G8100

Black Carbon Monitoring system

Engineered with revolutionary in situ-technology

Green Instruments

Innovative in situ-technology
– for maritime applications

Introducing state-of-the-art exhaust emissions monitoring with a new advanced black carbon analyzer. Engineered with revolutionary in situ-technology that delivers accurate, continuous measurement of black carbon concentrations in real time.

This system changes the current methods of black carbon monitoring by providing direct measurements with logging and reporting capabilities for further data treatment. The G8100 relies on technology that has been widely tested and validated in maritime operations, making it the first monitoring system designed explicitly for maritime applications. This ensures reliable performance at sea while delivering continuous data that supports compliance, efficiency, and helps minimize environmental footprint.

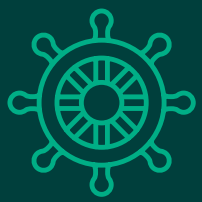
Black carbon is the second largest contributor to the climate impact of shipping, representing 21% of total shipping CO2-eq over a 20-year period. IMO and EU are expected to adopt requirements to reduce soot and black carbon, and regulation on the subject has already entered into force in the Arctic regions.

With the G8100 Black Carbon Monitoring System on board, operators can avoid costly downtime or penalties and stay ahead of regulatory deadlines.

- **Stay on the forefront of future GHG regulation**
- **Document your black carbon emission profile with real data**
- **Detect poor combustion efficiency**

Why use a black carbon Monitoring System?

Measuring and reporting black carbon supports compliance and transparency in delicate regions such as Arctic waters and densely populated coastal areas. By monitoring black carbon trends, operators can also detect early signs of combustion inefficiency, helping to protect critical exhaust equipment including exhaust gas boilers and carbon-capture systems from degradation caused by excessive soot exposure.

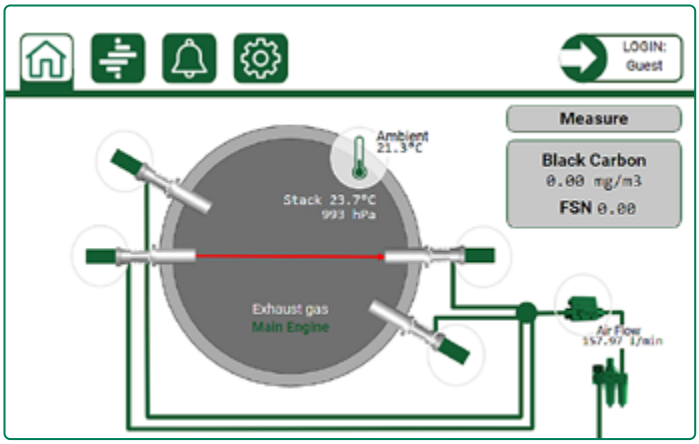


How does the black carbon monitoring system work?

