



# Complete Solutions for H<sub>2</sub> Flow Measurement

ACCURATE MEASUREMENT OF HYDROGEN

Flow Metering Systems

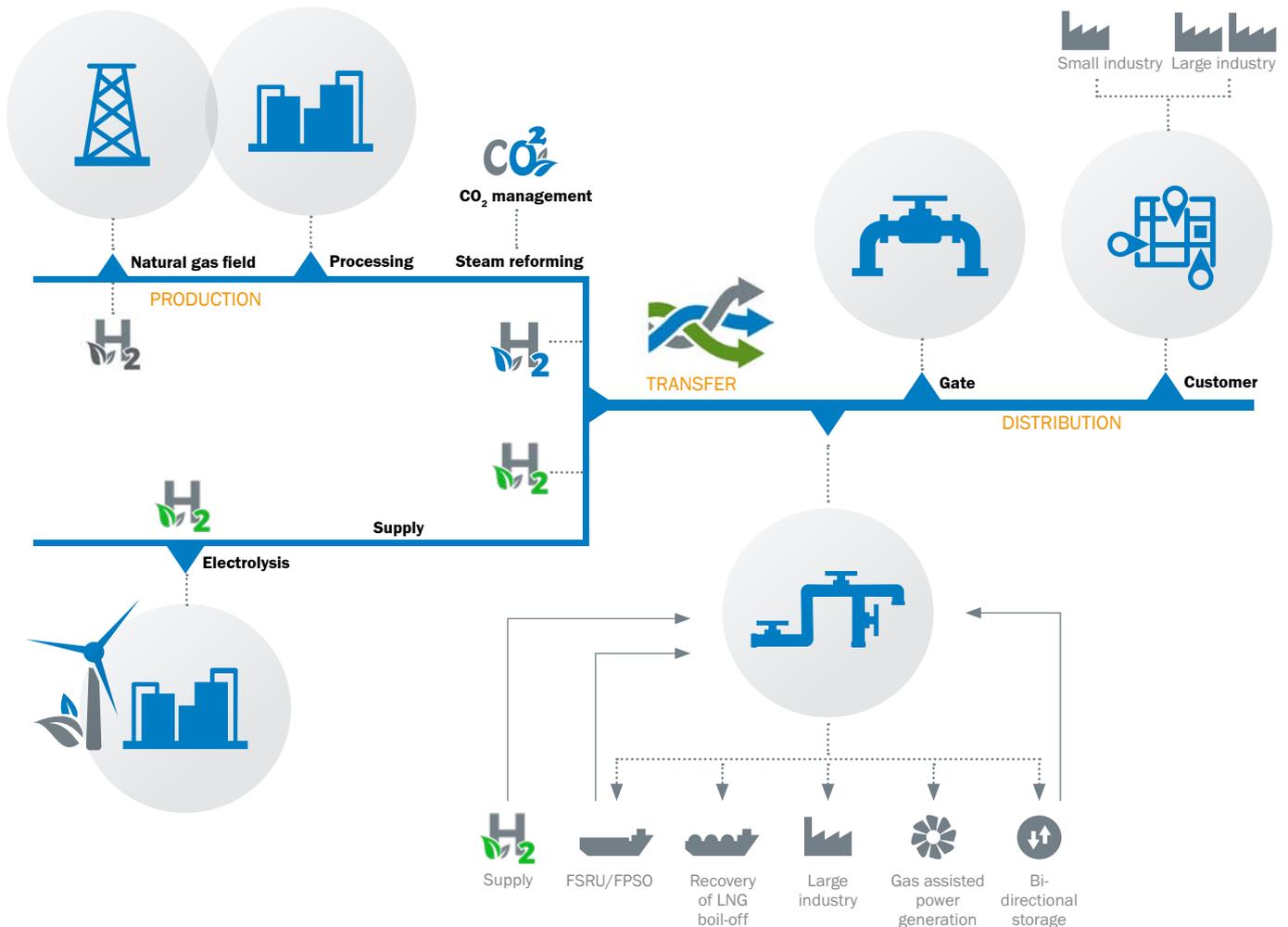
**SICK**  
Sensor Intelligence.



