

Scential SL50











Compact Air Quality and odour Monitoring Station



SCENTROID
Future of Sensory Technology

(ES) Equipements Scientifiques SA - Département Bio-tests & Industries - 127 rue de Buzenval BP 26 - 92380 Garches
Tél. 01 47 95 99 90 - Fax. 01 47 01 16 22 - e-mail: bio@es-france.com - Site Web: www.es-france.com

Contents

	1. Scentinal Overview	2
	2. Scentinal Features	6
	3. Scentinal Data Server and Communication Protocol.....	17
	4. Odour Monitoring.....	21
	5. Total Odour Management (TOMS)	23
	6. Scentinal Accessories	25
	7. Scentinal Application (Industries and Recommended Sensors)	26
	8. Installation, Maintenance and Operation Cost	31
	9. After-Sale Support	34
	10. Scentinal	35

1. Scential Overview

1.1 An Intelligent Odour & Air Quality Monitoring Station

Scential uses up to 20 sensing modules ranging from Photo-Ionization Detector, Non-Dispersive Infrared Detector, Electro-Chemical Cell, Laser Scattered Counter and Metal Oxide Sensors. All data is stored locally and sent to the central server accessible by the user. The Sensor Information Management System is used to not only store and display monitoring results but also provide remote configuration, calibration, and diagnosis of multiple Scential units.

Scential is a simultaneous ambient pollutant and odour emission monitoring system based on high accuracy (ppb level) sensing technology. Scential can provide continuous monitoring of odorous gases such as H₂S, Ammonia, VOCs, and SO₂ as well as non-odorous gases such as CO₂ and Methane.



1.2 An Intelligent Process Controller

Scentinal is more than just a monitoring station, it can also act as an intelligent process controller. Scentinal is equipped with up to three optional programmable relays that can be used to activate alarms, mitigation technology, and any other electrical device based on monitored parameters. For example, the Scentinal can be used to measure emissions from the exhaust of a bio-scrubber and bypass carbon polishing filter if odour levels are below set limits, or activate misting stations if odour levels at perimeter are exceeding 5 OU/m3. The possibilities are endless!

SET ALARM

ACTIVATE
FILTER

ACTIVATE
FANS

SEND SMS

SPRAY
NEUTRALIZER

BYPASS
CARBON
FILTER

1.3 The Most Easy to Use AQ Station



Scentinal is easy to setup and use. Each Scentinal comes pre-loaded with a SIM card so all you have to do is mount it to a wall or a pole and power the unit up. Scentinal will detect its location using built-in GPS, and start transmitting to the central server. All configuration and maintenance can be done on the on-unit 7" touch screen monitor or remotely through the SIMS software. (To know more about SIMS software check page 17)

1.4 The Most Affordable Solution

Scentinal is extremely affordable. At a fraction of the cost of a traditional air quality station, Scentinal can provide pollutant and odour emission data that would be critical in meeting your environmental objectives. In addition to an affordable purchase price, Scentinal has minimal operating cost. Just electricity and GPRS data (GPRS costs are less than \$100 per year). Add to that Scentroid's unparalleled 2 year comprehensive warranty, covering all aspects of the instrument including even sensors, and Scentinal becomes the most affordable solution for continuous pollutant and odour monitoring in the world!



1.5 Scentinal Specifications

Product Name	Scentinal SL50
Maximum # of Sensors	20
Type of sensors	PID, NDIR, EC, Laser Particulate counter, and MOS
Sampling rate	Adjustable from 0.5 to 999 min
# of Sampling ports	1 to 3
Weight	77 LB
Size	24" x 20" x 8"
Power requirements	100-240V 50/60HZ 2A
Power Consumption	30W without AC - 150W with AC
Communication	GPRS (Default), LAN (Default), WIFI (optional)
On-Board Data storage	64GB - SD Card
Cloud Server	Included by Default
Local Server	Optional
On-Board Server	Included by Default
User Interface	7" touch screen on Panel door and Remote access Sensor Information Management System
Ambient Temperature range	0 to 35 °C without AC system -50 to +50 °C with Heating and AC system
Sample conditions	-50 to +50°C and 10 – 90% RH without pre-dilution system -50 to 120°C and 0 – 100% RH with pre-dilution system
Decontamination	Automated procedure using oxidization technology
Calibration	Manual using calibration gas and On-board screen Optional automatic calibration using built in calibration gas
Warranty	24 Months full warranty on all parts including sensors
Sensor replacement frequency	Sensor dependant – first 2 years covered by warranty
Software	Sensor Information management System – free access for life of product
Cabinet	NEMA 4X
Mounting hardware	Wall and pole mounting hardware included



2. Scentinal Features

2.1 Reliability through 300% Redundancy

Scentinal provides 3 levels of redundancy through:

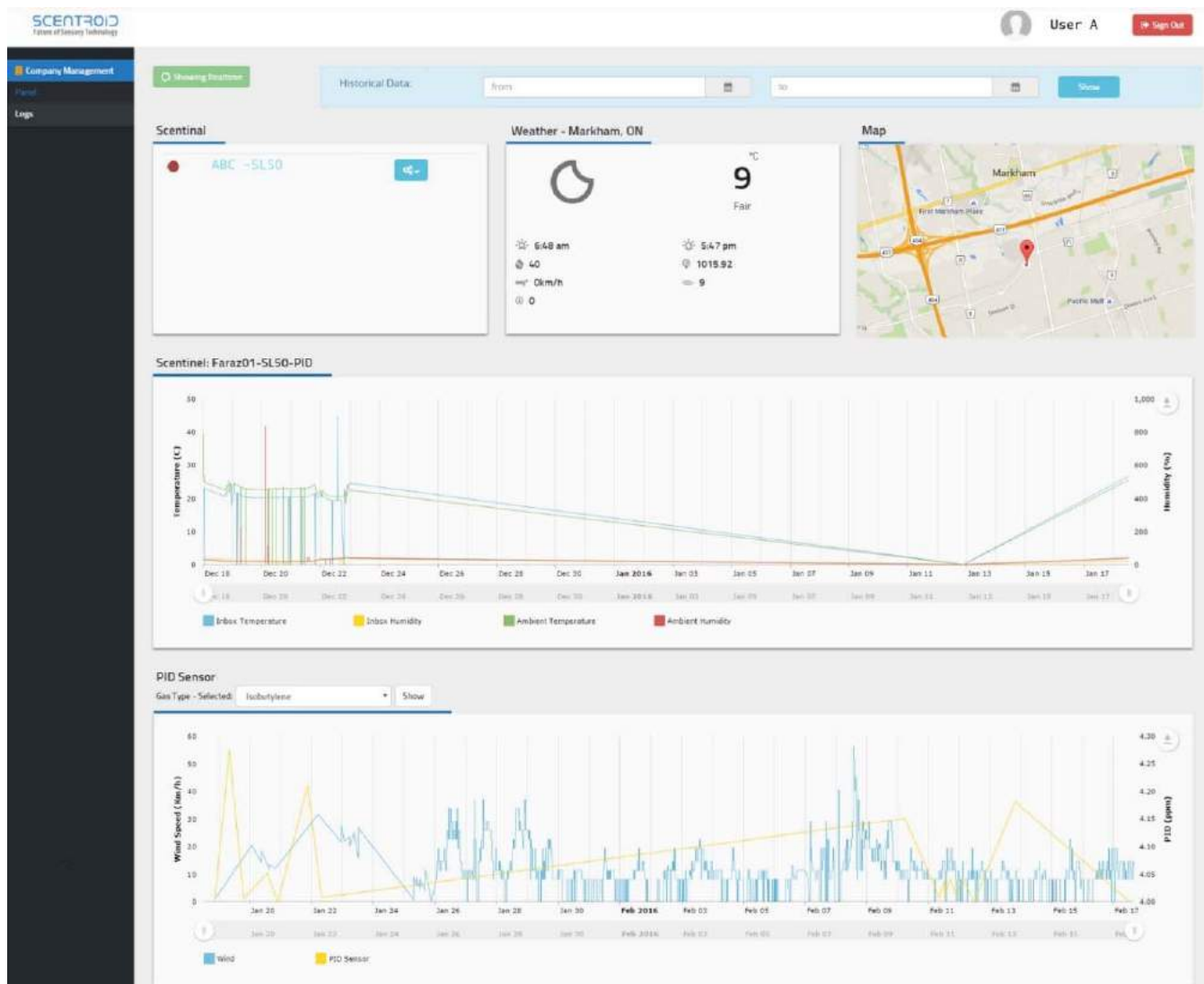
- a) Storage of all data on SD card
- b) Transmission and storage of data on the on-board server
- c) Transmission and storage of data on cloud/localized Server

2.2 Each Scentinal is also a Server

Standard on each Scentinal is a separate dedicated micro-computer acting as an on-device server to run Scentroid's Sensor Information Management System. Through the 7" touchscreen, users are able to view historical data, change system configuration, recalibrate the instrument, and provide real-time diagnostics.

