

# MCS100FT FTIR Analysis System

Continuous monitoring of gaseous emissions  
in combustion processes



# MCS100FT

## Everything under control with advanced, proven technology

### AREAS OF APPLICATION

- Waste incineration plants and multifuel furnace plants, for example cement works
- Power stations, also with additional fuels
- Plants with chemical combustion
- Aluminium production, steel and iron production
- Smelting plants

#### COMPLETE MONITORING

- An analysis system for continuous emission monitoring
- HF, HCl, SO<sub>2</sub>, NO, NO<sub>2</sub>, NO<sub>x</sub>, CO, NH<sub>3</sub>, N<sub>2</sub>O, CH<sub>4</sub> and additionally CO<sub>2</sub>, H<sub>2</sub>O, O<sub>2</sub> and VOC
- Designed for the following directives and requirements: 2001/80/EC, 2000/76/EC, TA Luft, MCERT, US EPA, GOST

#### STURDY ANALYSIS

- More than 30 years of experience in spectroscopic emission measurement and more than 2000 installed systems
- Long term stable measured values thanks to automatic spectrum adjustment
- Low maintenance effort, intervals of typically 3 ... 6 months

#### CONTROL OF HF LIMIT VALUES

- True monitoring of strict HF limit values:
  - 0 ... 3.0 mg/m<sup>3</sup>
  - Specially optimized analysis for HF, from sampling to the sample gas cell
- Short reaction time of approx. 200 s
- Smallest HF measuring range tested for suitability for multi-component systems

#### EN 15267-3 (VDI 4203-2)

- Complies with minimum requirements of Directive EN 15267-3 (QAL1)
- Overall system, from sampling to data evaluation, tested for suitability
  - With test gas feeding before sampling filter
- Complies with EN 14181 requirements for QAL2 and QAL3
- Qualified, experienced support for official acceptance