# ENVIRONMENTALLY-FRIENDLY HYDROGEN – THE ENERGY CARRIER OF THE FUTURE

The interest in renewable energy generated from wind, water, sunlight and biomass will continue to grow globally during the coming years in order to reduce the consumption of traditional fuels and thereby protect the environment. Hydrogen is the latest trend in the current climate discussion. It is particularly interesting because it can be produced with the help of renewable energy, has a carbon neutral footprint, and produces only water when it is burned. Up to 10 % hydrogen is already being fed into some natural gas networks today.

Hydrogen can be used in many ways, for example to power land vehicles, trains, ships and aircraft, to produce synthetic fuel, in the steel and cement production, as fuel for turbines or to heat buildings – the applications are nearly endless. SICK offers a range of intelligent sensor solutions throughout the entire value chain.



## SICK sensor solutions for clean industries

Hydrogen changes hands several times from production to the end consumer. The ability to accurately determine the gas volume at each transfer point for billing purposes is essential to the acceptance and commercial success of hydrogen as an energy carrier. The purity of the hydrogen is also of significant importance. Contaminated hydrogen may contain sulfur components, ammonia or hydrocarbons in various mixtures and concentrations and, for example, have a detrimental effect on the service life of fuel cells. Different technologies, each with their typical measurement advantages, will be suitable for quality testing depending on the requirements. When natural

gas is mixed with hydrogen, completely different measurement characteristics apply. The ultrasonic gas flow meters and gas flow measuring instruments from SICK reliably measure different gas mixtures in the gas network or in power-to-gas systems and are easy to integrate into the existing measuring technology. They are also rugged: hydrogen containing natural gas will not harm either the electronic enclosures and adapters or the media contacting parts such as ultrasonic probes, O-rings and flow conditions.

## Measuring tasks



### Gas composition measurement

Measuring the gas composition shows exactly which gases the gas stream contains and in what quantities.



### Volume measurement

The quantity measurement indicates the amount of gas that has flowed through the line. It takes place in the gas flow meter, which then outputs the measured values to the flow computer.



### Pressure measurement

Monitoring the pressure in the pipeline and responding to changes is important because gas pressure and gas volume are interdependent.



### Temperature measurement

Temperature monitoring is just as important as pressure measurement, as gas expands or contracts due to temperature changes.



### Flow calculation

The values for composition, quantity, temperature and pressure serve as variables for the calculation of the calibrated gas flow rate.

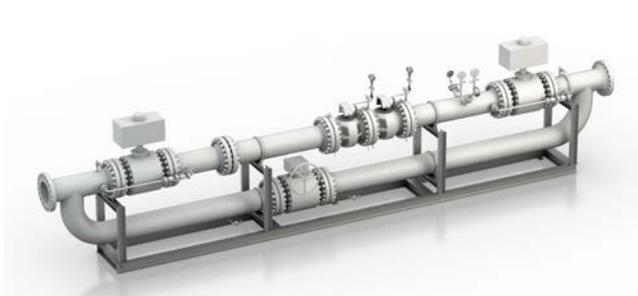


### Supervisory system

The supervisory system provides an overview of all measurement activities. It records the data of the measuring components and transmits them to the main plant control system.

## COMPLETE SOLUTIONS FOR GAS FLOW MEASUREMENT

The FLOWSKID and FLOWRUN complete solutions from SICK offer complete turnkey solutions for gas flow measurement. The flow metering systems can be flexibly configured and provide highly accurate measurement data. At the heart of our solutions is a FLOWSIC600 or FLOWSIC600-XT gas flow meter, which makes these systems very reliable. The metering skids can be expanded to include TDLS gas analyzers, gas chromatographs, etc. and flow computers and thus individually adapted to application requirements.



### FLOWSKID

Reliable complete solution for fiscal measurements.

→ [www.sick.com/flowskid](http://www.sick.com/flowskid)



### GAS FLOW METERS: FLOWSIC600

Gas flow meters for custody transfer and process applications.



→ [www.sick.com/flowsic600](http://www.sick.com/flowsic600)

### GAS FLOW METER: FLOWSIC600-XT

Perfect combination: Can be integrated into all custody transfer applications and connected to all common flow computers.



