DCM500 Aquatics Controller

Keypad Navigation

BACK Button.
In navigation screens, used to go back 1 level.
NOTE: In Output Status Screens 1-9, BACK is used to change output HOA (HAND / OFF / AUTO) mode.
On the LCD screen **BACK** is represented as **0**, so pressing can force the output ON or OFF depending on the Output Status LCD screen

UP & DOWN Buttons.
Move up or down to view options or to EDIT numbers.

RIGHT Button.
Advance to the next integer when changing values, or change HOA mode in Output Status Screens 1-9.

ENTER Button.
Used to progress to the next sub menu level or accept parameter changes made.

LCD Display Symbols

↑ ↓ ↕ Permits movement in indicated direction to scroll UP or DOWN, or EDIT values using related buttons.

↵ Permits selection of displayed menu option or execution of editing changes by pressing ENTER.

C 3 Letters indicate inputs and numbers represent outputs

Status Lights

Blue OK light - Controller is operational, and no alarms exist.

Red **Alarm** light – Controller has logged one or more alarms. Alarms may have corrected themselves, but may need to be acknowledged

Quick Start Guide

Menu Selections

Main Menu

The Main default display shows "Pool" followed by the ORP millivolts and an ENTER symbol, ↵ followed by a ↕ symbol. The second line shows the pH measurement and the optional Chlorine residual. Pressing the ENTER ↵ key in any menu allows access to additional submenus. Pressing the BACK button several times will take you to one of the respective default displays shown below.

Pool 750.1 mV ↵ ↕
7.49pH 1.53ppm

Press ENTER to view or modify system settings.

Pool Oxidant ↵ ↕
OFF: Setpoints

Pressing the DOWN key lets you see status of the pool primary oxidant feed and alarm status. Active alarms are displayed by the letters A..Z of the input or 1..9 of the output

pH Sensor C ↵ C
7.23 pH

Present value of the pH sensor connected to sensor input C. Press ENTER to calibrate,view/set alarms, & diagnostics.

Acid Pump ↵ 2
OFF: Setpoints

Auto control ↵ 2
0=Manual →=OFF

The acid pump is controlled by relay output 2 and is OFF because the pH value is less than the setpoint. Alternates with Auto-Man-Off selector. Press & hold BACK or RIGHT to select.

ORP Sensor ↵ D
716.1 mV ↕

Present value of the ORP sensor connected to sensor input D. Press ENTER to calibrate, view/set alarms, & diagnostics.

Oxidant Pump ↵ 3
ON 70.5 min

Auto control ↵ 3
0=Manual →=OFF

The Oxidant pump is controlled by relay output 3 and is ON for 70.5 minutes this feed cycle. Press ENTER to view/modify setpoints, alarms, diagnostics. Alternates with Auto-Man-Off selector. Press & hold BACK or RIGHT to select.

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Quick Start Guide

Diagnostics

To view or modify the Diagnostic for any device parameter or the controller itself, key UP or DOWN to the top menu for the specific input or output. The top menu provides the current state. Press ENTER and key DOWN to 'Diagnostic' & key ENTER, then UP or DOWN. Diagnostics provide invaluable information if you have a configuration problem or fault.

Adjusting Setpoints

To change a control setpoint, press the DOWN button until the control output (relay) number associated is shown, then press ENTER. Use the UP and DOWN buttons to find, then choose Setpoints by pressing the ENTER key once. For ON/OFF control, the display will show 'Turn ON setpoint' and a value. To change the value where the relay turns ON, press ENTER again and the screen will change to **`Editing↵ or Exit.`** Use the **UP** or **DOWN,** and **RIGHT** buttons to change to the new value, then press **ENTER.** To exit without changing the setpoint, press **BACK.** Scroll down to choose and change the 'Turn Off setpoint' in the same way. The difference between the Turn ON and Turn Off values is the dead-band or hysteresis, and should be set to keep the relay from 'chattering'.

Sensor Calibrations

Similarly, calibrations are performed much like the setpoint adjustment, but adjusting the readings to a known value introduced to the sensor input. Most routine calibrations are single point calibrations synchronizing to a test kit or buffer reading.

