

A STATE OF THE ART INTEGRATED BIOLOGICAL, CHEMICAL & RADIATION WATER MONITORING SYSTEM

Model ~ UNITECT



REAL-TIME, AUTOMATIC, CONTINUOUS FLOW THROUGH SYSTEM

APPLICATIONS:

- MILITARY & CIVILIAN
- GROUND & SURFACE DRINKING WATER & WASTEWATER
- RESERVOIRS
- HIGH PROFILE BUILDINGS:
CONVENTION CENTERS, SPORTS
ARENAS, GOVERNMENT
ESTABLISHMENTS
- INDUSTRIAL CONTAMINANTS:
LABORATORY, POWER PLANT,
AGRICULTURAL, COMMERCIAL
INDUSTRIES
- RESIDUAL TREATMENT ADDITIVES

FEATURES	Select from List	BENEFITS
COMBINES MULTIPLE DETECTION GOALS INTO ONE MONITOR		All-in-One, Continuous, Real-Time, Automatic, On-Line Monitor
BIOLOGICAL DETECTION: (18) Measures with (4) or more different biosensors	18	No Reagents Required Except for Trace Metals
CHEMICAL DETECTION: (52) 7 or more major chemical tests provided or tailored to your needs including but not limited to: Turbidity, pH, Nitrates, Chlorine	52	Easy Installation & Integration into Facility Control Center
TRACE & HEAVY METALS: (17) Including but not limited to: Lead, Arsenic, Cadmium	17	Calibration Can be Customized for Specific Contaminants
RADIATION DETECTION: (6) Alpha, Beta, Gamma, Tritium, Radon, Radium	6	Customer Controlled Alarm Threshold
		Data Archive / Retrieval; SCADA Compatible
		Local & Remote Display, Control, & Communications



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OVERHOFF TECHNOLOGY

Divisions of  US NUCLEAR CORP

Ticker UCLE

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SYSTEM PHYSICAL PARAMETERS

MEASUREMENT	RANGE	SENSOR	MAINTENANCE	COMMENTS
FLOW TEMPERATURE	0.06 gpm – 2.0 gpm 32 -100 °F	Volumetric RTD Ceramic	None Periodic Calibration	10 – 36 VDC Input 10 – 36 VDC Input
PRESSURE	0 – 60 psi	Diaphragm	None	10 – 36 VDC Input

FLOW RATE:

STANDARD: 100 to 1,000 ml/minute
OPTIONAL - Wide range of flow rates available

SAMPLE TEMP: Up to 80 °F liquid.
OPTIONAL: Up to 115 °F

AMBIENT TEMP: 50° F - 100 °F (10° C – 37.7 °C)

OPTIONS: Cooler model: **Cool-33** for detector and samples with higher sample or ambient temperatures.

WEIGHT & DIMENSIONS:

CABINET: 29"W x 31"D x 59"H (Including Wheels)
CHEM PANELS: 36"W x 28"H (2 Each)
BIO PANELS: 28"W x 50"H
WHEELS: 5" Diameter, high Capacity, Rugged Wheels
With Lock & Rubber Tires
WEIGHT: Standard Unit: 300kg



CABINET SIDE VIEW



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STANDARD CHEMICAL SENSORS

MEASUREMENT	SENSITIVITY	RANGE	SENSOR METHOD	EPA BASIC STANDARDS	MAINTENANCE TIME - ACTION
TOTAL CHLORIDE	.5 mg/l	2-1000	Ion-Selective Electrode (ISE)	4 mg/l	Monthly Cleaning - 6 month sensor life
PH		0-14	PH electrode	6.5-6.5 (recommended non-enforceable)	Occasional Cleaning 5 year sensor life
CONDUCTIVITY	>0 uS/cm	>0-5000 uS/cm	Graphite Electrodes	n/a	Occasional Cleaning 5 year sensor life
TURBIDITY	>0 FNU	>0-3000 FNU	Optical Sensor	.3 FNU	Occasional Cleaning 3 year sensor life
NITRATE	2 mg/l	2-100 MG/L	Ion-Selective Electrode (ISE)	10 mg/l	6 Month Life of sensor tip
OIL IN WATER CRUDE REFINED		0-1500 ppb 0-20ppm	Fluorometer		Cleaning every 3-6 Months



