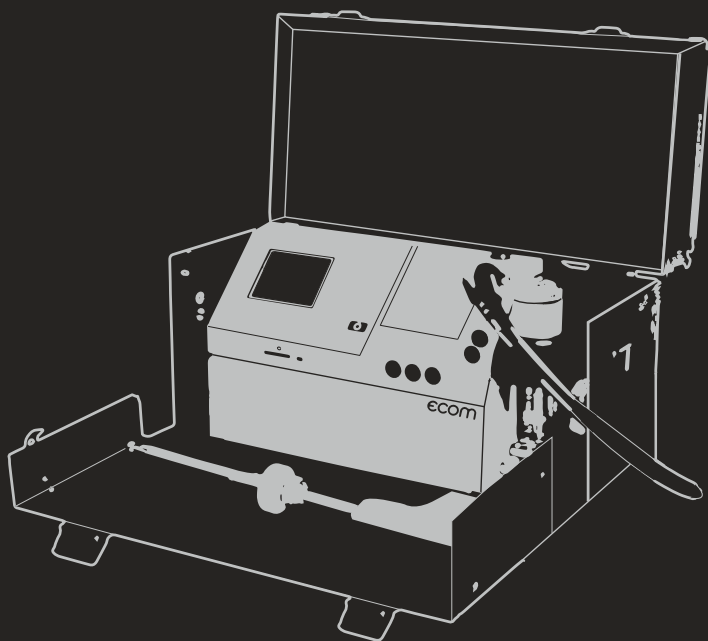


ecom

**INTELLIGENT MESSEN!**  
*MEASURE WITH INTELLIGENCE!*

**ecom<sup>®</sup> EN3**

*Flue Gas Analysis*



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**ecom GMBH**

# ecom PRODUCTS OFFER YOU MANY BENEFITS...



## EXTREM EFFICIENT.

The high output level (up to 2.6 liters/minute) not only enables ecom analyzers to provide a fast reading: It also makes it possible to bridge long distances during sampling, or negative pressure in the application. Manometers also provide readings in record time.



## EXTREM ACCURATE.

The reading accuracy of gas sensors (CO, NO, SO<sub>2</sub>) is determined and adjusted at 5, 20 and 40°C in the climatic test chamber using standardized test gases. High-quality sensors provide a perfect reading for pressure measurements.



## EXTREMELY COMPLETE.

ecom analyzers are sold and designed as an entity (device, probe, probe hose, case). In addition: Printer paper and filter, a solid shoulder strap, PC software and Apps.



## EXTREMELY COOL.

The drier, the better: The gas to be measured is continually cooled to 5°C using a gas cooler. This way, the drying process is controlled. Collected condensate can be easily emptied in some cases this occurs in automatic mode.



## EXTREMELY FAR-REACHING.

ecom analyzers communicate wirelessly: Via Bluetooth as well as radio (highest range with the most stable connection). This way instruments can be remote-controlled via e.g. smartphones or ecom remote control unit.



## EXTREMELY ROBUST.

Hard on the outside - even harder on the inside! Almost all ecom measuring devices are housed in an ultra-light aluminium casing. Its durability pays off in its daily use - especially in rougher conditions.



## EXTREMELY SAFE.

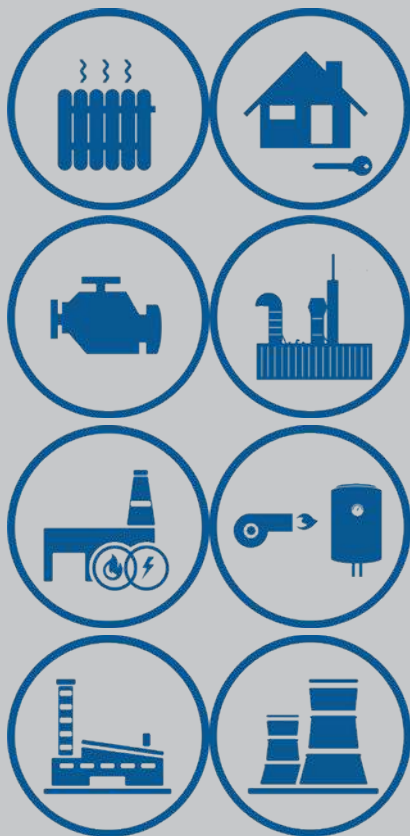
The condensation control protects from moisture. An automatic CO shut-off (flushing of the CO sensor) without interruption of the measuring process ensures the long lifespan of the CO sensor. Each ecom instrument has its own „safety equipment.“



## EXTREMELY LOSS-FREE.

To measure the full concentration of extremely water soluble gases an inner PTFE coated hose or a heated sampling system are available. This guarantees the fast and condensate free flue gas transport.