The Scentinal on-device server is capable of storing data locally for up to 5 years. This data can be polled by the central station as required and if the system communication is lost then the system can recover without any data lost. In fact it is entirely possible to run Scentinal with no external server. The system is password protected to ensure only authorized users have access to critical system parameters. The on-device server not only provides additional redundancy but also makes the system extremely easy to use.





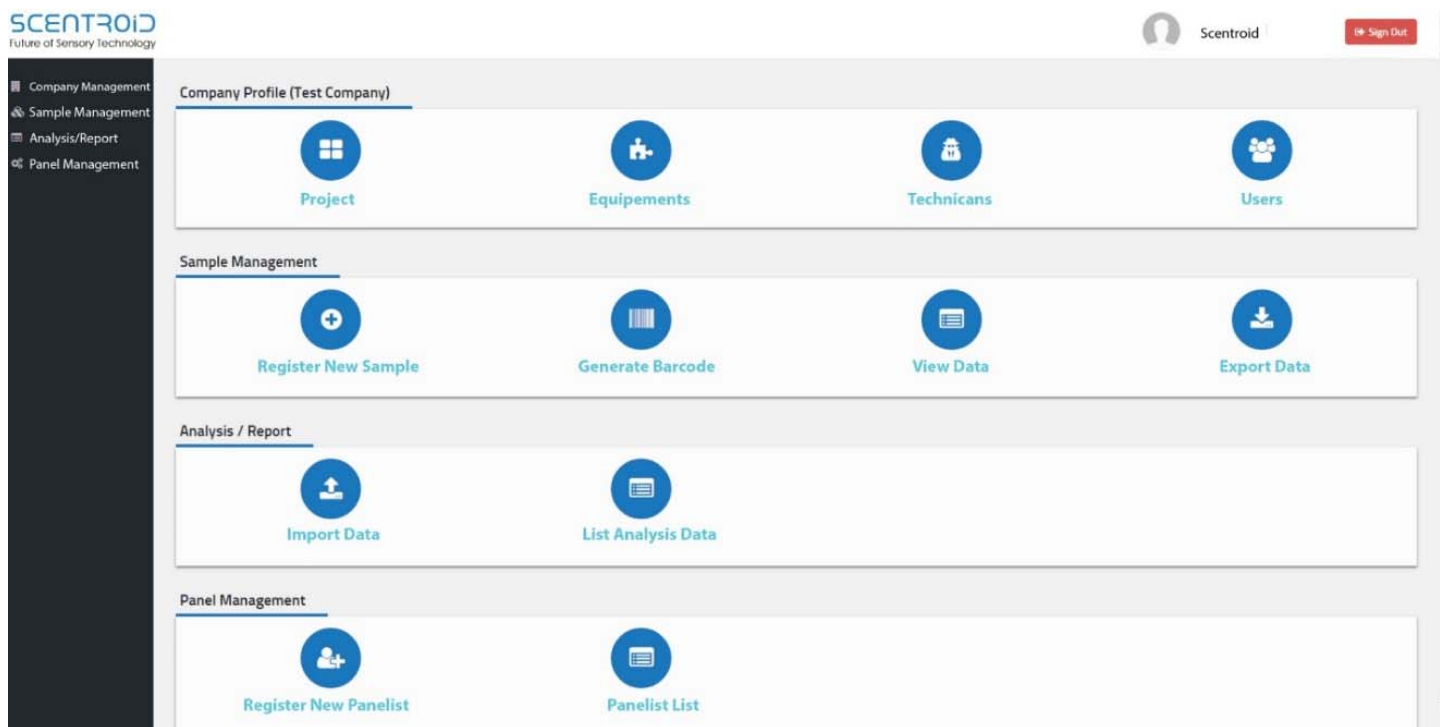
2.3 Scentinal for Process Control



In addition to email and SMS alarms, every Scentinal is equipped with 3 industrial relays of up to 20 Amps that can be used to control a variety of equipment. For example Scentinal can be used to:

1. Provide visual and audible alarms
2. Engage odour control technologies such as misting systems when fence line pollutants levels exceed limits
3. Secondary polishing filter only when needed to reduce operating costs.
4. Activate external sampling pump for bag sampling.

The limits and conditions for engagement of each relay can be set based on pollutants or total odour units. All limits and activation conditions are done through SIMS via remote server or on-device touch screen.



2.4 Automated Decontamination for Maintenance free Operation

Scentinal uses a new method of decontamination to ensure accurate reading even at ppb levels. Periodically (interval is set through remote SIMS software or on-device server) the system injects carbon filtered air into the sample line to measure contamination. If contamination is detected, Scentinal will start its ozone generator and flush the lines, pumps, and sensors with ozone and hydroxyl. These reactive molecules will destroy all bacteria, mold, and pollutants. Scentinal will then inject carbon filtered air again and ensure the contamination has been dealt with. This means that once installed, Scentinal is virtually maintenance free.

2.5 Flexible Sensing and Modular Design



The Scentinal product can be equipped with up to 20 sensors from the extensive sensor list (Sensor list are on page 15). There are 5 categories of sensors including:

1. Photo-Ionization Detector,
2. Non-Dispersive Infrared Sensor,
3. Electro-Chemical Sensor,
4. Laser Scattered Counter (for PM1-10), and
5. Metal Oxide Sensor.

Each Scentinal can be customized with the exact sensors required for the application at hand. Our flexible pricing means you pay for exactly what you need.



2.6 Installation and Connectivity

Each Scentinal has a micro controller capable of recording the unit's exact GPS position. This position is sent to the central server with each data transfer. At the time of the installation the technician simply needs to place the Scentinal unit and power it on. The central computer will automatically recognize the Scentinal unit and know of its exact location. To reconfigure the network the physical sensor can be moved and the system will learn and adapt to this change. Multiple Scentinal units can be configured within one monitoring area. The connectivity is flexible and secure using one of the following options:

- ✓ Encrypted transfer over GPRS
- ✓ WIFI
- ✓ LAN
- ✓ Analog/SCADA

The system can either connect to a local server or Scentroid's cloud based SIMS server. Cloud based SIMS server is included and free for the life of the Scentinal. It is even possible to operate Scentinal with no centralized servers thanks to its on-board server. (To know more about SIMS please check page 17)



2.7 Prepaid GPRS SIM CARD Included

Each unit comes complete with a prepaid GPRS SIM card. The unit comes pre-configured with all necessary information to transmit data to the central server. Data transfer costs are fully covered for the first year. Once powered, the instrument will determine its location using a built in GPS receiver and start transmitting data to the closest SIMS server.



2.8 Portability

The small form factor and low weight of the Scentinal makes it easy to transport and install. Scentinal weighs just 10 Kg and can be setup in a matter of minutes.

- ✓ Easy to use
- ✓ Portable
- ✓ Quick to setup



2.9 Multiple Sampling Port

Scentinal can be equipped with up to 3 sample ports to allow the unit to measure pollutants from different process points or locations. For example Scentinal can be setup to record input and output of a bio trickling filter to provide live efficiency calculations. The $\frac{1}{4}$ " sample ports can be outfitted with ambient sampling hoods or be directly connected to a PTFE line.



2.10 Noise Monitoring



In addition to gas and particulate monitoring, Scentinal can also be equipped with outdoor Class 1 noise sensor. No additional equipment are required to measure and record ambient noise. Integrated automatic calibration make Scentinal convenient and accurate. Measurement range is from 30 to 100 dB (A).

