



Environmental Soil Gas Analyzers



www.dps-instruments.com

Millions of liters of chlorinated solvents used in industry over the years have spilled, polluting our air, soil, rivers, lakes, and streams. Environmentally conscious legislation has been passed in many parts of the world to limit future spills, clean up existing polluted sites, and lessen the overall risk to ourselves and to our children.

Looking towards a greener world, DPS has configured a Companion 2 Portable Soil Gas GC Analyzer, enabling analysis in the field for Type 1 hazardous substances (11 compounds) specified in the Soil Contamination Countermeasures Law in Japan. The DPS Soil Gas GC has a built-in Sample Concentrator with Trap and dry purge functions for low ppb level analysis of these 11 compounds, and the newly added compound, Chloroethylene. The PID is very sensitive to aromatics and alkenes, and the BCD is ultra-sensitive to chlorinated and brominated compounds. This combination of detectors covers all of the compounds in the Countermeasures Law, and more. All DPS GC systems are small, lightweight and modular for expandability, upgrades, and easy service.



Available Configurations Include:

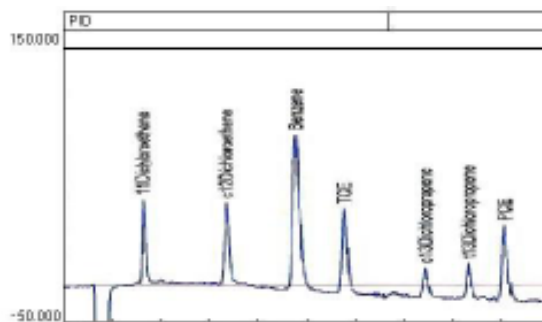
500-C2-013 - Companion 2 Portable Soil Gas GC Analyzer (PID, BCD, 30m)

500-C2-019 - Companion 2 Portable Low-Level GC Analyzer (PID, BCD, 30m, and Sample Concentrator)



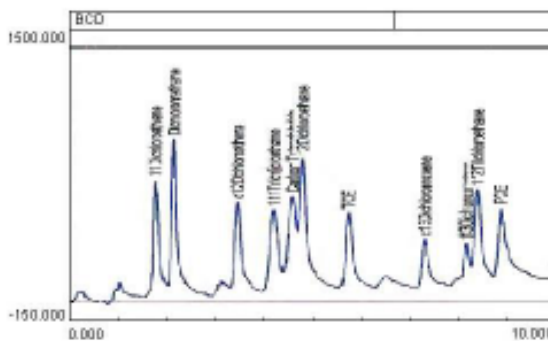
Companion 2 Portable GC
(With Air Concentrator)

1 ppm Hazardous Substances



PID Detector
 Detector Temperature = 175C
 High Voltage = 800V
 Gain = 6
 Collector = -100V
 Carrier = Helium @ 60 kPa = 10mls/min
 Column = 30m x 0.53 MXT-502.2
 Temperature Program = 50C (hold 3 min) to 120C @ 10C/min

Peak	Component	Area	ppm
1	1,1-Dichloroethene	195.6	1
2	cis-1,2-Dichloroethene	295.2	1
3	Benzene	672.7	1
4	Trichloroethylene	322.4	1
5	cis-1,3-Dichloropropene	90.4	1
6	trans-1,3-Dichloropropene	106.2	1
7	Tetrachloroethylene	270.6	1