Chemical Feed Controls

Chemical feed setpoints can be set or changed as per the method in 'Adjusting Setpoints' above. Feed limits are times for pumps & solenoids controlled by relays 1...5 and volumes for frequency controlled outputs 6..9. Set limits so that worst-case operation thereby avoiding nuisance alarms.

Configuration Changes

Most configuration changes beyond calibrations and setpoints are more easily done using the Web Browser interface or Trackster 3 Software. The graphical view reflects operation and permits changes using both the main view and diagnostic screens. Consult the browser manual for details.

Security and Passwords

There are four Operations Passwords (Operators) and three Configuration Passwords (Owners, Managers or Distributors) that can be used to change settings in the controller. Your **ProMaqua** distributor should work with you to assign these passwords at the time of installation and commissioning. These passwords, once assigned are the same for all forms of access to the controller, the pushbuttons, the HTML web page or the Trackster 3 software.

Communication

The controller can be interrogated remotely by using a web browser. It is possible to make changes via a remote computer. A data historian can send information to the Aquatics SMTP server for report generation if configured. Refer to the browser manual for more information.

Flow Switch Operation

IMPORTANT: Digital input 'O' is configured by default as the primary sensor flow switch and will inhibit all chemical feed if not connected.

WARNING Disabling the flow switch can cause personal injury or death if concentrated chemicals are allowed to feed into an empty return water line.

For safety considerations, **do not** attempt to **disable** the interlocks of **input "O"** with any chemical feed control outputs.

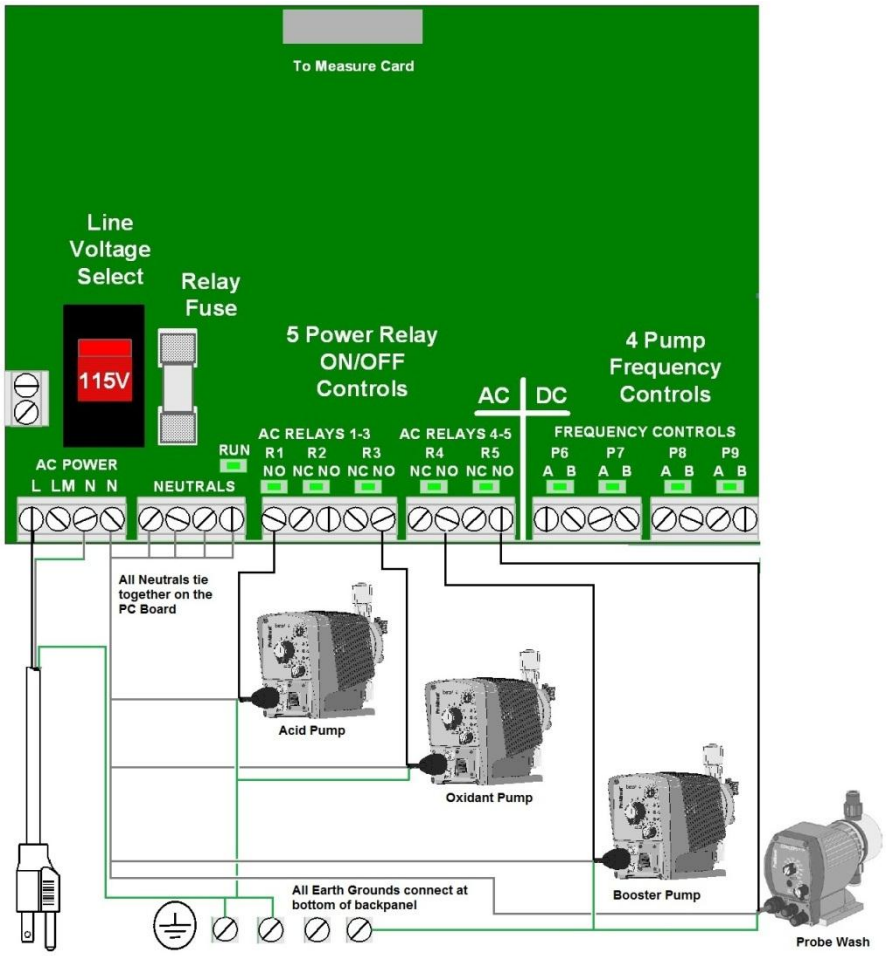
NEVER CONNECT FEEDER DIRECTLY TO POWER SOURCE

This will bypass critical safety features of the ProMinent Controller and may cause severe injury or death.