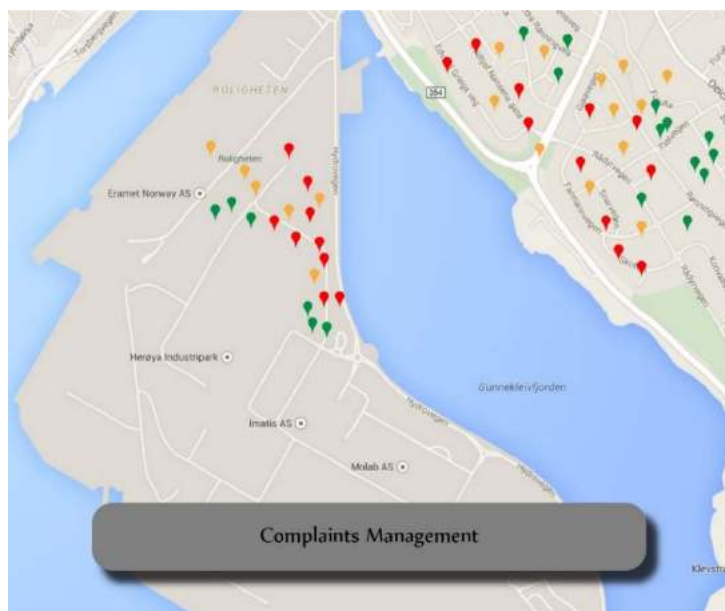
2.11 Wind Sensor



Scentinal can be equipped with on-board wind direction and wind speed sensor. This information can be used to determine localized wind conditions such as turbulence and down drafts. Scentroid offers either ultrasonic or cup and vane wind sensors to fit any application and budget. For gathering meteorological data, Scentroid provides an independent weather station that can be installed in accordance to USEPA guidelines. The Scentroid weather station is equipped with its own communication module and will seamlessly integrate with Scentinal in the SIMS local or cloud based software.

2.12 Integration with Total Oodour Management System Software (TOMS)

The second stage of implementing a Scentinal sensing system is to input the data into Scentroid's real-time dispersion modeling software TOMS. TOMS offers a complete, integrated suite for odour management. The system provides a perfect integration of real-time odour impact estimation with management of odour complaints from neighbouring residents. The simple to use software uses Scentinal sensory data, in field-olfactometry and live weather data to produce real time odour plumes showing you the exact location and level of odour emissions. Neighbouring complaints are automatically logged and compared to odour emissions for fast and efficient validation. The system will even provide forecasting of when and where next odour episodes will be allowing the plant to optimize its operation



2.14 Scentinal Sensor List

#	Sensor ID	Type	Chemical	Maximum Detection Limit	Lowest Detection Threshold	Resolution (ppm)	Cross sensitivity
1	CD1	NDIR	Carbon Dioxide - High Concentration	5%, 20% and 100%	20 ppm	100, 2000, 10000 ppm	NONE
2	CD2	NDIR	Carbon Dioxide - Low Concentration	5000 ppm	0 ppm	15 ppm	NONE
3	CO1	EC	Carbon Monoxide (low Concentration)	500 ppm	15 ppm	5 ppm	H2 <10%
4	CO2	EC	Carbon Monoxide (high concentration)	10000 ppm	250 ppm	20 ppm	H2 <10%
5	C11	EC	Chlorine	20 ppm	200 ppb	20 ppb	H2S, NO2
6	E1	EC	Ethylene Oxide	100 ppm	1 ppm	0.1 ppm	H2S, NO, C2H4
7	H1	EC	Hydrogen	5000 ppm	1 ppm	0.8 ppm	C2H4
8	HCL1	EC	Hydrogen Chloride	100 ppm	0.1 ppm	0.1 ppm	H2S, NO2, CL2
9	HCY1	EC	Hydrogen Cyanide	100 ppm	0.1 ppm	0.1 ppm	H2S, NO2
10	AM1	EC	Ammonia	100 ppm	0.5 ppm	0.3 ppm	H2S, NO2, CL2
11	ON1	EC	Oxidizing Gases Ozone and Nitrogen Dioxide	O3- 20; NO2- 20 ppm	20 ppb	15 ppb	H2S, CL2
12	PH1	EC	Phosphine (low Concentration)	10 ppm	50 ppb	30 ppb	H2S, C2H4,
13	PH2	EC	Phosphine (high Concentration)	2000 ppm	5 ppm	2 ppm	H2S, C2H4,
14	HS1	EC	Hydrogen Sulfide (low Concentration - ppb)	1 ppm	3 ppb	1 ppb	CL2<20%
15	HS2	EC	Hydrogen Sulfide (high Concentration - ppm)	2000 ppm	1 ppm	1 ppm	CL2<20%
16	E2	MOS	Organic solvents (Ethanol, Iso-Butane, H2)	500 ppm	0 ppm	1 ppm	Benzines <20%
17	MT1	NDIR	Methane (LEL)	100 % LEL (25000 ppm)	500 ppm	200 ppm	Methane, propane,
18	NC1	EC	Nitric Oxide - NO - (low Concentration)	20 ppm	15 ppm	5 ppb	None
19	NC2	EC	Nitric Oxide - NO (High Concentration)	5000 ppm	2 ppm	1 ppm	None
20	ND1	EC	Nitrogen Dioxide (Low Concentration)	20 ppm	0.03 ppm	0.02 ppm	H2S, CL2,
21	ND2	EC	Nitrogen Dioxide (high Concentration)	200 ppm	0.3 ppm	0.1 ppm	H2S, CL2,
22	O1	EC	Oxygen	20%	0.01%	0.01%	NONE
23	O2	EC	Oxygen	100%	0.20%	0.10%	NONE
24	PD1	PID	Total VOCs (ppb) - PID	50 ppm (isobutylene)	0 ppm	1 (ppb isobutylene)	All VOCs
25	PD2	PID	Total VOCs (ppm) - PID	300 ppm (isobutylene)	1 ppm	0.1 (ppm isobutylene)	All VOCs
26	SD1	EC	Sulfur Dioxide (high Concentration)	2000 ppm	0.5 ppm	0.5 ppm	NO2, CL2
27	SD2	EC	Sulfur Dioxide (low Concentration)	20 ppm	10 ppb	5 ppb	NO2, CL2
28	FM1	EC	Formaldehyde	10 ppm	0.01 ppm	0.01 ppm	Ethanol
29	PM 1-10	Laser Scattered	Particulate PM 1, 2.5, 10 (simultaneous)	10,000 Particles/Sec	PM 1	N/A	NA
30	MS1	MOS	General Purpose Odours (VOCs)	1000 ppm isobutanol	0.5	0.5	VOCs and Solvents
31	MS2	MOS	TRS and Amines	3 ppm (Methyl Mercaptan)	10 ppb	10 ppb	Trimethyl Amine, Methyl Mercaptans, H2S, other
32	MS3	MOS	Air Contaminants (ammonia, Ethanol, Toulene)	3 ppm (ammonia)	10 ppb	10 ppb	ammonia, Ethanol, Toulene
33	MS4	MOS	Ammonia	300	10	0.5	Ammonia, H2S, Ethanol

