User's Guide D5132 October, 2008

Bristol ControlWave Pump Controller Application User's Guide



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Chapter 1 – Introduction

This manual explains how to install and configure the ControlWave Pump Controller application. This application may be used with either ControlWave MICRO or ControlWave Express controllers.

Chapter 1 details the structure of the manual, and discusses the basic features of the ControlWave Pump Controller application.

In This Chapter

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1.1 Scope of this Manual

Chapter 1 Introduction	Describes the organization of the manual, and the basic features of the ControlWave Pump Controller application.
Chapter 2 Installation	Describes how to install the ControlWave Pump Controller pages on your PC.
Chapter 3 Configuration	Describes how to use the configuration menus of the application to configure the ControlWave Pump Controller.
Chapter 4 Start Up	Describes how to use the startup menus of the ControlWave Pump Controller application.
Chapter 5 Operation	Describes how to use the operation menus of the ControlWave Pump Controller application.
Chapter 6 Logs	Describes how to retrieve historical data (archive files, audit trail data) from the ControlWave Pump Controller.

This manual is divided up into the following chapters:

Other relevant documentation you may need to refer to:

For help on this:	Refer to these document(s):
Installing the controller hardware, wiring I/O, connecting	Depending upon the type of controller model you purchased, either
communication cables to the PC, etc.	CI-ControlWave MICRO -or-
	CI-ControlWaveExpress
Using portions of the TechView software related to calibration or on- line editing.	TechView User's Guide (D5131)

1.2 Overview

The Emerson ControlWave Pump Controller is a pre-programmed application that may be configured by the user to perform a variety of pump station control actions.

These actions include starting and stopping up to 3 fixed speed pumps based on:

- a local or remote tank level indication,
- tank floats,
- local discharge and suction pressure,
- well drawdown level and
- time of day.

In addition, the fixed speed pumps may be operated to supplement a single variable frequency drive (VFD) pump.

The VFD may be operated to maintain either flow or discharge pressure setpoints.

The ControlWave Pump Controller monitors other typical parameters at a pump station, including chlorine residual, pH, and intrusion alarms.

The ControlWave Pump Controller generates alarms when any of these parameters exceed operator specified alarm limits, and maintains historical information (minimum, maximum, and averages or totals) on an hourly and daily basis.

There is no programming required to use the ControlWave Pump Controller. The user configures the controller using OpenBSI TechView, which presents operator menus for performing configuration, monitoring, and operating the pump station. Initial configuration can be done using the Configuration Wizard, which presents the user with a series of questions to be answered. After configuring the initial site, configuring additional sites can be performed by copying a previous configuration into the new ControlWave Pump Controller. The ControlWave Pump Controller is available in the following configurations:

Platform	I/O Boards	Configuration
ControlWave MICRO	2 Mixed I/O Boards	CWM_2M
ControlWave MICRO	1 Mixed I/O Board 1 Mixed DI/O Board	CWM_1M_1D
ControlWave MICRO	1 Mixed DI/O Board 1 Mixed AI/O Board	CWM_1D_1A
ControlWave Express PAC	1 I/O Expansion Board	MPMP_1_0_D

Each of these configurations comes standard with two (2) RS-232 ports and one (1) RS-485 port. An Ethernet port can be added as an option to each.

A Keypad/Display is available as an option with each of these units.

Configuration	DI	DO	DI/O	AI	AO	HSC	CNT/DI
CWM_2M	0	0	12	8	2	4	0
CWM_1M_1D	12	4	6	4	1	2	0
CWM_1D_1A	12	4	0	6	2	0	0
ExpressPAC	4	2	2	3	1	2	2

The available I/O for each configuration is shown below:

Chapter 2 – Installation

Chapter 2 discusses some preliminary activities which must be performed before you start, and then covers the process of loading the ControlWave Pump Controller application pages onto your PC.

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2.3	Installing the Application	.2-2

2.1 Before You Begin

Verify that the latest version of OpenBSI or BSIConfig is installed on your PC. To confirm that the software is installed, click on **Start** \rightarrow **Programs** and look for a program group called OpenBSI or BSIConfig



Verify that the ControlWave Pump Controller is wired to the field devices and power is applied to the unit.

2.2 Downloading the Application from the Web Site

In your Internet browser, go to the Remote Automation Solutions web site, at the following address:

http://www.bristolbabcock.com/services/members/application_files/ap_ controlwave_std_programs.htm

Download the file PUMP_APP.EXE, and save it on your desktop

2.3 Installing the Application

<u>STEP 1</u>

Double-click on the MPMP_1_0.EXE icon (saved as an icon on your desktop in the previous step.).

MPMP_1_0.exe	WinZip Self-Extractor - MPMP_1_0.exe To unzip all files in MPMP_1_0.exe to the specified folder press the Unzip button. Unzip to folder: C: Browse Image:	Unzip Run WinZip Close About Help	
		нер	

<u>STEP 2</u>

Click on Unzip to extract the required files to the C drive. The program will automatically install the required files in the

C:\OpenBSI\WebWaterApp folder. If this folder does not exist, it will be created. Close the WinZip Self Extractor.

<u>STEP 3</u>

Two Icons will now be available from the Desktop – mH2OIP.tvs is used to connect to the ControlWave Pump Controller via Ethernet and mH2OSerial.tvs is used to connect to the ControlWave Pump Controller via a serial RS-232 connection.



If you have purchased a ControlWave Pump Controller, or have already re-configured your ControlWave Micro or ControlWave Express as a ControlWave Pump Controller, proceed to <u>STEP 4</u>.

To reconfigure a previously purchased ControlWave Micro or ControlWave Express as a ControlWave Micro Pump Controller, proceed to the instructions in Sections 2.4.1 and 2.4.2 then return to STEP 4.

<u>STEP 4</u>

To connect to a ControlWave via a serial RS-232 connection, connect a null modem serial cable (P/N 392843-01-3) between a serial port on your PC and COM1 (the C1 port) on the ControlWave Micro or ControlWave Express. If you don't have a null modem serial cable, you can build one according to the instructions in the controller's hardware manual. After the connection is made, proceed to <u>STEP 5A</u>

If you wish to connect to the ControlWave Pump Controller using Ethernet, and if the desired IP Address of the Controller has already been set in the Controller, make an Ethernet connection between the PC and the Controller. This can be done by connecting a null modem Ethernet cable directly between the Ethernet Port on the Controller and the Ethernet Card on your PC, or connecting an Ethernet patch cable between the Controller and an Ethernet Switch and a second patch cable between the Ethernet Switch and the PC. Please proceed to <u>STEP 5B</u>. If the IP Address in the Controller has not been set, follow the instructions in Section 2.4.1 and then return to STEP 5B.

STEP 5A

Start TechView by double clicking on the mH2OSerial.tvs shortcut on the Desktop.

Ignore the question regarding the number of runs.

Runtime Configuration Parameters		
How many runs does the RTU's application load support ?	1	
What is the Local Address of the RTU that you like to connect to ?	1	•
What port would you like to use ?	COM1	•
What baud rate would you like to use ?	115200	•
ОК		

By default, the TechView session assumes the Local Address of the unit is 1. If you have previously changed the Local Address of the ControlWave Pump Controller, select the correct address from the drop down menu.

By default, the TechView session uses COM1 from your PC. If the communications port being used on your PC is a port other than COM1, change it by using the drop down menu.

By default, the TechView session communicates at a baud rate of 115200. It is strongly recommended that you use this speed to communicate with the ControlWave Pump Controller via TechView. If it was necessary to change the baud rate of the ControlWave Pump Controller, select the proper baud rate from the drop down menu.

Click on OK.

SignOn to RTU
Status: Node currently off-line
Username: SYSTEM
Password: *****
Signon Cancel

You will be prompted for a Username and Password. By default, the Username is SYSTEM and the Password is 666666. Enter the Username and Password and click on Signon.

Proceed to STEP 6

<u>STEP 5B</u>

Start TechView by double clicking on the mH2OIP.tvs shortcut on the Desktop.

	Runtime Configuration Parameters
	How many runs does the RTU's application 1
Enter the IP Address of the Pump Controller. Click on OK.	What is the IP Address of the RTU that you like to connect to ? What port would you like to use ? What baud rate would you like to use ? COM1 What baud rate would you like to use ? CM1 CM
You will be prompted for a Username and Password. By default, the Username is SYSTEM and the Password is 666666. Enter the Username and Password and click on Signon.	SignOn to RTU It is recommended that you supply a username when signing on to Controlwave type devices Signon Status: Login required Username: SYSTEM Password: Signon Cancel

Proceed to STEP 6

<u>STEP 6</u>

If TechView is successfully connected to the ControlWave Pump Controller, you should see the screen below. To start configuring the ControlWave Pump Controller, proceed to <u>STEP 7</u>.



If TechView is unable to connect to the ControlWave Pump Controller, you will see the 'Node currently off-line' message. Verify that your communication configuration parameters are correct (address, port, etc.) are correct, and that cables are connected properly.

SignOn to RTU
Status: Node currently off-line
Username: SYSTEM
Password: *****
Signon Cancel

<u>STEP 7</u>

If you see the screen below, you have successfully connected to the ControlWave Pump Controller with TechView.

Along the right hand side of the screen are some icons.



Click on the **Station** icon.

	\	
🛸 TechView - mH2OSerial.tvs		
File Configure Operations View Help		
□ 🛎 🖬 🕨 🥙 🕮 🜆 🍄 💩 🖪 🐼 😵		
Image: RTU Image: Configure Image: Start Up Image: Operation System Information System Information	ate Dugs Calibration	
For Help, press F1	User signed on to RTU at security level 6 1 Run CWave_Micro 04	.60.00 1

Station icon

By clicking on the System Information button, the following screen will be displayed.

	Actual	Recommended
Web Page Version	V01:00:00	V01:00:00
CPU Type	CWM	CWM
PROM Version	V04:72:00	V04:72:00
IO Card Slot 1	Multi I/O 6-DIO 2-HSC 4-AI 1-AO	Multi I/O 6-DIO 2-HSC 4-AI 1-AO
IO Card Slot 2	Multi I/O 6-DIO 2-HSC 4-AI 1-AO	Multi I/O 6-DIO 2-HSC 4-AI 1-AO
Resource	CWM	1_2M
Designer Project Name	МРМР	21_0
Designer Project Version	V01:0	00:00
Control		

This page is a summary of System Information. A comparison of the CPU Type, Firmware Revision, and I/O cards is made between the actual and required. If everything is OK, the screen will appear as above. If there is a mismatch detected, some items will be highlighted, as shown in the screen below:

	Actual	Recommended	
Web Page Version	V01:00:00	V01:00:00	
CPU Type	CWM	CWM	
PROM Version	V04:60:00	V04:72:00	
IO Card Slot 1	Multi I/O 6-DIO 2-HSC 4-AI 1-AO	Multi I/O 6-DIO 2-HSC 4-AI 1-AO	
IO Card Slot 2		Multi I/O 6-DIO 2-HSC 4-AI 1-AO	
Resource	CWM	1_2M	
Designer Project Name	MPMF	<u>_1_0</u>	
Designer Project Version	V01:	00:00	
control		u	

Before proceeding, any I/O card mismatches must be resolved.

MARNING If you fail to resolve IO Card mismatches the ControlWave Pump Controller will not operate properly.

If you have a mismatched PROM version, verify that the actual PROM version is older than the desired PROM version (for instance, PROM version V04:60:00 is older than V04:72:00; PROM version V04:80:00 is newer than V04:72:00).

Using an older PROM Version or Web Page Version may cause some of the features of the ControlWave Pump Controller program to function improperly.

If you do have an older PROM version, you may upgrade by downloading the latest firmware from our web site:

www.bristolbabcock.com/services/members/application_files/Contract/f lashware/controlwave_flashware.htm

In order to be able to download the latest firmware, you must be a Software Support Plan member. If you are unsure if you are a Software Support Plan member, please contact your local sales representative.

Close this page by clicking on the **M**. button.

2.4 Updating an Existing Controller with the Pump Controller Application

If you have an existing ControlWave MICRO, or ControlWave Express, already installed in the field, with the required I/O, and want to update it to run the pump controller application, you will need to:

- Load the Flash Configuration Profile (FCP) file for the Pump Controller application.
- Download the appropriate ControlWave project into the unit.

2.4.1 Loading the Flash Configuration Profile (FCP) File

 In TechView, click on Operations → Access Flash Parameters -or- click on the 'Access Flash' icon, to start the Flash Configuration Utility.



2. In the Flash Configuration Utility, click on the [Read Profile from File] button.

Click on the [Read Profile From File] button

3. Choose the FCP file for the water application, located in the \OpenBSI\WebWaterApp\Config folder, and click on **[Open]**.

Read Flash Con	figuration Profi	ile			? 🔀
Look jn:	Config		•	🗢 🗈 💣 🏢	-
My Recent Documents Desktop My Documents My Computer	mH2O.fcp				
My Network Place≉	File <u>n</u> ame:	mH20.fcp	, .	•	<u>O</u> pen
	Files of type:	Flash Configuration Profile [*	I CP)	•	

Choose the FCP file, then click on **[Open]**.

4. The FCP file for the ControlWave Pump Controller application will be opened. If you need to set the proper IP address for the controller, click on the 'Ports' tab, and enter the address in the "**IP ADDR A**:" field.

Flash Configuration - RTU	X
Ports IP Parameters Application Parameters Archive Audit IP Routes Security Port Protocol IP ADDR A: 10 1 ,10 2 IP COM1 BSAP Sla IP ADDR B: 0 0 ,0 0 IP COM3 MODBUS IP MASK : 255 , 255 ,0 IP ENET1 IP IP MASK : 255 , 255 ,0 Status: Flash configuration profile has been read successfuly. Status: Flash configuration profile has been read successfuly.	Apply New Node Sign On Load From NetDef Save to NetDef Load From RTU Save to Rtu Read Profile From File Write Profile To File Close Help
When finished click on [Save to Ptu]	

- 5. When you have completed any necessary edits, click on the [Save to Rtu] button.
- **6.** When prompted to confirm that you want to proceed, click **[Yes]**. The FCP file will be copied into the ControlWave for you.

2.4.2 Downloading the ControlWave Project

1. *Right*-click on the 'RTU' icon in TechView, and choose "Downloader" from the pop-up menu.

Click on the [Browse Bootfile] button, and navigate to the \MPMP_V_vv subfolder of the Downloads directory, where V is the major file version, and vv is the minor file version. NOTE: In these examples, the version shown is 1_0D, however; your version will be different.

🚰 ControlWave Downloader	
<u>File V</u> iew <u>H</u> elp	
Node: RTU Username: Password: .	Begin Cancel
Project Path: c:\OpenBSI\Downloads\MPMP_1_0	owse Bootfile
User Files Path: c:\OpenBSI\Downloads\MPMP_1_0_D\X B	rowse Path
🔽 Warm Boot 🔲 ZipFile 🗌 Download Use	r Files
For Help, press F1	
Click on the [Browse Bootfile] bu and navigate to the \MPMP_V_vv folder.	utton,

3. From that folder, you need to select the resource sub-folder which contains the project file (*.PRO) you need to download. (See Section 1.2 for details on the different resources.)

Open		?×
Look <u>i</u> n:	🗁 MPMP_1_0_D 🔽 🗢 🗈 📸 📰 -	
My Recent Documents	CWM_1D_1A\$RTU_RESOURCE CWM_1M_1D\$RTU_RESOURCE CWM_2M\$RTU_RESOURCE XpressPAC\$RTU_RESOURCE	
My Documents		
My Computer		
My Network Places	File name: ▼ Files of type: Project(*.pro)	<u>O</u> pen Cancel

4. Once you have selected the project which has the correct configuration for your hardware, click on it, then click on **[Open].**

Open		? 🔀
Look jn:	: 🎦 XpressPAC\$RTU_RESOURCE 💽 🔶 🖻 📸 📰 🗸	
My Recent Documents Oesktop	MPMP_1_0_D.PRO	
My Documents		
My Computer		
My Network	File name: MPMP_1_0_D.PR0	<u>O</u> pen
Places	Files of type: Project(".pro)	Cancel

5. In the Downloader, enter a valid username/password combination for the controller, then click on **[Begin]**. The project (.PRO file) will be downloaded into the ControlWave unit.

	Enter a valid "I combination, th	Username"/"Password" nen click on [Begin].
	/	
📴 ControlWay	ve Downloader	
<u>File View H</u> elp		
Node:	RTU	Begin
Username:	SYSTEM	Cancel
Password:	*****	
Project Path:	C:\OpenBSI\Downloads\MPMP_1_0_D	🛛 Browse Bootfile
User Files Path:	c:\OpenBSI\Downloads\MPMP_1_0_D\	Browse Path
💌 Warm Boo	t 🗖 ZipFile 🗖 Dowr	nload User Files
Valid user and pa	assword required	
For Help, press F1		

Chapter 3 – Configuration

This chapter covers the steps necessary to configure the ControlWave Pump Controller application.

