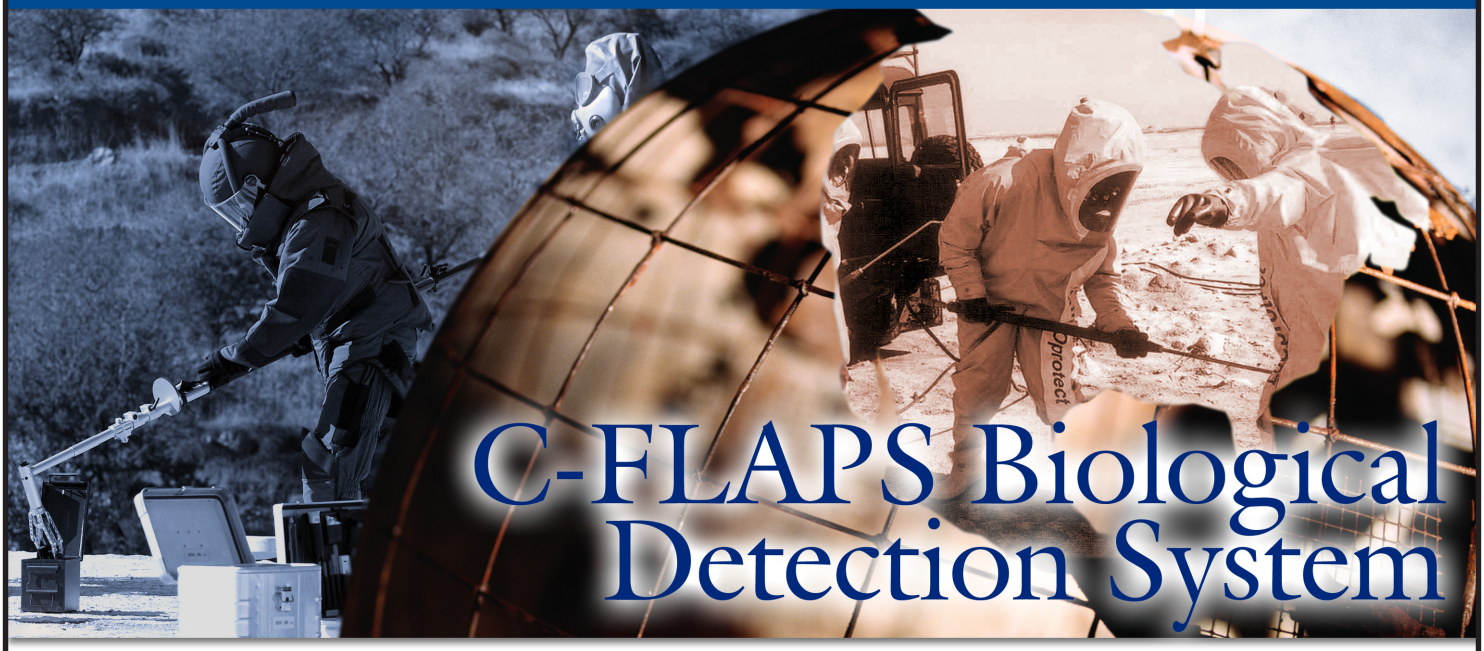


C-FLAPS Biological Detection System

C-FLAPS is the latest biological detection system from a distinguished pedigree of ***proven, fielded and flexible solutions*** by the team of Dycor Technologies Ltd. and TSI Incorporated. It is an off-the-shelf system, deployed operationally with defense and research customers around the world today.

C-FLAPS is based on fluorescent laser aerodynamic particle sizing technology pioneered by Dr. Jim Ho and his team at Defense Research and Development Canada – Suffield, a leading authority on aerosol science and applications of fluorescence excitation for biological identification. Commercialization of this technology and development of successive generations of FLAPS-based biological detection capability has been conducted by a working partnership between Dycor Technologies, TSI Incorporated and DRDC-Suffield, in a program of continuous improvement. C-FLAPS with its core FLAPS III (3317) Fluorescence Aerosol Particle Sensor technology has been adopted as a major component of the referee system by the US Air Force operational test and evaluation facility at Eglin Air Force Base in Florida, as well as at the US Army West Desert Test Center in Dugway, Utah, and at DRDC Suffield in Canada. C-FLAPS has also been designed for deployment with military forces in reconnaissance vehicles, naval platforms, and vital point protection configurations, and is fielded with a number of defense clients.