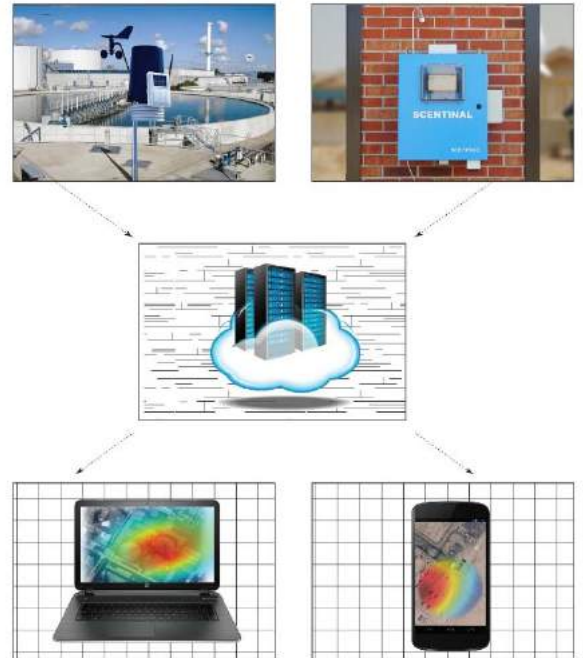
#	Sensor ID	Type	Chemical	Urban	Odour	WWT	Industrial	Safety	Process Co.	Agri	IAQ	Compost	Combustion	Industry	Expected Life (years)	Warmup Time (Min)	Response Time (Sec)
1	CD1	NDIR	Carbon Dioxide - High Concentration	-	-	-	-	✓	✓	-	-	-	✓	Safety/Combustion/ process control	5	30	40
2	CD2	NDIR	Carbon Dioxide - Low Concentration	✓	-	-	✓	-	-	-	✓	-	-	Urban, Industrial, IAQ	5	30	40
3	CO1	EC	Carbon Monoxide (low Concentration)	✓	-	-	✓	-	-	-	✓	-	-	Urban, Industrial, IAQ	2	45	25
4	CO2	EC	Carbon Monoxide (high concentration)	-	-	-	-	✓	✓	-	-	-	✓	Safety/Combustion/ process control	2	45	25
5	C11	EC	Chlorine	-	-	-	✓	✓	-	-	-	-	-	Industrial, Safety	2	120	60
6	E1	EC	Ethylene Oxide	-	-	-	✓	✓	-	-	-	-	-	Industrial, Safety	2	120	200
7	H1	EC	Hydrogen	-	-	-	✓	✓	-	-	✓	-	-	Industrial, Safety, IAQ	2	120	80
8	HCL1	EC	Hydrogen Chloride	-	-	-	✓	✓	-	-	-	-	-	Industrial, Safety	1	120	200
9	HCY1	EC	Hydrogen Cyanide	-	-	-	✓	✓	-	-	-	-	-	Industrial, Safety	1	120	120
10	AM1	EC	Ammonia	-	✓	✓	✓	✓	-	-	-	-	-	Odour, WWTP, Industrial, Safety	1	180	60
11	ON1	EC	Oxidizing Gases Ozone and Nitrogen Dioxide	✓	-	-	✓	✓	✓	-	-	-	-	Industrial, Urban, Safety, Process control	2	60	35
12	PH1	EC	Phosphine (low Concentration)	-	-	-	✓	✓	-	-	-	-	-	Industrial, safety	2	60	30
13	PH2	EC	Phosphine (high Concentration)	-	-	-	✓	✓	-	-	-	-	-	Industrial, safety	2	60	30
14	HS1	EC	Hydrogen Sulfide (low Concentration - ppb)	✓	✓	✓	✓	-	-	-	✓	-	-	WWTP, Odour, IAQ, Urban, Industrial	2	180	55
15	HS2	EC	Hydrogen Sulfide (high Concentration - ppm)	-	-	✓	-	✓	-	-	-	-	-	Safety, WWTP	2	180	55
16	E2	MOS	Organic solvents (Ethanol, Iso-Butane, H2)	-	✓	-	✓	-	-	-	-	✓	-	Industrial, Odour, Compost	1	30	10
17	MT1	NDIR	Methane (LEL)	-	-	-	✓	✓	✓	-	-	-	✓	Safety/Combustion/Inprocess control, Industrial	>3 years	30	40
18	NC1	EC	Nitric Oxide - NO (low Concentration)	✓	-	-	✓	-	-	-	✓	-	-	Urban, IAQ, Industrial	2	120	45
19	NC2	EC	Nitric Oxide - NO (High Concentration)	-	-	-	✓	✓	✓	-	-	-	-	Industrial, safety, Process control	2	120	45
20	ND1	EC	Nitrogen Dioxide (Low Concentration)	✓	-	-	✓	-	-	-	✓	-	-	Urban, IAQ, Industrial	2	120	70
21	ND2	EC	Nitrogen Dioxide (high Concentration)	-	-	-	✓	✓	✓	-	-	-	-	Industrial, safety, Process control	2	120	70
22	O1	EC	Oxygen	✓	-	-	✓	✓	-	-	✓	-	-	IAQ, Safety, Industrial, Urban	2	60	35
23	O2	EC	Oxygen	-	-	-	-	✓	✓	-	-	-	-	Process control, Safety	2	60	35
24	PD1	PID	Total VOCs (ppb) - PID	✓	✓	✓	✓	-	-	-	✓	-	-	WWTP, Odour, IAQ, Urban, Industrial	5*	5	3
25	PD2	PID	Total VOCs (ppm) - PID	-	-	-	✓	✓	-	-	-	-	-	Safety, Industrial	5*	5	3
26	SD1	EC	Sulfur Dioxide (high Concentration)	-	-	-	✓	✓	-	-	-	-	-	Safety, Industrial	2	120	40
27	SD2	EC	Sulfur Dioxide (low Concentration)	✓	-	-	✓	-	-	-	✓	-	-	Urban, IAQ, Industrial	2	120	40
28	FM1	EC	Formaldehyde	-	-	-	✓	✓	-	-	✓	-	-	IAQ, Safety, Industrial,	3	60	20
29	PM 1-10	Laser Scattered	Particulate PM 1, 2.5, 10 (simultaneous)	✓	-	-	✓	-	-	-	✓	-	-	Urban, IAQ, Industrial	>5 years	NA	NA
30	MS1	MOS	General Purpose Odours (VOCs)	-	✓	-	-	-	-	-	-	-	-	Odour	1	30	10
31	MS2	MOS	TRS and Amines	-	✓	✓	-	-	-	-	-	-	-	Odours, WWTP	1	30	10
32	MS3	MOS	Air Contaminants (ammonia, Ethanol, Toulene)	-	✓	✓	✓	-	-	-	-	-	-	Odours, WWTP, Industrial	1	30	10
33	MS4	MOS	Ammonia	-	-	-	✓	-	-	✓	-	-	-	Agricultural, Industrial	1	30	10

3. Scentinal Data Server and Communication Protocol

3.1 Cloud Based Hosting

The central monitoring station is hosted on a secure cloud based server allowing remote access via any internet based computer. The access is restricted and the data is encrypted for maximum security. Users are given a password and user name which will define their permission level. Operator access can simply view the results and create reports while administrator access can reconfigure the system and set all parameters.

The monitoring station is designed to collect all data from the sensors and present the sensor data in an easy to understand graphical interface.



3.2 Local Server (Optional)

It is possible to hosting of SIMS (Scentinal Information Management System) on a local server with secure Wi-Fi or LAN connection. Scentroid will provide all necessarily hardware and software to setup a local server.

This option includes:

- Computer hardware (including monitor, keyboard...)
- SIMS software
- Ethernet hub



3.3 Communication Protocols

GPRS

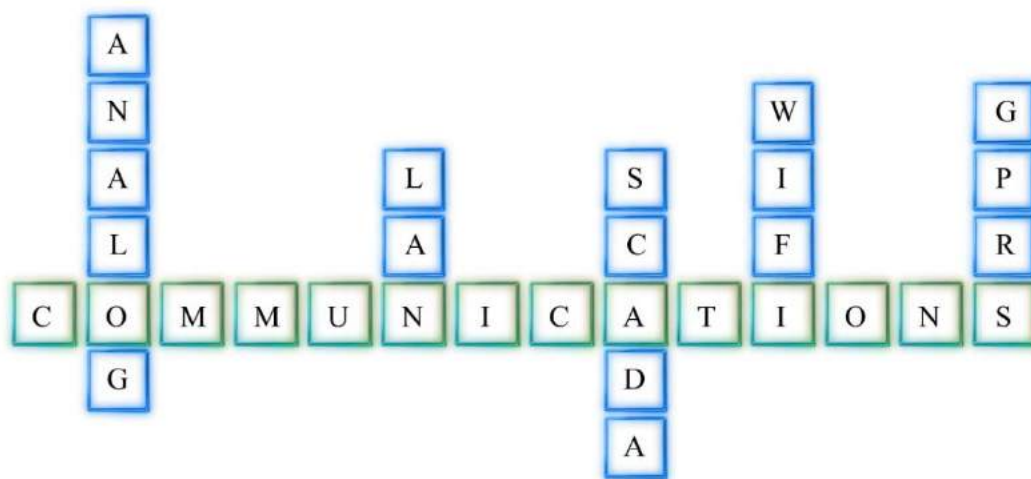
Scentinal comes as default with GPRS module for wireless communication through existing cell towers. The communication is encrypted and sent to Scentroid's secured SIMS cloud server. The SIM card required is included and pre-paid for one year. The SIM card is capable in operating in any country with no additional roaming charges. Local SIM cards can also be used if required.

