multiFLEX
Browser Manual

Contents: M714_Browser

Safety

CAUTION: The operator of this instrument is advised that if the equipment is used in a manner not specified in this manual, the protection provided by the equipment may be impaired.

Electrical Shock Hazard

Opening the controller enclosure with the controller plugged in, exposes the user to AC line voltages on the lower of the two controller circuit boards.

USER WARNING : CAUTION

Water Treatment Controllers operate steam and water valves and may pump hazardous, corrosive and toxic chemicals. Opening the controller enclosure exposes user to the risk of electrical shock at power line voltages.

Understand fully the implications of the control setpoints, interlocks and alarms that you select. Harm to personnel and damage to equipment may result from mis-application.

Unplug or turn OFF the AC power to the controller if you have any concerns regarding safety or incorrect controller operation and notify supervisory staff.

INDIVIDUAL CONTROLLERS

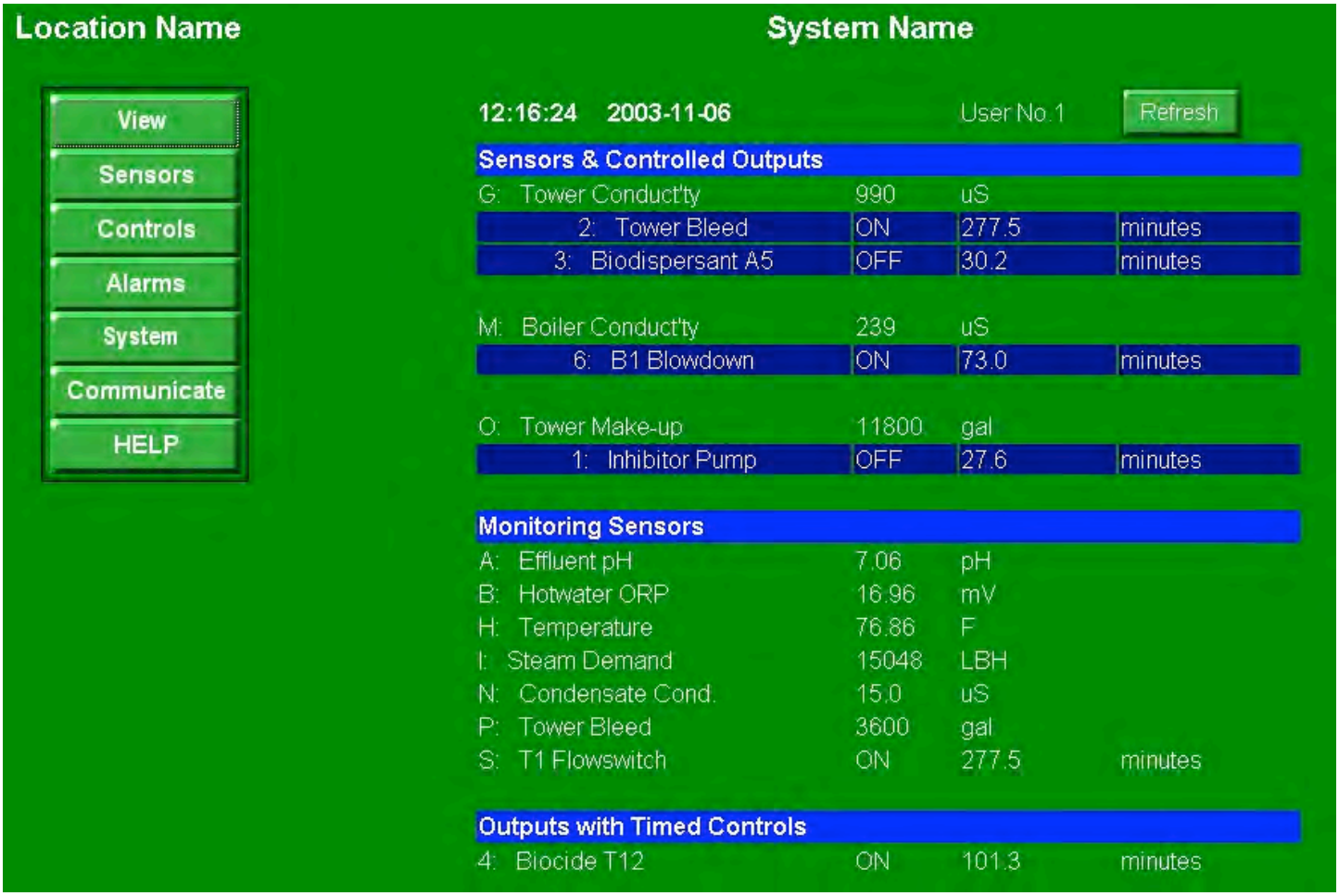
Controllers are supplied in many different configurations.

The **HELP** section in the M714_User manual contains the information for terminating the sensors supplied with each controller.

The **HELP** section in the M714_User manual depicts the installation plumbing header showing the sensor set supplied with each controller.

1.1 View

View is HOME for the controller. Return to HOME by **View** or **Cancel**



Letters 'A' to 'Z' : Inputs

Displays the value of analog sensors, volume today for water meters, state for contact sets.
Locates sensor inputs in the controller enclosure.

Numbers '1' to '10', C1 to C8 : Outputs

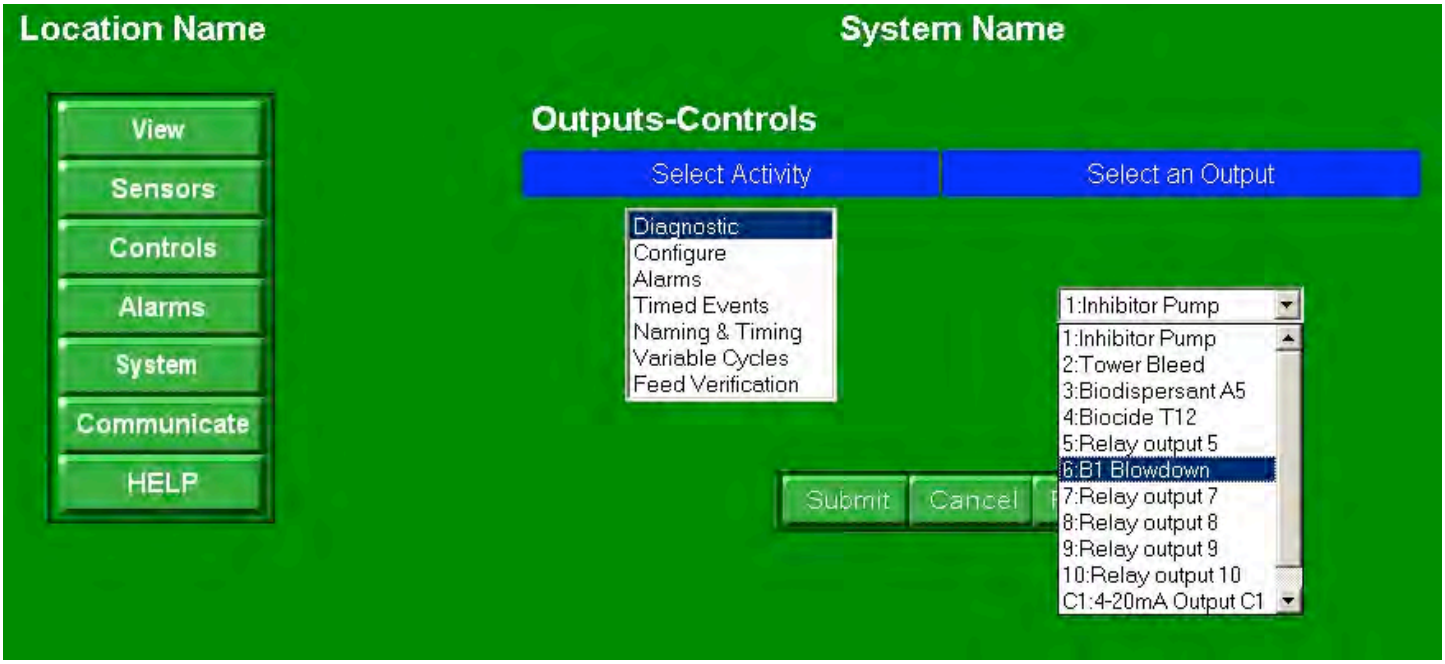
Displays the state of the pump or valve and run time.
Locates relay 1..10 outputs in the controller enclosure.
C1..C8 are 4-20mA outputs. Current mA level displayed.

