

# Sludge level measurement via radio connection

CABLE-FREE, SAFE, EASY TO INSTALL

Running cables is extensive, costly or not feasible? With the radio modules of the IQ SENSOR NET System, Xylem offers an easy and reliable solution: No complex installation, no expansive temporary solutions and no needless compromises when choosing the right measurement location. An example from Denmark illustrates, how the optimization of sludge level measurement saves operational and installation costs – even more in case of multiple sedimentation tanks.

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The advantages of the measuring technique can be proven with an example in eastern Denmark. On this plant (Fig. 1), the IQ SENSOR NET was already in use. For quite some time, the aeration times were controlled successfully by oxygen and nitrogen sensors. Hence, to integrate the sludge level as another controlling parameter was a logical as well as an easy step.



Fig. 1: Aerial image of the plant in Denmark (Source: maps.google.de)



## What does the sludge level control?

In our example, the pump times of the recirculation pipe is controlled by the sludge level. As figure 2 shows, the pump starts and stops at sludge heights of 60 cm and 50 cm, respectively. The amount of activated sludge, transferred from post sedimentation to aeration is therefore controlled by sludge level. By this, the sludge management could be optimized. The reduction of the sludge height after end of pumping, visible in figure 2, can be explained by a further thickening of the settled sludge.

To realize this strategy, on each of four scraper bridges, slave modules were installed and connected to a master module by pairs.

As the two master modules were connected to other IQ SENSOR NET modules nearby, the integration within the existing IQ SENSOR NET was fast and easy.

Further, the installation of the four slave modules required low effort - power supply was available on the bridges and the sensors are powered via the module.

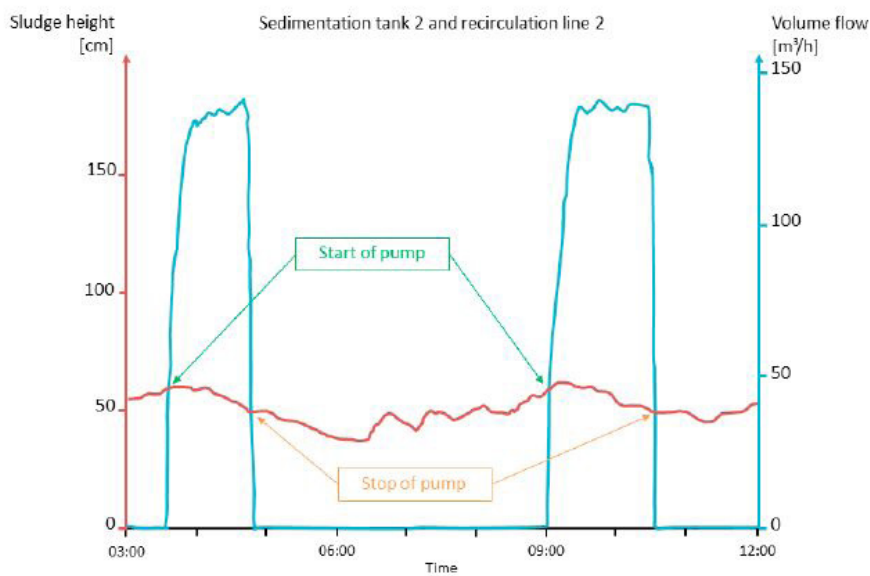


Fig. 2: Height of sludge level in sedimentation tank 2 (red) and volume flow in recirculation line 2 (blue)

The operator was excited not only by the easy extension, but also that there was no need to run additional fieldbus cables.

The data is transferred to the controller of the IQ SENSOR NET and further on to the PLC by radio connections and already existing modules, respectively.

## Sludge level sensor IFL 700 IQ

The IFL 700 IQ is characterized by low operational costs and low maintenance.

This is based on the ultrasonic measuring principle, the integrated contact free cleaning and the high-quality materials like titanium. The sensor is ready for use and provides reliable measuring values.

