



MINESIC700 TBS

CUSTOMIZED ANALYZER SYSTEMS

The atmosphere must be just right

SICK
Sensor Intelligence.



MINESIC700 - THE ATMOSPHERE MUST BE JUST RIGHT

Monitoring gas levels in underground coal mines is a challenging task and presents high demands on measurement technology. With over 30 years of experience and ongoing development SICK's tube bundle system MINESIC700 TBS reliably measures underground atmospheres and meets coal mine regulation standards.

Challenges in measuring underground coal mine atmospheres

Underground coal mines contain potentially harmful gases, which must be monitored and controlled in order to allow normal mining operations, 24/7. Measuring percentage levels of oxygen (O₂), carbon dioxide (CO₂), methane (CH₄) and ppm levels of carbon monoxide (CO) down to 1ppm gives the mine long and short term trending information. This allows early warnings in case of spontaneous combustion and also allows monitoring explosive atmospheres in sealed sections of the mine where there is little or no access.

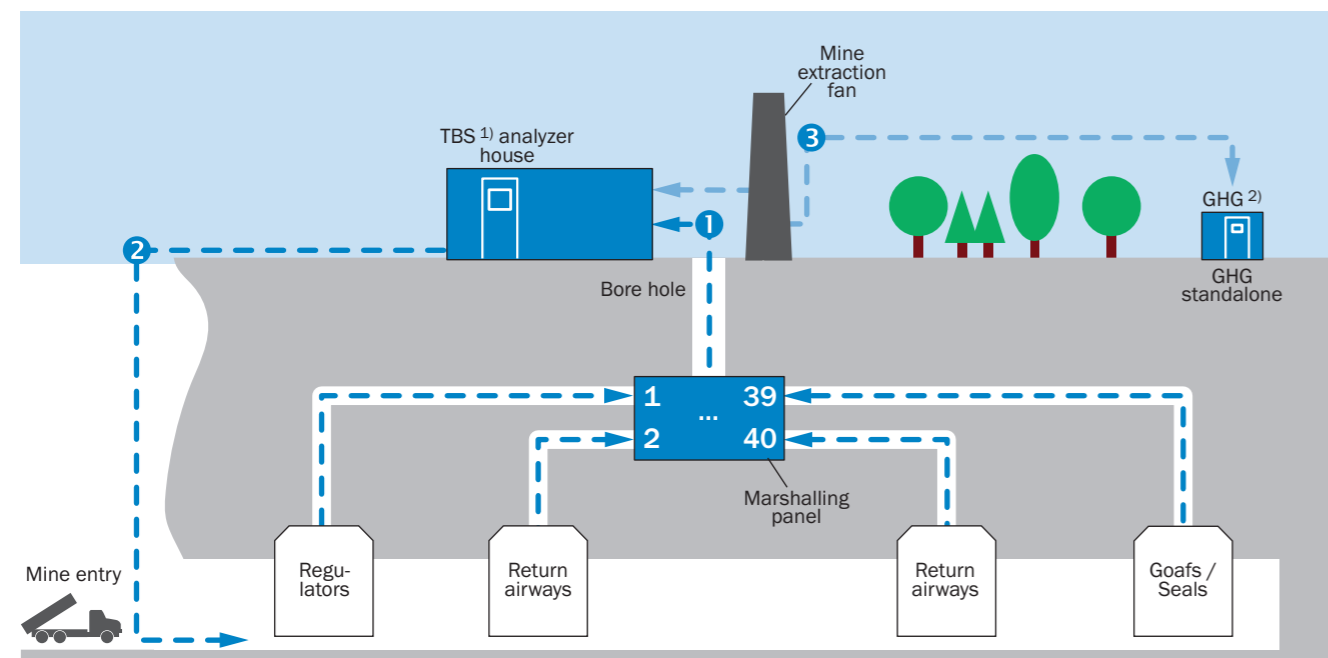
Measuring equipment used in monitoring underground mine atmospheres must meet coal mine regulation standards. The coal mining industry recognizes three techniques for effectively monitoring mine atmospheres: real-time (telemetric), tube bundle and gas chromatographs (GC).

SICK's solution MINESIC700 TBS tube bundle system

The MINESIC700 TBS analytical equipment is housed on the surface in a 40ft container with dedicated air conditioned and ventilated rooms. The tube bundle system draws gas samples (CO, CO₂, CH₄ and O₂) from designated (up to 40) sampling locations underground through specially designed LDPE tubes using vacuum pumps. Sampling locations are spread throughout the mine, including sealed areas / goafs. The tube bundle system is the only option to monitor the gas compounds in goafs. Once a tube is positioned, there is no further requirement to access the end sampling point. Only the sample filters and water traps require maintenance.