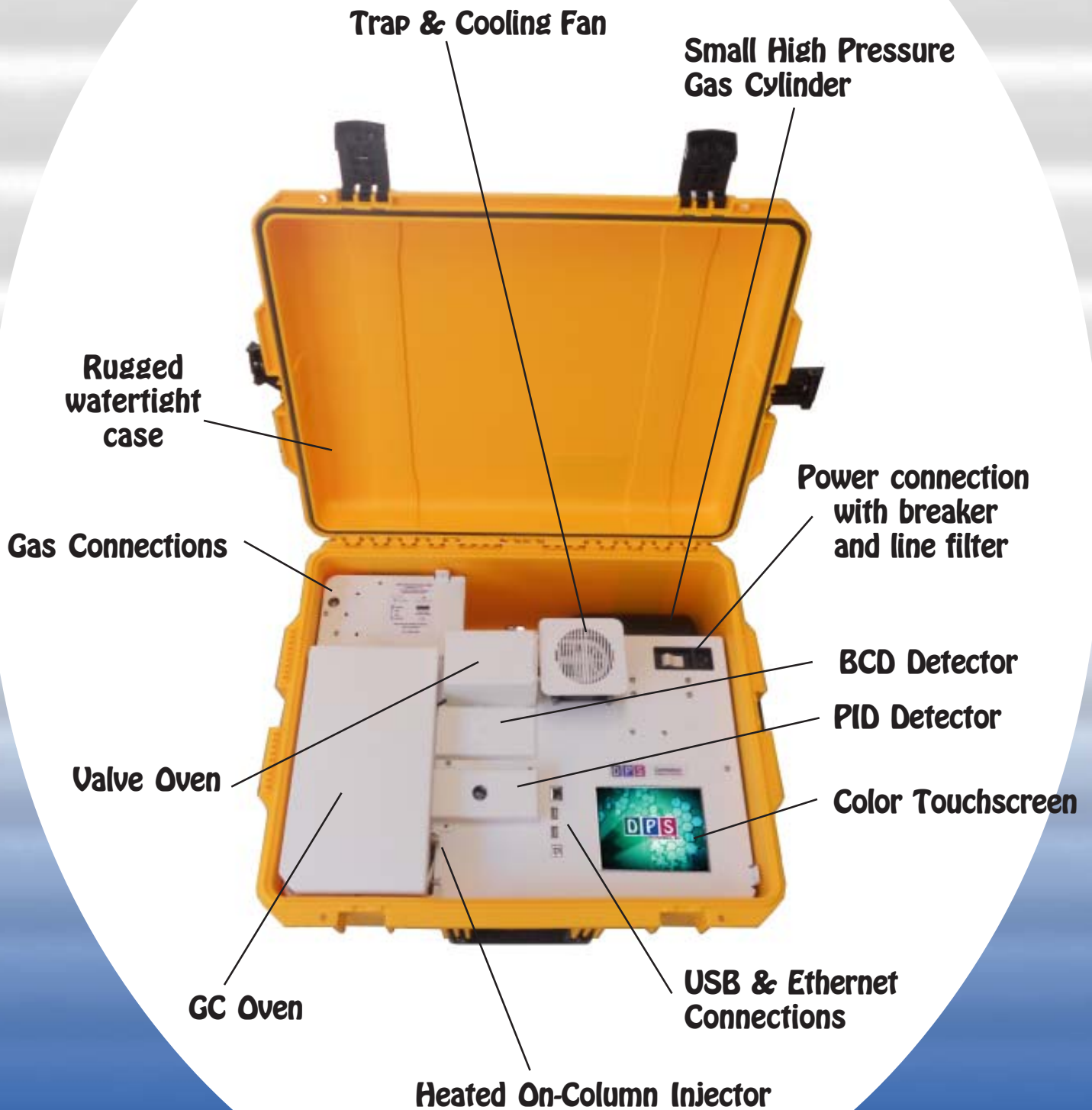


BCD Detector
 Detector Temperature = 175C
 Cell Temperature = 800C
 Gain = 2
 Collector = -100V

Peak	Component	Area	ppm
1	1,1-Dichloroethene	5598.7	1
2	Dichloromethane	7122.3	1
3	cis-1,2-Dichloroethene	5880.7	1
4	1,1,1-Trichloroethane	5615.1	1
5	Carbon Tetrachloride	3126.5	1
6	1,2-Dichloroethane	4668.1	1
7	Trichloroethylene	5903.7	1
8	cis-1,3-Dichloropropene	3056.6	1
9	trans-1,3-Dichloropropene	1262.2	1
10	1,1,2-Trichloroethane	5295.4	1
11	Tetrachloroethylene	4838.6	1

8/2018
 Specifications may change without notice.

