

# Remote Monitoring for Water Quality Improvement

Franconian Lake District, Germany

## Case Study



Expertise in Flow



### 2105G Interface Module

#### Benefits and features of the 2105G:

- Stationary or portable
- Long battery life (15 months at 15 minute storage intervals)
- Rugged, submersible enclosure (IP 68)
- Easily combined with 2100 series flow meters or stand alone
- Data logging (79MB)
- Variable rate data storage
- GSM/ GPRS modem
- Landline modem
- Inputs:
  - SDI-12
  - Modbus
  - Analog (4-20 mA) via converter
  - Rain gauge
- Outputs:
  - Modbus
  - Digital pulse for enabling or pacing a sampler
  - Analog (4-20 mA) via 2108 module
  - Alarms

*Teledyne Isco offers a complete remote water quality monitoring solution for a project to improve water quality of an artificial lake in the Nuremberg Area, Germany. The monitoring system takes flow based water samples and provides continuous and frequent updates of rain and flow data to a central server, needed to identify problems and verify the effects of actions taken.*



*Typical stream monitoring application with V-shaped weir, ultrasonic level sensor and automatic water sampler.*

### Background

The Franconian Lake District is located in the southwest of Nuremberg, Germany. Completed in 2000, the seven man-made lakes are the result of one of Germany's largest water management projects, with the goal of even water distribution between North and South Bavaria. In periods during summer, Lake Igelsbachsee has problems with mass growth of blue-green algae (eutrophication). The result of such growth is harmful depletion of oxygen in the water and the forming of a toxic foam of dead algae on the surface, reducing recreational uses such as fishing and swimming. Eutrophication is the ecosystem's response to the addition of nutrients, such as nitrates and phosphates, entering the lake via polluted streams from catchment area.

### Remote water quality monitoring requirements

In 2010, the regional Water Authority of Ansbach (WWA Ansbach) decided on an action plan to reduce the influx of nutrients to the lake. In order to identify problem areas and monitor effects of implemented nutrient reduction steps, the plan included long-term water quality monitoring of 5 selected streams, specifically arriving from agricultural areas. WWA Ansbach needed an integrated system that would be able to take flow proportional water samples, log data including flow rate and rainfall, and send data and alarms remotely to enable quick actions and reduce the need for site visits.

*"The Future of Flow!"™*



**2110 Ultrasonic Flow Logger**

**Benefits and features of the 2110:**

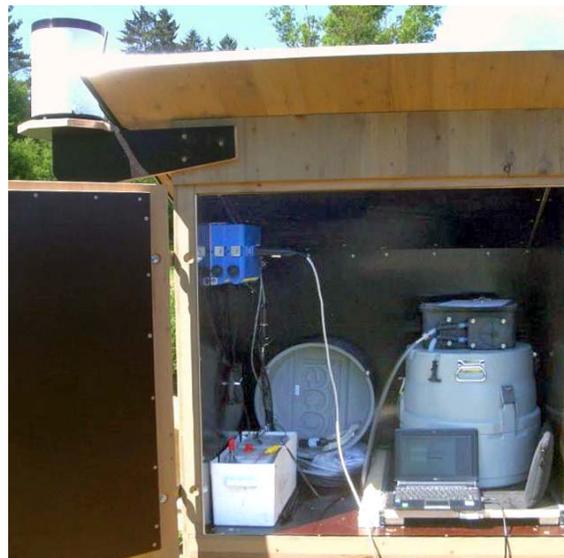
- Two sensor options
  - 0.1–1.8m
  - 0.3–3.6m
- Minimal deadband with digital sensor
- Horizontal or vertical sensor mounting
- Stationary or portable
- Long battery life (15 months at 15-minute data storage interval)
- Rugged, submersible enclosure (IP68)
- Easily combined with 2100 Series flow meters or standalone
- Variable rate data storage



**3700FS Automatic Water Sampler**

## Teledyne Isco remote water quality monitoring solutions

Teledyne Isco's distributor in South Germany, Deinlein & Lunz Umwelttechnik, was approached by WWA Ansbach to provide a solution for the monitoring project, and suggested a combination of the Isco 2105G Interface Module, the Isco 2110 Ultrasonic Flow Logger, the Isco 3700FS automatic water sampler, and the 674 Rain Gauge, meeting all requirements of the project. All data is logged and pushed via GPRS to the server of the WWA Ansbach. User-selected alarms can be provided via SMS or e-mail, and the system gives full access to manual or automatic changes in the flow meter or sampler programming via remote communications if an alarm event occurs.



### Teledyne Isco 2105G Interface Module

The 2105G Interface Module is a powerful solution to interface different types of monitoring equipment, including the Isco 674 Rain Gauge and external equipment with SDI-12 and Modbus (4-20mA) input. It records all data with variable storage rates. This ensures maximum information during events. The 2105G can take intelligent actions such as enabling and pacing automatic samplers, and can generate alarms. Operators can be informed when the sampler is started, if events are occurring, or if maintenance is needed. The continuous data pushed to the server via GPRS is easily accessible through the internet via a WebUI. The 2105G is robust (IP68) and battery conservative, allowing installation in harsh field conditions over long periods of time without maintenance.

### Teledyne Isco 2110 Ultrasonic Flow Logger

The Isco 2110 Ultrasonic Flow Logger provides accurate non-contact liquid level measurement, using built-in software to calculate flow in weirs, flumes and streams. The modular 2110 Flow Logger is directly networked (stacked) with 2105G Interface Module. Like the 2105G, it is rated IP68 and has variable data storage rates. The battery can provide up to 15 months of operation before replacement, making it ideal for remote monitoring stations.

### Teledyne Isco 3700 Full Size Automatic Water Sampler

The Isco 3700FS automatic water sampler is a durable portable peristaltic pump sampler, ideal for battery operation and, with an IP67 rating, installation in tough environments. The full-featured 3700 Sampler collects sequential (24 bottles) or composite (1 bottle) samples based on time, flow rate, or storm conditions. The collected water samples are analyzed at the Bavarian State Environmental Agency.

### Customer Feedback

*Dr. Dieter Krause from WWA Ansbach is very pleased with the results from the monitoring stations. "We now have 5 complete monitoring stations with equipment from Teledyne Isco. The stations have been running without any problems. This is a major tool for us to limit the amount of nutrients entering the lake. The WebUI gives easy access to water quality information, and alarms help us to act on short notice when needed."*

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