



## E<sup>2</sup>M

- Enhanced Environmental Mass Spectrometer

# Enhanced GC/MS System



## E<sup>2</sup>M with GC and mounting

The E<sup>2</sup>M is a mobile, compact, lightweight and rugged GC/MS system for fast, reliable onsite identification and quantification of organic substances in soil, air, water and from surfaces.

The E<sup>2</sup>M is the successor to the highly successful and proven GC/MS system EM 640. It represents Bruker's continuing commitment to the advancement of existing instruments. The instrument can be mounted on vehicles and operated while the vehicle is underway. The E<sup>2</sup>M uses 24 VDC which means that it can use the vehicle power supply.

The E<sup>2</sup>M is able to identify organic chemicals from any medium (soil, water, air) within 20 minutes via complementary sampling techniques. Specifications and performance are not limited to a selected portion of chemicals. New libraries can be created and used by the customer. The detection limit for volatile organic compounds is from low ppb to the low ppm range depending on the analytical procedure, e.g. adsorbent enrichment (low ppb range) or on-line monitoring (approx. 1 ppm range) from ambient air. Training and operation is reduced to the lowest possible level whilst the reliability is increased.

## Quadropul - heart of the E<sup>2</sup>M



## • System Components and Accessories



**E²M base unit  
with transport case**

Quadrupole Mass Spectrometer



**E²M gas  
chromatograph  
with transport case**

- Inlet: Thermodesorber / Injector / SPME programmable up to 240 °C
- Carrier gas: ambient air
- Capillary: various polarities, 5....20 m
- GC temperature range: 3 ramps up to 240 °C



**Sampling case**

- Fast on-site sample preparation
- Air samples
- Solid/Soil samples
- Liquid Samples (Purge&Trap)
- Wipe Tests
- Brief SOP's for sampling methods



**Air/surface probe**

Direct measurement of air and surface contaminations



**Ruggedized notebook**

For use in harsh environments



**Injector kit / SPME kit**

- Split-injection of liquid samples
- Solid Phase Micro Extraction

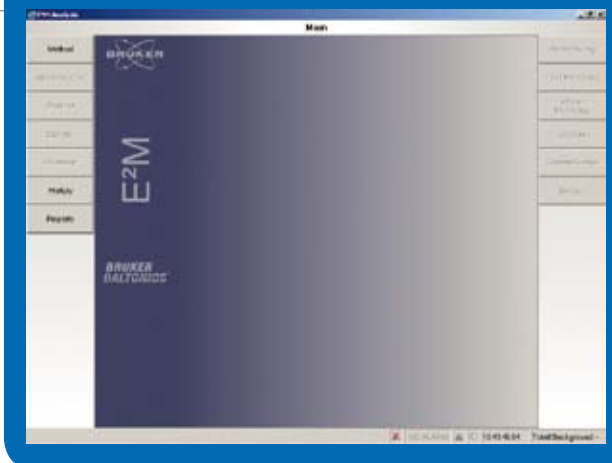
## ● Control Software

### The E<sup>2</sup>M software includes all standard MS acquisition methods

- Full spectra acquisition; 1...520 da
- Single ion monitoring (SIM)
- Easy to use graphical user interface
- Adaptation to existing fire brigades SOP
- HAZMAT database linkage

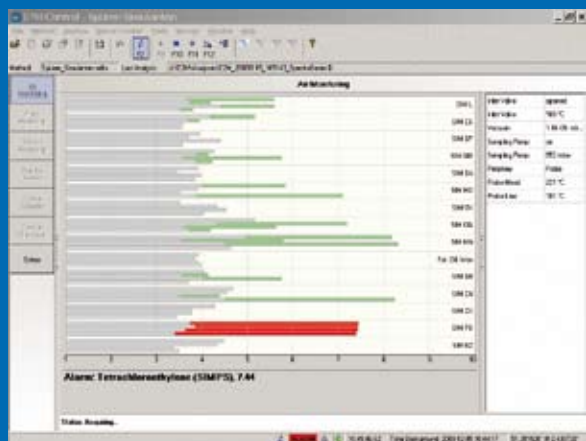
The E<sup>2</sup>M is supported by new Software Modules for instrument control and data acquisition. The E<sup>2</sup>M Control (Advanced User) is used to set all parameters of the instrument and therefore to create new applications.