Controlling sensors are grouped with the relays that they control followed by Monitoring Sensors, Relays controlled by Time and Unused Outputs.
The View auto-configures as the user modifies controls, enables & disables I/O, adds feed events…

The left side **Services** menu responds immediately when a menu item is selected.

1.2 Controls Services

Select **Controls**



Select an Activity and an Output from the pull down and **Submit**

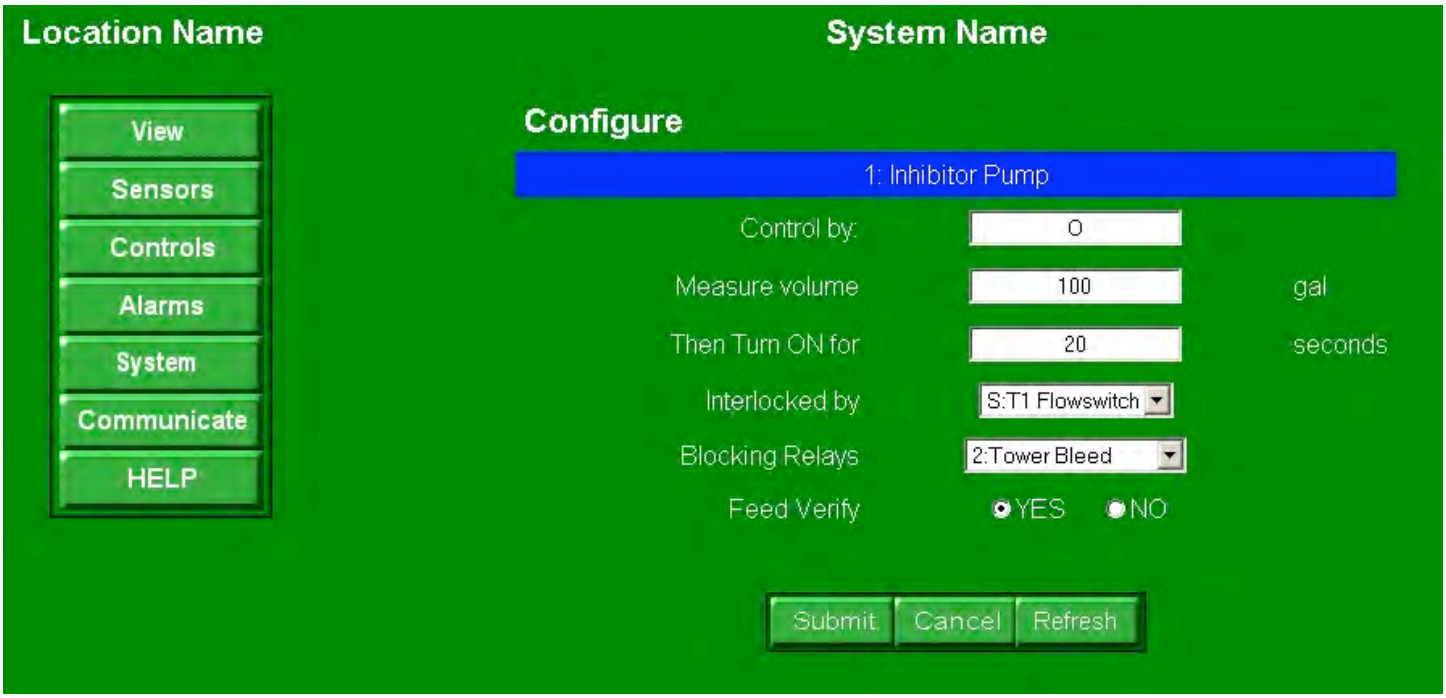
Activity	Activity Services	Notes
Diagnostic	Prime, state, setpoint, special control status, run stats, biocide day	1.
Configure	Setpoint, Control Equation, Interlocks, Blocking, Special Controls	2.
Alarms	Feed limit timers, action on alarm and clear alarms.	3.
Timed Events	Biocide timing, start and run times, frequency	
Naming & Timing	Modify Name, Log period, Timed Event Cycle, Disable Output	5.
Variable Cycles	Set 3 Make-up Conduct. Ranges & Cycles. Set Max. Tower Conductivity	
Feed Verification	Option: Set Verify meter location and cycles of concentration method	7.

Notes

1. Best tool to find out what's happening with your control. Very useful with special controls.
2. View current settings & Modify. Select Variable Cycles & Feed Verification (optional).
3. Clear Alarms ends Priming, Biocide Events & Lockouts. Zeroes time owed.
5. Event Cycle may be set to 1,7 or 28 days for each relay.
7. Set the A..Z locations used for ppm and tank inventory logging.

