QUICK GUIDE | OmniCTRL (pH/CO_2)

1.2 | LOLIGO® SYSTEMS

FIRST TIME USE

1 Download the latest version of **OmniCTRL** from our website: loligosystems.com/downloads
Follow the installation instructions on the screen and then restart the PC.

2 Power on each WTW meter by pressing the *Power* button. Press and hold the *ENTER* button to enter the *Storage & config menu* (**arrow**, 3c). Select *System* > *Interface* > *Baud rate*, and set the baud rate to 19200. Press the *F1* button until you return to the start screen.

SETUP

3 Insert the Loligo® license dongle (3a) in a USB port on the PC to unlock the full software. OmniCTRL will run in demo mode, if the license dongle is not inserted. Running OmniCTRL in demo mode will enable virtual hardware that simulates data during an experiment (i.e., you cannot use real hardware).

4 Connect the **Long range Bluetooth dongle** to a USB port on your PC, and let it initialize (3b). Disable any other Bluetooth radios on your PC.

Connect the **PowerX4** power strip to a grounded wall outlet (4a).

Connect the **WTW meter** to a USB port on your PC. Power on the meter.

If you are using a Witrox oxygen instrument... Connect the **Witrox** (4b/c) to a power source (PC USB or USB adapter). Click the red *Power* button. The blue connect icon will now flash blue (for 5 min.) indicating that the Witrox is in pairing mode.

5 Open **OmniCTRL** > **Devices** > Choose **Scan for new devices**. When scanning is complete, press and hold the *F2* button on the WTW meter until the *Autom. USB Output menu* appears. Change *Interval rate*, if necessary. Choose *Continue* to exit. The data shown on the WTW meter display will now show on the WTW illustration display in OmniCTRL (**arrow**, 5).

Now choose the type of regulation you want each instrument to perform by clicking the *regulation buttons* on the left. The buttons will turn green when active:

- ✕ = No regulation
- ↓ = Decrease parameter level
- ↑ = Increase parameter level
- ↑↓ = Increase/Decrease parameter level

The type of regulation will be assigned to a relay on the available PowerX4(s) (**arrow**, 5). Make sure to connect the required hardware (i.e. solenoid valve) to the correct relay on the PowerX4.

6 Each WTW probe and Witrox oxygen sensor must be calibrated before first time use. See step 12-14 for more information.

RUNNING AN EXPERIMENT

7 Repeat step 3-4, and open OmniCTRL. Go to Devices > Choose **Use current configuration**, and complete step 5 from "*When scanning is complete...*"

8 It may be necessary to perform a new WTW probe or Witrox oxygen sensor calibration (see step 12). If regulating CO_2, a pH -> CO_2 conversion is needed (see step 11).

9 Main menu > **Experiment**: See real-time data and start regulating water quality.
Start regulation: Click on ⚙ for each channel to change setpoint, regulation type etc. (**arrow**, 9). Choose regulation type (Off, Manual, Automated or File), and change regulation settings, if necessary. View the protocol by clicking the 👁 button. Click *Apply* to start regulating.
Start logging: Click *Start logging* (**arrow**, 9) > Choose file destination > Logging starts

10 Main menu > **Protocol designer**: Create custom protocols for special regulation requirements (e.g. simulating diurnal curves). In the settings panel to the right, click on a given graph illustration to determine the regulation pattern (**arrow**, 10). Additionally, change the regulation settings underneath to customized the protocol to your liking. The protocol will be displayed as a graph on the left. Click **Export** to save the current protocol as an editable text file (**arrow**, 10). Load the saved protocol file during an experiment (i.e. choose *File* as regulation type).