### Main menu from E<sup>2</sup>M operator software



The software tools are compatible with standard WINDOWS systems and standard PCs. The data transfer is provided by an Ethernet-100 interface.

### Air monitoring with E<sup>2</sup>M control software



The E<sup>2</sup>M Analysis (Operator level) supports an easy and uncomplicated operation of the system for already prepared methods.

Both software tools include the fully automated data evaluation based on the NIST spectra library (National Institute of Standards and Technology), and the Bruker TICLib (Toxic Industrial Compounds) or a customer specific libraries.

### E<sup>2</sup>M Analysis / E<sup>2</sup>M Control:

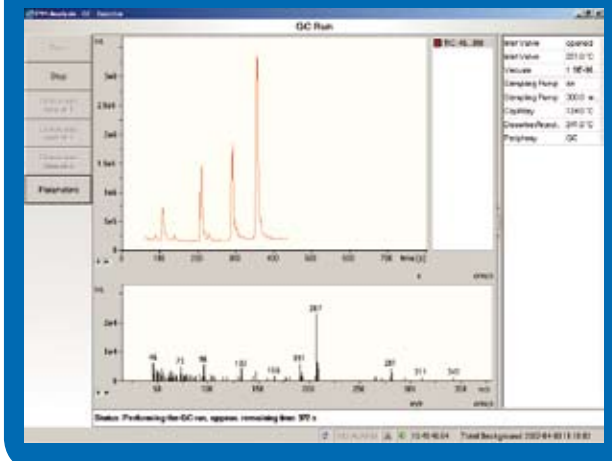
Air- and Surface monitoring of TICs

- up to 20 substances simultaneously
- up to 8 characteristic ions per substance

### E<sup>2</sup>M Analysis-GC Mode:

Recording chromatograms of complex substance mixtures and identification of the substances via MS spectra libraries (NIST, TICLib or customer specific libraries)

### GC run in E<sup>2</sup>M Analysis Software





## Typical Applications of the E<sup>2</sup>M

### Environmental protection

Fast and reliable on-site detection and identification of hazardous chemicals from soil, water and air within minutes.

### Mobile on-site analysis

E<sup>2</sup>M is designed for vehicle integration and can operate while the vehicle is underway. Vehicles can be cars, vans, trucks as well as ships, helicopters and other aircrafts.

### Event monitoring

Protection of major events such as sport, concerts, folk festivals etc. Identification of released chemicals leads to correct timely decisions and reduces the number of potential casualties.



### First responders

Fast investigation of chemical hazards, drugs and explosives by the Fire Brigades, Police and other Emergency and Blue Light Services.

### Homeland defence

Fast detection and clear identification of released chemicals in critical infrastructures (subways, airports, railway stations, public buildings etc) by first responders (police, custom, fire brigades, analytical task forces).



# Technical Specifications

## Dimensions (LxWxH)

436 x 368 x 442 mm

## Weight

37,7 kg

## Volume

58 l

## Ionisation

Electron impact, 70 eV

## Filament

Dual

## Mass stability

0.2 da at all allowed operating conditions

## Detector

Off axis CEM, automatic tuning

## Vacuum system

Ion getter pump < 10<sup>-6</sup> mbar (20 l/s, N<sub>2</sub>), noiseless

## Inlet

Membrane, heated

## Mass range

1 – 520 da

## Scan rate

7200 da/s with a resolution of 0.1 da

## Calibration

PFTBA, automatic tuning

## Selected Ion Monitoring (SIM)

Up to 20 substances simultaneously

## MTBF

1500 hours, 2 hours-in 3-months-operation for vacuum-hold

## MTBS

2 years

## External power supply

24 V DC (18 ... 32V)  
< 250 W @ 20°C

## Humidity

95% @ 60°C

## Certifications

- CE
- IP42
- IEC 61000 (EMC)
- IEC 60068-2 and 2-2
- CISPR 16-1, 16-2 (radiated emissions)
- 0...+50°C (Temperature)
- IEC 60068-2-6, -2-27 (Shock/Vibration)

## Data handling

- Separate standard PC, WINDOWS based operating systems
- Connected via Ethernet-100 Interface
- Three level software for result visualization, expert

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