



# WASTE AND RECYCLING

SENSOR SOLUTIONS FOR WASTE-TO-ENERGY PLANTS

**SICK**  
Sensor Intelligence.

## TASKS IN THE WASTE AND RECYCLING INDUSTRY

The objective of the recycling economy is limiting the dumping of waste in landfills to a minimum as well as a strong push for recycling. In this context, the sorting and recycling of waste as well as the recovery of energy from waste are growing in importance. SICK offers ideal automation and safety solutions for the collection, sorting and recycling of waste. Emissions are also subject to strict requirements. For instance, these include the Industrial Emissions Directive (IED) 2010/75 / EU for waste incineration plants and the newly-revised BREF for waste incineration. Analyzer systems from SICK are used for incineration optimization, flue gas purification and the continuous monitoring of emissions, to name a few examples. SICK offers complete measurement technology and data evaluation from a single source.



Read more about sensor solutions for the waste and recycling industry:  
[→ www.sick.com/waste\\_and\\_recycling](https://www.sick.com/waste_and_recycling)



### Emission monitoring

The regulatory requirements for emission monitoring and reporting are becoming more stringent in nearly every country in the world. SICK analyzers and system solutions monitor and check emission limit values, contaminant emissions and the release of other substances into the environment.



### Flue gas treatment

Scrubbers, catalytic reactors and particulate filters all remove gaseous pollutants from the flue gas. Process gas analyzers provide real-time measurement to optimize removal efficiency. This leads to significant savings of material and to less maintenance for plant operators.



### Plant safety

Gas analyzers, dust monitors and level sensors ensure plant operation and safety. They monitor e.g. biomass bunker. SICK sensors monitor electrostatic precipitators, bag filters and control the stock of necessary reagents.



### Service

Competent consulting, qualified planning support, detailed project planning and engineering, installation and start-up – SICK provides all of these services by its own personnel. SICK also provides service support of equipment.

## FROM A SINGLE DEVICE TO A COMPLETE ANALYSIS SYSTEM

SICK's capabilities do not end with the sale of a single product. We employ an extensive team of custom system planning and project engineers as well as detail engineers with expertise in electrical and mechanical engineering. SICK's

system engineers plan and design tailor-made solutions including the complete range of peripheral equipment such as walk-in shelters, PLC connections, calibration gas distribution and data handling and evaluation. All solutions are

designed and built in accordance with recognized international standards. An experienced project manager follows the project from initial order through to site acceptance test and hand over to local field service specialists.

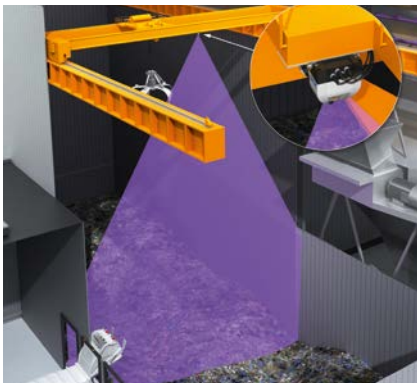
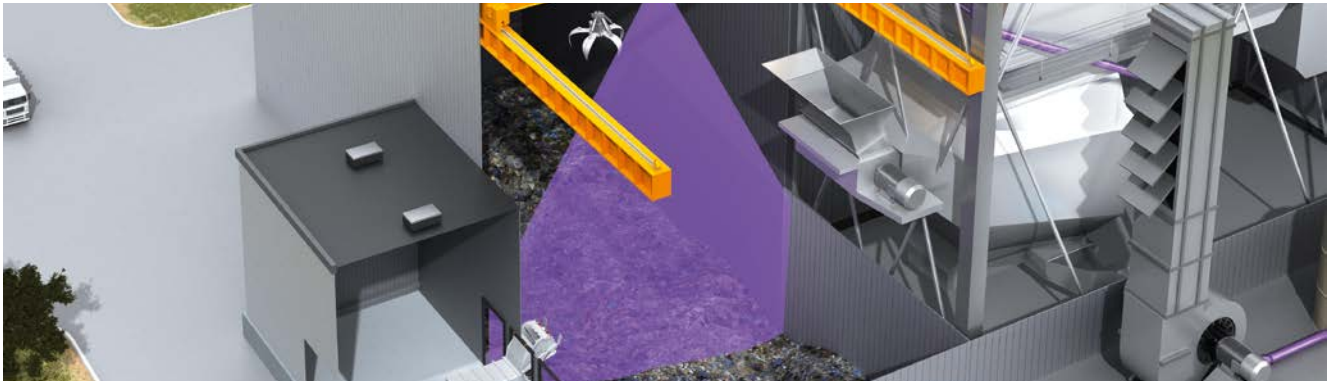


