

Hydro-Logic<sup>®</sup> Smart Monitoring

# Applications

Flow, Level, Weather, Quality



# Monitoring applications

Accurate, reliable remote capture of water level, flow, weather and quality data enables engineers, municipal organisations and consultants to carry out critical flood mitigation, water resource planning and long-term environmental research activities.

## Monitoring weather

A comprehensive monitoring network may consist of temperature and precipitation, solar radiation, air pressure, wind, soil moisture, river and oceanic variables.

Rainfall is a prime upstream indicator of potential flood risk, and monitoring systems that measure climatic factors such as this can provide insight into imminent flood events. However, rainfall alone does not take into account contributory factors such as ground water, river levels or (in some regions) snow melt.

As such, while meteorological measures might provide an indicator of probability of flooding, they may be insufficient on their own to provide accurate, location-specific flood warning and should therefore be factored into a more comprehensive monitoring network.

The ability to monitor current and trending weather variables is especially important for the management of water resources and rainfall is just a single factor. The effects of wind, sun, changing pressure, humidity, etc. all play a part and these data are important components of a comprehensive management system.

**River flow** - this is calculated using a distributed rainfall-runoff model using the output from the rainfall model.

**Monitoring for droughts** - one of the most important uses for rain gauges is to monitor droughts in areas reliant on agriculture, as well as cities that don't get much rain.

**Monitoring for floods** – this is often used in conjunction with level to create a catchment model.

The compact Hydro-Logic® Flexi Logger 105, which fits into a pole top enclosure and has a large data storage capacity, is ideal for monitoring weather.



## Monitoring water levels

River level is the depth of water at a monitoring station, measured in metres to a specified datum.

A good indicator of flood risk are the water levels in natural and man-made bodies of water such as rivers and sewers. These water levels represent a tangible, realistic measure of the volume of water that is being conveyed downstream, and can provide accurate signals as to likely flooding.

Monitoring watercourses like these upstream of homes, businesses and infrastructure provides a reliable measure of flood risk, and water level monitoring systems can form the core of an effective flood warning system.



## Monitoring flow

Flow is the volume of water passing a monitoring site, measured in cubic metres per second. Flow can be measured directly or derived from continuous measurements of river level and water velocity.

River flow forecasting is very important as a basis for early flood warning

As flow is a function of river level and velocity it is possible to get different values of flow for the same level. This can happen if the characteristics, for example, roughness of the channel, change as the result of a flood or from the growth of vegetation.



Both the Hydro-Logic® Flexi Logger 105 and the Hydro-Logic® Flexi Logger 300Ex are suitable for monitoring water levels and monitoring flow.

The ATEX and IECEx compliant Hydro-Logic® Flexi Logger 300Ex should be used for any location where there is a risk of explosion.

## Monitoring water quality

Effective water quality monitoring is the key to environmental protection of watercourses and for reliable process control and wastewater treatment. Discharge consents under EPR regulations dictate that water quality monitoring is undertaken to ensure that consented parameters are below the consented concentration.

Traditionally this has been done using water quality sampling methods, but increasingly automatic water quality measurement sensors linked to real-time telemetry is seen as the most reliable and timely means of ensuring that treatment processes are operating efficiently and that EPR compliance is maintained.



The Hydro-Logic® Flexi Logger 105 with its large data storage capacity and compatibility with a large range of sensors is ideal for water quality monitoring.

## Sewer Network and CSO Monitoring

Hydro-Logic® Smart Monitoring can help water companies understand the operation of their sewer networks in various conditions and enable them to model and then mitigate sewer flooding.

Monitoring spill frequency at Combined Sewer Overflows (CSOs) is key to providing water companies with the data they need to be able to reduce the number of spills and improve the quality of the water environment.

Both of these applications are essential to helping water companies meet their Water Industry National Environment Programme (WINEP) objectives.

The Hydro-Logic® package for these applications comprises a Hydro-Logic® Flexi Logger 300Ex paired with a Pulsar dBi sensor.