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5.0	3.8.1 Configure Suction Pressure Input	3-25
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2.0	5.6.2 Configure Suction Pressure Overhue	2 20
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3.12	Time Control	3-44
	3.12.1 Configure Timeclock Control	3-45
	3.12.2 Configure Restricted Time of Use Override	3-47
3.13	Station Control	3-49
3.14	Chlorine Residual	3-51
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3.15	Configure pH Monitor	3-53
	3.15.1 Configure pH Monitor Input	3-54
3.16	Chemical Feed Pump	
3 17	Rain Gauge	3-56
0	3 17 1 Configure Rain Gauge Input	3-57
3 18	I/O Configuration	3-58
0.10	3 18 1 Configure All I/O	3-50
	3 18 2 Configure CI 2 Probe	0 00 3_6/
	3 18 3 Configure of Probe	0-0 3_65
3 10	Racina	5-00 3⊒66
5.19	2 10 1 Croating a Dacina	2 67
	J. 13.1 Orealing a Neupe	

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To configure the ControlWave Pump Controller, click on the Configure tab and then click on the Station Configuration Wizard button.

The System Information screen was discussed earlier in Section 2.3.

/ First, click on the 'Configure' tab, then click on the Station Configuration Wizard button.	
View Configure Start Up Operate Logs Station Configuration Wizard System Information	Calibration Calibration Station On Line Edits

This will open the Configuration Wizard screens.

Starting the Configuration Wizard 3.1

The Station Configuration Wizard asks you questions to assist you in configuring the ControlWave Pump Controller.

WARNING	While configuring the Co will be able to change I/O setpoints, and adjust alar make sure that all equips controller in the configur associated processes be o control. This precaution accidentally running out done.	ontrolWave) assignmen rm limits, et ment is mad ration mode losed down will prevent of control v	Pump Controller, t ats, modify start and tc. It is up to the us le safe. Before putt e, it is recommended or placed under ma t any processes from while configuration	the user l stop er to ing the l that any anual n is being
To on Sta	start the Configuration Wiz the [Start?] button. Clickin rt button does two things:	ard, click ng on the	Start?	
•	It saves the current configu ControlWave Pump Contro at any time (See Section 3. It also allows the user to en the screen does not say Co	aration in a to oller. This co 20). Inter the Configuring, th	emporary file on the onfiguration may be figuration Wizard scr te user is not permitte	restored reens. If
Con	forward in the configuration	Select a Dev		
Recon	figure this RTU for this station?	Configuring	Start?	
By p mode, limit contr down runnin	- WAI pressing the 'Start?' button, you are enterin you will be able to change I/O assignment s, etc. It is up to the user to make sure tha oller in the configuration mode, it is recom or placed under manual control. This prec g out of control while configuration is being user acknowledges	RNING - g the configuration s, modify start and tt all equipment is n mended that any as aution will prevent a g done. By clicking this recommendati	mode of this controller. In this stop setpoints, and adjust alarm nade safe. Before putting the ssociated processes be closed any processes from accidentally on the 'Start?' button above, the ion.	
	N	EXT	FINISH	

Pump Station Controller

Bristol Control

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Wave

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EMERSON.

ice mark of Emerson Electric Co.

There are two ways to navigate through the Configuration Wizard:

- Click on the NEXT button at the bottom of each page to sequentially move through the configuration, -or-
- Use the 'Select a Device' drop down menu, to choose a particular item to configure, and then click on Configure. (*This option is accessible from all of the main configuration pages, and allows the user to quickly navigate the system to make changes to a particular item.*)

3.2 Pump Configuration

The first screen allows the user to choose how many fixed speed pumps are included in the system. Selection of and configuration of the variable speed drive (VFD) will be done in a separate step.

PUMPS		
How many pumps are there?	? 3 Pumps	CONFIGURE PUMPS
BACK	NEXT	FINISH

Once the number of pumps has been selected, the user may configure the pumps by clicking on the CONFIGURE PUMPS button.

3.2.1 Configure Pumps

From this screen, the user may provide a unique descriptor for each pump, and set other parameters for the pump controls.

Field	Description
MODE	The user may select between 2 WIRE or 3 WIRE. 2 WIRE control is used when there is a single maintained contact for starting the pump. 3 WIRE control is used when there is one momentary start contact and one momentary stop contact for starting and stopping the pump.
START DELAY (Seconds)	The amount of time, in seconds, that the program will wait after receiving a start command before it turns on the start DO.
RESPONSE DELAY (Seconds)	The amount of time, in seconds, that the program will wait for a positive indication that the pump has started or stopped after a start or stop DO is turned on.
MINIMUM RUNTIME (Seconds)	The amount of time, in seconds, that the pump will run after being started, even if a stop command is issued. The pump will be stopped immediately if the pump interlock conditions are not met.
MAXIMUM STARTS/HOUR, MAXIMUM STARTS/DAY	This represents the maximum starts per hour or day that will be allowed for the pump. After the maximum starts are attempted in a period, any additional start attempts will be ignored.

To return to the previous screen, click on BACK.

3.3 Variable Frequency Drive (VFD) Configuration

Clicking on CONFIGURE VFD will bring up a page similar to the page for configuring the pumps. (See 3.3.1)

The VFD speed may be used to control the operation of the fixed speed pumps. Typically, a fixed speed pump would be started if the VFD speed reached some high limit, and then the fixed speed pump would be stopped if the VFD speed reached some low limit. If this option is required click on CONFIGURE FIXED SPEED PUMP CONTROL. (See 3.3.2)

Configure VFD 3.3.1

FD CONTROL	MODE	START DELAY (Seconds)	RESPONSE TIME (Seconds)	MINIMUM RUNTIME (Seconds)	MAXIMUM STARTS/HOUR	MAXIMUM STARTS/DAY
VFD 1	2 WIRE	0	10	0	2	48
UTPUT	ZERO	SPAN	UNITS			
	0.0	100.0	Hz			
BAOK						

The only difference between this page and the pump configuration page is that the analog output used to control the VFD is configured on this page.

Field	Description
MODE	The user may select between 2 WIRE or 3 WIRE. 2 WIRE control is used when there is a single maintained contact for starting the VFD. 3 WIRE control is used when there is one momentary start contact and one momentary stop contact for starting and stopping the VFD.
START DELAY (Seconds)	The amount of time, in seconds, that the program will wait after receiving a start command before it turns on the start DO.

RESPONSE DELAY (Seconds)	The amount of time, in seconds, that the program will wait for a positive indication that the VFD has started or stopped after a start or stop DO is turned on.
MINIMUM RUNTIME (Seconds)	The amount of time, in seconds, that the VFD will run after being started, even if a stop command is issued. The VFD will be stopped immediately if the pump interlock conditions are not met.
MAXIMUM STARTS/HOUR, MAXIMUM STARTS/DAY	This represents the maximum starts per hour or day that will be allowed for the VFD. After the maximum starts are attempted in a period, any additional start attempts will be ignored.
OUTPUT ZERO	This is the speed command sent to the VFD when the output is 4 mA or 1 Volt.
OUTPUT SPAN	The difference between the value of the speed command at 4 mA (or 1 volt) and its value at 20 mA (5 volts). For instance, if the ZERO is 5.0 Hz and the SPAN is 85.0 Hz, the SPAN is 80.0.
OUTPUT UNITS	This is the engineering units of the speed command.

To return to the VFD screen, click on BACK.

3.3.2 Configure Fixed Speed Pump Control

UMPS AVAILABLE	3			
IXED SPEED PUMP	CONTROL BA	SED ON VFD	SPEED	
VFD 1	0.0 %			
UMP	START SETPOINT	STOP SETPOINT	START COMMAND	STOP COMMAND
EAD	90.0	0.0	OFF	OFF
AG 1	95.0	0.0	OFF	OFF
	0010			
AG 2	97.0	0.0	OFF	OFF
AG 2 BACK	97.0		OFF	OFF

Depending on the number of fixed speed pumps configured, the user may assign up to three start setpoints and three stop setpoints, to control the operation of the fixed speed pumps.

Field	Description
START SETPOINT	If the actual VFD speed exceeds this value, the START COMMAND will be activated to start the associated fixed speed pump.
STOP SETPOINT	If the actual VFD speed falls below this value, the STOP COMMAND will be activated to stop the associated fixed speed pump.
START COMMAND	The START command is activated (and displays 'START' in this field) when the actual VFD speed exceeds the START SETPOINT. Otherwise, this field displays 'OFF'.
STOP COMMAND	The STOP command is activated (and displays 'STOP' in this field) when the actual VFD speed falls below the STOP SETPOINT. Otherwise, this field displays 'OFF'.

3.4 Single Loop Controller (SLC) Configuration

If there is a VFD being used, then the Single Loop Controller (SLC) function must be included to provide PID control to the VFD.

\sim	
<u>C).</u>	
ed Yes CONF	No? IGURE THE SLC
NEXT	FINISH
NEXT	FINISH
	ed <u>CONF</u>

To configure the Single Loop Controller click on CONFIGURE THE SLC. (See 3.4.1).

3.4.1 Configure the SLC

PV1 FLOW	0.0			
	0.0	100.0	GPM	PV1 -FLOW
PV2 DISC PRESS	0.0	100.0	PSI	PV2 -DISCHARGE
DESTINATION	ZERO	SPAN	UNITS	DESCRIPTION
MV VFD1 SPEED	0.0	100.0	%	SLC OUTPUT
BACK				

Field	Description
PV1/PV2 SOURCE	The source of each process variable may be selected from this list: Discharge Pressure, Suction Pressure, Local Level, Remote Level, Drawdown Level, Chlorine Residual, a Fixed Value, or Zero (0.0)
	<signal value=""> ST1.SLC1_PV1_SELECT</signal>
	ST1.SLC1_PV1_SELECT OK Old Value: FLOW New Value: Cancel FLOW ▼ Fixed Q-Data Zero Q-Data DISC PRESS Off SUCT PRESS Off LOCAL LEVEL REMOTE LEVEL DRAWDOWN CL2 RES
PV1/PV2 ZERO	The value of the process variable (PV1 or PV2) at 4 mA or 1 volt.

PV1/PV2 SPAN	The difference between the value of the process variable (PV1 or PV2) at 4 mA (or 1 volt) and its value at 20 mA (5 volts). For instance, if the ZERO is 0.0 GPM and the flow rate at 20 mA is 150.0 GPM, the SPAN is 150.0. If the ZERO is 15.0 GPM and the flow rate at 20 mA is 150.0 GPM, the SPAN is 150.0.
PV1/PV2 UNITS	The engineering units of the process variable (PV1 or PV2).
PV1/PV2 DESCRIPTION	A textual description of the process variable (PV1 or PV2)
MV DESTINATION	The destination of the manipulated variable (MV) is currently the VFD1 speed.
MV ZERO	The value of the manipulated variable (MV) at 4 mA or 1 volt.
MV SPAN	The difference between the value of the manipulated variable (MV) at 4 mA (or 1 volt) and its value at 20 mA (5 volts). For instance, if the ZERO is 0.0 GPM and the flow rate at 20 mA is 150.0 GPM, the SPAN is 150.0. If the ZERO is 15.0 GPM and the flow rate at 20 mA is 150.0 GPM, the SPAN is 150.0.
MV DESCRIPTION	A textual description of the manipulated variable (MV).

Tuning of the Single Loop Controller PID loops is done via the Startup or Operate pages.

To configure alarm limits, click on ALARM LIMITS. (See Section 3.6 for details.)

When finished, click on BACK.

3.5 Station Flow

The ControlWave Pump Controller will perform flow measurement in a variety of ways:

- If there is an analog flow transmitter available, the flow rate measurement and flow totalization will be performed via an analog input to the ControlWave Pump Controller.
- If there is a pulse type flow meter (turbine meter, ultrasonic meter, propeller meter) the flow rate measurement and flow totalization will be performed via a high speed counter input to the ControlWave Pump Controller.

- There are some flow meters that offer an analog variable for flow rate and a pulse signal for flow totalization. In this case, both an analog input and a high speed counter input would be used on the ControlWave Pump Controller.
- Finally, there are some systems where there is no flow measurement device at all, but flow can be estimated based on the run status of the pumps.

STATION FLOW.				
s there flow measure	d at this site?	Yes	No?	
		CONFIGURE FLOW INPUT		
Would you like to estimate flow based on pump run status at this site?		No	Not Available	
		CONFIGURE ESTIMATED FLOW INPUT		
How is flow totalization performed?		PULSE	Analog?	
		CONFIGURE FL	OW TOTALIZATION	
BACK	NE	EXT	FINISH	

To configure the Flow Rate Input from an analog transmitter, click on CONFIGURE FLOW INPUT and see Section 3.5.1.

To configure Estimated Flow, Click on ESTIMATE FLOW? button, then click on CONFIGURE ESTIMATED FLOW INPUT and see Section 3.5.2.

To configure flow totalization, click on CONFIGURE FLOW TOTALIZATION and see Section 3.5.3.
Configure Flow Input 3.5.1

STATION FLOW		ALARM LIMITS		
	ZERO	SPAN	UNITS	DESCRIPTOR
FLOW RATE	0.0	100.0	GPM	FLOW
ВАСК				
BACK				

Configuratio	on Wizard	- Input Cor	nfiguration	ו
STATION FLOW		ALARM LIMITS		
	ZERO	SPAN	UNITS	DESCRIPTOR
FLOW RATE	0.0	100.0	GPM	FLOW
BACK				
DAGR				
Bristol Control	Dump	Station Con	trollor	4

Field	Description
ZERO	The value of the flow rate variable at 4 mA or 1 volt.
SPAN	The difference between the value of the flow rate variable at 4 mA (or 1 volt) and its value at 20 mA (5 volts). For instance, if the ZERO is 0.0 GPM and the flow rate at 20 mA is 150.0 GPM, the SPAN is 150.0. If the ZERO is 15.0 GPM and the flow rate at 20 mA is 150.0 GPM, the SPAN is 135.0.
UNITS	The engineering units of the flow rate variable.
DESCRIPTOR	A textual description of the flow rate variable. This descriptor will be used throughout the rest of the menus to represent flow.

To configure alarm limits, click on ALARM LIMITS. (See Section 3.6 for details.)

3.5.2 Configure Estimated Flow Input

ESTIMATED FLOW						
Some users are value associated estimate the flow the estimated flo	able to est d with it. W v. When m w value for	timate the flow /hen a pump ore than one r each pump.	w based on is running, t pump is op	the output o he flow value erating, stati	f the pump(s associated ion flow is de	b). Each pump has a flow I with the pump is used to etermined by the sum of
	VALUE	PUMP 1	PUMP 2	PUMP 3	UNITS	DESCRIPTOR
FLOW	0.0	0.0	0.0	0.0	GPM	FLOW
	0.0	0.0	0.0	0.0		
BA	СК					

Field	Description
VALUE	This is the live value of the estimated flow.
PUMP1, PUMP2, PUMP3	This is the estimated value of flow when each pump is running. If more than one pump is running, the estimated flow will be the sum of the estimated flow for each pump that is running.
UNITS	This is the engineering units for flow.
DESCRIPTOR	This is a textual description of the flow transmitter.

3.5.3 Configure Flow Totalization

Flow totalization can be performed one of two ways, by integrating the flow rate received via the analog input, or by accumulating pulses from a flow meter that represent a fixed volume of flow per pulse.

When totalization is performed using the analog input, the flow rate (Gallons per minute, gallons per hour, million gallons per day, etc.) is integrated to calculate the total volume (Gallons, Million Gallons, etc.) delivered over a period of time.

FLOW TOTALIZATION		
ANALOG Pulse Counts?		
K FACTOR	1.000	VOLUME PER PULSE
TOTALIZER SPAN	1.000	
Total Span = (Gal/Min)*(M Total Span = 1/(60*1,000, Total Span = 0.00000001 Other common conversions ar Gallons Per Second (GPS Gallons Per Second (GPS	in/60 Seconds 000) 667 e: i) to Gals = 1.0 i) to MGals = 0.01 i to Gals = 0.01	.000001 667

In order to perform this integration, a totalizer span value must be entered. This totalizer span is used to adjust the available flow rate units to the desired flow total units.

For example, if the flow rate is in Gallons per Minute (GPM) and the desired flow total units are Million Gallons (MGals) the totalizer span is 0.00000001667, as shown by the calculation below:

TOTALIZER SPAN = (Gal/Minute) * (Minute/60 seconds) * (Seconds/Sample) * (MGals/1,000,000) GAL

TOTALIZER SPAN = 1/(60*1,000,000)

TOTALIZER SPAN = 0.00000001667

When totalization is performed using a pulse input, each pulse represents a fixed volume (Gallons, cubic feet, etc.) that has passed through the meter. In this case totalizing the volume requires that each pulse gets multiplied by a factor (commonly called a K Factor by the meter manufacturer). The K Factor must be entered as volume per pulse (for instance, 100 gallons/pulse).

However, some manufactures list their K Factor as pulses per volume (for instance, 11.7 pulses/gallon). In this case, the K Factor entered in the Pump Controller must be the reciprocal of the manufacturers K Factor.