See Install Manual for more detailed information.

120 VAC Power Wiring

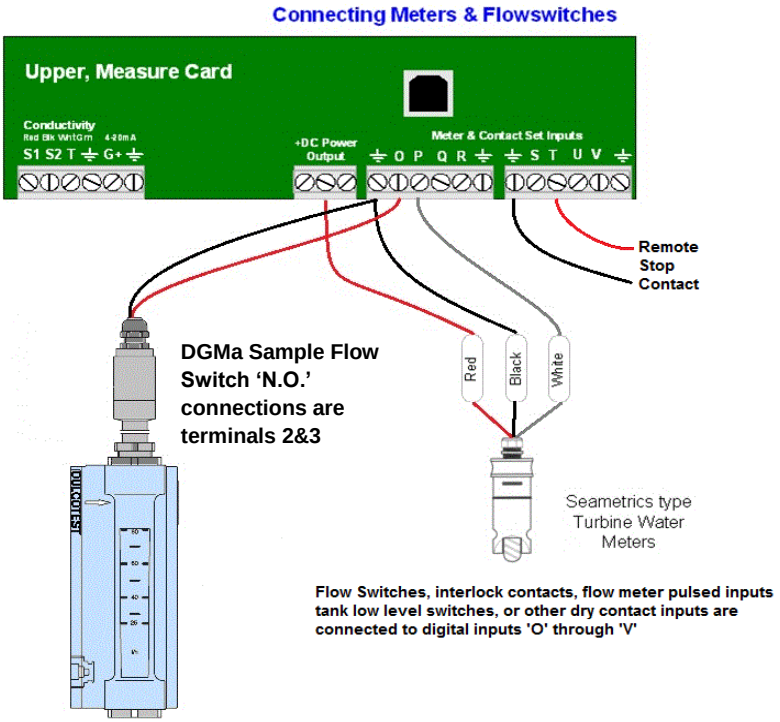
Connect 120VAC Line power and 120VAC chemical feed pumps as shown below. Consult Install manual for more details.



Flow Switches, Water Meters and Digital Inputs (Contact Sets)

Water meters, flow switches and 'dry' contact sets are connected to input terminals 'O' through 'V' and a ground terminal. 5VDC limited by 10KΩ puts 1/2mA through a closed contact set. Input 'O' is reserved for the sample flow switch function and should not be changed. Paddlewheel and Turbine water meters (Hall-Effect types) are powered by the 15-22VDC controller power supply, thermally fused at 100mA.