WIFI/LAN

Scentinal can also transmit data over WIFI or LAN network to Scentroid's cloud server or a secured local server. LAN connection is included by default and WIFI is included as an option when ordering.

Analog/SCADA

Scentinal is an open platform allowing interface to many other instruments and systems such as the plant SCADA. Scentinal can be setup to transmit any one of the sensor outputs as 0-5V or 4-20mA to be connected to plant monitoring systems such as SCADA.



3.4 Scentinal Information Management System (SIMS)

Scentinal Information Management System, SIMS, is an all-inclusive software, used to view historical data, run diagnostics, configure, and set alarm levels for Scentinal. Provided as part of the Scentinal package, the software is installed on:

1. On-board server (default)
2. Scentroid's cloud based server (default)
3. Client's localized server (optional).



Sensor List for SL50 Scentinal - IDES

Date Created: from to

Serial: to entries

Search:

Name	ID	Type	Data Unit	Created at	Actions
Ambient Humidity		humidity	%	Th 10/03/2016, 2:04 pm	Delete Link
Ambient Temperature		temp	C	Th 10/03/2016, 2:05 pm	Delete Link
CO Sensor		Carbon Monoxide (low concentration)	PPM	Th 10/03/2016, 2:02 pm	Delete Link
Inbox Humidity		humidity	%	Th 10/03/2016, 2:04 pm	Delete Link
Inbox Temperature		temp	C	Th 10/03/2016, 2:06 pm	Delete Link
NO2 Sensor		Nitrogen Dioxide (low concentration)	PPM	Th 10/03/2016, 2:02 pm	Delete Link
PID Sensor		pid	PPM	Th 10/03/2016, 2:01 pm	Delete Link
Name		Type	Data Unit	Created at	Actions

Showing 1 to 7 of 7 entries (Filtered from 28 total entries)

< Previous 1 Next >

SIMS Configuration

Equipment Settings for SL50 Scentinal - IDES

Time Intervals:

Sampling Interval Time: 20 Seconds(s)

Recording Interval Time: 20 Seconds(s)

Sampling Motor Wait Time: 10 Seconds(s)

Transferring Interval Time: 60 Seconds(s)

Purge:

Purge Interval Time: 24 Hour(s)

Purge with Onset Duration: 30 Seconds(s)

Purge without Onset Duration: 10 Seconds(s)

Air Conditioning:

AC OFF Temperature: 20 C

AC ON Temperature: 28 C

Save

SIMS Equipment Setting

4. Odour Monitoring

4.1 Using SM100 (Correlation of Scentroid Elements Measurements to Odour Unit)

Scentinal is the world's only air quality monitoring station that provides simultaneous pollutant and odour measurements. Data from individual sensors is processed by Scentroid's chemical and olfactometric correlation system to determine odour concentration in OU/m³. The system uses a neural network learning algorithm to determine odour concentration from chemical readings.

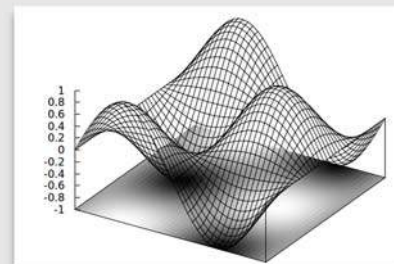
Olfactometric measurements, using the Scentroid SM100 Field Olfactometer, are collected periodically (monthly, bi-monthly, or semi-annually) and are inputted into the learning algorithm along with recorded chemical composition. This sophisticated algorithm will then create a non-linear relationship between chemical readings and odour concentration. This data is used to teach the network and enhance the accuracy of odour concentration prediction from chemical composition. The advantage of this system over other competing technologies such as E-Noses is that chemical to odour concentration is based on routinely gathered olfactometric data and therefore is always up to date regardless of changes to the plant processes.



4.2 Difference between E-Nose & Scentinal

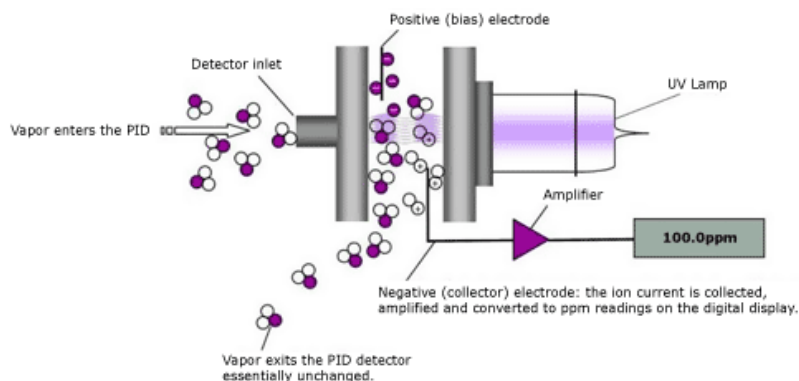
Traditional E-Nose is a collection of 4 to 30 metal oxide sensors and a software algorithm. The calculation from the sensor to odour concentration is based on a handful of calibration point that are obtained using traditional olfactometric laboratory. The issue with this approach is:

- The strong cross sensitivity of metal oxide sensors
- The rapid “drift” of sensors results in different signal for same pollutants over time,
- The handful of calibration points is insufficient for the complex correlation between sensor readings to odour units.



4.3 What is the Scentinal Approach to Odour Measurement?

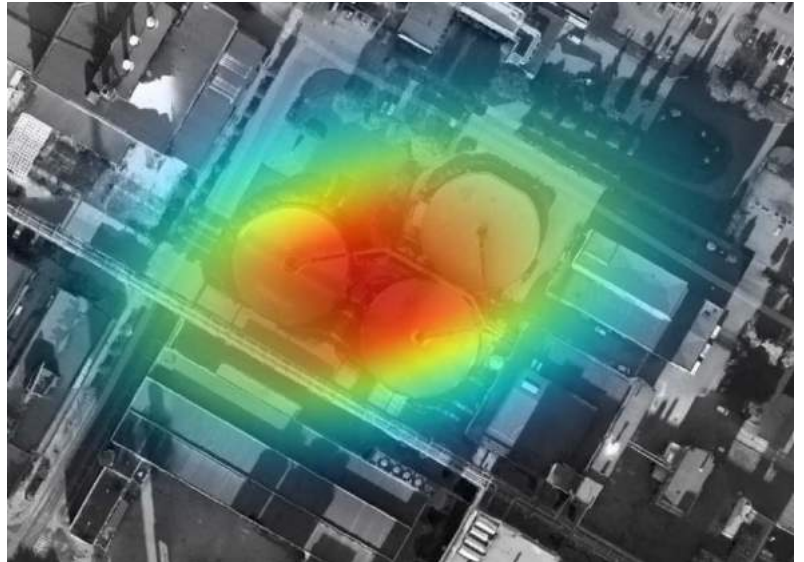
- Scentinal uses Photo-ionization, Non-Destructive Infrared Sensors, and Electrochemical cells as well as metal oxide sensors. These sensors allow Scentinal to get individual pollutant levels.
- Sensors are selected based on the application and therefore customized to individual plants. This allows Scentinal to find the real tracer that can be used to correlate chemical readings to odour concentration.
- Large number of calibration points (minimum of 30) are collected easily using SM100i field olfactometer. The initial readings along with periodic measurements ensure the system has enough data points to develop an accurate model reflecting all changes to process, pollutants, and sensors.
- A sophisticated machine learning algorithm is used to find the complex correlation between odour units and pollutants measured. The software provides quality of the fit and the expected error range to ensure reliable data is used