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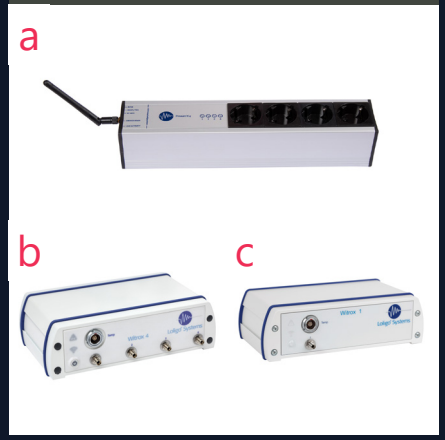

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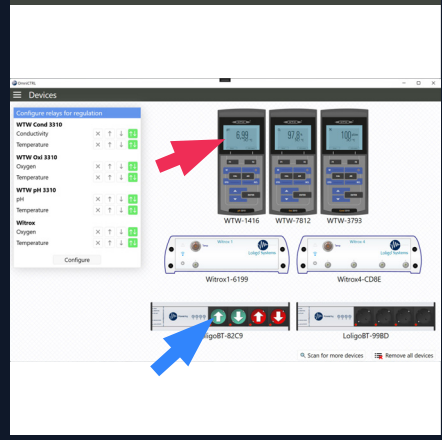

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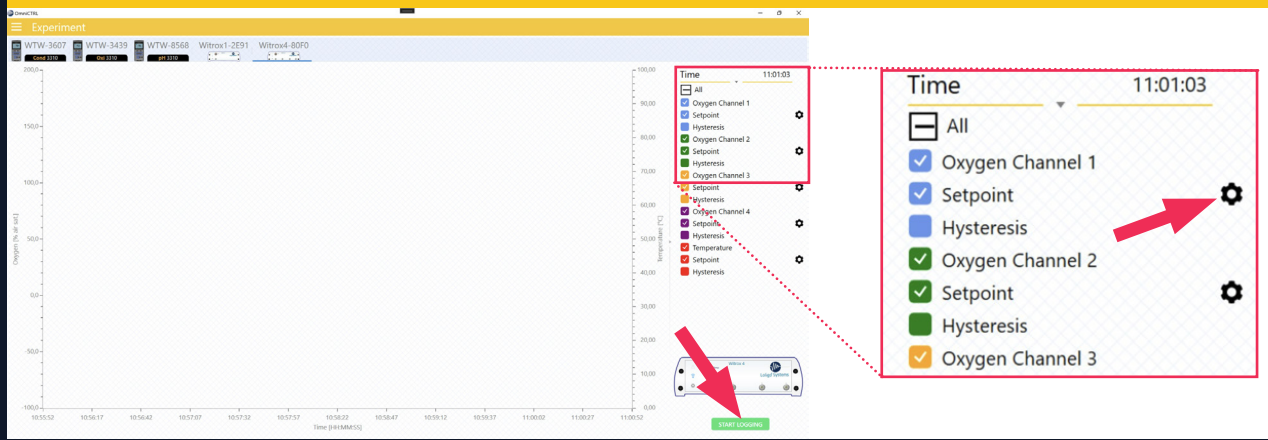

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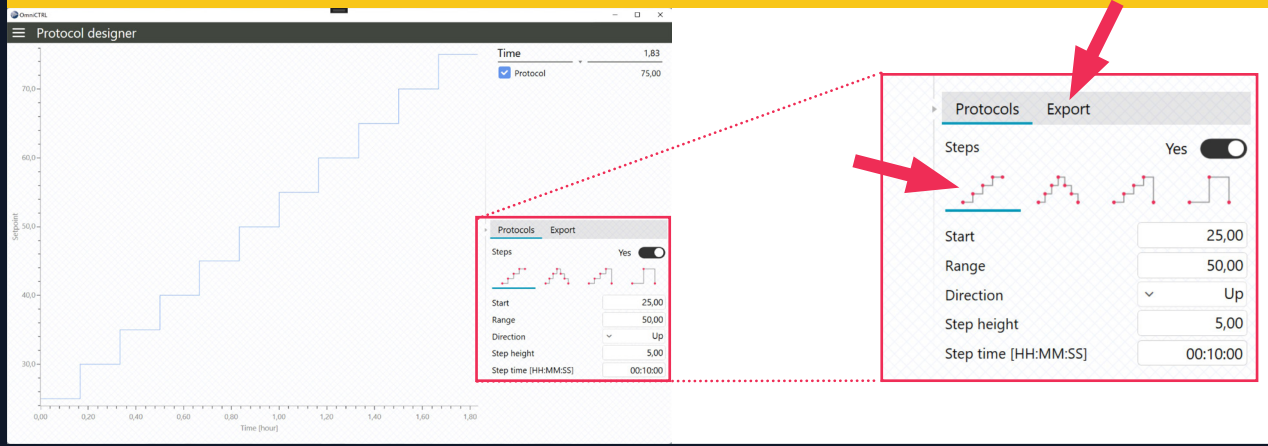

