HYDRO-GUARD®

a **MUELLER** brand

1200 Series S.M.A.R.T. Flushing System

⚠ **WARNING:**

1. Each person involved in the assembly, installation and/or maintenance of the Hydro-Guard Automatic Flushing Device must read this manual carefully and follow all instructions prior to performing any installation or maintenance procedures involving the Unit.

2. Verify the drainage path prior to installation to ensure that pedestrian and vehicular hazards will not be created by the installation and use of the Hydro-Guard Automatic Flushing Device (In areas in which freezing may occur, special attention should be given to this procedure).

3. Never assemble, disassemble, or perform Hydro-Guard maintenance unless the influent supply valve has been closed, verified and secured, and internal piping pressure has been relieved.

4. Always use all necessary safety equipment and follow all recommended procedures when installing, operating and maintaining the Hydro-Guard Automatic Flushing Device.

5. Replace worn or defective parts with OEM parts and check your battery twice a year.

6. Operate the Hydro-Guard Automatic Flushing Device only when fully installed and correctly assembled.

7. It is recommended that a pressure reducing valve be installed in front of the Hydro-Guard where pressure could exceed 120 psi.

⚠ **CAUTION:**

The recommended optimal operating pressure for a Hydro-Guard® Automatic Flushing System is between 20 psi and 120 psi. In the event pressure may exceed 120 psi it is recommended that a Pressure Regulating Valve be installed ahead of the Hydro-Guard flushing system.

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1200 SERIES S.M.A.R.T. FLUSHING SYSTEM

INTRODUCTION

This operating manual is intended to cover the operation and initial setup for the Hydro-Guard® 1200 Series S.M.A.R.T. Flushing System controller GEN 2. Please refer to electrical diagrams for all electrical connections.

CONTROLLER SETTINGS

Both the Controller and the Graphical User Interface (GUI) communicate via the Ethernet network. The following address is used when shipped at time of build.

- Address: 192.168.1.99
- Subnet : 255.255.255.000
- Default Gateway : 192.168.001.001

Record changes to IP Address in the allowed space:

IP ADDRESS CHANGES

IP Address:	Subnet:	Default Gateway:	Date of Change:	Authorized By:

To connect to the 1200 Series S.M.A.R.T. controller, set the host computer's IP address and subnet to be in the same subnet range for connection via Ethernet port. Next attach an Ethernet cable to the PC and the Ethernet port on the controller.

Connect to 1200 Series S.M.A.R.T. Flushing System Controller

· To connect to the 1200 Series S.M.A.R.T. controller, launch Internet Explorer or equivalent web browser with JAVA enabled

from a PC or MAC device and enter the controller's IP address. Note the controller address must be documented if changed to allow connection. A standard CAT 5e cable is used to make connection.

NAVIGATION SCREEN

Pressing any of the buttons will navigate to the corresponding screen

1. Operations

2. Alarms

3. Timer Flush/Level 2 access required*

4. Configuration/Level 3 access required*

5. Monitoring

6. Daily Trend – Trend graph of data in 10 second intervals

7. Monthly Trend – Trend graph of data in 5 minute intervals

8. Comms – IP address management/Level 3 access required*

9. Clock – Real time clock settings/ Level 3 access required*

10. Login – Change user level and password management

*For information regarding user access levels, see pg. 12

OPERATIONS OVERVIEW

1. Manual Flush – This selection is only active when the system is placed in the Manual Operation and not automatic. When green, the system is in the manual flushing operation.

2. Man | Auto – Selection for manual flushing or automatic flushing commands. Automatic flushing commands are those commands from scheduled operations and/or sensor operations.

3. Indicates state of the flushing valve. Red is the indication that the system is requesting the off/command close of the flushing valve. Green is the indication that the system is requesting the on/command open of the flushing valve. Note the indicator is only an indication of the request to open or close. Monitoring of the flow by way of a flow switch or combination control valve/meter are the only methods to ensure the valve is physically open or closed.

4. Trend line for on/off state of the flushing valve.

5. Indications for each of the available 10 time-based flushing programs. The check mark indicates the program is enabled. The flushing valve icon will indicate a flush is active for this program, when the icon is visible and of blue color.

6. Indicates each of the sensors are enabled and the time elapsed for the flush cycle. The flushing valve icon will indicate a flush is active for this program, when the icon is visible and blue in color.

ALARMS SCREEN

ONLINE ALARM HISTORY AND ACTIVE ALARMS

Overview

1. Shows the most recent active alarm in red. Once acknowledged it will turn yellow.

2. Table showing recent alarms.

3. Buttons to navigate pages within the web portal.

4. Acknowledge Page button. This button will acknowledge active alarms and turn from red to yellow.

5. Electrolyte and Membrane monitors. This information is used for the customer to track how long it has been since the electrolyte and membrane have been changed in the chlorine probe.

NOTE: There are also alarms to notify the user that the usable life of these parts have expired and require changing.

6. Download Alarm History - This drop down box allows the user to download all the alarm data for a given month. Once the desired month is selected, a "Download CSV" button will appear under the drop down menu.