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OPTIONAL CHEMICAL SENSORS

CHEMICAL	CHEMICAL	CHEMICAL
UV254/SAC254 (Light Absorbed by Organic Compounds)	HAA (Haloacetic Acid)	PHOSPHORUS
ALKALINITY	HARDNESS	POLYMERS
AMMONIUM (NH ₄ -Cation)	HYDROGEN PEROXIDE (H ₂ O ₂)	POTASSIUM (K)
BTEX (Benzene, Ethylbenzene, Toluene, Xylene)	MANGANESE (Mn)	SALINITY (EC Electrical Conductivity)
BTX (Benzene, Toluene, Xylene)	MONOCHLORAMINE	SILICA
CHLORIDE (Cl ⁻) - STANDARD	NITROGEN (N)	SOAPS
CHLORINE (Cl)	NITRATE (NO ₃) - STANDARD	SODIUM (Na)
CHLORINE (Free / Total Cl)	NITRITE (NO ₂)	SULFATE (Surfactants)
COD (Chemical Oxygen Demand)	OXYGEN (O ₂)	TDS (Total Dissolved Solids) - STANDARD
COLOR	TRIOXYGEN / OZONE (O ₃)	TDG (Total Dissolved Gases)
CONDUCTIVITY - STANDARD	OIL IN WATER (Refined / Crude) - STANDARD	THM (Trihalomethanes)
CYANIDE	OXIDANTS (Chlorine, Chlorine Dioxide/Ozone)	TOXICITY
DIESEL FUEL	PARTICLE COUNTING	TSS (Total Suspended Solids)
DISINFECTANTS	PERMANGANATE (KMnO ₄)	TURBIDITY - STANDARD
DYES	pH	UV ABSORPTION (Spectral Fingerprint)
FATTY ACIDS	PH/ORP	THM (Trihalomethanes)
FLUORIDE (F ⁻)	PHENOL (C ₆ H ₅ OH)	
HYDROGEN SULFIDE (H ₂ S)	PHOSPHATE	



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RADIATION SENSORS

DETECT	PAG LEVEL	LOWER LIMIT of SENSITIVITY	TOP OF RANGE	SENSOR / METHOD USED	TIME	MAINTENANCE for finished water
					TIME	ACTION
Alpha	U-238 3,000 pCi/l			5" dia. Dual PM Tube crushed scintillation bed of crystals	3 mo	Replace particulate filter cartridge
30 min 24 hr		25,000 pCi/l 3,000 pCi/l	2 x 10 ⁷ pCi/l			
Beta	K-40 30,000 pCi/l			5" dia. Dual PM Tube 1000ml chamber	3--6 mo	Replace particulate filter cartridge
30 min 24 hr		30,000 pCi/l 10,000 pCi/l	2 x 10 ⁷ pCi/l	1100cm ² Beta Scintillator		
Gamma	Co-58 30,000 pCi/l			MultiChannelAnalyzer Smart peak detection software	3--6 mo	Simple MCA check
30 min 24 hr		20,000 pCi/l 5,000 pCi/l	2 x 10 ⁷ pCi/l	75x75mm NaI(Tl) Crystal		
OPTIONS:		LOWER LIMIT	TOP OF RANGE			
DETECT						
Tritium		20,000pCi/l	1 x 10 ⁶ pCi/l	crushed scintillation bed of crystals		Replace ion exchange cartridge
Radon		100pCi/liter	2000pCi/liter		1-3 mo	Clean or replace vapor trap
PRE-CONDITION						
Expel Radon						Clean or replace vapor trap



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STANDARD BIOLOGICAL SENSORS

Water may contain biological material or organisms such as bacteria, spores, protozoa, algae the UNITECT will provide useful quantitative data.

MEASURE	SENSITIVITY	RANGE	SENSOR METHOD	EPA BASIC STANDARDS	MAINTENANCE TIME - ACTION
TOTAL DISSOLVED SOLIDS (TDS)	>0 g/l	0-65 g/l	Graphite Electrode	500 mg/l	Occasional Cleaning 3 year sensor life
OXYGEN REDUCTION POTENTIAL (ORP)		-999 to 999 mV	PH electrode	n/a	Occasional Cleaning 5 year sensor life
TOTAL ORGANIC CARBON (TOC)	>0 mg/l	>0-400 mg/l		n/a	
ALGAE (BLUE-GREEN)	>0 ug/l	>0-500 ug/l	Fluorometer	n/a	Cleaning every 3-6 Months
COLIFORM COUNTS (TOTAL FECAL & E-COLI BACTERIA)	1 count/100 ml	1-100 count/ml	Combination Fluorescence and turbidity sensors plus thermistor	0 counts (based on testing procedure)	Cleaning every 3-6 Months