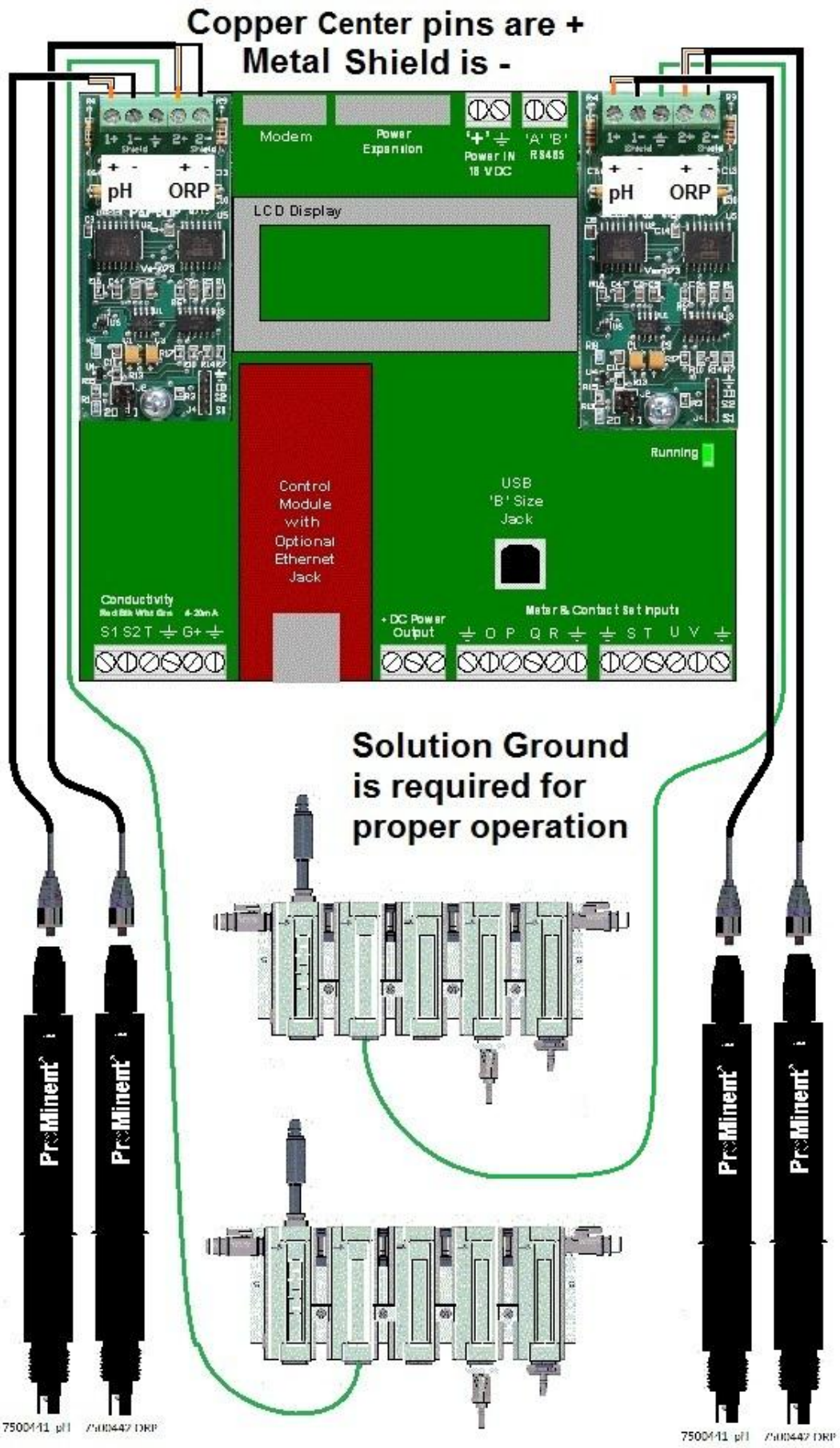
WARNING **Removal of shaft clip may allow flow switch minimum flow rate to drop to an unsafe level. If concentrated chemicals are allowed to feed with inadequate water flow, chlorine gas can be released, causing severe injury or death.**

