

Air Server™ and MCS06/08 Systems For On-line/Canister Automation

UNITY can also be upgraded by the addition of an Air Server or MCS autosampler for the introduction of whole-air / gas samples (canisters, bags or gas streams) directly into the cold trap, without the requirement for a sorbent tube. The process can be automated either for a sequence of multiple containers or for unattended round-the-clock monitoring of gas / air streams. Three, six or eight channels can be accommodated as standard.

UNITY-Air Server/MCS systems are compact system (< 30cm (12") overall width), and are compatible with real-time / process detectors as well as conventional GC (-MS). Their small size facilitates installation in remote or mobile laboratories.

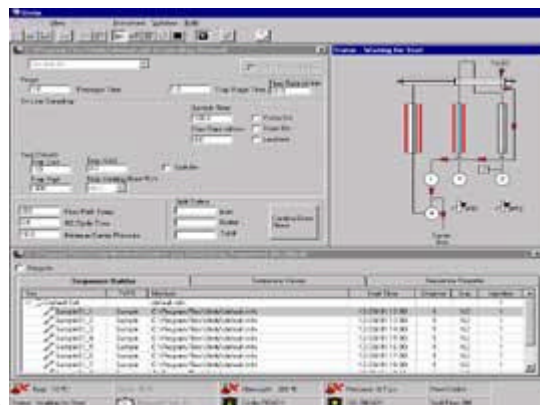


UNITY Air Server

UNITY-Air Server/MCS operation

In on-line mode, users select sampling flow and time parameters as part of the desorption method. In operation, user-determined volumes of gas are pumped or drawn into the focusing trap at electronically controlled flow rates. Only inert, non-emitting components are allowed to come into contact with the sample and the flow path is purged with carrier gas between samples to eliminate carryover.

Standard systems feature automatic interchange between 3, 6 or 8 gas streams at a user defined frequency. Sequences may be recycled indefinitely to minimise system programming.



- Timed Start

It is possible to generate a series of analyses, configured to start at a pre-determined date and time with a pre set interval between each sample.

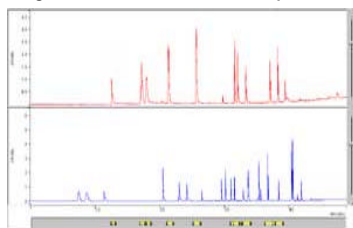
Environmental Applications

The state-of-the-art electrically-cooled focusing trap at the heart of the UNITY-Air Server/MCS meets and exceeds the specifications given in modern ambient air standards such as US EPA Guidance for Photochemical Assessment Monitoring (C2 to C10 ozone precursors), US EPA Method TO-15 and ASTM Standard D-5466.

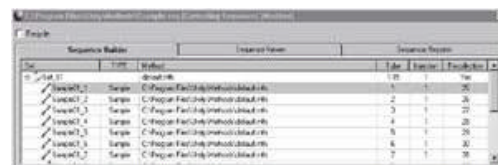
- Ozone Precursors

A key application is the on-line monitoring of volatile hydrocarbons ranging from acetylene to trimethyl benzene - so called ozone precursors.

Quantitative retention of acetylene from 600 mL air and splitless desorption allows detection limits of 30 ppt (C4 hydrocarbons) and 50 ppt (C2 - C4 hydrocarbons) to be readily achieved with simple FID detection



Splitless TD-GC-FID analysis of acetylene to trimethylbenzene ozone precursors using a 2-column Dean's switch system for optimum resolution



Seq ID	TIME	Method	Injection Point	Injection Volume	Injection Pressure
seq01_1	1:00	C:\Program Files\Agilent\ChemStation\bin\td\td.fid	1	10	1
seq01_2	2:00	C:\Program Files\Agilent\ChemStation\bin\td\td.fid	2	10	1
seq01_3	3:00	C:\Program Files\Agilent\ChemStation\bin\td\td.fid	3	10	1
seq01_4	4:00	C:\Program Files\Agilent\ChemStation\bin\td\td.fid	4	10	1
seq01_5	5:00	C:\Program Files\Agilent\ChemStation\bin\td\td.fid	5	10	1
seq01_6	6:00	C:\Program Files\Agilent\ChemStation\bin\td\td.fid	6	10	1
seq01_7	7:00	C:\Program Files\Agilent\ChemStation\bin\td\td.fid	7	10	1

