

## MINESIC700 TBS

The atmosphere must be just right

**SICK**  
Sensor Intelligence.

## MINESIC700 TBS

### 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 (O<sub>2</sub>), carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>) 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.

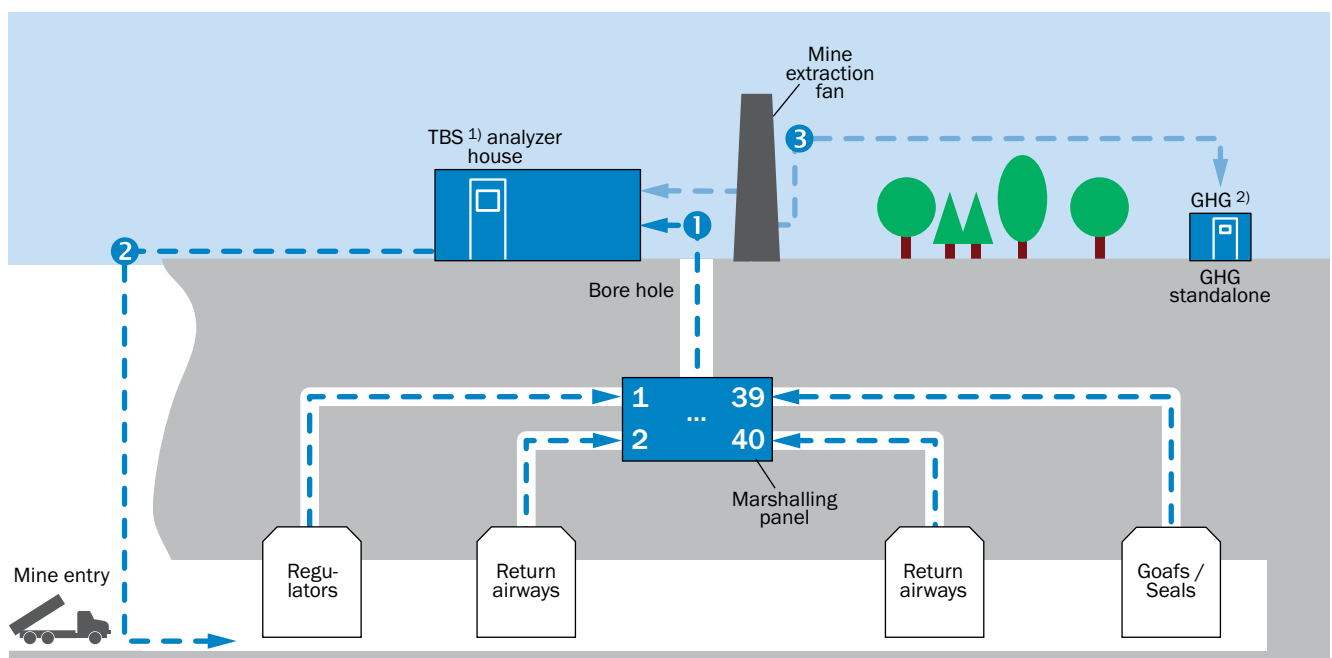
Measuring equipment used in monitoring underground mine atmospheres must meet coal mine regulation standards. The coal mining industry recognizes three techniques for effectively monitoring mine atmospheres: real-time (telemetric), tube bundle and gas chromatographs (GC).

#### 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, CO<sub>2</sub>, CH<sub>4</sub> and O<sub>2</sub>) from designated (up to 40) sampling locations underground to the surface 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.



<sup>1)</sup> TBS = MINESIC700 TBS; <sup>2)</sup> 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.