1.2.1 Setpoints

Select Controls **Activity = Configure**



Displays current Settings. Modify and Submit

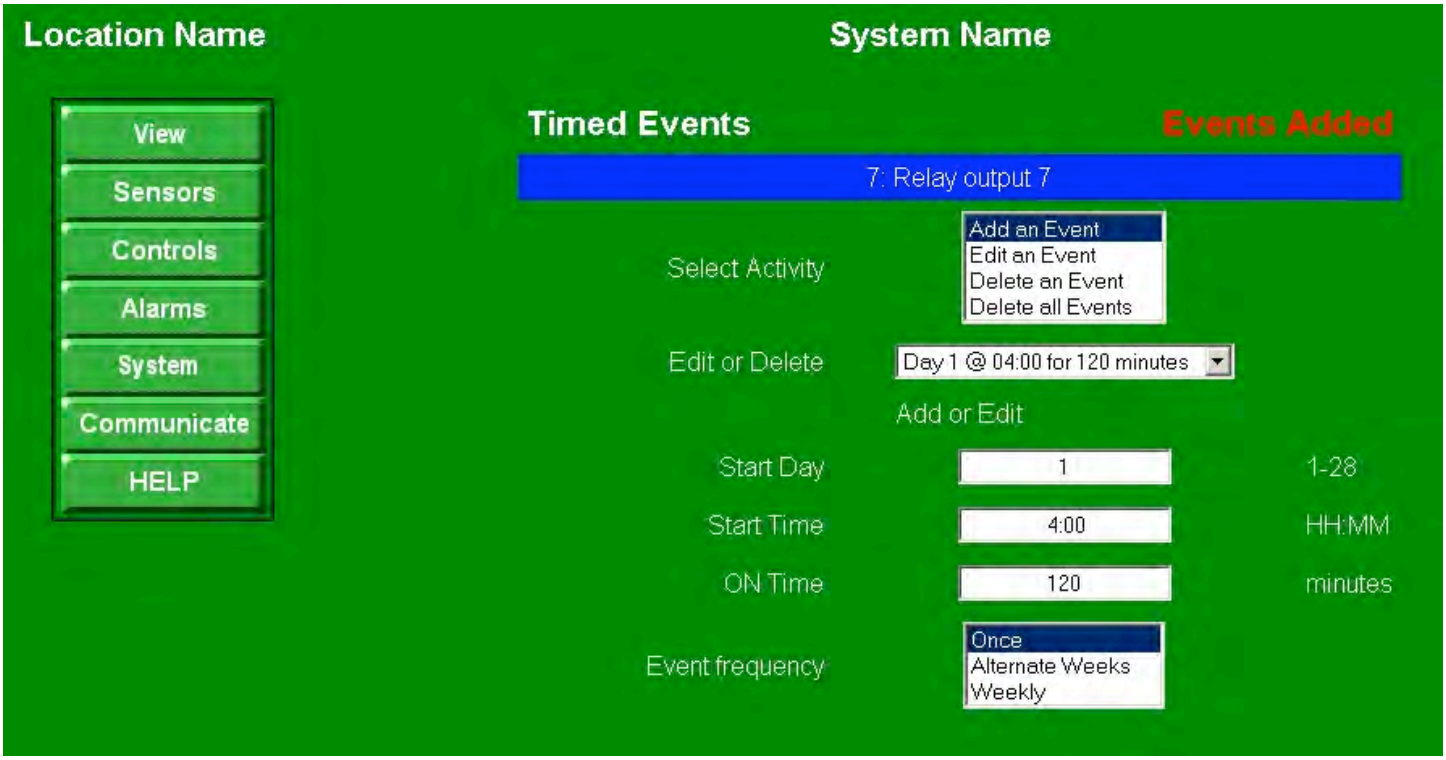
Field	Function	Notes
Control by:	Letter(s) of sensor(s) controlling the relay. Example: watermeter 'O'	1.
Measure volume	Every 100 gallons measured on water meter 'O'	2.
Then turn ON for	Turns ON the Inhibitor Feed pump for 20 seconds.	3.
Interlocked by	Flowswitch or Contact set(s), must be closed for Relay to turn ON	4.
Blocking Relays	This relay will NOT turn ON when the blocking relay is ON	5.
Feed Verify	Optional ppm, fail-to-feed & tank level services turned ON	

Notes

1. Setpoints vary with controlling sensor type. Control equations combine more than one sensor.
2. Analog sensors, A..N, show Turn ON setpoint in place of Measure Volume.
3. Analog sensors show Turn OFF setpoint. ON time accumulates while volume increases.
4. Interlocks may be ANDed or OR'd in more complex control schemes.
5. This example prevents inhibitor from pumping down the drain when the bleed is ON.

1.2.2 Timed Events

Select Controls **Activity = Timed Events**



Pull down displays current Timed Events. Modify and Submit

Field	Function	Notes
Select Activity	Options limited to 'Add an Event', if no events exist.	
Edit or Delete	1-28 events may be set on each relay 1..10.	
Start Day	Day 1 is Sunday for 28 and 7 Day Event Cycles.	3.
Start Time	24 Hour clock from 00:00 to 23:59.	
ON Time	Pump run time from 1 to 1440 minutes. 1440 minutes = 1 day.	
Event frequency	Frequency options vary with Event Cycle: 1,7 or 28 Days.	

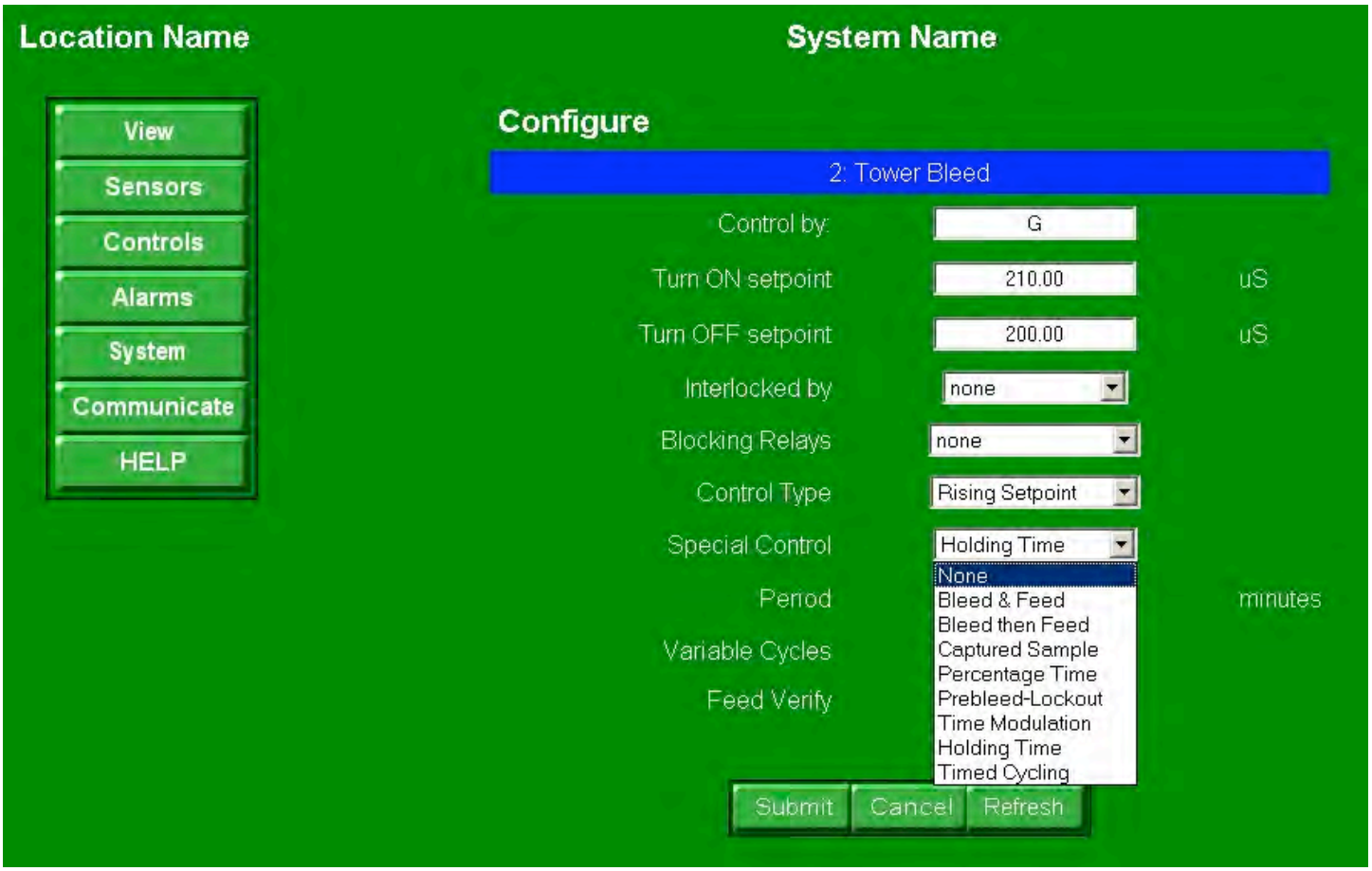
Notes

3. One day event cycles are always Day 1.

The **Red 'Events Added' Message** above the **Blue** header, confirms a previous activity or advises you of problems.