DPS Companion 2 Soil Gas GC Layout

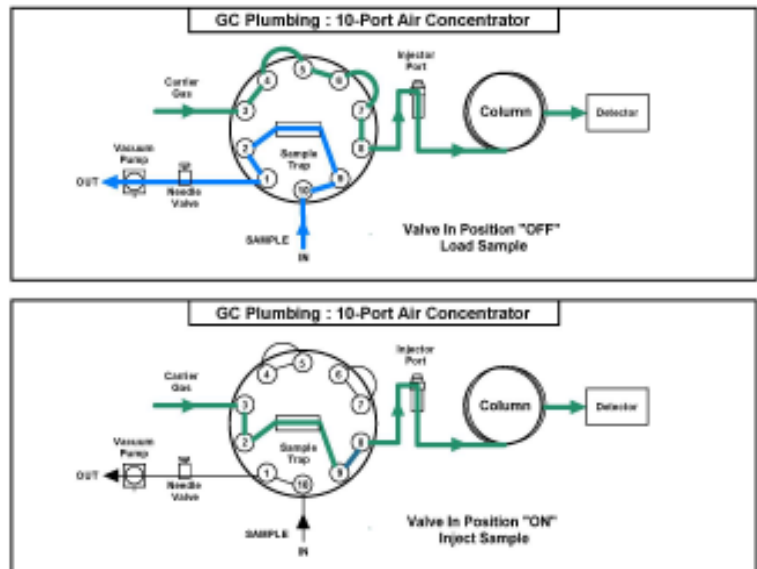


Plumbing Diagram

Sample Concentrator: The Air Sample Concentrator is built right into the Companion 2 GC Chassis to provide both a compact portable sample concentrator and a shortest possible sample path. The valve and sample lines are heated creating a inert sample path.

Load Sample: The vacuum pump draws the sample from the inlet through the Trap and then to the flow controller and pump to limit any possible cross contamination between samples. The entire sequence of the Air Sample Concentrator is automated through the Timeline of the DPS Control Software for the analysis of one sample at a time, or the system can be set up to run unattended 24/7, collecting and analyzing samples every hour, or so. A dry purge option can be added to eliminate extra water from the sample if needed.

Inject Sample: The carrier gas sweeps the components from the trap to the analytical column. The entire sample path is heated to facilitate a smooth transfer of components to the analytical column and to limit any potential carry-over from high concentration samples.



**Built-in Air Concentrator
Plumbing Diagram**

Results, Data & Connectivity

Results: In this unique plumbing configuration, which utilizes a precise sample flow path and precision metering, so you get the same peak areas on the chromatogram from run to run. Both detectors are stable, rugged, and reliable.

Data and Connectivity: The built-in computer is used to collect and store the data. Data can also be copied to a USB Stick to transfer to another computer. Data can be transferred from the built-in computer to another computer on the LAN through the Ethernet port using standard Windows protocols. Or, we can use a USB cable to connect the GC to the remote computer where the data can be collected and stored on that hard drive.

DPS Soil Gas Data Summary

Reproducibility Data - 3 Consecutive day Summary

Standard Preparation - 5 uL of the Original JEOL Standard diluted into 1L
200uL Direct Injection

PID Detector Data

	Area					
	Day 1	Day2	Day3	Average	AVE DEV	% DEV
1,1-Dichloroethene	202.6	185.0	226.1	207.9	12.2	5.85
cis-1,2-Dichloroethene	286.1	276.5	293.2	285.3	5.8	2.05
Benzene	680.8	665.8	732.7	693.1	26.4	3.81
TCE	316.9	306.0	328.1	317.0	7.4	2.33
cis-1,3-Dichloropropene	93.5	84.8	94.1	90.8	4.0	4.41
trans-1,3-Dichloropropene	101.0	86.1	98.4	95.2	6.0	6.33
PCE	276.0	279.6	287.5	281.0	4.3	1.54

Retention Time

	Day 1	Day2	Day3	Average	AVE DEV	% DEV
1,1-Dichloroethene	1.733	1.743	1.749	1.742	0.006	0.34
cis-1,2-Dichloroethene	3.450	3.459	3.482	3.457	0.005	0.14
Benzene	4.848	4.851	4.854	4.851	0.002	0.04
TCE	5.832	5.828	5.828	5.829	0.002	0.03
cis-1,3-Dichloropropene	7.485	7.482	7.453	7.480	0.005	0.07
trans-1,3-Dichloropropene	8.350	8.342	8.338	8.343	0.004	0.05
PCE	9.075	9.067	9.065	9.069	0.004	0.05