The Hydro-Logic® Flexi Logger 300Ex is ATEX and IECEx compliant (to Zone 0) so is the ideal, safe choice for both applications.



## Select the right logger for your application

We have two models of Hydro-Logic® Flexi logger and they each have attributes that can make them ideal for some applications and not others. The table below compares the two:

| Attributes   | Hydro-Logic® Flexi Logger Model   |   |
|--|---|---|
|  | 105   | 300Ex   |
|  |  |  |
| Environmental protection                                 | IP68  | IP68  |
| ATEX and IECEx compliant (to Zone 0)                     |   | ✓   |
| Networks   | 4G that supports NB-IoT and CAT M1 with 2G fallback included                        | GSM, GPRS or 3G   |
| Input capability   | Analogue, Digital and SDI-12  | Analogue, Digital and HART  |
| Solar or wind external charging system connection option | ✓   |   |
| Number of channels                                       | 32  | 8   |
| Storage capacity   | 119,700   | 29,768  |
| Protected Wi-Fi configuration                            | ✓   |   |

## Hydro-Logic® Flexi Logger 105

The Hydro-Logic® Flexi Logger 105 delivers faster ARM-based processing, Wi-Fi connection and large data storage capacity, but is still small enough to fit into a standard pole top installation.



### Model Specific Features

- ARM based logger provides faster processing
- 32 channels as standard.
- Uses a 4G modem that supports Long-Term Evolution technology (NB-IoT and CAT M1). 2G fallback included.
- Protected Wi-Fi configuration without ever removing the unit from its installation casing.
- Compatible with Hydro International standard pole top casings so upgrades to existing sites are straightforward.
- 119,700 data storage capacity.
- Switched 12 Volt DC output for powering sensors.
- External power-source capability.
- Configurable sample rate, 10 seconds to 12 hours.
- Industry-standard input capability Analogue, Digital and SDI-12.
- Rugged, environmental protection to IP68 (at 1.2 m submersion for 48 hours without significant ingress).

## Hydro-Logic® Flexi Logger 300Ex

ATEX certified, the Hydro-Logic® Flexi Logger 300Ex is ideal for installation in chambers or tanks where a potentially explosive atmosphere may be present.



### Model Specific Features

- ATEX and IECEx compliant (to Zone 0).
- 3 sensor connectors suitable for field wiring.
- Remote monitoring of up to 3 HART or float switch sensors and one 4-20mA input.
- 29,768 16-bit readings for up to 8 channels
- 18V sensor power supply.
- User-replaceable battery 96Ah battery.
- Rugged, environmental protection to IP68 (at 1.2 m submersion for 48 hours without significant ingress).

## Harvest configuration software

All our Hydro-Logic® Flexi Loggers are supplied with our Windows Harvest logger control software package which enables users to configure all loggers, sensor and telemetry settings via serial port communications, and inspect collected data and trends. It is also used to export and manage data retrieved from these devices.

Harvest software is available in two versions:

- Harvest for Windows based PCs.
- Pocket Harvest for Windows Mobile based devices including the rugged Juniper Archer 2.

You can download Harvest Windows software free of charge from our support website:  
[www.hydro-int.com/smart-monitoring-support](http://www.hydro-int.com/smart-monitoring-support).

## Upgrading from the 100 to the 105

**Get nearly four times the readings storage, double the available channels, 4G network connectivity, lower power usage and a faster processor with the Hydro-Logic® Flexi Logger 105.**

The Hydro-Logic® Flexi Logger 105 has been designed to enable an easy upgrade to the Hydro-Logic® Flexi Logger 100 in most situations.

The new design will fit easily into our standard pole-top enclosure so upgrades to existing sites are straightforward.