On the surface the gas samples are dried and passed through particulate filters before they sequentially enter the extractive gas analyzer. The samples are analyzed using the proven infrared and paramagnetic cell technology of the SICK S715 gas analyzer.

Tube bundle through: 1 bore hole, 2 mine entry, 3 mine extraction fan.



¹) TBS = MINESIC700 TBS; ²) GHG = MINESIC700 GHG (GHG system can be installed in TBS).

CERTIFIED SYSTEM WITH PROVEN MEASUREMENT TECHNOLOGY

Reliable measurement technology

SICK's MINESIC700 TBS is IECEx certified and sets high standards for monitoring underground coal mine atmospheres. The technology is based on proven SICK extractive gas analyzing technology. The tube bundle system is known for outstanding performance and reliability. Continuous development by SICK over the last 30 years ensures the MINESIC700 TBS is fully compliant and certified to meet worldwide coal mine standards and regulations.

Sample point switching without going underground

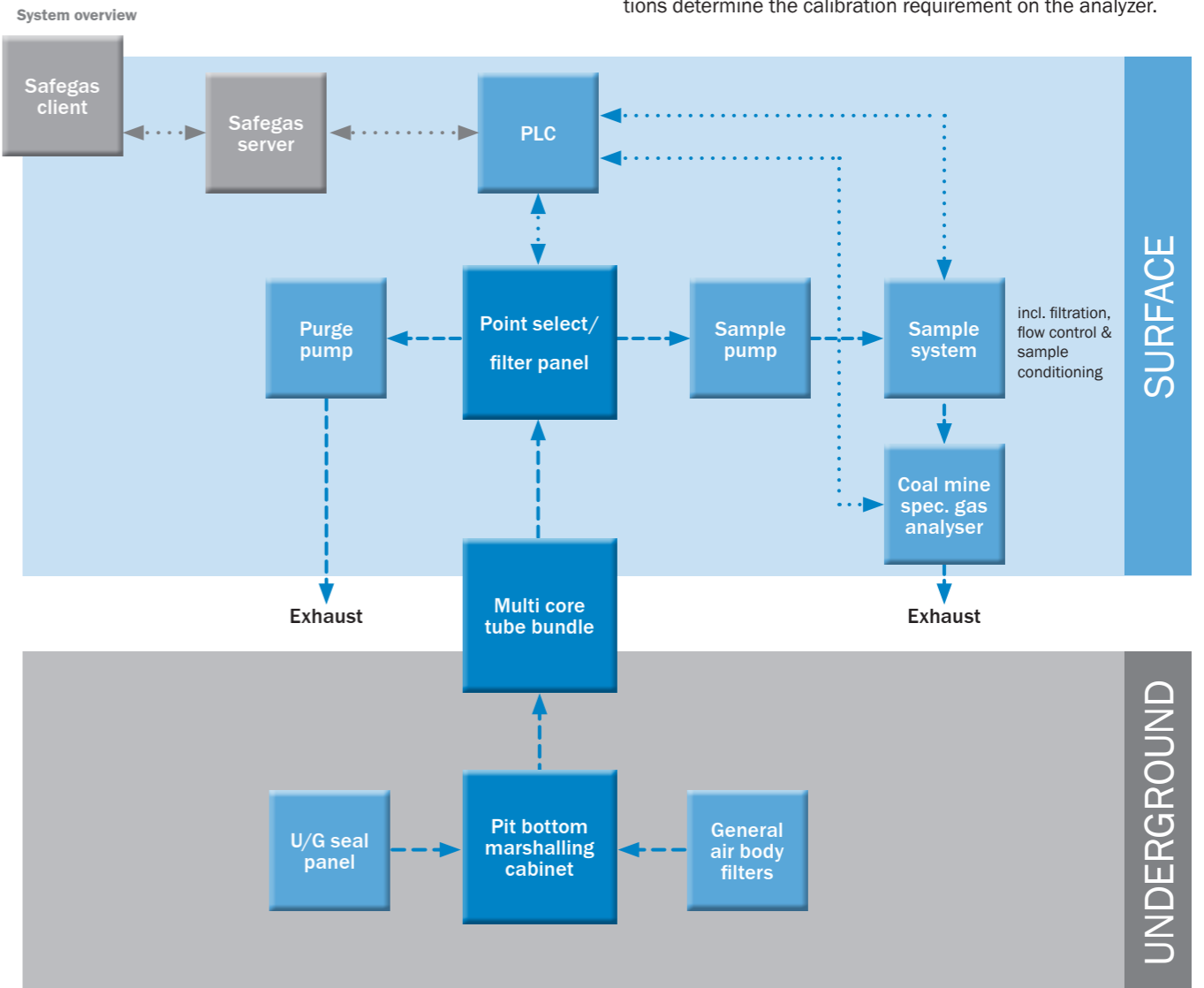
The MINESIC700 TBS will monitor critical points more than once during a cycle should the user require this option. The system allows for user configurable measuring point switching which can be performed locally or via remote access.