## ...BY EVERY APPLICATION.



### HEATING

Combustion gas analysers, pressure meters, leak detectors and more for the HVAC handicraft, chimney-sweep and heating after-sales service. For control and adjustment works in order to reduce emissions and to optimize the efficiency of heating plants.

### ENGINES

For control and adjustment works among all by commissioning of gas engines, thermal power blocks, etc. as well for the perfect measurement of water-soluble gases like nitrogen oxide – especially recommended for the NO<sub>x</sub> measurement.

### COMBUSTION

Combustion gas analysers, pressure meters, leak detectors and more for control and adjustment works at burners and large-scale firing plants in order to reduce emissions, to arrange for a more efficient combustion process and to optimize the thermal process.

### INDUSTRY

Combustion gas analysers, pressure meters, leak detectors and more for the perfect preparation of water-soluble gases (i.a. NO<sub>2</sub> and SO<sub>2</sub>) by industrial applications (like e.g. aluminium process, coke oven plants, cement processing, power plants, refineries, waste incineration...).

## Overview of technical data

√ Standard • Option x not possible

Flue gas analyser model			EN3/-R	EN3-F	
Gas Components	Resolution	Accuracy	max. 4	max. 6	
<b>O<sub>2</sub></b>	O <sub>2</sub> (0 - 21 vol.%) - electrochemical	0,1 vol.%	± 0,3 vol.%	√	√
<b>CO</b>	CO (H <sub>2</sub> -komp. 0 - 10.000 ppm) - electrochemical	1 ppm	± 20 ppm or 5 % of reading**	√	√
	CO (n. H <sub>2</sub> -komp. 0 - 20.000 ppm) - electrochemical	1 ppm	± 40 ppm or 10 % of reading**	•	•
	CO% (0 - 63.000 ppm) - electrochemical	5 ppm	± 100 ppm or 10 % of reading**	•	•
<b>CO<sub>2</sub></b>	CO <sub>2</sub> (0 - 20 vol.%) - NDIR* sensor	0,1 vol.%	± 0,5 vol.% or 5 % of reading**	•	•
	CO <sub>2</sub> (0 - 100 vol.%) - NDIR* sensor	0,1 vol.%	up to ± 5 % of measur range endvalue	•	•
<b>NO<sub>x</sub></b>	NO (0 - 5.000 ppm) - electrochemical	1 ppm	± 5 ppm or 5 % of reading**	•	•
	NO <sub>Low</sub> (0 - 500 ppm) - electrochemical	0,1 ppm	± 2 ppm or 5 % of reading**	•	•
	NO <sub>2</sub> (0 - 1.000 ppm) - electrochemical	1 ppm	± 5 ppm or 5 % of reading**	•	•
	NO <sub>2Low</sub> (0 - 1.000 ppm) - electrochemical	0,1 ppm	± 5 ppm or 5 % of reading**	•	•
	NO <sub>x</sub> - measuring - electrochemical			via NO/NO <sub>2</sub>	via NO/NO <sub>2</sub>
<b>SO<sub>2</sub></b>	SO <sub>2</sub> (0 - 5.000 ppm) - electrochemical	1 ppm	± 10 ppm or 5 % of reading**	•	•
<b>H<sub>2</sub></b>	H <sub>2</sub> (0 - 2.000 ppm) - electrochemical	1 ppm	± 10 ppm or 5 % of reading**	•	•