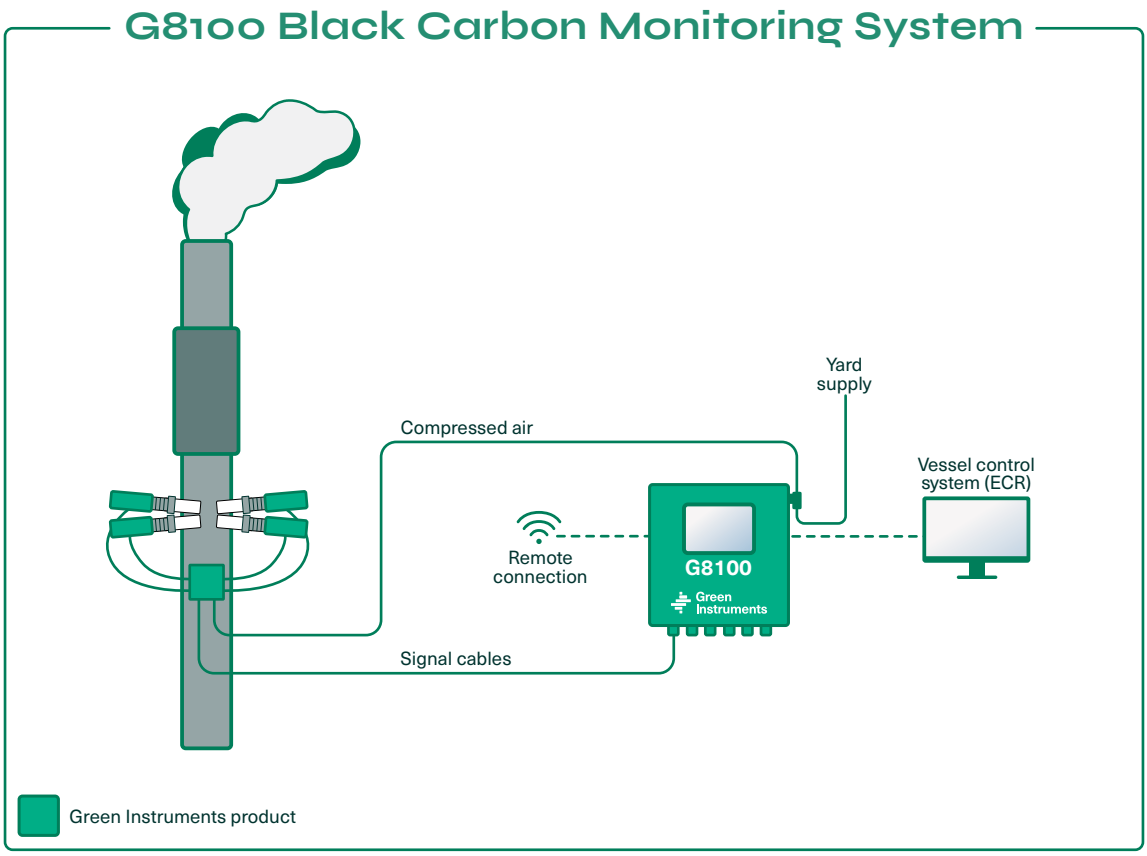
The system detects black carbon with in situ-EMS (extinction minus scattering) technology, that provides highly accurate data directly within the exhaust stream, eliminating delays, improving reliability, and ensuring truly representative measurements during all operational conditions. The instruments can calculate mass concentration using the black carbon absorption properties and automatically convert the data to the recognized standard FSN (filter smoke number). Data obtained from stack monitoring is displayed on the system's HMI where operators can view the system's status as well as black carbon values measured in both mg/m^3 and FSN.

Turning the invisible into insights

– reveal excessive soot exposure



The G8100 Black Carbon Monitoring System home page gives an overview of the system status and live operational status of components such as purge air flow, stack temperature and pressure, and ambient temperature.



The G8100 Black Carbon Monitoring System is designed for purpose.

Specifications G8100

G8100 BLACK CARBON MONITORING SYSTEM

Equipment including	Transmitter module, Receiver modules, Temperature transmitter, Pressure transmitter, Flow transmitter, air filter regulator and oil/particle separator, HMI, PLC.
Power Supply	230 VAC – 50/60 Hz
Power Consumption	See the electrical documentation
Display	7" TFT LCD color display with touch screen
External Communication	Modbus TCP/IP (RJ45) 1 x Analog output (4-20mA) [mg/m3] 1 x Analog output (4-20mA) [FSN] 4 x Digital output (Alarms) Optional Modbus RTU
Electrical connection	See the electrical documentation
Purge air supply	ISO 8573-1 Class 3-3-3 160 L/min. 4-10 bar
Ambient temperature	5°C to 55°C
Humidity	Max 96% RH
Material/Enclosure Class	Painted mild steel RAL 7035, IP54
Dimensions/Weight (Controller Unit)	400 x 400 x 300 mm (H x W x D) Approx. 16 kg
Stack diameter	0,5m – 1m

TRANSMITTER AND RECEIVER MODULES

Material	Aluminum EN-AW 6082	
Weight	Transmitter: 0,65 kg Receivers: 0,6 kg	
Flue gas temperature	Above dewpoint up to 460°C	
Flue gas pressure	-50 to + 50 hPa	
Measuring principle	Extinction and scattering	
Measuring range	Soot Concentration	0-70 mg/m3
	FSN	0-2,5
Resolution	Soot Concentration	**0,01 mg/m3**
	FSN	0,01
*Accuracy	Max. ±3% of sensor range	
Compensations	Compensated for the effects of temperature and pressure in the stack.	
Laser Class	3B	

**Based on testbed data using an FSN reference instrument.*

Impacting the world – one ship at a time!