TIMER FLUSH SCREEN

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Timer Flush

Timer Programs	
1 View Program	No Program ▽
2 Status	Enabled ▽
3 Start Day	Wednesday ▽
4 Start Hour	11 A.M. ▽
5 Start Minute	-- : 32 ▽
6 Duration Minutes	10 Minutes ▽
7 Save Program	

8

	Program #1	Program #2	Program #3	Program #4	Program #5	Program #6	Program #7	Program #8	Program #9	Program #10
	Wednesday	Tuesday	Tuesday	Friday	Saturday	Saturday	Saturday	Sunday	Sunday	Sunday
	11	11	11	23	9	19	22	2	14	19
	32	10	22	50	16	22	14	6	4	45
	10	5	87	50	217	36	83	58	55	151

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1. View Program – Pull Down selection allows selection of the program to be modified.

2. Status – This drop down menu allows the user to enable or disable flush programs.

3. Start Day – Selection of day for program to start.

4. Start Hour – Selection of hour of day for program to start.

5. Start Minute – Selection of minute of day for program to start.

6. Duration Minutes – Selection of the duration of program in minutes.

7. Save Program – Save Program changes to the controller. Failure to save changes will result in no modifications to selected program.

8. This area shows all of the pre-programmed flushes for the unit. This area will remain blank until timed flushes have been programmed into the unit.

MONITOR SCREEN/LEVEL 2 ACCESS REQUIRED
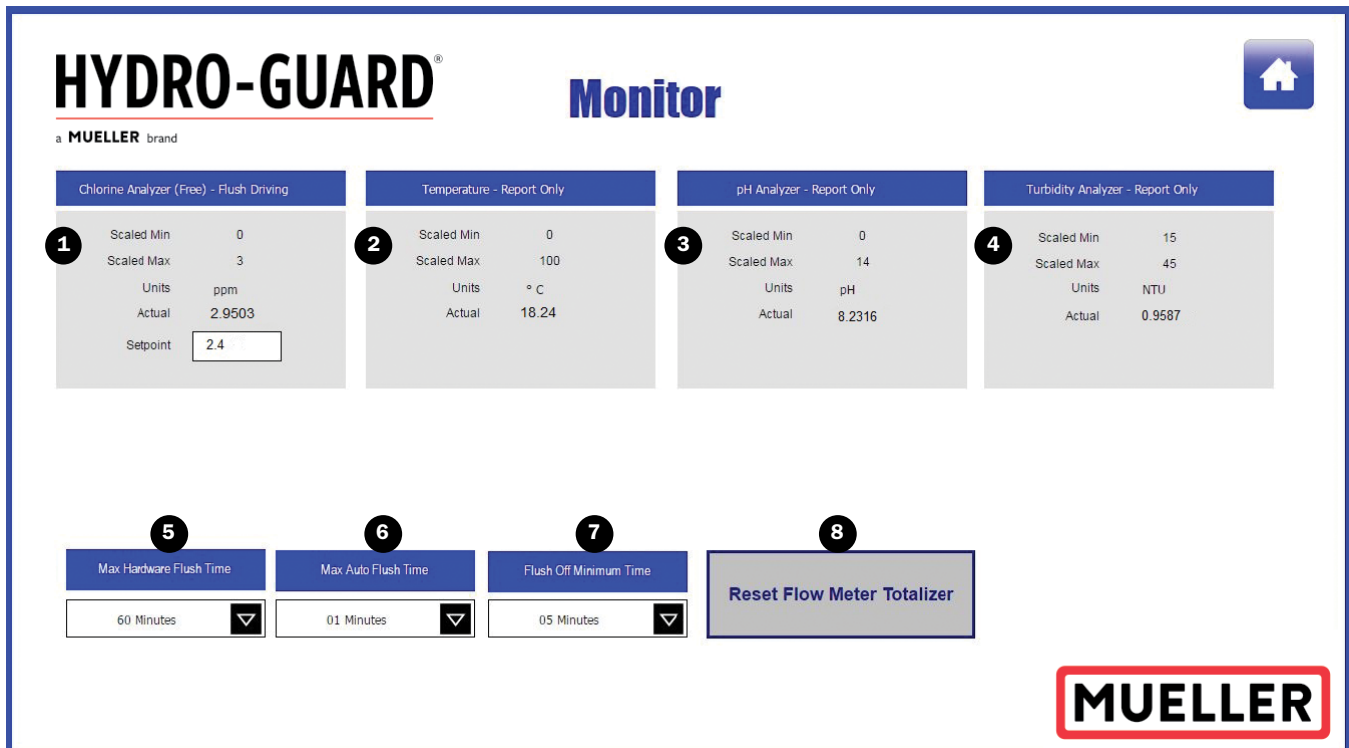
1. Displays the analog sensor setup on channel 1 in the "Config" screen. (See Page 8). Note that the sensor is a free chlorine sensor and is set to "Flush Driving"; therefore the "SetPoint" field is visible and the user can set when the unit will flush based on the user specified value.