BCD Detector Data

	Area					
	Day 1	Day2	Day3	Average	AVE DEV	% DEV
1,1-Dichloroethene	4785	4140	4252	4386	252.7	5.76
Dichloromethane	7123	6711	7383	7072	240.8	3.40
cis-1,2-Dichloroethene	5419	5673	5132	5408	183.8	3.40
1,1,1-Trichloroethane	5566	4401	5060	5008	405.2	8.09
Carbon Tetrachloride	3253	3030	3548	3277	180.8	5.52
1,2-Dichloroethane	4055	4009	4295	4119	116.8	2.84
TCE	5627	4998	5004	5210	278.0	5.34
cis-1,3-Dichloropropene	2803	2161	2660	2541	253.5	9.98
trans-1,3-Dichloropropene	1235	1048	1183	1149	66.9	5.83
1,1,2-Trichloroethane	5147	5237	5142	5175	41.3	0.80
PCE	4411	4332	4005	4250	162.3	3.82

Retention Time

	Day 1	Day2	Day3	Average	AVE DEV	% DEV
1,1-Dichloroethene	1.872	1.876	1.888	1.879	0.008	0.33
Dichloromethane	2.217	2.216	2.231	2.222	0.006	0.29
cis-1,2-Dichloroethene	3.613	3.615	3.631	3.620	0.007	0.21
1,1,1-Trichloroethane	4.414	4.404	4.419	4.412	0.008	0.13
Carbon Tetrachloride	4.784	4.777	4.790	4.783	0.004	0.09
1,2-Dichloroethane	5.010	5.007	5.023	5.013	0.006	0.12
TCE	6.017	6.019	6.028	6.021	0.004	0.06
cis-1,3-Dichloropropene	7.663	7.643	7.648	7.651	0.007	0.10
trans-1,3-Dichloropropene	8.550	8.535	8.533	8.539	0.007	0.08
1,1,2-Trichloroethane	8.774	8.772	8.789	8.772	0.002	0.02
PCE	9.285	9.278	9.267	9.277	0.007	0.07

Results are Reproducible Day after Day

DPS Soil Gas Calibration Data

PID Detector Data

Calibration

Run	B156 1 vol	B157 0.5 vol	B159 0.1 vol	Average Calibration Factor	r2
1,1-Dichloroethene	210.3	110.3	21.5	215	0.999
cis-1,2-Dichloroethene	294.9	125.3	29.0	279	0.992
Benzene	679.1	338.0	65.6	669	1.000
TCE	306.5	139.9	37.8	321	0.995
cis-1,3-Dichloropropene	75.4	37.7	8.4	78	0.999
trans-1,3-Dichloropropene	71.2	31.3	7.8	71	0.993
PCE	258.4	130.0	25.1	256	0.999

Run	B156 1 vol	B157 0.5 vol	B159 0.1 vol	Average	AVE DEV	% DEV
1,1-Dichloroethene	1.763	1.736	1.753	1.751	0.010	0.56
cis-1,2-Dichloroethene	3.493	3.436	3.480	3.470	0.022	0.65
Benzene	4.900	4.836	4.883	4.873	0.025	0.51
TCE	5.886	5.813	5.863	5.854	0.027	0.47
cis-1,3-Dichloropropene	7.523	7.446	7.520	7.496	0.034	0.45
trans-1,3-Dichloropropene	8.416	8.346	8.400	8.387	0.028	0.33
PCE	9.146	9.080	9.116	9.114	0.023	0.25

BCD Detector Data

Run	B156 1 vol	B157 0.5 vol	B159 0.1 vol	Average Calibration Factor	r2
1,1-Dichloroethene	4533	1886	365	3985	0.992
Dichloromethane	7290	4164	546	7026	0.989
cis-1,2-Dichloroethene	4838	2977	461	5134	0.978
1,1,1-Trichloroethane	4641	1859	440	4253	0.986
Carbon Tetrachloride	3794	2051	356	3819	0.999
1,2-Dichloroethane	4379	2296	411	4360	0.997
TCE	5001	2671	424	4961	0.997
cis-1,3-Dichloropropene	2236	1031	320	2499	0.993
trans-1,3-Dichloropropene	919	561	105	1030	0.982
1,1,2-Trichloroethane	6672	2702	570	5925	0.988
PCE	4138	2220	159	3389	0.993