CALIBRATION, CLEANING, AND MAINTENANCE

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pH -> CO_2 conversion: Calibrate (13) the WTW SenTix HWD pH probe before conversion. Prepare three water samples of the same quality (i.e. buffer capacity) as the water used for experiments, and keep water temperature constant and the same.

Use a gas mixing pump (Wösthof), mass flow cells, or ready-made gas mix to bubble the three samples at three different pCO_2 levels within the range of your experiment min/max pCO_2 level.

Place the SenTix HWD pH probe in the first water sample, click the ⍈ to measure pH, and then type in the corresponding pCO_2 level. Click ✚ to add the next measurement point (11). Perform three measurements per water sample to ensure stabilized readings. The conversion is now done.

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When to calibrate... In general, you should perform a new sensor calibration if you experience sensor performance issues (e.g. signal drift). Otherwise, a new calibration is recommended:

- **WTW Oxi 3310 (CellOx 325)**: When the probe symbol flashes (after the set calibration interval has expired (150 days as standard)) or when using a new probe.
- **WTW Cond 3310 (TetraCon 325)**: Every 6 months or when using a new probe.
- **WTW pH 3310 (SenTix HWD)**: When the probe symbol flashes (after the set calibration interval has expired (7 days as standard)) or when using a new probe.
- **Witrox**: When the % air sat. level drifts with > +/-2 % or when using a new oxygen sensor. The temp. probe is pre-calibrated and cannot be manually calibrated.

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Calibrate a WTW probe: Please see the respective WTW meter user manual for more instructions. Each manual can be found at: loligosystems.com/manuals

14

Calibrate a Witrox oxygen sensor: In OmniCTRL > Main menu > Calibration > Choose Witrox instrument. Click on the relevant channel (⚙ CH1-CH4) to open the channel calibration menu (14). Select the type of temperature input (Witrox controlled or User defined) and then perform a **Manual 2-point calibration** (14 and 14.1):

a. Place the sensor tip in a mixed air-equilibrated water sample. This can be achieved by purging atmospheric air into sample water, e.g. with an air pump.

b. Wait for the phase reading (sensor signal) to stabilize and then click **Read current values** to save the current value as the HIGH calibration value (100 % air saturation).

c. Transfer the sensor to an oxygen free water sample, e.g. by purging nitrogen gas into sample water or by dissolving ~10 grams of Na_2SO_3 in 500 ml of distilled water.

d. Wait for the phase reading to stabilize and then click **Read current values** to save the current sensor signals as the LOW calibration value (0 % air saturation).

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How to clean... In general, clean each instrument and sensor between uses.

- **WTW probes**: Please follow the cleaning instructions provided in the manual for the CellOx 325, TetraCon 325, or SenTix HWD probe. Each manual can be found at: loligosystems.com/manual
- **Witrox oxygen sensor**: Use a mild soap solution or bleach, and rinse with demi water. Then dry (15).
- **WTW and Witrox meters**: Wipe the outside of the measuring instrument with a damp, lint-free cloth. Disinfect the housing with isopropanol as required. Avoid contact with acetone or similar detergents that contain solvents.

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Store all sensors in a dark, dry place between trials. Avoid exposing the fluorescent dye on the Witrox oxygen sensor to UV light. UV light will bleach the sensor dye and decrease the signal strength (amplitude).

