

Focus on  
Sludge!

# SLUDGE BLANKET & TS- CONCENTRATION MEASUREMENT

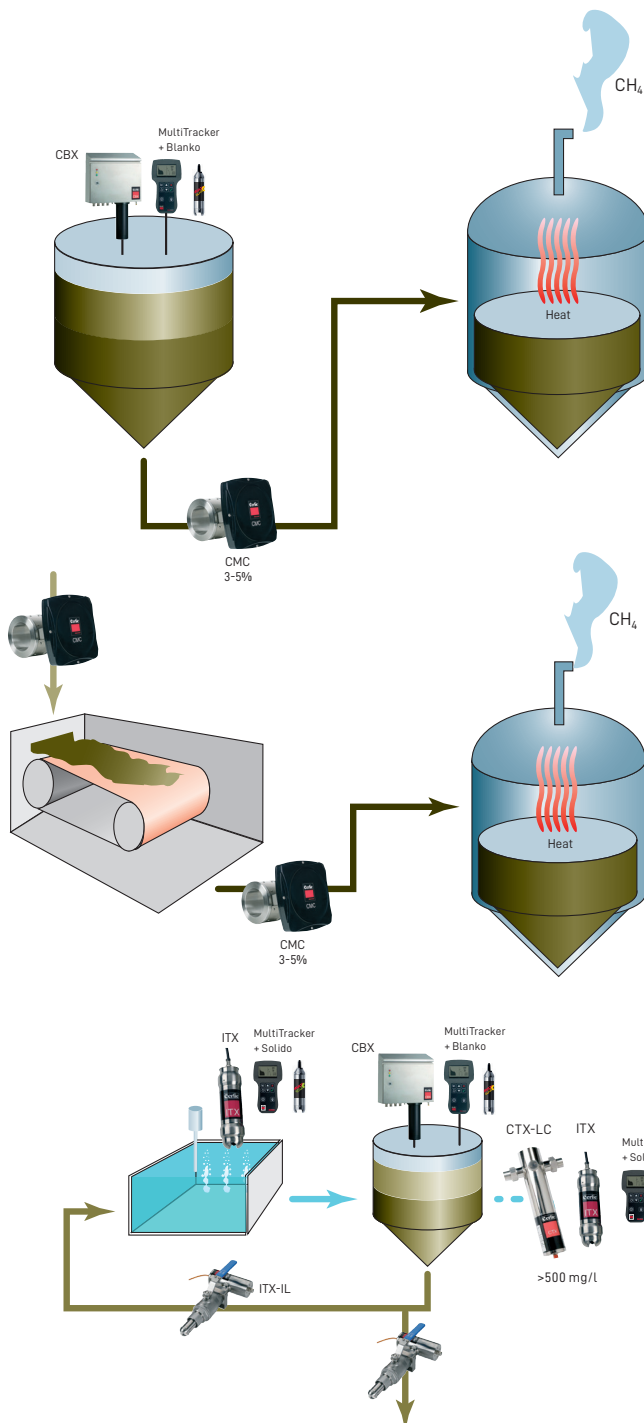
Saving resources and energy optimization

*Cerlic has expertise in TS- & sludge blanket measurement*

 **Cerlic**

# THE MARKET'S BROADEST PRODUCT PROGRAM FOR SLUDGE

ENERGY SAVINGS | POLYMER SAVINGS | PROCESS OPTIMIZATION



## Applications

### GRAVITY THICKENER

A gravity thickener's capacity can be considerably improved by automation of sludge blanket measurements. When the sludge in a digestion chamber heats up, a large energy saving can be achieved by pumping a higher TS concentration into the digestion chamber. In this way, unnecessary volumes of water are not heated up and the yield of gas is higher. This can be achieved by letting the sludge blanket meter determine when it is time to start the pumps. On low sludge blanket = low output TS, the pumps do not start, only when the selected sludge blanket is reached do the pumps start up. In this way, not only is a higher TS level obtained but also a more uniform one, which benefits the digestion process and save energy from not heating excess water.

