WTW FDO 700 IQ setup

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Installation:

WTW FDO 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 FDO sensor as possible for the purpose of collecting check data.

Mangahao at Ballance

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.

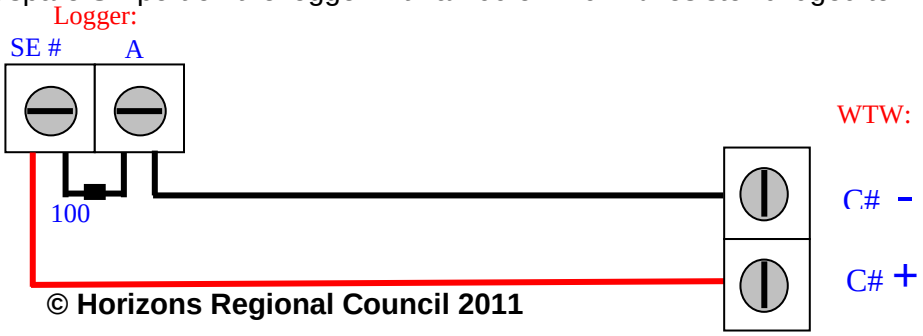
The preferred method is to use 50 mm galvanised pipe running from the river bank to the water pinned in place with steel. The sensor and cable should screw on to a PVC 25 mm threaded end attached to 25 mm PVC pipe. This allows for easy inspection of the sensor most of the year. An atmospheric pressure sensor must be installed within 50 km of the site measuring dissolved oxygen. Water temperature must also be collected from the WTW sensor.

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). 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.)**

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):



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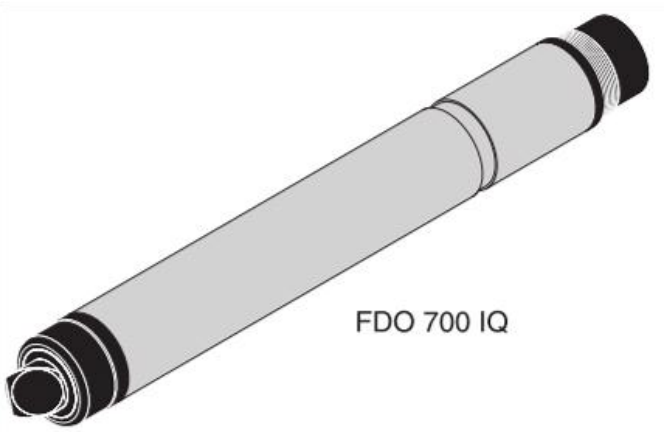
Before connecting the sensor:

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 FDO 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 instrument relocation form.

From the settings menu, make sure the altitude correction is set to 0 meters (we do barometric pressure correction in the office).

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

The following settings should be in the controller (alter them if needed):

Measuring mode: Saturation
Measuring Range: 0 – 200%
Response Time (t90): 150 sec or 360 sec (older firmware)
Calibration: Factory Calibration
Temperature mode: ^{o}C
Temp Adjustment: 0.0 ^{o}K (This is only used if the temperature probe needs an offset)
Salinity: Off

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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)

Dissolved oxygen saturation:	Water temperature:
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: 200 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: Adjoining Variable Start Value: 0 End Value: 50 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 = 0.1	Logger multiplier = 0.025

Barometric pressure:

Barometric pressure must be collected when measuring dissolved oxygen. It is preferable to measure the atmospheric pressure directly at the site. Do not correct the atmospheric pressure to sea level, true atmospheric pressure is required. If this is not available, then there must be barometric pressure available within 50 km of the site measuring dissolved oxygen.

When using a remote barometer, altitude correction (between the dissolved oxygen sensor and the barometer) must be applied to the pressure readings).

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 a clear of silt before repositioning the sensor. Algae do not seem to grow on the membrane and is therefore not an issue.

The membrane does degrade over time with each sample. The membrane should last for two years. To ensure we do not exceed the two year limit, Horizons have opted to change the membranes annually (approx $200).

Calibration:

No ongoing calibration is required for the WTW FDO sensor. The calibration constants are stored in the sensor cap, and are transferred to the sensor automatically when the membrane and sensor cap are replaced.

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Validation:

Dissolved oxygen sensor performance shall be checked when possible by a two point validation at the start and end of the membrane life. Refer to *method 10.18* of this manual for validation procedures. Check data will also be collected as per *method 10.4* of this manual.

Replacement Sensor:

In the event the DO 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 Saturation and Temperature readings.)

Unplug the old sensor and plug in the new sensor. The controller should find the new sensor and prompt you to replace add the sensor as a replacement or a substitute sensor. Chose the replacement option, otherwise the serial number from the old sensor will remain.

Check the sensor is running on the factory calibration. (User calibrations are stored in the sensor). Then setup the sensor outputs for Dissolved Oxygen Saturation as above, and water Temperature.