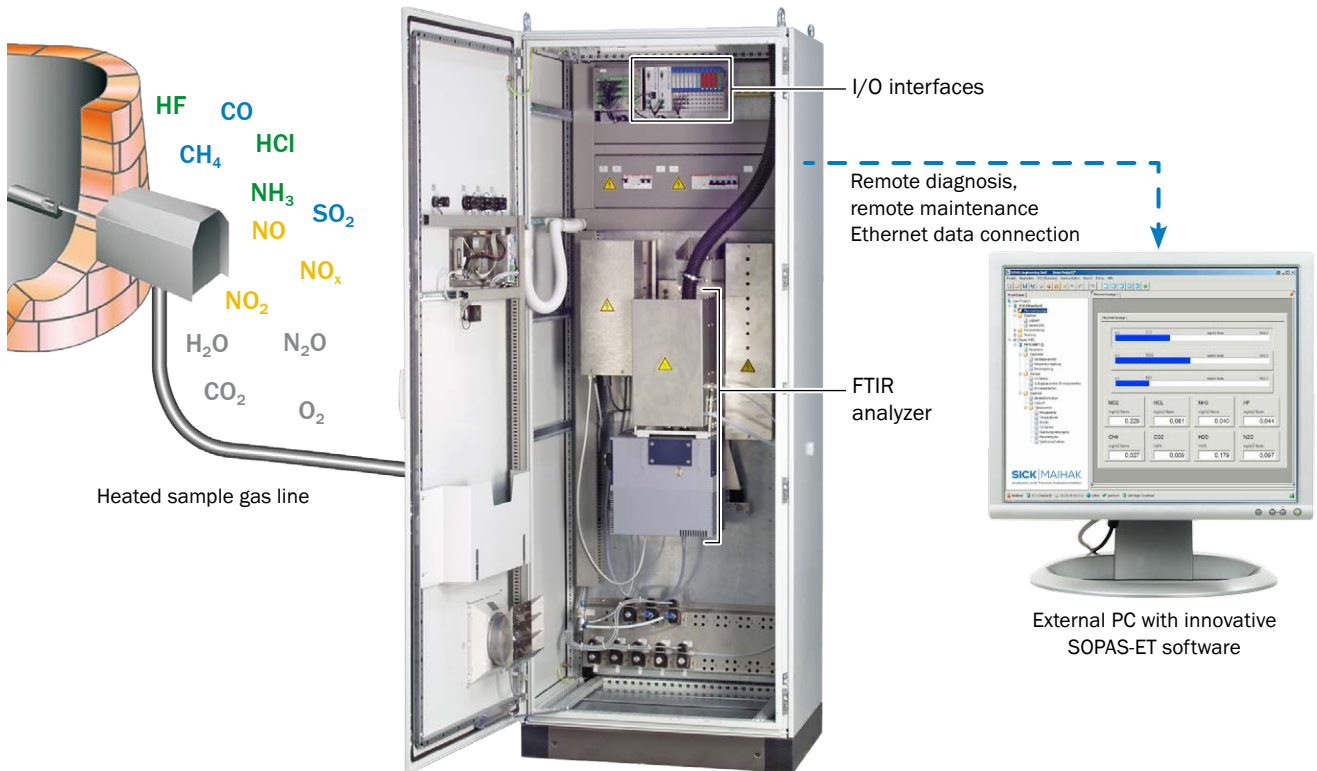
### PERFORMANCE FEATURES

- Extractive multi-component analysis system with up to 13 measuring components
- Standardized system technology
  - Extractive high-temperature measuring technology
  - Representative gas sampling
  - Also for corrosive, aggressive media
  - Ejector principle with high gas flow; no memory effects, short reaction time ( $t_{90}$ )
  - High temperature sample gas cell made of non-corrosive material
  - Automatic zero and calibration gas cycles, back flushing and filter cleaning
- Two measuring points can be directly connected
- Usage of state-of-the-art FTIR technology (Cube Corner interferometer): Precise and reliable measuring results
- Comfortable touchscreen operating unit
- Innovative SOPAS-ET software for
  - direct access via PC
  - remote control and remote maintenance at the push of a button
- Easy to use Logbook function
  - All important information available at all times
- Communication (e.g. PROFIBUS, Modbus, TCP/IP, OPC)
- Tailored solutions for the respective customer requirements



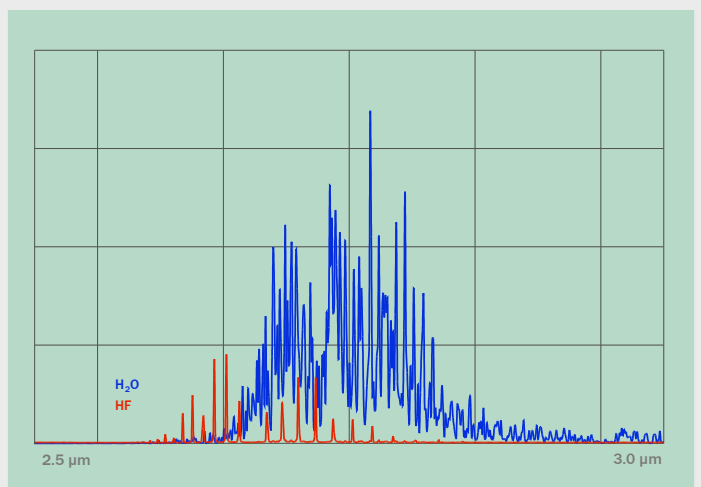
Touchscreen operating unit on-board

## SYSTEM COMPONENTS



## FTIR MEASURING PRINCIPLE

Infrared spectroscopy according to the Fourier Transformation (FTIR) principle ensures high measuring precision – especially in combination with the proven sample gas cell. Exact gas concentrations from selected gas components are determined from very fast spectrum measurement using chemometric models. The Cube Corner technique used by the interferometer delivers very reliable and stable measuring results. “Rocksolid spectrometer” with high spectral resolution and high measuring speed, unaffected by vibration and temperature and permanently adjusted.