### MECHANICAL THICKENER

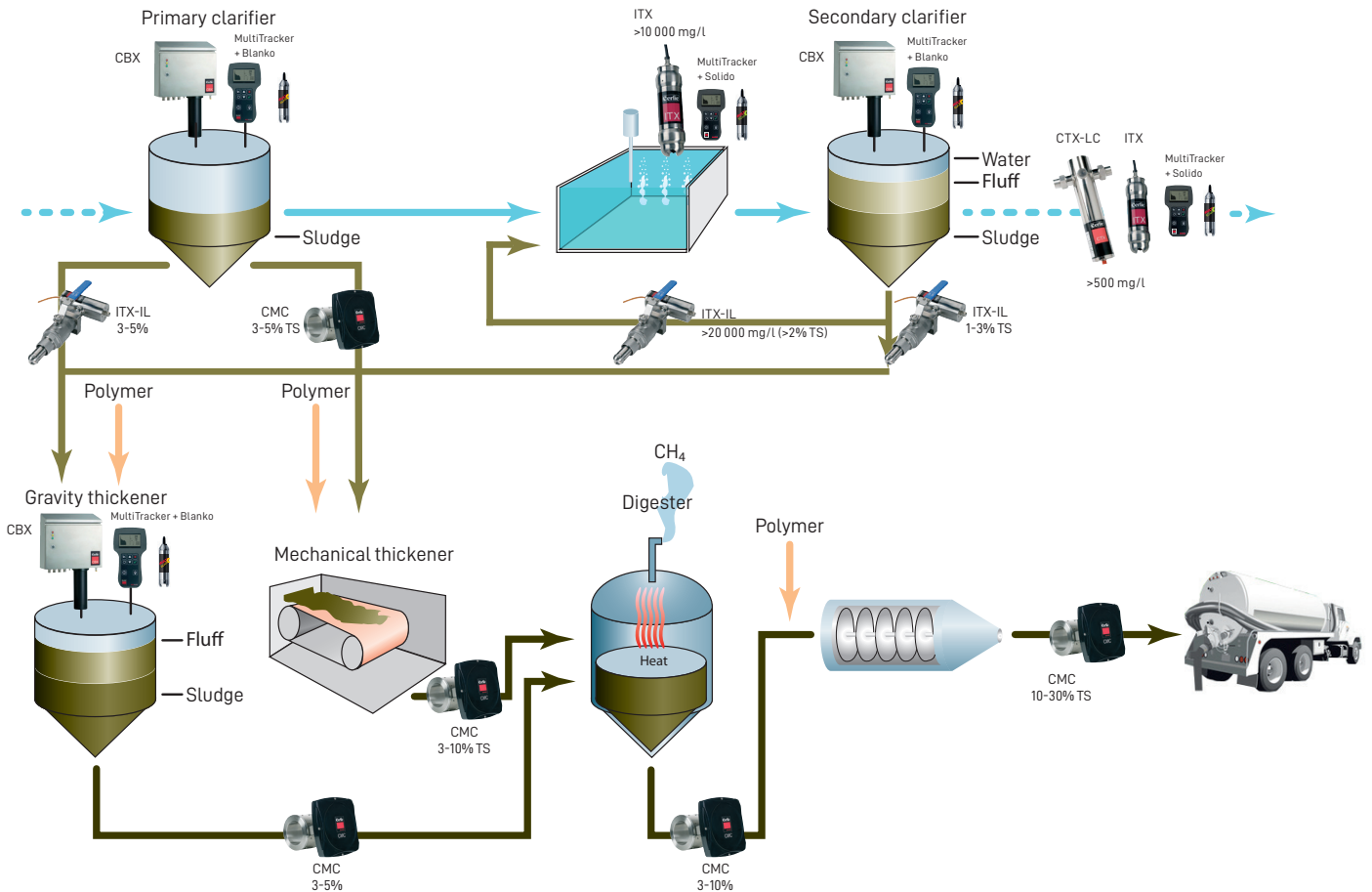
By means of mechanical thickening prior to the digestion chamber, the TS level is increased to prevent heating up unnecessary water and for a better digestion grade. To ensure the function of mechanical thickening, Cerlic uses microwave technology on the inlet sludge to the digestion chamber. In this way, the total solids concentration can be checked prior to digestion and the performance of the thickener can be improved. Measurement of TS both before and after thickening gives savings in the use of polymer and a check on the TS content before it reaches the digestion chamber.

### CLARIFIER / SRT CONTROL

Cerlic ITX-IL measures sludge in-line and can thus control the process at an early stage. In order to prevent unnecessary amounts of water from being pumped from the clarifiers, a threshold value is set. This value stops the pumps if the TS level drops too low. If the pumps would continue pumping, the surplus water would have to be treated. The result: higher energy consumption, higher dosage of polymers and higher transportation costs.