In this example, our K Factor would be 1 Gallon/11.7 Pulses, or 0.08547 Gallons/Pulse.

In addition, the user may opt to adjust the totalized units using the K Factor. If the K Factor represents 1 gallon per pulse, but the user wanted to see total volume in Millions of Gallons (MGAL), the K Factor would be entered as 0.000001 (1/1,000,000).

METHOD		
PULSE Analog?		
K FACTOR	1.000	VOLUME PER PULSE
TOTALIZER SPAN	1.000	
(MGals) the totalizer span is 0 Total Span = (Gal/Min)*(M	0.00000000160	37.)*(Seconds/Sample)*(MGals/1.000.000 Gal)
Total Span = 1/(60*1,000, Total Span = 0.00000001	000) 667	,
Other common conversions ar	e:	
Gallons Per Second (GPS Gallons Per Second (GPS Gallons Per Minute (GPM)	6) to Gals = 1.0 6) to MGals = 0) to Gals = 0.01) to MGals = 0.0	.000001 667 0000001667

Configuration Wizard - Totalization

3.6 Alarm Limit Configuration

Selecting Alarm Limits from any analog configuration menu allows for configuration of the alarm limits for any and all analog input parameters.

Click here to configure alarm limits ~

Configuration Wizard - Input Configuration

STATION FLOW		ALARM LIMITS	
	ZERO	SPAN	UNITS
FLOW RATE	0.0	100.0	GPM

Alarm limits can be configured during the individual analog input configurations or after all inputs are configured.

ANALOG INPU	JT ALARM L	IMITS	<u>1/0</u>	D CONFIG		
DEVICE	FLOW	SUCTION	DISCHARGE	CL2 RES	LEVEL	DRAWDOWN
VALUE	0.00	0.00	0.00	0.00	0.00	0.00
HI HI LIMIT	110.00	110.00	110.00	110.00	110.00	110.00
HIGH LIMIT	110.00	110.00	110.00	110.00	110.00	110.00
LOW LIMIT	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
LO LO LIMIT	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
HIGH DB	1.00	1.00	1.00	1.00	1.00	1.00
LOW DB	1.00	1.00	1.00	1.00	1.00	1.00
DAMPENING	ON	ON	ON	ON	ON	ON
DAMPENING TIME (Seconds)	4.00	4.00	4.00	4.00	4.00	4.00
ANALOG OUT	PUT ALARN	LIMITS		I/O CONFIG		
DEVICE	METERING PUMP					

Issued	Oct-08	

VALUE

HI HI LIMIT

0.00

110.00

Alarm limits are provided for High, HI HI, Low, Low – Low. Each limit has an independent High and Low Deadband and dampening filter.

Field	Description
VALUE	The current value of this variable.
HI HI LIMIT	A high-high alarm message is generated when the variable's value exceeds this value. The high-high alarm condition remains in effect until the value of the variable falls below the HI HI LIMIT, minus the HIGH DB value.
HIGH LIMIT	A high alarm message is generated when the variable's value exceeds this value. The high alarm condition remains in effect until the value of the variable falls below the HIGH LIMIIT, minus the HIGH DB value.
LOW LIMIT	A low alarm message is generated when the variable's value falls below this value. The low alarm condition remains in effect until the value of the variable rises above the LOW LIMIT, plus the LOW DB value.
LO LO LIMIT	A low-low alarm message is generated when the variable's value falls below this value. The low-low alarm condition remains in effect until the value of the variable rises above the LO LO LIMIT, plus the LOW DB value.
HIGH DB	A value used to define a range below the HI HI LIMIT, or HIGH LIMIT, within which the alarm condition for that limit still exists, even though the value of the variable is below the limit. This range helps reduce the number of multiple alarm and return-to normal messages being generated if the value of the variable is fluctuating near the alarm limit.
LOW DB	A value used to define a range above the HI HI LIMIT, or HIGH LIMIT, within which the alarm condition for that limit still exists, even though the value of the variable is above the limit. This range helps reduce the number of multiple alarm and return-to normal messages being generated if the value of the variable is fluctuating near the alarm limit.
DAMPENING	When ON, enables the dampening feature. When OFF, the dampening feature is disabled. The dampening feature delays the speed of the response of the output to a given change of the input. It is used to slow down the output response to a rapid or oscillatory change of the measured variable.
DAMPENING TIME (seconds)	The period of time (in seconds) during which the indicated value changes only 63% of the difference between the 'present measured variable' and the 'present indicated value' in one damping time period. It would take 5 times the Dampening Time for the 'present indicated pressure' to equal the 'present measured pressure' (if a change in the 'present measured pressure' didn't occur). An increase in the Dampening Time results in an increased smoothing of the indicated value.

3.7 Discharge Pressure Measurement and Control

The ControlWave Pump Controller will perform discharge pressure measurement.

SCHARG	E PRESS	URE		
there a loc essure use	al discharg ed at this sit	e or system e?	Yes CONFIGURE DISCH	N₀? ARGE PRESSURE INPUT
the discha	rae or svste	em pressure used for	Yes	No?
mary cont	rol of local	pumps at this site?	CONFIGURE DISCHAR	GE PRESSURE CONTROL
the discha	rge or syste	em pressure used for	Yes	No?
erride con	discharge or system pressure used for ide control of the local pumps?			
	trol of the lo	ocal pumps?	CONFIGURE DISCHAR	GE PRESSURE OVERRIDE
	BACK	ocal pumps?	CONFIGURE DISCHAR	GE PRESSURE OVERRIDE FINISH

In addition, the discharge pressure may be used for primary control of the pumps, or override control of the pumps.

To configure the Discharge Pressure Input from an analog transmitter, click on CONFIGURE DISCHARGE PRESSURE INPUT and see Section 3.7.1

To configure the discharge pressure for primary pump control, click on CONFIGURE DISCHARGE PRESSURE CONTROL and see Section 3.7.2

To configure the discharge pressure for override pump control, click on CONFIGURE DISCHARGE PRESSURE OVERRIDE and see Section 3.7.3

3.7.1 Configure Discharge Pressure Input



Field	Description
ZERO	The value of the discharge pressure value when the analog input is at 4 mA or 1 volt.
SPAN	Enter the SPAN value. The SPAN represents the difference between the discharge pressure value when the analog input is 20 mA or 5 Volts and when the analog input is at 4 mA or 1 Volt. For instance, if the ZERO is 0.0 PSI and the discharge pressure at 20 mA is 300.0 PSI, the SPAN is 300.0. If the ZERO is 25.0 PSI and the discharge pressure at 20 mA is 300.0 GPM, the SPAN is 275.0.
UNITS	The engineering units of the discharge pressure input.
DESCRIPTOR	A textual description of the discharge pressure input. This descriptor will be used throughout the rest of the menus to represent discharge pressure.

To configure alarm limits, click on ALARM LIMITS. (See Section 3.6 for details.)

3.7.2 Configure Discharge Pressure Control

Configuration Wizard - Control Configuration

PUMPS AVAILABLE	3			
DISCHARGE PRESSL	IRE CONTROL			
DISCHARGE	0.0 PSI			
PUMP	START SETPOINT	STOP SETPOINT	START COMMAND	STOP COMMAND
LEAD	0.0	0.0	OFF	OFF
LAG 1	0.0	0.0	OFF	OFF
LAG 2	0.0	0.0	OFF	0FF

	BACK		
Bristol	Control	Pump Station Controller	EMERSON

Field	Description
PUMPS AVAILABLE	This represents the number of pumps available for control.
DISCHARGE (or other name)	This is the DESCRIPTOR assigned to the Discharge Pressure Input. The field to the right is the live Discharge Pressure reading.
LEAD / LAG1 / LAG2 START SETPOINT	When the live pressure value drops below this setpoint, the appropriate pump START COMMAND will be set to START.
LEAD / LAG1 / LAG2 STOP SETPOINT	When the live pressure value rises above this setpoint, the appropriate pump STOP COMMAND will be set to STOP.
LEAD / LAG1 / LAG2 START COMMAND	When the live pressure value drops below the START SETPOINT, the corresponding START COMMAND is set to START, to start the pump. Otherwise, it is set to OFF.
LEAD / LAG1 / LAG2 STOP COMMAND	When the live pressure value rises above the STOP SETPOINT, the corresponding STOP COMMAND is set to STOP, to stop the pump. Otherwise, it is set to OFF.

To configure alarm limits, click on ALARM LIMITS. (See Section 3.6 for details.)

When finished, click on BACK.

-

3.7.3 Configure Discharge Pressure Override Control

ISCHARC			DE CONTROL		
	0.00 PSI			SETPOINT	COMMAND
DISABL	START OVERRIDE	ONLOW	DISCHARGE	0.00	0FF
DISABL	STOP OVERRIDE	ONLOW		0.00	OFF
TOP OVER	RIDE WILL BE	PERMIS			
E	BACK	<u> </u>			

Configuration Wizard - Override Control

Override Control provides start and stop overrides that would take precedence over primary control. Override Control is used to either start a single pump or stop all pumps.

From here, either or both START OVERRIDE control and STOP OVERRIDE control can be enabled and configured.

Field	Description
START OVERRIDE	<i>Right</i> -click in this field, and choose either 'ENABLE' or 'DISABL' from the drop-down menu.
ENABLE/DISABL	When enabled, a pump can be started based on whether the discharge pressure value either exceeds (ONHIGH) or falls below (ONLOW) the START OVERRIDE SETPOINT. This start command takes precedence over the primary pump control scheme.
START OVERRIDE	<i>Right</i> -click in this field, and choose either 'ONLOW' or 'ONHIGH' from the drop-down menu.
ONLOW / ONHIGH	When START OVERRIDE is enabled, 'ONLOW' causes the START OVERRIDE command to be activated when the discharge pressure value falls below the START OVERRIDE SETPOINT.
	When START OVERRIDE is enabled, 'ONHIGH' causes the START OVERRIDE command to be activated when the discharge pressure value rises above the START

	OVERRIDE SETPOINT.
	When START OVERRIDE is disabled, this field is ignored.
START OVERRIDE SETPOINT	When START OVERRIDE is enabled, this is the trigger value for the discharge pressure at which a pump will be started.
	When START OVERRIDE is disabled, this field is ignored.
START OVERRIDE COMMAND	Displays 'START' when the START OVERRIDE condition exists or 'OFF' when the START OVERRIDE condition does not exist.
STOP OVERRIDE	<i>Right</i> -click in this field, and choose either 'ENABLE' or DISABL' from the drop-down menu.
	When enabled, a pump can be stopped based on whether the discharge pressure value either exceeds (ONHIGH) or falls below (ONLOW) the STOP OVERRIDE SETPOINT. This stop command takes precedence over the primary pump control scheme.
	When disabled, the pump is only under primary control.
STOP OVERRIDE ONLOW / ONHIGH	<i>Right</i> -click in this field, and choose either 'ONLOW' or 'ONHIGH' from the drop-down menu.
	When STOP OVERRIDE is enabled, 'ONLOW' causes the STOP OVERRIDE command to be activated when the discharge pressure value falls below the STOP OVERRIDE SETPOINT.
	When STOP OVERRIDE is enabled, 'ONHIGH' causes the STOP OVERRIDE command to be activated when the discharge pressure value rises above the STOP OVERRIDE SETPOINT.
	When STOP OVERRIDE is disabled, this field is ignored.
STOP OVERRIDE SETPOINT	When STOP OVERRIDE is enabled, this is the trigger value for the discharge pressure at which a pump will be stopped.
	When STOP OVERRIDE is disabled, this field is ignored.
STOP OVERRIDE COMMAND	Displays 'STOP' when the STOP OVERRIDE condition exists or 'OFF' when the STOP OVERRIDE condition does not exist.
STOP OVERRIDE WILL BE PERMIS / INTLCK	The user can choose whether the STOP OVERRIDE is a PERMISSIVE OVERRIDE (PERMIS) or an INTERLOCKED OVERRIDE (INTLCK).
	A PERMISSIVE STOP OVERRIDE may be overridden by a START OVERRIDE, but will not be overridden by a start command issued by any of the primary controls. An INTERLOCKED STOP OVERRIDE will not be overridden by any start command, whether issued by a primary control or an override control.

3.8 Suction Pressure Measurement and Control

The ControlWave Pump Controller will perform suction pressure measurement.

	lizard	Select a Device		e
s there a local suction pres	sure transmitter	Yes	No?	
used at this site?		CONFIGURE SUCT	ION PRESSURE IN	IPUT
Is the suction pressure use	d for override	Yes	No?	
control of the local pumps?	,	CONFIGURE SUCTIO	N PRESSURE OVE	RRIDE
ВАСК	NE	EXT	FINISH	

In addition, the suction pressure may be used for override control of the pumps.

To configure the Suction Pressure Input from an analog transmitter, click on CONFIGURE SUCTION PRESSURE INPUT and see Section 3.8.1.

To configure the suction pressure for override pump control, click on CONFIGURE SUCTION PRESSURE OVERRIDE and see Section 3.8.2.

3.8.1 Configure Suction Pressure Input

🖋 TechView - RTU (CWave_	_Exp - 1 Run Load) - c	::\OpenBSI\WebWater	App\ConfigWizard_St	art.htm	
Configuratio	n Wizard •	Input Cor	nfiguration	1	-
SUCTION PRESS	URE	ALARM LIM	<u>TS</u>		
	ZERO	SPAN	UNITS	DESCRIPTOR	
PRESSURE	0.0	100.0	UNITS	XMTR_DESC	
				· · · · ·	
BACK					
Bristol Control	Pump	Station Con	troller	EMERSON	
© 2007 Remote Automation Solutions, division	of Emerson Process Management. All ri	ghts reserved. The Emerson logo is a tra	demark and service mark of Emerson Ele	ectric Co.	

Field	Description
ZERO	The value of the suction pressure value when the analog input is at 4 mA or 1 volt.
SPAN	Enter the SPAN value. The SPAN represents the difference between the suction pressure value when the analog input is 20 mA or 5 Volts and when the analog input is at 4 mA or 1 Volt. For instance, if the ZERO is 0.0 PSI and the suction pressure at 20 mA is 300.0 PSI, the SPAN is 300.0. If the ZERO is 25.0 PSI and the suction pressure at 20 mA is 300.0 GPM, the SPAN is 275.0.
UNITS	The engineering units of the suction pressure input.
DESCRIPTOR	A textual description of the suction pressure input. This descriptor will be used throughout the rest of the menus to represent suction pressure.

To configure alarm limits, click on ALARM LIMITS. (See Section 3.6 for details.)

3.8.2 Configure Suction Pressure Override

ONLOW ONLOW ONLOW INTLCK	OL SETPOINT 10N 0.00	COMMAND OFF OFF
ONLOW ONLOW INTLCK	SETPOINT 0.00 0.00	COMMAND OFF OFF
ONLOW SUCT ONLOW INTLCK	10N 0.00	OFF OFF
ONLOW SUC		OFF
INTLCK		
Pump Station	Controller	EMERSON
	Pump Station	Pump Station Controller Paragement. All rights reserved. The Emerson logo is a trademark and service mark of Emers

Override Control provides start and stop overrides that would take precedence over primary control. Override Control is used to either start a single pump or stop all pumps.

From here, either or both START OVERRIDE control and STOP OVERRIDE control can be enabled and configured.

Field [Description
START T OVERRIDE S	Typically, START OVERRIDE would not be used with suction pressure, however, it is supported if required.
ENABLE/DISABL	<i>Right</i> -click in this field, and choose either 'ENABLE' or DISABL' from the drop-down menu.
V ti f; T F	When enabled, a pump can be started based on whether the suction pressure value either exceeds (ONHIGH) or falls below (ONLOW) the START OVERRIDE SETPOINT. This start command takes precedence over the primary pump control scheme.
V	When disabled, the pump is only under primary control.
START F OVERRIDE	<i>Right</i> -click in this field, and choose either 'ONLOW' or ONHIGH' from the drop-down menu.
ONLOW / ONHIGH ti ti	When START OVERRIDE is enabled, 'ONLOW' causes the START OVERRIDE command to be activated when the suction pressure value falls below the START

	OVERRIDE SETPOINT.
	When START OVERRIDE is enabled, 'ONHIGH' causes the START OVERRIDE command to be activated when the suction pressure value rises above the START OVERRIDE SETPOINT.
	When START OVERRIDE is disabled, this field is ignored.
START OVERRIDE SETPOINT	When START OVERRIDE is enabled, this is the trigger value for the suction pressure at which a pump will be started.
	When START OVERRIDE is disabled, this field is ignored.
START OVERRIDE COMMAND	Displays 'START' when the START OVERRIDE condition exists or 'OFF' when the START OVERRIDE condition does not exist.
STOP OVERRIDE	<i>Right</i> -click in this field, and choose either 'ENABLE' or 'DISABL' from the drop-down menu.
	When enabled, a pump can be stopped based on whether the suction pressure value either exceeds (ONHIGH) or falls below (ONLOW) the STOP OVERRIDE SETPOINT. This stop command takes precedence over the primary pump control scheme.
	When disabled, the pump is only under primary control.
STOP OVERRIDE ONLOW / ONHIGH	It is very common to use low suction pressure for STOP OVERRIDE.
	<i>Right</i> -click in this field, and choose either 'ONLOW' or 'ONHIGH' from the drop-down menu.
	When STOP OVERRIDE is enabled, 'ONLOW' causes the STOP OVERRIDE command to be activated when the suction pressure value falls below the STOP OVERRIDE SETPOINT.
	When STOP OVERRIDE is enabled, 'ONHIGH' causes the STOP OVERRIDE command to be activated when the suction pressure value rises above the STOP OVERRIDE SETPOINT.
	When STOP OVERRIDE is disabled, this field is ignored.
STOP OVERRIDE SETPOINT	When STOP OVERRIDE is enabled, this is the trigger value for the suction pressure at which a pump will be stopped.
	When STOP OVERRIDE is disabled, this field is ignored.
STOP OVERRIDE COMMAND	Displays 'STOP' when the STOP OVERRIDE condition exists or 'OFF' when the STOP OVERRIDE condition does not exist.
STOP OVERRIDE WILL BE PERMIS / INTLCK	The user can choose whether the STOP OVERRIDE is a PERMISSIVE OVERRIDE (PERMIS) or an INTERLOCKED OVERRIDE (INTLCK).
	A PERMISSIVE STOP OVERRIDE may be overridden by a START OVERRIDE, but will not be overridden by a start command issued by any of the primary controls. An INTERLOCKED STOP OVERRIDE will not be overridden

by any start command, whether issued by a primary control or an override control.