	H <sub>2</sub> (0 - 20.000 ppm) - electrochemical	1 ppm	± 100 ppm or 5 % of reading**	•	•
<b>H<sub>2</sub>S</b>	H <sub>2</sub> S (0 - 1.000 ppm) - electrochemical	1 ppm	± 10 ppm or 5 % of reading**	•	•
	H <sub>2</sub> S (0 - 5.000 ppm) - electrochemical	1 ppm	± 50 ppm or 5 % of reading**	•	•
<b>C<sub>x</sub>H<sub>y</sub></b>	C <sub>x</sub> H <sub>y</sub> (0 - 4 vol.%) - catalytic	0,01 vol.%		•	•
	CH <sub>4</sub> (0 - 5 vol.%) - NDIR* sensor	0,01 vol.%	± 0,2 vol.% or 5 % of reading**	•	•
	CH <sub>4</sub> (0 - 100 vol.%) - NDIR* sensor	0,1 vol.%	up to ± 5 % measur range endvalue	•	•
<b>Additional Measurements   Display Options</b>		<b>Resolution</b>	<b>Accuracy</b>		
<b>T-Gas</b>	0 - 500 °C	1 °C	± 2 °C or 1,5 % of the reading**	√	√
	0 - 1.100 °C	1 °C	± 2 °C or 1,5 % of the reading**	•	•
<b>T-Air</b>	0 - 99 °C	1 °C	± 1 °C	√	√
<b>Pressure   ΔP</b>	± 100 hPa	0,01 hPa	± 0,5 hPa or 1 % of the reading**	√	√
<b>Calculated values</b>					
	CO <sub>2</sub> - 0 - CO <sub>2</sub> max			√	√
	Combustion efficiency (ETA)			√	√
	Excess air (Lambda) - > 1			√	√
	Losses qA - 0 - 100 %			√	√
	Dew point - x °C			√	√
	mg/m <sup>3</sup> - x mg/m <sup>3</sup>			√	√
	mg/KWh - x mg/KWh			√	√
	O <sub>2</sub> - reference- x % O <sub>2</sub>			√	√
<b>Gas processing</b>					
	Electronic condensation monitoring			√	√
	Automatic condensation evacuation			•	√
	Electronic gas cooler			•	√
<b>Operation safety</b>					
	Temperature trend indication for core stream search			√	√
	CO switch-off			√	√
	Fresh air purge by CO exceeding			√	√
	Fresh air purge after operation			√	√
	Flow meter for pump performance control			√	√
<b>Sampling system</b>					
	Unheated probe, type SCD			•	x
	Unheated probe, type SU			x	•
	Heated probe, type SB			•	•
<b>Gas transportation (tubing)</b>					
	Multi-chamber silicone tubing			√	√
	NO <sub>x</sub> / SO <sub>2</sub> special tubing with PTFE inner coating			•	•
<b>Printer</b>					
	Thermal quick-printer, integral			√	√
<b>Data processing</b>					
	Serial interface for data transfer			√	√
	USB interface for data transfer			√	√
	Wireless data interface (e.g. for connection to a smartphone or tablet)			√	√
	Data recording on multimedia card			•	•
	Reception possibility for diagnosis data from ecom-AK			√	√
<b>Remote control</b>					
	via backlit keypad			√	√
	via smartphone/tablet (free iOS + Android app)			√	√
<b>Transport</b>					
	Aluminum-framed transport case			√	x
	Under case			•	x
	Hardtop transport case			x	√

\* NDIR = non dispersive infrared technology

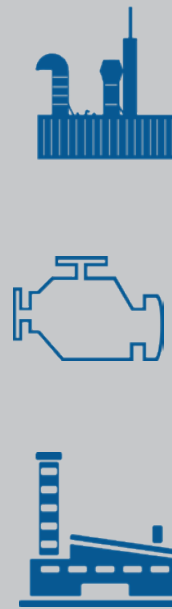
\*\* the higher value prevails

# ecom® EN3

## FLUE GAS ANALYSIS



Testing according to DIN EN 50379-2 and 1st. BlmSchV.