Technical Data	MCS100FT		
<b>Measuring Parameters</b>			
Available measuring ranges	min.	max.	Unit
Hydrogen fluoride HF	0 ... 3	0 ... 10	mg/Nm <sup>3</sup> , dry
Hydrogen chloride HCl	0 ... 15	0 ... 150	mg/Nm <sup>3</sup> , dry
Ammonia NH <sub>3</sub>	0 ... 10	0 ... 50	mg/Nm <sup>3</sup> , dry
Carbon monoxide CO	0 ... 75	0 ... 1500	mg/Nm <sup>3</sup> , dry
Sulphur dioxide SO <sub>2</sub>	0 ... 75	0 ... 1500	mg/Nm <sup>3</sup> , dry
Nitrogen oxides NO <sub>x</sub>	0 ... 200	0 ... 2000	mg/Nm <sup>3</sup> , dry
Nitrogen monoxide NO	0 ... 200	0 ... 2000	mg/Nm <sup>3</sup> , dry
Nitrogen dioxide NO <sub>2</sub>	0 ... 100	0 ... 500	mg/Nm <sup>3</sup> , dry
Nitrous oxide N <sub>2</sub> O	0 ... 50	0 ... 500	mg/Nm <sup>3</sup> , dry
Methane CH <sub>4</sub>	0 ... 50	0 ... 150	mg/Nm <sup>3</sup> , dry
Carbon dioxide CO <sub>2</sub>	0 ... 25	-	vol.%
Water H <sub>2</sub> O	0 ... 40	-	vol.%
Oxygen O <sub>2</sub>	0 ... 21	-	vol.%
VOC (with FID) C <sub>n</sub> H <sub>m</sub>	0 ... 15	0 ... 150	mg/Nm <sup>3</sup> , dry
Response time (t <sub>90</sub> )	< 200 s for standard sample gas lines up to max. 35 m		
<b>Measuring Conditions</b>			
<b>Sampling Point (Stack)</b>			
Sample gas temperature	220 °C maximum In the process, 1300 °C maximum		
Sample gas pressure	900 ... 1100 hPa (atmospheric)		
<b>Ambient Conditions</b>			
Ambient temperature	+5 ... +35 °C, up to +50 °C with cooling unit (optional)		
<b>Approvals</b>			
Compliances	<ul style="list-style-type: none"> <li>• TÜV-tested for equipment subject to authorization: 2001/80/EC, 2000/76/EC</li> <li>• TA Luft, GOST, MCERTS, U.S. EPA, EN 14181, EN 15267-3</li> </ul>		
Degree of protection	<ul style="list-style-type: none"> <li>• IP 43</li> <li>• IP 54 optional</li> </ul>		
<b>Inputs, Outputs, Interfaces</b>			
Analog output module <sup>1)</sup>	2 outputs: 0/4 ... 22 mA, electrically isolated; 500 Ω max. load		
Analog input module <sup>1)</sup>	2 inputs: 0/4 ... 22 mA, electrically isolated; 100 Ω input resistance		
Digital input module <sup>1)</sup>	4 inputs: Open contact; potential-free		
Digital outputs <sup>1)</sup>	Power relay, electrically isolated or digital output module of I/O modules		
Interfaces	<ul style="list-style-type: none"> <li>• RS232 (9 poles)</li> <li>• RS422/485</li> <li>• Ethernet</li> </ul>		
Bus protocol	<ul style="list-style-type: none"> <li>• TCP/IP via Ethernet</li> <li>• PROFIBUS via RS422/485</li> <li>• Modbus via RS422/485</li> <li>• OPC</li> </ul>		
<b>General</b>			
System components	<ul style="list-style-type: none"> <li>• System cabinet with FTIR analyzer, touchscreen operating unit and process interfaces</li> <li>• Sample gas sampling system</li> <li>• Heated sample gas line</li> </ul>		
Operation	Via SCU operating control unit or SOPAS ET software		
Control function	Integrated check cycle for zero point adjustment		

<sup>1)</sup> Configuration is project-dependent