2. Sensors that are configured as report only will not display the set point entry field.

3. No display will be shown if the available input is not configured. Only the active configured sensors will have a display available.

4. In the above image all the channels have been configured so there is no blank area.

5. Max Hardware Flush Time is an entry for the maximum flush time when manual flush has been commanded. If the manual flush has an elapsed time greater than the set maximum the system will disable the manual flush and display

warning on the Operations Overview screen. Removing the hardware flush command will reset this warning and allow elapsed time to be reset.

6. Max Auto Flush Time is an entry for maximum flush time when an automatic flush has been commanded by any one of the configured sensors. If the automatic flush has an elapsed time greater than the set maximum the system will disable the automatic flush and display warning and reset on the Operations Overview screen.

7. Flush Off Minimum Time is an entry for the minimum time the flushing valve must remain off directly following a flushing command. If multiple sensors or a single sensor are commanding a flush to occur the elapsed flushing time is monitored, when this elapsed time is greater than the maximum auto flush time the system will command the flushing valve to close and the flush minimum time off must elapse before another

flushing command can be issued.

8. Reset Flow Meter Totalizer will command the totalization value to be set to zero. (This command is only active when one of the available digital inputs is configured for a flow meter).

CONFIG SCREEN/LEVEL 3 ACCESS REQUIRED

1. There are four analog input channels of the 4 - 20 mA type signal available for configuration on the 1200 Series S.M.A.R.T. controller. Channels can be configured to allow for flush driving or report only

    a. Type of sensors available

        i. No Sensor Connected

        ii. Chlorine Analyzer (Free) - Report Only

        iii. Chlorine Analyzer (Total) - Report Only

        iv. pH Analyzer - Report Only

        v. Temperature - Report Only

        vi. Turbidity Analyzer - Report Only

        vii. Chlorine Analyzer (Free) - Flush Driving

        viii. Chlorine Analyzer (Total) - Flush Driving

        ix. Temperature - Flush Driving

        x. Turbidity Analyzer - Flush Driving

b. Scale Min and Scale Max are numeric entries to allow the sensor configuration to be scaled to the proper units. Scaling is a linear scaling across the 4 - 20 mA signal input.

c. Units can be selected from the available unit list. The units will be displayed on the 1200 Series S.M.A.R.T. flushing system screen for the configured sensor.

    i. pH

    ii. °F

    iii. °C

    iv. NTU

    v. FNU

    vi. ppm

d. Dead band is a numeric entry that sets the hysteresis in which the sensor is to operate the flushing valve. The set point is entered on the 1200 Series S.M.A.R.T. screen for the configured sensor. This

is to keep the system from switching on and off rapidly when the specified reading is near the set point.

e. Control is how the sensor is to be monitored and control of the flushing.

    i. Flush on High – for sensors configured flush on high the active scaled sensor value is monitored, upon reaching the set point (value from Operations page for said configured sensor) the system will command a flush and remain in flush until the sensor scaled value fall to the (set point value – ½ dead band value).

    ii. Flush on Low – for sensors configured flush on low the active scaled sensor value is monitored, upon reaching the set point (value from 1200 Series S.M.A.R.T. page for said configured sensor)

the system will command a flush and remain in flush until the sensor scaled value fall to the (set point value + ½ dead band value).

iii. Flush on Window – for sensors configured flush on window the active scaled sensor value is monitored, if value falls below the set point (value from 1200 Series S.M.A.R.T. page for said configured sensor) – ½ dead band the sensor will command flush until sensor scaled value is greater than set point or auto max flush time has elapsed. If the value rises above set point + ½ dead band the sensor will command a flush until sensor scaled value is less than the set point value or auto max flush time elapsed.

2. Configured discrete inputs

    a. No Sensor Connected

    b. Flow Switch

    c. Flow Meter

    d. Tamper Switch

    e. Hardware Manual Flush

3. *****ANY CHANGE TO THE CONFIGURATION DROP DOWN MENUS WILL RESULT IN A LOSS OF DATA FOR THE ACTIVE DAY AS WELL AS THE ACTIVE MONTH. BACKUP ALL RELEVANT DATA BEFORE ANY CHANGE IS MADE IN THE CONFIG SCREEN. ***

