

# OptimEDAR

## Smart Wastewater Solution

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WATER & ENVIRONMENT  
TECHNOLOGY

Increasing pollution and energy demand for water treatment are growing concerns in countries all over the world. Currently most of wastewater treatment plants must comply with the international water treatment directives and be upgraded to perform nutrient removal.

OptimEDAR is a new control and management solution for small and medium wastewater treatment plants (WWTP) based on an eco-innovative on-line monitoring of the aeration process in the biological reactor. OptimEDAR optimizes the operation of the bioreactor in small and medium WWTPs, in order to achieve proper regulation of the process by automatic corrections and adjustments, taking into consideration influent and environmental conditions.

The OptimEDAR solution allows WWTPs to run affordable on-line management scheme of the aeration process, deriving in higher quality of treated water (less reactant and chemical by-products) and less energy consumption, meaning an increased productivity of the whole system and a faster water quality control loop.

### STRUCTURE

- Control cabinet. It includes all the automatism, with the control outputs of the blowers and the selector switch, that are connected to the control equipment already placed in the control centre.
- Sensors cabinet. It includes the electronics of oxygen and redox sensors that are installed in the bioreactor.

Data transfer between cabinets is done by wireless connections, simplifying installation facilities. In addition, a data collection software is delivered in order to manage and monitoring the system.

OptimEDAR can also be implanted in existing wastewater treatment plants:

- It is easy to install.
- It does not interfere with existing automation tools.
- It allows the operator to work with existing tools and easily change into the new system, by means of a selector switch located in the control centre.

### OPERATION

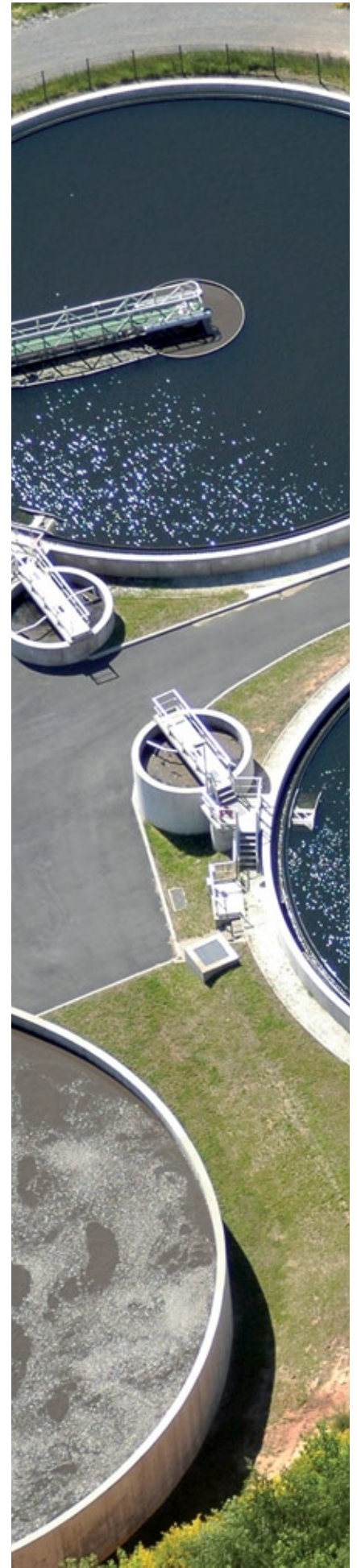
The classic automatic operation of a WWTP biological treatment is based on controlling the operation of the blowers by measuring the dissolved oxygen parameter (DO) and its following comparison with a specific value, whereas in a manual state, blowers are controlled for timed cycles on / off.

The OptimEDAR solution uses dissolved oxygen and redox measures to determine the status of the biological reactor. OptimEDAR acts through the existing control of blowers, determining the moment for starting or stopping the blowers. OptimEDAR operates as a parallel automatism equipment and uses the existing automatism, improving their chances completely.

By adjusting the timing and operating conditions of the blowers according to the stringent reactor's oxygen requirements, energy consumption is optimised and biological results can be modulated according to the need of elimination of the organic matter. OptimEDAR addresses the problem of controlling the blowers in the bioreactor through continuous measurements of SO and redox potential. As a result, instantaneous values, their temporal evolution and trend are achieved and provided to mathematical algorithms based on calculus of probability and fuzzy logic techniques, to derive a set of parameters which reflect the oxygen demand, and depending on real and current estimation of the organic matter loading in the bioreactor.

### NOTEWORTHY CHARACTERISTICS

- Reduce the "ecological footprint" of the complete wastewater treatment process.
- Increase energy, water and handling efficiency.
- Improve water quality of receiving water bodies.
- Upgrade small and medium size WWTPs with online monitoring system and innovative "green" knowledge, promoting eco-innovative solutions into the market.



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### GENERAL CHARACTERISTICS

#### Wastewater Treatment Plant Requirements

Type of plants	Active Sludge small and medium WWTPs with biological reactor
Number of blowers	1 to 3
Type of blowers	1 or 2 speeds blowers
Type control	Start / stop, without frequency converter regulation



#### Control Cabinet Requirements

Power supply	100-230 V $\pm$ 10 V AC, 50/60 Hz
Consumption	< 100 W
Working range	-20..+60 °C; 95 % HR, without condensation
Dimension	500 x 750 x 320 (H x W x D)
IP	IP65
Maximum distance to PLC	10 m, optional >10m
Distance between sensors and control cabinets	< 300 m.
Connection to control centre	GSM / GPRS connection, 3G

#### Sensors Cabinet Requirements

Supply	100-230 V $\pm$ 10 V AC, 50/60 Hz
Consumption	< 35 W
Working range	-20..60 °C; 95 % HR, without condensation
Dimension	500 x 500 x 320 (H x W x D)
Maximum distance to control cabinet	300 m.
Distance of sensors to sensor cabinet	< 10 m, optional < 25 m



In partnership with:



Further information at [www.optimedar.eu](http://www.optimedar.eu)



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