### ecom-EN3

COMPACT FLUE GAS ANALYZER

- O<sub>2</sub> / CO (H<sub>2</sub>-comp.) Longlife sensors
- Up to 4 sensors possible
- CO sensor overload protection without measurement interruption
- Condensate trap with electronic condensation monitoring
- Brushless high-performance gas pump
- With sampling probe (220 mm, Ø 8 mm), thermocouple, fixation cone and 3-chamber sampling tubing (3 m)
- T-Room sensor with cable, fixation cone and fixation magnet
- Integrated thermal fast printer
- Fitted in aluminum-framed transport case with comfort carrying strap
- Complete in ultralight aluminum housing
- TFT color display and backlit keypad
- Powerful Lithium-Ion battery
- Mains charger with protective pouch (battery charging also possible by closed case)
- LED flow display
- Calibration certificate
- Wireless data interface (e.g. for connection to a smartphone or tablet)

### ecom-EN3-R

WITH INTEGRAL SOOT MEASUREMENT

- Heatable soot probe (250 mm, Ø 10 mm) with thermocouple, fixation cone and 3-chamber sampling tubing 3 m

#### ADDITIONAL OPTIONS

- NO sensor
- CO% sensor
- SO<sub>2</sub> sensor
- H<sub>2</sub> sensor
- Gas flow measurement
- NO<sub>x</sub> tubing
- Mini gas cooler

#### Measureable Gases

O <sub>2</sub>	CO	NO	CO%	NO <sub>2</sub>
H <sub>2</sub>	H <sub>2</sub> S	SO <sub>2</sub>		

■ = Base; ■ = Optional EC

### ecom-EN3-F

FLUE GAS ANALYZER IN FIT TO FLY TRANSPORT CASE

- O<sub>2</sub> / CO (H<sub>2</sub>-comp.) Longlife sensors
- Up to 6 sensors possible
- CO sensor overload protection without measurement interruption
- Electronic condensate monitoring with automatic draining
- With sample gas cooler
- Brushless high-performance gas pump
- Fitted in hardtop transport case
- With heated sampling probe (350 mm, Ø 10 mm), thermocouple, cone and 3-chamber sampling tubing (3 m)
- T-Room sensor with cable, fixation cone and fixation magnet
- Integrated thermal-quick-printer
- Fitted in hardtop transport case
- Aluminum housing (ultralight)
- TFT color display and backlit keypad
- Powerful Lithium-Ion battery
- Power supply + power supply bag
- LED flowdisplay
- Calibration certificate
- Wireless data interface (e.g. for connection to a smartphone or tablet)

Dimensions (W x H x D) 550 x 185 x 380 mm  
Weight approx 9 kg (complete with sampling system)

### ecom-EN3-F EXPERT

FOR PERFECT NO<sub>x</sub> /SO<sub>2</sub>- MEASUREMENTS

- NO<sub>x</sub> version (equipped with O<sub>2</sub> / CO / NO / NO<sub>2</sub> sensors)
- Low-NO<sub>x</sub> version also possible
- With high-quality sampling probe (350 mm) including thermocouple, cone and 3-chamber NO<sub>x</sub> tubing (3.5 m)



### ecom-EN3-F ENGINE

FOR MEASUREMENTS AT CHPS AND ENGINES

- NO<sub>x</sub> version (equipped with O<sub>2</sub> / CO / NO / NO<sub>2</sub> sensors)
- Up to a total of 6 gas sensors (including SO<sub>2</sub> or IR CO<sub>2</sub> or CH<sub>4</sub> sensors)
- Preset for NO<sub>x</sub> measurements, as well as mg/m3 at 5% O<sub>2</sub> reference (freely adjustable)
- Sampling probe (360 mm), NO<sub>x</sub> / SO<sub>x</sub> tubing with mini-heat protection shield on the probe cone and 2-chamber NO<sub>x</sub> tubing



#### Measureable Gases

O <sub>2</sub>	CO	NO	NO <sub>2</sub>	C <sub>x</sub> H <sub>y</sub>
H <sub>2</sub>	CO%	SO <sub>2</sub>	H <sub>2</sub> S	CO <sub>2</sub>
				CH <sub>4</sub>

■ = Base; ■ = Optional EC; ■ = Optional NDIR; ■ = Optional Pellistor



ACCURATE



ROBUST



EFFICIENT



SAFE



FAR-REACHING



COMPLETE



COOL



LOSS-FREE

## USEFUL

### ecom-AK

READOUT UNIT FOR DIGITAL AUTOMATIC BURNER CONTROLLERS

- Automatic identification of automatic burner controller type
- Readout feature for errors and operating conditions
- Built-in display
- Data transfer via cable to PC or ecom-EN3 analyzer
- Data transfer via radio to the ecom-J2KNpro control panel (display + printing via flue gas analyzer)

Displayed data:

- Display of recent and past failures
- Display of burner operating conditions
- Measurement of the flame signal/comparison with minimum value
- Checks of delayed flame development
- Detection of the number of burner starts
- Display of all relevant operating times (safety time, etc.)