1.2.3 Special Controls

Select Controls **Activity = Configure**

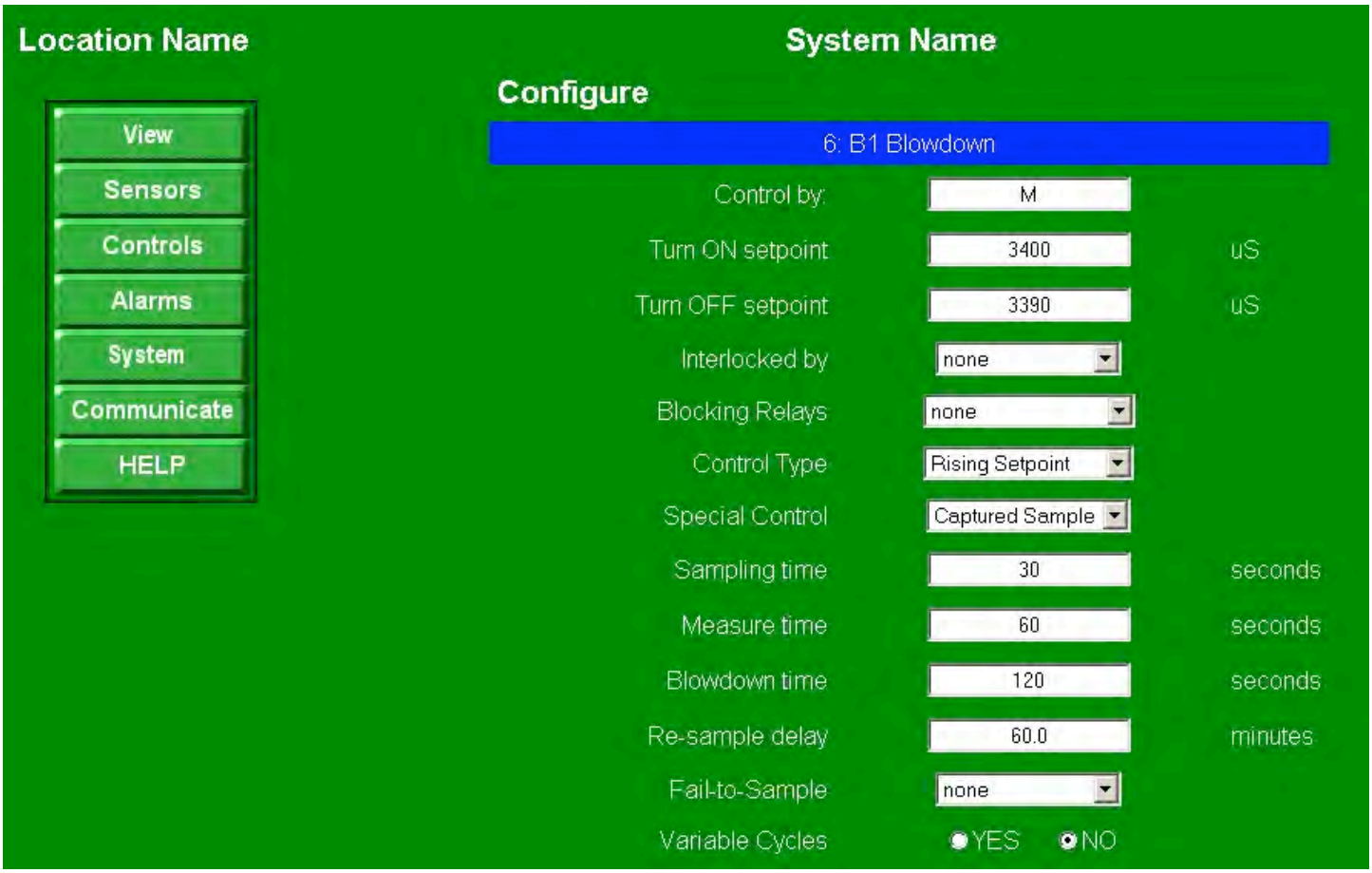


Pull down displays special control options. Select and Submit

Control	Function
Bleed & Feed	Select Bleed Solenoid Relay and % of Feed time in every 300 seconds of Bleed
Bleed then Feed	Select Bleed Solenoid Relay and % of Feed time after Bleed ends.
Captured Sample	Boiler blowdown option – refer to 1.2.4
Percentage Time	Set % of ON time every 300 seconds. Stops accumulating on an open interlock.
Prebleed-Lockout	Select Bleed Solenoid, Prebleed time & conductivity, Lockout after Prebleed
Time Modulation	Set period. ON time decreases as the Turn OFF setpoint is approached.
Holding Time	Controlling sensor value is averaged over user set period.
Timed Cycling	Feed for user set time then wait period. Used in slow-to-respond processes.