Analyzers and measurement systems supply monitoring and control-relevant information and protect people and systems. When optimally integrated and maintained, these components and sys-

tems guarantee safe processes, constant product quality and protect people and the environment. From the outset and over many years, SICK Life-Time Services provide suitable services

for all aspects of your measurement systems and plants: from planning and conception to commissioning and ongoing operations, all the way to conversions and upgrades.

## WASTE COLLECTION AND WASTE BUNKERS



### Level measurement and crane operation in waste bunkers

The LMS511 2D LiDAR sensor quickly detects changes to peaks in bulk materials. This makes it possible to measure the heap much more accurately, improving the working procedure and performance of the crane system.

- LMS5xx 2D LiDAR sensor



→ [www.sick.com/LMS5xx](http://www.sick.com/LMS5xx)



### Industrial crane positioning

Two DL100 Pro long range distance sensors are installed per crane. The sensors ensure exact positioning of the crane and crane trolley, and prevent them from colliding with the walls of the waste bunker. Their rugged construction, in connection with laser measurement, guarantees high availability with minimum maintenance required. By installing two parallel sensors it is also possible to monitor the synchronization control of the industrial crane.

- Dx100 long range distance sensor



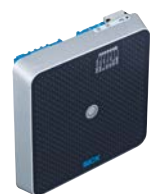
→ [www.sick.com/Dx100](http://www.sick.com/Dx100)



### Identification of garbage trucks at bunker gates

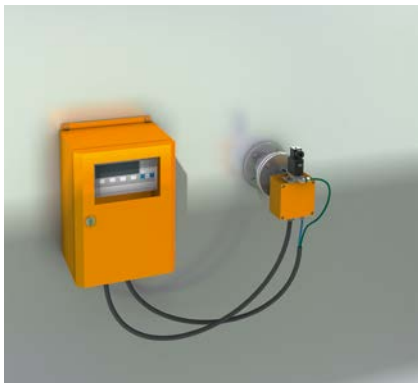
The RFU63x RFID read/write device identifies arriving garbage trucks contact-free. The fees for disposal can be billed and the respective gates at the waste bunker automatically open when identification is complete. The RFID technology of the device is suited for use in waste and recycling systems since the radio-based identification system is not impaired even in dirty environments and works without mechanical and optical components. This ensures the RFU63x has a long service life.

- RFU63x RFID read/write device



→ [www.sick.com/RFU63x](http://www.sick.com/RFU63x)

# INCINERATION OPTIMIZATION AND EXHAUST GAS PURIFICATION



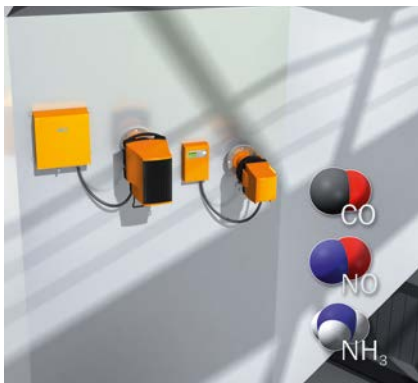
## Monitoring incineration efficiency (O<sub>2</sub>)

The ZIRKOR200 in-situ gas analyzer is used to measure O<sub>2</sub>. It quickly, reliably, and continuously measures the oxygen concentration during incineration. This allows optimal regulation of oxygenation from primary and secondary air, achieving permanent monitoring for the purposes of combustion optimization.