Dimensions (W x H x D) approx. 88 x 41 x 32 mm

Weight approx. 322 g - incl. belt pouch



ROBUST



COMPLETE



EFFICIENT



ecom-AK will show the following display messages:

Automat DKO 972 / 22	Identification of burner controller (Honeywell-Satronic DKG, DKO, DKW, DMO, DMG, DLG, DVI, DIO, SH, SG incl. N versions as well as Siemens-Landis & Staefa LMG, LMO).
☺ ☹ ☺ ☹ ☺ ☹ * 2.3µA 231V	Indication of burner operating mode.
* 2.2µA ☺ IS * 1.2µA ☺ MIN	Measurement of flame signal and comparison with minimal value.
Rest time TSA 3.9 sec	Check if flame occurs immediately or with delays.
Current error Flame signal during straylight check !	Indication of current disturbance source as well as of 5 past disturbances.
Start-ups counter 664	Determination of burner starts.



### ecom-UNO

FOR THE ADJUSTMENT OF GAS BURNERS /GAS HEATINGS

- Device connection pressure (flow pressure)
- Nozzle pressure (flow pressure)
- Gas operating pressure (system pressure)
- Static pressure
- Switchable units: hPa / mbar, mmH<sub>2</sub>O, psi, mmHg
- Measurement range: ± 200 hPa, ± 2038 mmH<sub>2</sub>O, ± 2.9 psi, ± 150 mmHg
- Resolution: 0.01 hPa / 0.01 mmH<sub>2</sub>O / 0.01 psi / 0.01 mmHg
- Accuracy: approx. 1%
- Overload: 300 hPa / 3060 mmH<sub>2</sub>O / 4.35 psi / 225 mmHg

Dimensions (W x H x D) approx. 106 x 64 x 28 mm

Weight approx. 150 g



### ecom-LSG

DETECTION OF FLAMMABLE GASES

- Three sensitivity levels adjustable
- Acoustic signal on/off at choice
- Display range up to 0.5% vol. CH<sub>4</sub>, Response time: < 2 seconds
- Backlit bargraph
- Display approx. 20 x 7 mm
- 1-14 bars (10 bars = approx. 1000 ppm CH<sub>4</sub>)
- Warm-up time: approx. 3 minutes
- Sensor temperature compensation (-5°C to 40°C)

Dimensions housing (W x H x D) approx. 155 x 35 x 22 mm

Swan-neck: approx. 355 mm

Weight: approx. 200 g

## ACCESSORIES



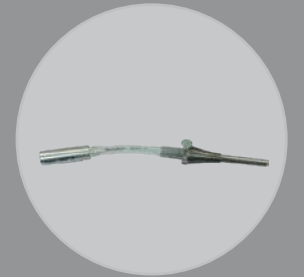
### Filter plate

Multi-level processing: water separation in condensate trap; pre filtering via fine particulate filter; silica gel drying; removal of sensor-damaging, organic compounds in the hydrocarbon filter.



### Probe prefilter

Metal filter with the smallest filter pores; ideal for preventing that solid exhaust gas components enter into the probe/the flue gas tract.



### Probe extension

For probe type Ø 8 mm, with flexible tube center piece. Is placed on the probe seats for measurements at difficult to reach, angled measuring openings.



### CO multi-hole probe

For the CO measurement of the CO concentration according to KÜO (sweeping and monitoring system) extendable from 80 to 280 mm.



### Ring slot multi-hole probe

For measurement on concentric exhaust systems. Continuously extendable (80 to 280 mm) - with three easily replaceable sealing plugs for measuring openings from Ø 5 to 25 mm.



### Contact sensor

Forerun and backrun temperature measurement.



### T-Room-probe (PT 2000)

For measuring the room or intake air temperature - for example for concentric flue gas systems.



