

Browser Manual

ProMinent[®] DCM 2 series

Aquatic Water Quality Controller

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Sidebars:

Are used to explain typical uses for feed and control functions.

Sidebars are at the bottom of the page detailing the function.

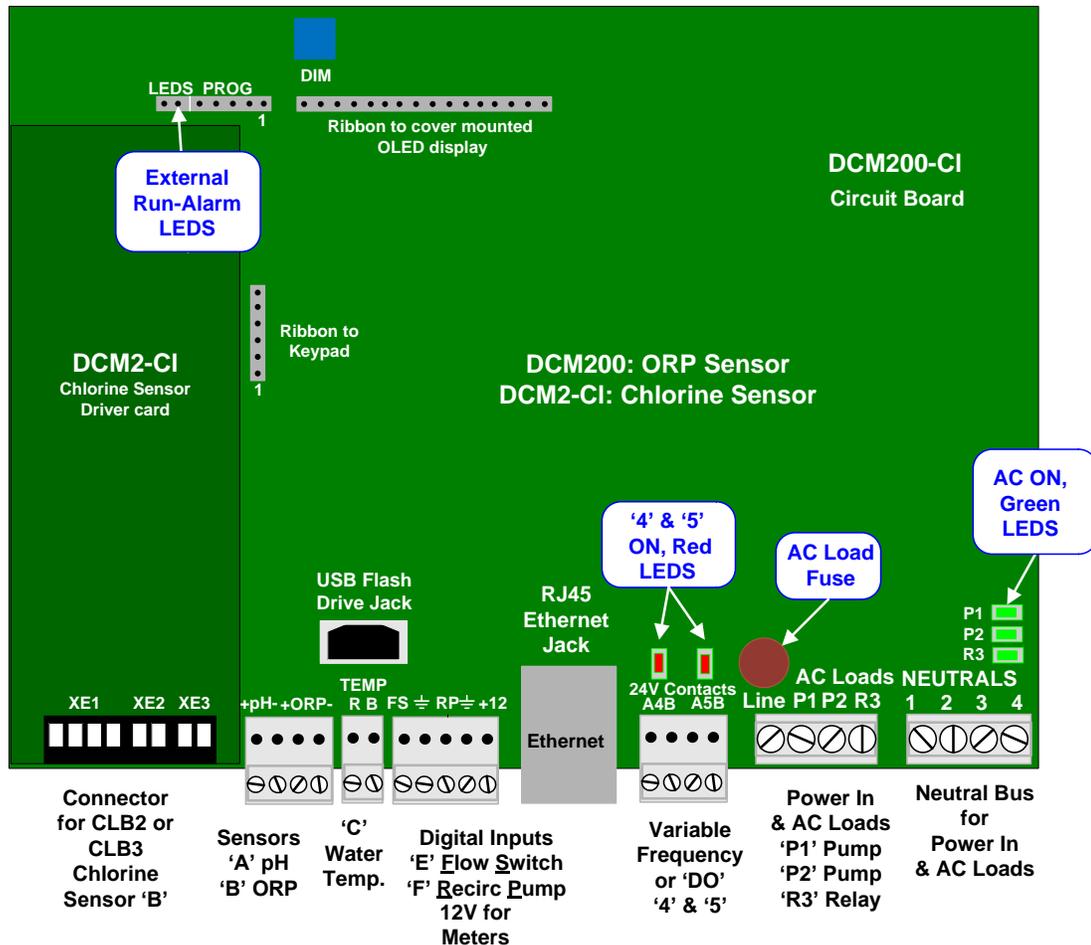
New users & users new to automated controls should find these explanations helpful.

DCM2 series controllers are shipped preconfigured.

This manual supports re-configuration required as you add and modify the way you feed chemicals and manage filters, heaters and sensors

Users may re-name controller inputs & outputs at each site.

DCM2-CI Browser DCM2-CI Input-Output Names



Physical Connection Locations on the Circuit Board.

Sidebar:

The physical connection points for inputs & outputs are designated in the DCM2 software by letters (**A-F**) for inputs & numbers (**1-5**) for outputs.

Inputs: Analog Sensors: **A to C** Virtual input **D** is the calculated LSI-Ryznar index values. **E** is dedicated as the sample flow switch, and cannot be changed.

F can be used as a flow switch, level switch, water flow meter or other contact set.

Outputs: Outputs: **1 to 3** are 120VAC Relays.

Outputs: **4 & 5** are Dry contacts or frequency pulse outputs
(Rated 24VDC & 250mA max)

Using letters & numbers provides a compact, generic way of defining a control input or output;

Example: The sensor connected to input **B** controls the pump connected to relay **2** when the flowswitch connected to input **E** is closed. Users can label **B & 2** with site specific names, but **E** cannot be changed.

Complex controls can be defined by letters (sensors) & numbers (pumps & solenoids).

Inputs & outputs don't need to have fixed functions & a more flexible controller results.

You will see references to these letters and numbers throughout the software, including the browser screens. Understanding the software's use of these generic labels should help you as you navigate the controller's software.

DCM2-CI Browser

1.0 Day-to-Day Browsing

1.1 Connect

On-Site using a Notebook PC to a DCM2 with an Ethernet cable. (Not connected to the Site Local Area Network (LAN))

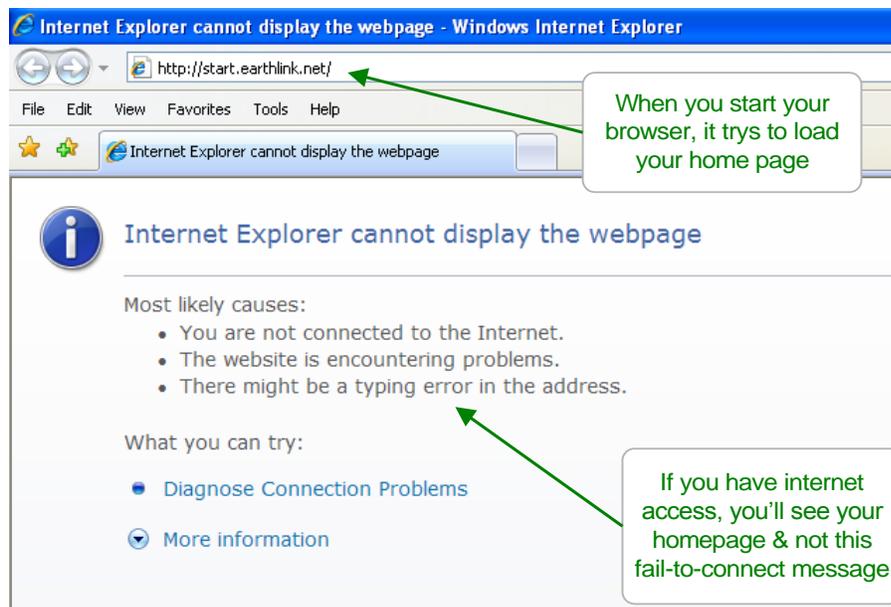
A. You may need an Ethernet crossover cable available from office supply & electronics stores, depending on the age and sophistication of your computer. Newer PC's have auto crossover Ethernet connections.

B. You'll need to set up a new connection in your notebook or PC.
Refer to Section 8.

Connect into the Ethernet jack extension conveniently protruding from the bottom of the DCM2, or you can remove the cover screws, open the controller enclosure lid and plug into the controller's Ethernet jack located on the lower center of the main circuit board.

Start your preferred browser like **Internet Explorer, Google Chrome** or **Mozilla's Firefox**.

NOTE: ProMinent's **Trackster 3** program does not connect to the DCM2 controller platform.

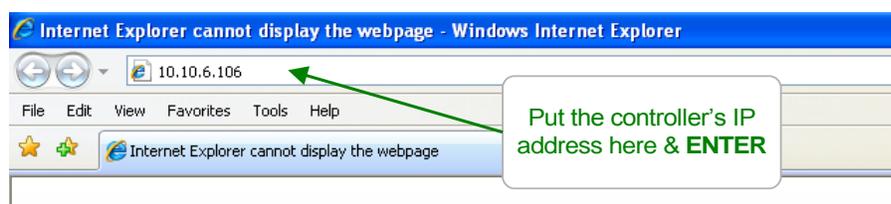


Notebook PC & Over the Site LAN

Key the controller IP address into the PC's browser address.

You can find the controller's IP address using the controller keypad (default = **10.10.6.106**).

Refer to Section 9.



DCM2-CI Browser

1.1 Connect continued

Remotely using a VPN

If the network administrator has provided you with VPN (Virtual Private Network) access to the site LAN, you'll need to start the VPN application on your PC to gain access to the site's LAN. See your IT person or the VPN administrator for more details. Once connected to the site LAN, follow the previous, 'Over the Site LAN' procedure.

Here's what you'll see in your browser on first connect.

The screenshot displays the ProMinent DCM200 monitoring interface. On the left, a dashboard shows various sensor and pump statuses: '0.2 LSI-Ryznar' (OK), '7.6 pH pH Sensor' (OK), '725.6 mV ORP Sensor' (OK), '73.0 F Temperature' (OK), '2.8min Flowswitch' (ON), '0 G Re-circ Pump' (OK), 'No alarms Alarm Out' (OFF), and 'No Event Filter Run' (OFF). A 'REFRESH' button is located above the dashboard. A callout box indicates 'Real time view updates every 2 seconds'. On the right, the 'System View' shows 'System: 15/12/11 S/N: U000X0005', 'Status: Waiting for Login', 'Select User: Public', a 'Password' field, and 'Alarms: none'. A callout box notes 'Requires password for command & control'. Below the system view, a callout box explains: 'System View: Current values of sensors, water meters and flowswitches and the status of pumps, solenoids are displayed in the System view.'

Note: Views are optimized for limited resolution displays, notebooks & PCs at 1024 x 768 pixels.

DCM2-CI Browser

1.2 Log-in

Pull down the **Select User** list and select a user id.
 Key in the **Password** for the selected user ID & press **SUBMIT**.
Status updates you on an incorrect password.
 Once you've logged in you can change your user ID & password.

Login

System:

06/11/07 S/N: A000X0005

Status **Waiting for Login**

Select User

Password

New View Diagnostic

Alarms none

RESET **SUBMIT**

Login view displays on connection

Select Diagnostic view without Login

Select User

System:

06/11/07 S/N: A000X0005

Status **Waiting for Login**

Select User

Password

New View

Alarms

RESET **SUBMIT**

Select your user name

Enter the password for the selected User and press **SUBMIT**

Once you've logged in, the controller's home page changes to show your user ID, **Current User**. Press the link at any sensor, meter, pump, solenoid or valve to view or modify.

Logged In

System:

06/11/07 S/N: A000X0005

Status **Logged in**

Current User **Configure6**

Logout Yes

New View Diagnostic

Alarms_Events and Timers Reset All

Alarms none

RESET **SUBMIT**

System menu now available

You're logged on as user **Configure6**

Ends priming & biofeed events. Zeroes owed time & volume.

Default Passwords:

The factory default passwords are:

Operator1 = 1 Operator2 = 2 Operator3 = 3 Operator4 = 4.
 Configure5 = 5 Configure6 = 6 Configure7 = 7 Administrator = AAAA
 There are 3 password levels, Operator, Configure and Administrator.
 The User IDs are used in the controller's keypress log.

WARNING: 5 incorrect passwords, blocks logon until 7:00AM or until a power OFF/ON.

DCM2-CI Browser

1.3 Checking & Clearing Alarms

Alarms display as **RED Alarm** hexagons.
Any alarm also sets the System alarm beside the Day-Time display.

Any active **Alarm** sets a System Alarm

Here's what kind of **Alarms** occurred & when they occurred

This example shows an LSI-Ryznar calculation in **Alarm**

Login, select **Reset All** & press **SUBMIT** to clear all alarms.

Sidebar:

Sensor alarms will alarm again, or re-trip, after the user set "Delay on Alarm", unless the fault is corrected.
Relay controlled pumps will alarm on Minutes/Actuation time. Frequency controlled pumps alarm on volume.

Individual input-output alarms may be cleared by selecting the input or output link and then selecting **Alarms** from the pull down menu at the top of the right side of the screen.

DCM2-CI Browser

1.4 View & Adjust Setpoints

Setpoint controls are located in the Feeder or Pump (Relay) settings. Setpoint values will vary with the use of the feeder.

The following typical example changes the pH sensor controlled Acid Pump setpoints.

Click on the [Acid_Pump](#) link

Links always display the **Diagnostic** first. Pull down this menu & select **Configure**

Diagnostic displays a summary of the link. In this example, the acid pump has been ON for **1.3** minutes today & **1.3** minutes this feed cycle

Acid Pump:1

Status	0
Mode	OFF
Control by: A	7.65 pH
TurnON setpoint	7.50 pH
OFF Setpoint	7.45 pH
Control Type	Feed Acid

1.3m ON today 1.3m ON, actuation

REFRESH SUBMIT

Configure displays the current **Acid_Pump** set-up and allows you to modify. You'll need to be logged in at the **Configure** or **Admin** password to modify.

Select **Configure** from the pull-down menu

Acid Pump is controlled by the pH sensor connected to input 'A'

Edit **setpoint** and then **SUBMIT**

Deadband sets the TurnOFF setpoint, 7.45pH in this example ($7.50 - 0.05$)

When the **Flowswitch** contact set connected to input 'E' opens, the acid pump **stops**.

Feed Acid turns **ON** the **Acid Pump** when the pH is greater than **TurnON** and **OFF** when the pH is less than **TurnON-Deadband**

Acid Pump:1

Control by: A

TurnON setpoint: 7.50 pH

Deadband: 0.05 pH

Interlocked: E Flowswitch

Blocked by: none

Control Type: Feed Acid

Special Control: None

RESET SUBMIT

DCM2-CI Browser

1.4 View & Adjust Setpoints continued

Relays (Pumps or Feeders) controlled by Chlorine, ORP, pH or temperature sensors have a setpoint limited by each sensors High and Low Alarm setpoints. If you attempt to adjust a control setpoint outside of the alarm limits, you'll get an **ON=OFF fault Status** message.

'**Interlocked**', '**Blocked by**', '**Control Type**' and '**Special Control**' are detailed in following sections of this manual.

Interlocked turns off pumps & feeders when flowswitch or another contact set turns OFF(opens).

Blocked by prevents a feeder from turning ON when another feeder is ON.

Control Type selects the setpoint order. For example, when you select **Feed Caustic**, **TurnON** is less than **TurnOFF**. **Feed Acid**, reverses this setpoint order. **TurnOFF** is calculating by adding or subtracting **Deadband** from **TurnON**

Special Control selections vary with sensor and output type.

For example,

Oxidant feeds may select PID control.

Outputs without a controlling sensor may be used to feed a chemical by a timer (filter aid or probe wash), or activate an alarm signal.

Sidebar:

Relays (AC powered contacts) are controlled by sensors to power Pumps and Solenoids ON and OFF. (AC Relays are outputs 1 to 3)

24VDC output contacts can be used for Frequency control of pumps or Simple On/Off control of other devices.

Frequency controlled Pumps feed chemicals at varying rates. Other devices that are frequently controlled by DC contacts in pools are: Salt Chlorine Generators, Heaters, and UV systems. (24VDC contacts are outputs 4 & 5)

Digital Outputs are dry contacts rated 24VDC & 250mA and are either ON/closed or OFF/open (Digital Outputs, DO are outputs 4 & 5. Outputs 4 & 5 are user configurable as frequency or Simple ON/OFF)

ON-OFF Acid pumps typically use setpoints 0.05 pH apart so that the delay between feeding acid and measuring its pH does not cause wide pH swings.

Pay attention to the number :1 to :5 that follows the pump or solenoid name.

It's the physical location on the controller circuit board that connects to the feeder or output device.

You may modify the name of the pump, feeder or solenoid but you'll need to know which output is controlling it, so you can check that the P1 to R3 **GREEN** or 4 & 5 **RED** indicating LED is ON when the pump, feeder or solenoid is ON.

DCM2-CI Browser

1.5 HOA: Manual On (Hand)-OFF-Auto

Controlled outputs default to 'Auto' allowing the DCM2 to control the pump, solenoid or feeder using an associated sensor. 'Manual' overrides controls and turns the output ON for priming & testing of pumps & solenoids. The default minutes/manual time is 5 minutes, after which the feeder reverts to AUTO 'OFF' turns the feeder OFF, by opening the digital output (DO). Cycling controller power has no effect on an 'OFF' pump or solenoid.

Top Screenshot (Manual Mode):

- System Name: OK
- 7.65 pH pH_Sensor
- 697.4 mV ORP_Sensor
- 84.7 F Temperature
- 15.6min Flowswitch
- 15.6min Re-circ. Pump
- ON: 14.9min Acid_Pump
- ON: User selects ON Oxidant_Pump
- ON: 14.9min UV_Control
- OFF: No Event Filter_Run
- Mode: Manual, ON
- Control by: B 697.4 mV
- TurnON setpoint: 680.0 mV
- OFF Setpoint: 742.3 mV
- Control Type: Feed Oxidant
- 10.9m ON today 0.1m ON, actuation
- Time Modulate Period:120 ON Countdown: 83, seconds

Bottom Screenshot (OFF Mode):

- System Name: Alarm
- 0.4 LSI-Ryznar
- 83.8 F Temperature
- 9.1min Flowswitch
- 9.1min Re-circ. Pump
- 9.1min UV_Control
- ON: 8.4min Acid_Pump
- OFF: User STOPs Oxidant_Pump
- OFF: No Event Filter_Run
- Mode: OFF
- Control by: B 697.4 mV
- TurnON setpoint: 680.0 mV
- OFF Setpoint: 742.3 mV
- Control Type: Feed Oxidant
- 6.5m ON today 0.8m ON, actuation
- Time Modulate Period:120 OFF Countdown: 32, seconds

Annotations:

- Mode displays the current feed state, Manual in this example
- Click on the Oxidant_Pump link
- Use Mode = Manual to prime or to bypass the automatic feed controls
- When the system setting 'Alarm on STOP' = YES, any stop alarms
- In this example, the user has turned OFF the Oxidant Pump
- Use Mode = OFF to stop a pump or control and to leave it OFF.