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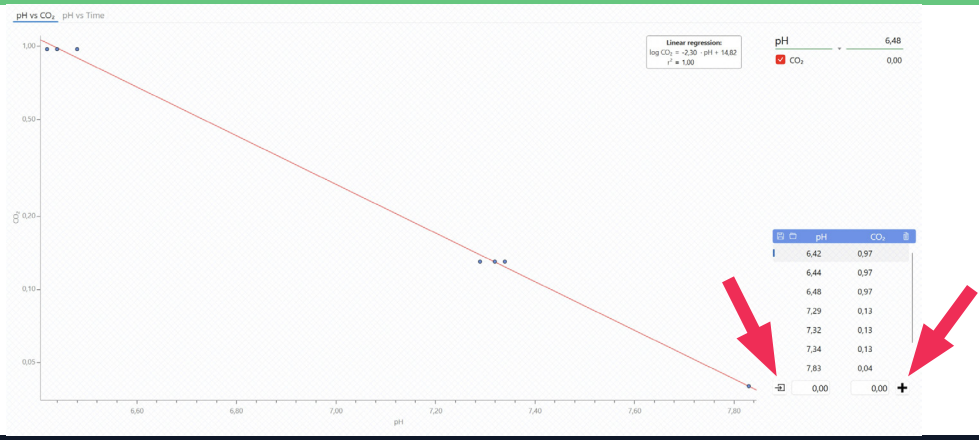

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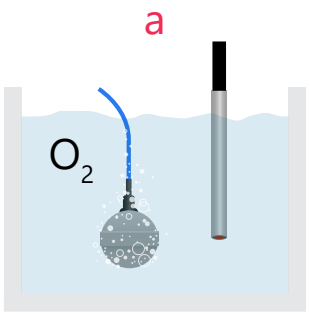
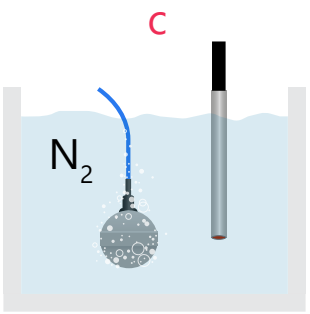
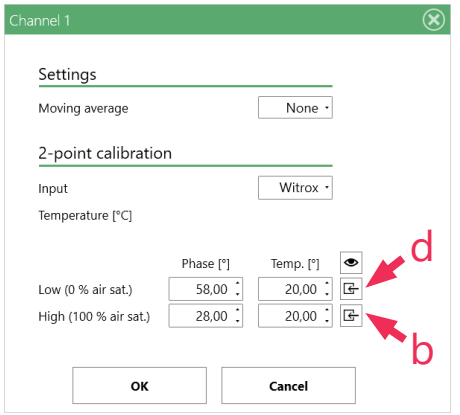


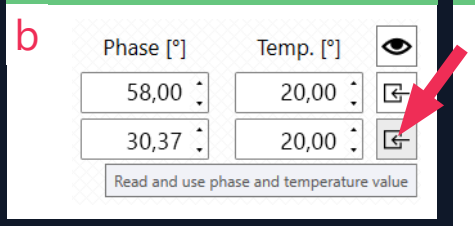
100 % air sat.

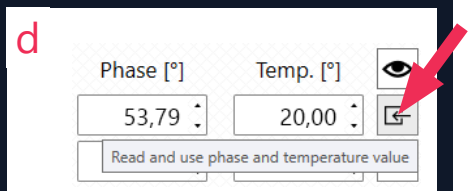


0 % air sat.