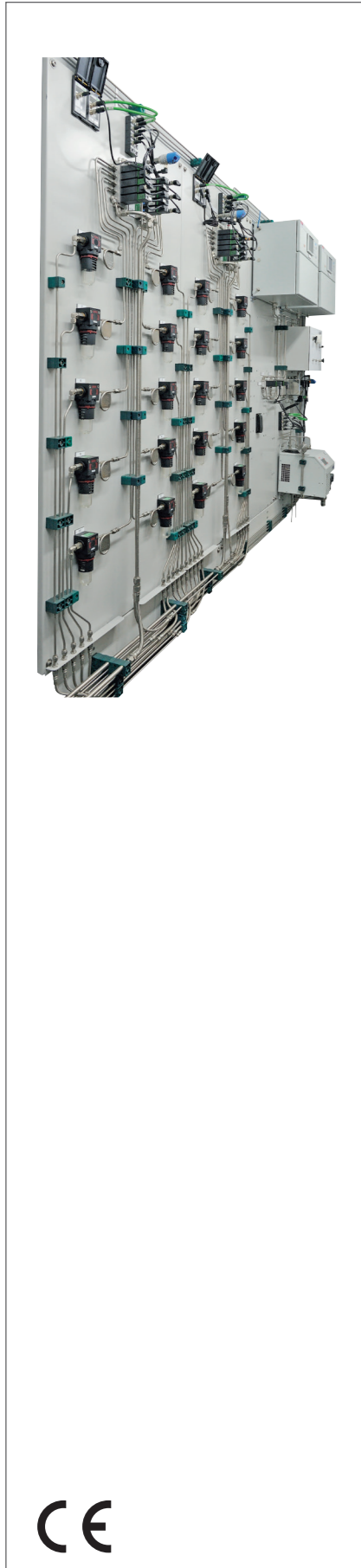
Long-term trending / Measuring range

For early detection of spontaneous combustion the tube bundle system monitors from below Lower Explosion Limit to above Upper Explosion Limit.

SICK LifeTime Services option

To ensure reliable and continuous repeatable, monitoring the MINESIC700 TBS requires a maintenance program which includes analyzer calibration, tube integrity testing and six month linearization calibration. SICK Service Engineers are qualified to perform this service maintenance. Worldwide coal mine regulations determine the calibration requirement on the analyzer.





Product description

The MINESIC700 TBS tube bundle analyzer system is ideally suited for monitoring the mine atmosphere in shafts and goafs in underground coal mines. The system extracts gas from different parts of the mine via specially designed polyethylene tubes that are connected to a

powerful gas sample pump. The system also comprises purge pumps, certified flame arrestors, and gas conditioning components. The gas sample is analyzed with approved NDIR gas analyzers and paramagnetic oxygen analyzers.

At a glance

- Extractive measurement of gases in coal mines
- Certified according to IECEx and ANZEx
- Reliable, continuous measurement (24/7)
- Automated switching between measuring points for up to 40 sites
- Automated alarm and alarm report
- Self-contained, transportable system
- Separate room for test gases
- Control room separated from the analysis and test gas room

Your benefits

- The system includes reliable and durable analyzers from SICK
- Modular system that can be expanded from 10 to 40 measuring points
- User configurable sample point switching device
- Improved mine safety as the long-term trends of the mine atmosphere at every measuring point are recorded
- Remote control from the central control room
- System is simple to operate and easy to maintain
- Full service package including various support options provided by SICK LifeTime Services
- In depth product knowledge with comprehensive user training