Sidebar:

Manual may also be used to slug feed during a system start-up in addition to testing pumps, dry contact outputs or solenoids.

Safeguards: A pump or solenoid that is Interlocked, Blocked or OFF on alarm will not turn ON when **Manual** is selected. This safeguard blocks feeding chemicals into a non-flowing line. Minutes/Manual will turn OFF **Manual** on time or volume limit if configured for **OFF on Alarm**.

DCM2-CI Browser

2.0 Chemical Feed Controls

2.1 Sensor Controlled ON/OFF Feed

Select the link on the target chemical feed pump and pull down the top, right menu, selecting **Configure**.

Oxidant Pump:2 Configuration:

- Control by:** B
- TurnON setpoint:** 720.0 mV
- Deadband:** 25.0 mV
- Interlocked:** E.Flowswitch
- Blocked by:** none
- Control Type:** Feed Oxidant
- Special Control:** None

Boost Pump:5 Configuration:

- Control by:** B
- TurnON setpoint:** 710.0 mV
- Deadband:** 25.0 mV
- Interlocked:** E.Flowswitch
- Blocked by:** none
- Control Type:** Feed Oxidant
- Special Control:** Simple ON/OFF

Callouts for Oxidant Pump:2:

- Setpoints are limited automatically to the controlling sensor high and low alarm settings
- The ORP sensor connected to input 'B' controls the Oxidant Pump connected to relay 2
- The pump turns ON when the ORP falls below 720mV and turns OFF when the ORP exceeds 745mV
- When the Flowswitch connected to input 'E', opens the pump turns OFF
- In this example we're not using 'blocking', stopping this pump when another pump turns ON
- Control Type options vary with sensor type.

Callouts for Boost Pump:5:

- Both 'E' & 'F' contact sets may be used to Interlock a control
- In this Booster Pump example, the feeder will turn ON if the oxidant level drops to 710mV and turn off when it reaches 735mV
- Control Type sets the setpoint order. Feed Oxidant turns ON as the Oxidant level drops, so OFF will be TurnON + Deadband
- Control Type = Simple ON/OFF is typical for a booster pump to turn on over a deadband to add additional oxidant under high load conditions
- If you set Control Type = Feed Caustic, the controller will switch the setpoint order.
- Any number of controls may share the same sensor. In this example, the ORP sensor @ 'B' is used to control pump relay 2 & digital output 5

Sidebar

Setpoints may be set incorrectly. Sensors eventually fail. Solenoids & Pumps fault. Refer to **Section 2.5 Limiting Feed & Alarms** to control a fault response.

DCM2-CI Browser

2.1 Sensor Controlled ON/OFF Feed continued

Control type:

Select the link on the target chemical feed pump and pull down the top, right menu, selecting **Configure**.

The screenshot shows the configuration interface for 'Acid Pump:1'. The 'Control Type' dropdown menu is open, showing options: 'Feed Acid', 'Feed Acid', 'Feed Caustic', and 'Between Sets'. The 'TurnON setpoint' is 7.55 pH, and the 'Deadband' is 0.05 pH. Callouts provide the following information:

- Control Type** sets the setpoint order. **Feed Acid** turns ON as the pH rises to 7.55 and turns OFF when it reaches TurnON Setpoint - Deadband, or 7.50 pH.
- If you set **Control Type = Feed Caustic**, the controller will switch the setpoint order.
- Between Sets** is seldom used with pH & ORP; more useful with temperature controls.

Each feeder controlled by a sensor uses a **Control Type** set by the chemical being fed. ORP, pH and temperature sensors have **Control Type's** specific to the sensor.

For example, when you select a temperature sensor, the **Control Type** options are **Lower Temp** & **Increase Temp**.

Sidebar:

Control Type is not applicable or displayed for water meter based feeds.

Between Sets turns ON a pump or solenoid whenever the controlling sensor value is between the TurnON & TurnOFF setpoints. This **Control Type** finds use in blocking and sequential PLC type controls.

Setpoint Order:

The controller will automatically switch the setpoint order to fit the selected **Control Type**, inserting a **Setpoints Switched** message into the **Status** line of the right hand side of the page.

DCM2-CI Browser

2.2 Proportional Feed

Special Control: Time Modulate for ON-OFF Pumps

Select the link on the target chemical feed pump and pull down the top, right menu, selecting **Configure**.

Time Modulate allows an ON/OFF pump or feeder to operate like a frequency or 4-20mA controlled pump.

This **Special Control** is used feed proportionally to a sensor value.

ON-OFF pumps are typically set to maximum stroke and rate when **Time Modulate** is selected.

Oxidant Pump:2 **Configure**

Control by: B

TurnON setpoint: 740.0 mV

Deadband: 30.0 mV

Interlocked: E:Flowswitch

Blocked by: none

Control Type: Feed Oxidant

Special Control: Time Modulate

Period: 60 seconds

RESET **SUBMIT**

Special Control = Time Modulate
typically increases Deadband for a more stable control.

Select **Special Control = Time Modulate**

Pump ON time varies from 0 to 60 sec. every 60 seconds

Sidebar:

Frequency controlled pumps connected to controller outputs '4' & '5' are proportionally controlled as the controlling sensor varies the pump frequency.

Often there is a desire to proportionally control an ON/OFF pump connected to one of the controller power relays '1' to '3'.

Examples: The pump may be oversized for light loads or turning down the pump stroke or frequency may cause loss of prime or feed line blocking.

The Time Modulate Special Control:

The Deadband setting used for ON/OFF control is used differently in the **Time Modulate Special Control**. In **Time Modulate**, the "Deadband" is used to define the proportional span or the proportional range between completely ON and completely OFF. Specifically between the **TurnON Setpoint**, and the value of (**TurnON Setpoint** + **Deadband** [Proportional Span]).

Between setpoints, linearly increases the ON time from zero @ the **TurnOFF** to always ON at the **Turn ON** setpoint.

Example Above: **Period=60** seconds, **ORP Turn ON** = 740mV, **Deadband= 30mV**, **TurnOFF= 740+30=770mV**.

Current ORP = 750mV. 750 is 1/3 of the way between the range of 740-770mV, or 2/3 of the way to 100% ON point of 740mV.

ON time = 2/3 of 60 seconds or 40 seconds in every 60 seconds, OFF time is = 20 seconds in every 60 seconds.

Time Modulate Special Control works for acid & caustic, chlorine, oxidant & de-chlor, setpoints.

DCM2-CI Browser

2.2 Proportional Feed

Frequency Controlled Pumps

Select the link on the target chemical feed pump and pull down the top, right menu, selecting **Configure**.

Frequency controlled pumps modify the feed rate as the value of the controlling sensor changes.

In this example, the pump frequency increases as the ORP falls towards 740mV. At 740mV the oxidant is fed at the maximum rate, increasing as the ORP decreases.

Oxidant Pump **Configure**

Control by: B

100%ON Setpoint: 740.0 mV

Deadband: 30.0 mV

Interlocked: E:Flowswitch

Blocked by: none

Control Type: Between Sets

Special Control: None

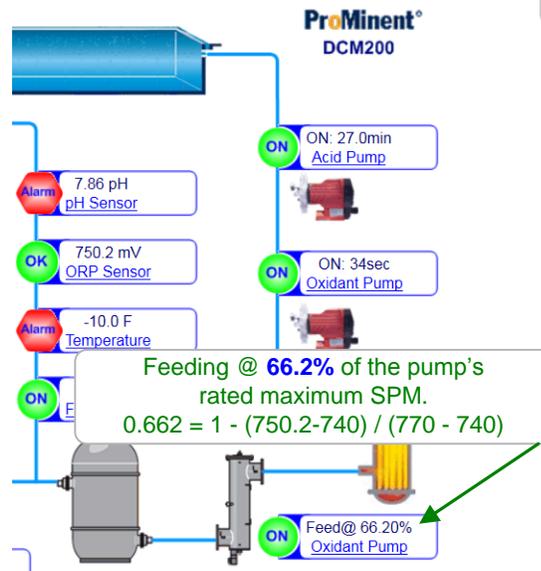
RESET SUBMIT

Frequency controller pumps are 4: and 5:

At 740 mV the pump feed at Maximum SPM

At 770 mV the pump is 100% OFF

Control Type is always Between Sets



Oxidant Pump :5 **Diagnostic**

Status: Operational, ON

Mode: Auto

Control by: B 750.2 mV

100%ON Setpoint: 740.0 mV

OFF Setpoint: 770.0 mV

Control Type: Between Sets

Volume today: 2.130G

REFRESH SUBMIT

Diagnostic displays when you select Oxidant Pump

Controlling sensor location, 'B' and its present value.

Volume pumped from midnight

Sidebar:

In this example the pump is rated @ 180 SPM, Strokes per Minute, and pumps 0.10mL / stroke so we're pumping (180 x 0.1 x 0.662) 11.92 ml/minute or 715 mL/Hr or 0.188 Gallons/hour

DCM2-CI Browser

2.3 Base Feed

Base feed is rarely used in Pools and Spas, but the controller has the ability to feed a pump at a constant rate of less than 100%, if needed.

Here's how: Select the link on the target chemical feed pump and pull down the top, right menu, selecting **Configure**.

For Relay 3, Set Special Control to Percent Time

Control by: No sensor
Interlocked: none
Blocked by: none
Special Control: Percent Time
% ON Time: 12 %
RESET SUBMIT

The pump connected to Relay 3 will be on for 12% of every 5 minutes

Flocculant:4 Configure

Control by: No sensor
Interlocked: E Flowswitch
Blocked by: none
Special Control: Base Feed
Feed: 4.5 ml/min
RESET SUBMIT

For relay 4 or 5, Set Special Control to Base Feed

The pump connected to frequency control 4 will feed at 4.5mL/min

AC ON-OFF Pumps: Setting the **% ON Time** greater than 100%, sets the % to 100. 12% ON time is 36 seconds ON in every 5 minutes (0.12×300 seconds).

Frequency Controlled Pumps: If you set a **Feed** rate greater than the pump rating, the controller will set the feed rate to pump maximum SPM. If the pump is rated 180 strokes/minute & 0.1mL stroke, the rate will be set to **18mL/min**.

Sidebar:

Base Feeds are used to continuously feed a chemical with a frequency controlled pump. While not normally used in Pools and Spas, the ability to remotely control a frequency controlled pump could be useful for unique situations.

Concentration is modified by changing the frequency controlled pump (4 & 5) feed rate or Relay (1 to 3) **% ON Time**.

DCM2-CI Browser

2.4 PID Controls

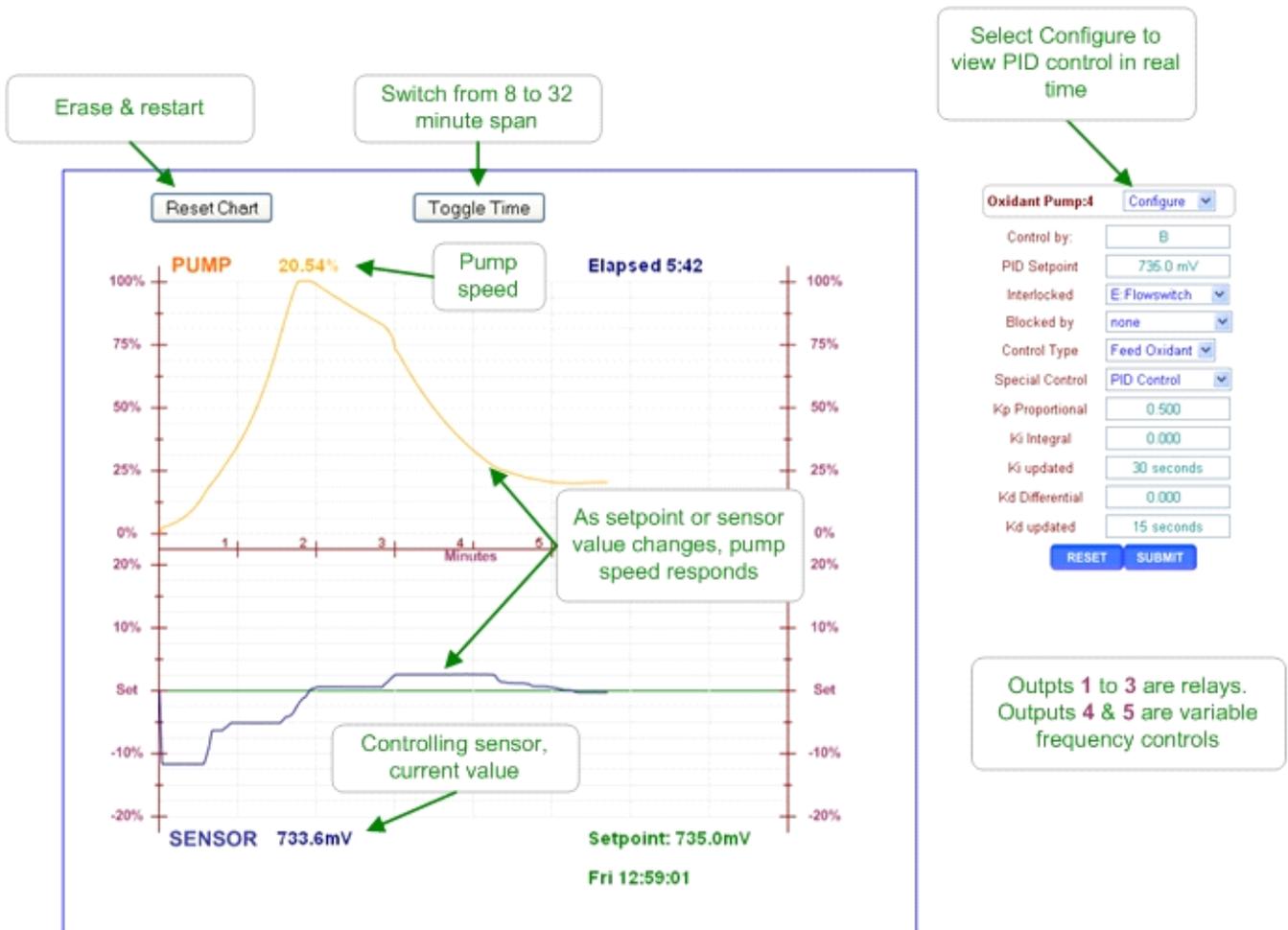
Each of the frequency-controlled pumps, outputs 4 & 5, can be configured for PID (Proportional-Integral-Derivative) control.

Relay outputs 1 to 3 may also be configured for PID control, implemented by continuously modifying the pump-powering relay ON & OFF times.

Users of the Mozilla Firefox browser and newer Microsoft Internet Explorer versions can view a real time 'chart' of pump rate versus setpoint as they adjust Kp, Ki & Kd to tune the PID loop response. The 'chart' HTML tag is not supported by Internet Explorer prior to Version 9.

Chart time spans of 8/16 minutes and 32/64 minutes are supported.

Set a pump **Special Control** = **PID Control** & charting will start on the next **SUBMIT** & re-start every time you select **Configure** on the pump.