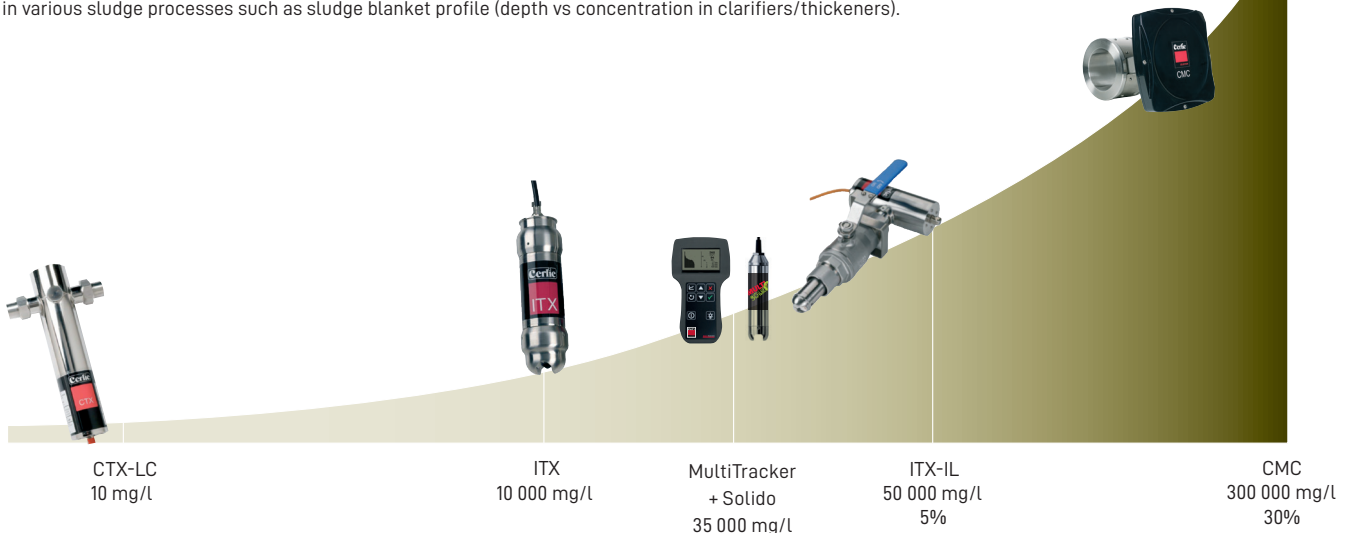
## HOW IT WORKS...

Biosolids and biogases are two byproducts from the sludge extraction cycle of the modern wastewater treatment process. Plant optimization means maximizing the amount of these byproducts. However, the processes involved are both costly and time consuming. By incorporating better, real-time control of sludge pathways throughout the entire wastewater treatment cycle, efficiency and economy can be vastly improved.