CLOCK SETTINGS
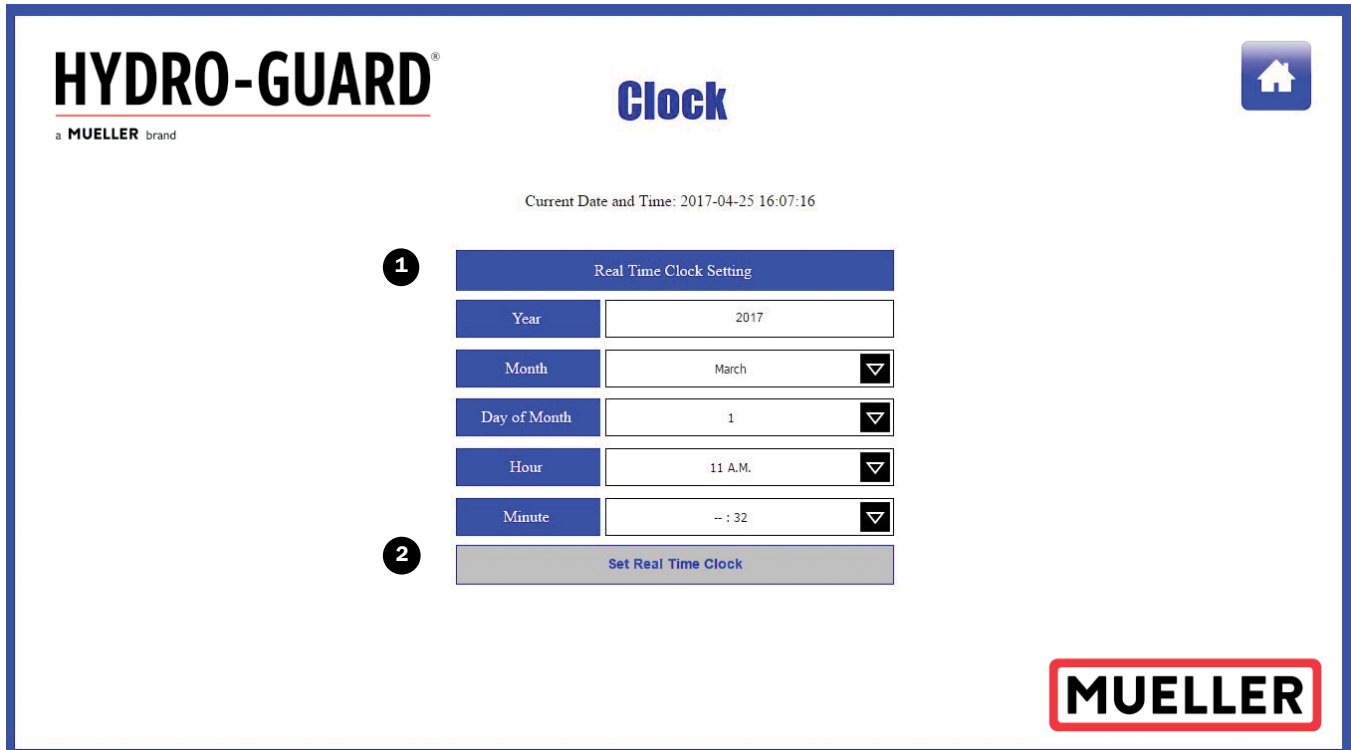
⚠ USE CAUTION WHEN SETTING REAL TIME CLOCK VALUES. Real time clock values are used for all alarm logs, trend logs, and programmed time controlled flush commands.

1. Setting the time

    a. Year is entered as eg. 2021. Must have all 4 numeric characters.

    b. Month is a selection from pull down and shall be set to the current month at time of clock setting.

    c. Day of month is a numeric entry for the day of the month 1 - 31. Must be entered as the correct day of month.

    d. Hour is a selection from pull down and shall be set to the hour of day.

    e. Minute is a selection from pull down and shall be set to the minute of the hour.

2. Set Real Time Clock commands the internal RTC of the controller to be set to the values entered into the selection menus. This setting will take effect on all alarm logs, trend logs and programmed time flushes immediately upon completion.

3. Real Time clock can retain its value up to 10 full days with no power to system after the capacitor has been fully charged after power on. This prevents the loss of retained memory and settings on brief power outages.