When finished, click on BACK.

3.9 Local Tank Level Measurement and Control

The ControlWave Pump Controller will perform local tank level measurement.

Configuration Wizard	Select a Device	✓ Configure
LOCAL TANK		
Is there a local level (tank, reservoir, wetwell, clearwell) included at this site?	Yes CONFIGURI	N₀? E LEVEL INPUT
Is the local level used for primary control of local pumps at this site?	Yes N₀? CONFIGURE LEVEL CONTROL	
Are the local pumps used to fill (pump up) or empty (pump down) the local tank at this site?	PUMPUP	Pump Down?
Is the local level used for override control of the local pumps?	Yes CONFIGURE L	N₀? EVEL OVERRIDE
Are there floats in the local tank used to control the local pumps?	Yes	No?
Do the floats cause the pump to fill (pump up) or empty (pump down) the local tank at this site?	PUMPUP	Pump Down?
BACK	EXT	FINISH
Bristol Control Pump Stat	ion Controller	4
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The local tank level can be used for primary and override control.

In addition, float switches can be used to perform pump control, either as primary or backup control to the tank level transmitter. If using float switches in the local tank, select whether the floats are used for PUMP UP or PUMP DOWN control.

To configure the local tank level input from an analog transmitter, click on CONFIGURE LEVEL INPUT and see Section 3.9.1 To configure the local tank level for primary pump control, first select whether operating the pumps will fill the tank (PUMP UP control) or operating the pumps will empty the tank (PUMP DOWN control). After selecting PUMP UP or PUMP DOWN control, click on CONFIGURE LEVEL CONTROL and see Section 3.9.2.

To configure the local tank level for override pump control, click on CONFIGURE LEVEL OVERRIDE and see Section 3.9.3.

3.9.1 Configure Level Input

LOCAL LEVEL	4	ALARM LIMITS		
	ZERO	SPAN	UNITS	DESCRIPTOR
LEVEL	0.0	100.0	FEET	CLEARWELL
VOLUME	0.0	100.0	MGAL	LEARWELLVOLUM

Configuration Wizard - Input Configuration

	BACK		
Bristol	Control	Pump Station Controller	EMERSON
D 2007 Remote	Automation Solutions, division	of Emerson Process Management. All rights reserved. The Emerson logo is a trademark and service mark of Emerson Electric Co.	Entertoort.

Field	Description
LEVEL ZERO	Enter the ZERO value. This represents the level value when the analog input is at 4 mA or 1 Volt).
LEVEL SPAN	Enter the SPAN value. The SPAN represents the difference between the level value when the analog input is 20 mA or 5 Volts and when the analog input is at 4 mA or 1 Volt. For instance, if the ZERO is 0.0 FEET and the level at 20 mA is 35.0 FEET, the SPAN is 35.0. If the ZERO is 35.0 FEET and the level at 20 mA is 45.0 FEET, the SPAN is 10.0.
LEVEL UNITS	Enter the engineering units indicating level.

LEVEL DESCRIPTOR

Enter a descriptor for the local level transmitter. This descriptor will be used throughout the rest of the menus to represent local level.

In addition to the level, it is possible in some cases to calculate the volume in the tank. This is only possible when there is a linear relationship between level and volume. In other words, if 1 foot of tank level always equals the same number of gallons in the tank, then volume can be calculated. However, if the tank is non-linear (for instance, a tank shaped like a sphere or a cylinder lying horizontally) volume measurement is not possible.

VOLUME ZERO	Enter the ZERO value. This represents the volume value when the level value is at zero.
VOLUME SPAN	Enter the SPAN value. The SPAN represents the difference between the volume value when the level input is at 20 mA or 5 Volts and when the level input is at 4 mA or 1 Volt. For instance, if the ZERO is 0.0 GALLONS and the volume when the level input at 20 mA is 300,000 GALLONS, the SPAN is 300,000.0. If the ZERO is 10,000.0 GALLONS and the volume when the level input is at 20 mA is 50,000 GALLONS, the SPAN is 40,000.0.
VOLUME UNITS	Enter the engineering units indicating volume.
VOLUME DESCRIPTOR	The volume descriptor will be generated automatically by appending the word 'VOLUME' to the LEVEL DESCRIPTOR. This descriptor will be used throughout the rest of the menus to represent volume of the local tank.

To configure alarm limits, click on ALARM LIMITS. (See Section 3.6 for details.)

3.9.2 Configure Level Control

PUMPS AVAILABLE	3			
OCAL LEVEL CONT	ROL			
CLEARWELL	0.0 FEET			
PUMP	START SETPOINT	STOP SETPOINT	START COMMAND	STOP COMMAND
EAD	0.0	0.0	OFF	OFF
AG 1	0.0	0.0	OFF	OFF
AG 2	0.0	0.0	OFF	ÛFE
-102	0.0	0.0		
BACK				

Field	Description
PUMPS AVAILABLE	The number of pumps available for control.
Descriptor	This is the descriptor for the Local Level Input. By default, this shows 'CLEARWELL'.
Level Reading	The live, local level reading.
LEAD, LAG1/2 START SETPOINT	Setting the START SETPOINTS depends on whether PUMP UP control or PUMP DOWN control was selected.
& START COMMAND	When PUMP UP control is selected, if the live tank level drops below the START SETPOINT, the appropriate pump START COMMAND will be set to START.
	When PUMP DOWN control is selected, if the live tank level rises above the START SETPOINT, the appropriate pump START COMMAND will be set to START.
LEAD, LAG1/2 STOP SETPOINT	Setting the STOP SETPOINTS depends on whether PUMP UP control or PUMP DOWN control was selected.
∝ STOP COMMAND	When PUMP UP control is selected, if the live tank level

rises above the STOP SETPOINT, the appropriate pump STOP COMMAND will be set to STOP.

When PUMP DOWN control is selected, if the live tank level falls below the STOP SETPOINT, the appropriate pump STOP COMMAND will be set to STOP.

When finished, click on BACK.

3.9.3 Configure Level Override

Override Control provides start and stop overrides that would take precedence over primary control. Override Control is used to either start a single pump or stop all pumps.

From here, either or both START OVERRIDE control and STOP OVERRIDE control can be enabled and configured.



Field	Description
START OVERRIDE	<i>Right</i> -click in this field, and choose either 'ENABLE' or 'DISABL' from the drop-down menu.

ENABLE/DISABL	When enabled, a pump can be started based on whether the local tank level value either exceeds (ONHIGH) or falls below (ONLOW) the START OVERRIDE SETPOINT. This start command takes precedence over the primary pump control scheme.
	When disabled, the pump is only under primary control.
START OVERRIDE	<i>Right</i> -click in this field, and choose either 'ONLOW' or 'ONHIGH' from the drop-down menu.
ONLOW / ONHIGH	When START OVERRIDE is enabled, 'ONLOW' causes the START OVERRIDE command to be activated when the local tank level value falls below the START OVERRIDE SETPOINT.
	When START OVERRIDE is enabled, 'ONHIGH' causes the START OVERRIDE command to be activated when the local tank level value rises above the START OVERRIDE SETPOINT.
	When START OVERRIDE is disabled, this field is ignored.
START OVERRIDE	When START OVERRIDE is enabled, this is the trigger value for the local tank level at which a pump will be started.
SETFOINT	When START OVERRIDE is disabled, this field is ignored.
START OVERRIDE COMMAND	Displays 'START' when the START OVERRIDE condition exists or 'OFF' when the START OVERRIDE condition does not exist.
STOP OVERRIDE	<i>Right</i> -click in this field, and choose either 'ENABLE' or 'DISABL' from the drop-down menu.
	When enabled, a pump can be stopped based on whether the local tank level value either exceeds (ONHIGH) or falls below (ONLOW) the STOP OVERRIDE SETPOINT. This stop command takes precedence over the primary pump control scheme.
	When disabled, the pump is only under primary control.
STOP OVERRIDE ONLOW / ONHIGH	<i>Right</i> -click in this field, and choose either 'ONLOW' or 'ONHIGH' from the drop-down menu.
	When STOP OVERRIDE is enabled, 'ONLOW' causes the STOP OVERRIDE command to be activated when the local tank level value falls below the STOP OVERRIDE SETPOINT.
	When STOP OVERRIDE is enabled, 'ONHIGH' causes the STOP OVERRIDE command to be activated when the local tank level value rises above the STOP OVERRIDE SETPOINT.
	When STOP OVERRIDE is disabled, this field is ignored.
STOP OVERRIDE SETPOINT	When STOP OVERRIDE is enabled, this is the trigger value for the local tank level at which a pump will be stopped.
	When STOP OVERRIDE is disabled, this field is ignored.

STOP OVERRIDE COMMAND	Displays 'STOP' when the STOP OVERRIDE condition exists or 'OFF' when the STOP OVERRIDE condition does not exist.
STOP OVERRIDE WILL BE PERMIS / INTLCK	The user can choose whether the STOP OVERRIDE is a PERMISSIVE OVERRIDE (PERMIS) or an INTERLOCKED OVERRIDE (INTLCK).
	A PERMISSIVE STOP OVERRIDE may be overridden by a START OVERRIDE, but will not be overridden by a start command issued by any of the primary controls. An INTERLOCKED STOP OVERRIDE will not be overridden by any start command, whether issued by a primary control or an override control.

When finished, click on BACK.

3.10 Remote Tank Level Measurement and Control

The ControlWave Pump Controller will perform remote tank level measurement.

The remote tank level is identical to the local tank level indication, with the following exceptions:

- There are no provisions for float control when using a remote tank level.
- There are no volume calculations provided for the remote tank level.

Configuration Wizard		Select a Device	Configure
REMOTE TANK			
s there a remote level (tank, reservoir, vetwell, clearwell) used at this site?		Yes CONFIGUR	N₀? E LEVEL INPUT
Is the remote level used for primary control of local pumps at this site?		Yes	No?
		CONFIGURE	LEVEL CONTROL
Are the local pumps used to fill (pump up) or empty (pump down) the remote tank?		PUMPUP	Pump Down?
Is the remote level used	for override control	Yes	No?
of the local pumps?		CONFIGURE I	LEVEL OVERRIDE
BACK	NEX	КТ	FINISH
			4

To configure the remote tank level input, click on CONFIGURE LEVEL INPUT and refer to Section 3.10.1.

To configure the remote tank level for primary pump control, first select whether operating the pumps will fill the tank (PUMP UP control) or operating the pumps will empty the tank (PUMP DOWN control). After selecting PUMP UP or PUMP DOWN control, click on CONFIGURE LEVEL CONTROL and refer to Section 3.10.2.

To configure the level override, click on CONFIGURE LEVEL OVERRIDE and refer to Section 3.10.3.

3.10.1 Configure Level Input

REMOT	E LEVEL			ALARM LIMITS			
		ZERO		SPAN	UNITS	DE	ESCRIPTOR
LEVEL		0.0)	100.0	UNIT	'S	XMTR_DESC
	BACK						
	BACK						

Field	Description
LEVEL ZERO	Enter the ZERO value. This represents the level value when the analog input is at 4 mA or 1 Volt).
LEVEL SPAN	Enter the SPAN value. The SPAN represents the difference between the level value when the analog input is 20 mA or 5 Volts and when the analog input is at 4 mA or 1 Volt. For instance, if the ZERO is 0.0 FEET and the level at 20 mA is 35.0 FEET, the SPAN is 35.0. If the ZERO is 35.0 FEET and the level at 20 mA is 45.0 FEET, the SPAN is 45.0 FEET, the SPAN is 10.0.

LEVEL UNITS	Enter the engineering units indicating level.
LEVEL DESCRIPTOR	Enter a descriptor for the remote level transmitter. This descriptor will be used throughout the rest of the menus to represent local level.

To configure alarm limits, click on ALARM LIMITS. (See Section 3.6 for details.)

When finished, click on BACK.

3.10.2 Configure Level Control

Configuration Wizard - Control Configuration

PUMPS AVAILABLE	3			
REMOTE LEVEL CON	TROL			-
XMTR_DESC	0.0 UNITS			
PUMP	START SETPOINT	STOP SETPOINT	START COMMAND	STOP COMMAND
LEAD	0.0	0.0	OFF	OFF
LAG 1	0.0	0.0	OFF	OFF
LAG 2	0.0	0.0	OFF	OFF

BACK

Bristol Control

Pump Station Controller



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Field	Description
PUMPS AVAILABLE	The number of pumps available for control.
Descriptor	This is the descriptor for the Remote Level Input. By default, this shows 'XMTR_DESC'.
Level Reading	The live, local level reading.

LEAD, LAG1/2 START SETPOINT	Setting the START SETPOINTS depends on whether PUMP UP control or PUMP DOWN control was selected.
& START COMMAND	When PUMP UP control is selected, if the live tank level drops below the START SETPOINT, the appropriate pump START COMMAND will be set to START.
	When PUMP DOWN control is selected, if the live tank level rises above the START SETPOINT, the appropriate pump START COMMAND will be set to START.
LEAD, LAG1/2 STOP SETPOINT	Setting the STOP SETPOINTS depends on whether PUMP UP control or PUMP DOWN control was selected.
&	
STOP COMMAND	When PUMP UP control is selected, if the live tank level rises above the STOP SETPOINT, the appropriate pump STOP COMMAND will be set to STOP.
	When PUMP DOWN control is selected, if the live tank level falls below the STOP SETPOINT, the appropriate pump STOP COMMAND will be set to STOP.

When finished, click on BACK.

3.10.3 Configure Level Override

EMC	TE LEVEL	OVERR	IDE CONT	ROL		
	0.00	UNITS			SETPOINT	
DISA	BL START (VERRIDE	ONLOW	XMTR DESC	0.00	OFF
DISA	BL STOP O	VERRIDE	ONLOW		0.00	OFF
STOP (VERRIDE W	ILL BE	PERMIS			
	BACK					

Field	Description
START OVERRIDE	<i>Right</i> -click in this field, and choose either 'ENABLE' or 'DISABL' from the drop-down menu.
ENABLE/DISABL	When enabled, a pump can be started based on whether the remote tank level value either exceeds (ONHIGH) or falls below (ONLOW) the START OVERRIDE SETPOINT. This start command takes precedence over the primary pump control scheme.
	When disabled, the pump is only under primary control.
START OVERRIDE	<i>Right</i> -click in this field, and choose either 'ONLOW' or 'ONHIGH' from the drop-down menu.
ONLOW / ONHIGH	When START OVERRIDE is enabled, 'ONLOW' causes the START OVERRIDE command to be activated when the local tank level value falls below the START OVERRIDE SETPOINT.
	When START OVERRIDE is enabled, 'ONHIGH' causes the START OVERRIDE command to be activated when the remote tank level value rises above the START OVERRIDE SETPOINT.
	When START OVERRIDE is disabled, this field is ignored.
START OVERRIDE SETPOINT	When START OVERRIDE is enabled, this is the trigger value for the remote tank level at which a pump will be started.
	When START OVERRIDE is disabled, this field is ignored.
START OVERRIDE COMMAND	Displays 'START' when the START OVERRIDE condition exists or 'OFF' when the START OVERRIDE condition does not exist.
STOP OVERRIDE	<i>Right</i> -click in this field, and choose either 'ENABLE' or 'DISABL' from the drop-down menu.
	When enabled, a pump can be stopped based on whether the remote tank level value either exceeds (ONHIGH) or falls below (ONLOW) the STOP OVERRIDE SETPOINT. This stop command takes precedence over the primary pump control scheme.
	When disabled, the pump is only under primary control.
STOP OVERRIDE	<i>Right</i> -click in this field, and choose either 'ONLOW' or 'ONHIGH' from the drop-down menu.
	When STOP OVERRIDE is enabled, 'ONLOW' causes the STOP OVERRIDE command to be activated when the remote tank level value falls below the STOP OVERRIDE SETPOINT.
	When STOP OVERRIDE is enabled, 'ONHIGH' causes the STOP OVERRIDE command to be activated when the remote tank level value rises above the STOP OVERRIDE SETPOINT.
	When STOP OVERRIDE is disabled, this field is ignored.