5. Total Odour Management (TOMS)

5.1 What is TOMS?

TOMS offers a complete, integrated suite for odour management. The system provides a perfect integration of real-time odour impact estimation with management of odour complaints from neighboring residents. The simple to use software combines field-olfactometry and live weather data to produce real time odour plumes showing you exactly the location and amount of your odour emission. Complaints are automatically logged and compared to odour emissions for fast and efficient validation



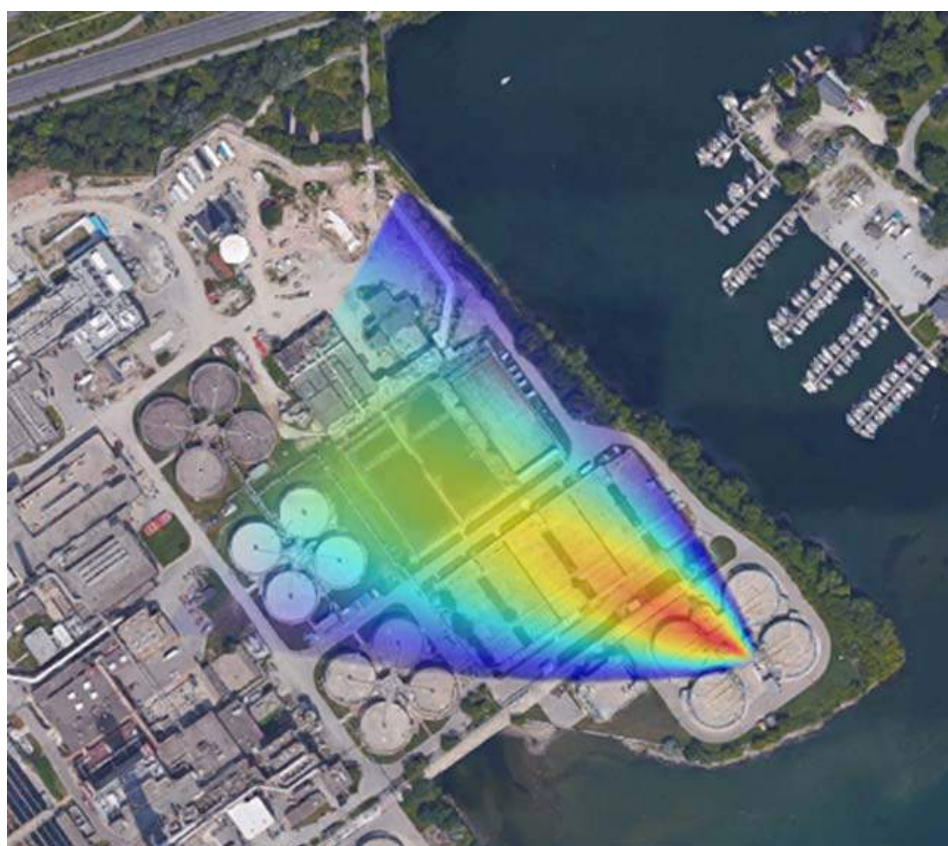
5.2 Real Time Odour Dispersion Monitoring

Total Odour Management System uses AERMOD dispersion modeling, current weather data, and odour concentration measurements from an SM100 field olfactometer to provide you with real-time graphical representation of the odour impact. The modeling software can be used to estimate emissions from a stack or area sources making it extremely easy to implement for any plant.



5.3 TOMS Features

- ✓ Automatically validate complaints
- ✓ Real-time view of odour plume
- ✓ Compatible with chemical sensors and GC based field analyzers for continuous monitoring
- ✓ Automated report generation
- ✓ Uses USEPA approved AERMOD modeling
- ✓ Can be used to monitor individual compounds or total odour impact
- ✓ Cloud based solution with 100% data reliability
- ✓ 2 way communication to residents and enforcement agency



6. Scentinal Accessories

6.1 Scentinal Air Conditioning and Heating System

Scentinal can be equipped with a powerful 400 BTU (100 Watt) air conditioner capable of ensuring optimal internal temperature even at extreme ambient temperatures. In cold climates the built-in heater will activate to keep the sensors above 15 °C. Internal temperature can be set and monitored remotely through SIMS software. The enclosure is also fully insulated to reduce power consumption and ensure Scentinal can operate in any ambient temperature from -50 °C to + 50 °C.



6.2 Scentinal Solar Power Unit

For locations where getting power to Scentinal might be challenging, a 300W solar panel and rechargeable battery (150+ AH/12V) can provide all the necessary power for your Scentinal. Scentinal's optional solar power unit will provide all the necessary charge controllers, power management system, and connections to install your solar power and batteries.



7. Scentinal Application (Industries and Recommended Sensors)

7.1 Urban

Urban air pollution has a significant threat to human health and the quality of life of all people around the world. Finding urban air pollution help people in their everyday lives and aid decision-making related to air quality control and the implementation of preventive actions to reduce emissions. Scentinal is perfect fit for air quality monitoring of the cities.

Recommended Sensors are:

- Carbon Dioxide - (Low Concentration)
- Carbon Monoxide - (Low Concentration)
- Oxidizing Gases Ozone
- Nitrogen Dioxide
- Nitric Oxide - NO (Low Concentration)
- Nitrogen Dioxide - (Low Concentration)
- Oxygen
- Total VOCs (ppb) - PID
- Sulfur Dioxide - (Low Concentration)
- Particulate PM 1, 2.5, 10 (Simultaneous)



7.2 Odour

Environmental odour is the highest source of nuisance and generates the greatest complaints. Environmental odour can be generated from a variety of industries including: food processing, Tobacco products manufacturing, chemical plants, paint plants, asphalt plants, pulp and paper, WWTP, and etc. Scentinal can be used to monitor odour emissions in order to help plants optimize processes and reduce odour impact.

Recommended Sensors are:

- Ammonia
- Hydrogen Sulfide - (Low Concentration - ppb)
- Organic Solvents (Ethanol, Iso-Butane, H₂)
- Total VOCs (ppb) - PID
- General Purpose Odours (VOCs)
- TRS and Amines
- Air Contaminants (Ammonia, Ethanol, Toluene)



7.3 Waste Water Treatment

One of the most important contaminant of concern from wastewater treatment plants (also known as sewage treatment plant) is odour. Many chemicals are generating odour the majority of which are sulfur based. At the start of the process H₂S, DMS, and other sulfur compounds are abundant while at the trailing end of the process (sludge processing), VOCs are more predominant.

Recommended Sensors are:

- Ammonia
- Hydrogen Sulfide - (ppb)
- Hydrogen Sulfide - (ppm)
- Total VOCs (ppb) - PID
- TRS and Amines
- Air Contaminants (Ammonia, Ethanol, Toluene)



7.4 Indoor Air Quality Monitoring

Indoor air quality plays an important role in human health and comfort. Scentinal provides a solution to monitor and control indoor air quality. Scentinal can provide continuous monitoring of all important parameters such as CO₂, CO, O₂, PM₁₋₁₀ as well as pollutants such as H₂S, Formaldehyde, SO₂, VOC, and Odour. The system can be programmed to activate mitigation technology or central HVAC system if pollutant levels are found to exceed set limits. This active monitoring and mitigation will ensure a fresh, healthy air for the occupants.

Recommended Sensors are:

- Carbon Dioxide - (Low Concentration)
- Carbon Monoxide - (Low Concentration)
- Hydrogen
- Hydrogen Sulfide - (ppb)
- Nitric Oxide - NO (Low Concentration)
- Nitrogen Dioxide - (Low Concentration)
- Oxygen
- Total VOCs (ppb) - PID
- Sulfur Dioxide - (Low Concentration)
- Formaldehyde
- Particulate PM 1, 2.5, 10 (Simultaneous)



7.5 Oil & Gas Industry

Pollutant and Odour monitoring in petrochemical as well as oil and gas industry is critical due to the number of hazardous pollutants released in these processes. Fence line and in-plant monitoring allows the plant to not only ensure conforming to local emission regulations but also to detect issues within the process such as tank leaks, loading spills, and other unexpected events.