COMMUNICATIONS/LEVEL 3 ACCESS REQUIRED
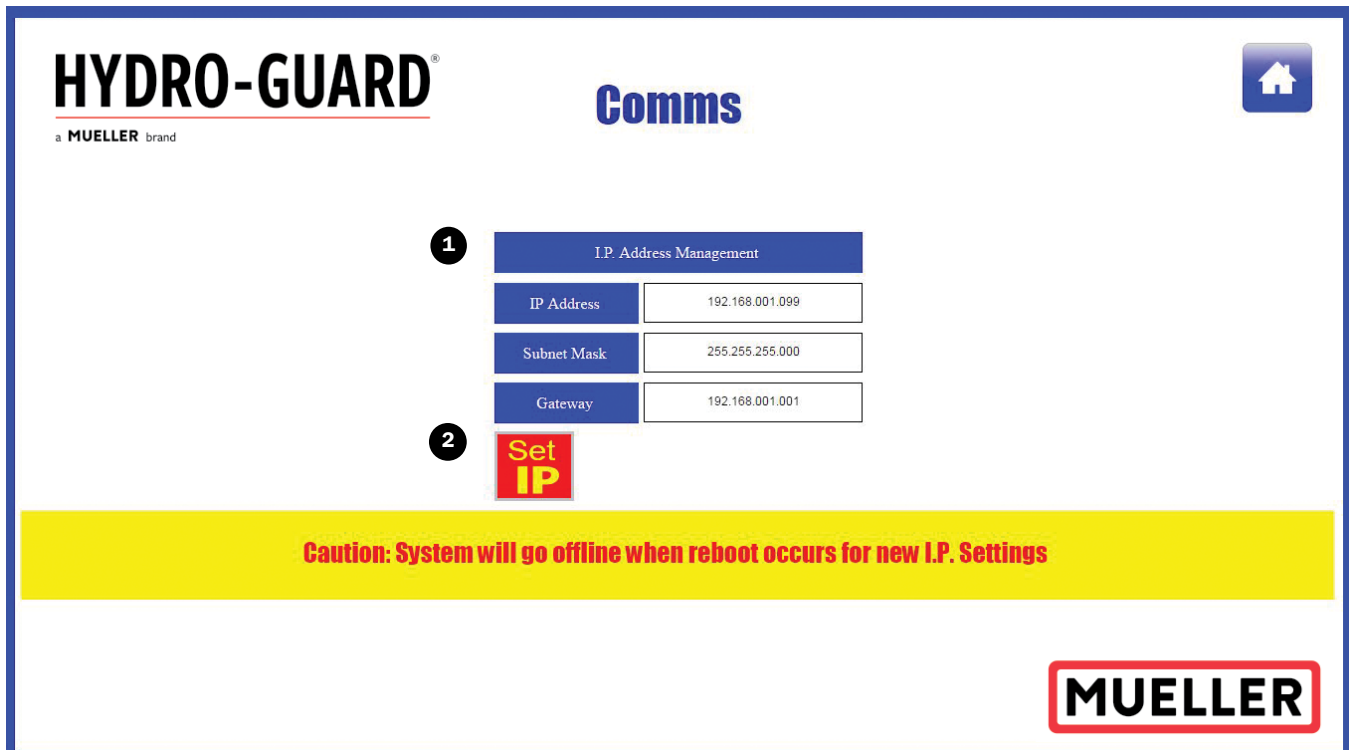
⚠ **USE CAUTION WHEN SETTING IP ADDRESS. Failure to enter values correctly may result in the loss of connection to the controller and SCADA values from being processed.**

1. IP Address can be configured and changed from the GUI. The values must be entered in the exact format for system communications to remain operative. All changes to these settings should promptly be recorded.

    a. IP Address MUST be entered with this configuration xxx.xxx.xxx.xxx eg. 192.168.1.99

    b. Subnet Mask MUST be entered with this configuration xxx.xxx.xxx.xxx eg. 255.255.255.000

    c. Gateway MUST be entered on the same subnet as the IP Address with this configuration xxx.xxx.xxx.xxx eg. 192.168.001.001

2. Set IP will command a system IP Address set. The system will temporarily go offline and the system will require a reboot. During the reboot the user must unplug all network connections to the controller after the power has been shut down. Then the user must power the unit back on and let the controller initialize with no network connection. Finally the user can plugin the customer Ethernet cable and access the unit from the new IP address. No operations will be performed during the system reset and all communications will be temporarily halted.You will be required to connect to the controller via the set IP address upon the reboot completion. All Scada systems will be required to connect to the newly set IP Address. See Quickstart guide regarding the change of IP address.

LOGIN
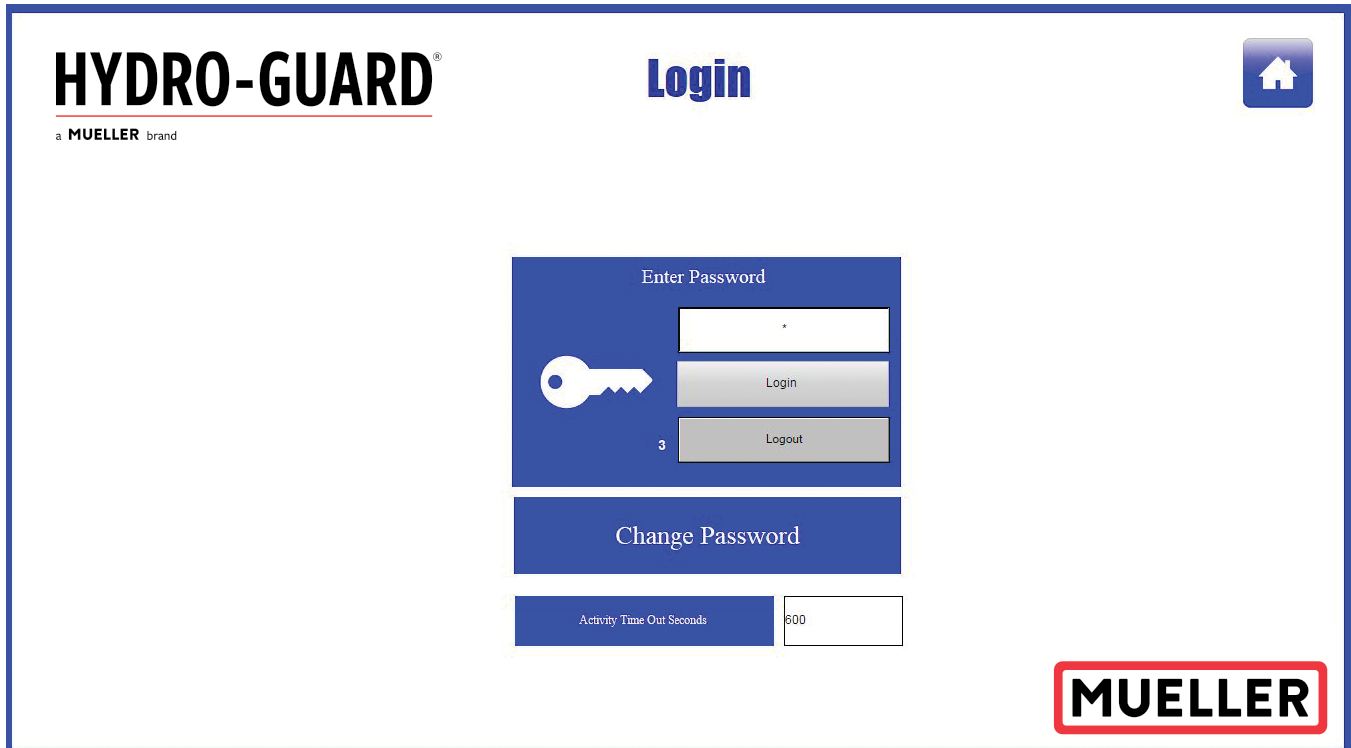
The system has 3 levels of user access. User level 1 is default on power up.