STOP OVERRIDE	When STOP OVERRIDE is enabled, this is the trigger value for the remote tank level at which a pump will be stopped.
SETPOINT	When STOP OVERRIDE is disabled, this field is ignored.
STOP OVERRIDE COMMAND	Displays 'STOP' when the STOP OVERRIDE condition exists or 'OFF' when the STOP OVERRIDE condition does not exist.
STOP OVERRIDE	The user can choose whether the STOP OVERRIDE is a
WILL BE PERMIS	PERMISSIVE OVERRIDE (PERMIS) or an
INTLCK	INTERLOCKED OVERRIDE (INTLCK).
	A PERMISSIVE STOP OVERRIDE may be overridden by a START OVERRIDE, but will not be overridden by a start command issued by any of the primary controls. An INTERLOCKED STOP OVERRIDE will not be overridden by any start command, whether issued by a primary control or an override control.

3.11 Well Drawdown Level Measurement and Control

The ControlWave Pump Controller will perform well drawdown level measurement.

Configuration wizaru	Select a Devic	ce Configure
is there a local well drawdown lovel	Yes	No?
transmitter used at this site?	CONFIGURE WEL	L DRAWDOWN LEVEL INPUT
is the well drawdown used for overrid	e Yes	No?
control of the local pumps?	CONFIGURE V	VELL DRAWDOWN LEVEL OVERRIDE
BACK	NEXT	FINISH
BACK	NEXT	FINISH
BACK Bristol Control	NEXT	FINISH
BACK Bristol Control Vavo D 2007 Remote Automation Solutions, division of Emerson Process Management. All	NEXT Station Controll	FINISH er wice mark of Emerson Electric Co.

In addition, the well drawdown level may be used for override control of the pumps.

For details on configuring the well drawdown level input, refer to Section 3.11.1.

For details on configuring the well drawdown override control, refer to the Section 3.11.2.

3.11.1 Configure Well Drawdown Level Input

VELL DRAWDO	NN.	ALARM LIMITS		
	ZERO	SPAN	UNITS	DESCRIPTOR
LEVEL	0.0	100.0	UNITS	XMTR_DESC
BACK				
BACK				
BACK				

Field	Description
LEVEL ZERO	Enter the ZERO value. This represents the level value when the analog input is at 4 mA or 1 Volt).
LEVEL SPAN	Enter the SPAN value. The SPAN represents the difference between the level value when the analog input is 20 mA or 5 Volts and when the analog input is at 4 mA or 1 Volt. For instance, if the ZERO is 0.0 FEET and the level at 20 mA is 35.0 FEET, the SPAN is 35.0 FEET, the SPAN is 35.0 FEET, the SPAN is 45.0 FEET, the SPAN is 10.0.
LEVEL UNITS	Enter the engineering units indicating level.
LEVEL DESCRIPTOR	Enter a descriptor for the well drawdown level transmitter. This descriptor will be used throughout the rest of the menus to represent local level.

To configure alarm limits, click on ALARM LIMITS. (See Section 3.6 for details.)

3.11.2 Configure Well Drawdown Level Override

VELL	DRAWDOWN LEV	ELOVER	RIDE CONTRO		
	0.00 UNITS			SETPOINT	COMMAND
DISA	BL START OVERRIDE	ONLOW	XMTR DESC	0.00	OFF
DISA	BL STOP OVERRIDE	ONLOW	AMIR_DESC	0.00	OFF
TOP (VERRIDE WILL BE	PERMIS			
	BACK				

Configuration Wizard - Override Control

Override Control provides start and stop overrides that would take precedence over primary control. Override Control is used to either start a single pump or stop all pumps.

From here, either or both START OVERRIDE control and STOP OVERRIDE control can be enabled and configured.

Field	Description
START OVERRIDE	<i>Right</i> -click in this field, and choose either 'ENABLE' or 'DISABL' from the drop-down menu.
ENABLE/DISABL	When enabled, a pump can be started based on whether the drawdown level value either exceeds (ONHIGH) or falls below (ONLOW) the START OVERRIDE SETPOINT. This start command takes precedence over the primary pump control scheme.
	When disabled, the pump is only under primary control.
START OVERRIDE	<i>Right</i> -click in this field, and choose either 'ONLOW' or 'ONHIGH' from the drop-down menu.
ONLOW / ONHIGH	When START OVERRIDE is enabled, 'ONLOW' causes the START OVERRIDE command to be activated when the drawdown level value falls below the START OVERRIDE SETPOINT.
	When START OVERRIDE is enabled, 'ONHIGH' causes the START OVERRIDE command to be activated when the drawdown level value rises above the START

	OVERRIDE SETPOINT.
	When START OVERRIDE is disabled, this field is ignored.
START OVERRIDE SETPOINT	When START OVERRIDE is enabled, this is the trigger value for the drawdown level at which a pump will be started.
	When START OVERRIDE is disabled, this field is ignored.
START OVERRIDE COMMAND	Displays 'START' when the START OVERRIDE condition exists or 'OFF' when the START OVERRIDE condition does not exist.
STOP OVERRIDE	<i>Right</i> -click in this field, and choose either 'ENABLE' or DISABL' from the drop-down menu.
	When enabled, a pump can be stopped based on whether the drawdown level value either exceeds (ONHIGH) or falls below (ONLOW) the STOP OVERRIDE SETPOINT. This stop command takes precedence over the primary pump control scheme.
	It is very common to use low suction pressure for STOP
ONLOW / ONHIGH	OVERRIDE.
	<i>Right</i> -click in this field, and choose either 'ONLOW' or 'ONHIGH' from the drop-down menu.
	When STOP OVERRIDE is enabled, 'ONLOW' causes the STOP OVERRIDE command to be activated when the drawdown level value falls below the STOP OVERRIDE SETPOINT.
	When STOP OVERRIDE is enabled, 'ONHIGH' causes the STOP OVERRIDE command to be activated when the drawdown level value rises above the STOP OVERRIDE SETPOINT.
	When STOP OVERRIDE is disabled, this field is ignored.
STOP OVERRIDE SETPOINT	When STOP OVERRIDE is enabled, this is the trigger value for the drawdown level at which a pump will be stopped.
	When STOP OVERRIDE is disabled, this field is ignored.
STOP OVERRIDE COMMAND	Displays 'STOP' when the STOP OVERRIDE condition exists or 'OFF' when the STOP OVERRIDE condition does not exist.
STOP OVERRIDE WILL BE PERMIS INTLCK	The user can choose whether the STOP OVERRIDE is a PERMISSIVE OVERRIDE (PERMIS) or an INTERLOCKED OVERRIDE (INTLCK).
	A PERMISSIVE STOP OVERRIDE may be overridden by a START OVERRIDE, but will not be overridden by a start command issued by any of the primary controls. An INTERLOCKED STOP OVERRIDE will not be overridden by any start command, whether issued by a primary control or an override control.

3.12 Time Control

The ControlWave Pump Controller will perform pump control based on the time of day.

TIME CONTROL			
Are the pumps at this controlled based on t	site primarily		
Are there any times d	uring the day when all	Yes	No?
pumps at this site should be prevented from running? This is an override control function that applies to all pumps.		CONFIGURE REST	RICTED TIME OF USE
	to an pumps.		
	to an pumps.		
BACK	NE	EXT	FINISH

There is timeclock control, for starting and stopping pumps at a specific time each day. To configure the time clock for primary pump control, click on CONFIGURE TIMECLOCK CONTROL and see Section 3.12.1.

There is also a restricted time-of-use override control, used to prevent pumps from operating during specific hours during the day. To configure the restricted time-of-use feature, click on CONFIGURE RESTRICTED TIME OF USE OVERRIDE and see Section 3.12.2.

3.12.1 Configure Timeclock Control

Configurati	on Wizard - C	ontrol Config	uration
-			
TIMECLOCK CONTROL CONFIGURATION			
Time of Day	7/30/2007 22:48:36		Command
Pumps Available	3		
Pump	No Selection	LEAD	OFF
Refresh	Read from Array	LAG 1	OFF
Update	Write to Array	LAG 2	0FF
Time	_	Command Setting	
0000 - 0059	Start?	FALSE	
0100 - 0159	Start?	FALSE	
0200 - 0259	Start?	FALSE	
0300 - 0359	Start?	FALSE	
0400 - 0459	Start?	FALSE	
0500 - 0559	Start?	FALSE	
0600 - 0659	Start?	FALSE	
0700 - 0759	Start?	FALSE	
0800 - 0859	Start?	FALSE	
0900 - 0959	Start?	FALSE	
1000 - 1059	Start?	FALSE	
1100 - 1159	Start?	FALSE	
1200 - 1259	Start?	FALSE	
1300 - 1359	Start?	FALSE	
1400 - 1459	Start?	FALSE	
1500 - 1559	Start?	FALSE	

Field	Description		
Time of Day	This represents the date and time from the real-time clock resident on the ControlWave Pump Controller. NOTE – this time may be different from the time on the PC.		
Pumps Available	This represents the number of pumps available for control.		
Pump	Select the pump to be configured by right clicking in the field and selecting LEAD, LAG 1, or LAG 2.		
Refresh	Clicking on READ FROM ARRAY reloads data to the screen from the ControlWave Pump Controller, to show the current timeclock configuration for the pump selected. This action must be performed whenever the pump selection is changed, in order to see the current configuration of the pump.		

Update	Clicking on WRITE TO ARRAY will download the current timeclock settings from the screen to the configuration for the selected pump.
Lead/Lag1/Lag2 Command	These fields represent the current state of the START command being issued by the timeclock control for each of the pumps.
	NOTE – When the timeclock START command transitions from START to OFF, a STOP command is issued for five (5) seconds. This will stop the appropriate pump, and this pump will not be restarted until another start command is issued by the program. The new start command may come from any source (discharge pressure, tank level, etc.)

Configuring the Timeclock:

To configure the timeclock, follow these steps:

- 1. Select the pump to be configured by right clicking on the PUMP field and selecting LEAD, LAG 1 or LAG 2 (as appropriate).
- **2.** Click on REFRESH. This will allow the current settings for the selected pump to be reviewed before making changes.
- **3.** To configure a pump to run during a particular hour, click on the START? button for that hour. (*If the specific hour is not visible, use the scroll bar to bring it into view.*). Once you have clicked on the appropriate START? Button, the field to the right should change from FALSE to START. If the field already indicates START, the pump is configured to run during that hour.
- **4.** In order to set the timeclock control command for a specific hour to FALSE, click on the OFF? button. The field to the right should change from START to FALSE.
- **5.** When the configuration settings are complete, click on the UPDATE button. The configuration for the pump selected will now be saved to the ControlWave Pump Controller.

Note: If the COMMAND SETTING field for a particular hour is false, other control parameters (tank level, discharge pressure, etc.) can cause the pump to start. The timeclock is not used to prevent a pump from running. To prevent a pump from being started during a particular time of day, the RESTRICTED TIME OF USE function must be used.

3.12.2 Configure Restricted Time of Use Override

Time of Day	7/30/2007 22	49:20	
	Start Hour (0-23	End Hour (0-23)	
Restricted TOU Period 1	0	0	
Restricted TOU Period 2	0	0	
	DEDI 4		
Permissive Command	PERMI		
Permissive Command The Restricted Time-of-U ertain times of the day isage periods.	se (TOU) function is used to prever It is typically used to prevent ope	Enabled t a device from operating duri ation of pumps during peak e	ing nergy
Permissive Command The Restricted Time-of-U ertain times of the day isage periods. During the restricted TO ermissive command wil Dutside of the restricted ermissive command wil	J periods, operation of all pumps at be set to OFF). TOU periods, pump operation will r be set to PERMIS).	Enabled t a device from operating duri ation of pumps during peak e the site will be prohibited (the ot be affected by the TOU log	ing mergy e jic (the

Note: The restricted Time-Of-Use (TOU) override is a permissive override. This means that if there is a start override configured (for instance, a start override on extremely low tank level or system pressure), a pump will be started, even during the restricted time-of-use period.

When enabled, the user can set two periods to restrict operation of all pumps. This is typically used to prevent pumps from operating during periods of high energy use.

Field	Description
Time of Day	This represents the date and time from the real-time clock resident on the ControlWave Pump Controller. NOTE – this time may be different from the time on the PC.
Start Hour (0-23)	The hour when the restricted time of use starts. The restricted time of use will start exactly at the top of the hour.
End Hour (0-23)	The hour when the restricted time of use ends. The restricted time of use will end at the end of this hour.

Permissive Command	If the time-of-use control is enabled, then during the restricted time-of-use period, the permissive command will be set to OFF. This will prevent the pumps from operating, unless a start override command is issued.
	If the time-of-use control is disabled, or if the time-of-use control is enabled and the time of day is outside the restricted time-of-use period, the permissive command will be set to PERMIS. This will allow the pumps to be started by any primary control or override control.
Disable ?/ Enable ?	Use this button to disable or enable the restricted time-of- use control.
3.13 Station Control

The ControlWave Pump Controller allows for alternating the LEAD, LAG 1 and LAG 2 pump starting order.

AUTOMANUAL MANUAL ? AUTO MODE ROTATION ? RUNTIME PUMPS AVAILABLE 3 START COMMAND START COMMAND STOP COMMAND LEAD PUMP FALSE LAG 1 PUMP FALSE	
NODE NODE PUMPS AVAILABLE 3 START COMMAND STOP COMMAND LEAD PUMP FALSE LAG 1 PUMP FALSE	
START COMMANDSTOP COMMANDLEAD PUMPFALSELAG 1 PUMPFALSEFALSEFALSE	
LEAD PUMPFALSEFALSELAG 1 PUMPFALSEFALSE	
LAG 1 PUMP FALSE FALSE	
LAG 2 PUMP FALSE FALSE	
PUMP CONTROLS	
PUMP NAME PUMP 1 PUMP 2 PUMP 3	
RANK 1 2 3	
RUNTIME 0.0 0.0 0.0	
BACK NEXT FINISH	

Field	Description
AUTO/MANUAL	When manual is selected, the operator may set the pump ranks manually. When auto is selected, the pump ranks are set automatically by the ControlWave Pump Controller, based on the mode (either RUNTIME or ROTATION) selected.
MODE	If the RUNTIME mode is selected, then the pump ranks are assigned by runtime, with rank 1 assigned to the pump with the least runtime and rank 3 assigned to the pump with the greatest runtime.
	If the ROTATION mode is selected, then ranks are changed after the pumps stop. The pump with rank 3 is assigned rank 2, the pump with rank 2 is assigned rank 1, and the pump with rank 1 is assigned rank 3.
PUMPS AVAILABLE	This represents the number of pumps available for control.
LEAD (LAG 1, LAG 2) START	The START command will be set to START if a start command is generated by any of the various control

(STOP) COMMAND	modes (discharge pressure primary control, discharge pressure override control, remote tank level primary control, etc.) If there are no start commands being generated, the START command will be set to FALSE. If there is both a START and STOP command present, the STOP command will override the START command.
LEAD (LAG 1, LAG 2) START (STOP) COMMAND	The STOP command will be set to STOP if a stop command is generated by any of the various control modes (discharge pressure primary control, discharge pressure override control, remote tank level primary control, etc.) If there are no stop commands being generated, the STOP command will be set to FALSE.
	If there is both a START and STOP command present, the STOP command will override the START command.
PUMP NAME	These are the descriptors assigned to the pumps during the pump configuration process.
RANK	This is the pump rank. If manual ranking is selected, these ranks can be changed by the user by right clicking on the field and selecting the rank to be assigned to the pump. If auto ranking is selected, the ranks are set by the ControlWave Pump Controller, and these fields cannot be written to.
RUNTIME	The runtime of the pump, in hours.

3.14 Chlorine Residual

If chlorine is monitored at this site, it may be monitored here using a chlorine monitor with a 4 - 20 mA output or an AquaSenors DataStick configured later in the Configuration Wizard.

Chlorine residual is not used for chemical dosing. Chemical dosing is paced by the station flow.