OPTIONAL BIOLOGICAL DETECTION LIBRARY

BIOLOGICAL DETECTION	BIOLOGICAL DETECTION
ACTIVATED SLUDGE	COLORED DISSOLVED ORGANIC MATTER (CDOM)
ASSIMABLE ORGANIC CARBON (AOC)	DISSOLVED ORGANIC CARBON (DOC)
ADENOSINE TRIPHOSPHATE (ATP)	FLUORESCENT DISSOLVED ORGANIC MATTER (fDOM)
BACTERIA CELL COUNTER	MICROBIAL BIOFILM
BLACK LIQUOR (Paper Mill Effluent)	OPTICAL BRIGHTNESS
BIOCHEMICAL OXYGEN DEMAND (BOD)	OXIDATION REDUCTION POTENTIAL – REDOX (ORP) -STANDARD
CHLOROPHYL	TOTAL DISSOLVED OXYGEN (TDO)
	TRYPTOPHAN (Amino Acid)



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OPTIONAL ~ TRACE & HEAVY METALS LIBRARY

Measuring trace metals and heavy metals requires automatic injection of chemical reagents.

TRACE METAL	TRACE METAL
ALUMINUM (Al)	LEAD (Pb)
ARSENIC (As)	MERCURY (Hg)
BARIUM (Ba)	NICKEL (Ni)
BORON (B)	SELENIUM (Se)
CADMIUM (Cd)	TRACE METALS (In General)
CHROMIUM VI (Cr6 / Hexavalent Chromium)	URANIUM (U)
COBALT (Co)	VANADIUM (V)
COPPER (Cu)	ZINC (Zn)
IRON (Fe)	



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ALARM SET SCREEN

This screenshot allows the user to set all "Alarm Set Points" for all Detector Chambers.



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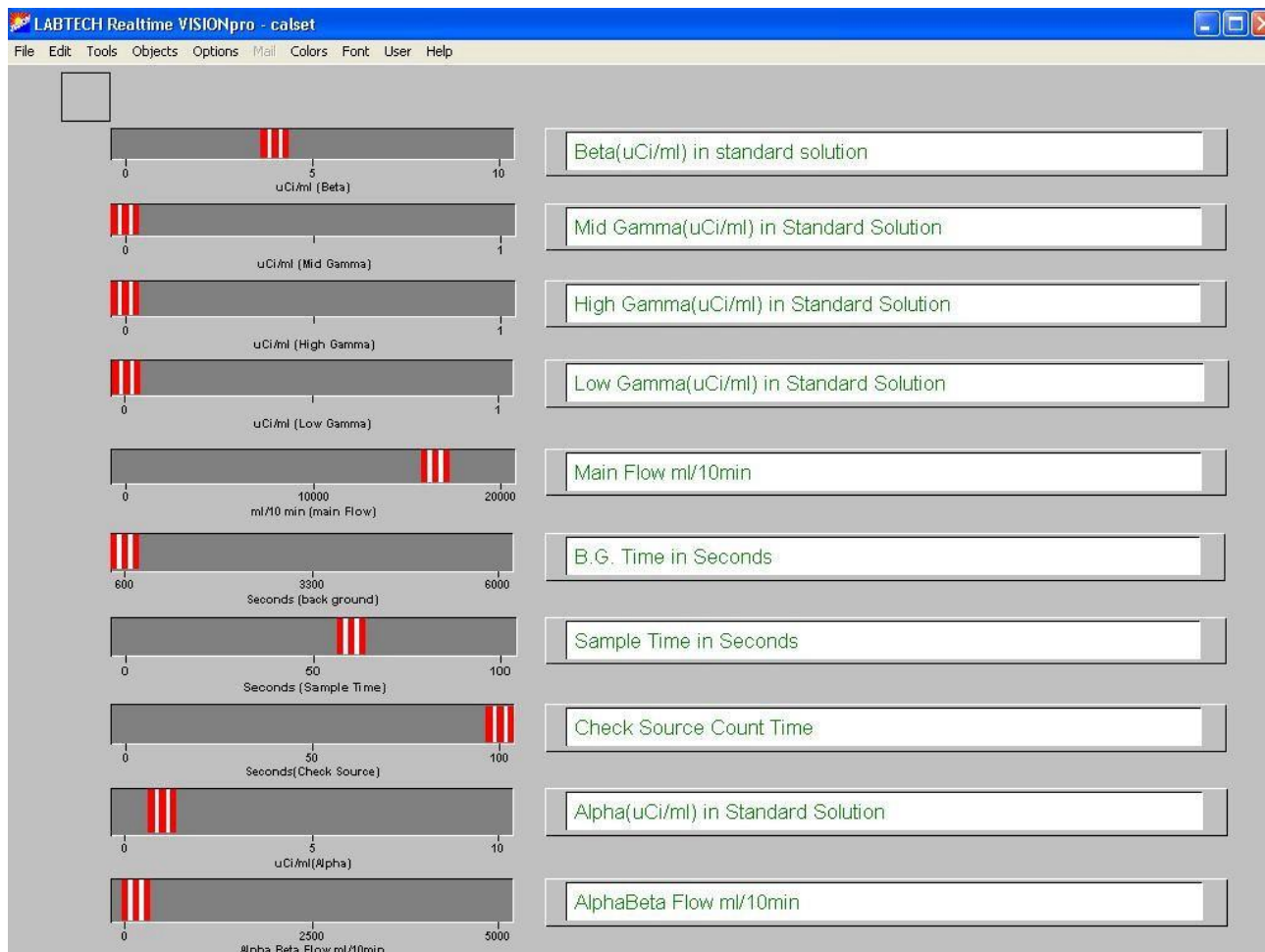
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CALIBRATION SET SCREEN