14.1





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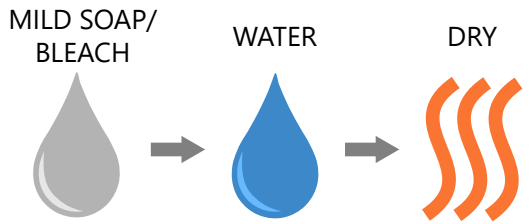
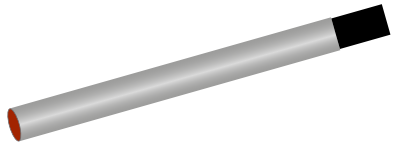
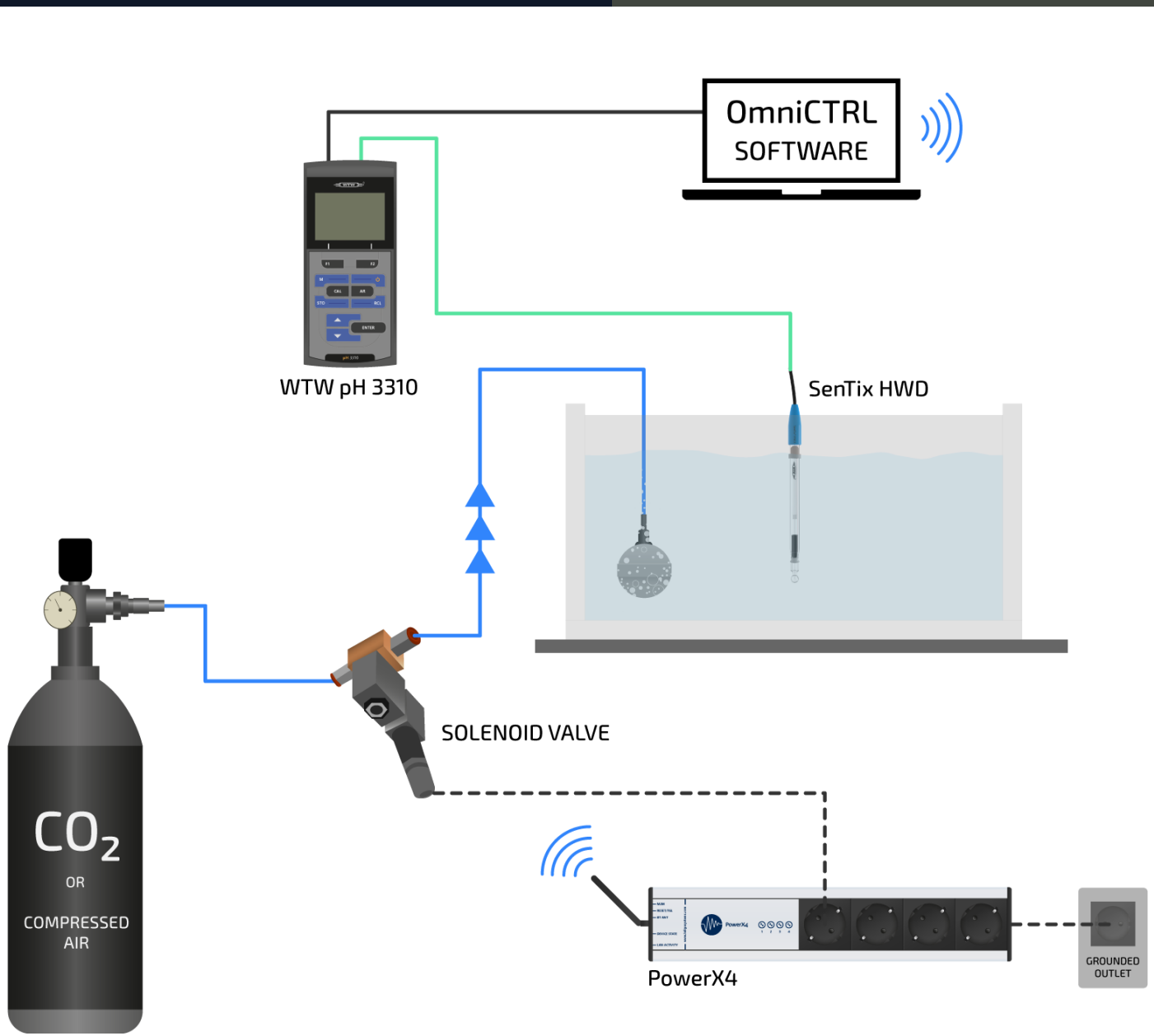






OmniCTRL system pH/CO_2 (1-way)