LEVELS OF ACCESS

Level 1 – Access to the Operations, Alarms, Trends, and Monitor screens for monitoring purposes.

Level 2 – Access to all Level 1 and timed flush Settings.

Level 3 – Access to all Level 1 and 2 and System Configurations.

PASSWORDS:

Level 1 Password is defaulted at a value of "1".

Level 2 Password is defaulted at a value of "2".

Level 3 Password is defaulted at a value of "3".

Passwords can be changed and saved by users in the respective access level as well as lower levels. (Level 1 can only change Level 1;

Level 2 users can change levels 2 and 1; Level 3 users can change all passwords) All passwords are retentive stored values. Retained values have the same properties of the RTC. If the RTC battery is dissipated all retained values are lost and system will boot with the defaulted values listed above.

To change password use the Change Password selection to change. You will be redirected to the change passwords page. Activity Time Out Seconds is the setting in which the current logged in user will be logged out after said minutes of inactivity have elapsed.

PASSWORD MANAGEMENT
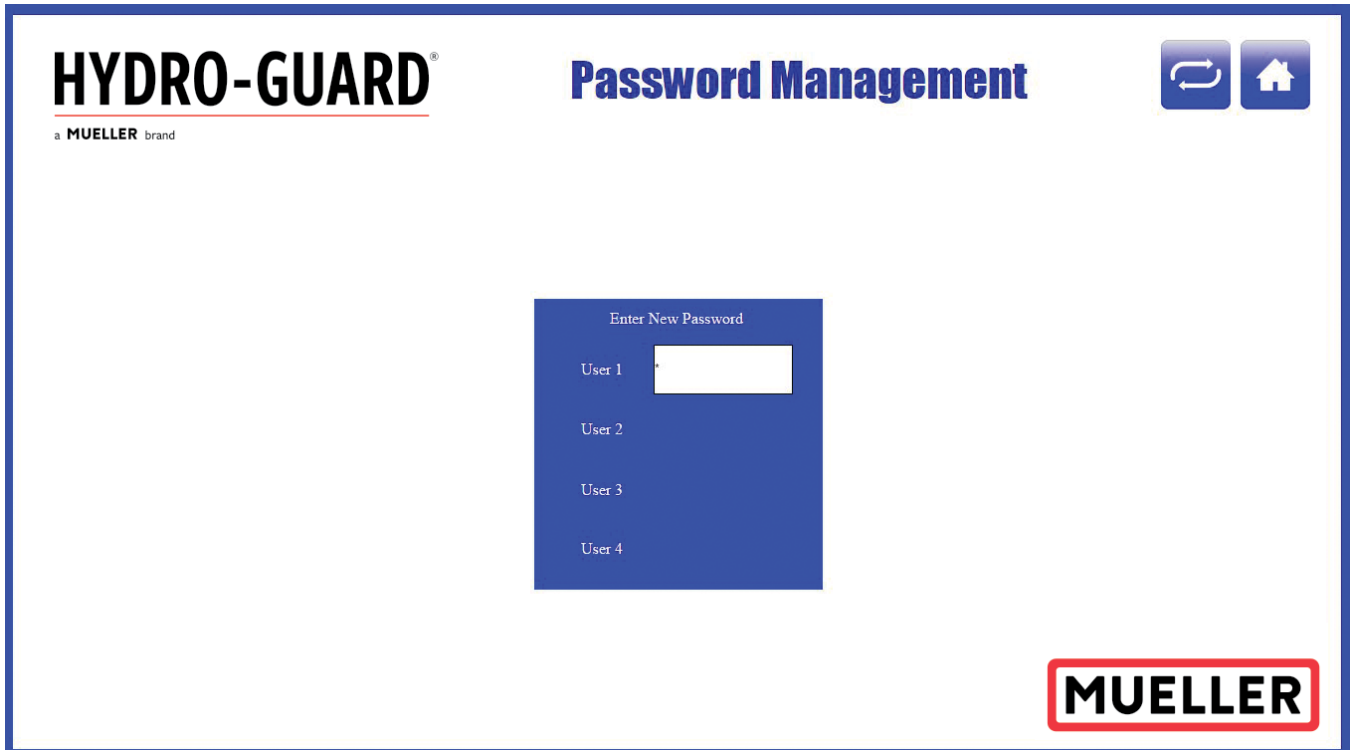
Passwords are limited to 8 alphanumeric characters. All password changes should be recorded.