- ZIRKOR200 in-situ gas analyzer



→ [www.sick.com/ZIRKOR200](http://www.sick.com/ZIRKOR200)



## Operation of a SNCR or SCR denitrification system

For gas purification through selective non-catalytic reduction, ammonia or an aqueous urea solution is directly injected behind the combustion chamber at a temperature of 900 to 1100 °C. This causes the nitrogen oxides to react with the ammonium compounds and turn into nitrogen and water. This reduces NO<sub>x</sub> emissions. At the combustion chamber outlet, the GM32 continuously measures NO, and the GM700 measures NH<sub>3</sub> slip. At low NO and CO concentrations, the MCS200HW can also be used for this process application.

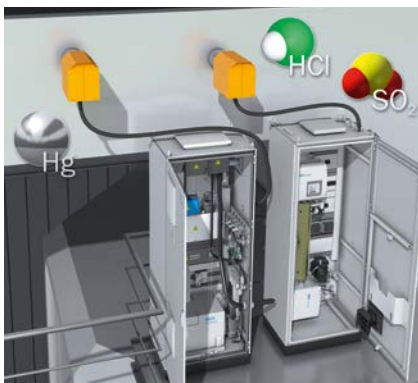
- GM32 and GM700 in-situ gas analyzers
- MCS200HW CEMS solution



→ [www.sick.com/GM32](http://www.sick.com/GM32)

→ [www.sick.com/GM700](http://www.sick.com/GM700)

→ [www.sick.com/MCS200HW](http://www.sick.com/MCS200HW)



## Process measurement at flue gas scrubber inlets

In the flue gas scrubber, among others, HCl and SO<sub>2</sub> are reduced with reagents. Activated carbon is added for mercury removal. The MCS300P HW simultaneously measures the SO<sub>2</sub>, HCl, H<sub>2</sub>O, and optionally the O<sub>2</sub>. Using the Zeeman measurement technique, the MERCEM300Z measures the mercury without cross sensitivity, even at high SO<sub>2</sub> concentrations, stable and with low-maintenance requirements. Countermeasures can be taken in a short time to reduce Hg peaks (>3,000 µg/m<sup>3</sup>). These measurements considerably contribute to lower the operating costs of the reagents.

- MERCEM300Z extractive gas analyzer
- MCS300P HW process solution



→ [www.sick.com/MERCEM300Z](http://www.sick.com/MERCEM300Z)

→ [www.sick.com/MCS300P\\_HW](http://www.sick.com/MCS300P_HW)

# CONTINUOUS EMISSION MONITORING



## Monitoring of dust emissions

Dust can be measured extractively in the case of moist exhaust gases, or continuously in-situ under dry stack conditions. SICK has a fitting solution for both applications. For the standard application with dry flue gas (above the acid dew point), a DUSTHUNTER S (scattered light measurement principle) is best suited. In the case of wet flue gas (under the acid dew point), the FWE200DH is used. Here, the gas to be measured is removed as a bypass from the stack, heated to above the acid dew point, and continuously measured.



- DUSTHUNTER SB100, DUSTHUNTER SP100 and FWE200DH scattered light dust measuring devices
- [www.sick.com/DUSTHUNTER\\_SB100](http://www.sick.com/DUSTHUNTER_SB100)  
→ [www.sick.com/DUSTHUNTER\\_SP100](http://www.sick.com/DUSTHUNTER_SP100)  
→ [www.sick.com/FWE200H](http://www.sick.com/FWE200H)

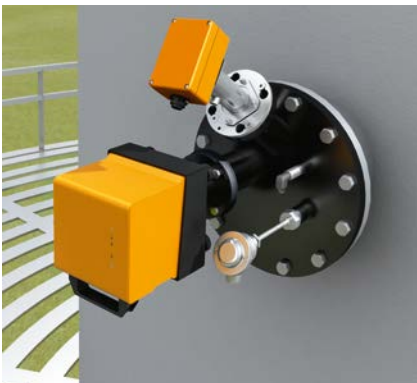


## Gas flow measurement in the stack

The FLOWSIC100 volume flow measuring device continuously measures gas flow in the stack with no contact needed. The device requires minimal maintenance due to the ultrasonic technology used. Ultrasonic measurements are particularly reliable because the volume flow is measured over the entire stack cross-section. High quality of measurement is key, as pollutant concentrations are given in relation to the volume of flue gas measured and are indicated in kg/h. This is a legal requirement under the applicable EU standard (IED 2010/75/EC) which all Member States of the EU must implement.