1.2.4 Boiler Blowdown Timing

Select Controls **Activity = Configure**



Displays current Captured Sample timing. Modify and Submit

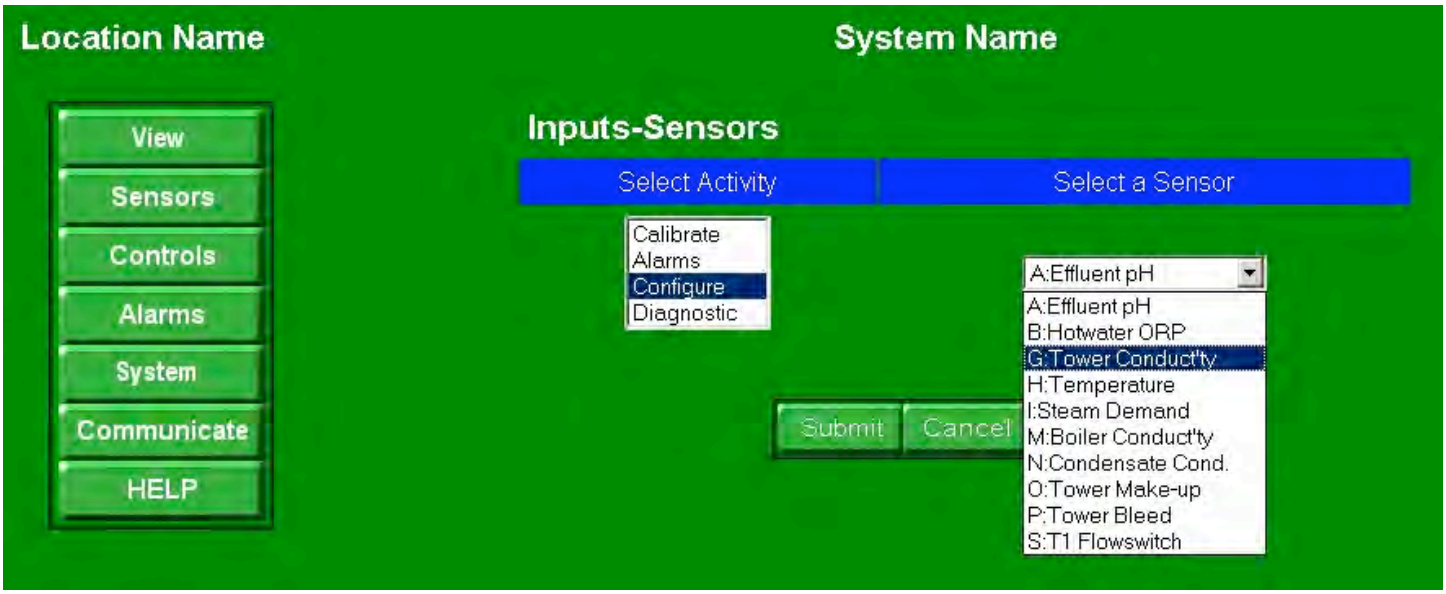
Field	Function	Notes
Sampling Time	Blowdown valve ON to acquire new sample at conductivity sensor.	1.
Measure Time	Valve OFF. Control decision made only at end of Measure.	2.
Blowdown Time	Valve ON if conductivity > Setpoint at end of Measure.	
Re-sample delay	Valve OFF if conductivity < Setpoint at end of Measure.	
Fail-to-Sample	Optional thermal switch at conductivity sensor	

Notes

1. Conductivity sensor installed on surface blowdown line, upstream of blowdown valve.
2. Measure-Blowdown sequence repeats until conductivity below setpoint.

1.3 Sensors Services

Select **Sensors**



Select an Activity and a Sensor from the pull down and **Submit**

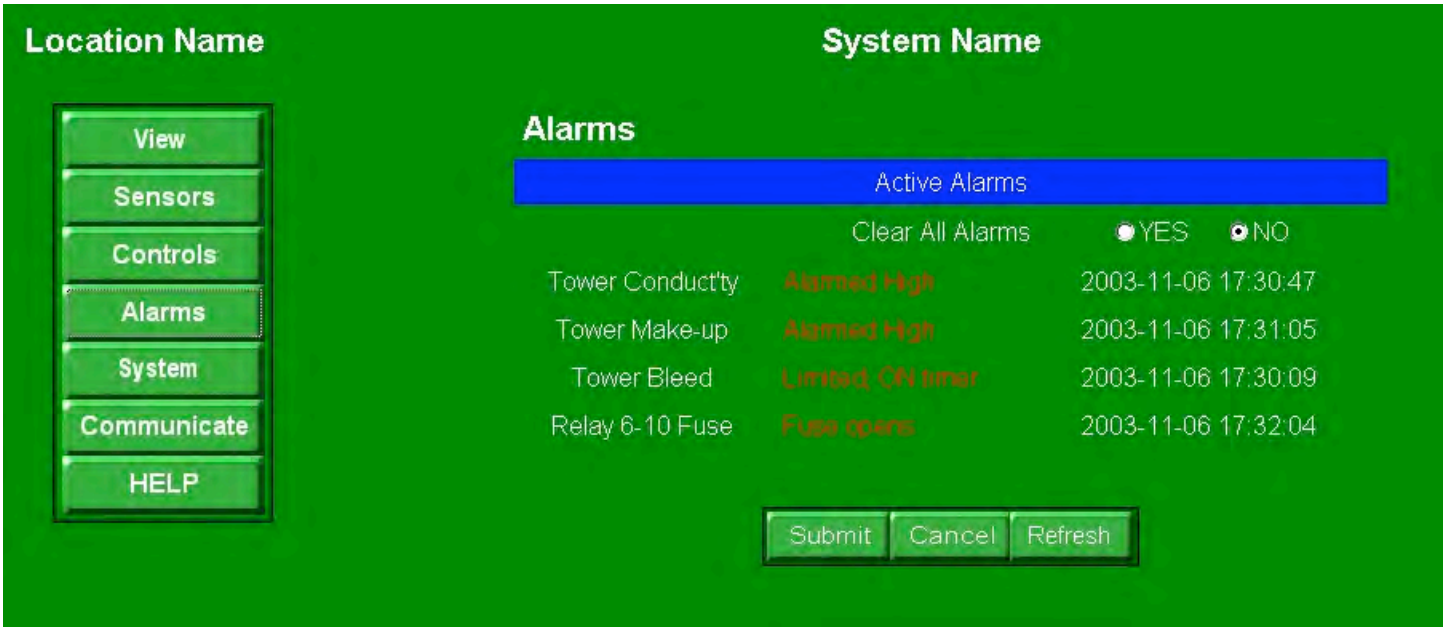
Activity	Activity Services	Notes
Calibrate	Single point for A..N., Key Value for Manual Entry, Reset to Factory	1.
Alarms	Set & View High & Low Alarm & Action On Alarm	2.
Configure	Naming, units, resolution, compensation type, log period, disable input	3.
Diagnostic	State, driver type, log stats, current & default OFFSETs & GAINs.	4.

Notes

1. Calibration method varies with sensor type. 4-20mA inputs are 2 point calibration.
2. Analog sensors A..N include 'Delay on Alarm' to suppress transients. Contact set alarms have both ON Time and a No Flow Alarm that trips on OFF time. Action on Alarm may set Alarm Relay and/or Dial-out on modem equipped controllers
3. View and/or modify. Add and/or modify Thermal, Manual and Rate-to-Volume compensation. Verify Corrosion Rate, Calculated (ppm) and Inventory type compensation.
4. Displays sensor mV levels, driver card ID levels, current compensation type