NOTE: In the above image the user was at level 1 access; therefore only the level 1 password can be modified. Level 2 users can change the password only for levels 1 and 2. Level 3 users have access to change all passwords.

TRENDING
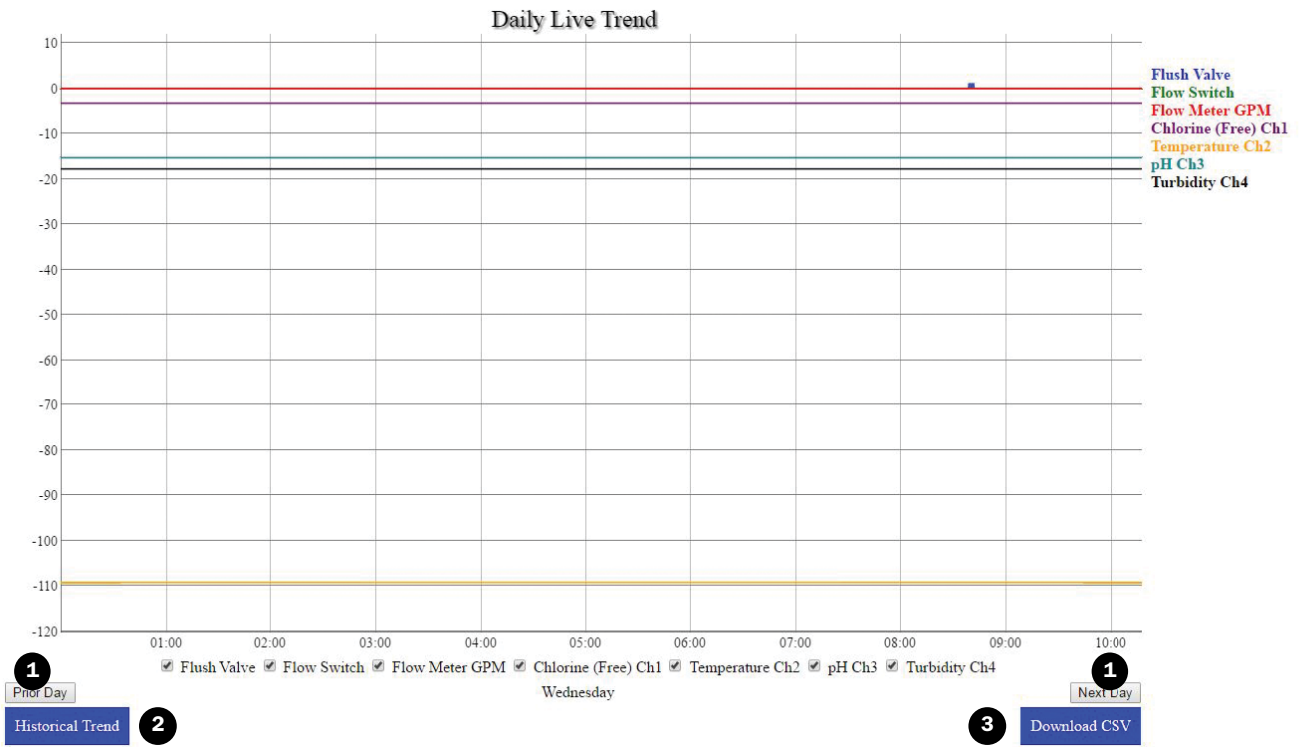
### HOW TO USE THE DAILY LIVE TREND SCALABLE AT RUNTIME

1. Prior/Next Day – These buttons allow the user to navigation within the web portal graphs of daily trends.

2. Historical Trend – This button allows the user to navigate to the historical (Monthly) trend pages.

3. Download CSV - This button allows the user to download the trend data as a CSV file so it can be saved permanently offline. *NOTE: Trend graph y axis come from the configuration of the sensors within the dataset. The dataset that the graph is built from is taking readings at 10 second intervals.*