Recommended Sensors are:

- Carbon Dioxide - (Low Concentration)
- Carbon Monoxide - (Low Concentration)
- Chlorine
- Ethylene Oxide
- Hydrogen Sulfide
- Hydrogen Chloride
- Hydrogen Cyanide
- Ammonia
- Oxidizing Gases Ozone and Nitrogen Dioxide
- Phosphine - (Low Concentration)
- Phosphine - (High Concentration)
- Hydrogen Sulfide - (Low Concentration - ppb)
- Organic Solvents (Ethanol, Iso-Butane, H₂)
- Methane (LEL)
- Nitric Oxide - NO (Low Concentration)
- Nitric Oxide - NO (High Concentration)
- Nitrogen Dioxide - (Low Concentration)
- Oxygen
- Total VOCs (ppb) - PID
- Total VOCs (ppm) - PID
- Sulfur Dioxide - (High Concentration)
- Sulfur Dioxide - (Low Concentration)
- Formaldehyde
- Particulate PM 1, 2.5, 10 (Simultaneous)
- Air Contaminants (Ammonia, Ethanol, Toluene)



7.6 Agriculture

Agricultural facilities emit a wide array of pollutants that must be monitored. The majority of these pollutants are not hazardous but are odorous and therefore a source of nuisance. Scentinal can provide monitoring of both odour and pollutants in agricultural facilities.

Recommended Sensors are:

- Ammonia
- Carbon dioxide
- Methane
- Particulate PM 1, 2.5, 10 (Simultaneous)



7.7 Safety

Worker in different industries can be exposed to multiple harmful chemical gases every day and every second, these chemicals can cause a lot of disease for the worker, industries need to monitor their air quality to prevent any problem for the worker, they need to make sure the workplace is safe for everybody.

Recommended Sensors are:

- Carbon Dioxide - (High Concentration)
- Carbon Monoxide - (High Concentration)
- Chlorine
- Ethylene Oxide
- Hydrogen
- Hydrogen Chloride
- Hydrogen Cyanide
- Ammonia
- Oxidizing Gases Ozone and Nitrogen Dioxide
- Phosphine - (Low Concentration)
- Phosphine - (High Concentration)
- Hydrogen Sulfide - (High Concentration - ppm)
- Methane (LEL)
- Nitric Oxide - NO (High Concentration)
- Nitrogen Dioxide - (High Concentration)
- Oxygen
- Total VOCs (ppm) - PID
- Sulfur Dioxide - (High Concentration)
- Formaldehyde



7.8 Compost

Worker in compost facility are exposed to chemical and biological risk as well as the neighbourhoods which are in the risk of being effected by chemical gasses and odours from the compost. It's critical to monitor air quality on the compost facility to ensure proper operation and conformity to local regulations.

Recommended Sensors are:

- Organic solvents (Ethanol, Iso-Butane,)
- Hydrogen Sulfide
- Ammonia
- Total VOCs - PID



7.9 Process Control

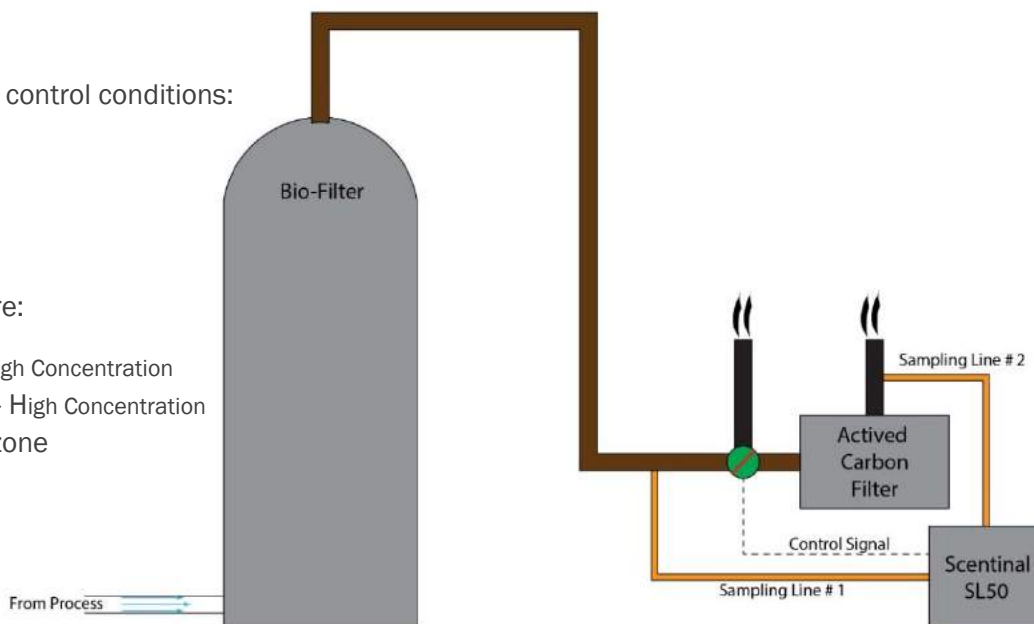
SL50 can be programed to detect any in process gasses and activate one or more of 3 built in relays to control in process event such as mitigation technology, alarm and more. SI50 will also calculate efficacy of activate carbon & send alarm for replacement. For example SL50 can detect if odour after bio-filter is above emission limit to engage carbon filter. By using activated carbon scrubbing only when needed, the SL50 will reduce power consumption and increase life of granular carbon.

Some possible example of control conditions:

- Odour > 500 OU
- H₂S > 1 ppm
- TVOC > 0.5 ppm
- NH₃ > 2 ppm

Recommended Sensors are:

- Carbon Dioxide - High Concentration
- Carbon Monoxide - High Concentration
- Oxidizing Gases Ozone
- Nitrogen Dioxide
- Methane (LEL)
- Sulphur Dioxide
- Nitrogen Oxides