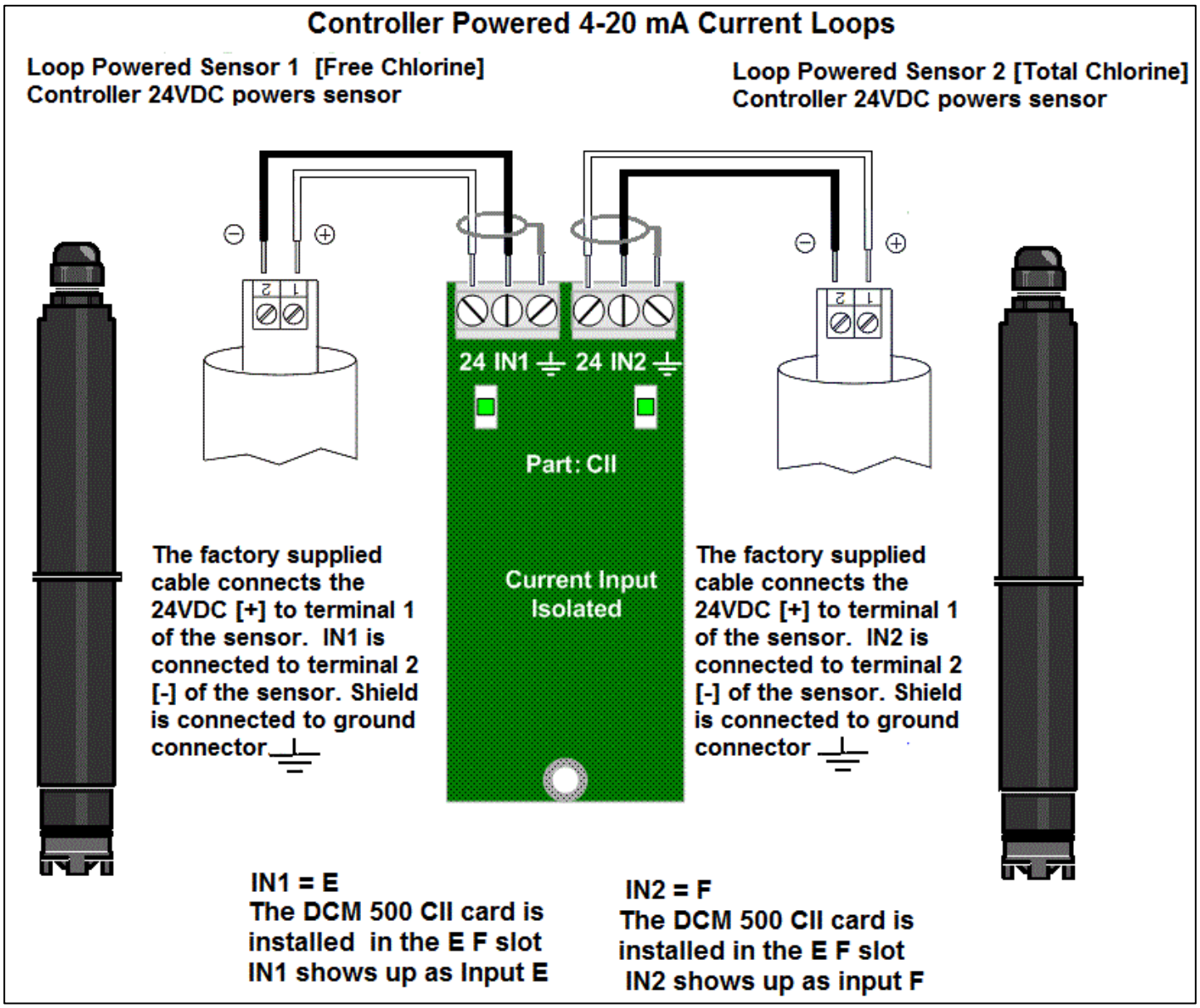


Controllers are defaulted to input 'O' as Sample stream flowswitch interlock, 'T' as the remote disable contact, and 'P' as the main recirculation paddlewheel flow meter.

Sensor Connections
pH and ORP Sensor Wiring

DCM 500 controllers have the cables for the pH and ORP sensors pre-wired and marked on the cables for the appropriate sensor. Connect center pins on coaxial cables to the positive [+] terminal and the metallic shield is negative [-]. A solution ground reference is required for proper operation. An SGT sensor has a solution reference (Green) and temperature sensor (White). Even if the temperature sensor is not being used, the solution reference must be connected to the ground terminal. Two pool system is shown below. If only 1 set of pH and ORP sensors are used then only the left 'OP' Driver card will be installed and connected.





Commissioning The Sensors
pH and ORP Sensors

CAUTION **Sensors cannot be left exposed to air for long periods without permanent damage. Do not remove the pH or ORP sensors from their protective caps until the sensor housing is fully plumbed and ready for sample flow.** Remove the protective caps by unscrewing the caps with the probe caps in the down position to avoid spilling the potassium chloride salt solution trapped within the cap. Set the cap aside for future use, or use a ½" NPT plug to seal the salt solution in the cap. Next clean the sensor tips using isopropyl alcohol and a soft toothbrush, followed by a few drops of acid on the same toothbrush. Rinse the sensors in pool water and insert into the first 2 probe housing modules, assuring the sensors stay wet while commissioning the residual sensors.

Residual Sensor Commissioning If you have performed sensor commissioning before, the steps that follow are meant as a brief guide and not a detailed set of instructions. The commissioning instructions for the CLE free chlorine probe are shown here, and are similar to the other residual sensors. Please follow the detailed instructions in the manual that accompanied your sensors.

