains uncertain.

Many tiny particles that are smaller than 100 nanometres can not be seen with conventional optical microscopes. These include viruses, ultrafine dust, and nanoplastics, which are often significantly smaller still.

At present, only complex, expensive procedures are available for this purpose, which can usually be conducted only in a laboratory. Chemical and biological methods can help here but always include a loss of detection accuracy and detection speed.

This is where Trendows from Kirsten Controlsystems and the sensor technology from MeiLuft come into play. Their technology makes particles visible that were previously barely measurable. The team led by founders Prof. Dr. Ralph Wystup, his brother Frederik Wystup, and Rainer Anglett has many years of experience in industry, research, and development.

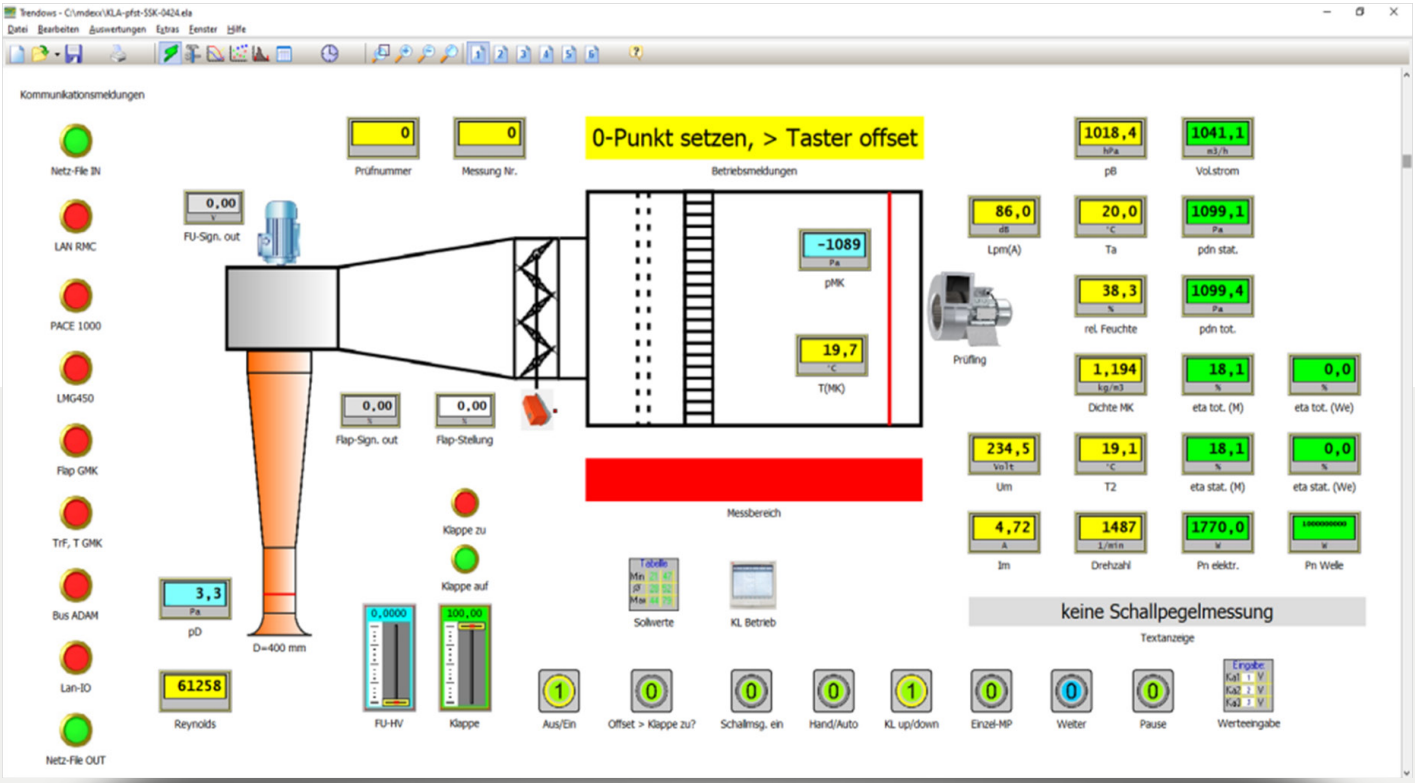
Thanks to their own laboratory with state-of-the-art equipment, such as electron microscopes, atomic force microscopes, and high-vacuum test stands, they have the best prerequisites for innovative solutions.

THE APPLICATIONS

Trendows® is a powerful and user-friendly software solution for the acquisition, visualization, and evaluation of measurement and test data, which can be flexibly adapted to a wide range of industrial and scientific applications. Thanks to its flexible configuration options, it can be used across all industries. Whether in quality assurance, process monitoring, or customized test benches, the software can be used to create and implement individual requirements.