Run	B156 1 vol	B157 0.5 vol	B159 0.1 vol	Average	AVE DEV	% DEV
1,1-Dichloroethene	1.900	1.873	1.883	1.885	0.010	0.52
Dichloromethane	2.250	2.213	2.243	2.235	0.015	0.67
cis-1,2-Dichloroethene	3.663	3.610	3.663	3.645	0.024	0.65
1,1,1-Trichloroethane	4.446	4.396	4.410	4.414	0.021	0.48
Carbon Tetrachloride	4.830	4.760	4.841	4.810	0.034	0.70
1,2-Dichloroethane	5.063	4.996	5.043	5.034	0.025	0.50
TCE	6.073	6.003	6.041	6.039	0.024	0.40
cis-1,3-Dichloropropene	7.716	7.643	7.684	7.681	0.025	0.33
trans-1,3-Dichloropropene	8.616	8.543	8.584	8.581	0.025	0.30
1,1,2-Trichloroethane	8.856	8.783	8.710	8.783	0.049	0.55
PCE	9.360	9.290	9.320	9.323	0.024	0.26

Calibrations are very Stable over Time

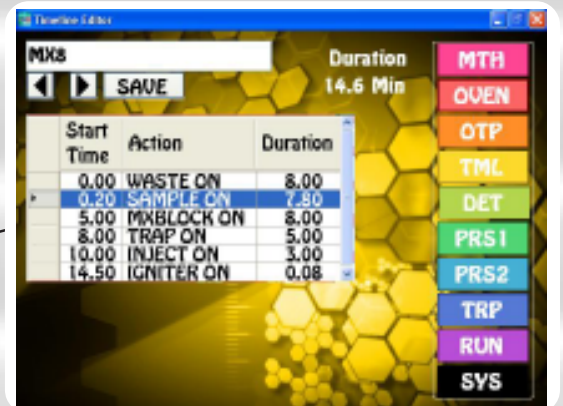
DPS GC Control Software

Easy to learn and master using a Graphical User Interface (GUI) and Color Touch Screen.

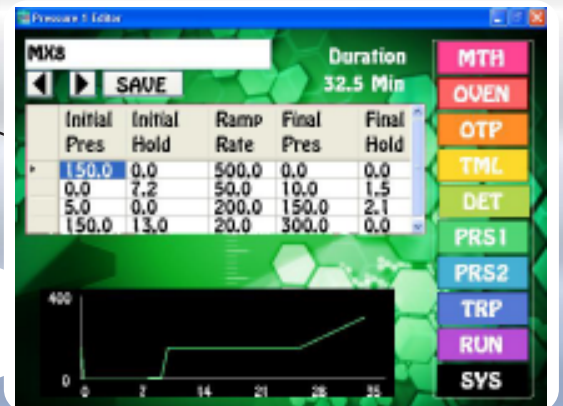
Editors let you customize the files associated with the GC Method.



Oven Temp Program Editor



Timeline Editor



Carrier Pressure 1 Editor



Carrier Pressure 2 Editor

Method Name

Save the current name or create a new one

File Selection Arrows

Navigation Buttons to Quickly jump from one screen to another. Most pages are one button away!



Keyboard to Enter Filenames



Number Pad for entering Values

GC Status pages display the parameters in the method, both graphically and as text and values.