= Power cable

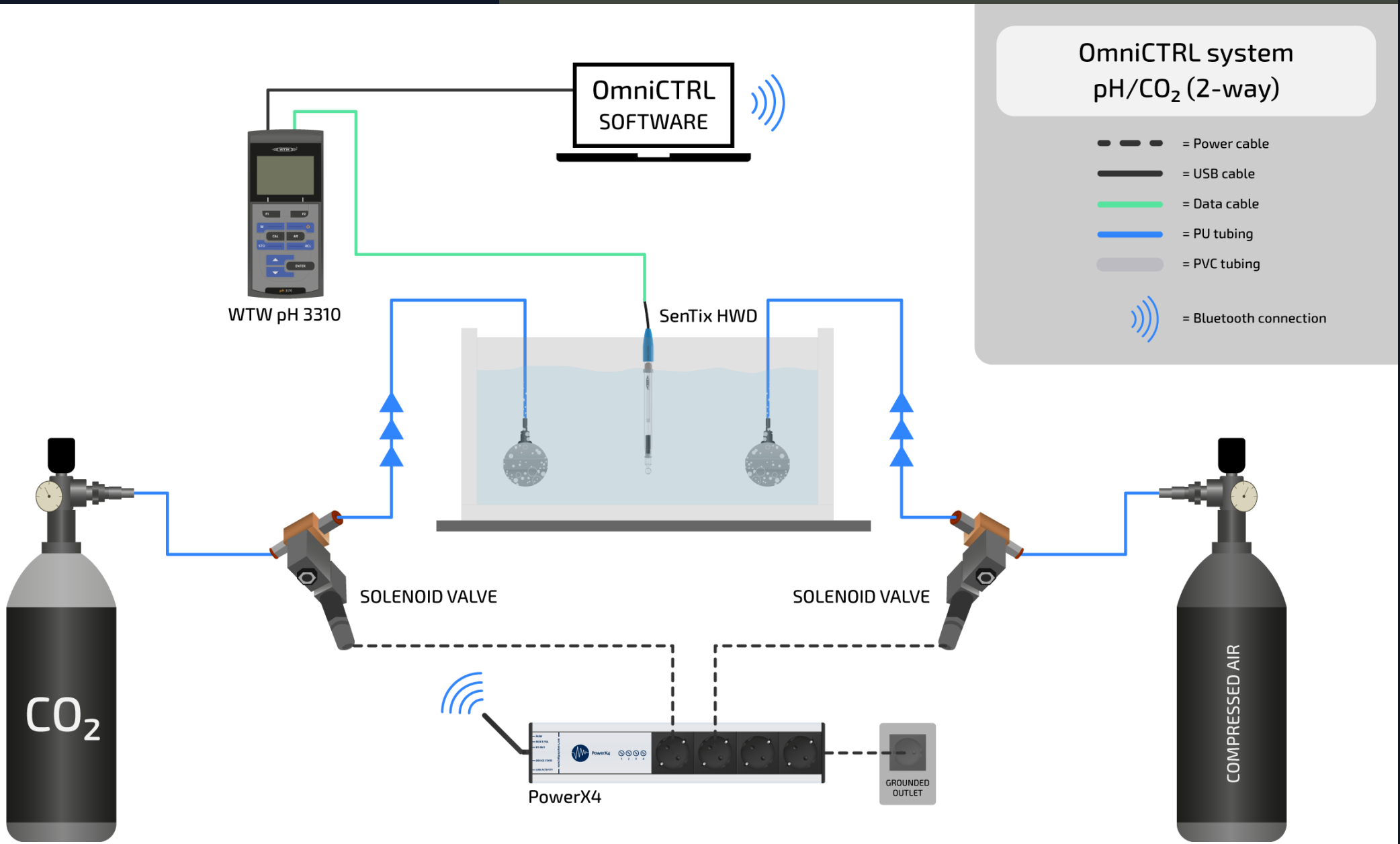
= USB cable

= Data cable

= PU tubing

= PVC tubing

= Bluetooth connection


OmniCTRL system
pH/CO2 (2-way)
= Power cable
= USB cable
= Data cable
= PU tubing
= PVC tubing
= Bluetooth connection
OmniCTRL
SOFTWARE
WTW pH 3310
SenTix HWD
SOLENOID VALVE
SOLENOID VALVE
CO2
COMPRESSED AIR
PowerX4
GROUNDED
OUTLET