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AccuSense® Value Proposition

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What is valuable to the chemical detection mission?

- Time is valuable
- Information is valuable
- Making the right decision is valuable

Providing high value information in real- time in a meaningful context that supports making the right decision is the value proposition presented by AccuSense.

The present detection technology status quo does not provide timely, high value information.

No matter the application, Hazmat, Occupational Industrial Hygiene, Environmental Health & Safety, military or civilian first responder, when the mission is "population safe" the need is for high value information. AccuSense technology removes the barriers to timely high-value information enabling decisions that can save lives.

The Low Information Environment

The present linear detection model asks, "Is there chemical X-Y-Z in the air?" resulting in a low information environment for responding officer. This model leaves unanswered questions such as:

- I see that X is in the air and no Y or Z - are there chemicals A-B-C present that I do not see?
- When chemicals X and Y are similar in nature and I identify X, is there also Y present that I do not see due to masking?
- Are *environmental confusers* present so that I see nothing or make wrong chemical signature identification?
- Am I getting a false negative or a false positive?
- Am I certain about what I am seeing?
- Am I seeing this information in a time frame that enables a high value decision?

These are the low information environments that many practitioners now work in when they are deployed.

Moving To a High Information Environment

How do we move to a high information environment? How does the gap between low and high information environments get filled? One word: **Separation**

The barrier to a detection model that says **"The air contains A, B, C … X, Y, Z at these concentrations"** is the separation of chemical spectra.

With never before obtainable separation of chemical spectra we go from the world of fuzzy to the world of clear and we go from low confidence to high confidence. If we can be certain of what we are seeing, then we can:

- Create a methodology for defining chemical signature databases
- Be certain that we are seeing ALL the chemicals present that are included in the chemical signature database
- Eliminate any confusion from environmental confusers
- Be certain of what we are seeing, no false results
- Operate in real-time sampling time frames (3 minute sample cycles)
- Detect – Identify – Quantify multiple chemicals from the same sample

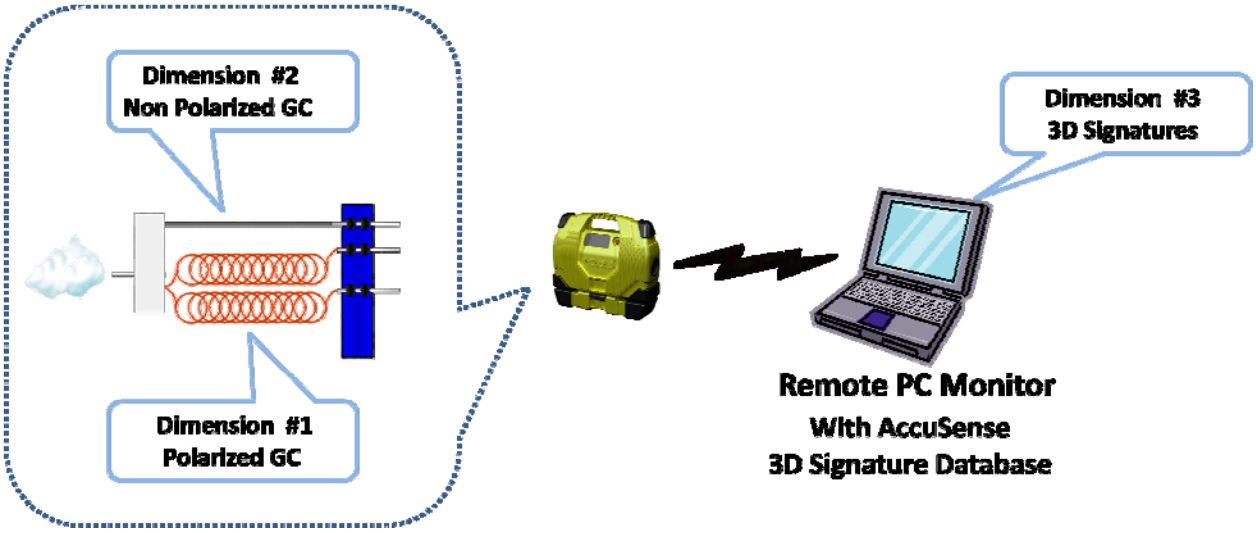
The AccuSense Solution to Separation

AccuSense is a new generation of detection technology that breaks through the chemical separation barrier. The AccuSense architecture combines dual-hyphenated gas chromatography (DHGC) hardware, thermal detection technology, and neural network software algorithms to build a *3 Dimensional* view of a chemical signature, which is unlike any current field portable gas/vapor analyzer on the market today.

- Dimension #1:
    - Polarized GC Colum #1 – What am I seeing?

