



ECO PHYSICS CraNOx II

APPLICATION EXAMPLES

- Background monitoring
- Flux measurements
- Long range transport
- Tropospheric research
- Certification and calibration



With CraNOx II, ECO PHYSICS is launching the second generation of its high-end measurement solution in the ppb and ppt range. The new system is smaller and more sophisticated, as it now has the power to calculate the photostatic equilibrium by means of the integrated ozone analyzer. The CraNOx II system is capable of simultaneously measuring NO, NO_x, NO₂ and O₃. Furthermore, it can be expanded to assess NO_y and NH₃ concentrations.

Measurement of:

- NO
- NO₂
- NO_x
- NO_y (Optional)
- NH₃ (Optional)

A Demanding Task for Mankind

The earth's atmosphere protects life on earth. The challenge is to minimize the man-made influence and impact by emissions to avoid any damage to this protecting shell.

Nitrogen Oxides (NO_x) and Particulate Matter (PM)

Nitrogen oxides are significant precursors of ozone and are formed in all combustion processes including engines, power plants or heating appliances. Ammonia (NH₃), a reduced form of a nitrogen oxide, appears as ammonia salt, usually in tiny particles. The assessment of particulate matter and nitrogen oxides is therefore the challenge for instrument manufacturers.

Correct Analysis of NO_x

Our abbreviation for the above title is CraNOx. The first system was launched in the early '90s by ECO PHYSICS. CraNOx has been part of many research programs and delivered reliable and continuous data all over Europe, from Spitsbergen to Croatia as well as in the Asian Pacific. It consisted of two CLDs with highest resolution and big external pumps, a photolytic converter, an ozone instrument and a calibrator, all built into a rack of more than 1.8 meters in height. Now, ECO PHYSICS announces the next generation: the CraNOx II – all included – even the pump – in less than a quarter of the size.

Compact

The main requirement for the new CraNOx II system was a high-performing two channel CLD with pre chambers for compensation of the chemical zero. Timely, the newly developed platform of the Supremeline offered the necessary sensitivity and speed. With its carefully designed housing of four height units and the integrated powerful pump it was the perfect housing for the further components of the CraNOx II system.

Complete

The system would not be complete without an appropriate control software, which handles and manages the different tasks. The software „CraNOx-Control is a Lab-View®-based Windows® application, that measures gases, presents data and performs calibrations.

Customer Friendly

The system starts automatically and quickly reaches measurement mode for continuous and unattended operation. The measured data is continuously stored and displayed on the high-resolution touch-screen. All control functions are easily accessible by means of the interface. Connections for mouse and keyboard as well as LAN and USB add the comfort of a PC. For an enlarged display use the video output for either an additional display or a digital projector. Just concentrate on the data validation and presentation – all other functions are taken over by your CraNOx II system.

- Four freely adaptable measurement ranges
- Remote operation, control and maintenance
- Pre chamber to offset cross sensitivity
- Choice between several types and numbers of converters
- Photolytic converter for NO₂ detection

Measurably better

SPECIFICATIONS

CraNOx II

NO/NO_x detection by CLD:

Measuring ranges	four freely selectable ranges from 1 ppb – 1'000 ppb
Min. detectable concentration *	<0.025 ppb
Noise at zero point (1σ) *	<0.01 ppb

NO₂ conversion by photolytic converter:

Converter volume	270 ml
Light source	metal halide lamp (200 W)
Analysis	automatic correction for photo dissociation rate and ambient ozone concentration

Ozone detection by UV photometer:

Measuring O ₃	1 ppb to 1'000 ppb
Precision	1 ppb
Noise	± 1 ppb

Calibrator:

Principle of operation	mass flow controller
Accuracy (of set point)	± 1 % (flow and concentration)
Modes of operation	man. or automatic zero/span range selectable; converter efficiency check and compensation

General specifications:

Lag time	<3 s
Rise time (0-90 %) *	<1 s
Temperature range	15-35°C
Humidity tolerance	5-95 % rel. h (non-condensing, ambient air and sample gas)

General specifications:

Sample flow rate	2.7 l/min
Input pressure	ambient
Dry air flow rate	140 ml/min
Oxygen use for O ₃ generator	100 ml/min
Interface	USB(3x), HDMI, Bluetooth, RS232 (w/o 9pin connector), LAN, WLAN
Display	8" color, touch screen
Data presentation	online values, graphs, tables
Data storage	> 1-year cont. operation measurement values, calibrations, states of operation
Export data format	ASCII (tables and online values)
Power required	1000 VA (incl. membrane pump and ozone scrubber)
Supply voltage	100–240 V / 50–60 Hz
Dimensions	height: 356 mm (14") / width: 450 mm (19") with molding: 495 mm / depth: 650 mm (25.6")
Weight	75 kg
Delivery includes	CraNOx II system, power cable, FTDI-RS232-USB cable, USB-LAN adapter, HDMI adapter
Standard	CraNOx II: two channels, pre chambers, photolytic-converter, ozone analyzer, calibrator
Options	· CON 765: NO _x gold converter · NO _x -amines, NH ₃ assessment (requires an additional nCLD899 C)

*Depending on filter setting
Connectivity properties are country-specific
ECO PHYSICS reserves the right to change these specifications without notice.

FLOW DIAGRAM