Sequence builder for Air Server operation, showing timed start for each analysis

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Av. Cerdanyola,73
Apartado 282
08190 SANT CUGAT DEL VALLES
(Barcelona-Spain)
Teléfono: 902456677
Fax: 902466677
Email: inf@ingenieria-analitica.com
www.ingenieria-analitica.com

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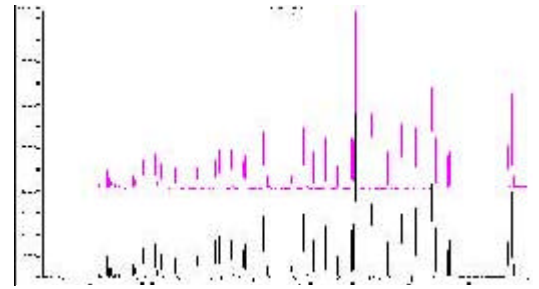
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- **TO14/TO15 Canister Sampling Methods/Air Toxics**

These methods are used to test ambient air for toxic compounds and current methodology (US EPA TO15) lists nearly 100 target VOCs - 'Air Toxics'.

Samples may be taken on-line from ambient air directly into UNITY-Air Server MCS or may be sampled into specially prepared canisters to be transported to the laboratory for subsequent analysis via the UNITY-Air Server/MCS system.



Repeat analyses of a TO14 'Air Toxics' mixture from a canister.



- **Odorous Compounds**

Volatile sulphur compounds (e.g. hydrogen sulphide, methyl mercaptan etc.) have a very low odour threshold and may need to be monitored round the clock in some locations.

Industrial Gas Stream Analysis

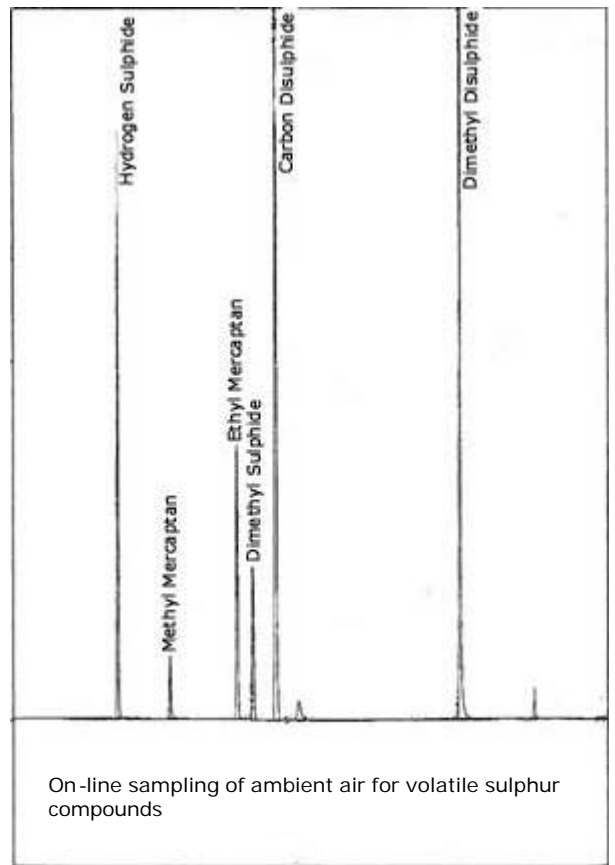
UNITY-Air Server/MCS in combination with GCMS is used extensively for many industrial applications (e.g. C2F6 in stack and vent gases).

When combined with real-time / direct read-out detectors, such as a process mass spectrometer or enose sensor array, UNITY-Air Server/MCS can also provide a rapid and high sensitivity QC tool.

Key applications include the monitoring of food grade CO2 for trace level benzene and other organics. Real-time industrial methods are readily validated using the UNITY-Air Server/MCS connected to both GC (-MS) and the direct read-out detector (enose, process MS, etc.) in parallel.

Air Server/MCS-SecureTD

All samples collected on-line may be re-collected manually or using an ULTRA autosampler in AutoSecureTD mode, provided the compounds are suitable for quantitative retention on sorbent tubes.



On-line sampling of ambient air for volatile sulphur compounds

Process measurement of trace level benzene and other organics using on-line thermal desorption with process-MS detection