Click on CONFIGURE CL2 RESIDUAL MONITOR INPUT to configure the Chlorine Residual Monitor and see Section 3.14.1.

oningulation wiza	ra Select a Devic	ce <u>Configure</u>
hlorine Residual Monitor		
there a Chlorine Residual Moni is site?	tor used at Yes CONFIGURE CL2	No? 2 RESIDUAL MONITOR INPUT
BACK	NEXT	FINISH
BACK Fristol Control	NEXT	FINISH er

3.14.1 Configure CL2 Residual Monitor Input

CHLORINE RESID	JUAL.	ALARM LIN	<u>nits</u>	
	ZERO	SPAN	UNITS	DESCRIPTOR
RESIDUAL	0.0	100.0	UNITS	XMTR_DESC
ВАСК				
BACK				
BACK	Dumm	Shatian Con		4

Field	Description
RESIDUAL ZERO	Enter the ZERO value. This represents the chlorine residual value when the analog input is at 4 mA or 1 Volt).
RESIDUAL SPAN	Enter the SPAN value. The SPAN represents the difference between the chlorine residual value when the analog input is 20 mA or 5 Volts and when the analog input is at 4 mA or 1 Volt. For instance, if the ZERO is 0.0 FEET and the level at 20 mA is 35.0 FEET, the SPAN is 35.0. If the ZERO is 35.0 FEET and the level at 20 mA is 45.0 FEET, the SPAN is 10.0.
RESIDUAL UNITS	Enter the engineering units indicating chlorine residual.
RESIDUAL DESCRIPTOR	Enter a descriptor for the chlorine residual monitor. This descriptor will be used throughout the rest of the menus to represent the chlorine residual monitor.

To configure alarm limits, click on ALARM LIMITS. (See Section 3.6 for details.)

When finished, click on BACK.

3.15 Configure pH Monitor

If pH is monitored at this site, it may be monitored here using a pH monitor with a 4 - 20 mA output or an AquaSenors DataStick configured later in the Configuration Wizard.

The pH reading is not used for control.

🖋 TechView - RTU (CWave_Exp - 1	Run Load) - c:\OpenB	SI\WebWaterApp\ConfigW	izard_Start.htm	
Configuration W	/izard	Select a Device	Configure	-
pH Monitor.				
Is there a Chlorine Residua	l Monitor used at	Yes	No?	
this site?		CONFIGURE p	H MONITOR INPUT	
				_
BACK	NE	EXT	FINISH	
Bristol Control	Pump Stati	ion Controller	4	
C 1007 Remote Automatica Solutions division of France	rump stati	on controller	EMERSO	N.
© 2007 Remote Automation Solutions, division of Emerson Pr	rocess management. All rights reserved. T	ne Emerson logo is a trademark and service man	k of Emerson Electric Co.	

To configure the Ph Monitor, click on CONFIGURE pH MONITOR INPUT, and see Section 3.15.1.

3.15.1 Configure pH Monitor Input

🖊 TechView - RTU (CWave	_Exp - 1 Run Load) - c	::\OpenBSI\WebWater	App\ConfigWizard_S	tart.htm	
Configuratio	n Wizard ·	Input Cor	nfiguration	า	-
pH MONITOR	AL	ARM LIMITS			
	ZERO	SPAN	UNITS	DESCRIPTOR	
RESIDUAL	0.0	100.0	UNITS	XMTR_DESC	
			·		
BACK					
BACK					
Bristol Control	Dump	Station Con	trollor	4	
© 2007 Remote Automation Solutions. division	of Emerson Process Management. All ri	ights reserved. The Emerson loap is a tra	demark and service mark of Emerson I	EMERSON.	

Field	Description
pH ZERO	Enter the ZERO value. This represents the pH value when the analog input is at 4 mA or 1 Volt).
pH SPAN	Enter the SPAN value. The SPAN represents the difference between the pH value when the analog input is 20 mA or 5 Volts and when the analog input is at 4 mA or 1 Volt
pH UNITS	Enter the engineering units indicating level. Typically, this would be pH.
pH DESCRIPTOR	Enter a descriptor for the pH Monitor.

To configure alarm limits, click on ALARM LIMITS. (See Section 3.6 for details.)

When finished, click on BACK.

_

3.16 Chemical Feed Pump

A chemical Feed pump can be controlled to produce a fixed feed rate such as ml/minute.

Configuration Wizard - Input Configuration

ZERO SPAN UNITS DESCRIPTOR	CHEMICAL FEED	PUMP.	ALARM	LIMITS	
		ZERO	SPAN	UNITS	DESCRIPTOR
SPEED OUTPUT 0.0 100.0 ml/min METERING PUMP	SPEED OUTPUT	0.0	100.0	ml/min	METERING PUMP

Field	Description
ZERO	Enter the ZERO value. This represents the value when the analog output is at 4 mA or 1 Volt).
SPAN	Enter the SPAN value. The SPAN represents the difference between the value when the analog output is 20 mA or 5 Volts and when the analog output is at 4 mA or 1 Volt
UNITS	Enter the engineering units indicating the fixed speed rate.
DESCRIPTOR	Enter a descriptor for the Chemical Feed Pump.

To configure alarm limits, click on ALARM LIMITS. (See Section 3.6 for details.)

3.17 Rain Gauge

A Rain Gauge input may be used.

onnyuration	Nizard	Select a Device	Configure
AIN GAUGE			N 0
there a Rain Gauge use	d at this site?	CONFIGURE RA	
BACK			
BACK	NEXT		FINISH
ВАСК	NEXT		FINISH
BACK	NEXT Pump Station	n Controller	FINISH

Click on CONFIGURE RAIN GAUGE INPUT and see Section 3.17.1.

3.17.1 Configure Rain Gauge Input

RAIN GAUGE			
	K FACTOR (VOLUME PER PULSE)	UNITS	DESCRIPTOR
RAIN GAUGE	1.000	GALS	TOTALS
BACK			
BACK			

Field	Description
K FACTOR (VOLUME PER PULSE)	A multiplier supplied by the rain gauge manufacturer. See Section 3.5.3 for a discussion of K Factor.
UNITS	Enter the engineering units here.
DESCRIPTOR	Enter a descriptor for the rain gauge.

When finished, click on BACK.

3.18 I/O Configuration

The final configuration step is to configure the I/O.

Configuration Wizard	Select a Device	Configure
IO CONFIGURATION		
Use this link to go to the I/O Configuration Page	CONFIGU	IRE ALL IO
Is the chlorine residual monitored by an	No	Yes?
AquaSensor Data Stick?	CONFIGURE	E CI2 PROBE
Is the pH monitored by an AquaSensor Data	No	Yes?
Stick?	CONFIGURI	E pH PROBE
BACK NE	EXT	FINISH
BACK NE	ion Controller	

To go to the I/O Configuration page, click on CONFIGURE ALL IO and see Section 3.18.1.

If you have an AquaSensor Data Stick to monitor Chlorine residual, click on CONFIGURE CL2 PROBE and see Section 3.18.2.

If you have an AquaSensor Data Stick to monitor pH, click on CONFIGURE pH PROBE and see Section 3.18.3.

3.18.1 Configure All I/O

A warning appears as a reminder to ensure that the system is in a safe mode prior to making I/O configuration changes. Click on **[OK]** to proceed.

Microso	oft Internet Explorer 🛛 🔀
?	WARNING - Changing I/O assignments will affect the operation of the controller. It is up to the user to make sure that all equipment is made safe before I/O assignments are changed! Do you want to continue?

MAX IO								
	DI	DO	Al	AO	HSC			
	10	4	3	1	4	·	-	
PUMPS.								
DEVICE	RUN STATUS DI POINT	REMOTE DI POINT	LOCAL DI POINT	TROUBLE DI POINT	POWER FAIL DI POINT	TAGOUT DI POINT	START DO POINT	STOP DC POINT
PUMP 1	DI 1	Always Off	Always Off	Always Off	Always Off	Always Off	D0 1	Always Off
PUMP 2	DI 2	Always Off	Always Off	Always Off	Always Off	Always Off	D0 2	Always Off
PUMP 3	DI 3	Always Off	Always Off	Always Off	Always Off	Always Off	D0 3	Always Off
VFD 1	DI 4	Always Off	Always Off	Always Off	Always Off	Always Off	Always Off	Always Off
TANK FLC	DATS	-			_			
DEVICE	HIHI FLOAT DI POINT	HI FLOAT DI POINT	LO FLOAT DI POINT	LOLO FLOAT DI POINT				
TANK 1	Always Off	DI 5	Always Off	Always Off	-			
BUILDING	SECURIT	Y						
DEVICE	INTRUSION DI	INTRUSION DISABLE DI						
INTRUSION	DI 6	Always Off						
1								

ANALOG INPUTS	ALARM LIMITS					
DEVICE	VALUE	AI POINT	ZERO	SPAN	UNITS	DESCRIPTOR
FLOW	0.000	Zero	0.000	100.000	GPM	FLOW
SUCTION PRESSURE	0.000	Zero	0.000	100.000	PSI	SUCTION

MAX I/O

This area provides information regarding the amount of I/O available considering the ControlWave model you are using.

Field	Description
DI, DO, AI, AO, HSC	Based on the specified type of ControlWave model you are using, this indicates the maximum number of I/O points of each type: DI (Discrete Input), DO (Discrete Output), AI (Analog Input), AO (Analog Output), or HSC (High Speed Counter).
	NOTE: For mixed I/O boards, the Pump Controller Application has no way to detect which I/O is actually available, since, some I/O is configured only by jumpers on the hardware. As a result, these fields only display the maximum I/O that <i>might</i> be present, based on the board type.

PUMPS

There are up to six inputs and two outputs that may be connected for each pump. The physical I/O available in the ControlWave model, and the indicator signals available from the particular model of pump, determine the number points you may assign to these inputs or outputs. Always On and Always Off are selectable when there is no connection to a physical input or output.

Field	Description
DEVICE	Identifies the pump to which the I/O is connected.
RUN STATUS DI POINT	This DI point indicates whether or not the pump is actually running. Select the appropriate DI that reports this status. If you don't have a DI that performs this function, choose either 'Always Off', or 'Always On', as appropriate to your application.
REMOTE DI POINT	If the pump is wired to a two-wire REMOTE-LOCAL switch, or a three-wire HAND-OFF-AUTO switch, specify the DI associated with the REMOTE or AUTO function. If you don't have a DI that performs this function, choose either 'Always Off', or 'Always On', as appropriate to your application.
LOCAL DI POINT	If the pump is wired to a two-wire REMOTE-LOCAL switch, specify the DI associated with the LOCAL function. If you don't have a DI that performs this function, choose either 'Always Off', or 'Always On', as appropriate to your application.
TROUBLE DI POINT	If the pump has a trouble-indicator that can be wired to a DI, specify the DI associated with that function here. If you don't have a DI that performs this function, choose either 'Always Off', or 'Always On', as appropriate to your application.

POWER FAIL DI POINT	If the pump has a power fail-indicator that can be wired to a DI, specify the DI associated with that function here. If you don't have a DI that performs this function, choose either 'Always Off', or 'Always On', as appropriate to your application.
TAGOUT DI POINT	If the pump has a 'Tagout' indicator, that means that the pump is out-of-service for maintenance or repair, specify the DI associated with that function here. If you don't have a DI that performs this function, choose either 'Always Off', or 'Always On', as appropriate to your application. NOTE: All start commands for this pump via the Pump Controller Application are stopped if this DI is ON.
START DO POINT	Specify the DO used to start the pump here. If you don't have a DO that performs this function, choose either 'Always Off', or 'Always On', as appropriate to your application.
STOP DO POINT	Specify the DO used to stop the pump here. If you don't have a DO that performs this function, choose either 'Always Off', or 'Always On', as appropriate to your application.

TANK FLOATS

Discrete inputs not assigned to the pumps are available for tank float inputs or building security.

Field	Description
DEVICE	Identifies the tank to which the I/O is connected.
HI HI FLOAT DI POINT	This DI point is used to indicate that the tank float level has exceeded the HI HI alarm level. Specify the DI associated with this level, or, if you don't have a DI for this function available, specify either 'Always Off' or 'Always On' as appropriate to your application.
HI FLOAT DI POINT	This DI point is used to indicate that the tank float level has exceeded the HI alarm level. Specify the DI associated with this level, or, if you don't have a DI for this function available, specify either 'Always Off' or 'Always On' as appropriate to your application.
LO FLOAT DI POINT	This DI point is used to indicate that the tank float level has reach the LO alarm level. Specify the DI associated with this level, or, if you don't have a DI for this function available, specify either 'Always Off' or 'Always On' as appropriate to your application.
LO LO FLOAT DI POINT	This DI point is used to indicate that the tank float level has reach the HI HI alarm level. Specify the DI associated with this level, or, if you don't have a DI for this function available, specify either 'Always Off' or 'Always On' as appropriate to your application.

BUILDING SECURITY

Discrete inputs not assigned to the pumps are available for tank float inputs and building security.

Field	Description
DEVICE	Identifies the building security device.
INTRUSION DI	This DI point indicates intrusion detection. Select the appropriate DI that reports this status. If you don't have a DI that performs this function, choose either 'Always Off', or 'Always On', as appropriate to your application.
INTRUSION DISABLE DI	This DI point disables the intrusion detection DI. If you don't have a DI that performs this function, choose either 'Always Off', or 'Always On', as appropriate to your application.

ANALOG INPUTS / ANALOG OUTPUTS

Analog inputs or outputs may be assigned to the AI POINT or AO POINT fields, respectively

Field	Description
DEVICE	Identifies the device associated with the input or output.
VALUE	The current value of the AI or AO. If the input or output has no physical connection, the VALUE will be the ZERO value.
AI POINT / AO POINT	Select the appropriate AI or AO for the DEVICE. A Zero in the cell indicates that there is no connection to a physical input or output; in this case the value in the VALUE field will be the same value entered in the ZERO field.
ZERO	Enter the ZERO value. This represents the value when the analog input (or output) is at 4 mA or 1 Volt).
SPAN	Enter the SPAN value. The SPAN represents the difference between the value when the analog input (or output) is 20 mA or 5 Volts and when it is at 4 mA or 1 Volt.
UNITS	Enter the engineering units here.
DESCRIPTOR	Enter a descriptor here. This descriptor will be used throughout the rest of the menus.

ANALOG INPUTS		ALARM	LIMITS			
DEVICE	VALUE	AI POINT	ZERO	SPAN	UNITS	DESCRIPTOR
FLOW	-24.986	AI 1	0.000	225.000	GPM	FLOW
SUCTION PRESSURE	0.000	Zero	0.000	100.000	PSI	SUCTION
DISCHARGE PRESSURE	0.000	Zero	0.000	100.000	PSI	DISCHARGE
CL2 RESIDUAL	0.000	Zero	0.000	100.000	ppm	CL2 RESIDUAL
pH MONITOR	7.000	Zero	7.000	7.000	UNITS	рН
REMOTE LEVEL	0.000		0.000	100.000	FEET	RESERVOIR
LEVEL	-24.980	AI 2	10.000	30.000	FEET	CLEARWELL
VOLUME	-116.600		0.000	100.000	MGAL	CLEARWELLVOLUME
WELL DRAWDOWN LEVEL	0.000	Zero	0.000	100.000	FEET	DRAWDOWN
VFD SPEED FEEDBACK	-24.994	AI 3	0.0	100.0	%	VFD 1
ANALOG OUTPUTS			MILIMITS			

ANALOG OUTPUTS	ALARM LIMITS					
DEVICE	VALUE	AO POINT	ZERO	SPAN	UNITS	DESCRIPTOR
METERING PUMP	0.000	Zero	0.000	100.000	%	
VFD	0.0	AO 1	0.000	100.000	Hz	VFD 1

HIGH SPEED COUNTERS

Analog inputs or outputs may be assigned to the AI POINT or AO POINT fields, respectively

Field	Description			
DEVICE	Identifies the device associated with the high speed counter.			
HSC POINT	Specify the HSC point associated with the DEVICE.			
K FACTOR (VOLUME PER PULSE)	A multiplier supplied by the Meter manufacturer. See Section 3.5.3 for a discussion of K Factor.			
UNITS	Enter the engineering units here.			
FLOW TOTALIZATION METHOD	The flow totalization method is shown here. Flow totalization may be enabled / disabled from the associated button.			

To configure alarm limits, click on ALARM LIMITS. (See Section 3.6 for details.)

Once you have finished configuring all I/O points, select 'BACK' at the bottom of the page.

3.18.2 Configure CL2 Probe

If using an AquaSensor Chlorine DataStick, it should be connected to communication port 3 which is an RS 485 port. Data Sticks may be multi-dropped with a unique address for each. The Pump Control application is pre-configured for a Chlorine Data Stick with address 1.

GIZ Aquaechser a	Data Stick		
	PORT	ADDRESS	
OMM SETUP	3	1	
	DESCRIPTION	TYPE	
SENSOR INFO	AIT101	0	
	VALUE	TEMPERATURE	STATUS
LIVE DATA	0.000	0.0	-8002
BACK			

Field	Description
PORT	Identifies the port on the ControlWave Pump Controller.
ADDRESS	The AquaSensor address.
DESCRIPTION	A description of the AquaSensor data stick.
ТҮРЕ	The type is displayed here.
VALUE	The current live reading from the AquaSensor data stick.
TEMPERATURE	The current temperature reading.
STATUS	Communications status. Negative values indicate bad communications; a 0 indicates good communications.

When finished, click on BACK.