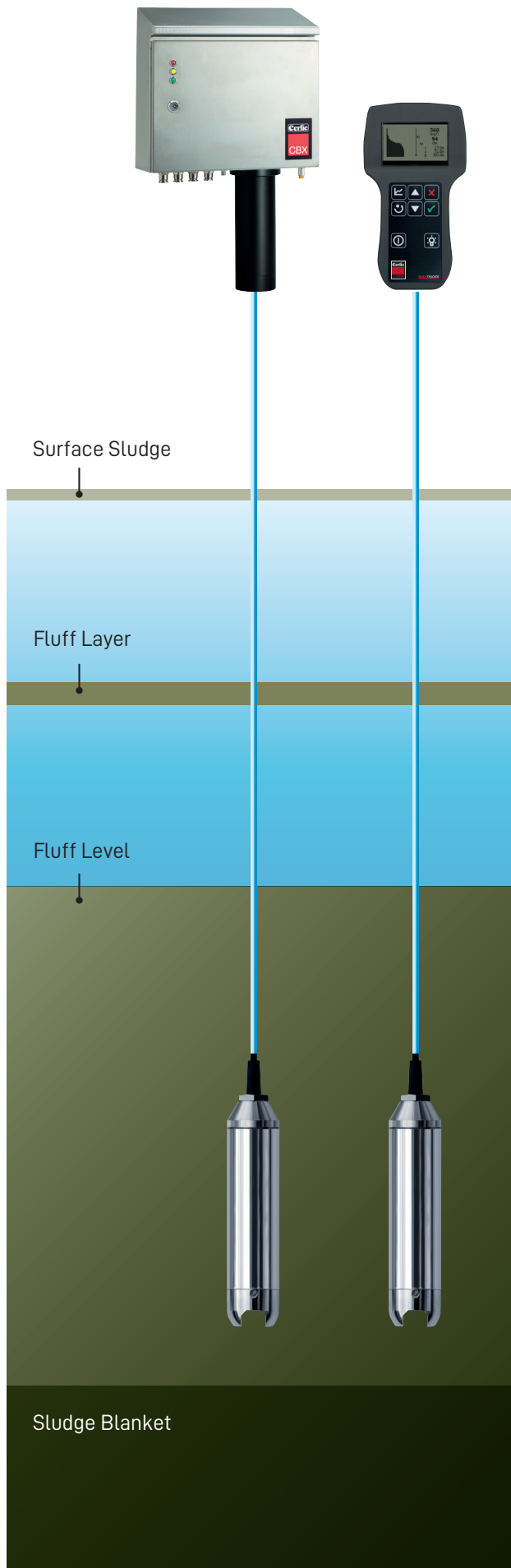


## THE MARKET'S BROADEST PRODUCT PROGRAM

Cerlic has developed a complete range for online, automated measurement of TSS concentration in various sludge processes such as sludge blanket profile (depth vs concentration in clarifiers/thickeners).







*See the sludge level rather than trying to hear it!*

## HAND HELD OR STATIONARY

The near infrared optical measuring head is lowered into the clarifier or thickener. It will continuously measure suspended solids concentration versus liquid depth.

There are two solids concentration settings and outputs for sludge blanket and fluff levels which make Cerlic's offer unique in the market place. Rising fluff is the cause of sludge wash outs resulting in increased phosphorus and other nutrients concentrations in the effluent. The Cerlic CBX Sludge Blanket Meter and MultiTracker supply accurate and repeatable measurement of the sludge blanket and fluff levels defined by solids concentration.

### BETTER PROCESS CONTROL

#### BETTER PROCESS CONTROL OF CLARIFIERS

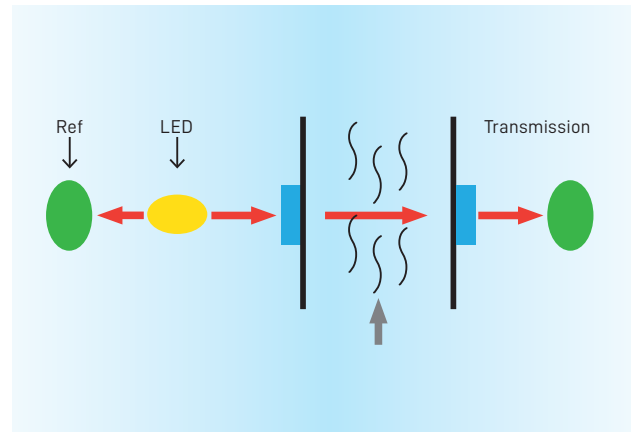
- Early warning of settling problems in the clarifier
- Measures both Blanket and Fluff levels for better control of clarifier
- Prevention of sludge wash out alleviates effluent TSS problems
- Blanket can be more accurately controlled which gives more consistent RAS concentrations
- Higher and more consistent RAS/WAS concentrations helps thickeners operate more effectively.
- Real time measurement, 24 hours per day, 365 days a year

#### OPTIMIZATION OF THICKENERS

- Higher and more consistent sludge concentrations will have a positive impact on the following treatment processes
- Increased sludge concentration means less volume to process
- Better supernatant quality decreases internal recirculation and reduces biological process upsets
- Lower energy costs for heating of digesters and increased gas production
- Less sludge volume reduces hauling costs

## TRANSMISSION

Optical measurement of particle content in liquids is a well proven method. A beam of light is affected if there is anything in its way; some of the light is scattered when it encounters a particle, while some of it is absorbed. Light that is neither scattered nor absorbed continues straight forward. A transmission meter measures the loss of light from the light passing through the medium and shows the quantity of suspended solids in the liquid. A transmission meter does not detect particles that are smaller than half the wavelength. This is an advantage when you want to measure suspended solids, as colloidal and other very small particles do not noticeably affect the measurement. Measuring sludge content using a transmission method provides a true reading for the suspended solids content without either colour compensation or indirect assumptions.



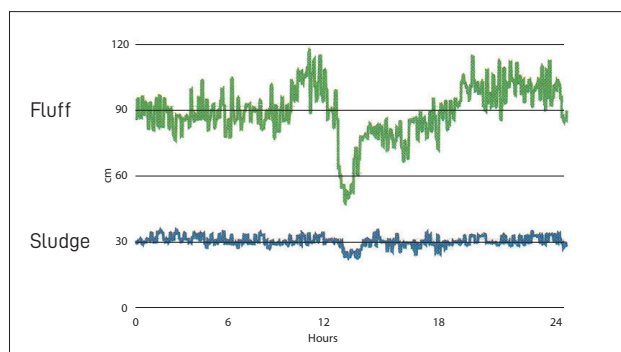
## STATIONARY CBX

Cerlic CBX is a reliable stationary Sludge Blanket Meter that measures suspended solids in liquids. The near infrared optical measuring head is lowered into the clarifier or thickener. It will continuously measure suspended solids concentration versus liquid depth.