The modular structure makes it easy to adapt to specific customer requirements. In addition to Delphi and VCL for Windows, the technologies used include REST web interfaces, MODBUS, MQTT, and others.

Available in German and English, it is a powerful tool that enables users to visualize and control their measurement and control tasks using a graphical freely definable process diagram.



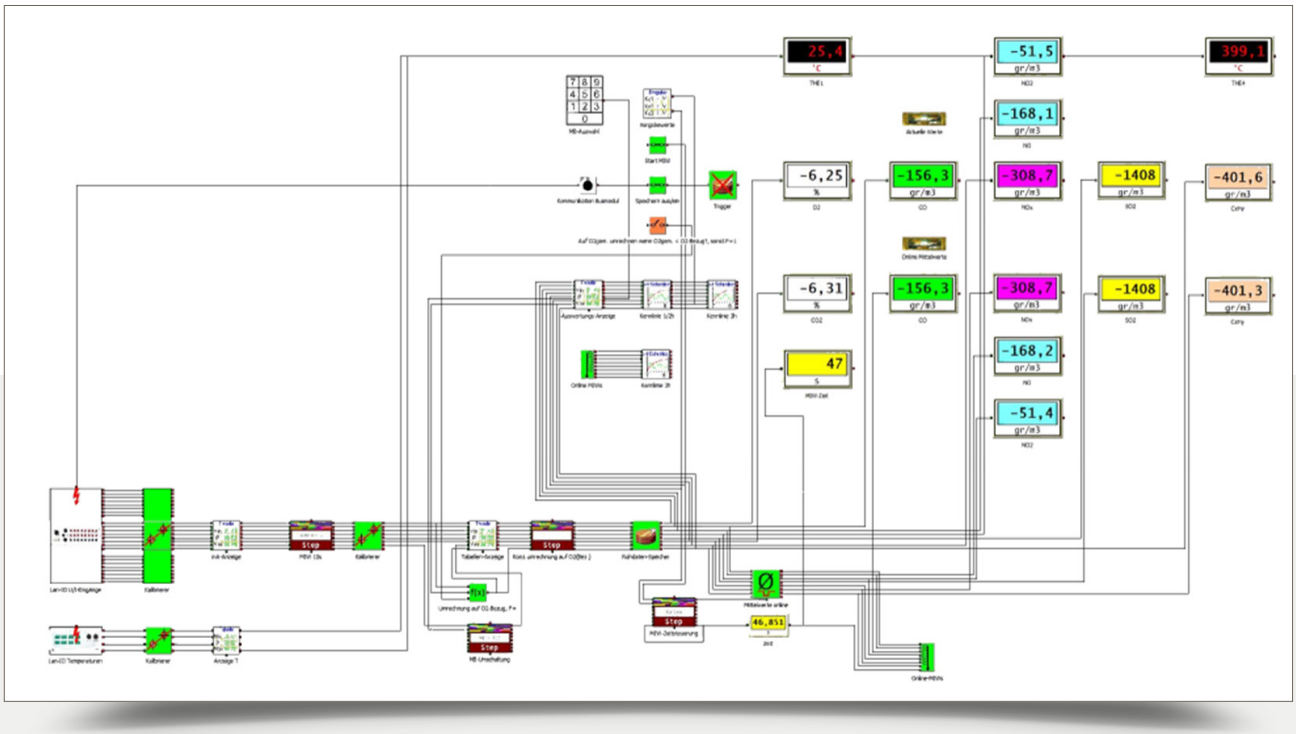
Visualisation for displaying the measured values and operation

The software supports the integration of a wide range of sensors and actuators via:

- Standard fieldbus systems
- Serial interfaces
- IP-based connections

The supported physical measurement categories include:

- Current, voltage, and power
- Pressure and volume flow
- Temperature and humidity
- Gas and particle analysis
- Magnetic flux
- Sound analysis
- Weight