If you would like advice on upgrading your existing Hydro-Logic® Flexi Logger 100, please contact us on: [smartmonitoring@hydro-int.com](mailto:smartmonitoring@hydro-int.com) or call: +44 (0)1275 878371



## Support for legacy models

### Hydro-Logic® Flexi Logger 100 and Hydro-Logic® Flexi Logger 200

If you are happy with your current logger, whether it's a Hydro-Logic® Flexi Logger 100 or a Hydro-Logic® Flexi Logger 200, rest assured we will happily continue to support both these models whilst under warranty.

If you have any queries, or would like technical support for either of the 100 or 200 Hydro-Logic® Flexi Loggers, please visit our support pages at:

<https://www.hydro-int.com/en-gb/smart-monitoring-support>

or call: +44 (0)1275 878371



# Select the sensor to match your logger and application

\* All listed sensors are supported and are compatible with our loggers. Pre-configured templates for all supported sensors are located with Harvest configuration software.

## Level Sensors

| Logger Model | Category    | Manufacturer and Model            |
|--------------|-------------|-----------------------------------|
| 105          | Contact     | Cynergy3 IMSL/S12C/S12S/LMP 307   |
|              |             | In-Situ Level Troll Range         |
| 105          | Non-contact | VegaPuls WL61Radar Sensor         |
|              |             | Pulsar dBi HART Transducer Series |
| 300Ex        | Contact     | Cynergy3 LMK 307                  |
| 300Ex        | Non-contact | Pulsar dBi HART Transducer Series |

## Flow Sensors

| Logger Model | Category    | Manufacturer and Model   |
|--------------|-------------|--------------------------|
| 105          | Contact     | Nivus POA Wedge (or CS2) |
|              | Non-contact | Sommer RQ                |
| 300Ex        | Non-contact | Pulsar Microflow-i       |

## Weather Sensors

| Logger Model | Category                 | Manufacturer and Model |
|--------------|--------------------------|------------------------|
| 105          | Tipping Bucket Raingauge | Casella TBR            |
|              |                          | EML ARG314             |
|              | Weather                  | Gill MetPak PRO        |

## Quality Sensors

| Logger Model  | Category              | Manufacturer and Model   |
|---------------|-----------------------|--------------------------|
| 105           | Sediment/Sludge Level | Vega VegaVib 63          |
|               | Turbidity/TSS         | Analite NEP 5000         |
|               |                       | In-Situ Aqua Troll Range |
|               | Dissolved Oxygen      | In-Situ RDO Pro-x        |
|               |                       | Ponsel OPTOD             |
|               | Redox/ORP             | In-Situ Aqua Troll Range |
|               |                       | Ponsel PHEHT             |
|               | pH                    | In-Situ Aqua Troll Range |
|               |                       | Ponsel PHEHT             |
|               | Conductivity          | In-Situ Aqua Troll Range |
|               |                       | Ponsel C4E               |
|               | Nitrate               | Aqua Troll Range         |
|               | Chloride              |                          |
|               | Salinity              |                          |
|               | Ammonium              |                          |
| Chlorophyll a | AquaRead AP-LITE      |                          |
|               | AquaRead AP2000       |                          |

| Logger Model    | Category          | Manufacturer and Model             |
|-----------------|-------------------|------------------------------------|
| 105             | Blue Green Algae  | AquaRead AP-LITE                   |
|                 | Rhodamine         |                                    |
|                 | Fluoresceine      |                                    |
|                 | Refined Oil       |                                    |
|                 | CDOM/FDOM         | AquaRead AP2000                    |
|                 | PAH               |                                    |
|                 | TOC               |                                    |
|                 | Soil Moisture     | TekBox TBSMP02 Soil Moisture Probe |
|                 |                   | Adcon SM1 Soil Moisture Probe      |
|                 | Multiparameter WQ | In-Situ Aqua Troll Range           |
| AquaRead AP2000 |                   |                                    |

# Choose your data visualisation software

## Hydro-Logic® Timeview

Hydro-Logic® Timeview provides an online platform for basic data visualisation, inspection and early warning on an annual subscription. The software enables you to:

- Capture latest data and trends.
- Reduce site visits to save cost of data collection.
- Use near real-time alarms to alert emergency staff ie. to clear blockages.
- Get warnings of events or licence compliance failure.
- Easily manage users and device features.

