

## Chem-Bio-Rad “Street-Smart” Intelligence & Response

The CEBIT family of microelectrochemical (MEC) processors comprises a group of devices sharing common platforms for enabling modular target-specific chemical, biological, and radiation sensors as well as actuator and responder logic to be delivered in low-power, compact, and embeddable electronics for use in a very wide variety of physical environments and operational settings.

“CEBIT” stands for **Cybernetic Environmental BINAR Technology** and this translates to: classical cybernetic control principles, employing nonlinear, inverse, and

TETRADYN developed CEBIT in order to solve not one or a few of today’s problems in chemical, biopathogen, radiation and explosive detection but to provide an extensive platform, comparable to technologies in computing hardware and software, that can adapt to new micro and nanoscale sensor and actuator advances and breakthroughs. Thus CEBIT devices incorporate, for different tasks and missions, one or more of:

- ◆ Piezo-electric
- ◆ Piezo-resistive
- ◆ Layer-by-layer film
- ◆ Nano-membrane
- ◆ BRET
- ◆ RePAS

Multiple  
Elements and  
Modes → Data  
Fusion →  
Accuracy

Contact us for:

- ◆ Technical Data Specs
- ◆ Comparative Studies
- ◆ Analytical Reports
- ◆ Technical and Product-Use Articles
- ◆ Cost Plans and Quotations

## Clients and Partners include:

Boeing Intel  
Solutia Wal-Mart  
Aegis Ontario Power  
Global Information Systems  
Dept. of Defense (USA)  
Dept. of Homeland Security (USA)  
Dept. of Energy (USA)



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# TETRADYN INNOVATION

Discovery  
Adaptation  
Reaction  
Evolution



## CEBIT

Compact Sensing &  
Control for  
Environmental and  
Homeland Security

Chemical-Explosive-Biopathogen  
Identification and Tracking

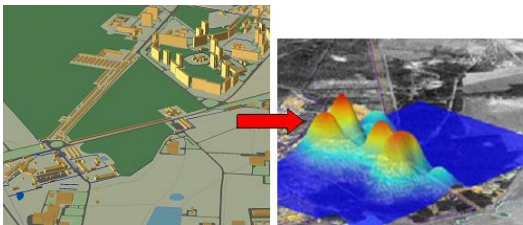
## PROBLEM

Our complex and overcrowded world has too many chemicals and agents in our environment - in our plants, offices, trains, cars and homes - that need to be controlled, monitored, avoided, or subject to immediate preventive action, before there are threats or damage to lives and property.

We are faced with dangerous organics, pesticides, toxic metals, bacterial and viral toxins, radiation hazards, and the intentional dangers of chem, bio or nuclear terrorism that may be as homegrown as the disgruntled angry person from across town. At the same time, there are pressing needs to measure and control what may be critical changes in natural or manmade environments due to global climate change and to the needs of producing better yields in crops as well as synthetic energy and fuel production.

All of this spells out the need for having better devices for sensing, identifying, reacting to, and controlling a host of substances in our world. We cannot expect to get a handle on the problems without having significantly more powerful and omnipresent tools, particularly for the general everyday user, the non-specialist, and for schools, companies and other institutions, not only for a few government agencies. We need to do for sensing and the environment what has been done in the world of PCs, iPods, PDAs and cell phones.

Thus, CEBIT was born and built.



## SOLUTION

TETRAD Innovation has developed and refined a remarkably simple yet technically superior architecture and product line to serve the needs of chemical, explosive, biological and radioactive sensing, tracking and control. Growing out of the threads of object-oriented software design, platform-independent electronics, nonlinear adaptive pattern recognition, and nanostructured materials, the CEBIT family is a breakthrough in concept, in engineering, and in economics.

**Chemical Targets** – HRVOC and other IDLH compounds found in petrochem, power, agriculture, semiconductor, and other industry plants and in their supply chains and product distributions.

**Biopathogens** – Tularemia, TB, e.coli are among those for which applications and tests have been designed but there are applications as well possible for protein markers and many antigenic identifiers.

**Radiation** – Dosimetry and measurement is conventional, but integration into portable, low-power, low-cost platforms is where CEBIT is a breakthrough in the device and analysis technologies employed.

**Explosives** – A special category of chemicals but one that is a growing public threat. CEBIT targets the detection of common commercially-available munitions and offers a defensive-responsive solution for the general community – schools, law enforcement, shopping centers, offices, factories, churches – where threats arise frequently in our disturbed modern society.

### “ACE” - ACCURACY, COST, EASE

CEBIT Changes the Paradigm like the PC did for computing in the 80's and the Cellphone in the 90's

## CEBIT Applications

Our technology and product reports plus formal papers explain how things work inside the devices. Here are a few words about how CEBIT can be applied to both everyday and unusual applications.

### Process Control and Regulation

Measurement in pipes, tanks, mixers, distinguishing changes in supply characteristics, flow

### Energy Efficiency Optimization and E-Fusion

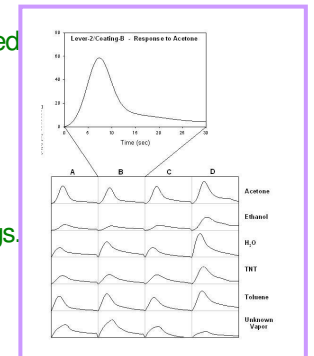
Integrating solar with wind, multiple solar generators, artificial photosynthesis, multi-fuel mixes and balances in hybrid power systems

### Environmental Sensing for Safety, Health and Security

Wider range, versatility, and array-accuracy for ambient and emission/effluent testing

### Explosives Detection in Public Places

More sensors, more entry points, and more concealed locations, within schools, churches, offices, malls. A deterrent force against not only terrorism but the growing rash of domestic and civilian mass shootings.



### PLUS

### Countering Illicit Drug Transport and Use

### Counter-IED and other Military Uses

### Public Health and Pandemic Prevention

### Mitigating the Threat of Nuclear Terrorism