→ [www.sick.com/flowsic600-xt](http://www.sick.com/flowsic600-xt)

### PROCESS GAS ANALYSIS SYSTEM: TRANSIC EXTRACTIVE

Oxygen measurement for any application



→ [www.sick.com/transic-extractive](http://www.sick.com/transic-extractive)

### EXTRACTIVE GAS ANALYZER: GMS800

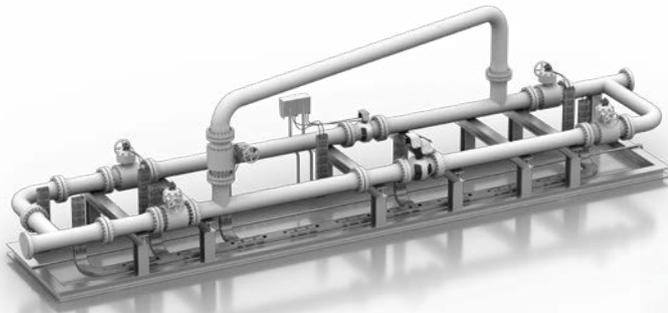
Customized gas analysis for process and emission monitoring.



→ [www.sick.com/gms800](http://www.sick.com/gms800)

**FLOW METERING SYSTEMS:**  
 MINIMAL MEASUREMENT UNCERTAINTY.  
 PRECISE MEASUREMENT.  
 INDIVIDUAL EXPANSION POSSIBLE.

→ [www.sick.com/flow-metering-systeme](http://www.sick.com/flow-metering-systeme)



**FLOWRUN**

Modular solution for fiscal measurements.

→ [www.sick.com/flowrun](http://www.sick.com/flowrun)

**SUPERVISORY SYSTEM:**

Customized control unit.



→ [www.sick.com/flowskid](http://www.sick.com/flowskid)

**DIGITAL FLOW SOLUTION: FLOW-X**

The optimal flow computer for gas measurements using ultrasonic gas flow meters.



→ [www.sick.com/flow-x](http://www.sick.com/flow-x)

**SHELTER SOLUTIONS:**

Space and protection for measurement and analysis technology.



→ [www.sick.com/sheltersolutions](http://www.sick.com/sheltersolutions)



SICK has many years of experience in all areas of gas flow measurement. For gas measurement applications, the system supplier provides you with numerous complete solutions tailored precisely to the respective requirements. From the concept to the analyzer to the gas flow meter: SICK offers you everything from a single source all over the world.

Special information "Complete solutions for CO<sub>2</sub> flow measurement":

→ [www.sick.com/8026625](http://www.sick.com/8026625)

## MODULARITY FOR OPTIMAL SYSTEMS

SICK takes a solution-oriented 360° approach to provide customers with gas measurement solutions tailored to their individual requirements. Our customers benefit from detailed personal consultation and flexible service throughout the entire project – from project planning to lifetime maintenance. One-stop shopping means improved schedules, lower costs and reduced risk.



## WORKING WITH SICK IN A DIGITAL WORLD

Make your digital business environment comfortable

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- Online product catalog
- Application Solver
- Online configurators and selectors

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- Clear product information
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- Document overview
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- Digital Service Catalog → [cloud.sick.com](http://cloud.sick.com)
- SICK AppPool → [apppool.cloud.sick.com](http://apppool.cloud.sick.com)



## SERVICES FOR MACHINES AND SYSTEMS: SICK LifeTime Services

The sophisticated and versatile SICK LifeTime Services perfectly complement the comprehensive SICK product range. Services range from product-independent consulting to traditional product services.



**Consulting and design**  
Secure and professional



**Product and system support**  
Reliable, fast, and on-site



**Verification and optimization**  
Safe and regularly tested



**Upgrade and retrofitting**  
Simple, 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 10,400 employees and over 50 subsidiaries and equity investments as well as numerous agencies worldwide, SICK is always close to its 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.

SICK has extensive experience in various industries and understands their processes and requirements. With intelligent sensors, SICK delivers exactly what the 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 SICK a reliable supplier and development partner.

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

**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](http://www.sick.com)