3.18.3 Configure pH Probe

If using an AquaSensor pH DataStick, it should be connected to communication port 3 which is an RS 485 port. Data Sticks may be multi-dropped with a unique address for each. The Pump Control application is pre-configured for a pH Data Stick with address 2.

ph Aquasensor D	ata Stick		
	PORT	ADDRESS	
COMM SETUP	3	2	
	DESCRIPTION	TYPE	
SENSOR INFO	AIT102	0	
	VALUE	TEMPERATURE	STATUS
LIVE DATA	0.000	0.0	-8002
BACK			
			4

Field	Description				
PORT	Identifies the port on the ControlWave Pump Controller.				
ADDRESS	The AquaSensor address.				
DESCRIPTION	A description of the AquaSensor data stick.				
ТҮРЕ	The type is displayed here.				
VALUE	The current live reading from the AquaSensor data stick.				
TEMPERATURE	The current temperature reading.				
STATUS	Communications status. Negative values indicate bad communications; a 0 indicates good communications.				

When finished, click on BACK.

3.19 Recipe

When the configuration and setup is completed, click on 'NEXT' at the bottom of the page to advance to the Recipe page.

The Recipe page allows the user to save a set of initial values for the variables in the ControlWave Pump Controller application, in a file at the PC. The values to be saved in the recipe file can be loaded directly from the ControlWave Pump Controller application, or the user can type them in manually.

At any later time, the user can load the values from the file into the associated variables in the application. This can be useful, for example, if various tuning parameters for the optimum performance of the application have been determined, and they should be saved for later use. This also allows a pump control configuration to be easily modified for use at other similar pump sites without having to do re-do the entire configuration at the other sites.

A default recipe file is included that you can use to upload or download configuration values for the application. You may also edit this file, or create your own recipes as described in Section 3.19.1.

onfiguration Wiza	ard	Select a Device Configure		
Station Name				
TEST_STATION		Configuring		
Load from RTU	Load from File	Modify Signal		
Write to RTU	Write to File	Delete Signal		
Floating Point Format	Load Signal List	Insert Signal		
	Total Signals : 596			
tipe Parameters				
ename : C:\OpenBSI\WebWaterApp\Co	nfig\DefaultMH20.rcp	Browse		
Signal Name	Value	Status 🔺		
ST1.STATION_ID	TEST_STATION			
STI.MAX_DEVICES	3.0000			
STIPROBE_1_INCLUDE				
ST1 VED1_INCLUDE	ON			
ST1.P1 INCLUDE	ON			
ST1.P2 INCLUDE	ON			
ST1.P3 INCLUDE	ON			
ST1.FLOAT_CTRL_INCLUDE	ON			
ST1.INTRUSION_INCLUDE	ON			

3.19.1 Creating a Recipe

To create a recipe you must first specify the variables you want included in the recipe. One way to do this is to *either* right-click on the grid in the center of the Recipe page and choose "**Insert Signal**" from the pop-up menu, *or* click on the **[Insert Signal]** button.

Insert Sig	×	
<u>N</u> ame:	@GV.ANALOG3	OK
<u>V</u> alue:	27	Cancel
_		

In either case, a dialog box will appear in which you can enter the variable's name. If desired, you can also enter a value for the variable. Click on **[OK]** when you are finished. Repeat for each additional variable. Up to 1000 variables can be included in a recipe.

If you don't enter values for the variable when you insert the variable, you can load the current values in the running control strategy for all variables in the recipe by clicking on **[Load from RTU]**.

Another way to specify	Signal List to Load	
variables for the recipe is to load the variables from a signal list. To do this, click on the [Load Signal	Signal List N	lumber:
the number of the signal list and click on [OK] .	ОК	Cancel

If, as you are creating the recipe, you decide you want to change a variable or value for a particular entry, *either* right click on the entry and choose **"Edit Signal"** from the pop-up menu, *or* click on the **[Modify Signal]** button. Make changes, as desired, and click on **[OK]**.

If you want to delete a variable in the recipe, *either* right-click on the line for that variable and choose **"Delete Signal"** from the pop-up menu, *or* click on the **[Delete Signal]** button. You will be prompted to confirm the deletion.

Edit Signa	×	
<u>N</u> ame:	@GV.ANALOG2	ОК
<u>V</u> alue:	14	Cancel

3.19.2 Changing the Floating Point Format of Values

If desired, you can change the format in which values are displayed in the recipe window by clicking on the [Floating Point Format] button.

Float For	mat		
Width	15	•	(OK)
Precision	0	-	Cancel
Exponent	f	•	
Example:		123	

Use the **"Width"** list box to specify the total number of characters in the field (including the decimal point) when displaying a floating point number. This can range from 0 to 15. The default is 12.

Use the **"Precision"** list box to choose the number of places to the right of the decimal point which should be displayed. This can range from 0 to 15. The default is 6.

Use the **"Exponent"** list box to choose the floating point format 'f', exponential notation 'e', or choose 'g' to have the Recipe control choose the best fit format.

Click on **[OK]** when finished.

3.19.3 Saving the Recipe

Type the path and filename for your recipe file in the **''Filename''** field or use the **[Browse]** button to specify the path, then type the name. Standard recipe files are stored with a file extension of (.RCP). You also have the option of saving the file as a .CFG file (which is intended for use with Coastal Flow Measurement Inc. Flow-CalTM software.)

Open					? ×
Look <u>i</u> n:	🔄 OpenBSI	•	£	d *	
Cw1 document: ibraries mwt Projects webpages	💼 WebTMS s 🔊 recipe2.rcp				
File <u>n</u> ame: Files of type:	recipe2.rcp Recipe Files (*.rc*)				<u>O</u> pen
	Recipe Files (*.rc*) FlowCal Files (*.cfg) All Files (*.*)				

Once you have specified the path and filename, click on the **[Write to File]** button, and the recipe will be written to the specified file.

3.19.4 Recalling a Saved Recipe, and Sending Its Values to the Pump Controller

To recall a recipe which you have saved previously, use the **[Browse]** button to locate it, or type its path and filename in directly in the **"Filename"** field. Finally, click on the **[Load from File]** button, and the recipe will be brought into the web page.

Once the recipe file has been loaded, you can send the recipe values to the controller by clicking on the **[Write to RTU]** button.

3.20 Saving the Configuration

When the configuration and setup is completed, click on 'Finish?'. The configuration may be Saved, Canceled or returned to Factory Defaults by right clicking in the SAVE field. Selecting CLOSE will automatically advance to the I/O Checkout page.

When finished, would you like to SAVE your changes. CANCEL your changes or	SAVE	
RESTORE FACTORY DEFAULTS?		
Complete configuration for this PTU2	Configuring	Finish?

Chapter 4 – Start Up

This chapter discusses the Start Up pages. These pages include the basic steps for starting the Pump Controller application, and verifying that it is operating correctly.

In This Chapter

		4.1 4.2 4.3	I/O Checkout 4-2 SLC Tuning 4-3 Pump Checkout 4-4 4.3.1 Permissive and Interlock Details			
			Ciii	CK ON IN	e Start Op lab	
🔲 V	ew 🕅 🛅 Configu	ire 🔟	Start Up	🛛 🔟 Logs	1	
_						
[l O Che	ckout		Pump Checkout	
		SLC T	uning		System Information	

For information on I/O Checkout, see Section 4.1. For information on SLC Tuning, see Section 4.2. For information on Pump Checkout, see Section 4.3 For details on System Information, see Section 2.3.

4.1 I/O Checkout

The I/O Checkout page is the same as the I/O Configuration page but shows live data rather than point configuration. This allows monitoring and checkout of all I/O.

See section 3.18 for details on the meaning of the various fields.

I/O Ch	eckout							
ΜΑΧ ΙΟ								
	DI	DO	AI	AO	HSC			
	10	4	3		4			
PUMPS.								
DEVICE	RUN STATUS STATE	REMOTE STATE	LOCAL STATE	TROUBLE STATE	POWER FAIL STATE	TAGOUT STATE	START DO STATE	STOP DO STATE
PUMP 1	STOP_D	OFF	OFF	ОК	ОК	0K	OFF	OFF
PUMP 2	STOP_D	OFF	OFF	ОК	ок	ОК	OFF	OFF
PUMP 3	STOP_D	OFF	OFF	0K	ОК	0K	OFF	OFF
VFD 1	STOP D	OFF	OFF	ОК	ок	0K	OFF	OFF
TANK FL DEVICE TANK 1	OATS HIHI FLOAT STATE OFF	HI FLOAT STATE OFF	LO FLOAT STATE OFF	LOLO FLOAT STATE OFF				
BUILDING	SECURIT	Y						
DEVICE	INTRUSION STATEDI	DISARM STATE						
INTRUSION	OFF	OFF						
ANALOG	INPUTS		ALAR	RM LIMITS				
DEVICE		VALUE		ZERO	SPAN	UNITS	DESC	RIPTOR
FLOW		0.00		0.00	225.00	GPM	FI	LOW

0.00

0.00

100.00

100.00

PSI

PSI

SUCTION

DISCHARGE

Issued	Oct-08
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SUCTION PRESSURE

DISCHARGE PRESSURE 0.00

0.00

4.2 SLC Tuning

The SLC tuning page allows on-line tuning of the control loop. The setpoint is configurable as well as the KP, KI & KD tuning parameters. PV1 or PV2 may be manually selected or set to automatic for override control. The output can also be placed in manual mode to manually set the output valve.

Note: For a description of the tuning parameters and procedures, see the PID3TERM page of the ACCOL3 online help, in ControlWave Designer.

A live real-time trend is used to assist in optimizing the loop tuning.

		LOC	LOOP 1		LOC	P 2	
PV DESCRIPTION		PV	1 -		PV2 -		
			%			%	
PV VALUE		0.00	0.00		0.00	0.00	
SP VALUE		30.00	0.00		30.00	0.00	
SELECTOR	Loop 1 S	Selected	Auto Select?		Loop 2?		
MANUAL CONTROL			Auto Output?				
MANUAL OUTPUT			35.00		0		
MV			35	5.0	0		
KP		1.00			1.00		
кі		0.20	Rpt/Minute		0.00	Rpt/Minute	
KD		0.50	Minutes		0.00	Minutes	
DEADBAND		0.00			0.00		





Field	Description			
PV DESCRIPTION	A textual description of the control loop.			
PV VALUE	The process variable's value.			
SP VALUE	The setpoint, or desired value for the process variable.			
SELECTOR	Only one loop may be tuned at a time. Select either 'Loop 1' or 'Loop 2' for tuning. If a loop is selected for tuning, its associated button will say 'Loop x Selected'.			
MANUAL CONTROL	This button toggles control between 'Auto' and 'Manual'. When auto, the loop calculations determine the value of the MV; when manual, MV is set to the MANUAL OUTPUT value.			
MANUAL OUTPUT	Specify a value for the output when manual control is active.			
MV	The value of manipulated variable (output).			
KP	The proportion constant (gain).			
KI	The integral time (in repeats per minute).			
KD	The derivative rate constant (in minutes).			
DEADBAND	Is a positive number used to reduce fluctuations of the output based on minor changes in the input.			

4.3 Pump Checkout

The pump startup page allows selection of Auto/Manual mode for each of the pumps. In Manual mode the pumps can be started and stopped provided the Permissive and Interlock conditions are met. If a pump is not starting or stopping as expected, the Permissive and Interlock Details may be selected.

PUMP NAME	VFD 1		PUMP 1		PU₩	1P 2	PUMP 3		
COMPUTER A/M	MANUAL ?	AUTO	MANUAL ?	AUTO	AUTO ?	AUTO ? MANUAL		AUTO	
START	N/A	OFF	N/A	OFF	START ?	OFF	N/A	OFF	
STOP	N/A	OFF	N/A	OFF	STOP ?	OFF	N/A	OFF	
SPEED	0.0 %	0.0 HZ							
AVAILABLE	0FF		OFF		OFF		OFF		
REMOTE	10	⁼F	OFF		OFF		OFF		
LOCAL	10	F	OFF		OFF		OFF		
PERMISSIVE	PER	MIS	PERMIS		PERMIS		PERMIS		
INTERLOCK	INTI	LCK	INTI	INTLCK		INTLCK		INTLCK	
	PEF	RMISSIN	/E AND I	NTERL	OCK DE	TAILS			
RUN STATUS	STOP_D		STOP_D		STOP_D		STOP_D		
RUNTIME	0.	0	0.	0.0		0.0		0	
FAIL	ОК	RESET ?	ОК	RESET ?	ок	RESET ?	ОК	RESET ?	

Pump Startup

Field	Description
PUMP NAME	The name of the pump.
COMPUTER A/M	For each pump, a button is provided to toggle its mode between AUTO and MANUAL. The current mode is also displayed.
START	A START button is provided for each pump. If the button label is 'N/A', the pump is not in MANUAL mode or not configured yet. The current running state of the pump is also displayed.
STOP	A STOP button is provided for each pump. If the button label is 'N/A', the pump is not in MANUAL mode or not configured yet. The current running state of the pump is also displayed.
SPEED	The field on the left shows the manual speed input; the field on the right is the actual speed.
AVAILABLE	Displays whether or not the pump is available. If a pump is not available, it cannot be started/stopped.
REMOTE	Displays whether the pump is in REMOTE mode.
LOCAL	Displays whether the pump is in LOCAL mode.
PERMISSIVE	If PERMIS is displayed, a permissive override is supported for this pump.
INTERLOCK	If INTLCK is displayed, no override is allowed from any pump control.

RUN STATUS	Displays the current running status of the pump.
RUNTIME	The accumulated running time of the pump is displayed here.
FAIL	Indicates a pump failure. To clear the failure status indication, click on the RESET button.

Manually Starting/Stopping a Pump

To start or stop a pump, manually, follow these steps:

- **1.** Check to see that the pump is currently in MANUAL mode. If not, click on the MANUAL? button, to put it into MANUAL mode.
- **2.** Click on START? to start the pump, or STOP? to stop the pump.
- **3.** Check the RUN STATUS field to whether the pump changes status, as desired.
- **4.** If the pump does not start/stop as desired, check the permissive and interlock details, and review other possible error conditions.

To view information about overrides for each pump, click on PERMISSIVE AND INTERLOCK DETAILS and see Section 4.3.1.

4.3.1 Permissive and Interlock Details

This page shows permissive and interlock status for all configured pumps.

PUMP DETAI	LS				
PUMP NAME	VFD 1	PUMP 1	PUMP 2	PUMP 3	
AVAILABLE	OFF	OFF	OFF	OFF	
REMOTE	OFF	OFF	OFF	OFF	
LOCAL	0FF	OFF	OFF	OFF	
STARTS HR	ОК	ОК	ОК	ОК	
STARTS DAY	ОК	ОК	ОК	ОК	
TAGOUT	ОК	ОК	ОК	ОК	
PERMISSIVE	PERMIS	PERMIS	PERMIS	PERMIS	
INTERLOCK	INTLCK	INTLCK	INTLCK	INTLCK	
RUN STATUS	STOP_D	STOP_D	STOP_D	STOP_D	
RUNTIME	0.0	0.0	0.0	0.0	
FAIL	OK RESET ?	OK RESET ?	OK RESET ?	OK RESET ?	
INTERLOCKS	SAND PERMISS	IVE (COMMON	TO ALL PUMPS)		
	Live Value	Override Type	Stop Setpoint	Command	
SUCTION	0.0 PSI	PERMIS	0.0	OFF	
DISCHARGE	0.0 PSI	PERMIS	0.0	OFF	
CLEARWELL	10.0 FEET	PERMIS	0.0	OFF	
RESERVOIR	0.0 FEET	PERMIS	0.0	OFF	
DRAWDOWN	0.0 FEET	PERMIS	0.0	OFF	
TIME OF USE		PERMISSIVE		PERMIS	

Pump Interlocks and Permissives

Field	Description			
PUMP NAME	The name of the pump.			
AVAILABLE	Displays whether or not the pump is available. If a pump not available, it cannot be started/stopped.			
REMOTE	Displays whether the pump is in REMOTE mode.			
LOCAL	Displays whether the pump is in LOCAL mode.			
STARTS HR	Displays whether the pump has exceeded its scheduled number of starts per hour.			
STARTS DAY	Displays whether the pump has exceeded its scheduled number of starts per day.			

TAGOUT	If the pump is in Tagout (out-of-service for maintenance or repair) the pump cannot be started by any control method.
PERMISSIVE	If PERMIS is displayed, a permissive override is supported for this pump.
INTERLOCK	If INTLCK is displayed, no override is allowed from any pump control.
RUN STATUS	Displays the current running status of the pump.
RUNTIME	The accumulated running time of the pump is displayed here.
FAIL	Indicates a pump failure. To clear the failure status indication, click on the RESET button.
Live Value	The value of the process variable, upon which, it is decided to start or stop the pump.
Override Type	Displays the override type currently active; either permissive or interlock.
Stop Setpoint	If this live value falls below this value, a STOP command is issued to the pump.
Command	Displays any COMMAND currently issued to the pump.
TIME OF USE	Displays the last time the pump ran.