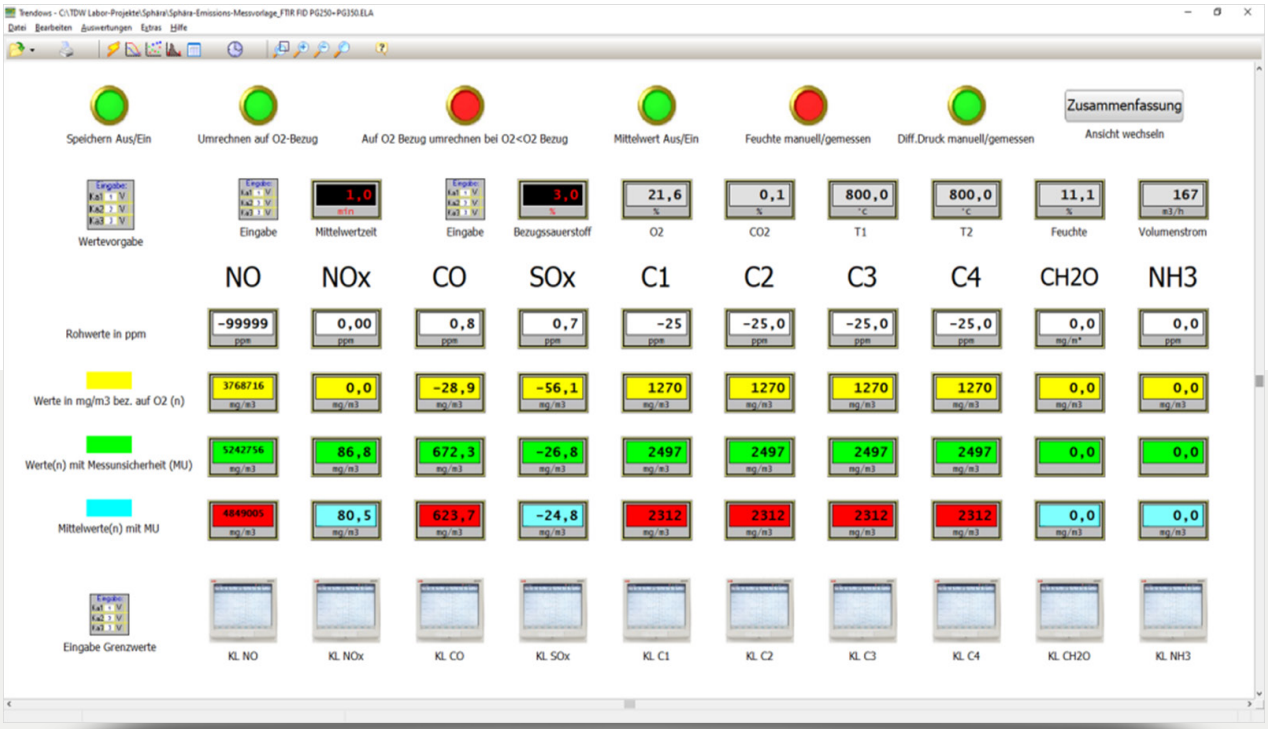
Online Monitoring

Trendows maximizes connectivity through a REST web interface, can act as a MODBUS client, and can provide data via MQTT. The software allows status or error messages to be sent via email, SMS, or voice output and enables applications in a wide range of industries, including:

- Production monitoring and control
- Emission control in industrial plants
- Automation of test benches
- Air quality monitoring
- Laboratory automation

Expandability and customization

In addition to the core software, Trendows can be connected to a **measuring box supplied by MeiLuft,** which serves as a data logger and I/O interface for analog and digital sensors. The modular design enables easy customization to specific customer requirements.



Visualisation for displaying the measured values and operation

Trendows on Raspberry Pi

Trendows can also be operated on a Raspberry Pi using the Wine runtime environment, currently in an advanced test phase.

Areas of use

- **Environmental measurements**
  The standard software is the market leader and is used by many measuring institutes to record the legally prescribed emission measurements.
- **Test bench measurements**
  Test benches can be controlled fully automatically and their characteristic curves can be documented. The measurements are then analyzed and compared.
- **Monitoring systems**
  Many processes, whether in the pharmaceutical industry (FDA certified), in the manufacture of circuit boards, or in the storage of products, can be monitored and notifications sent in the event of deviations from standard values.

CONCLUSION

From planning to implementation, **Trendows** offers a powerful but easy-to-use software system for measurement and testing technology that allows foremen, shift supervisors, and laboratory technicians to perform their daily measurement tasks for quality assurance, process, and product development easily, quickly, and reliably.

The long-standing use of Delphi and the Visual Component Library (VCL) in Trendows shows why **Delphi is the perfect choice for long-lasting and powerful software.** Delphi enables robust software solutions that last for decades. Thanks to its modular structure, Trendows remains flexibly expandable and can be continuously adapted to new requirements.

The native compiler means that Delphi offers high performance, especially for the real-time evaluation of measurement data. Trendows processes sensor data efficiently and displays it in real time.

The integration of REST web interfaces, MODBUS, and MQTT as well as support for various fieldbus systems, serial interfaces, and IP connections make Trendows highly compatible with current and future industry standards.

Delphi offers longevity, investment security, native performance, and versatile connectivity options—the ideal basis for Trendows and modern measurement and automation systems.

You can read more about the Trendows software solution and sensor development on the Kirsten Controls and MeiLuft websites.

> **Trendows has relied on Delphi as a solid and robust basis for many years.** We are therefore ideally positioned for our current customer projects, as well as for future challenges and extensions such as the TrendowsAI modules.
>
> Frederik Wystup
> **CEO of the MeiLuft Group** and **Managing Director of Kirsten Controlsystems GmbH**

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