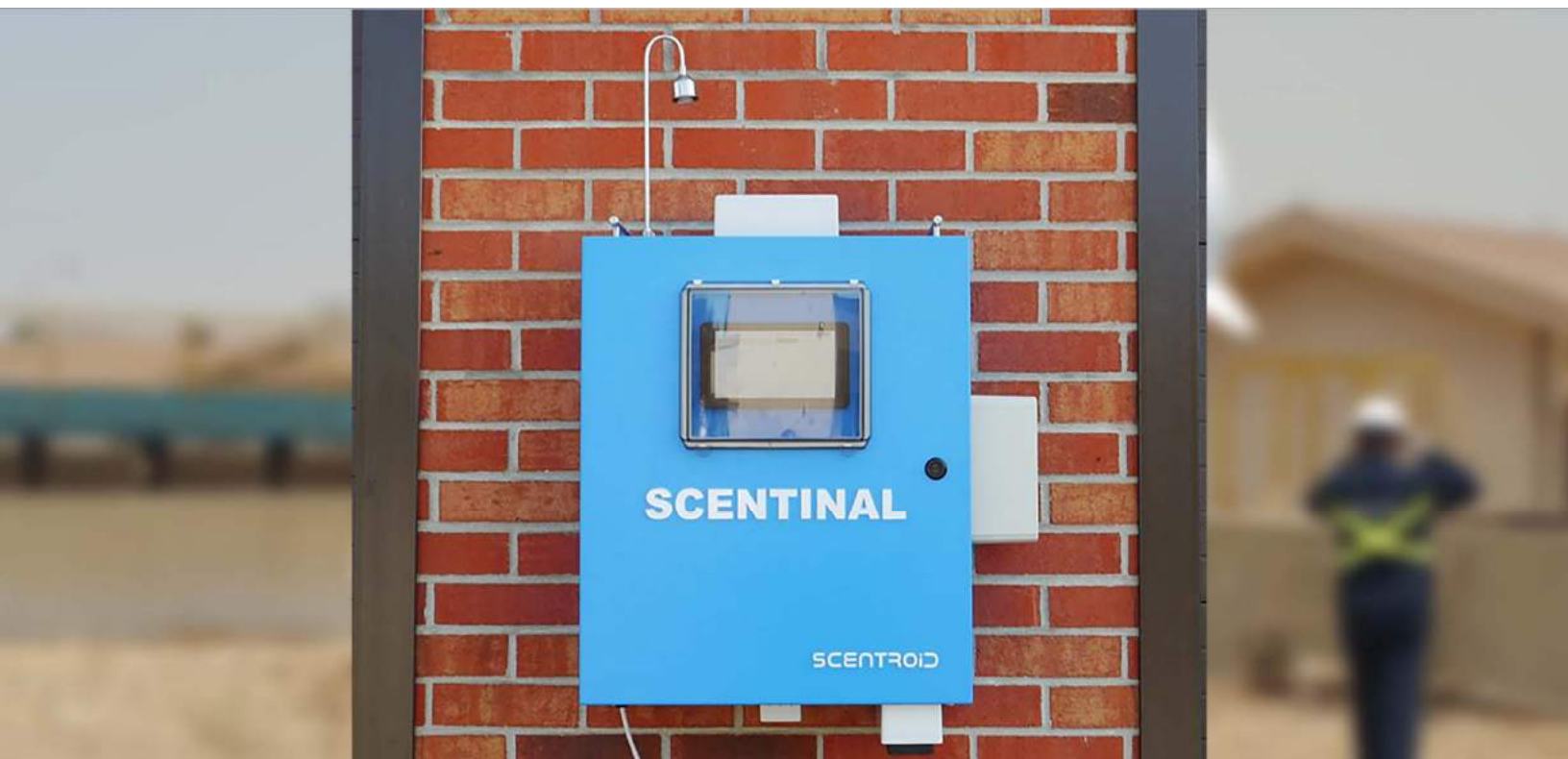


8. Installation, Maintenance and Operation Cost

8.1 Installation

The small form factor and low weight of the Scentinal makes it easy to transport and install. Each unit comes complete with a prepaid GPRS SIM card. To install the Scentinal, all that is required is to mount it to a wall or a pole and plug in the AC power. Solar panels and rechargeable battery option allows the unit to work in remote locations. Once powered, the instrument will determine its location using a built in GPS receiver and start transmitting data to the closest SIMS server. That's it!

PLUG IN



8.2 Maintenance

Scentinal uses a new method of decontamination to ensure accurate reading even at ppb levels. Periodically the system assesses contamination using a built-in carbon filter and if required decontaminates all lines, pumps, and valves using oxidizers. Remote diagnostic tools and built-in calibration gas (option) means that once installed, Scentinal is virtually maintenance free.



8.3 Calibration

8.3.1 Onsite Calibration

Scentinal can be calibrated easily through the on-device 7" touch screen and using calibration gas. Calibration should be done at minimum every year to ensure optimal performance. The entire calibration does not take more than 10 minutes per sensor and requires minimal technical skills.

8.3.2 Automatic Calibration

Optional automated calibration module will allow Scentinal to conduct periodic self-calibration. Scentinal will automatically inject calibration gas, which is permanently connected to the unit, into the sample line and verify/update calibration parameters.



8.4 Operation Cost

Operational cost of Scentinal is minimal with electricity and data being the only utilities required. The system will require less than 0.5 amps at 220 VAC., if you add AC additional 75 watt will be add. With the optional solar panel there will be no requirement for external electricity. Data cost is paid for one year. After the first year the data cost is dependent on the country of installation, for example:

Australia, Canada, UAE, UK and USA is roughly \$100 per year (\$0.25 per MB rate and 2 minute update time is assumed).

8.5 Sensor Replacement

Sensors are warranted for 24 months from date of shipment. Additional warranty can be purchased to cover sensor replacement. Typical sensor life cycle depends on the type of sensor and is between 1 to 5 years.

9. After-Sale Support

9.1 Training

Training is the key of using any instrument, and Scentroid provides worldwide training programs for our clients and distributors. Training can be conducted by Scentroid or your local distributor. Scentroid training tools include: online training, videos, brochure, operation manual and on-site workshops. We also offer you a Hands on training on our high tech simulation room. Scentroid's state of the art simulation room is located at our head quarter in Canada, Markham. You are more than welcome to visit us and enjoy the day full of experiment. You can also meet with people behind these products.



9.2 Technical Support

We are responsible for any products that exit from our manufacture door! Our support team offers different ways to help you. Pick the one which is more convenient for you.



✓ Local Support

We have developed a vast growing network of distributors and repair facilities. To find your local support please check our distributors map.



✓ Phone Support

Our highly professional customer services are here to serve you, for any technical issue reach them easily via phone: 416.479.0078 – Ext215



✓ SME Support

Connecting you to the Subject Matter Experts! Our customer support is unique in that you can talk directly to the designer or programmer of each product.



✓ Live Chat

If you feel more convenient to solve your technical issue via chat, No problem! Reach our highly professional customer services through Live Chat.



✓ Email Support

For any technical issue you can reach one of our engineers via email. For fast and efficient support simply email support@scentroid.com

9.3 Warranty

We are so confident of the reliability of our products that we are glad to offer our clients comprehensive 24 month full warranty for Scentinal SL50. We do have additional warranty that you can purchase for the 3rd, 4th and 5th year. For more information about our additional warranty pick any of above method to contact us.



10. Scentinal

10.1 Why Choose Scentinal?

Every year more than 2.4 million people died because of air pollution, that's the enough reason to understand the importance of air quality monitoring. We need to monitor air quality to take the effective action.

Scentinal offers many unique **features** including, ozone based self-cleaning, multiple sampling Port, prepaid sim card, self-Configuration for plug and play installation, time synchronized readings, alarm/notifications, powerful air conditioner and more.

You also receive the most comprehensive warranty in the industry. Our **2 years full warranty includes even sensor replacement** shows we are extremely confident about our product. We also offer additional warranty that can be purchased for 3rd, 4th and 5th year.

Scentinal has the most reasonable price of any monitoring stations in its class. The price is dependent on the type of sensors you select (PID, NDIR, Fuel-Cell, Laser Scattered, Metal Oxide sensors) therefore you never pay for more than what you need.

At Scentroid, we pride ourselves on our customer care and **after sales support**. We offer onsite training, online training, as well as videos, brochure, operation manual, and more.

Those are few advantage of our Scentinal SL50 over other air quality monitoring station. To get more information or to speak to one of our engineers about your applications;

Email us at info@scentroid.com

Call us at +1.416. 479.0078.

10.2 Air Quality Standards

Pollutant	Scentinal Calibration Range	Detection Limit	US EPA Standard	EU Standard
Ozone	0 - 0.05 ppm (1000 µg/m ³)	0.01 ppm (2 µg/m ³)	0.075 ppm/ 8h (157 µg/m ³ / 8h)	(0.102 ppm/ 1h) (1000 µg/m ³) (1000 µg/m ³) (1000 µg/m ³)
PM2.5	0-2000 µg/m ³	1 µg/m ³	35 µg/m ³ / 24h	25 µg/m ³ / 24h
PM10	0-2000 µg/m ³	1 µg/m ³	150 µg/m ³ / 24h	50 µg/m ³ / 24h 40 µg/m ³ / 1Y
Odour	1+OU	1 OU	0 OU	NA
Sulfur Dioxide	0-10 ppm (0-29 µg/m ³)	0.009 ppm (25 µg/m ³)	0.14ppm/ 24h (365 µg/m ³)	(0.133 ppm/ 1h) (0.047 ppm/ 24h) 350 µg/m ³ / 1h 125 µg/m ³ / 24h
Carbon Monoxide	0-25 PPM (0-29 µg/m ³)	<0.04 ppm (<0.05 µg/m ³)	9 ppm/ 88h (10.3 µg/m ³)	8.74 ppm/ 8h 10 µg/m ³ / 8h
Nitrogen Dioxide	0-0.2 ppm (380 µg/m ³)	0.01 ppm (1.9 µg/m ³)	0.053 ppm/ 1Y (1.9 µg/m ³)	(0.115 ppm/ 1h) (0.023 ppm/ 1Y) 200 µg/m ³ / 1h 40 µg/m ³ / 1Y



SCENTROID

Division of IDES CANADA

Scentroid

431 Alden Road#3
Markham, ON, L3R 4C1

Contact us

+1 416.479.0078

Web and Email

Email: info@scentroid.com
www.scentroid.com

FOLLOW US