DYCOR™

The Intersection of Innovation and Technology

C-FLAPS operates on the following principles:

- Concentration of the particle stream for delivery into a biological trigger in volumes and concentrations that provide for rapid positive detection is achieved by the XMX/2A air-to-air concentrator. The XMX/2A provides a variable airflow of up to 350 SLPM that can be fine-tuned to respond to specific environmental conditions as required. The most important function the concentrator performs is to improve the signal-to-noise ratio.
- Discrimination and elimination of particles outside the important respirable range of 1-10 μm. Aerosol science demonstrates a high degree of improbability of sub-micron pathogens traveling as single entities, rather forming agglomerations which fall within the respirable range. Respirable aerosols under 1 micron are re-expelled by the lungs, particles larger than 10 microns either drop out of aerosol due to gravity or lodge in upper respiratory tract for less-than-ideal pathogenicity. The unique design of the XMX/2A aerosol concentrator makes it a particle separator, restricting particle intake to those within this range of interest.
- Fluorescence excitation of NADH and Riboflavin, (compounds which are present only in live organisms), and measurement of their fluorescence emissions along two wavelengths, along with scattered light intensity readings, providing exceptional discrimination and rejection of interferents. This function is provided by the FLAPS III 3317-40 Biological Trigger. This instrument is derived from the highly successful and fielded FLAPS II -based detection systems that established this technology as the recognized benchmark for the industry, both in test ranges and now in fielded solutions.
- Using integrated alarming algorithms, giving the operator the ability to vary parameters based on background conditions in order to minimize false alarms, so as to differentiate between non-living and harmless interferents, and actual biological events. Multiple algorithm methodologies are employed to maintain the high sensitivity while minimizing false alarms. Continuous refinement of those algorithms through numerous chamber trials, field trials, and deployed background studies is key to the minimization of false alarms.
- Wet and/or dry collection of samples upon verification of a biological event, in media that allow for rapid onsite PCR identification as well as laboratory culturing. C-FLAPS can be configured to connect to Dycor's XMX/2L-MIL High-Volume Aerosol Collector, to automatically initiate sample collection (liquid or dry impingement) upon detection of a biological event.
- Communications and interface with Command and Control functions are achieved through the Ethernet port, or optionally, by an embedded Spread Spectrum Data Radio operating within our clients' national communications frequency restrictions (North America regions).
- An embedded global positioning system provides GPS location and time-stamping capability.
- All disciplines are integrated into one seamless system.
- Ruggedized laser technology allows for operational field deployment.

Enclosure Ruggedization

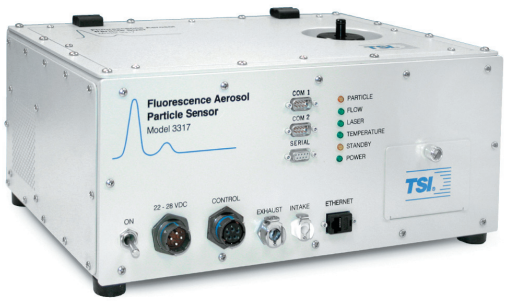
Dycor is prepared to work with a customer to further enhance the capabilities of the systems environmental enclosure. The enclosure can undergo a repackaging/ redesign process based on more stringent specifications, as desired by a customer. Military standard compliance (according to MIL-STD-810F and MIL-STD-461E or equivalents) can be facilitated for enhanced field operation and survivability in extreme environments and conditions, including:

- Armored protection
- Increased storage and operational temperature
- Solar Radiation Effects
- Driving Rain
- Humidity (Non Condensing)
- Corrosion Resistance
- Blackout/Night Operation
- Low Pressure (Altitude) - Transportation
- Sand and Dust
- Electromagnetic Compatibility
- Shock
- Vibration

C-FLAPS Components and Specifications:

Biological Trigger Unit - FLAPS III 3317-40

This instrument provides three real-time measurements of individual airborne particles. These correlated, single-particle measurements give the FLAPS III exceptional discrimination and interference rejection for biological threat detection applications. The FLAPS III measures, for each airborne particle between 0.8 μm and 10 μm, the scattered light intensity and the fluorescence emissions in two wavelength regions.



These simultaneous single-particle measurements enable end-users to distinguish biological particles from inanimate materials in real time.

Fluorescence and scattered-light signals are excited using a 405 nm laser diode, which provides high reliability and stability, and supports long service intervals. Fluorescence emissions are measured in two distinct wavelength bands by two highly sensitive photomultiplier tubes. Real-time data analysis using advanced alarm algorithm techniques provides exceptional discrimination and interference rejection for biological threat detection.

The FLAPS III technology was designed and developed for rapid detection of biological agents. During independent testing, the FLAPS III has been shown to be an extremely effective "trigger" device for detecting airborne particles with biological agent profiles. Within an integrated biological agent warning system, the FLAPS III serves as the fast-responding sensor to initiate sample collection and identification techniques to confirm or reject a biological threat condition. The FLAPS III technology was redesigned from the ground up as a rugged trigger, employed in harsh environmental conditions around the world. The fluorescence detection methodology is evolved from the Ultraviolet Aerodynamic Particle Sizer technology currently deployed by the US Army's Biological Integrated Detection system (BIDS) Program, and the FLAPS II technology currently used by the Canadian Department of National Defense and other biological threat detection programs worldwide.