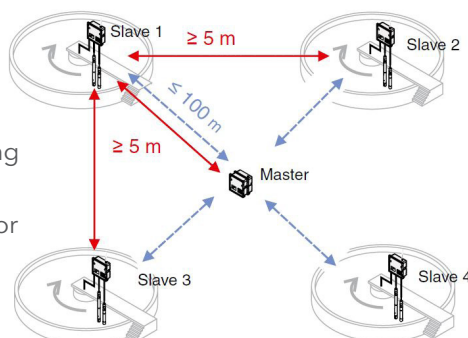
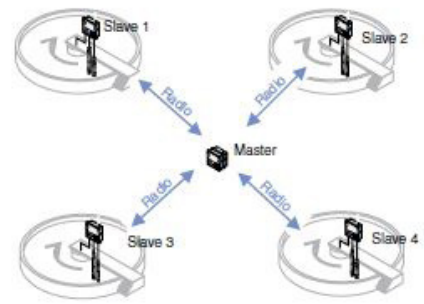


Fig. 3: Distance between modules

Radio network 1



Radio network 2

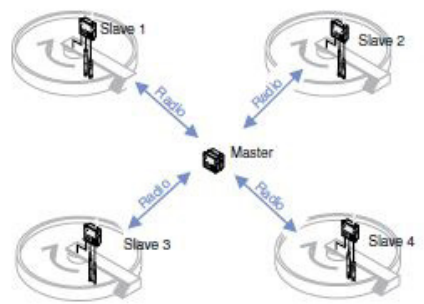


Fig. 4: Set up of two radio networks with one master and four slaves each

## The sludge level measurement as a typical radio application

Due to rotating scrapper bridges, a continuous sludge level measurement is often proven to be difficult.

Indeed, controller and sensor can be installed on the bridge or at the edge of the tank. However, both cases involve some constraints. The edge of the tank is not the ideal measuring location and the connection from the bridge to a central controller or even the PLC is difficult. A radio connection copes with all these challenges: ideal measuring location on the bridge, connection to an existing controller and therefore easy integration to the PLC. Besides this main application, the radio modules MIQ/WLPS can be used in general for cable free communication within the IQ SENSOR NET.

### As simple as that

For the cable free communication, two radio modules are required – to be ordered as a starter set. Both modules are pre-configured as master and slave and can be integrated to an existing IQ SENSOR NET System – without software update. These factory settings save a lot of time and needless installation effort. Thereby, the master module can be connected to existing modules fast and easy by our proven stack mounting. The slave module can be installed on the bridge, including the sludge level sensor IFL 700 IQ.

By the integrated mains adapter, the module can be powered on the bridge. As soon as a radio network of master and slave is established, further slave modules can be integrated easily. The latter are also preconfigured and will be recognized automatically by the master and the IQ SENSOR NET. By connecting several slaves to one master, the costs of any additional measuring location gets lower compared to the first one, as only one module is needed. Basically, an unlimited number of slaves can be connected to one master.

### The following should be taken into account:

- Min. distance between two modules: 5 m
- Max. distance from Master to Slave: 100 m
- Direct “view connection” has to be ensured between master and slave. Typical installations consist of two to four Slaves per Master (Fig. 3).

### Additional radio networks? No problem!

If additional radio networks are required, there is a solution. With a new master, a new radio network can be established – including additional slaves within this network (Fig. 4).

Both masters can be connected within the same IQ SENSOR NET.

### The most important facts at a glance

- Start with the MIQ/WL PS SET (Nr. 480025) – Two pre-configured modules (master and slave)
- Extension with the MIQ/WL PS (Nr. 480023) – One pre-configured module (slave)
- Reliable and stable data transfer
- To be used with all IQ SENSOR NET systems
- No additional power supply required when connecting an IFL 700 IQ sludge level sensor

Do you have further questions?  
Please contact our  
Customer Care Center:

Xylem Analytics Germany Sales  
GmbH & Co. KG, WTW  
Am Achalaich 11  
82362 Weilheim, Germany  
Phone +49 881 1830  
Fax +49 881 183-420  
Info.WTW@xylem.com