### 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.

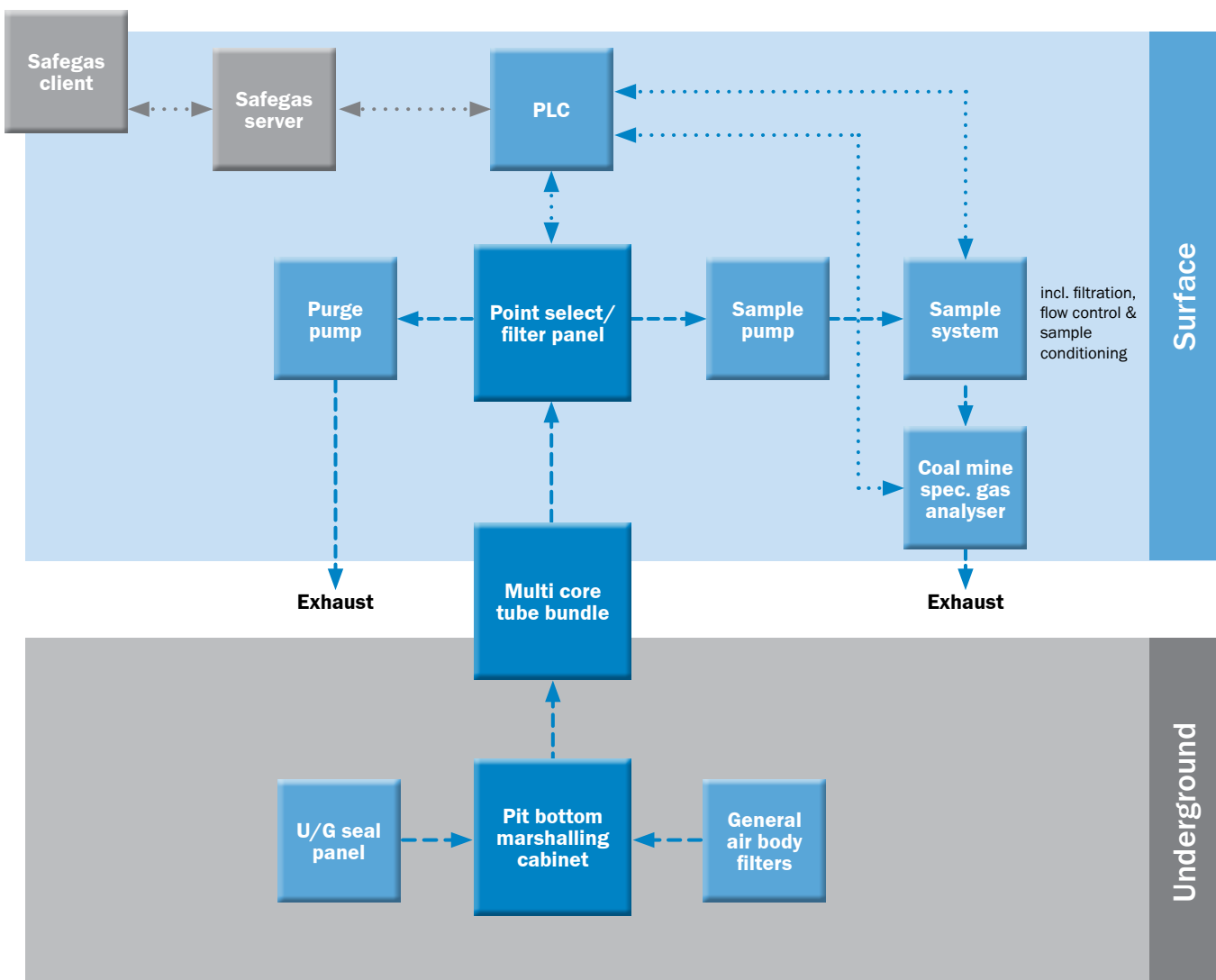
### Sample point switching without going underground

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.

### 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.

System overview





The atmosphere must be just right



## 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

## Additional information

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

## Application

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

## Detailed technical data

### System

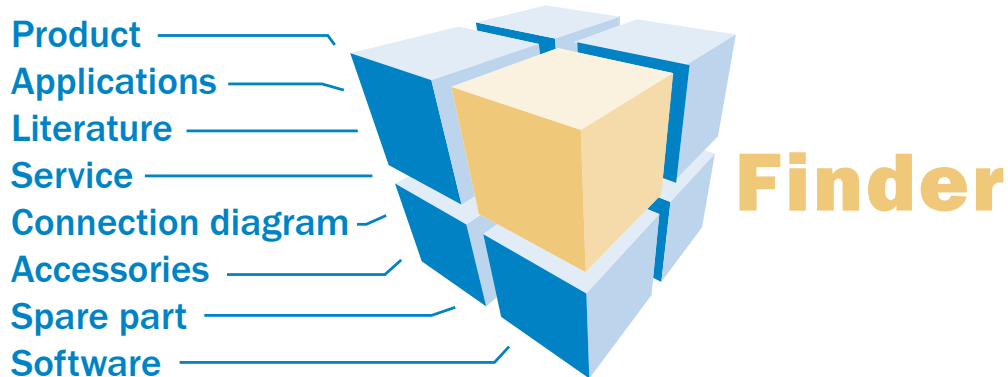
Measured value	CO, CO <sub>2</sub> , CH <sub>4</sub> , O <sub>2</sub> , other components on request
Sample quantity	Analyzer: ≤ 60 l/h via automatic flow control
Sample temperature	+5 °C ... +50 °C
Ambient temperature	+5 °C ... +50 °C
Storage temperature	+5 °C ... +55 °C
Conformities	ANZEx Ex V (AS1482) — 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	<div>Voltage</div> <div>Frequency</div> <div>Power consumption</div> 415 V AC 50 Hz ≤ 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.