Pouring Electrolyte

IMPORTANT

Do not touch, damage or bring into contact with greasy substances the white membrane or the electrodes on th electrode shaft. The sensor will not, in such cases, work accurately.
Replace the membrane cap or send the sensor to ProMi to have the electrodes cleaned.

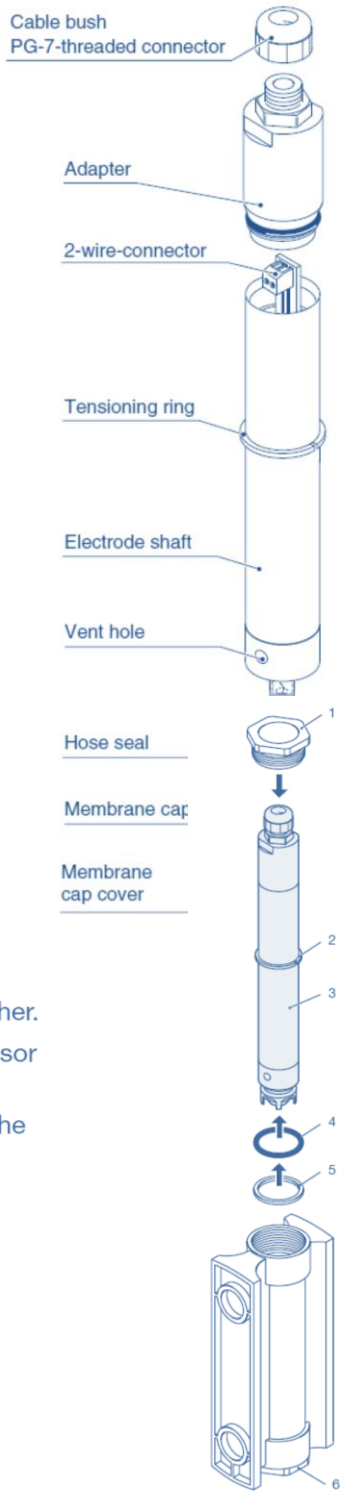
NOTE

Carry out the following actions over a washbasin.

- Remove the red cap completely from the nozzle and cut the nozzle at marked position to open the nozzle canal.
- Remove the membrane cap cover and unscrew the membrane cap fr the electrode shaft.
- Rinse the membrane cap and the electrode with a little electrolyte.
- Fill the membrane cap up to the rim with electrolyte.
- Remove air bubbles by lightly tapping the membrane cap on an even surface.

Assembling membrane cap

- Place the electrode shaft upright onto the filled membrane cap and tv until the thread bites.
- Rotate the electrode shaft until the vent hole is pointing upwards.
- **Slowly** screw in the membrane cap by hand up to the stop. Excess electrolyte will seep out of the vent hole as you screw the parts together.
- Rinse away the excess electrolyte from your fingers and from the sensor under running water.
- There should be no air left in the membrane cap/electrolyte. Repeat the above steps if there is still air present.



Sensor Sample

The optimum location to obtain a sample for chemistry control is just after the main filters and prior to the heaters or any other water treatment, especially upstream of chemical injection. The optimum return point is to the surge pit or to a point downstream of the sample that creates a difference in pressure to cause 10-12 g/h flow.

CAUTION never return the sample to the suction side of the main circulation pump as this can/will cause a vacuum on the sample stream which will cause inaccurate sensor readings and permanent sensor damage [non-warranty].

Constant flow is critical for proper residual sensor operation. Ideal flow is between 10 and 12 gph as shown on the rotameter flow switch provided with the modular DGMa in-line probe housing illustrated below.

The ball valve (1) regulates and stops the flow. The rotameter module (2) has a float (4), which indicates the flow. A flow sensor (3) monitors the flow. There is a reed contact in the tip of the flow sensor, which opens if the float moves more than 2 mm away from the sensor and acts as a flow switch to permit correct controller operation . The flow plug ensures optimal flow to the membrane capped sensors ("25 mm", pos. 10). It prevents air bubbles from forming on the membrane of the sensor (PG 13.5, pos. 5).