DCM2-CI Browser

2.4 PID Controls

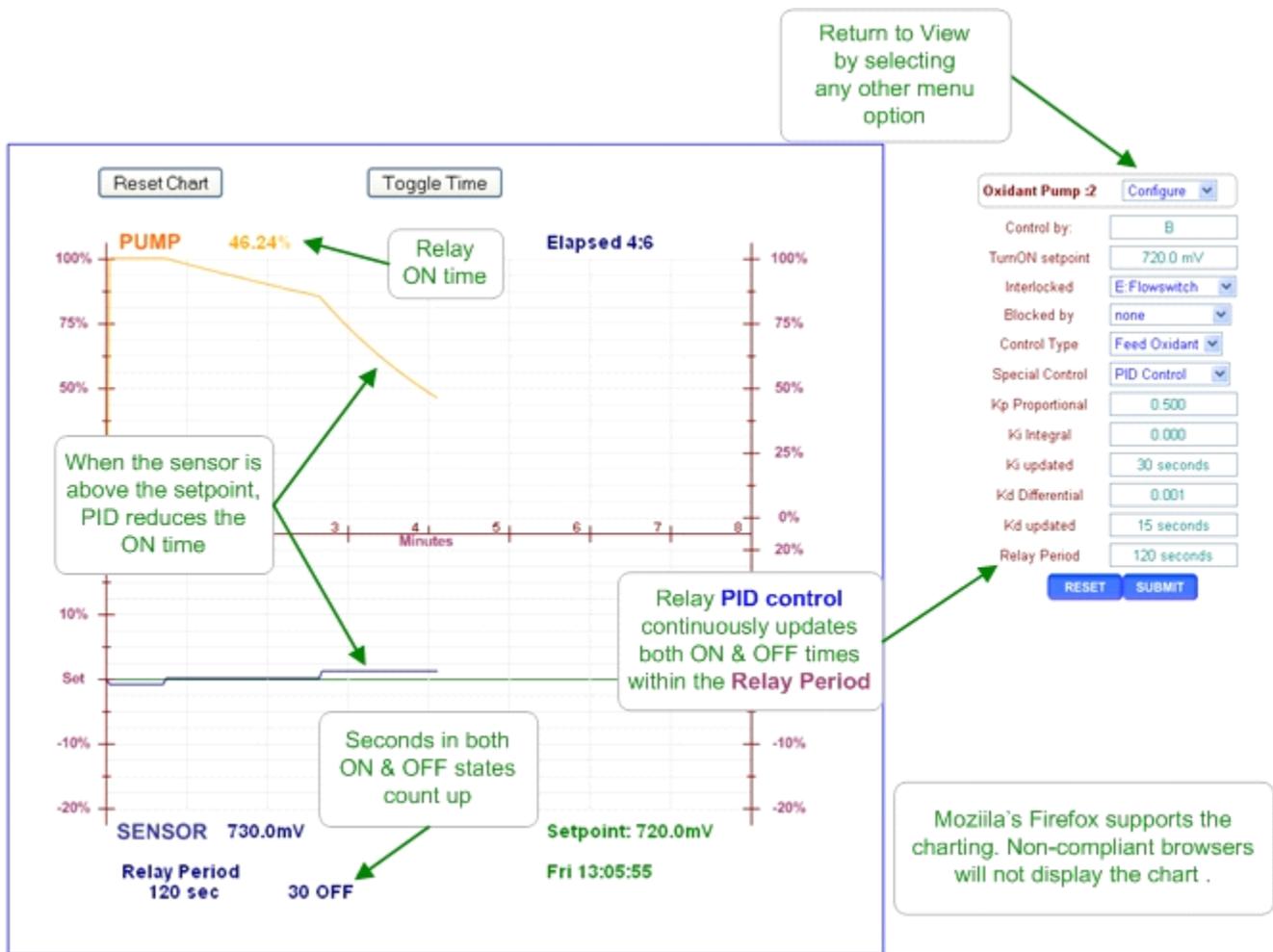
Most aquatics systems have a time delay between feeding the chemical and the controlling sensor measuring the effect of the fed chemical.

This delay effectively adds to the **Kp** value to make PID feed systems oscillate & means that few aquatics chemical feed systems will need **Ki**.

The default **Ki** & **Kd** settings (0.001) disable the Integral & Derivative control.

Most feed systems and slow responding systems in particular will benefit from frequent (**Kd Updated = 1 second**), differential control (**Kd > 1.0**).

ON/OFF pump PID controls include the **Relay Period** field and the real time chart includes a display of the ON & OFF times within each **Relay Period**.



DCM2-CI Browser

2.5 Oxidant Feed Controls

Pumps and solenoids controlled by ORP & Chlorine sensors have additional, optional controls.

The screenshot shows the 'Oxidant Pump :2 Setup' page. The status is 'Reconfigured'. The description is 'Oxidant Pump'. The 'Event Controls' are set to 'Yes', with a callout stating: 'Event Controls replace the pump control setpoints during user defined event periods'. The 'Event setpoint' is '735.0 mV'. The 'Event Cycle' is set to '7 Days', with a callout stating: 'Event Controls allow up to 28 events in each user selected Event Cycle period.' The 'Lockout mode' is set to 'high & low pH', with a callout stating: 'Lockout Mode selects which pH alarms turn OFF the oxidant pump'. The 'Disable output' is set to 'No'. There are 'RESET' and 'SUBMIT' buttons at the bottom.

Any pump controlled by an ORP sensor has extra controls for oxidant feed

Event Controls replace the pump control setpoints during user defined event periods

Event Controls allow up to 28 events in each user selected Event Cycle period.

Lockout Mode selects which pH alarms turn OFF the oxidant pump

Sidebar:

Event Controls are used to implement periods of high oxidant or low ppm (alternate setpoint) typically when the water feature or pool is offline.

If **Event Controls** = **No**, the **Events** pull-down option and Event sub-fields on the **Setup** page do not display.

DCM2-CI Browser

2.5 Oxidant Feed Controls

If **Setup Event Controls** = **Yes**, pull down & select **Events** on the oxidant feeder pull down to view and/or set events.

Oxidant Pump :2 Events ▼

Select Activity Add an Event ▼

Start Day 1 1-7

Start Time 6:30 HH:MM

ON Time 45 minutes

Event frequency Once
Alternate Days
Daily ▼

RESET SUBMIT

Select the **OxidantPump** link & pull down the **Diagnostic** selector to **Events**

Edit the **Day, Time & ON Time** duration. Select an **Event Frequency** & **SUBMIT**

Oxidant Pump :2 Events ▼

Status **Events Added**

Select Activity Add an Event
Edit an Event
Delete an Event
Delete all Events ▼

Select for Edit & Delete

Day 1 @ 00:06 for 45 minutes ▼

Values for Add & Edit

Start Day 1 1-7

Start Time 00:20 HH:MM

ON Time 20 minutes

Event frequency Once
Alternate Days
Daily ▼

RESET SUBMIT

Events may be edited, deleted & replicated

Pull down this selector to view existing events & select an event for editing & deleting.

These fields apply to the selected event on **SUBMIT**. Use **Event Frequency** to replicate an edited event

DCM2-CI Browser

2.6 'Simple' ON/OFF Controls

Frequency controlled outputs **4** & **5** may be re-configured as dry contact ON/OFF outputs by selecting the **Simple ON/OFF Special Control**.

The **Simple ON/OFF** option is available for outputs controlled by sensors connected to inputs 'A' to 'C'.

Special Control = Simple ON/OFF is used to control devices, filters, UV's... that require a dry contact set to operate

Relay outputs **1** to **3** are powered at AC line voltage & would require an interposing relay to convert control to a dry contact set.

Oxidant Pump:4 Configure

Status **Reconfigured**

Control by:

100%ON Setpoint

Deadband

Interlocked

Blocked by

Control Type

Special Control

RESET

Select **Simple ON/OFF** to make a variable frequency output, a dry contact ON/OFF output

Oxidant Pump:4 Diagnostic

Status **Operational,ON**

Mode

Control by: B

TurnON setpoint

OFF Setpoint

Control Type

23.5m ON today 0.1m ON, actuation

Simple ON/OFF

REFRESH SUBMIT

Simple ON/OFF controls report and log ON time, not volume pumped.

Simple ON/OFF controls by pH, chlorine ORP and temperature sensors do not require pump type selection and do not have added control options in the **Setup** page.

Sidebar:
Digital outputs **4** & **5** are DC isolated, floating, non-polarized, electronic contact sets. thermally fused @ 250mA & 30VDC.
Do not switch AC line voltages with these contact sets.

Thermal fusing prevents damage to the contact set due to wiring errors, recovering automatically when the wiring fault is corrected.

DCM2-CI Browser

2.7 Limiting Feed & Alarms

Select the link on the target chemical feed pump and pull down the top, right menu, selecting **Alarms**.

The screenshot displays the 'Alarms' configuration for 'Acid Pump:1'. The interface includes the following elements and callouts:

- Frequency controlled pumps alarm on volume fed @ maximum SPM & Volume/Day**: Points to the 'Mins/Actuation' field.
- Pump alarms after any single feed greater than 240 minutes.**: Points to the 'Mins/Actuation' value of 240.0 minutes.
- Pump returns to AUTO after 10 minutes in MANUAL mode.**: Points to the 'Minutes/Manual' field.
- Pump turns OFF on alarm & stays OFF until Reset Alarm.**: Points to the 'OFF on Alarm' radio button.
- Alarm Relay turns ON any output with Special Control = Alarm Output when this output alarms.**: Points to the 'Alarm Relay' radio button.
- Yes & SUBMIT clears alarm. Immediately re-alarms if you have exceeded Minutes/Actuation.**: Points to the 'Reset Alarm' radio button.
- Outputs with Special Control = Alarm Output, Sensor Wash or Filter Event do not have elapsed time alarms.**: Points to the 'Alarm Relay:3' configuration below.

Buttons for 'REFRESH' and 'SUBMIT' are visible at the bottom of the configuration area.

Sidebar:

Feed Limits are ON times for pumps & solenoids controlled by relays 1 to 3 and simple ON/OFF configured outputs 4 & 5.

Feed Limits are volumes for frequency controlled outputs 4 & 5.

Set the limit so that worst case operation on the hottest day or highest load will not trip the limit, avoiding nuisance alarms. In more critical applications, run the limit close to actual operating volume or time & use the limit alarms to flag unusual system operation.

Chemical feeds other than Chlorine, Oxidant & Acid feeds are usually all set to **OFF on alarm** since an overfeed indicates an operating problem which requires correction whereas continuing to feed Chlorine, Oxidant or Acid may put users at risk. NSF Standard 50 Requires OFF on Alarm to be enabled.

The Minutes/Manual limit automatically returns to automatic control for users that inadvertently leave a controller in Manual mode.

Note: Unlike most timers in the DCM2 controller, the Minutes/Actuation alarm does not reset @ midnight so that feed events that start prior to midnight alarm correctly.

DCM2-CI Browser

2.8 No Feed on No Flow

Select the link on the target chemical feed pump and pull down the top, right menu, selecting **Configure**.

Each Pump, Valve & Solenoid views & selects its Interlock on the **Configure** page.

Pull down this selector to view possible additional interlocks. **E:Flowswitch** cannot be removed and 'none' is not an option on DCM2 controllers.

The **Acid Pump** connected to Relay '1' is **Interlocked** to the **Flowswitch** connected to input 'E'

In this example, whenever the **Flowswitch** is OFF, the **Acid Pump** is OFF

Sidebar:

Interlocks are contact sets that must be closed for a Pump to feed, a Solenoid to open or a Feed Valve to operate.

Aquatics sites use a flowswitch installed in the modular sensor flow cell (DGMA) to detect that the pool/spa/water sample stream is flowing & it's OK to feed chemicals.

One or more closed contact sets may be required to **Interlock** a pump.

Examples:

If both the sensor sample flow switch (Input 'E') and the circulation flow switch (Recirculation Pump Input 'F') are ON, enable the oxidant pump. The oxidant pump **Interlocked = More than one**, **SUBMIT**. Then enter **E+F** in the **Interlocked** box, then press **SUBMIT** again.

If there is flow in the sensor sample flow line (Input 'E') and the tank level switch (Input 'F') shows chemical available, feed chemical. The chemical pump **Interlocked = E+F**

Interlocks may be configured with **OR** logic (either switch will allow chemical feed) using the **/** symbol or **AND** logic (both switches must be closed to feed chemicals) using the **+** symbol.

DCM2-CI Browser

2.9 Blocking a Feed

Blocking prevents one or more chemicals from feeding at the same time. To configure a feeder with the Blocking feature, select the link on the chemical feed pump that you wish to block and pull down the top, right menu, selecting **Configure**.

Acid Pump:1 Configure

Control by:

TurnON setpoint

Deadband

Interlocked

Blocked by

Control Type

Special Control

Pull down the **Blocked by** selector to view all other pumps, valves & solenoids.

In this example, select the pump you wish to block the **Oxidant Pump** & **SUBMIT**

Sidebar:

Blocking prevents one or more chemicals from feeding at the same time. If you are owed time or volume on the blocked pump (a timed feed event was interrupted), the controller remembers and feeds when the block clears.

A pump may be **Blocked** by one or more other feeders, pumps, solenoids or valves.

Examples:

1. You may wish to prevent acid and oxidant feed during an automatic water level 'fill' event. Blocking the Acid pump connected to Relay '1' and Oxidant pump connected to Relay '2' with the autofill solenoid connected to Relay '3'.
Acid & Oxidant Pumps **Blocked by** = '3'.

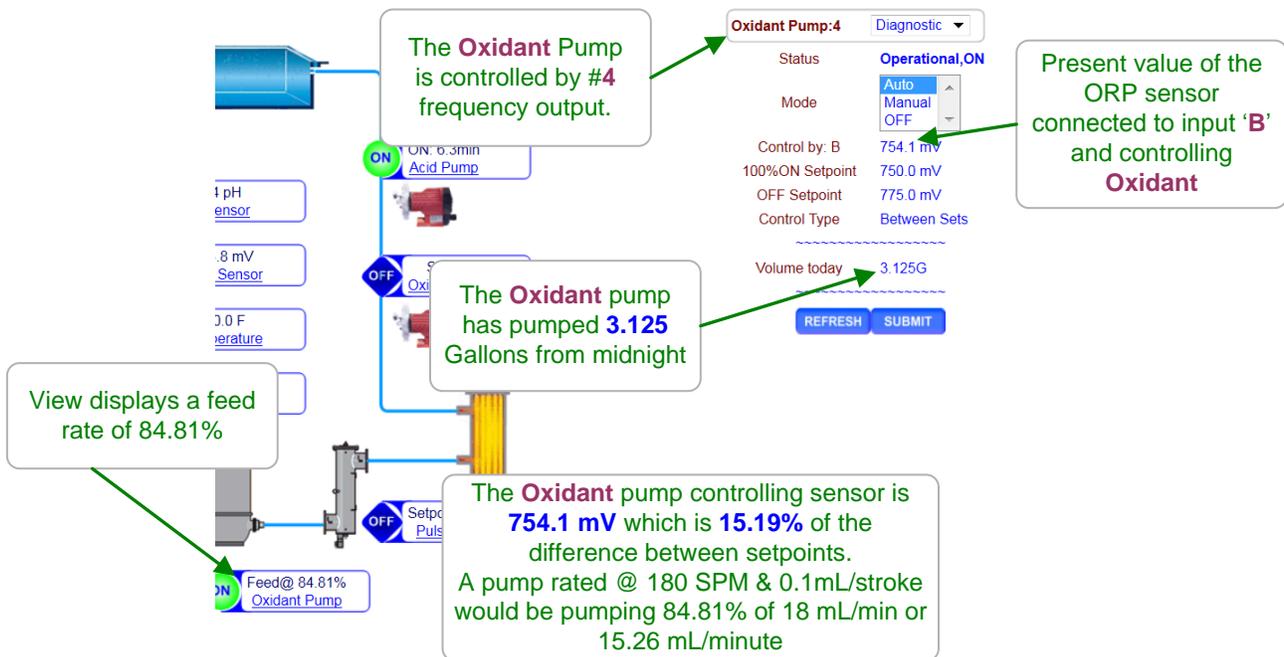
2. Some chemicals are degraded by high levels of oxidant. The Filter Aid pump is connected to Relay '3' & the Oxidant pump connected to Relay '2'. Filter Aid **Blocked by** = '2'

Caution: Be careful **Blocking** with frequency outputs '4' & '5' that are controlled by a sensor to ensure that they occasionally turn OFF to allow the blocked pump to feed.

DCM2-CI Browser

2.10 Feed Diagnostics

Select the link on the target chemical feed pump. The pump **Diagnostic** displays on the right.



Sidebar:

Diagnostics vary with the output type and control.

Relays '1' to '3' use ON time instead of the volumes of Frequency controls '4' & '5'.

The main menu displays **Blocked** followed by the blocking output number OR **Lockout** & the **Interlock** input letter OR "**Alarmed**" if a pump cannot feed.

Diagnostic tells you a lot about the operation of the aquatics system and is invaluable if you have a configuration problem or feed fault.

Even if you have Keypad **Passwords** turned ON, any Keypad-LED user can still view the **Diagnostics**. An uninformed user reading the **Diagnostic** screen sequence over the phone to an experienced technician may prevent a service visit.

DCM2-CI Browser

3.0 Event Controls

3.1 Four Types of Events

Alarm : Sensor Wash : Filter : Oxidant-Chlorine Controlled (refer to Section 2.5)

Events turn on a pump, solenoid, feeder or valve for user set time (Relay & Digital Outputs) at a user set day & time or on alarm.

Non-Alarm events can be repeated every Day, Week or Four Week cycle.

Special Control
Sensor Wash & Filter Events turn ON @ the user set time for the user set event duration.
Alarm Output turns ON when an alarm event occurs

Alarm Output
relays or dry contacts turn ON when an I/O with **Alarm Relay = YES**, alarms

Yes alarms on **Flowswitch OFF** and any sensors set to **Alarm Relay**.

Sensor Wash
relays or dry contacts hold all sensor values during each wash event and flashes the **BLUE OK** LED to let you know that the pH, ORP, Temperature & LSI are **not** changing

Filter Events
relays or dry contacts turn ON during the event

DCM2-CI Browser

3.2 Setting & Viewing Events

Select the link on the target output, pump or solenoid and pull down the top, right menu, selecting **Setup** to modify the event cycle or **Events** to view, add or modify events.

The diagram illustrates the configuration interface for an event cycle. It shows a dropdown menu for 'Acid Wash :3' with an 'Events' sub-menu. The 'Events' sub-menu includes options: 'Add an Event', 'Edit an Event', 'Delete an Event', and 'Delete all Events'. A callout box explains that 'Sensor Wash & Filter Events Special Controls and Oxidant feeds display the Events selection'. Another callout states 'Select Setup to change the event cycle from 1 to 7 to 28 days'. A third callout says 'To add a new event select Add an Event'. Below the menu, there is a 'Select for Edit & Delete' section with a dropdown showing 'Day 1 @ 15:55 for 5 minutes'. The 'Values for Add & Edit' section includes 'Start Time' (15:55 HH:MM), 'ON Time' (5 minutes), and 'Event frequency' (Once, Alternate Hours, Hourly). A callout box explains 'Event frequency selections vary with selected cycle days'. Another callout says 'Edit the Start Day (Sunday = day 1) Start Time & ON Time'. At the bottom, there are 'RESET' and 'SUBMIT' buttons. A callout box says 'Select frequency and SUBMIT'. A final callout box states 'Up to 28 events may be scheduled for each relay, pump or digital output (DO)'. Below this, the 'Filter Events :3' interface is shown with a dropdown menu listing various event configurations like 'Day 1 @ 00:22 for 20 minutes', 'Day 1 @ 06:00 for 35 minutes', etc. A callout box says 'Pull down the selector to view active event set'. Another callout box explains 'In this example the Filter Events enabling relay #3, runs twice a day, every other day, repeating every week'. At the bottom of this section are 'RESET' and 'SUBMIT' buttons.