This screenshot displays & finds both Background & Source Counts, and sets Parameters.



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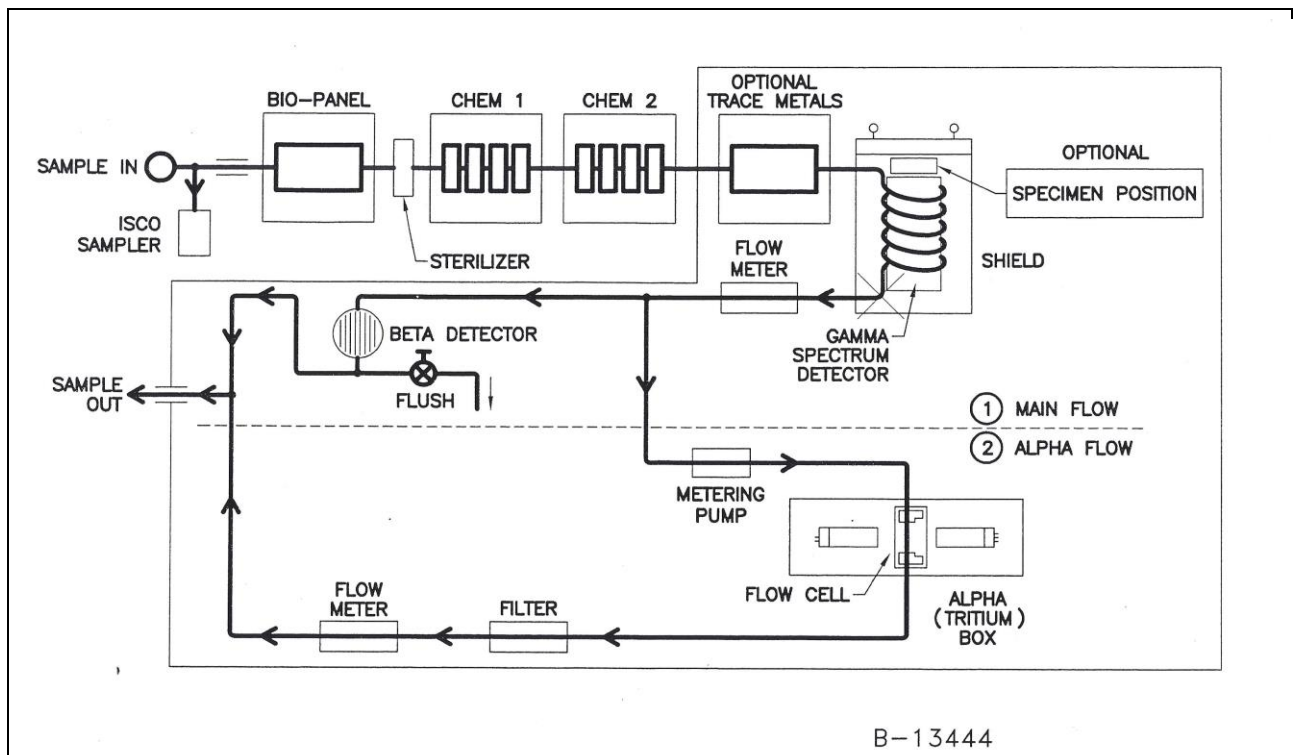
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UNITECT FLOW CHART For Biological, Chemical & Radiation Detection