The equipotential plug (8) contains a potential equalizer pin. The outlet nozzle (6 or 10 for 25 mm or PG 13.5 version) and the sampling tap (11, 25 mm or PG 13.5 version) allow you to take water samples and empty a module. The calibration cup (8) can be used to calibrate the pH or redox sensors without dismantling them. It also has a potential equalizer pin.

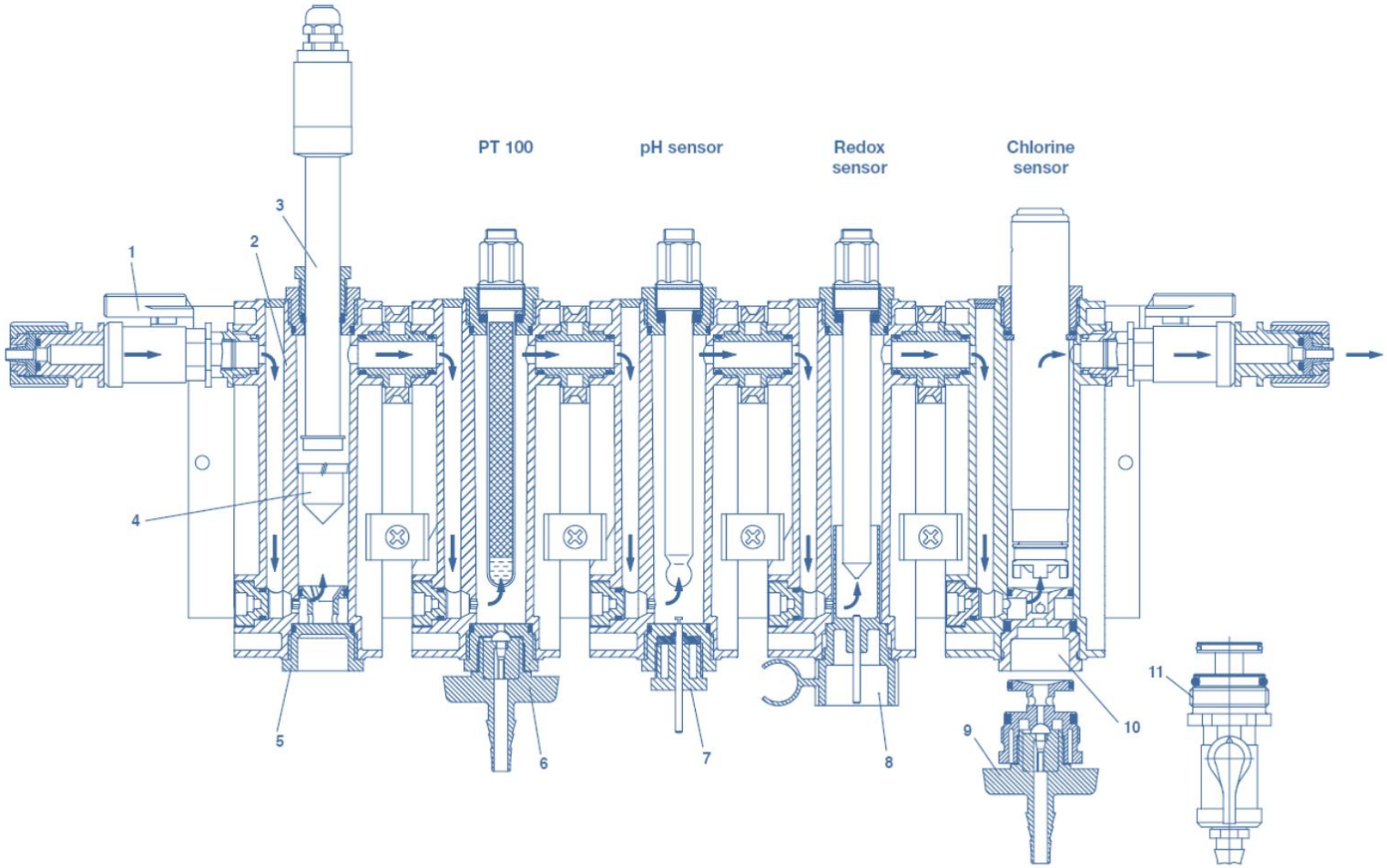
NOTE: Stopping the rise of the rotameter does not limit the flow.