- FLOWSIC100 volume flow measuring device
- [www.sick.com/FLOWSIC100](http://www.sick.com/FLOWSIC100)



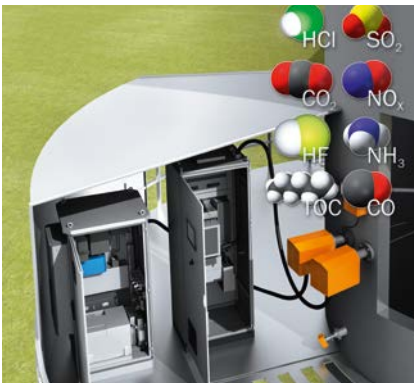
## Space-saving solution for measuring dust, flow, pressure, and temperature

With the CP100 combined probe, dust, flow, pressure, and temperature can be measured in the stack with minimal usage of space. This solution involves installing a DUSTHUNTER SP100 (scattered light method), a FLOWSIC100 PR (ultrasonic measuring principle as a probe), and a PT100 temperature sensor and pressure sensor on a combination flange (DN250 PN6). This renders additional couplings or flanges unnecessary. This space-saving solution especially proves its worth where redundant design of the measuring devices is required.



- Combiprobe CP100 CEMS solution
- [www.sick.com/Combiprobe\\_CP100](http://www.sick.com/Combiprobe_CP100)

## CONTINUOUS EMISSION MONITORING



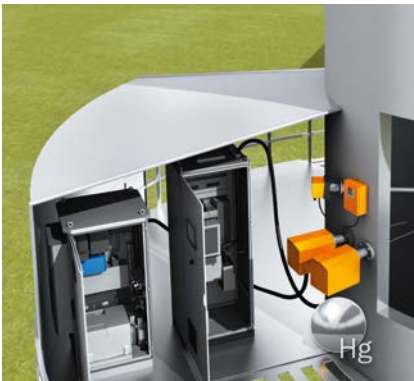
### Continuous emissions monitoring of all pollutant components in exhaust gases

The MCS100FT can continuously measure the following components using one single extractive heated gas sample: HCl, CO, NO<sub>x</sub> as the sum of NO and NO<sub>2</sub>, SO<sub>2</sub>, NH<sub>3</sub>, O<sub>2</sub>, H<sub>2</sub>O, CO<sub>2</sub>, Cges, and HF. For normalization, the pressure and temperature parameters are also measured. The QAL3 test can be carried out without test gas with the certified, integrated filter.

- MCS100FT CEMS solutions



→ [www.sick.com/MCS100FT](http://www.sick.com/MCS100FT)



### Monitoring mercury in emissions

The MERCEM300Z extractive gas analyzer has one of the smallest certified measuring range of all measuring systems suitability tested in accordance with EN 15267-3, with a range from 0 to 10 µg/m<sup>3</sup> total mercury content. It is also suitable for continuously monitoring the annual threshold of 10 µg/m<sup>3</sup>. The greatest advantage of the MERCEM300Z is that it transforms oxidized mercury into elemental mercury without the addition of chemicals or converters, which significantly reduces the amount of maintenance required in comparison to all other measuring systems.

- MERCEM300Z extractive gas analyzer



→ [www.sick.com/MERCEM300Z](http://www.sick.com/MERCEM300Z)



### Emissions calculator

The MEAC emissions calculator is ideal for recording, saving, normalizing, analyzing, displaying, and forwarding a continuous flow of data. It is available in several different variants, which perform reporting in accordance with the applicable local legislation. The MEAC is TÜV-tested and certified, and provides data analysis that takes into account QAL3 data on drift control, amongst other elements. SICK also provides solutions involving the MEAC for redundant operation. For digital data transfer to the control system, all standard data transmission protocols are available.

- MEAC data acquisition system



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

## 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)