The CBX has up to two solids concentration settings and outputs for sludge blanket and fluff levels which makes the CBX unique in the market place. Rising fluff is the cause of sludge wash outs resulting in increased phosphorus and other nutrients concentrations in the effluent. The Cerlic CBX Sludge Blanket Meter supplies an accurate and repeatable measurement of the sludge blanket and fluff levels defined by solids concentration, second to no other measuring method in the market at this time.

**Sludge Profile.** By lowering an optical suspended solids sensor working with transmission of NIR-light, both solids concentration and depth are measured. This allows you to see the profile of the sludge versus depth and how the amount of suspended solids varies in the clear zone.

### Results of fluff and sludge measurement



## HAND HELD MULTITRACKER

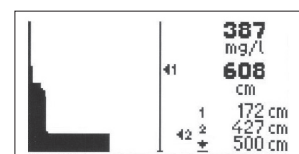
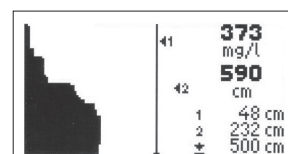
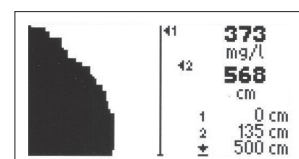
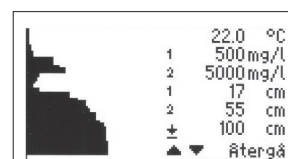
The Cerlic Portable MultiTracker is a new generation of hand held units for measuring of sludge blanket, profile and suspended solids.

Two levels of suspended solids concentration may be programmed in order to detect sludge blanket as well as fluff sludge. When each level is detected, an acoustic signal, as well as a vibration, is generated and simultaneously the concentration and depth are presented on the screen and stored in the built in data logger which enables a follow up of long time process changes of the sludge properties.

**The MultiTracker is protected** in a robust housing.

The graphical display shows blanket concentration versus depth. The built in vibrator and acoustic signals alerts operator of preset fluff and sludge blanket concentrations.

### How sludge profiles vary



## AUTOMATIC SLUDGE BLANKET METER, CBX

Cerlic CBX detects the blanket by means of a near infrared (NIR) suspended solids sensor, which travels through fluff layers until it finds the preset blanket solids concentration. Sensor is lowered on pulse from rake limit switch or timer. Field adjustable concentration setting. Automatic water flushing system of cable and sensor after each cycle.

**Applications:** measurement of blanket depth in clarifiers and thickeners in WWTP and WTP.



## MICROWAVE TOTAL SOLIDS METER, CMC

The CMC high concentration suspended solids meter is an excellent tool for continuous online TS concentration measurement in waste water treatment and biosolids applications.

The reliable and well tested measurement principle of microwave true-phase technology used in the CMC is proven to provide high measurement accuracy over a wide range of TS concentrations.

The rugged design with no moving parts guarantees high uptime and minimum maintenance. The meter can be used on pipes DN50 – DN300 and in-line.

**Repeatability:** 0,01% TS.

**Resolution:** 0,001/ 0,002% TS depending on pipe size.



## SUSPENDED SOLIDS SENSOR, ITX

ITX sensor is used for continuous measurement of suspended solids in liquids. ITX for ranges up to 20 000 mg/l depending on process. The sensor is used in aeration basins, return sludge troughs, primary clarifier etc.



## IN-LINE SUSPENDED SOLIDS SENSOR, ITX-IL

In-line sensor supplied with 1 1/2" SS isolation valve with mechanical stop. The sensor is used for continuous measurement of suspended solids in RAS, WAS, MLSS etc.



## MULTIRACKER

Portable instrument for several parameters. Choose your sensor for suspended solids or sludge level.

You can easily change sensor by means of a simple contact connection.

Two different alarm levels can be set for min/ max value with vibration and acoustic signal.

Data logger to store up to 250 samples. The log can easily be transferred to your computer via a USB-connection.



## LOW SUSPENDED SOLIDS SENSOR, CTX-LC

Low Suspended Solids Sensor for continuous on-line measurement of suspended solids.

The sensor has high accuracy for applications with very low consistencies. To be used on final effluent and reuse water applications in municipal and industrial waste water treatment plants.



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