FLAPS III also contains an embedded computer/controller module for providing FLAPS data buffering and processing, alarming algorithm, diagnostics, self tests, configuration, high speed communications, and XMX speed control interface.

High Volume Aerosol Particle Concentrator – XMX/2A

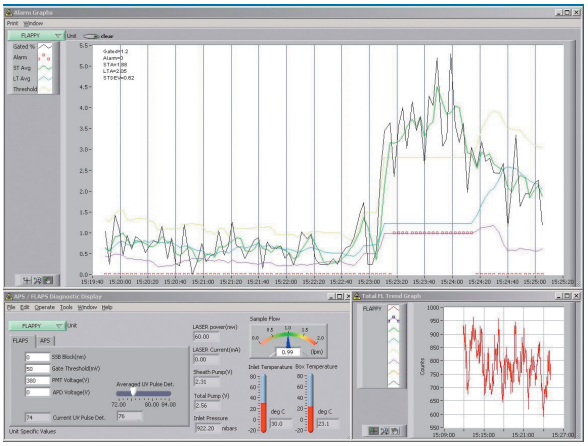
Dycor's XMX/2A particle concentrator is a three-stage concentrator, and collects particles ranging in size from 1 – 10 microns. This XMX, which is integrated into the C-FLAPS enclosure, is coupled to the FLAPS for efficient particle transfer. Dycor also provides a variable speed drive (0 – 350 SLPM), controlled through a software controllable interface, so that the operator can vary the amount of air/number of particles collected and passed to FLAPS through the CBNET software. The concentrator assembly is constructed for durability and ease of cleaning. Every concentrator is rigorously tested before delivery to meet or exceed Dycor's specified performance standard using our in-house aerosol containment chamber. Custom stack length can be ordered to accommodate different customer requirements and applications.

CBNET Proprietary Alarming and Control Software

As part of the integrated system, Dycor provides its own CBNET software which resides in two locations: 1) on the host PC/laptop, where the operator views all graphs, stores the data, and configures the instruments; and 2) on the embedded control computer resident on FLAPS, where the actual alarming algorithm runs, and where control software is used to control all of the instruments and multiplex the data back to the host PC.

The FLAPS software module reads data from FLAPS, logs all particle and fluorescence data, and provides real time display of the particle size, numbers and fluorescence data. The key component of this module is the alarming algorithm, which provides audible and visual alarms to the operator, based on a predefined set of parameters. The alarming algorithm allows customers to vary the parameters based on background conditions in order to minimize false alarms, while alarming when biological threats are present. This software has been used for research and development as well as military detection applications.

Dycor's CBNET software performs automated system diagnostics to ensure the system is functioning correctly. When the system is turned on, the software performs several system checks to ensure that communication is normal to all instruments and that they are in fact working correctly. The user is notified of errors on the host PC display to simplify maintenance. Additionally, an IBIT process can be initiated by the operator through CBNET's web interface.



CBNET is also capable of providing real-time location information, time stamped data based on a GPS-based system clock. Furthermore, a built-in TCP/IP server provides the user with the capability to connect CBNET to external third-party software programs, including command and control systems.

Communications

An Ethernet port allows customers worldwide to connect via cable or wireless radio based on their operational requirements. Additionally, as an option for the North American market, the C-FLAPS system can include an integrated FreeWave™ radio, which utilizes spread spectrum, frequency-hopping technology, and operates at 902-928 MHz, license-free. FreeWave™ radios have a 115kbaud maximum data rate, and can operate at up to 32 kilometers line-of-sight. Their frequency-hopping and robust characteristics are ideally suited for integration into military command, control and communications structures and deployment scenarios. Other wireless options exist for the European and Asian markets.

Global Positioning System

C-FLAPS incorporates a COTS based GPS OEM receiver module to provide data time stamping and location information. This GPS receiver is a civilian module and complies with the NMEA 0183 protocol standard. Its primary purpose is to provide data time stamping. Location information is a secondary feature but this receiver is not intended to provide the same level of accuracy as found on military GPS receivers.

Specifications:

Dimensions	Width: 57 cm, Height: 73 cm (with stack), Depth: 39 cm
Weight	34 kilograms
Power Requirements	100 - 240V AC, 50/60Hz
Power Consumption	200 W
Laser Source	Laser diode, 30mW at 405 nm
Communications	10BaseT Ethernet; Optional Spread-spectrum, frequency-hopping, 902 MHz, 115kbaud max. data rate, 32 km. max line of sight.
Intake Flow Rate	0 – 350 standard liters (maximum) per minute (SLPM) @ 110V/220V AC (variable speed), +/- 25 SLPM
FLAPS Aerosol Flow Rate Sheath Air Flow Rate	1 liter per minute 4 liters per minute
Particle Size Range	Between 1 – 10 microns
Temperature Range	0 - 45°C (FLAPS III internal), 0-40°C (system operating)
Environmental Enclosure	Protection from rain designed according to Mil-Std 810F section 506.4 Proc 1 and 3.

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