When all pump checkout is completed, the window may be closed to return to the main Pump Controller TechView window.

Chapter 5 – Operation

This chapter covers the 'Operate' tab. The Operate tab allows direct access to the I/O Setting, Pump Operation, Fixed Speed Pump Settings, SLC Control Setting and System Information pages.

In This Chapter

5.1 Fixed Speed (FS) Pump Control Settings5-2

Typically, this page would be used by Operators or Technicians, after configuration has been completed.

🎭 TechView - mł	H2OSerial_Demo.tvs	
File Configure Op	erations Config Pages View Help	
🗋 🖆 🔚 🕨 🛉	🛠 🗃 🕮 🜆 💬 🧶 🛐 🌆 🐟 🦎 🖇	
	🔲 View 🔟 Configure 🔟 Start Up 🔟 Operate 🔟 Logs	
	I/O Settings FS Pump Control Settings	Calibration
	Pump Operation SLC Control Settings	
	System Information	Station
		On Line Edits

For information on I/O Settings, see Section 4.1.

For information on Pump Operation, see Section 4.3.

For details on System Information, see Section 2.3.

For information on SLC Control Settings, see Section 4.2.

Fixed Speed Pump Control Settings are discussed in the next section.

5.1 Fixed Speed (FS) Pump Control Settings

This page brings together details on the fixed speed, non-VFD pumps in a single place.

Fixed Speed Pump Control Settings

FIXED SPEED PUMP CONTROL SETTINGS					
Description	Live Value	Primary Controls	Override Controls	History	
		Modify			
			Modify	View	
		Modify	Modify	View	
		Modify	Modify	View	
		Modify	Modify	View ·	
			Modify	View	
Timeclock		Modify	Modify		

MISCELLANEOUS						
Description	Live Value	Control		History		
22222				View		
11111				View		
11111				View		
		Modify		View ·		
23333	18833			View		

Field	Description
Description	A user-defined description of the pump or device.
Live Value	The current reading of the process variable which dictates whether or not the device should be started or stopped.
Primary Controls – Modify	Click on this button to change the start and stop setpoints for the device. See Section 3.3.2.
Override Controls – Modify	Click on this button to change the override settings for the device.
History - View	Click on this button to see running average, minimum, and maximum calculations for the process variable over the current hour, previous hour, current day, and previous day.
Timelock Modify	Click on these buttons to modify the timelock configuration, and override settings.

Chapter 6 – Logs

This chapter covers the 'Logs' tab. The Logs tab allows direct access to historical data in the ControlWave Pump Controller.

In This Chapter

6.1	View Archives	6-2
6.2	View Audit Trail	6-6
6.3	Collection	6-9

The ControlWave Pump Controller logs and stores time-stamped historical data in the RTU. This data may be accessed, viewed, collected and stored on the PC.

🗣 TechView - mH2	OSerial_Demo.tvs		
File Configure Opera	tions Config Pages View Help		
🗅 🖻 🖬 🕨 🛠	🖻 🕮 🜆 🌮 👼 🖬 🐟 🔥 🎗 🕅		
	🔟 View 🔲 Configure 🔟 Start Up 🔟 Operate 🔟 L	.ogs	
	View Archives Collection	View Audit Trail System Information	Calibration Station

To view archive files, click on **[View Archives]** and see Section 6.1. To view audit trail data, click on **[View Archives]** and see Section 6.2. To view the Historical Log Collection, click on **[Collection]** and see Section 6.3.

6.1 View Archives

Hourly, Daily and Periodic historical Archives are logged in the ControlWave Pump Controller.

The data values will be displayed in the format selected with the 'Floating Point Format' button.

/iew	Logs						
Daily	Archive Num	nber	Ηοι	irly Ar	chive Number	Periodic Archiv	e Number
	1				2	3	
Colle	ct Data Save P	arameters	S	earch Criter	ia Floating Point Form	at File Definition	
Archive I	Collection Parameters					Stats	
	ect by Name	Start from	oldest rec	ord	✓ Freeze Date/Time	Fields Collected: 27	
File Nun	nber: 1	File Name	: HOUF	RLY		Records Collected: 19	
Record	DATE/TIME	LS	N	GSN	SUCT_MIN	SUCT_MAX	_
1	13:03:32.000 28-MAR-20	08 20	83	140	-24.98	0.00	
2	12:00:00.000 28-MAR-20	1 <mark>08</mark> 20	82	360	0.00	0.00	
3	11:00:00.000 28-MAR-20	08 20	31	290	0.00	0.00	
4	10:00:00.000 28-MAR-20	08 20	80	228	-24.98	0.00	
5	09:13:16:000 28-MAR-20	08 20	79	166	-24.98	0.00	
6	08:00:00.000 28-MAR-20	08 20	78	11455	0.00	0.00	
7	07:00:00.000 28-MAR-20	08 20	77	11394	0.00	0.00	
8	05:00:00.000 28-MAR-20	08 20	/6	11333	0.00	0.00	_
9	05:00:00.000 28-MAR-20	20	/5	11272	0.00	0.00	_
10	04:00:00.000 28-MAR-20	08 20	70	11150	0.00	0.00	
12	03:00:00.000 28-MAR-20	08 20	72	11100	0.00	0.00	
12	02:00:00:000 28-MAR-20 01:00:00 000 28-MAR-20	00 20	71	11005	0.00	0.00	
14	01:00:00:000 20-MAI1-20	108 20	70	10967	0.00	0.00	

The Hourly and Daily logs contain Min. Max, Avg. & Total values for the following measurements:

- Suction Pressure
- Discharge Pressure
- Flow
- Level
- Volume
- Chemical Feed
- Chlorine Residual

Pump Runtimes and Starts are also logged in the Hourly and Daily logs.

The Periodic log stores the following parameters per minute for seven days.

- Suction Pressure
- Discharge Pressure
- Flow
- Pump Run Status
- Chemical Feed
- Chlorine Residual

Field	Description
Collect by Name	Disabled for this application.
Start from oldest record	If you would like the oldest archive file entries to appear first, select this option.
Freeze Date/Time	As you scroll through the archive file window, the first column (which may contain date/time stamps) may disappear from the window as higher numbered columns are brought into the window. To prevent this, select this option.
File	This is the unique ID number for the Archive File you want to view.
Number	The file number is the log number. Valid entries are 1 for Daily, 2 for Hourly and 3 for Periodic.
File Name	This dislays the archive file name of the Archive File you want to view, based on the number you selected.
Fields Collected	Displays the number of fields (columns) in the archive file which have been collected.
Records Collected	Displays the number of records (rows) in the archive file which have been collected.
Collect Data	Click on this button to collect archive data based on your entries in the "Archive Collection Parameters" section.
Save	This button calls up the Save Parameters dialog box. You can save the

Save This button calls up the Save Parameters dialog box. You can save the **Parameters** archive data you have viewed into a file on your PC hard disk.

Save Parameters	×
🔽 Save Archive Data	ОК
Filename : ARCHIVE.000	Cancel

To save the archive data, check the "**Save Archive Data**" check box, then enter a filename in the "**Filename**" field, or choose the [...] button to locate a path and filename of a file. NOTE: This only saves a snapshot of the data you have actually viewed on the screen; it does NOT save the entire archive file. As you scroll to bring new data on the screen, it will be added to the specified file. If you want to save an entire Archive File, you should use a tool such as the Open BSI Harvester or the Historical Log Storage control.

	Click on [OK] when finished.					
Search Criteria	This button calls up the Select Data Collection Criteria dialog box.					
	Select Data Collection Criteria					
	Collect All Available Information					
	O Collect by specified Date Cancel					
	Begin Date: 1/1/70					
	End Date: 10/23/01					
	O Collect by specified Period Today					
	This dialog box allows you to filter the archive data which will be displayed.					
	"Collect All Available Information" specifies that all archive data from this archive file should be collected.					
	"Collect by specified Date" specifies that only archive data with timestamps between the " Begin Date " and " End Date " entries you specify should be collected.					
	"Collect by specified Period" specifies that only archive data collected during the period you specify should be collected. Choices are 'Today', 'This Week', or 'This Month'.					
	Click on [OK] when you have finished selecting the search criteria, or [Cancel] to exit without saving changes.					
Floating Point Format	Calls up the Float Format dialog box. In this dialog box, you can spec the precision with which analog (floating point) values are displayed.					
	Eloat Format					
	Width 15 V					
	Precision 0 Cancel					
	Exponent f					
	Example: 123					
	Use the "Width" list box to specify the total number of characters in the field (including the decimal point) when displaying a floating point number. This can range from 1 to 15. The default is 12.					
--------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------					
	Use the "Precision" list box to choose the number of places to the right of the decimal point which should be displayed. This can range from 0 to 15. The default is 6.					
	Use the "Exponent" list box to choose the floating point format 'f', exponential notation 'e', or choose 'g' to have the Archive Collection control choose the best fit format.					
	Click on [OK] when finished.					
File Definition	This button displays certain configuration parameters for this archive file, e.g. number of records. NOTE: These parameters CANNOT be changed here, they are only displayed.					

6.2 View Audit Trail

Audit trail data may be collected from the ControlWave Pump Controller. Audit trail data includes alarms and a log of significant system events.

Station Audit Trail

Collect Data Data Storage Search Criteria Total # o Collected				# of Records ted: 60	
	Date/Time	Signal	Description	Audit Seq#	Global Seq# 🔺
1	13:55:22.390 12-JUN-2008	COLD START		3587	12
2	13:55:23.450 12-JUN-2008	ST1.FLOW.VALUE	-24.98999 LOLO C-ALM (-10	3588	14
3	13:55:23.480 12-JUN-2008	ST1.SUCTION.VALU	-24.98599 LOLO C-ALM (-10	3589	16
4	13:55:23.520 12-JUN-2008	ST1.DISCHARGE.VA	-24.97998 LOLO C-ALM (-10	3590	18
5	13:55:25.790 12-JUN-2008	ST1.INTRUSION.AL/	INTRDR C-ALARM	3591	20
6	13:58:24.670 12-JUN-2008	PLC STOP		3592	21
7	13:58:33.220 12-JUN-2008	WARM START		3593	22
8	13:58:34.770 12-JUN-2008	ST1.INTRUSION.AL/	INTRDR C-RETURN TO NORMAL	3594	24
9	13:58:36.070 12-JUN-2008	ST1.INTRUSION.AL/	INTRDR C-ALARM	3595	26
10	10:17:17.910 13JUN-2008	ST1.TCSETUP.TC00	FALSE TO TRUE STATUS CHAP	3596	49
11	10:17:33.510 13JUN-2008	ST1.TCSETUP.TC02	FALSE TO TRUE STATUS CHAP	3597	50
12	10:17:49.910 13JUN-2008	ST1.TCSETUP.TC01	FALSE TO TRUE STATUS CHAP	3598	51
13	10:18:35.900 13JUN-2008	ST1.TCSETUP.TC00	TRUE TO FALSE STATUS CHAP	3599	52 🚽
	10 10 50 010 10 10 10 0000	LOTA TOOLTUD OF LE		2000	

Field	Definition		
Collect Data	Click here to start the audit collection.		
Data Storage	Click here to call up the Data Storage Parameters dialog box. This can be used to set up the system so that copies of the audit log data currently being viewed, can be stored on your PC. See Section 6.2.1.		
Search Criteria	Click here to call up the Select Data Collection Criteria dialog box. This can be used to filter the amount of data collected. See Section 6.2.2.		

6.2.1 Data Storage

Data Storage Par	ameters		
Store Data on Collection			
- Storage Parameters			
File: I\WebWaterApp\Logs\Station.AUD			
Create File	C Append F	File	
Data Delimiter:	(Space) 💽]	
Convert Da	ata to Exteneded F	ormat	

Note: This only saves a snapshot of the data you have actually viewed on the screen; it does NOT save the entire contents of the audit buffers. As you scroll to bring new data on the screen, it will be added to the specified file. If you want to save ALL Audit data, see Section 6.3

Field	Definition		
Store Data on Collection	If checked, stores the current audit data in view in a file on the PC.		
File	Specifies the path and filename of the audit file on the PC. You can use the [] button to navigate to the appropriate path.		
Create File	If checked, a new file is created for each collection.		
Append File	If checked, new data from a collection is appended to an existing file.		
Data Delimiter	Choose a format for the way the audit data entries will be separated in the file. Choices include a space, comma, or semi-colon.		
Convert Data to Extended Format	Disabled for this application.		
OK	Saves the changes made in this dialog box, and exits to return to the Station Audit Trail page.		
Cancel	Exit the dialog box and return to the Station Audit Trail page, without saving changes.		

6.2.2 Search Criteria

Select Data Collection Criteria	X
Records Both Alarms & Events Events Only Alarms Only	OK Cancel
Search Method Collect All Available Records	
C Start Date:	
Oriection From Oldest to Newest From Newest to Oldest	

Field	Definition
Records	There are three possible choices here:
	Both Alarms & Events
	When this option is selected, both alarm and event data will be displayed.
	Events Only
	When this option is selected, only event data will be displayed.
	Alarms Only
	When this option is selected, only alarm data will be displayed.
Search	This dialog box allows you to filter the audit data which will be displayed.
Method	Collect All Available Records specifies that all audit data from this alarm and event buffer should be collected.
	Start Date will display a list box, from which you can select a particular date. Only audit data with timestamps on that date or newer than that date will be collected.
	Specified Period specifies that only audit data collected during the period you specify should be collected. Choices are 'Today', 'This Week', or 'This Month'.
Direction	Choose From Oldest to Newest to display the records chronologically with the oldest records at the top of the screen, and newest records towards the bottom.
	Choose From Newest to Oldest to display the records in reverse chronological order, with the newest records at the top of the screen, and oldest records towards the bottom.

ОК	Saves the changes made in this dialog box, and exits to return to the Station Audit Trail page.
Cancel	Exit the dialog box and return to the Station Audit Trail page, without saving changes.

6.3 Collection

The Collection button provides another method for collecting, storing and viewing historical data. Many users find this method preferable to the individual View Archives and View Audit methods.

Historical Data Collection			
	Station Name		
Storage Fol	der: C:\OpenBSI\W	ebWaterApp\Logs	Browse
Туре	Description	Log #	Target File
Archive Archive Archive Audit	HUURLY DAILY TREND Audit	1 2 3	
List	CONFIG	11	
<			>
Start Collection Stop Collection View Storage Convert to CSV			

Once the collection is started, it will continue until 'Stop Collection' is selected. The collected log may be viewed and saved to the specified location on the PC as a .CSV formatted file.

Field	Description
Station Name	This is typically the name of the controller. This name will be used as the file basename of the log file.
Storage Folder	This is the directory on the PC where the log files will be stored. This directory must exist. You can type is the folder name or use the [Browse] button to locate it.

Log selection window	The window in the center of the page displays details of the available data in the controller, which can be used to create log files. Included are the Type of data (audit, archive), a Description of the data, a "Log#" which identifies the archive file number (not applicable to audit), and Target File which shows the file extension which will be used for the log file.
	This window is also used to specify which logs you want to collect, view, or convert to CSV. To select a log, click on it. You can select multiple logs for collection by holding down the [Ctrl] key as you select. Once you have selected the logs, you can start the collection by clicking on [Start Collection] . The view and convert options can only be used on one log at a time.
[Start Collection]	When clicked will start collections of all selected logs. This button is disabled if collections are already in progress.
[Stop Collection]	When clicked, will terminate all underway collections. Note: This can result in incomplete data being stored in log files.
[View Storage]	When clicked, will display the contents of the currently selected log file in a separate window on the screen.
[Convert to CSV]	When clicked, will generate a comma separated variable (CSV) file, from the contents of the currently selected log file. This file will be created in the folder specified in the " Storage Folder " field. The filename will be the original file basename, followed by an underscore, followed by the original file extension, then (.CSV) for the extension. For example, the CSV file generated from the log file DAILY.DLY would be named DAILY_DLY.CSV.

Emerson Process Management

Remote Automation Solutions 1100 Buckingham Street Watertown, CT 06795 Phone: +1 (860) 945-2262 Fax: +1 (860) 945-2525 www.EmersonProcess.com/Remote

Emerson Process Management

Remote Automation Solutions 6338 Viscount Rd. Mississauga, Ont. L4V 1H3 Canada Phone: 905-362-0880 Fax: 905-362-0882 www.EmersonProcess.com/Remote

Emerson Process Management Mexico

Viveros de la Colina No 238 Col. Viveros de la Loma Tlalnepantla, Mexico 54080 T +52 (55) 57.28.08.00 F +52 (55) 53.66.26.18 www.EmersonProcess.com/Remote

Emerson Process Management, Ltd.

Remote Automation Solutions Blackpole Road Worcester, WR3 8YB United Kingdom Phone: +44 1905 856950 Fax: +44 1905 856969 www.EmersonProcess.com/Remote

Emerson Process Management AP Pte Ltd. Remote Automation Solutions Division 1 Pandan Crescent Singapore 128461 Phone: +65-6770-8584

Fax: +65-6891-7841 www.EmersonProcess.com/Remote

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