1.4 Alarms

Select **Alarms**



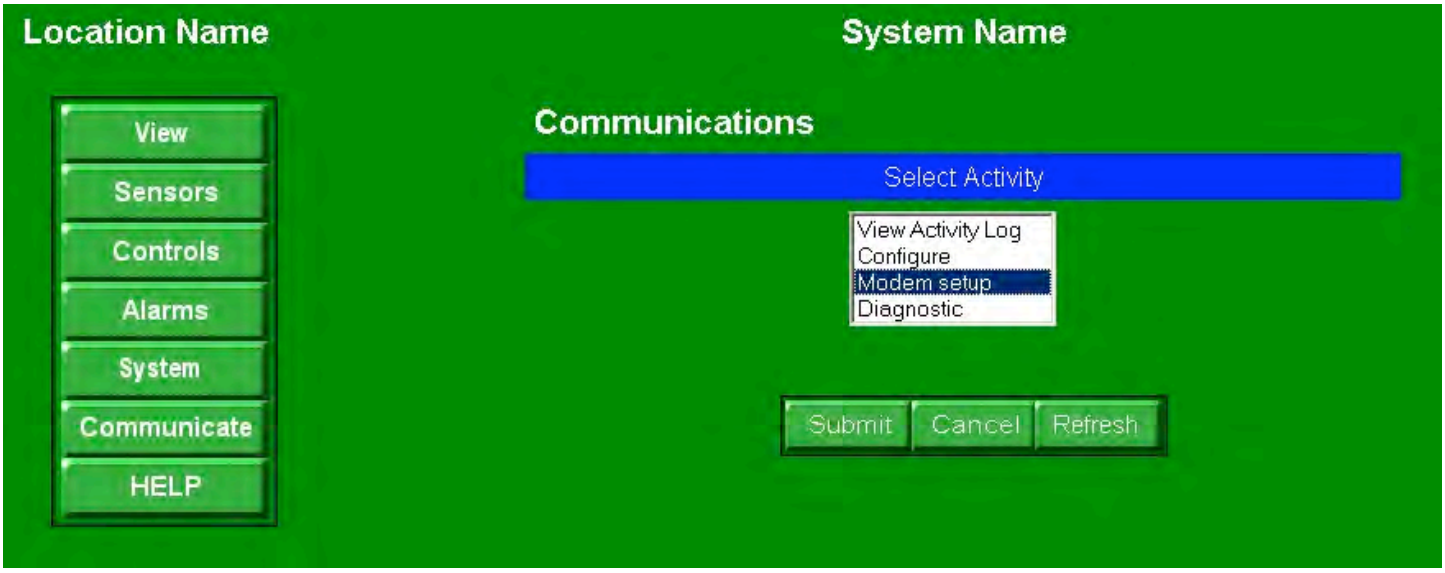
To clear all active alarms, select YES and **Submit**

Each active alarm has a Name, Cause and Date & Time tripped.

Alarm	Type & Detail
Tower Conductivity	Analog Sensors A..N. High or Low alarm trips after user set delay, which blocks transient alarms
Tower Make-up	Digital Inputs – Water Meters, Contact Sets O..Z Meters have both high volume alarm and low volume checked at midnight. Contact sets have both time closed and time open (no flow) alarms.
Tower Bleed	Control Relays 1…10 Feed Limit alarms on Time/Actuation and Time/Day. User set Action on Alarm, turns Relay OFF or Ignores.
Relay 6-10 Fuse	System Level Alarms Trips on fuse failures. Trips on Configuration, A/D & power supply faults.

1.5 Communicate

Select **Communicate**



Select an Activity and **Submit**

Activity	Activity Services	Notes
View Activity Log	Log of hardware changes, control modifications	
Configure	View-Modify IP, Netmask, Gateway, HTML & Telnet Ports. View MAC	2.
Modem Setup	Set up to 4 dial-out phone numbers, set pager message & pager delay	
Diagnostic	Force dial-out, Carrier detect state, Mirror LCD. View refresh time	4.

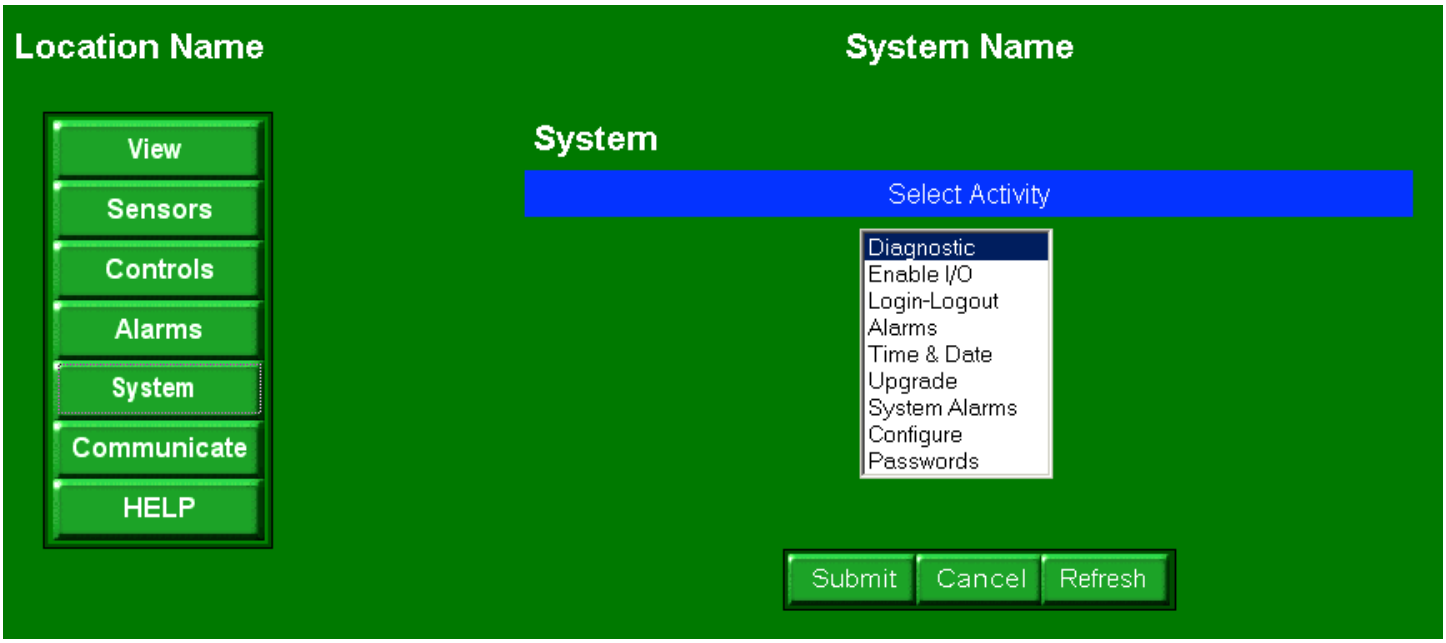
Notes

1. Requires Admin password. Includes modem ringcount and initialization.
   View-modify controller location timezone with respect to GMT:
   PACIFIC = –8, MOUNTAIN= –7, CENTRAL= –6, EASTERN= –5.

4. Display the User view of the controller four line LCD character display.
   Includes Parser mirror for encoded URL & telnet API developers.

1.6 System Services

Select 



Select a system service and 

Selection	Services	Notes
Diagnostic	Fuse, power supply status, S/N, Firmware version, AC current, Options	
Enable I/O	Select from lists of disabled Inputs A..Z & Outputs 1..10, C1..C8	
Login-Logout	Logout Sets user to 'Public', Displays current user & userid set.	3
Alarms	Clear all alarms, Active Alarm table with cause & date, time tripped	
Time & Date	Modify Date, Time & day of week.	
Upgrade	Enter code to reset passwords and/or add Ethernet & FV options.	
System Alarms	Select Alarm Relay & Dial-out options for each system level alarm.	
Configure	Metric units, Keypad password switch, Load & Save Configuration.	8
Passwords	Changes password for current user, case sensitive.	9

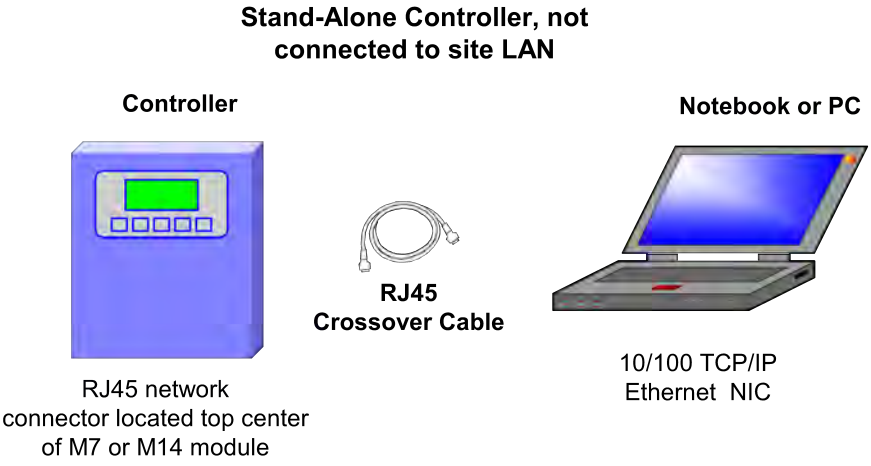
Notes

3. Browser will auto-logout after 30 minutes of no user activity
8. Admin password required
9. Keypad userid passwords are limited to A..Z caps & 0..9.