### Soot pump set

Consisting of soot pump, soot comparison scale, piston lubricant oil, socket wrench and 200 soot test strips.



### Under case

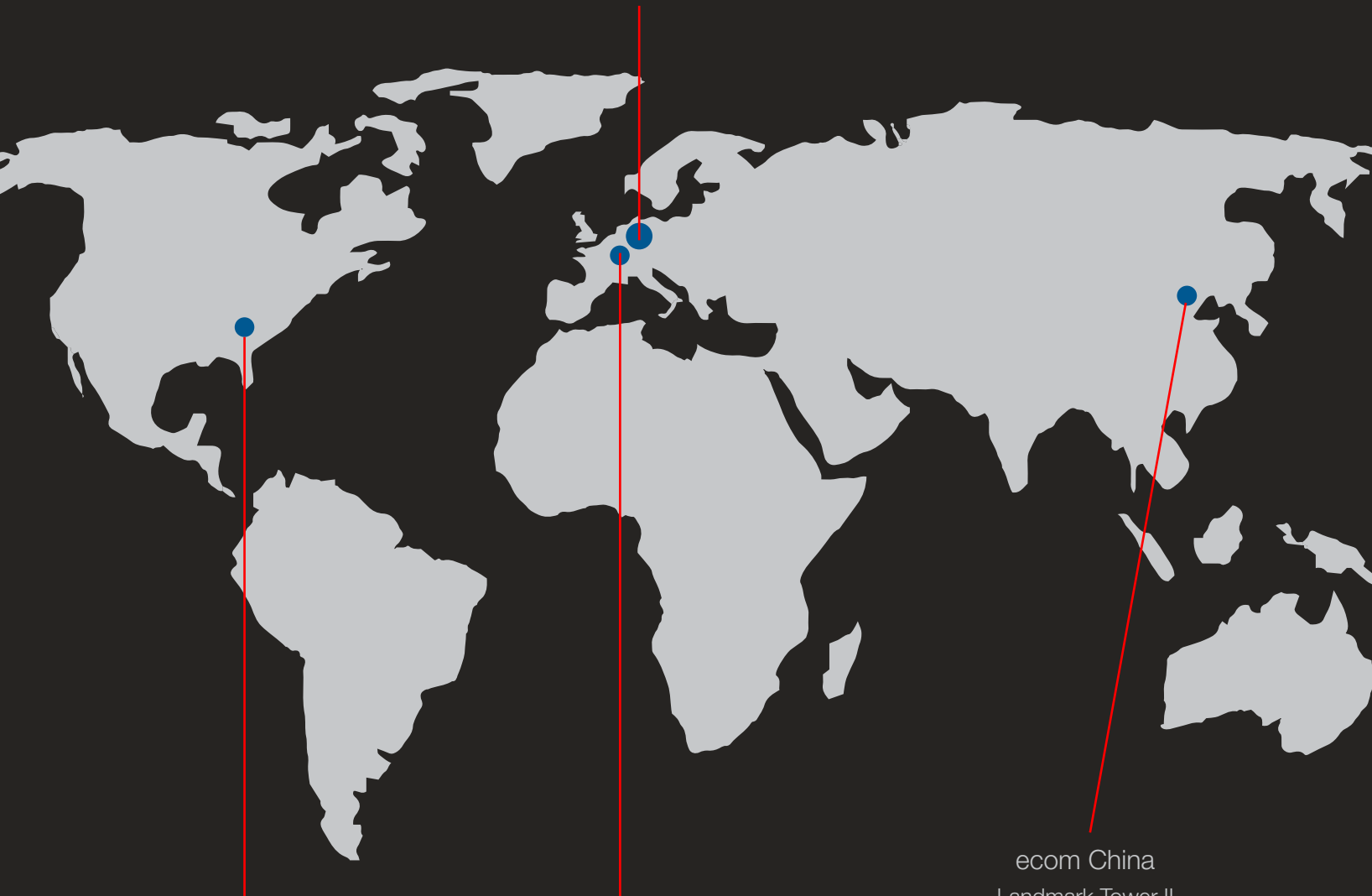
For the storage of accessories, tools, and small devices.

Other accessories on demand.

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