Hydro-Logic® Timeview automatically receives data from remote Hydro-Logic® data loggers, and provide an interface to enable you to inspect data outputs, helping you to identify potential system blockages and alerting you to changes in environmental conditions that could indicate an imminent flood event.

Hydro-Logic® Timeview also manages any automated alerts that have been configured, distributing them via e-mail or SMS to designated recipients to provide early warning of flood events or other environmental risks.

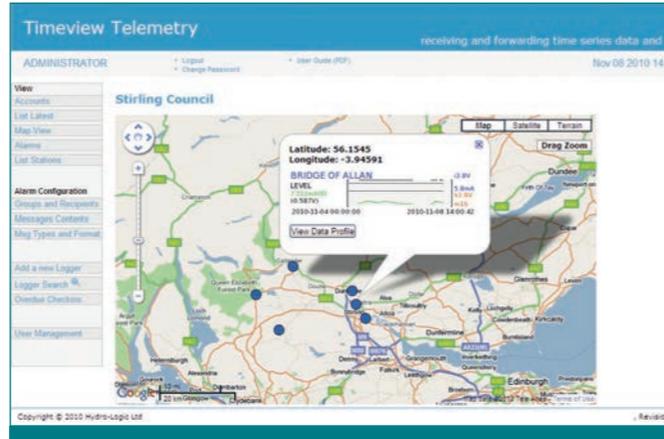
## Hydro-Logic® Timeview DBi

Hydro-Logic® Timeview DBi is a streamlined online database for long-term data warehousing of hydrometric, climate and environmental data, equipping you with analysis tools to help you derive meaningful, actionable insights from that data.

## Hydro-Logic® Aquator water resources modelling software

Hydro-Logic® Aquator software enables engineers and analysts to create and run complex models of water resources systems, providing insight into system performance under current and future supply, demand and environmental conditions in order to make better planning, development and resourcing decisions.

Hydro-Logic® Aquator is the only water resources/supply software in the world with the right to use Microsoft Visual Basic® for Applications (VBA) to customise its models - making it uniquely capable of helping water providers to overcome their most important challenges.



## Aquarius Time-Series™ software

Hydro-Logic® Services is the approved distributor in the UK and Ireland for Aquarius software products.

AQUARIUS is the leading software for water time series data management. The world's most advanced environmental monitoring agencies trust AQUARIUS to achieve higher data integrity, defensibility, and timeliness. Its simple design delivers the latest hydrological science and techniques in an intuitive interface.

AQUARIUS allows water resource managers to correct and quality control time series data, build better rating curves, and derive and publish hydrological data in real-time to meet stakeholder expectations.

# Consultancy projects and managed services

Many organisations don't have the time, resources or expertise to design, install or operate a Smart Monitoring system, and many face similar difficulties in collating, manipulating and interpreting hydrometric data.

Our Hydro-Logic® Services team is hugely experienced in all aspects of Smart Monitoring, and is able to provide expert system design, installation and operation services, or to deliver stand-alone hydrometry consultancy projects such as MCERTS inspections.

Our Hydro-Logic® Services consultants can help you to address your most complex, critical and urgent Smart Monitoring challenges.

## Services

### Field Hydrometry

Smart Monitoring network design, management and operation.

### Consulting Hydrometry

Specialist hydrometry guidance, advisory support and training.



To learn more about how our Hydro-Logic® Smart Monitoring products and services can help you make better water management decisions visit [hydro-int.com/smartmonitoring](http://hydro-int.com/smartmonitoring) or search **hydro-logic smart monitoring** online.

Contact us to talk to an expert:

### Products

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Hydro-Logic® Smart Monitoring  
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### Consultancy services

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Make better water management decisions