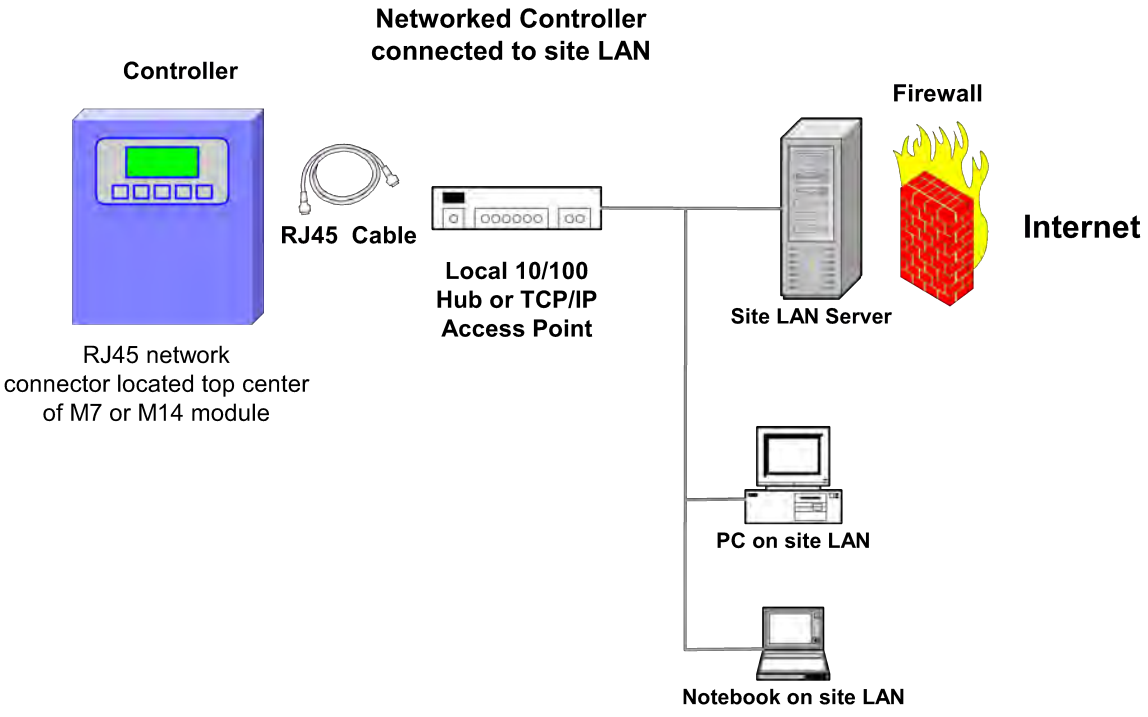
2.1 LAN Communications

Controllers not connected to a network may be browsed using a crossover cable and a notebook's or local PC's browser

Refer to Section 3.1 for detail on notebook browser set-up.



Controllers use a static IP address to communicate using TCP/IP 10 base T.
Site IT provides LAN IP addresses and they may also wish to modify the ports used for HTML (default 80) and Telnet (default 23) . They may also require the controller MAC.
Key ENTER @ System and DOWN to 'LAN Setup' to view & modify IP, Netmask & Gateway.
MAC, HTML & Telnet ports are view only. Ports can be modified using a browser connection.



CAUTION: Exercise caution in making the controller Internet accessible. At a minimum, modify the factory default passwords for Admin and Users 1-7, before making a controller Internet accessible.

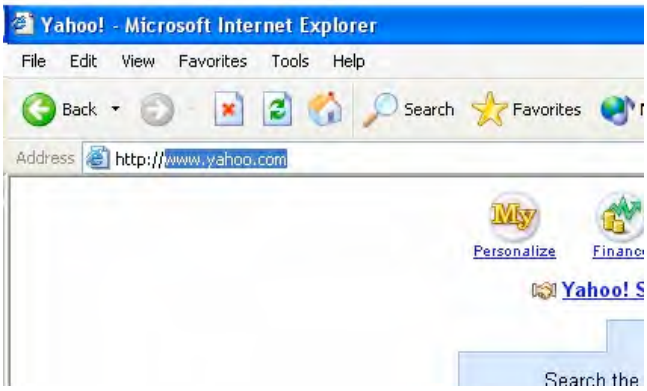
2.2 Browse

Open your browser.

Most users will select the Internet Explorer icon on their PCs or notebook's desktop.

Your browser will connect or try to connect you to your Home page.

In this example YAHOO is the Home page. Your Home page may differ.



Edit the address line of your browser, inserting the controller IP address and keying ENTER

In this example the IP address is 10.10.6.106.

If you do not know the address of your controller, refer to section 2.3 View –Modify IP Address.

If you've previously connected to the controller, the browser will supply likely addresses as you type.

If the controller browser port has been changed from the default Port 80, you'll need to add **:Port#** to the controller address.

In this example, the port has been changed to 5080

NOTEBOOK – CROSSOVER CABLE USERS
If you are at the controller, you'll see the green LINK light ON when the crossover cable is connected & your notebook is ON

The yellow ACTIVE light will flicker as the controller serves up the initial View display.
If you don't connect, refer to Appendix, App. Note AN_T004.

2.3 View-Modify IP Address 1 of 2

Key ENTER at System:

WARNING: Only site IT staff can assign IP Addresses, Netmasks & Gateways

```
System:2003-11-06 ↵
S/N: M0386034
Alarms:  16:38:11 ↑
D G 2 Sys
```

↵

```
System:
Configure          ↑
Time & Date
LAN Setup          ↵
```

Key DOWN to LAN Setup and key ENTER

↓ **then** ↵

Key DOWN to view the LAN parameters

```
System:
LAN Setup.....
IP Address
10.10.6.106        ↵↓
```

Current Address is 10.10.6.106
Key ENTER to modify
Example on Page 2

↓

```
System:
LAN Setup.....
Netmask
255.255.255.0      ↵↕
```

Current Netmask is 255.255.255.0
Key ENTER to modify

↓

```
System:
LAN Setup.....
Gateway
10.10.6.19         ↵↕
```

Current Gateway is 10.10.6.19
Key ENTER to modify

↓

```
System:
LAN Setup.....
Browser-HTML Port
        80         ↕
```

Browser port is Default, Port 80
Browser connect to modify

↓ **Continued on Page 2**

2.3 View-Modify IP Address 2 of 2

Telnet port is Default, Port 23
Browser connect to modify

```
System:
LAN Setup.....
Telnet Port
        23
```

↓

```
System:
LAN Setup.....
MAC Address
00:90:c2:c1:8c:42
```

MAC Address may be required by network admin.
View only.