- Dimension #2:
    - Non-Polarized Colum #2 – Confirm what I am seeing and show me what I might have missed from the polarized view

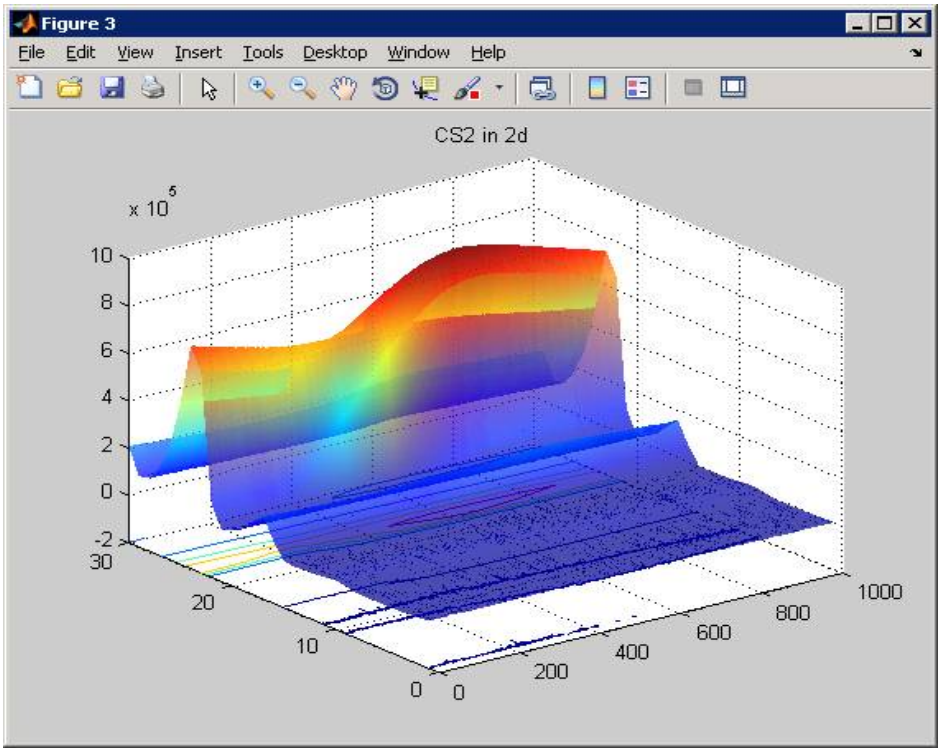
- Dimension #3:
    - A mathematical signature definition – Confirm what I am seeing against a database of known signature definitions



The AccuSense 3D Signature – The *How* for Identification and Measurement

Transforming Gas Chromatography from a laboratory science to a field utility device is a remarkable technical accomplishment in itself. However, it is the creation of an artificial intelligence-based methodology using neural network science to generate definitions of chemical spectra that enables the third dimension in the separation, faultless identification and accurate measurement of chemical concentrations.

Upon gathering hundreds of data points related to the parameters listed above, proprietary neural network algorithms analyze matrices of these data points and develop unique chemical signatures for each chemical. By taking the two independent variables and creating a third dependent variable, the AccuSense 3D Signature is created. The more unique the parameters for a particular chemical are, the easier it is for detection, identification, and quantification of that chemical. The 3D mathematical representation of the chemical signature for Methyl Ethyl Ketone (MEK), which is done through the utilization of MATLAB® software on a Cray® supercomputer at SEER offices, is shown below:



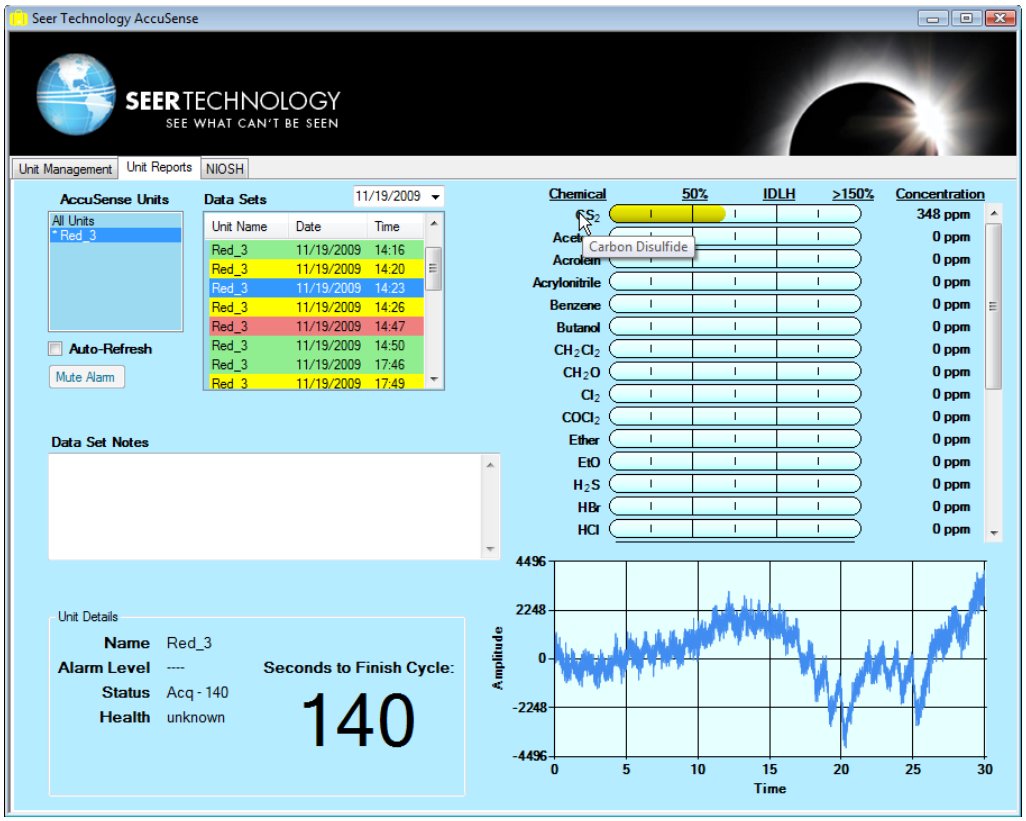
3D Representation of MEK

To create this picture a baseline is established using an Agilent® mass spectrometer and applying dilution standards for samples. From this baseline the neural network is trained to create the 3D Signature (picture).

The AccuSense 3D Signature database resides on the AccuSense PC monitor. Having completed the 2 dimensional separation in the AccuSense instrument, chemical spectra are communicated to the PC monitor where they are compared against the AccuSense 3D Signature database. A match equals identification and variations within this match represent quantification – a measurement of concentration.

Gaseous Chemical Detection Information Gap Filled

Below is a sample of the display of Immediately Dangerous to Life and Health (IDLH) information presented to the end-user on the AccuSense remote PC monitor.



Accusense displays the percentage of IDLH concentration along with the Parts Per Million (PPM) concentration for the user in a simple, easy to understand, interface.

This is the outcome of an AccuSense high information environment.

Information Type

- Is there a chemical gas in the atmosphere
- What is it
- What is the concentration level
- What harm may that concentration level cause to a human?
- Repeated for every chemical in the database in a single sample cycle

Information Quality

- Complete
- Timely
- Certain

Information Value

- High IDLH Context Value
- High Confidence Value
- High Decision Value

Chemical Detection System Comparison Matrix

							
		SEER Technology	Smiths	Inficon	RAE Systems	ICx	MSA
		AccuSense	Gas ID	HAPSITE ER	AreaRae Steel	ChemSense 600	SafeSite MTX
Detection Technology		DHGC w/Thermal Detection	FTIR	GC/MS	PID and Electrochemical Sensors	MS/MS	PID, Electro Chemical Sensors, and SAW
Detector Dimensionality	ANALYTICAL	2	1	2	1	2	1
Displays Concentrations of Chemicals	ANALYTICAL	X		X	X	X	X
Displays Concentrations of *Multiple* Chemicals	ANALYTICAL	X		X		X	
Organic AND Inorganic Chemicals Detected	ANALYTICAL	X		X		X	
Resistant to Confuser Chemicals	ANALYTICAL	X		X		X	
Neural Network Data Analysis	ANALYTICAL	X					
No Consumables	USABILITY	X					
Point Detection AND Fixed-Site	USABILITY	X		X	X		X
Upgradeable Chemical Database	USABILITY	X					
Light Training Burden	USABILITY	X			X		X
Minimal Maintenance Required	USABILITY	X					
Wireless Communications	OPERATIONAL	X		X	X		X
Battery Life 16-Hrs	OPERATIONAL	X					
Customers		Military & Government, HAZMAT & LE, Domestic & International	Emergency responders, LE personnel, military agencies	US and international armed forces, emergency response teams, government agencies	Heavy industrial including petrochemical, HAZMAT, Homeland Security and Emergency response	Building and facility monitoring	Fire / HAZMAT / Homeland Security / Industrial / Chemical
MSRP (approx.):		$26,000	$55,000	$150,000	$50,000 (RDK)	$100,000 (est)	$35,000

DHGC = Dual Hyphenated Gas Chromatography
FTIR = Fourier Transform Infrared
PID= Photoionization
MS = Mass Spectrometry
SAW = Surface Acoustic Wave
RDK = Rapid Deployment Kit