UNITECT FLOW CHART



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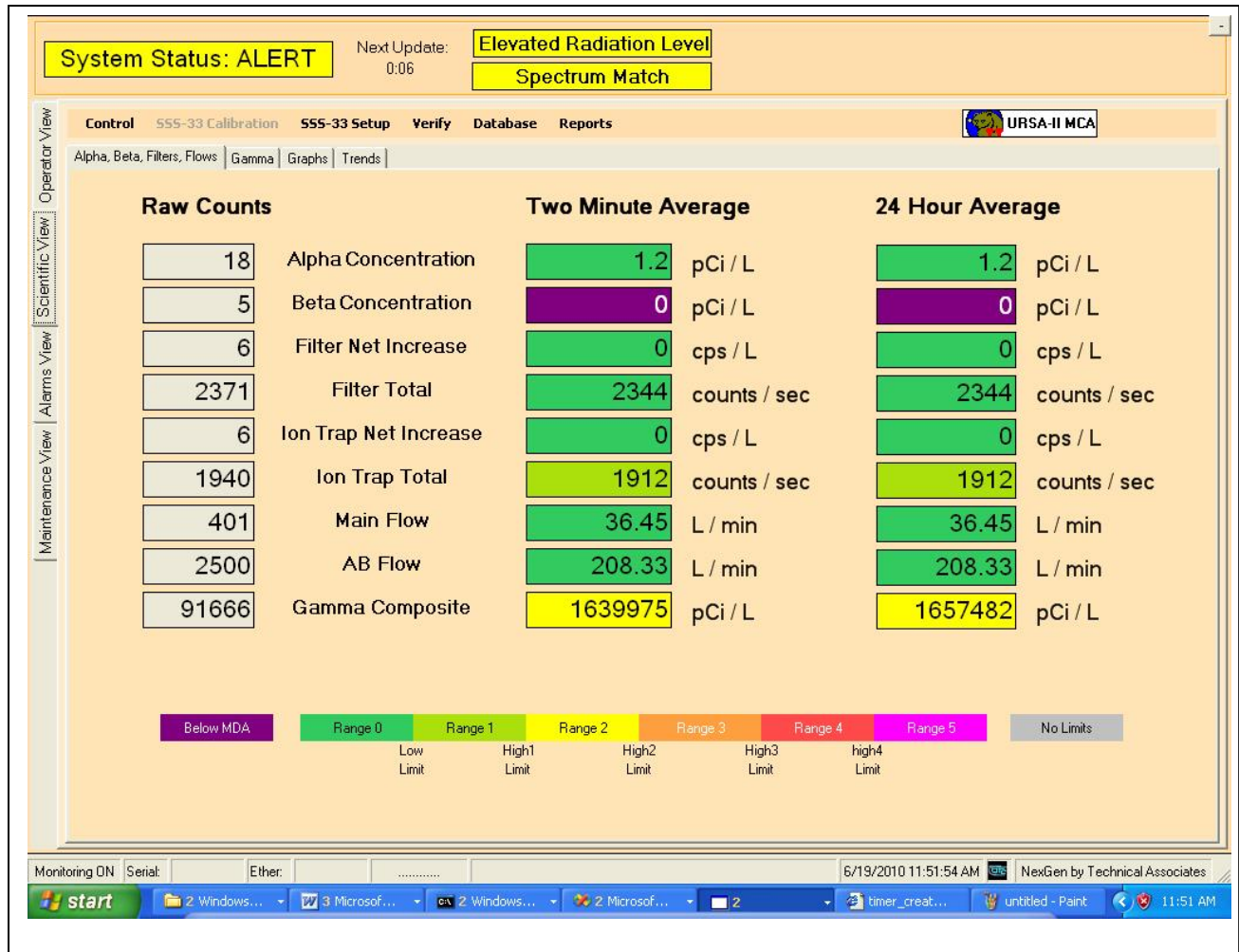
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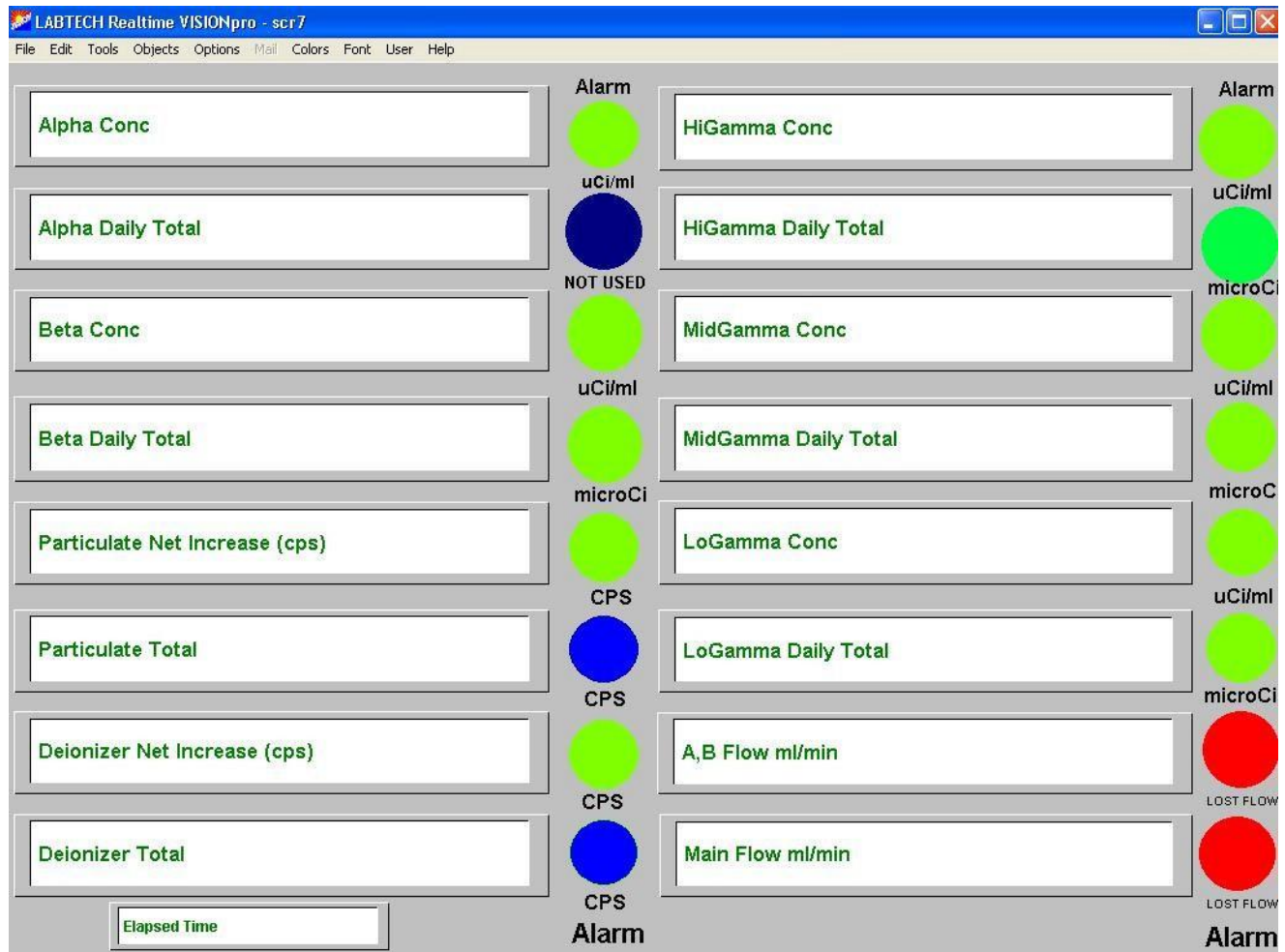
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OPERATION SCREEN

This screenshot displays & finds both Background & Source Counts, and sets Parameters



UNITECT combines several detection goals into a single monitor.

- The **UNITECT** continuously monitors radionuclides using both ion exchange resin beads and charcoal filter.
- Biologicals, Chemicals, and optional trace metals are monitored with detectors integrated within the **UNITECT** system. Monitoring will be tailored to specific needs upon request.
- Measurements are logged 24 hr/day - 7 day/week, with alarm capability and a universal read out adaptable to mainframe infrastructure computers.



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