Oven Status

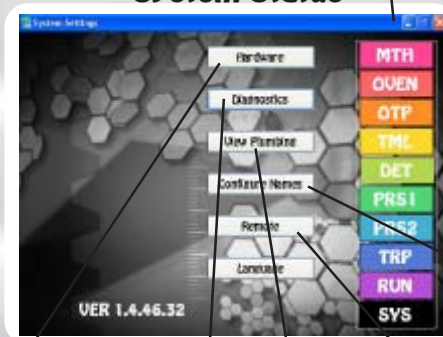


Method Editor



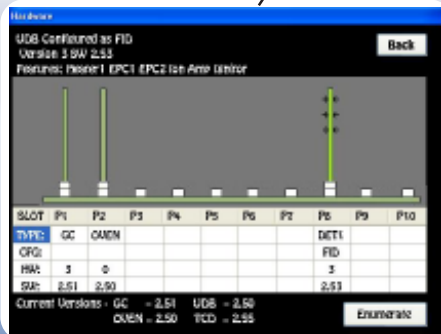
Detector Status

System Status

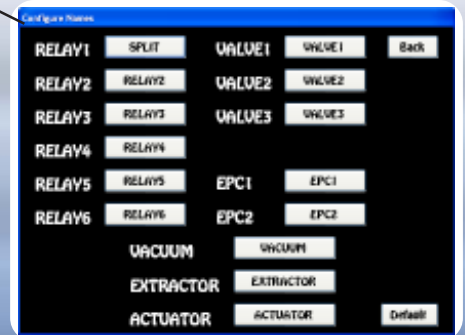


Run Status

System status pages display the health and viability of the GC instrument.



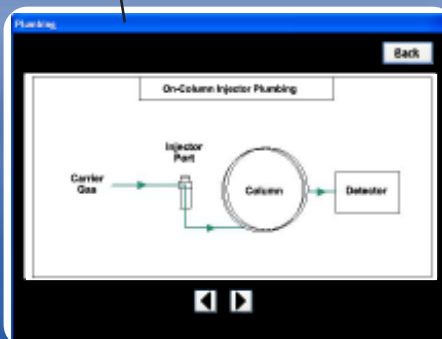
Hardware



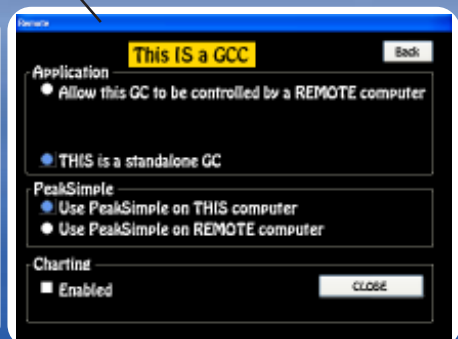
Configure Names



Diagnostics



Plumbing



Remote Control

Companion 2 Portable Soil Gas GC Specifications:

Electronics Module:

- Enter and store GC Methods via Color Touch Screen
- Actual and set-point display of all GC parameters
- Safety Limits on all user entered parameters
- Oven Temperature Programs (OTP) with Multiple Ramps
- Pressure Programs for Carrier Gases with Multiple Ramps
- Timeline for sequencing Relays and Valve
- Detector Control of all Parameters on one page
- Electronic Pressure Controllers (EPC's):
 - Atmospheric Pressure & Temperature Compensation
 - EPC Pressure Control with 0.1 kPa set-point resolution
- Plug and Play GC Control, Oven, and Detector Board
- Microprocessor Controlled
- Proprietary Digital Signal Processing
- Digital Signal Outputs for each Detector
- Universal voltage input (85 – 240 Vac) with line filter and breaker.

Detectors:

PID – Photoionization Detector
BCD – Bromide Chloride Detector

- 400 °C Temperature Limit with 0.1 °C set-point resolution
- 24-bit Digital Outputs for the detector via USB
- EPC Pressure Control with 0.1 kPa set-point resolution

Columns:

15m, 30m, or 60m Capillary Columns

Results:

Automatically calibrated, corrected and reported

Companion 2 Oven Module:

- Ambient to 325 °C Column Oven
- Up to 80 °C per/min Oven Ramp
- Fast Cooldown 300 °C to 50 °C < 4 min
- 200 watt Heater Element
- Temperature Ramps with 0.1 °C set-point resolution
- 12.5 x 10.5 x 12.5 cm area for Packed, or Capillary Columns
- 7 amps at 48 Vdc total power consumption

Built-In Accessories:

- Air Sample Concentrator

Injectors:

- Heated On-column Injectors
- Multiple Pressure Ramps with 0.1 kPa set-point resolution

Data Communications:

- Bi-directional communication with popular Data System

Network Connectivity:

- Enterprise Compatible Network GC running Windows XPe
- Ethernet Connection using Windows Network Protocol
- On Board ETX Computer for GC Control and Data Acquisition
- Remote Control of GC and Data Acquisition over LAN



*Lab Quality Analyses in the Field,
"It Goes with you Anywhere!"*

