WTW Viso Turb 700 IQ setup

Technical Overview:

The Viso Turb sensors measure scattered light at an angle of 90 degrees. The light source is in the infra red spectrum at a wavelength of 860 nm. The Viso turbidity sensors conform to EN27027 and also the ISO7027 standards.

Installation:

WTW Turbidity sensors need to be installed in the river in a position where the sample is representative of the main river flow. Care should be taken to avoid slow moving sections or back eddies. The sensor should be mounted so that a hand held meter can be positioned as close to the turbidity sensor as possible for the purpose of collecting check data. While several different mounting options are possible, Horizons prefer to use a method that allows the sensor to be removed from the water during low and medium water flow conditions.

Mangahao at Ballance

The preferred method is to use 50 mm galvanised pipe running from the river bank to the water pinned in place with steel. The sensor and cable should screw on to a PVC 25 mm threaded end attached to 25 mm PVC pipe. This allows for easy inspection of the sensor most of the year.

The sensors are marked with an arrow. This arrow needs to point **DOWN STREAM**. There must be a minimum distance between the river bed or edges and the sensor of at least 10 cm.

Wiring:

Horizons tend to purchase the 240 volt controllers and run them through an inverter off the site battery. We also have some controllers which require a 24 volt power supply (Check which power supply is required before deployment).

If this is a new site, do not connect any sensors until the controller has been powered up and the language changed to “English”. Failure to change the language first will result in the sensors being programmed to that language.

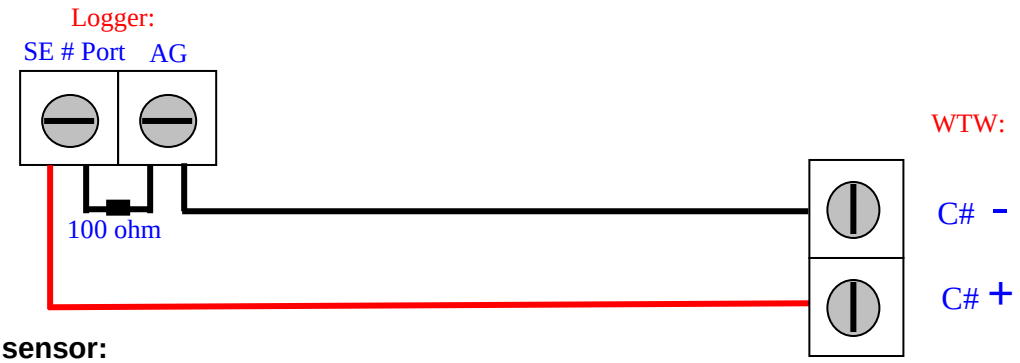
The WTW use their own IQ sensor net, which is a form of digital bus communications. It does not matter which sensor net port is used as they use their own sensor addressing. Connect the sensor cable to the controller by connecting the Red, Black and Green wires to any one of the sensor net ports. (Hint the controller has the colours written beside the terminals). Note: you can bridge two or more sensors to one sensor net port (useful where longer cable runs may be required).

Caution: Make sure you turn the power off the WTW before opening the controller and wiring the terminals. (There is a risk of damage to the controller and to your personal safety. Do not power up until all connections are made, and the controller box is closed.)

WTW Viso Turb 700 IQ setup

Wire the communications to the data logger. Select any two spare C outputs (C1, C2, CR1, CR2, CR3) [C1 & C2 are on the front module, CR1, CR2 & CR3 are on the rear module]

Wire the 0 – 20 mA outputs to a spare SE port on the logger with a 100 ohm 0.1% resistor bridged to ground (per output):



Before connecting the sensor:

If it is the first time the controller has been used, press the “S” button, then select “Language”, then “English”. While not necessary, it is best practice to also set the date and time.

Connecting the sensor and initial configuration:

After wiring the sensor and connecting to a power supply as above, plug the Viso Turb sensor into the cable and power up the controller.

When you plug the sensor in the controller should display “INIT” and after a short wait it will show the serial number and then the actual readings from the sensor. Record the serial number and fill out an instrument relocation form.

Press the “S” button to enter the setup menu.
Use the arrow keys to select the Turbidity sensor. Press “OK”

The following settings should be in the controller (alter them if needed):
Measuring mode: FNU
Measuring Range: Auto Range
Signal Averaging: Use default settings
Application Offset: 0
Ultrasonic Cleaning: Either set to “On” or “Pulse”

Communications:
Press the “S” button to access the settings menu use the arrow keys and select the communications port corresponding to the wiring (C1, C2, CR1, CR2, CR3)

WTW Viso Turb 700 IQ setup

Turbidity Point Sample:	Turbidity (Low Range):
Select “Set Output” Link to: Select the right sensor Current Output: Recorder Recorder Type: 0 – 20 mA Measured Variable: Main Variable Start Value: 0 End Value: 4000 Attenuation: 20 mA/s I – UFL/OFL: Error Behaviour at Error: Fixed current value Current with error: 21.0 mA Save and Quit	Select “Set Output” Link to: Select the right sensor Current Output: Recorder Recorder Type: 0 – 20 mA Measured Variable: Main Variable Start Value: 0 End Value: 400 Attenuation: 20 mA/s I – UFL/OFL: Error Behaviour at Error: Fixed current value Current with error: 21.0 mA Save and Quit
Logger multiplier = 2.0	Logger multiplier = 0.2

Maintenance:

Generally little to no maintenance is required. The sensor housings may be prone to fouling with silt, care should be taken to ensure the housings are clear of silt before repositioning the sensor. An ultrasonic cleaning head incorporated as part of the sensor keeps the sensor clear of algae growths.
Caution the ultrasonic boards have a limited lifespan of around two years. After the ultrasonic boards stop working, manual cleaning will be needed to maintain the data quality. Replacement boards can be fitted in the factory only at a cost of ~$1500 (2012). Replacement sensors are needed while new boards are fitted as this process will take up to 10 weeks.

Calibration:

No ongoing calibration is required for the WTW Viso Turb sensor. The calibration constants are stored in the sensor itself. While it is possible to calibrate the sensors, Horizons have opted to use the factory calibration and collect check data / lab results as our control of accuracy.

Validation:

Through collection of water samples which are sent to the laboratory and tested for suspended sediment and turbidity.

Replacement Sensor:

In the event the Turbidity sensor needs replacing, it is best to check the controller outputs before starting. These will be deleted when the new sensor is connected. (Take note of which outputs are configured for High: [Turbidity (Point sample)] and Low [Turbidity (Low Range)]). Unplug the old sensor and plug in the new sensor. The controller should find the new sensor and prompt you to substitute the sensor or replace the sensor. Chose the replacement option, otherwise the serial number from the old sensor will remain. Check and setup where necessary the controller outputs.