## Ordering information

Our regional sales organization will help you to select the best fitting device configuration.



## Search online quickly and safely with the SICK “Finders”



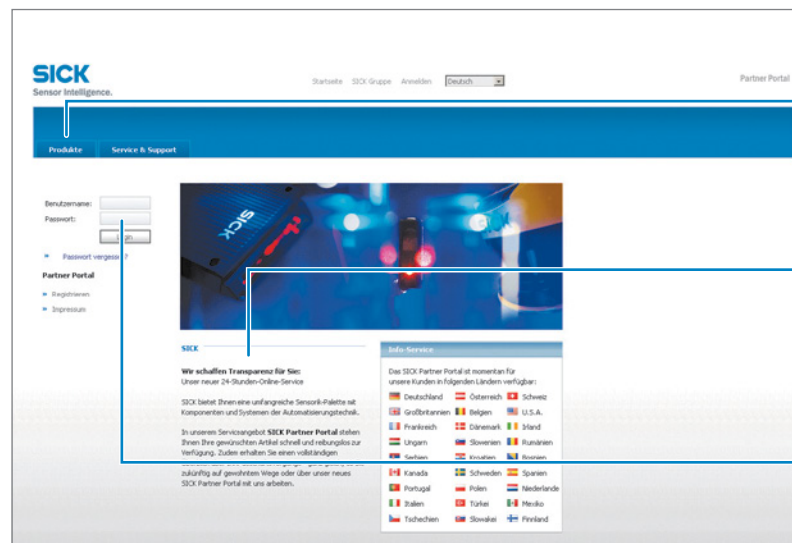
**Product Finder:** We can help you to quickly target the product that best matches your application.

**Applications Finder:** Select the application description on the basis of the challenge posed, industrial sector, or product group.

**Literature Finder:** Go directly to the operating instructions, technical information, and other literature on all aspects of SICK products.

These and other Finders at [www.mysick.com](http://www.mysick.com)

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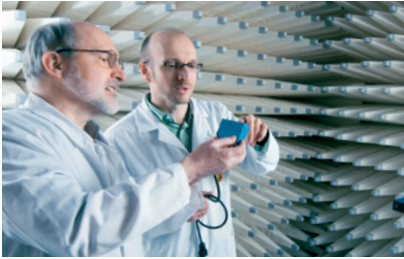
### Request or view a quote

You can have a quote generated online here. Every quote is confirmed to you via e-mail.

### Order online

You can go through the ordering process in just a few steps.

## SICK at a glance



### Leading technologies

With a staff of more than 5,000 and over 50 subsidiaries and representations worldwide, SICK is one of the leading and most successful manufacturers of sensor technology. The power of innovation and solution competency have made SICK the global market leader. No matter what the project and industry may be, talking with an expert from SICK will provide you with an ideal basis for your plans – there is no need to settle for anything less than the best.



### Unique product range

- Non-contact detecting, counting, classifying, positioning and measuring of any type of object or media
- Accident and operator protection with sensors, safety software and services
- Automatic identification with bar code and RFID readers
- Laser measurement technology for detecting the volume, position and contour of people and objects
- Complete system solutions for analysis and flow measurement of gases and liquids



### Comprehensive services

- SICK LifeTime Services – for safety and productivity
- Application centers in Europe, Asia and North America for the development of system solutions under real-world conditions
- E-Business Partner Portal [www.mysick.com](http://www.mysick.com) – price and availability of products, requests for quotation and online orders

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China  
Danmark  
Deutschland  
España  
France  
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