To scale the graph while online the user can simply click and drag the cursor across the area which the user wishes to zoom in upon. See Images Below. Double-click anywhere within the graph to return to original scaling.
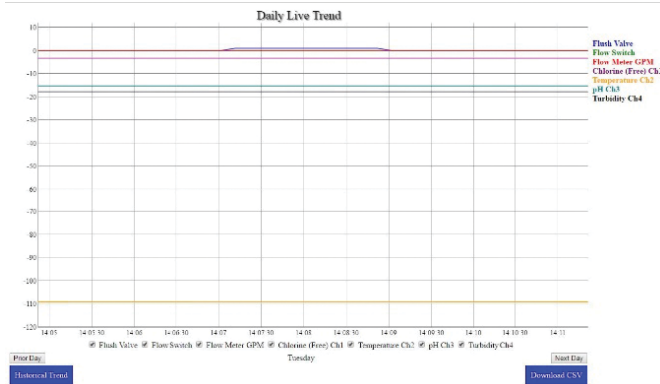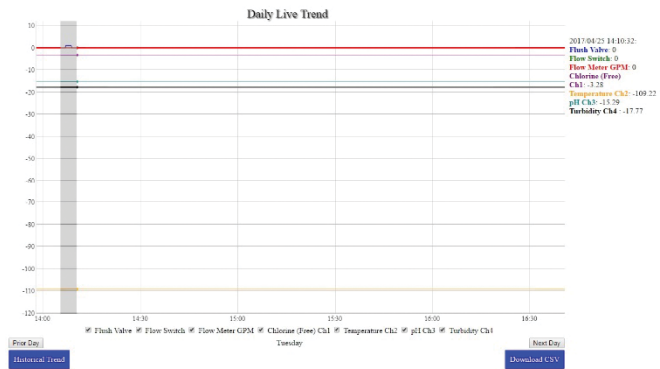
MONTHLY TREND (HISTORICAL)
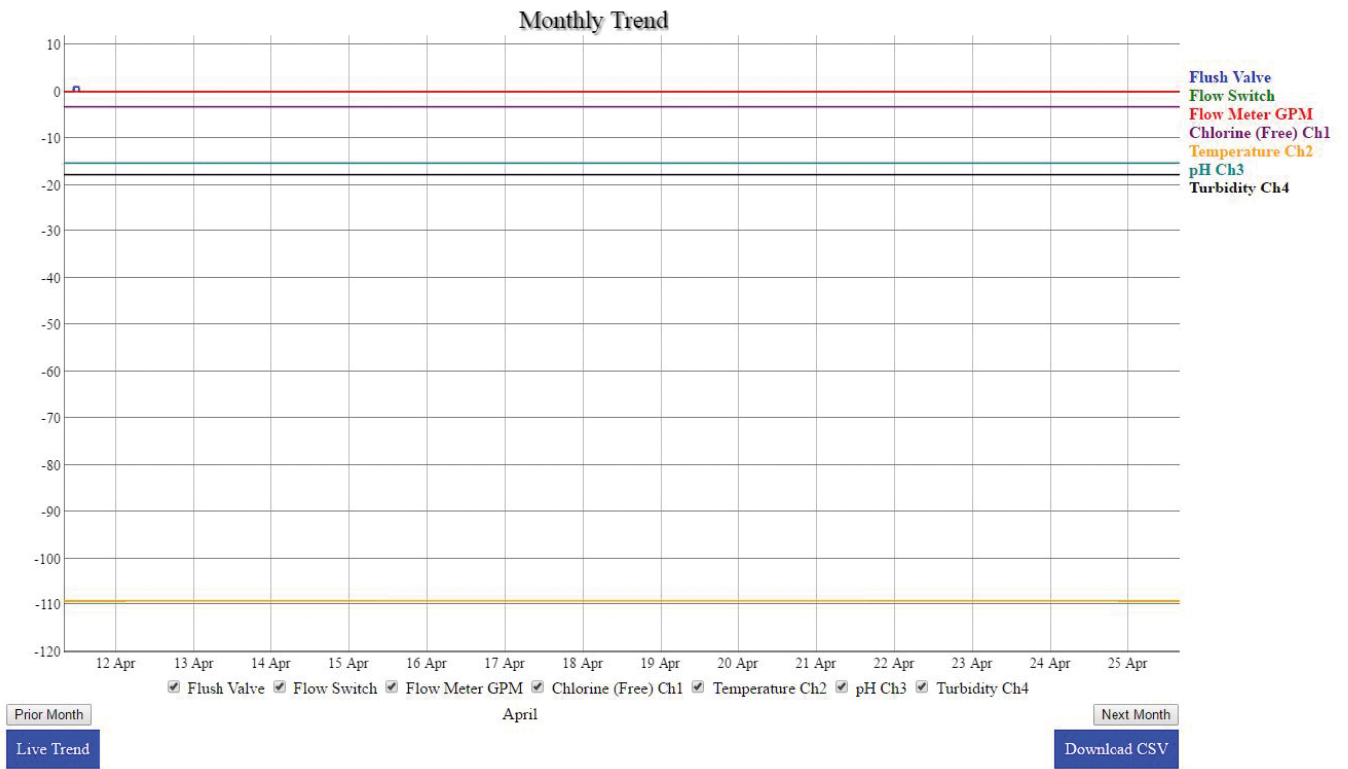
The buttons in the Monthly Trend page
work the same as the Daily Trend.

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