Fields of application

- Underground coal mines
- Underground hardrock mines
- Methane drainage plants

Detailed technical data

Features

Measured value	CO, CO ₂ , CH ₄ , O ₂ , other components on request
Sample quantity	Analyzer: ≤ 60 l/h via automatic flow control
Sample temperature	+5 °C ... +50 °C
Ambient temperature	+5 °C ... +50 °C
Storage temperature	+5 °C ... +55 °C
Conformities	ANZEx Ex V (AS1482) – CERT No. ANZEx 12.2006 Analyzer NATA certified
Interfaces	Ethernet Fiber optic
Bus protocol	MODBUS (analyzer) Ethernet TCP/IP
Operation	Via Allen-Bradley PLC Via Safegas software Via SICK Flexi Soft PLC (operation of the container MINESIC700 TBS)
Model	Systems for 10, 20, 30 or 40 measuring points Modular extension with 10 measuring points; max. 40 measuring points per system
Dimensions (W x H x D)	12.2 m x 2.9 m x 2.44 m (40' High Cube container)
Weight	≤ approx. 8,500 kg depending on system configuration
Electrical connection	Voltage 415 V AC Frequency 50 Hz Power consumption ≤ 15 kW:
Correction functions	Manual adjustment with test gases (via Safegas software)
Test functions	Monitoring of analyzer room and fresh air supply (TBS measuring points 41 and 42) Forced ventilation of analyzer room and gas room via Ex D fans
Integrated components	Sample gas cooler Sample gas pump Purge pumpe (one per 10 measuring points) Sample gas lines (1/2", max 6,500 m or 5/8", max. 9,500 m)
Options	Fire supression systems Emergency generator Gas chromatograph Closed circuit television Integration of greenhouse gas measuring system MINESIC700 GHG Methane drainage system Underground marshalling cabinets / panels End of line filters, water traps, underground seal panels Line integrity test kit Blow back panel Tool kit
Items supplied	The scope of delivery depends on application and customer specifications.



→ www.sick.com/MINESIC700

For more information, simply enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.



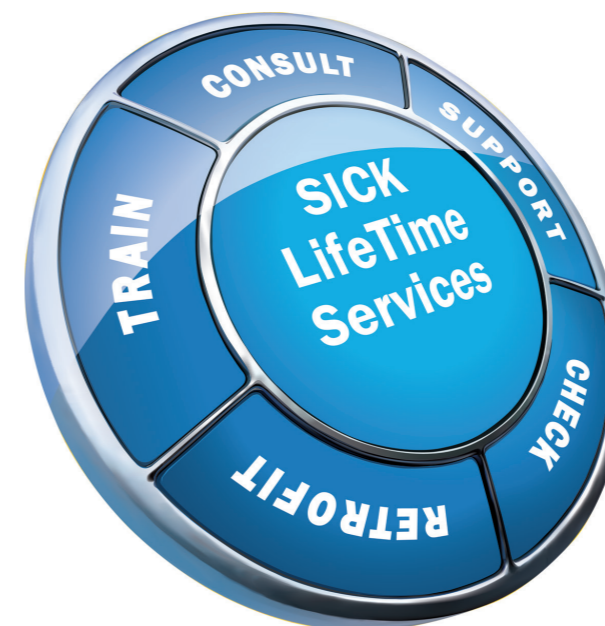
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SERVICES FOR MACHINES AND PLANTS: SICK LifeTime Services

Our comprehensive and versatile LifeTime Services are the perfect addition to the comprehensive range of products from SICK. The services range from product-independent consulting to traditional product services.



-  **Consulting and design**
Safe and professional
-  **Product and system support**
Reliable, fast, and on-site
-  **Verification and optimization**
Safe and regularly inspected
-  **Upgrade and retrofits**
Easy, safe, and economical
-  **Training and education**
Practical, focused, and professional

SICK AT A GLANCE

SICK is a leading manufacturer of intelligent sensors and sensor solutions for industrial applications. With more than 8,000 employees and over 50 subsidiaries and equity investments as well as numerous agencies worldwide, we are always close to our customers. A unique range of products and services creates the perfect basis for controlling processes securely and efficiently, protecting individuals from accidents and preventing damage to the environment.

We have extensive experience in various industries and understand their processes and requirements. With intelligent sensors, we can deliver exactly what our customers need. In application centers in Europe, Asia and North America, system solutions are tested and optimized in accordance with customer specifications. All this makes us a reliable supplier and development partner.

Comprehensive services round out our offering: SICK LifeTime Services provide support throughout the machine life cycle and ensure safety and productivity.

For us, that is “Sensor Intelligence.”

Worldwide presence:

Australia, Austria, Belgium, Brazil, Canada, Chile, China, Czech Republic, Denmark, Finland, France, Germany, Great Britain, Hungary, Hong Kong, India, Israel, Italy, Japan, Malaysia, Mexico, Netherlands, New Zealand, Norway, Poland, Romania, Russia, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Thailand, Turkey, United Arab Emirates, USA, Vietnam.

Detailed addresses and further locations → www.sick.com