Sidebar:

Event Day can be set from **1** to **28** for Pumps set on a 28 day **Event Cycle** and from **1** to **7** for controllers set on a 7 day **Event Cycle** or always 1 on a 1 day **Event Cycle**.

Events repeat every **1**, **7** or **28** days.

Relays '1' to '5' feed time in minutes.

DCM2-CI Browser

4.0 Sensors

4.1 Sensor Calibration

Select the underlined link for the sensor you'd like to calibrate and pull down the top, right menu, selecting **Calibrate**.

Factory Reset returns the sensor back to its default calibration. This is the only calibration allowed for the ORP sensor. It's useful when you are trying to identify a faulted sensor or correct an incorrect calibration.

In this example, pH calibration requires an offset correction from **7.0** to **6.9544**

Enter the grab sample value of the **pH Sensor** here & press **SUBMIT**

After **SUBMIT** the DCM2 displays the **Diagnostic** page

Sensors are measured in millivolts and then **Gain & Offset** are applied to convert to user units, **pH** in this example.

Calibration modifies either **Gain** or **Offset**. If either gets too far from **Default** values, the sensor will fail to calibrate and show a calibration error

Parameter	Value
Status	Alarmed
Sensor Type	pH Sensor
Period Maximum	7.51 pH
Period Minimum	-5.88 pH
Period Average	6.13 pH
Period	1227 minutes
Compensation	None
Measured Level	-31.7 mV
Gain Multiply	-0.0170
Default Gain	-0.0170
Offset Adjust	6.9544
Default Offset	7.0000

Sidebar:

Single Point Calibration: All sensors can be single point calibrated. Obtain a grab sample from the sensor sample petcock, perform the chemical test on the sample and then calibrate the sensor to the value of the tested grab sample. It's the simplest, most repeatable method.

Process control and monitoring only sites which may operate over a wide sensor and temperature range (fountains or non-leisure applications), may benefit from 2 point calibrations. For these users, the controller supports direct set of sensor OFFSET & GAIN and 2 point calibration of pH. Consult the factory before attempting 2 point calibrations.

Calibration Faults: Refer to the next page for options on fault.

LSI-Ryznar sensors

Use **Calibrate** after you measure conductivity, alkalinity or hardness to update the **LSI_Ryznar** calculation.

DCM2-CI Browser

4.1 Sensor Calibration

Sensor Fault displays on a failure to calibrate. Although you may elect to ignore and bypass this warning, it's usually indicating there's a problem with the sensor. You may force the sensor input to read a value, but it may not track changes in pH, ORP, Chlorine Residual or Temperature.

The screenshot shows the 'Temperature :C' calibration page. The status is 'Sensor fault'. The 'Enter value' field contains '79.3 F'. There are radio buttons for 'Factory Reset' (Yes/No) and 'Calib. Override' (Yes/No). 'No' is selected for both. 'RESET' and 'SUBMIT' buttons are at the bottom.

You can override **Sensor Fault warning by re-typing **Enter Value**, selecting **Calib Override = Yes** & **SUBMIT****

After **SUBMIT The controller displays the **Sensor Fault** and returns **value** to its previous setting**

Set **Factory Reset to **Yes** & **SUBMIT** to return the sensor to it's 'as installed' value.**

Ensure the sensor is correctly installed and fully immersed. pH & ORP sensors must be installed vertically, tip down. There must also be a solution ground connected.

Do not calibrate pH & ORP when the **BLUE** LED is flashing, indicating a sensor wash or a start-up delay after a loss of flow

Caution: Sensor Pressure/Vacuum

Optimal sensor pressures are those that avoid negative pressure (vacuum) and less than 30 psig (2bar). Residual sensor also requires constant flow for reproducible readings. Ideal flow through sample cell manifold is 11-12 g/h

Sidebar:

Sensor Fault: The DCM2 verifies that sensor OFFSET or GAIN are within the range of typical sensor operation.

If out of range, **Sensor Fault** displays. Fault Cause will vary with sensor type.

ORP: Verify solution ground connected. Verify sensor cable not damaged or altered & firmly connected at both the SN6 end and the removable terminal strip. Verify not visibly fouled. Clean platinum or gold cap and white Teflon liquid junction with alcohol followed by acid using a soft bristle toothbrush.

Chlorine: Verify sensor cable not damaged or altered & firmly connected at the spring loaded terminal strip. Verify not visibly fouled. Carefully clean gold tips with alcohol followed by acid using a soft bristle toothbrush.

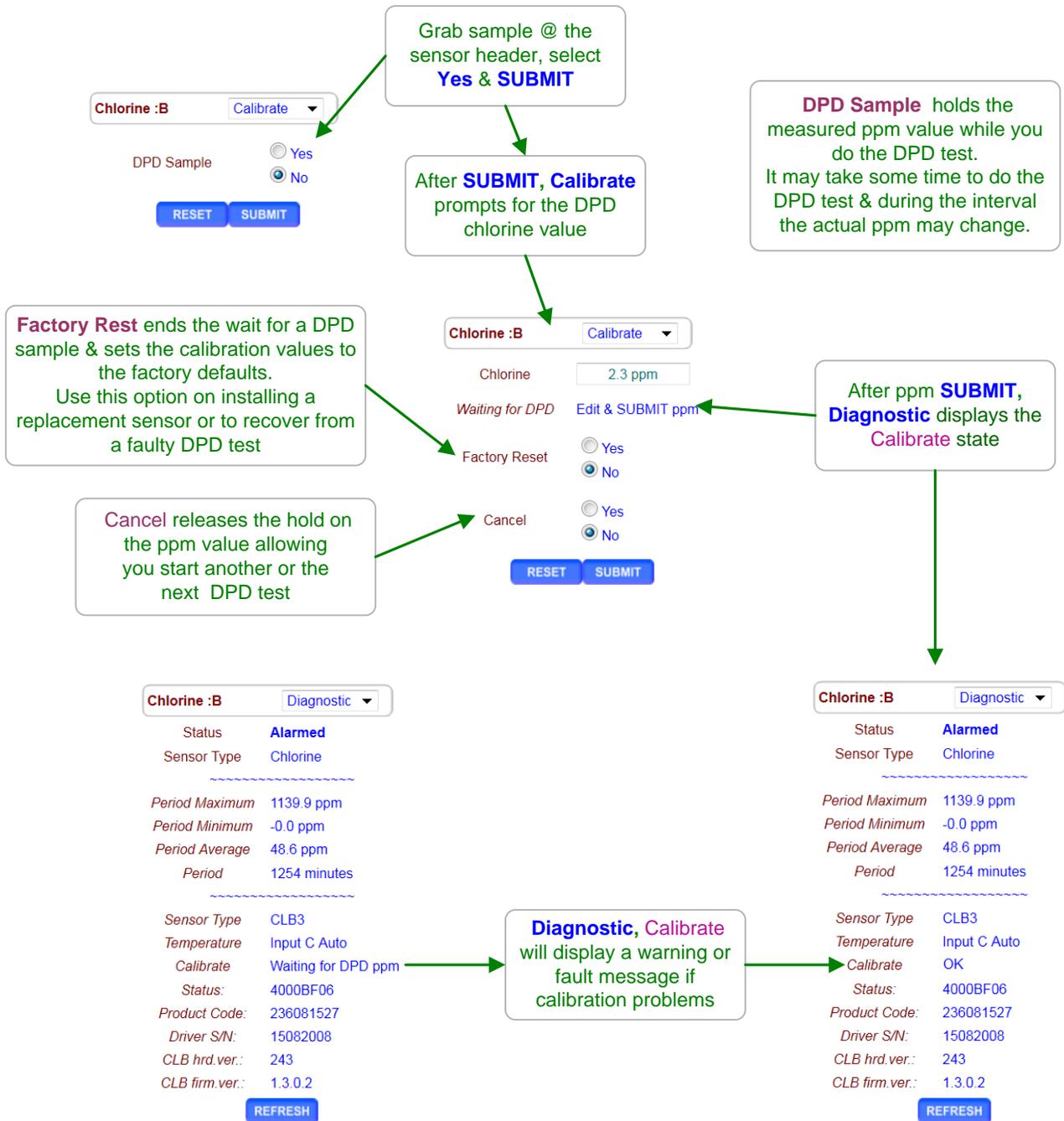
pH: Verify solution ground connected. Verify sensor cable not damaged or altered & firmly connected at both the SN6 end and the removable terminal strip. Verify not visibly fouled. Clean glass bulb and white Teflon liquid junction with alcohol followed by acid using a soft bristle toothbrush.

Temperature: Verify color coding correct and sensor wires firmly connected. Inspect sensor for damage or leaking.

DCM2-CI Browser

4.2 Chlorine Calibration

Select the link on the chlorine sensor and pull down the top, right menu, selecting **Calibrate**.



DCM2-CI Browser

4.3 LSI-Ryznar Calculation

LSI-Ryznar calculations use a combination of measured sensor & manual test values.

LSI-Ryznar:D Configure

Description LSI-Ryznar

Decimal digits 1

Compensation LSI-Ryznar

uS to TDS 0.670

Disable Input Yes No

REFRESH SUBMIT

Select **LSI-Ryznar Compensation** to configure for a Langelier -Ryznar calculation

uS to TDS conversion typical for non-brine streams
Brine streams use **0.5**

LSI-Ryznar:D Calibrate

CaCO3 Hardness 200.0

Alkalinity 90.0

Conductivity 500

RESET SUBMIT

Grab sample, measure & enter a **Conductivity** measurement in uS

Select Calibrate to enter chemical test values for **Hardness & Alkalinity**.

Hardness limited 50 to 400ppm
Alkalinity limited 30 to 140ppm

LSI-Ryznar:D Alarms

LSI Scaling 0.0

RYZ Corrode 6.0

RYZ Scaling 8.0

Alarm Relay Yes No

Delay on Alarm 30.0 minutes

RESET SUBMIT

Ryznar alarms display both **Scaling & Corrode** alarms.

These LSI-Ryznar alarm values are recommended.

LSI > LSI Scaling displays a **Scaling** alarm here.

LSI-Ryznar:D Diagnostic

Status Operational

Sensor Type Calculated

Period Maximum 0.4

Period Minimum -13.2

Period Average -1.2

Period 1272 minutes

Compensation LSI-Ryznar

Ryznar 7.1

REFRESH

Diagnostic for the LSI-Ryznar input shows the **Ryznar** value. The LSI value is logged.

DCM2-CI Browser

4.4 Sensor Alarms

Select the link on the target sensor and pull down the top, right menu, selecting **Alarms**.

ORP Sensor:B Alarms

Status: **Control limited**

High Alarm: 900.0 mV

Low Alarm: 600.0 mV

Alarm Relay: Yes No

Delay on Alarm: 5.0 minutes

RESET SUBMIT

Temperature :C Alarms

Status: **Alarmed**

High Alarm: 95.0 F

Low Alarm: 80.0 F

Alarm Relay: Yes No

Delay on Alarm: 5.0 minutes

Clear Alarms: Yes

Alarmed Low: 21:28 13/10/14

RESET SUBMIT

Blocks, if you attempt to adjust an alarm on a pH, ppm or ORP sensor used for control to a value outside of the present control setpoints

Alarm Relay = Yes will turn ON any output with **Special Control = Alarm** when this sensor alarms

If the sensor measures greater than **High** or less than **Low**, it will Alarm after the **Delay**

Delay block transient, nuisance alarms. Set to >1440 to prevent alarms (1 day = 1440 minutes)

pH, ppm, ORP and temperature pump & solenoid controls block setpoints outside of the controlling sensor alarm range

If an input is **Alarmed**, the time-date stamp will display with the cause of the alarm

Set **Clear Alarms = Yes**, and **SUBMIT** to acknowledge & clear the alarm

Alarms do not auto-clear so that problems that occur when you are not viewing the controller are not missed

Sidebar:

Clear Alarms: Resets the **Delay on Alarm** time.

If the **Delay on Alarm** is set to zero minutes and the sensor is above the **High Alarm** or below the **Low Alarm**, the sensor alarm will immediately re-trip.

Water meters & Contact sets also have alarms & these are defaulted to not trip the **Alarm Relay**.

DCM2-CI Browser

4.5 Sensor Configure

Select the link on the target sensor and pull down the top, right menu, selecting **Configure**.

Callout 1: Edit **Description** for up to 14 letters & numbers. Changes the View on **SUBMIT**

Callout 2: **Gain** or **Offset** are modified by the controller when you Calibrate the sensor

Callout 3: **Display Units** may be set to any three characters

Callout 4: **Decimal digits** sets the number of digits displayed after the decimal point.

Callout 5: The DCM200 won't let you **Disable** ppm, pH, ORP, temperature & flowswitch sensors.

Callout 6: In this example, the pH sensor is **Thermal Compensated**. Aquatics sites typically do not need to temperature compensate pH

Sidebar:

Description: Text is rejected if it contains special characters like < or >.

Avoid assigning duplicate or similar names for sensors, requiring the user to identify using only the identifying letter 'A' to 'F'.

Each sensor has only one name. It's the same for both Keypad-LED and Browser users and is included in the controller data logs.

Resolution: When you select the number of digits displayed after the decimal:

1. Keep the number to a minimum to unclutter the display, making sensor values easier to read & remember.
2. pH is typically displayed with 1 digits of resolution & ORP with 0 digits after the decimal point

The displayed resolution of a sensor does not alter the data log resolution or the resolution used for control or the accuracy of sensor calculations.

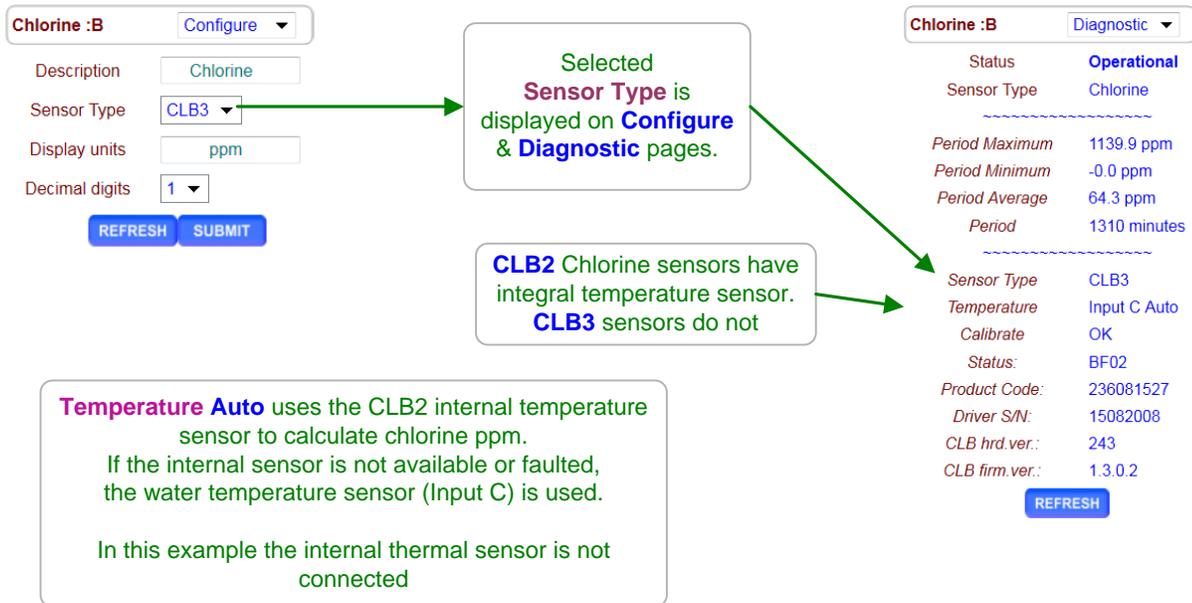
Disabling a sensor removes it from the display and all selection menus used for control and compensation. Data logging stops for disabled sensors.

DCM2-CI Browser

4.5 Sensor Configure cont.

DCM2-CI controllers include a CLB sensor driver card, mounted on the left side of the controller circuit board and usually a CLB3 chlorine sensor installed in the sensor manifold (DGMA). Alternatively, a CLB2 sensor may be provided in special circumstances.

Select the link on the chlorine sensor and pull down the top, right menu, selecting **Configure**.



DCM2-CI Browser

4.6 Sensor Diagnostics

Select the link on any sensor to view the **Diagnostic** page for the sensor.

Status displays Alarmed if tripped.

Normal variation reflect typical control response. **Minimum** may reflect a drained sample line.

When you calibrate a **pH Sensor**, the controller adjusts the **Offset** to modify the displayed value.

'A' indicates where the sensor's connected, independent of the site's sensor name

Summary of the sensor variation within the run time period. **Period** resets @ midnight

The 0.0456 pH difference between **Default Offset & Offset Adjust** indicates an OK sensor, operating close to Factory default.

pH Sensor:A		Diagnostic	
Status	Alarmed	Status	Alarmed
Sensor Type	pH Sensor	Sensor Type	pH Sensor
Period Maximum	7.51 pH	Period Maximum	7.51 pH
Period Minimum	-5.88 pH	Period Minimum	-5.88 pH
Period Average	6.13 pH	Period Average	6.13 pH
Period	1227 minutes	Period	1227 minutes
Compensation	None	Compensation	None
Measured Level	-31.7 mV	Measured Level	-31.7 mV
Gain Multiply	-0.0170	Gain Multiply	-0.0170
Default Gain	-0.0170	Default Gain	-0.0170
Offset Adjust	6.9544	Offset Adjust	6.9544
Default Offset	7.0000	Default Offset	7.0000

Sidebar:

Diagnostic displays how the sensor is configured, compensated and calibrated.

Offset & Default Offset

When you calibrate a pH, ORP or temperature, the DCM2 adjusts the OFFSET to make your measured value match the displayed value.

Manual Sensors:

These sensor types use only the OFFSET to set the displayed value. The controller ignores GAIN for these sensor types.

Measured Level:

pH sensors have a well defined mV to pH relationship of 59.16mV/pH unit.

Example 7.000 pH = 0.0 mV, 10.000 pH = -177.48mV and 4.000 pH = 177.48 mV.

Displayed sensor value = (**GAIN x Measured Level**) + **OFFSET**.

Using this simple equation, you can directly modify the OFFSET & GAIN to get a desired display. This is seldom done, and not recommended for typical aquatic sensors.

DCM2-CI Browser

4.7 Water Meters: Volume & Rate

Select the link on the F input to configure and pull down the top, right menu, selecting **Configure**.

Flow Meter:F Configure

Status **Reconfigured**

Digital Type **Volume meter**

Description **Flow Meter**

'K' Factor **100.00**

Meter Type **Turbine Meter**

Display units **gpm**

Decimal digits **0**

Volume to Rate Yes No

STOP on alarm Yes No

Disable Input Yes No

REFRESH **SUBMIT**

If you are using a turbine or paddlewheel meter, set **Meter Type** to **Turbine Meter** & **SUBMIT**. Then adjust **'K' Factor** & **SUBMIT**

Set **Digital Type** to **Volume Meter**

If you are using a Contact meter, (this is unusual in pools and spas) set **Volume/contact** to the value measured each time the meter contacts close.

If you have set the controller to **U.S. Units**, **Display Units** are **'G'**allons. Metric Units display **'L'**iters

Sidebar:

Contact Head Meters (rarely used in Pools and Spas)

Meters may often be user configured for many Gallon/Contact or Liter/Contact settings. Make sure you get the volume/contact correct or volume errors will occur.

Turbine-Paddlewheel Meters

Nominal **'K' Factors** or Pulses-per-Gallon are listed for each pipe size on the manufacturer's web site or on the installation manual supplied with the meter.

When meters are supplied with entry fittings, the actual **'K'** factor may be labeled on the body of the meter.

Common Meter Wiring Errors:

1. Switching wire colors when extending 3 wire meter cables.
2. Routing meter wiring in the same conduit as AC power.
Meter cables are low voltage. If site practice allows, tie wrap meter cabling to the outside of conduit rather than share a conduit with AC power.

Contact Set Debouncing:

Mechanical water meter contact sets bounce when closing or opening. The DCM2 software debounces so that you don't measure extra counts when you select **Contact Meter**.

Maximum Turbine Pulse Rate:

Turbine pulse streams are not debounced and will measure up to 400 pulses/sec. or Hertz. 400 Hz. is faster than the pulse stream from the typical insertion flow meter at maximum flow rate.

DCM2-CI Browser

4.7 Water Meters: Volume & Rate cont.

Flow Meter:F Configure

Status: **Reconfigured**

Digital Type: Volume meter

Description: Flow Meter

'K' Factor: 100.00

Meter Type: Turbine Meter

Display units: gpm

Decimal digits: 0

Volume to Rate: Yes No

STOP on alarm: Yes No

Disable Input: Yes No

REFRESH SUBMIT

Flow Meter:F Alarms

Status: **Adjusted Alarm**

High Alarm: 1000 gpm

Low Alarm: 50 gpm

Alarm Relay: Yes No

RESET SUBMIT

Tue 09:07:08
Your Lap Pool
DCM2-CI

Alarm

REFRESH

Note that if output 4 was controlled by a float switch but not interlocked with the flowswitch, it does not STOP on a low recirculation rate

If STOP on Alarm = Yes when the Flow Meter alarms, the System alarms & all 4 control outputs are **interlocked** and turn **OFF**

If STOP on Alarm = Yes a rate alarm will STOP any control that's interlocked with the flowswitch

Insertion paddelwheels & Turbine Meters will display rate in **gpm** or **lpm** if **Volume to Rate = Yes**

- Sidebar:**
1. The alarm on Volume-to-Rate is non-latching so that when flow recovers, feed & control restart automatically.
 2. When a low rate alarm occurs, the System Alarm is set so the **Orange ALARM** LED on the enclosure face turns Flashes.
 3. Control & feed will not restart until the cause of rate alarm is corrected, the alarm setpoints are changed or **STOP on Alarm = NO**

DCM2-CI Browser

5.0 Flowswitches & Contact Sets

5.1 Switching Meters & Contact Sets

Select the link on the target water meter or contact and pull down the top, right menu, selecting **Configure**.

The screenshot shows the configuration page for 'Flow Contact:F'. The interface includes a 'Configure' dropdown menu, a 'Digital Type' dropdown set to 'Contact set', a 'Description' field with 'Flow Contact', and two radio button options: 'Invert sense' (set to 'No') and 'Disable Input' (set to 'No'). At the bottom are 'REFRESH' and 'SUBMIT' buttons. Four callout boxes provide additional information:

- Invert sense** makes a contact set display ON when it is open.
- The input's **Diagnostic** page for contact sets 'E' & 'F' will tell you if a contact set is Open or Closed
- The DCM2 has a single assignable digital input 'F'. Input 'E' Flowswitch cannot be reconfigured.
- Water Meters used for feed control and Contact sets used for interlocking or control cannot be **Solid State** (digital) switches.

Additional instructions from the text above the screenshot: **Set Digital Type to Contact Set and SUBMIT**

Sidebar:

Volume & Contact Set Input:

Controller input 'F' may be set to be a water meter or a contact set.

The DCM2 is defaulted as a contact set at input 'F', and is recommended that it be used as a circulation safety switch.

DCM2-CI Browser

5.2 Contact Set Alarms

Select the link on the target sensor and pull down the top, right menu, selecting **Alarms**.

The screenshot shows the configuration page for 'Flowswitch:E'. At the top, there is a dropdown menu set to 'Alarms'. Below it, the status is 'Adjusted Alarm'. There are two input fields: 'ON Time Alarm' set to '1500.0 minutes' and 'No Flow Alarm' set to '5.0 minutes'. The 'Alarm Relay' section has two radio buttons, 'Yes' and 'No', with 'No' selected. At the bottom, there are 'RESET' and 'SUBMIT' buttons. Three callout boxes provide additional information: the first explains the 'ON Time Alarm' (1500 minutes), the second explains the 'No Flow Alarm' (5.0 minutes), and the third states that any event or condition can be alarmed.

ON Time Alarm in this **Flowswitch** example is set to exceed the maximum number of minutes in a 24 hour period (1440). Alarm timers are reset at midnight. Flow=ON is a normal condition that should not cause an alarm. 1500 minutes is the default value to prevent an alarm.

The **No Flow Alarm** in this example would alarm **5.0 minutes** after a loss of flow.

Any event or condition that can be indicated by a contact set, can be alarmed... circulation flow high or low chemical or water levels, temperatures, pressures, etc.

Sidebar:

Default alarm times are set so that contact sets won't alarm unless user configured. It's unlikely that you would set both alarms on any one contact set but the ability to alarm both ON & OFF states gives you a lot of application flexibility.

ON Time Alarm:

On Time alarms are used as a deadband of sorts so that a fleeting contact closure does not cause a nuisance alarm.

If the flow switch on your filter return line shows low flow you'd like to stop chemical feed immediately, and if low for more than a few minutes, display and log an alarm.

If the flowswitch on a water feature which typically is ON between 6:00AM & 8:00PM

Is ON for more than 15 hours, either the flowswitch has faulted OR the water feature operation has changed.

No Flow Alarm:

If you have an aquatics system that runs 24/7 you'd want to alarm on a flowswitch that has no flow since it indicates that the circulation is too low for proper operation or inadvertently valved OFF.

DCM2-CI Browser

5.3 Contact Set Controls

Select the pump, valve or solenoid you wish to control using a contact set or flowswitch and pull down the top, right menu, selecting **Configure** and set **Control by** to either contact set 'E' or 'F'.

When the controlling contact set is **ON**, the relay is **ON** .

In this example when input 'F' is **ON**, relay 3 is **ON** after the **Deadtime** has elapsed.

If the contact set is controlling a variable frequency pump output, 4 or 5, the pump feeds at 100% when the contact set is ON.

Set **Control by** to a contact set input. In this example we've selected input 'F' to control relay 3

Deadtime in this example is used to remove bounce from a float switch

The **Diagnostic** display shows the total time the output has been **ON** today & **ON** time of the controlling contact set this **actuation** .

If **Invert sense** is set to **Yes**, the controlling contact set in this example will be **ON** when the contact set is **OPEN**.

This setting allows you to turn the relay or pump **ON** when the contact set is **OPEN** or **CLOSED**.

Contact set controls are simple. There are no setpoints or special controls, just a **Deadtime**.

DCM2-CI Browser

6.0 Frequency Controlled Pumps

6.1 Selecting a Pump

Select the link on the target pump and pull down the top, right menu, selecting **Setup**.

Pull down the **Pump Type** selector and select one of the 6 built-in pumps

The controller sets the **Rated SPM** and **mL/stroke** for a 40 psi injection head.

Pull down the **Pump Type** selector and select **Other** if your pump isn't one of the 6 built-in ProMinent pumps

Set the **Rated (Max) SPM** and **mL/stroke** for your pump & **SUBMIT**

Built-in Pump types

Pump Type	ml/stroke	Liters/hr	Gallons/hr
1601	0.13	1.404	0.371
1602	0.24	2.592	0.685
1001	0.10	1.080	0.285
1002	0.24	2.592	0.685
0704	0.42	4.536	1.198
0705	0.50	5.400	1.427

Sidebar:

Pump Type:

If you select one of the 6 built-in ProMinent pumps, the feed volume mL/stroke and maximum frequency are set correctly and automatically assuming a nominal 40 psi feed line pressure. If you select 'Other' as a pump type, you'll need to provide both the nominal mL/stroke and maximum stroke rate. Pumps with maximum stroke rates from 50 SPM to 400 SPM are supported by the controller.

Relay Controls:

Frequency controlled pumps may also be switched ON/OFF by one of the controller's relays '1' to '3'. Disconnect and remove the frequency control cable, if installed, and plug the pump power cord directly into the receptacle cord on the controller.

This is not the best use for a frequency controlled pump but if you need an additional pump and both the controller's frequency controls are being used, it's an option.

DCM2-CI Browser

6.2 Adjusting mL/stroke

Select the link on the target frequency controlled pump and pull down the top, right menu, selecting **Setup**.

Select the **Setup** option to modify a frequency controlled pump's **ml/stroke**

Verify that you are using a **0704** type pump cable to frequency control '4'

The default ml/stroke for each pump assumes a 40psi injection head.

If you require more **ml/stroke** accuracy, modify the default setting & **SUBMIT**

Sidebar:

Calibrating Stroke Volume:

Not normally used in Pools and Spas, but when your chemical ppm tests don't match the feed volume, then consider calibrating the pump ml/stroke.

If you find you're correcting the mL/stroke value frequently, then it's very likely that the error source is not the mL/stroke setting since the feed head hasn't changed.

Calibration Limits:

The controller limits the range of **mL/stroke** calibration for the built-in ProMinent pumps.

DCM2-CI Browser 7.0 System Settings

7.1 Site Configuration

Select the system or home link. Pull down the top, right menu, selecting **SYS Configure**.

The screenshot shows the 'SYS Configure' page with the following settings and callouts:

- System:** SYS Configure (dropdown)
- Status:** Reconfigured
- Site name:** Your Lap Pool (callout: Edit these fields to uniquely identify your DCM2(s))
- Controller name:** DCM2-CI (callout: Edit these fields to uniquely identify your DCM2(s))
- Metric Units:** Yes, No (callout: Metric Units displays temperatures in 'C'centigrade and volume in 'L'itres)
- Keypad Password:** Yes, No (callout: Selecting Yes will require a password on the keypad to modify the controller configuration.)
- Flow ON delay:** 20 seconds (callout: Flow ON delay allows time for a representative sample of water to reach the sensors after sample flow has been interrupted)
- Flowswitches:** Yes, No (callout: Flowswitches designate which digital inputs initiate a chem feed stop and then Flow ON delay)
- Wash END delay:** 30 seconds (callout: Wash END delay holds sensor values past the end of a wash event to allow time for rinsing and sensor recovery .)
- Alarm on STOPs:** Yes, No (callout: Select Yes to alarm on all pumps or solenoids user set to STOP)
- Log Period:** 10 minutes (callout: Sensor values & state, Contact set ON times, Meter volumes, Pump ON time or pumped volume and output states are logged at this frequency)
- System restart:** Yes, No (callout: Remote reboot equivalent to AC power OFF then ON. Clears alarms, resets diagnostics & restarts the Flow ON delay)
- Erase Log:** Yes, No (callout: Select Yes to permanently remove all logged data records)
- Factory Reset:** Yes, No (callout: Select Yes to restore all inputs and outputs to factory defaults)
- Serial number:** U214C0001
- Chlorine:** Yes, No
- Buttons:** RESET, SUBMIT

Sidebar:

Commissioning: *Select U.S. or Metric Units when you commission or install.*

Data logging uses the Units setting for the units on logged volumes and temperatures. Changing units does not change data already logged, so this should be one of the first settings changed during a start-up commissioning.

Metric Inputs:

If you switch back to U.S. units, temperatures are converted to Fahrenheit using the default offset & gain, removing the effect of any user calibration.

Metric Outputs:

Pumped volumes are reported in mL & Liters.
 Event feed volumes are in Liters and not Gallons.
 The controller uses the units of the controlling sensor for setpoints.
 If a water meter was set to measure Gallons prior to switching the **Metric Units**, it will still display Gallons on the meter and wherever it's used for control.

DCM2-CI Browser

7.2 Passwords

Select the system or home link. Pull down the top, right menu, selecting **Passwords**.

Displays your access level, **configure, operate** or **Admin**

System: Passwords

Status Login @ configure

User ID Configure5

New Password 5

Confirm Password 5

RESET SUBMIT

You can only view & modify the **User ID & Password** of the present current login.

System: Passwords

Status Login @ Admin

New Password AAAA

Confirm Password AAAA

Select User O:Operator1

Access Level Operate

RESET SUBMIT

The **Admin** login user can set the access level for other userids

Select the User ID, select the **Access Level** and then **SUBMIT** to change a user's access.

Default Passwords:

Operator1 = 1 Operator2 = 2 Operator3 = 3 Operator4 = 4.
 Configure5 = 5 Configure6 = 6 Configure7 = 7 Administrator = AAAA
 There are 3 password access levels, Operate, Configure and Administrator.

The eight User IDs are used in the controller's keypad log.

Login Page: Operators can view all controller pages.

When you modify a page & **SUBMIT** the Status message will display **Login @ configure** OR **Login @ Admin** if a higher access level is required.

Go to the home page or select the system link and **Logout & SUBMIT**, then login at the required access level.

Modify Passwords:

If the controller is accessible on the site LAN, you should modify all 8 passwords. Passwords are limited to 8 Capital letters and numbers. Keypad passwords are the same as the browser passwords.

Any space in a password ends the password on both editing and **Login** password entry. (No spaces allowed)

Two users cannot share the same password because only the password is used to identify keypad users. The controller displays **Password Fail** on a duplicate password. There are only 5 password attempts allowed. After 5 failed attempts, all access is locked out until the following 7:00AM, or until the power it turned off then on causing a reboot. The password status will show '**Alarmed**' to indicate users have been locked out.

Reset Passwords: If you forget your password, a **Reset Password**, available from ProMinent and is specific to your controller's serial number, setting all passwords to factory default.

DCM2-CI Browser

7.3 Time & Date

Select the system or home link. Pull down the top, right menu, selecting **Time & Date**.

The screenshot shows a web interface for configuring the system's time and date. At the top, there is a dropdown menu labeled "System:" with "Time & Date" selected. Below this are three input fields: "Date DD/MM/YY" with the value "10/06/14", "Time HH:MM:SS" with the value "15:48:10", and "Weekday" with a dropdown menu showing "Tue". At the bottom of the form are two buttons: "RESET" and "SUBMIT".

Callouts in the image:

- A box on the left says: "Note the **DD/MM/YY** date digit sequence". An arrow points from this box to the Date input field.
- A box on the left says: "The controller uses a 24 hour clock, **18:00:00** is 6PM.". An arrow points from this box to the Time input field.
- A box on the right says: "Modify the date and/or time and/or day of week & **SUBMIT**". Arrows point from this box to the Date, Time, and Weekday fields, and to the SUBMIT button.

Sidebar:

Time & Date:

The controller uses a 24 hour clock where 14:30 is 2:30 PM.

Controller Response to a new Time&Date:

When you change the time & date, the controller:

1. Turns all outputs OFF, resets all control timing and restarts the logging period on each I/O
2. Zeroes time and volume owed which ends all timed & volume events.
3. Does a midnight reset which will may set volume-meter Low Alarms.
4. Sets the events Day 1 to the most recent Sunday.

Example: If you are at Day 19, Thursday of week 3, on a 28 day event cycle.

After a **Time&Date** change you are now at, Day 5, Thursday of week 1

DCM2-CI Browser

7.4 Activity Log

Select the system or home link. Pull down the top, right menu, selecting **Activity Log**.

The screenshot shows the Activity Log interface. At the top, there is a dropdown menu labeled 'System:' with 'Activity Log' selected. Below this, a list of activities is displayed. Each activity is shown on two lines: the first line contains the activity name and the second line contains the user ID and the date and time. Three callout boxes with arrows point to specific parts of the log:

- The first callout points to the top of the log and states: "The last 25 user activities, 2 lines for each activity".
- The second callout points to the first line of an activity and states: "1st line displays the name of the sensor, meter or pump and the activity".
- The third callout points to the second line of an activity and states: "2nd line displays the user id and the time and date of activity".

System:	Adj. Date-Time
admin	15:52 14/10/14
System:	Adj. Date-Time
admin	15:48 14/10/14
System:	Reconfigured
admin	15:10 14/10/14
System:	Adj. Date-Time
admin	15:10 14/10/14
System:	Cleared Alarms
admin	15:02 14/10/14
Bleach	Cancelled
admin	14:51 14/10/14
Bleach	New pump
admin	14:51 14/10/14
System:	Cleared Alarms

Sidebar:

Activity Log:

The log contains the last 25 activities that effect the operation of the controller. The most recent activities are shown first. Both keypad and browser user activities are logged.

User IDs:

Keypad Password ON: Logs the User IDs listed in **Section 7.1 Default Passwords**.

Keypad Password OFF: Logs all User IDs as **Keypad**.

Browser user IDs are always logged because login is always required to make any changes.

Actions taken by the controller, like Power OFF/ON, use the **System** user ID.

DCM2-CI Browser

7.5 Enabling I/O, Switching Icons

The screenshot shows a web interface for configuring I/O. At the top, a 'System:' dropdown menu is set to 'View-Config'. Below it are two identical dropdown menus for selecting I/O types: 'A:pH Sensor', 'B:ORP Sensor', and 'C:Temperature'. Below these are radio buttons for 'Enable I/O' and 'all I/O enabled'. At the bottom are 'RESET' and 'SUBMIT' buttons. Three callout boxes provide instructions: 1. 'Any enabled I/O may be switched with any other enabled I/O. Select one I/O from each selector & SUBMIT' points to the I/O dropdowns. 2. 'Switch icon with icon' points to the I/O dropdowns. 3. 'Enable I/O displays all currently disabled I/O. Select the I/O you wish to enable & SUBMIT' points to the 'Enable I/O' radio button. A fourth callout box points to the 'System:' dropdown menu with the text 'Select View-Config from the System link pull down'.

System: View-Config

none
A:pH Sensor
B:ORP Sensor
C:Temperature

none
A:pH Sensor
B:ORP Sensor
C:Temperature

Enable I/O all I/O enabled

RESET SUBMIT

Any enabled I/O may be switched with any other enabled I/O. Select one I/O from each selector & **SUBMIT**

Switch icon
with icon

Enable I/O displays all currently disabled I/O. Select the I/O you wish to enable & **SUBMIT**

Select **View-Config** from the **System** link pull down

Disabling I/O:

Select Input link to disable and then the **Configure** top menu option, then **Disable & SUBMIT**. Inputs **A**:pH, **B**:ORP or Chlorine, **C**:Temperature & **E**:Flowswitch cannot be disabled. Sensor inputs **D** and **F** may be disabled if not being used for control.

Select Output link then the **Setup** top menu option, then **Disable & SUBMIT**.

I/O in use by the controller for control or sensor compensation cannot be disabled.

Disabled I/O is removed from the view.

Disabled I/O is not logged and does not appear in the selections used to compensate and configure other enabled I/O

Enabling Inputs:

Flow Meter and Contact Set Input '**F**' is enabled and configured as either a flowswitch, water-flow meter OR, contact sets, level-pressure switches ...

Enabling Outputs:

Outputs **1** to **3** are AC line powered switching relays that are enabled to power pumps, Solenoids, feeders or motorized valves.

Outputs **4** & **5** are frequency controlled outputs or dry contact digital outputs (DO) that are enabled to proportionally control pumps or enable external equipment, or send alarms.

DCM2-CI Browser 7.6 Communications

Select the system or home link. Pull down the top, right menu, selecting **COM Configure**.

The screenshot shows the 'COM Configure' page with the following fields and values:

System:	COM Configure
IP Address	192.168.1.90
Netmask	255.255.255.0
Gateway	192.168.1.1
Primary DNS	192.168.1.1
HTTP Port	80
MAC Address	001e:c0c3:9dac

Callouts and annotations:

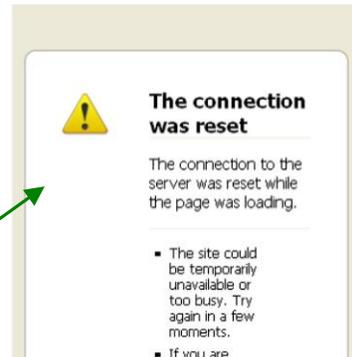
- Top right:** DHCP is not available on the DCM2 series controllers. Admin user can modify the IP Address & Netmask.
- Right side:** The default IP Address is 10.10.6.106. In this example, we've changed it to 192.168.0.90.
- Bottom right:** Gateway & Primary DNS are required to auto-send E-mails.
- Left side:** You'll need to modify both the IP Address & the Netmask for your site's LAN.

Buttons: RESET, SUBMIT

If using the keypad, navigate to **System / Communicate & ENTER**, then scroll through the LAN settings, or refer to the Keypad User's manual.

Note: When you modify any Ethernet parameter, the DCM2 resets the browser connection by restarting.

Warning: If you incorrectly, remotely modify the Ethernet settings you may not be able to reconnect to the controller.



Sidebar:

Warning: Do not connect the DCM2 Ethernet connection into a site LAN without approval from site IT staff .

Browser passwords are the same as the default keypad passwords listed in Section 7.2 Passwords.

You'll need to configure a portable computer to connect directly to the DCM2's Ethernet port.

Refer to Section 9 for Ethernet TCP-IP setup and the following page to get your site's LAN settings.

DCM2-CI Browser

7.6 Communications cont.

Windows operating systems have a simple way to find the Ethernet setup parameters:

Try clicking Start then enter CMD in the "Search Programs and files" box, then press ENTER

Otherwise, locate 'Run' (location differs with Windows version) and open the "cmd" command window

Type 'ipconfig/all' and ENTER

You can find **Netmask, Gateway & Primary DNS** from any PC or notebook; hardwired or wireless connected to the site LAN

In this example
Netmask:Subnet Mask = 255.255.255.0
Gateway:Default Gateway = 192.168.0.1
Primary DNS:DNS Servers = 192.168.0.1

```
C:\windows\system32\cmd.exe
Microsoft Windows XP [Version 5.1.2600.5512]
(C) Copyright 1985-2001 Microsoft Corporation
C:\Documents and Settings\Owner>

C:\windows\system32\cmd.exe
C:\Documents and Settings\Owner> ipconfig/all

Windows IP Configuration

Host Name . . . . . : Development
Primary Dns Suffix . . . . . :
Node Type . . . . . : Mixed
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No

Ethernet adapter Local Area Connection 2:

Connection-specific DNS Suffix . :
Description . . . . . : SIS 900-Based PCI Fast Ethernet Adapter #2
Physical Address. . . . . : 00-E0-18-6F-75-45
Dhcp Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes
IP Address. . . . . : 192.168.0.103
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . : 192.168.0.1
DHCP Server . . . . . : 192.168.0.1
DNS Servers . . . . . : 192.168.0.1
Lease Obtained. . . . . : Monday, December 26, 2011 6:40:10 PM
Lease Expires . . . . . : Tuesday, December 27, 2011 6:40:10 PM

Ethernet adapter Local Area Connection 4:

Media State . . . . . : Media disconnected
Description . . . . . : Omega Virtual Ethernet Adapter
Physical Address. . . . . : 00-10-B8-76-03-00

C:\Documents and Settings\Owner>
```

You can use either the Keypad-LED interface or the browser to setup the controller's IP Address, Netmask, Gateway & Primary DNS. HTTP Port is not changeable on the DCM2.

DCM2-CI Browser

7.7 E-Mail Out

DCM2's connected to the site LAN will soon be able to E-mail alarms & system operating parameters thru ProMinent's internet application.

The screenshot shows the 'E-mail Setup' configuration page. The fields and their values are: System: E-mail Setup; Status: ON :authorize fails; E-mail Out: Yes (selected); Frequency: 4 hours; Account: DCM500@prominent.us; Mail To: datastream@prominent.us; SMTP Server: prominent.smtp.com; Test E-mail: Yes; Next mail: 155 minutes; Notify E-mail: unused. There are REFRESH and SUBMIT buttons at the bottom.

Callout boxes provide the following information:

- Scheduled DCM2 E-mails include sensor & pump values & system diagnostics.**
- Status** in this example, shows that the last scheduled E-mail or Alarm E-mail was sent successfully.
- E-mail Out** in this example is turned **ON**. Select **No**, **SUBMIT** to stop E-mailing.
- Frequency** selectable from 1 to 24 hours.
- ProMinent's server app will take care of distributing E-mails, building summary reports ...
- E-mails are sent on the hour & synched with midnight. The next one is sent in **155 minutes**.
- Check **Yes** & **SUBMIT** to send an E-mail now. Press **REFRESH** to update the status during send.
- Select **System: E-mail Setup** to configure E-mail out.

Status: messages

OFF: = E-mail out Disabled by user

ON : = E-mail out Enabled by user

Testing: = User selects Test E-mail

:Mail Sent = last test, alarm or scheduled E-mail successfully sent.

:Busy, wait! = file server temporarily unavailable. In use by LAN or USB log uploader.

:none sent = Power-on state, prior to 1st E-mail.

DCM2 Mail Server Messages

:Can't Send = E-mails blocked external to the DCM2

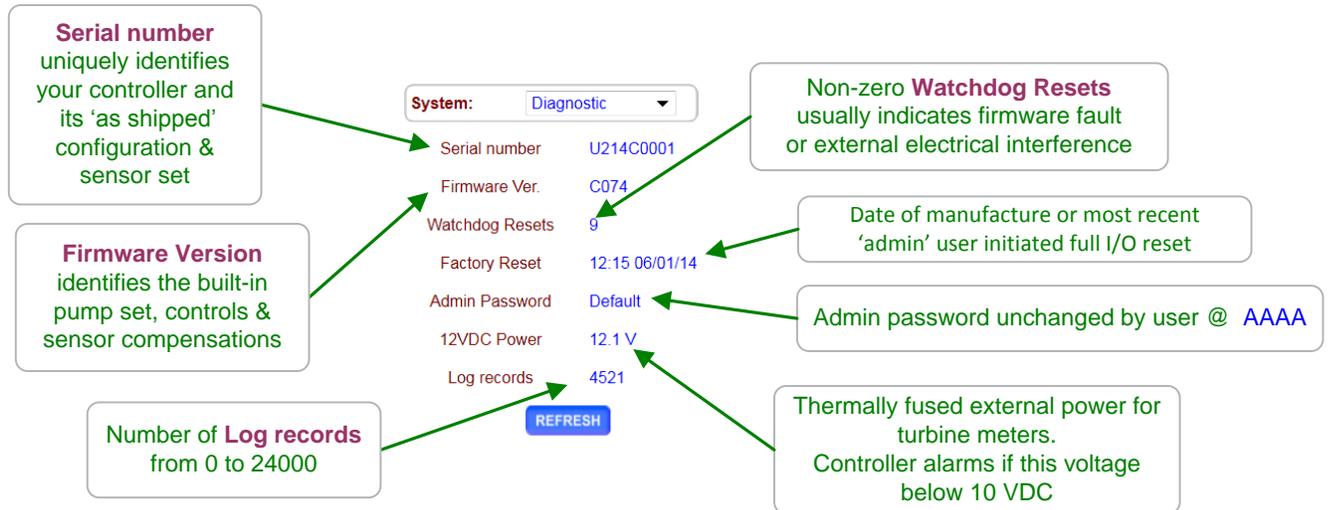
:fails, no DNS = cannot connect to SMTP server, check Primary DNS & Gateway settings

:authorize fails = password or user name incorrect, report fault to ProMinent

DCM2-CI Browser

7.8 System Diagnostic

Select the system or home link then select **Diagnostic** at the top on the right side page.



Sidebar:

If the **System Diagnostic** Admin Password is not Default, then you will not be able to use the default 'AAAA' administrator password to log onto the controller.

Watchdog Resets should always be near zero.

If static has been discharged onto one of the controller circuit boards, or one of the meter, sensor or contact set cables is in the same conduit as AC power switching transients, you may see the Watchdog Resets count up as the controller times-out & recovers.

Touch the grounded controller internal aluminum frame before handling controller terminals to avoid static discharge.

Static discharge is not typically a problem on-site in humid concrete pump rooms but is common in office settings.

Correct wiring to remove sensor and digital signal cabling from AC power conduits.

DCM2-CI Browser

8.0 Notebook & PC Ethernet Set-up

8.1 Ethernet Overview

If you are going to occasionally browse the DCM2 using an Ethernet crossover cable, leave the controller IP address @ the default 10.10.6.106 & setup a connection to this IP in your portable computer, using the instructions later in this section for the Windows version operating your notebook. If you are connecting directly with an Apple computer, refer to the Apple owner's manual for how to configure the Apple for an Ethernet connection.

8.2 View-Modify the DCM2 IP Address

If the DCM2 is on the site LAN, you can use the keypad to view/modify the DCM2 IP parameters.

To view or adjust the controller Ethernet setting press **ENTER** and **DOWN** to **Communicate** at the power up or top of menu display.

Key **ENTER** @ **Communicate**

Displays the current LAN **IP address**.
In this example, it's the factory default.

Key **ENTER** to modify.

Netmask is usually this value for most sites.
Key **ENTER** to modify.

Gateway is frequently the '1' address on the subnet
Key **ENTER** to modify.

Primary DNS is frequently provided @ the same address as the **Gateway**
Key **ENTER** to modify.

The DCM2 HTTP server is fixed at Port 80.

The **MAC address** is six 2 digit hexadecimal numbers, separated by colons into 3 groups of 4 to fit the LCD screen.

In this example, the **MAC address** is **00 04 0a 30 00 00**

The screenshot shows a menu titled "Communicate" with the following options and values:

- Pool 742.5mV ←↕↕
7.65pH 80.3F
- Communicate ←↕↕
Configure ↓
- IP Address ←↕↕
10.10.6.106 ↕↕
- Netmask ←↕↕
255.255.255.0 ↕↕
- Gateway ←↕↕
10.10.6.1 ↕↕
- Primary DNS ←↕↕
10.10.6.1 ↕↕
- HTTP Port ↕↕
80 ↕↕
- MAC Address ↕↕
0004:0a30:0000 ↕↕

Navigation icons (left arrow, right arrow, up arrow, down arrow, and enter) are shown between menu items to indicate how to navigate and modify settings.

8.3 Browser Connect

If the DCM2 is on the site's LAN, you're ready to Ethernet connect & browse.

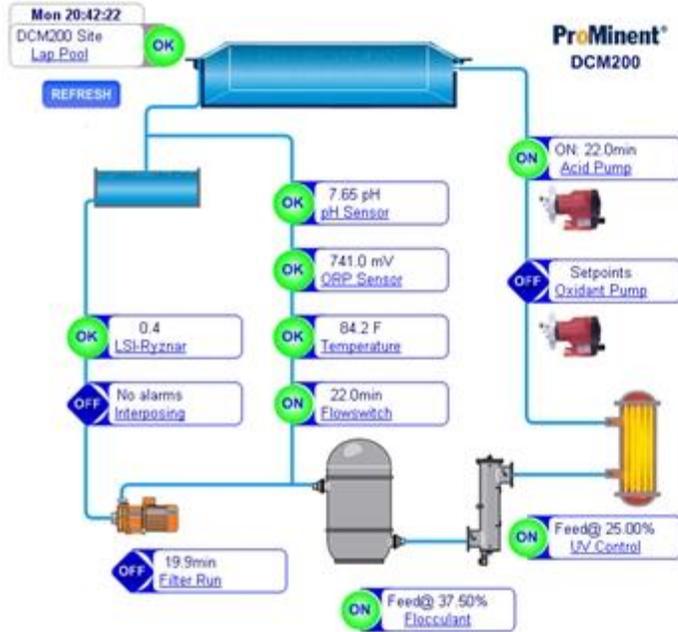
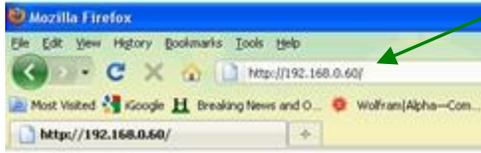
If you are not on the site LAN & are going to use a cable to directly connect, see one of the following sections for your operating system (Windows 7, Vista, XP or 8) TCP-IP connection set-up.

DCM2-CI Browser

Connect a 'cross-over' cable between you notebook's Ethernet jack & the controllers Ethernet jack.

Start you browser, Internet Explorer or Mozilla's Firefox.
If you have wireless internet access you'll connect to your ISP.

Then key the controller's IP address into the browser's address line.
192.168.0.60 in this example. Factory default IP is **10.10.6.106**.
In either case, your browser will convert to **http://[IP Address]**



System: 26/12/11 S/N: DC11X0123
Status: **Waiting for Login**
Select User: Public
Password:
Alarms: none

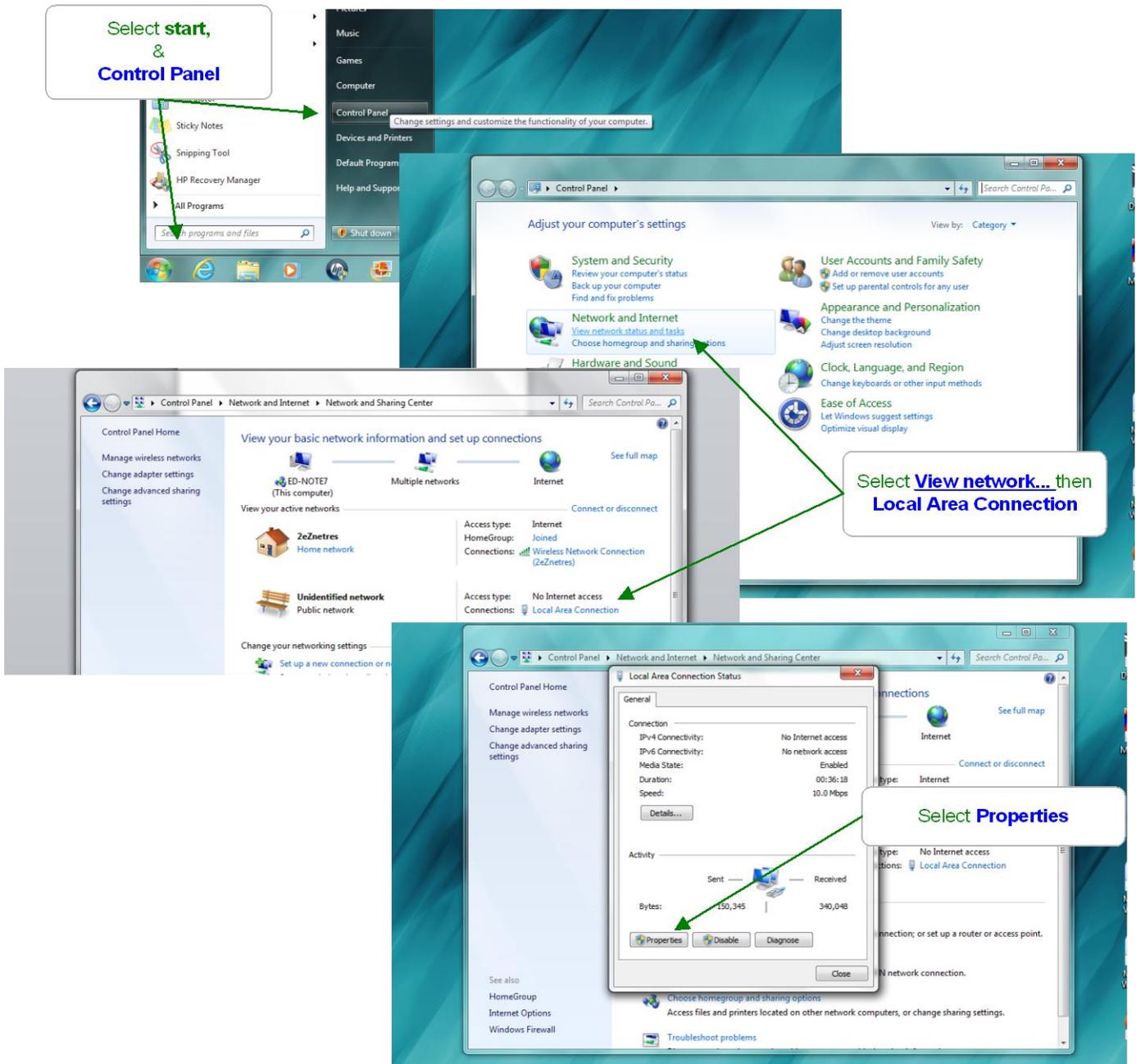
You'll see a real time view of your DCM2 updated automatically every 2 seconds.

To do anything else, you'll have to **Login** to the controller.

Five incorrect **Login** attempts will lock all users out until a power OFF/ON reset or 7:00 AM the following morning

DCM2-CI Browser

8.4 Windows 7 Cross-Over Set-up



DCM2-CI Browser

8.4 Windows 7 Cross-Over Set-up cont.

The image shows a Windows 7 desktop with several windows open. The primary window is 'Local Area Connection Properties', which lists various network protocols. A green arrow points to 'Internet Protocol Version 4 (TCP/IPv4)'. Another window, 'Internet Protocol Version 4 (TCP/IPv4) Properties', is open, showing the 'General' tab with the 'Use the following IP address' option selected. The IP address is set to 10.10.6.200, and the subnet mask is 255.255.255.0. A third window, 'Internet Protocol Version 4 (TCP/IPv4) Properties', is also open, showing the 'General' tab with the 'Use the following IP address' option selected. The IP address is set to 10.10.6.200, and the subnet mask is 255.255.255.0. A fourth window, 'Internet Protocol Version 4 (TCP/IPv4) Properties', is also open, showing the 'General' tab with the 'Use the following IP address' option selected. The IP address is set to 10.10.6.200, and the subnet mask is 255.255.255.0.

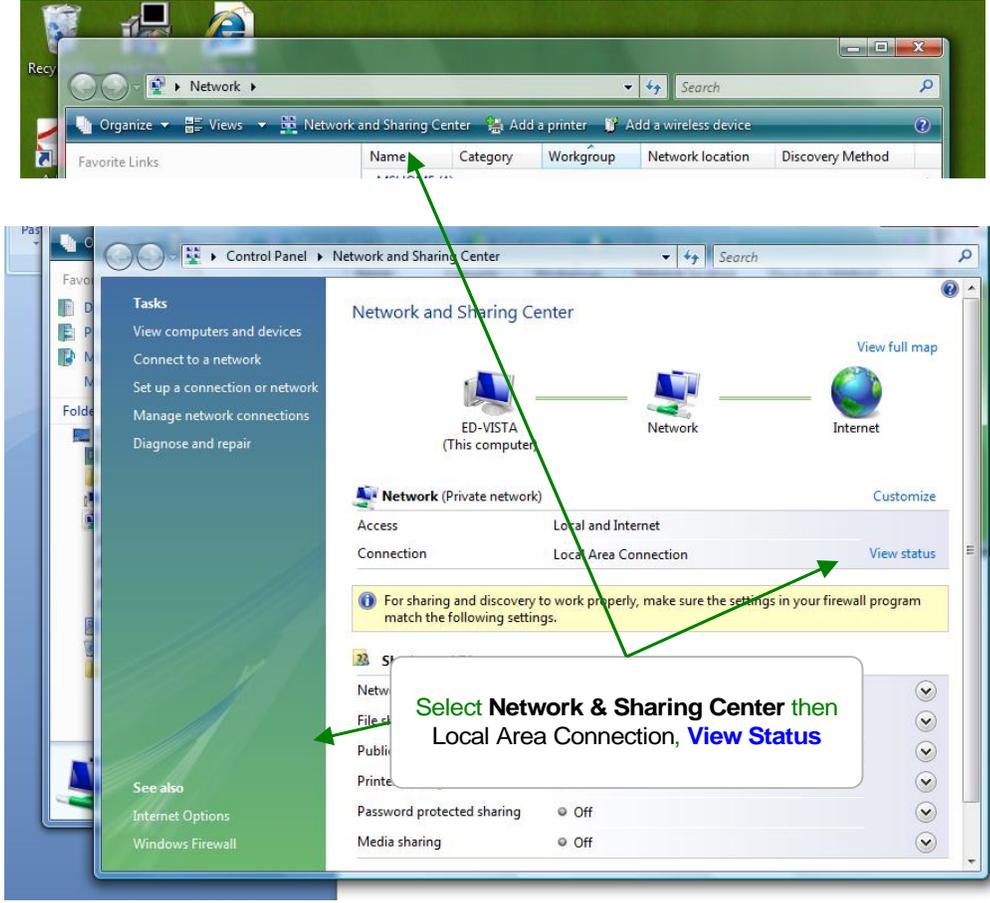
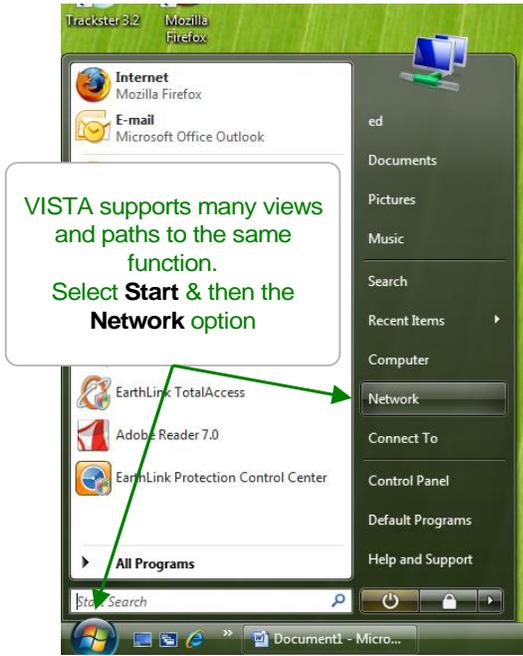
Select **TCP/IPv4** then select **Use the following...**

Note the present IP Address and gateway, server settings before you modify. You'll need to restore them after browsing the controller **if** you use the local Ethernet jack to connect to other devices or services

Edit the IP address, 10.10.6.200 in this example & **OK**

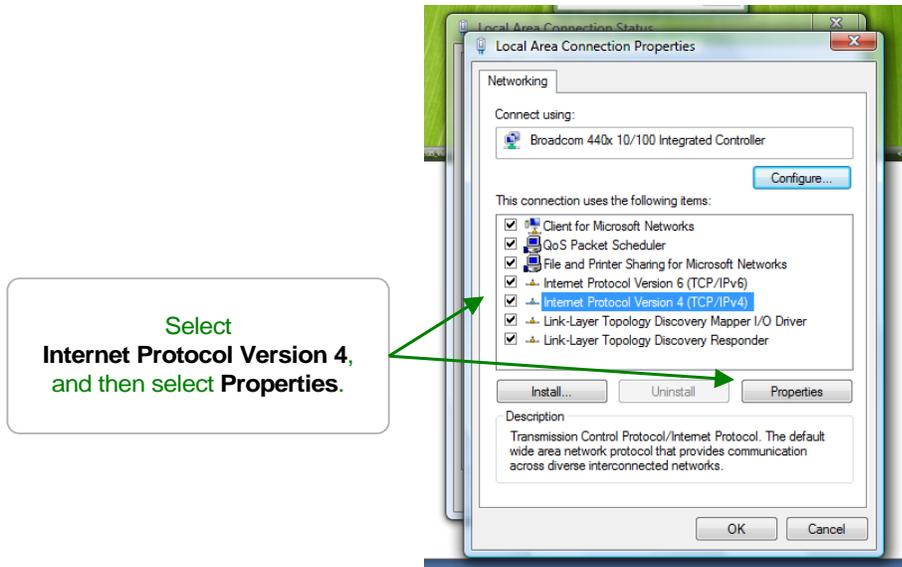
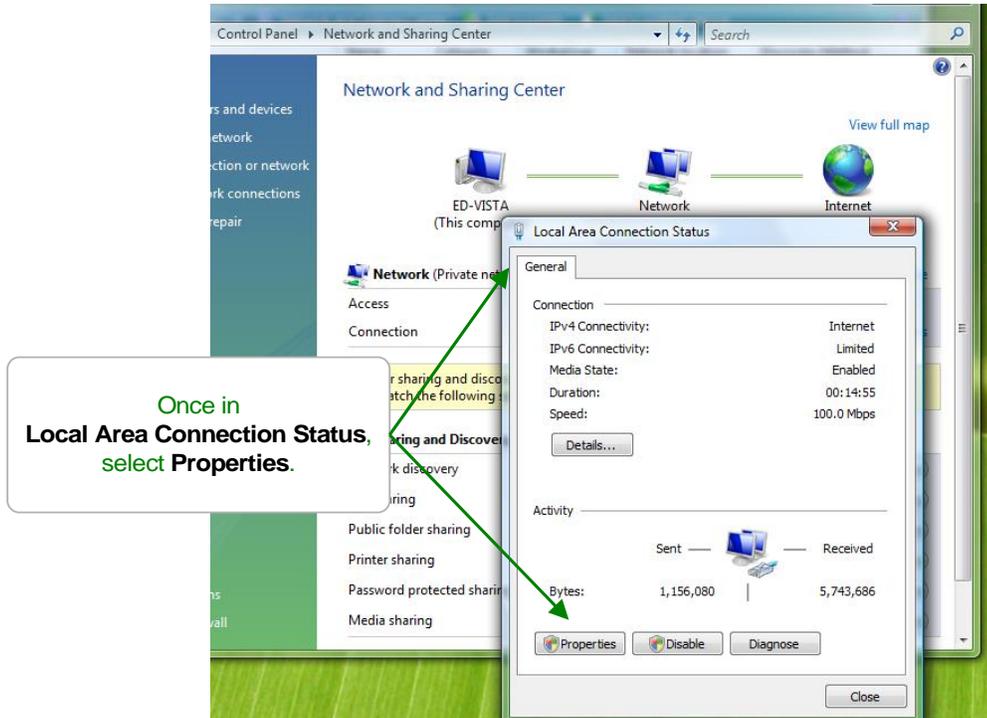
We've put our notebook PC on the same LAN as the DCM500. Now we can connect using an Ethernet cross-over cable

DCM2-CI Browser
8.5 Windows VISTA Cross-Over Set-up



DCM2-CI Browser

8.5 Windows VISTA Cross-Over Set-up cont.



DCM2-CI Browser

8.5 Windows VISTA Cross-Over Set-up cont.

Select **Alternate Configuration** and **User Configured**.

Set the **IP address** so that only the last 2 digits differ from the controller's IP address.

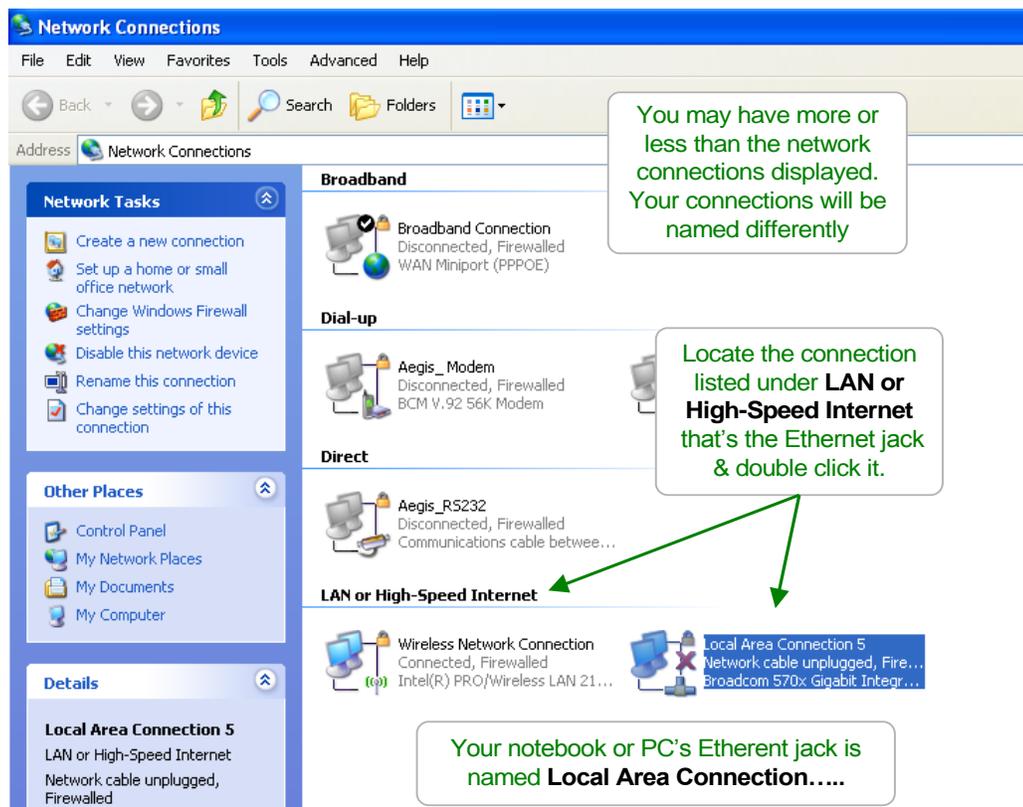
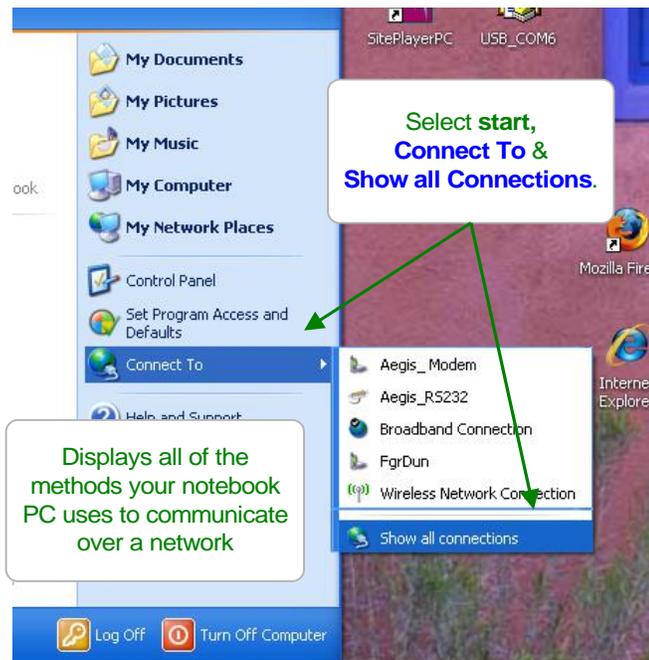
This **Subnet mask** will match 99.9% of controllers. Don't modify it.

Leave all four of these fields blank.

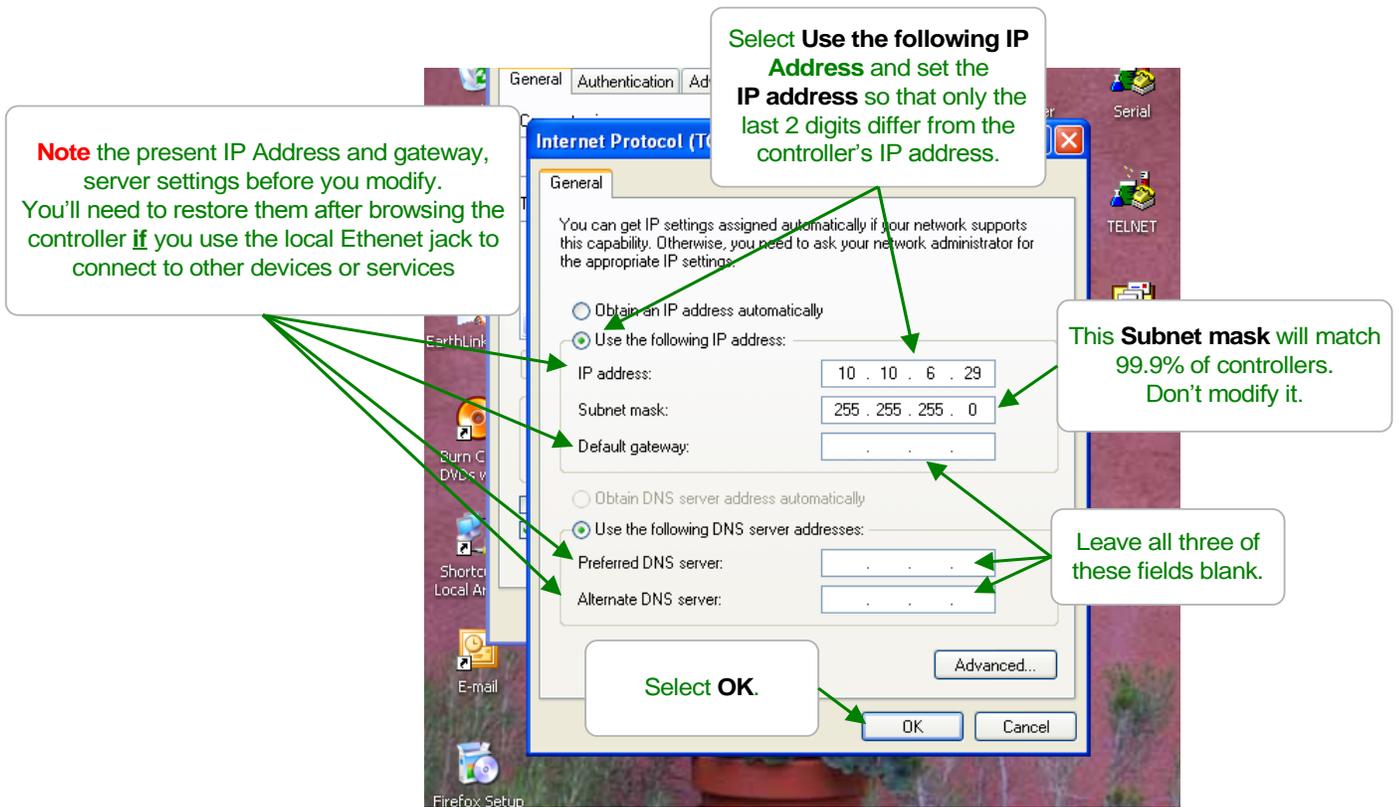
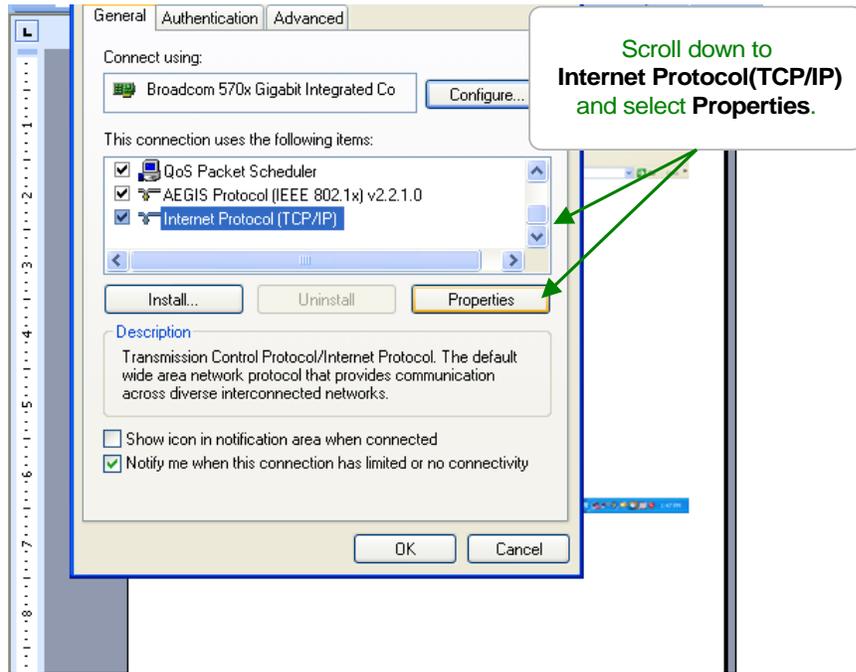
Select **OK**.

If **Alternate Configuration** is not an option, note the present IP Address and gateway, server settings before you modify. You'll need to restore them after browsing the controller **if** you use the local Ethernet jack to connect to other devices or services

8.6 Windows XP Cross-Over Set-up



8.6 Windows XP Cross-Over Set-up cont.



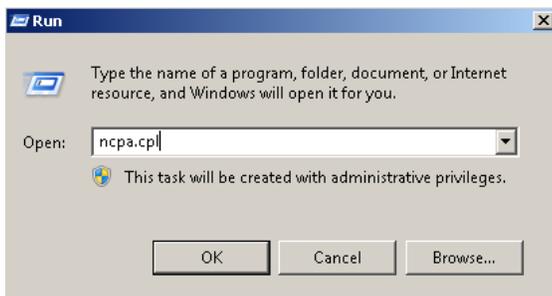
DCM2-CI Browser

8.7 Windows 8 Cross-Over Set-up

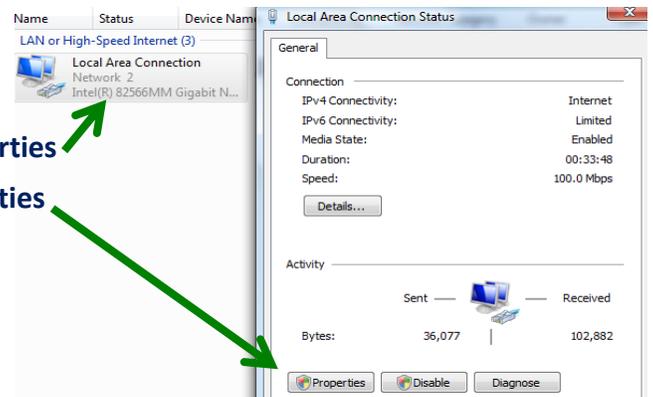
- 1 Logon to Windows 8 computer with any account that has administrative privileges.
- 2 From the available options click on **Desktop**.



- 3 On the desktop screen press **Windows + R** keys simultaneously to initiate **Run** command box.
- 4 In the available field type **NCPA.CPL** command and press OK.

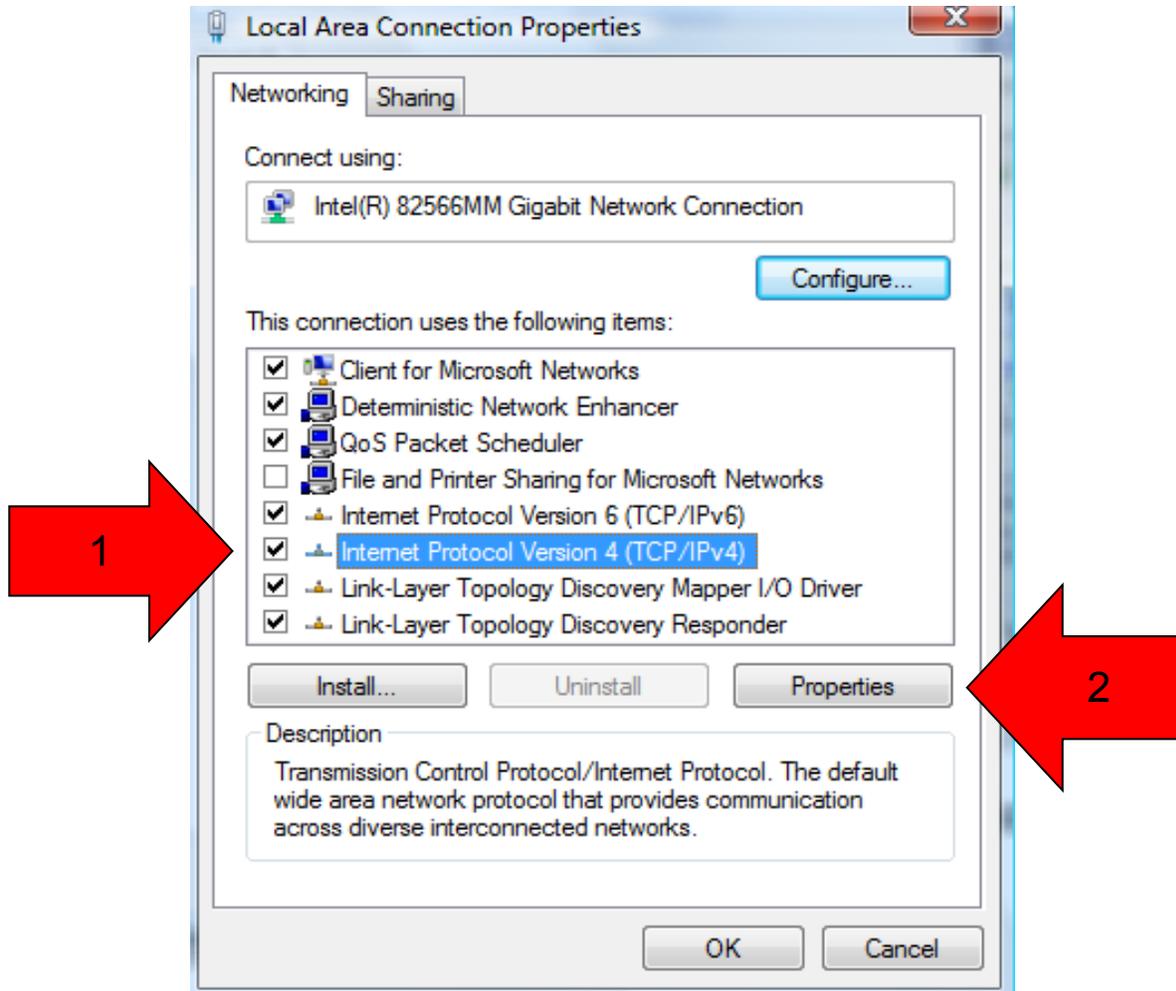


Double click on **Local Area Connection** and select **Properties**
OR you may see **Ethernet Connection** and select **Properties**



DCM2-CI Browser

8.7 Windows 8 Cross-Over Set-up cont.



(1) Highlight Internet Protocol **Version 4** (TCP/IPv4)

(2) Select Properties

DCM2-CI Browser

8.7 Windows 8 Cross-Over Set-up cont.

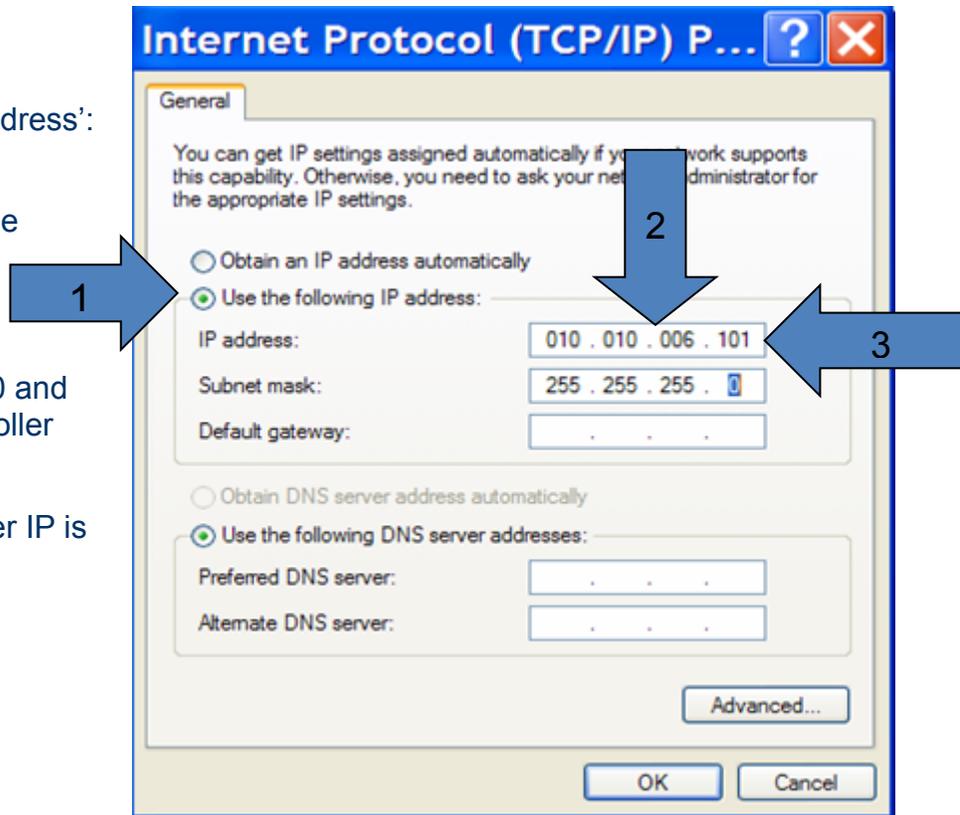
Select the 'Use the following IP address': circle (1)

Enter the first three numbers of the controller's IP address (2)

Example: 010.010.006.____

Then enter a number between 000 and 255 that is different from the controller address

In this example, since the controller IP is 010.010.006.106, we used 010.010.006.101 (3)

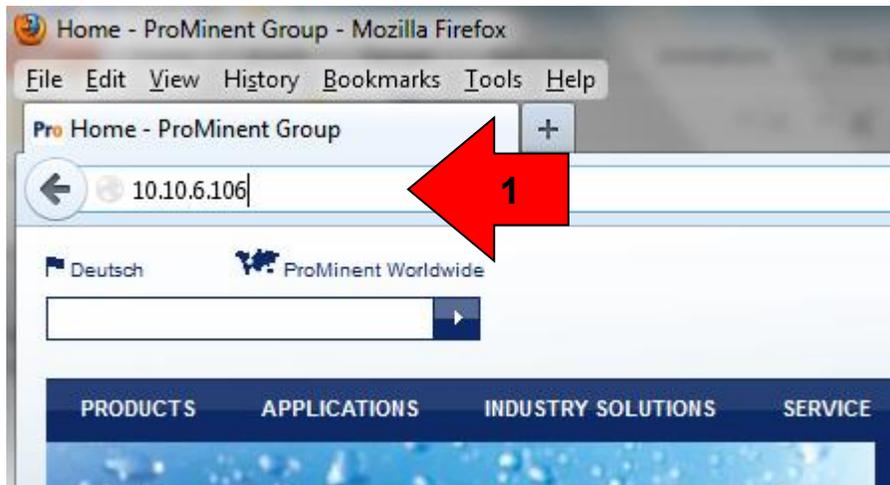


Press the Tab key and enter the Subnet mask of 255.255.255.0

Select OK here and on the Local Area Connection window

DCM2-CI Browser

8.7 Windows 8 Cross-Over Set-up cont.



Connect CAT5 Ethernet **crossover** cable from PC to controller

Open WEB Browser

Enter **controller** IP address (1). Default is 10.10.6.106. Press enter

'http' and 'www' are not necessary.

DCM2-CI Browser

8.7 Windows 8 Cross-Over Set-up cont.

Once you have concluded your Browser session with the controller, you should reconfigure your PC to the previous configuration, usually this is 'Obtain an IP address automatically' by selecting the circle (1) as shown

Use Connection – Ethernet setup steps above to get to this screen

Select OK on this screen and then again on the Local Internet Connection window to save the change.