EXIT to return to System: display.

(⊘) or ↑

Modifying the IP Address

WARNING: Only site IT staff can assign IP Addresses

```
System:
LAN Setup.....
IP Address
10.10.6.106      ↵↓
```

Key ENTER to modify IP Address

↵

```
System:
IP Address.....
168.013.031.106  ↕→
↵ Executes  ⓪ Exits
```

Key UP DOWN to change each of the four address numbers

then key RIGHT, to edit the next number

Key ENTER to modify or EXIT to leave IP unchanged

↓ ↑ → then ↵

```
System:
LAN Setup.....
IP Address
168.013.031.106  ↵↓
```

ENTER or EXIT displays current IP address

3.1 Browsing a non-LAN Controller 1 of 3

1. Overview – Application Note AN_T004

'Crossover' cables are used to browse the controller when the controller is not connected to the site Ethernet LAN. They are widely available. Comp USA is a typical vendor.

If the controller were connected to the site LAN, you'd browse it from one of the PCs on the LAN.

Connecting to a controller using a 'crossover' cable requires that the notebook and the controller be on the same subnet. This application note details set-up verification.

2. NETMASK & IP Internet Protocol Addresses

Assuming that the controller NETMASK is the default 255.255.255.0.
The first three numbers of the controller and the notebook IP addresses must be the same.

For example; if the controller IP = 10.10.6.106 (default) the notebook IP could be 10.10.6.100.
If any of the first three numbers don't match, you won't be able to use a crossover cable to browse the controller.

3. Finding & Editing the controller's IP

Key ENTER at **System:** 2003-04-10 (Today's date)
Key DOWN to **LAN Setup** & key ENTER.
Displays the default controller IP = 10.10.6.106

If you wish to edit the controller IP, Key ENTER.
Warning:
Do not change the IP, Netmask or Gateway of any controller connected to a local LAN.
The system administrator will have assigned these numbers.

4. Verify the controller's Browser Port#

Key ENTER at **System:** (Today's Date)
Key DOWN to **LAN Setup** & key ENTER.
Key DOWN to Browser-HTML Port.

If the Port = 80 (default), ignore. It's also your browser's default Port#.
If not 80, note the Port#, you'll need to add it to your IP. Refer to step 6.

5. Finding your Notebook's IP

WINDOWS XP

Select **Start -> Control Panel -> Network Connections -> NetworkBridge**

Double click: **NetworkBridge,**
Select: **General -> Properties -> Internet Protocol (TCP-IP) -> Properties -> Alternate Configuration**
Check: **User Configured**

Assuming that the **User Configured** fields are blank. Set the IP address = **10.10.6.100,** assuming that the controller IP address (See Section 3.) is **10.10.6.106.** Set the Subnet mask **= 255.255.255.0** & select **OK.**

Any pair of Notebook & Controller IPs will work if:
1. The first three numbers are the same
2. The last numbers are never '0' or '255'

WINDOWS 98 & ME

Select: **Start -> Settings -> Control Panel -> Network**

You may have several options under **Network**, Select the **TCP-IP** option which is NOT dial-up. & then select IP Address (This tab is usually the default)

Option 1. *'Obtain an IP Address Automatically'* **is Checked**
If you connect your notebook to your company's LAN, you'll likely have *'Obtain an IP Address Automatically'* checked. Select '*Specify an IP Address'* , set the IP Address to 10.10.6.100 and Subnet Mask to 255.255.255.0.
Select OK, Your notebook may restart.
Note: Once you have finished browsing the controller, check *'Obtain an IP Address Automatically'* so you can log back into your corporate LAN.

Option 2. 'Specify an IP Address' **is Checked**
Use the controller keypad (See Section 3.) to set the controller the IP where the first 3 numbers match the notebook IP and the third number is any number but '0' or '255'
For example: If you notebook is 12.135.120.58, make the controller 12.135.120.68

Warning:
Do not change the IP, Netmask or Gateway of any controller connected to a local LAN. The system administrator will have assigned these numbers.

6. Browsing the Controller

1. Connect a crossover cable to your notebook's RJ45 Ethernet network jack and the controller's RJ45 network jack located in the center, front of the top controller circuit board.

2. The green **LNK**, link light will turn ON beside the controller jack, indicating you have a connection.

3. Double click on the Internet Explorer desktop icon and enter 10.10.6.106, or the current controller IP in the browser **Address** line & key ENTER.

4. If your controller's Browser-HTML Port is NOT 80, add **:Port#** to the IP. For example, if the controller Browser-HTML Port = 5080, the browser Address line would be 10.10.6.106:5080.

5. The yellow **ACT**, active light on the controller will flicker as the controller serves the VIEW home page.

6. If the yellow ACT light does not turn ON, there is an error in setup, IP address or port#.
   If the green **LNK** light is not ON, it's likely that you are not using a crossover cable.

3.2 Technical Support 1 of 2

Aquatrac Phone Support
800-909-9283
909-476-2333

On-Line Help
Internet HELP is linked in real time by browser users with internet accessible controllers.

Keypad User Manual
Download **M714_user** from www.aquatrac.com
A copy of M714_user is shipped with each controller.

Controller – Sensor Set
The installation instructions for specific controllers are detailed in the M714_user manual shipped with the controller in the HELP section YELLOW pages.

Controller Technical Manual
Download **M714_tech** from www.aquatrac.com

Upgrade Kits
Controls can be added to installed controllers.
Upgrade kits include sensor(s), entry fitting(s), driver card and installation instructions.

Fusing

Protects	Rating / Type	Manufacturer – Vendor
Power Relays Fuse 1-5 & Fuse 6-10	6.3 Amps @ 120VAC 3.15 Amps @ 250VAC 5mm x 20mm, Fast Acting	Littlelfuse, Type 217, 250VAC Digikey Part# F953-ND Digikey Part# F950-ND www.digikey.com 1-800-344-4539
Controller – Modem Control Fuse	1 Amp @ 120VAC ½ Amp @ 250VAC	Cooper Bussmann, PC-TRON, PCC Series, 250VAC Digikey Part# 283-2118-ND Digikey Part# 283-2120-ND www.digikey.com 1-800-344-4539

Controller Parts

Part#	Description
Fuses-M	120VAC Fuse Kit, 20 x 6.3A Relay Fuses, 4 x 1 Amp control fuses
Cable-Xover	Crossover cable, Controller RJ45 to Notebook NIC
Mod-LCD4	Replacement 4x20 LCD Display
Mod-M3000	Micro controller module
Mod-M7	Seven analog, Six digital input module
Mod-M14	Fourteen analog, Twelve digital input module
Mod-PR5	Five power relay, power module
Mod-PR10	Ten power relay, power module
Modem	Modem, serial cable & power cube
PBOX4	120VAC Four Plug box, flex conduit & fittings, pre-wired
PBOX2	120VAC Two Plug box, flex conduit & fittings, pre-wired
H-SEN6	Sensor entry gland, six cable seal