Once the float touches the bottom of the flow switch shaft, it cannot go any higher, therefore cannot indicate the true, and now possibly higher, flow rate. Rapid spinning or vibrating of the float is an indication the flow rate may far exceed the level of the float on the rotameter gage.

Adjust the flow rate so the rotameter float very slowly rises and barely touches the bottom of the flow switch at ~12 gph. Recheck flow rate whenever system flows change i.e. after a filter backwash.

Probe and housing pressure limit is 14.7 psi and should never be allowed to operate at a negative pressure (vacuum), as indicated by the sample valve drawing in air when opened. Use the sample discharge valve to adjust backpressure, to avoid vacuum situations that may be caused by falling water.

WARNING Water must be circulating to safely allow chemical feed. The flow switch safety clip prevents setting the flow switch below 10 g/h that might inadvertently allow chemical feed in an empty line. DO NOT REMOVE this important safety device, nor operate the controller if this device is removed.



Sensor and Output Settings

Input	Type	Configuration or typical use
A	Analog Fixed	Conductivity
B	Analog Fixed	Temperature
C	Analog Driver Card	pH
D	Analog Driver Card	ORP
E	Analog Driver Card	Free Chlorine or pH
F	Analog Driver Card	Total Chlorine or ORP
G	Analog Fixed	4-20 mA (non-Isolated)
H	Analog Virtual	Typically Combined Chlorine
I	Analog Virtual	unassigned
J	Analog Virtual	Typically used for Ryznar and LSI
K	Analog Virtual	unassigned
L	Analog Virtual	unassigned
M	Analog Virtual	unassigned
N	Analog Virtual	unassigned
O	Digital	Sample Flow Switch
P	Digital	Recirc Flow Meter
Q	Digital	Acid Low Level Switch
R	Digital	Chlorine Low Level Switch
S	Digital	Surge Tank level autofill
T	Digital	Remote Enable (default)
U	Digital	Unused
V	Digital	Unused
W	Digital Virtual	Unused
X	Digital Virtual	Unused
Y	Digital Virtual	Unused
Z	Digital Virtual	Unused
Output	**Type**	**Configuration or typical use**
1	120 VAC NO Relay	Acid Feed
2	120 VAC SPDT Relay	TDS or autofill control
3	120 VAC SPDT Relay	Oxidant Feed
4	120 VAC SPDT Relay	Booster Pump or alarm annunciator
5	120 VAC SPDT Relay	Heater, UV control or Probe Wash
6	DC Dry contact output	Pulsed Pump control
7	DC Dry contact output	Pulsed Pump control
8	DC Dry contact output	Alarm Contact
9	DC Dry contact output	Unassigned

More Information

More detailed electrical connections and configuration information can be found in the Users, Browser and Install manuals available from your **ProMinent** Aquatics distributor, or from:

ProMinent USA
136 Industry Drive
Pittsburgh, PA 15275-1014
Tel: (412) 787-2484
Fax: (412) 787-0704
eMail: sales@prominent.us
www.prominent.us

Browser Connect Windows 7

(Refer to Browser manual for other OS instructions)

Connect an Ethernet 'cross-over' cable between your computer's Ethernet jack and the jack in the controller.

Remember how to "undo" what you will need to configure below, so your computer will re-connect to your office network after you are done.

Verify your computer is configured for a fixed IP address by using the following steps:
From the main Windows desktop, Click on **START \ Control Panel \ Network and Internet \ View network status and tasks \ Local Area Connection**\. In the **Local Area Connection Status** box, click '**Properties**' button, then highlight "**Internet Protocol Version 4 (TCP/IPv4)**" (*do not uncheck this line*), then click the "**Properties**" button. In the "**Internet Protocol Version 4 (TCP/IPv4) Properties**" window select "**Use the following IP address:**" and fill in the following information:
IP address : **10.10.6.200**
Subnet mask: **255.255.255.0**

Click the "**OK**" button and close all the open windows.
Open your internet browser [Windows Internet Explorer] and enter the controller's default IP address **10.10.6.106** into the http:// address line.
The Live View screen something like this should appear: