Catalog Number 51350-18

AquaTrend® Interface

Model 51200 – AquaTrend
Model 51350 – AquaTrend/SOM
Model 51400 – Portable AquaTrend

Instrument Manual

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Please read this entire manual before unpacking, setting up, or operating this instrument. Pay particular attention to all danger and caution statements. Failure to do so could result in serious injury to the operator or damage to the equipment.

To ensure the protection provided by this equipment is not impaired, do not use or install this equipment in any manner other than that which is specified in this manual.

Use of Hazard Information

If multiple hazards exist, this manual will use the signal word (Danger, Caution, Note) corresponding to the greatest hazard.

DANGER
Indicates a potentially or imminently hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION
Indicates a potentially hazardous situation that may result in minor or moderate injury.

NOTE
Information that requires special emphasis.

Precautionary Labels

Read all labels and tags attached to the instrument. Personal injury or damage to the instrument could occur if not observed.


This symbol, if noted on the instrument, references the instruction manual for operation and/or safety information.


This symbol, if noted on the product, indicates the need for protective eye wear.


Section 5.3.1, AquaTrend Interface with Signal Output Module (SOM) to PS1201 Power Supply Connections, on page 60.

Specifications

Specifications are subject to change without notice.

Sensor input capability	Eight
Operating humidity	5 to 95% non-condensing
Operating temperature	0 to 40 °C (32 to 104 °F)
Storage temperature	-20 to 60 °C (-4 to 140 °F)
Power requirements	External power supply 12 VDC nominal ±25% (9 to 15 VDC range) with peak to peak ripple to be less than 10% of nominal.
Enclosure	NEMA 4X (indoor), IP 66
Display visibility	LCD backlit, visible at 10 feet with single reading; visible at 3 feet with multiple readings.
Clock	Real time
Mounting	Wall, panel, or pole
Shipping weight	AquaTrend® Interface or AquaTrend with Signal Output Module (SOM): 4 lb Portable AquaTrend Interface: 3 lb
Outputs (AquaTrend with SOM only)	Two current analog outputs; range either 4-20 mA or 0-20 mA (user selectable); both outputs isolated to 500 VDC; may be trimmed ±20% if needed (via AquaTrend Interface).
Relays (AquaTrend with SOM only)	SPDT 250 VAC, 5A resistive
Communications	Echelon® fieldbus compatible; utilizes LonTalk® protocol. Maximum of 400 meters between devices with a 500 meter maximum per segment; distances in excess of 500 meters require a repeater. Up to 3 repeaters can be used for a total network length of 2000 meters.
Data logging capability	1 hour log (1 min. intervals), 30 day log (15 min. intervals)
AquaTrend Interface and AquaTrend/SOM	
	Capable of Master or Remote operation; the Master AquaTrend Interface is capable of communicating with 34 Hach devices including:
	8 sensors and/or analyzers
	8 Signal Output Modules (SOM)
	8 Digital Display Modules (DDM) or 8 Portable AquaTrend Interfaces
	8 Remote AquaTrend Interfaces
	2 Serial I/O Modules (SIO)
Function	Network configuration, system setup, sensor calibration, data logging
Accessories	Network terminator provided on the Signal Output Module (SOM) board or the AquaTrend Interface. One required per network.

Operation

Section 1 General Description

Read this section of the manual to determine the appropriate system configuration for your operation, and to familiarize yourself with basic operating instructions before installing the AquaTrend® Interface.
A Glossary of terms is provided on page 81 to help you understand the AquaTrend Network.

1.1 Introduction

Hach's AquaTrend Interface network system is designed to meet the needs of small and large water analysis facilities alike. Unlike using a dedicated controller for every instrument, the AquaTrend Interface network system uses a single AquaTrend Module to interface a variety of devices. This enables customization of systems to meet a variety of analytical testing needs. The AquaTrend Interface network system utilizes a digital fieldbus communication protocol called LonWorks to perform network operations and data management tasks. Every device on an AquaTrend Interface network must be identifiable in order to communicate with other AquaTrend Interface network devices.

An AquaTrend Interface network system is built by adding an AquaTrend Module to a sensor with a power supply and any other Hach peripheral devices. Power and network connections are required for all AquaTrend Interface devices operating on the network. After physically installing the devices, you must add each device to the AquaTrend Interface network via the network menus in the Master AquaTrend Interface. After adding all devices to the network, you must designate which devices communicate with one another. For example, once a sensor is attached to an AquaTrend Interface, you must instruct the sensor to attach its reading to a designated AquaTrend Interface display channel. Because many underlying network connections occur when performing network operations, it is important to have all existing devices on the network powered and operating normally when network operations are conducted. Careful attention to network management operations and the interconnection of devices will ensure successful operation of the AquaTrend Interface network system.

1.2 Using This Manual

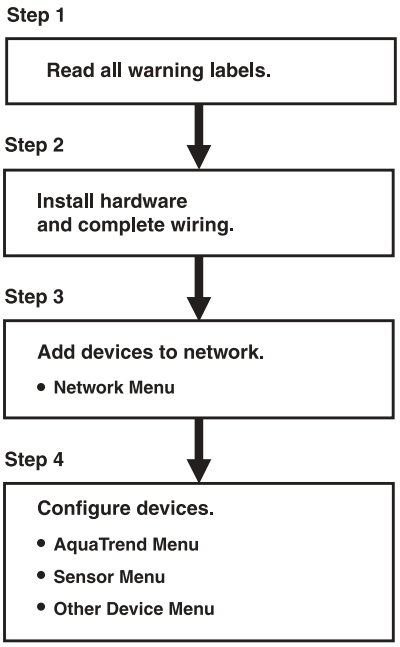
This manual includes setup and operating instructions for AquaTrend Interface, AquaTrend/SOM with integrated Signal Output Module, and Portable AquaTrend Interface. If you are installing an AquaTrend/SOM and want to include relay and analog output connections, see the Signal Output Module (SOM) manual for information on making electrical connections.

Once you have gathered the necessary information to set up the AquaTrend Interface and related sensors, read all instructions and warnings in Section 5 then proceed with the installation.

After making electrical and mechanical adjustments, read Section 2 to decide which devices to include on the network. Then read and follow instructions in Section 3 to set up communications between the AquaTrend Interface and other network devices.

Figure 1 illustrates the basic installation sequence for all AquaTrend Interface Network devices, except the PS1201 Power Supply, and includes references to sections of this manual where instructions can be found.

Figure 1 General Installation Information



Refer to Safety Precautions on page 5 and to the sections referenced on that page.

Section 5 of this manual.

See the Quick Reference Guide and section 3.1.1 on page 23 of this manual.

Section 3 and Section 4 of this manual.

1.3 Unpacking the AquaTrend Interface

After opening the packing carton, remove the insulating foam and identify the device you have received as an AquaTrend Interface, AquaTrend/SOM, or Portable AquaTrend Interface. The AquaTrend Interface and AquaTrend/SOM cartons contain the items listed in Table 1, and the Portable AquaTrend Interface carton contains the items listed in Table 2. Remove the items from the carton and verify that no visible damage has occurred during shipment. Contact Hach Customer Service at 1-800-227-4224 if any items are missing or damaged.

Table 1 Items Packaged with AquaTrend Interface and AquaTrend/SOM

Item	Catalog Number
AquaTrend Interface or AquaTrend/SOM	51200-60 or 51350-60
Bracket, Wall Mount	51409-00
Cable Termination Kit	52156-00
Instruction Manual	51350-18

Table 2 Items Packaged with Portable AquaTrend Interface

Item	Catalog Number
Portable AquaTrend Interface with cable assembly	51400-60
Bracket, Wall Mount	51405-00
Instruction Manual	51350-18

1.3.1 Optional Equipment

Additional items and devices can be obtained to expand the AquaTrend Interface network system. Some of these items are shown below. A more detailed description of network devices and network capabilities can be found in Section 2.

Network Devices

- Serial I/O Module (SIO)
- Signal Output Module (SOM)
- Signal Input Module (SIM)
- Digital Display Module (DDM)
- AquaTrend Interface, AquaTrend/SOM, and Portable AquaTrend Interface
- Sensors, including 1720D Turbidimeter

Other Equipment

- PS1201 Power Supply
- Floor stand
- U-bolts for floor stand or pole mounting
- Network repeater
- Cable

1.4 Instrument Description

The AquaTrend Interface provides a link between sensors and communication devices. This networked system provides simplified use of multiple instruments and requires fewer wiring configurations than systems without a single digital wiring bus.

The AquaTrend Interface is available in three different physical configurations:

- AquaTrend Interface
- AquaTrend Interface with SOM
- Portable AquaTrend Interface

See section 2.2, Device Descriptions on page 18 for additional information on the different configurations.

1.4.1 Operating Environment

Place the AquaTrend Interface in an accessible location, where you can easily see the display and operate the keypad. The backlit display is visible at 3 ft. with multiple readings and at 10 ft. with single reading.

The AquaTrend Interface is designed to operate from 0 to 40 °C (32 to 104 °F) and 5 to 95% relative humidity, non-condensing. The water-tight design meets NEMA 4X (indoor) and IEC 529 IP66 enclosure requirements.

1.4.2 AquaTrend Interface Keypad Description

The AquaTrend Interface keypad is designed for straightforward navigation through the AquaTrend Interface menus. The keypad contains four arrow keys, a DISPLAY key, a MENU key, an EXIT key, and an ENTER key. See Figure 2.

Figure 2 AquaTrend Interface Keypad

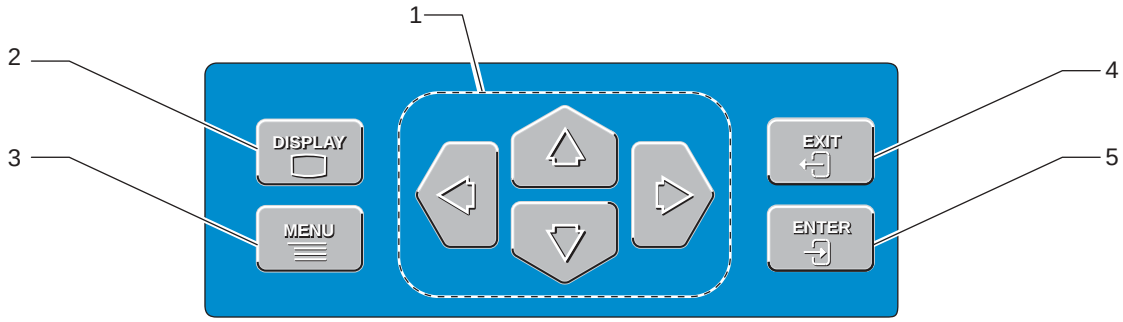
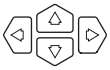


Table 3 AquaTrend Interface Key Functions

Number	Key	Function of Keys
1		Allows you to navigate through the various menus, to change settings, and to move the cursor when observing graph data. Table 4 summarizes the functions of the arrow keys in each menu view.
2		Displays active data in numeric or graphical format. Pressing the DISPLAY key toggles between data presented in numerical form and graphical form.
3		Displays the main menu from any menu level or from the data display.
4		From the Main Menu, pressing the EXIT key provides access to the data display screen. From any other menu level, press the EXIT key to display the previous menu screen. The EXIT key can also be used to abandon any alphanumeric entry or selection process.
5		Press while in any menu to accept menu options and confirm entries.

The arrow icons and their positions in the arrow field in the top right corner of the display (item 7 on Figure 4) indicates the active arrow keys. For example, if three arrow icons are present in the arrow field, pointing up, down, and right, then the up, down, and right arrow keys can be used while viewing that screen. Figure 3 shows examples of the screen categories with summaries of the arrow key functions for each screen category.

Table 4 Arrow Key Functions

Screen Category	Function
1. Menu Screen	Move the pointer to next (down) or previous (up) item. For menus no longer than one page, the pointer will loop around from the bottom to the top or from the top to the bottom. For multiple-page menus, the pointer will move to the next (down) or previous (up) page.
2. Numeric Data Display Screen (1 to 8 numeric readings)	Left and Right Arrow: Changes the number of channels shown. Press the Right Arrow to increase the number of channels or press the Left Arrow to decrease the number of channels. Up and Down Arrow: changes the active channel designation.
3. Graph Display Screen	Up: displays preceding channel graph. Down: displays next channel graph. Left and Right Arrow: moves curser if it is enabled. If not enabled, changes the graph time base.
4. Pop-up Entry Screen	Increment (up) and decrement (down) currently highlighted character. Move highlight to next (right) or preceding (left) character. Loop around at either end.

1.4.3 AquaTrend Interface Display Description

Press the DISPLAY key to alternate between displaying the data in numeric and graphical mode.

- Viewing data in numeric mode allows you to display from one to eight measurements at the same time. When additional measurements are shown on the screen, less information is displayed for those measurements.

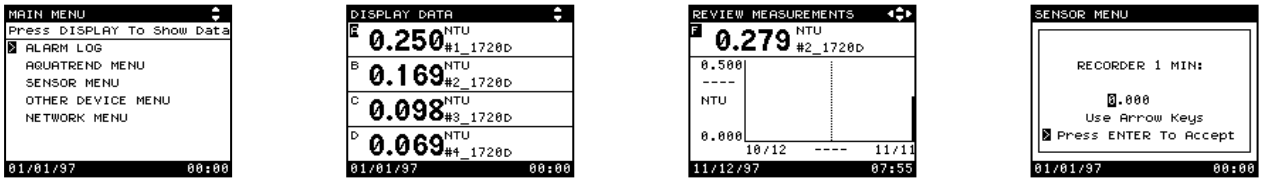
- Viewing data in graphical mode allows you to see a history of sensor readings over the last 2 hours, 8 hours, 30 hours, 7 days, or 30 days, depending on the graph time base selected. However, the AquaTrend Interface displays data for only one channel at a time in the graphic mode.

For details on selecting the number of numeric channels of data shown and the graph time base, see section 3.5.1 and section 3.5.2.

Press the MENU key to return to the Main Menu at any time. To return to data display mode, press either the EXIT or DISPLAY keys.

AquaTrend Interface screens appear in several different formats. Sensor measurements are attached to separate channels, labeled A-P, on the AquaTrend Interface. Refer to Figure 4 and Figure 5 for descriptions of each field.

Figure 3 AquaTrend Interface Display Categories



1. Menu Screen **2. Numeric Data Display Screen** **3. Graph Display Screen** **4. Pop-up Entry Screen**

Figure 4 AquaTrend Interface Menu and Numeric Data Display Fields

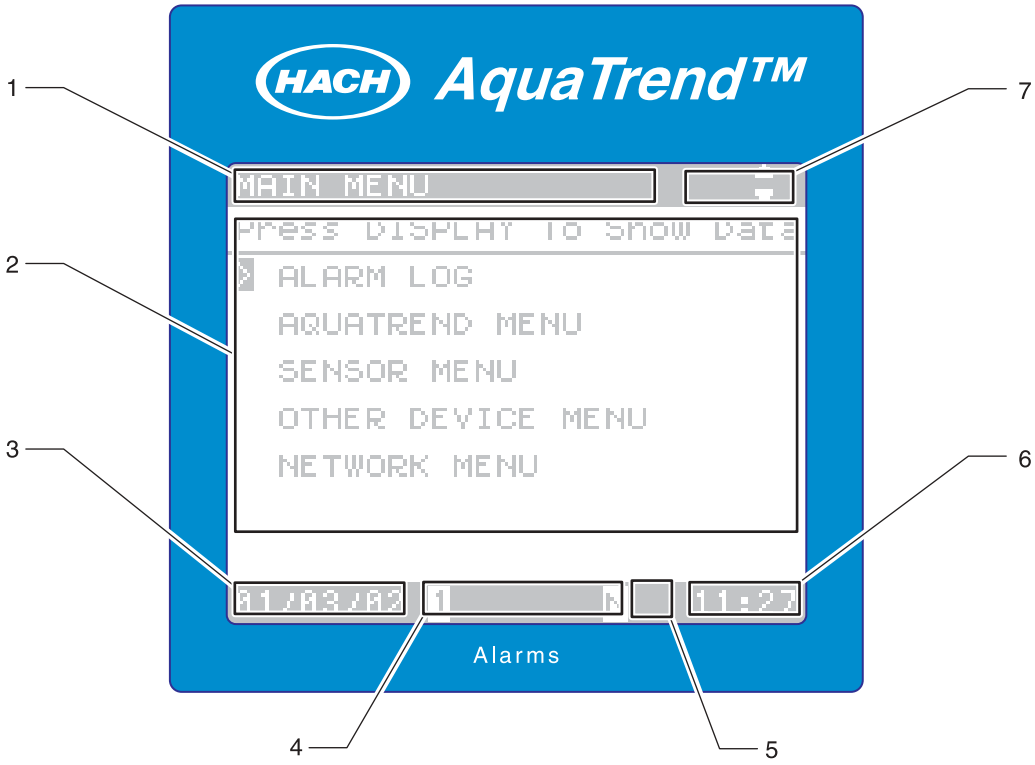


Table 5 AquaTrend Interface Menu and Numeric Data Display Fields

Number	Field	Information Shown in Display Field
1	Status Bar	Numeric Data display: shows DISPLAY DATA Main menu: shows MAIN MENU Lower menus: shows top level menu (main menu item)
2	Text/Data	Numeric data (1- 8 channels), graphical data, menus, and pop up boxes appear here.
3	Date	Current date
4	Alarms	Numbers that appear here, 1 through 8, correspond to the sensor with active alarms. If “N” appears in this field, a Network alarm is active. If no indicators appear in this field, no system alarm is active. See section 4.2 on page 47 for information on reviewing alarms.
5	Security Icon	When displayed, indicates a security level of Partial or Total
	Hourglass Icon	When displayed, indicates the datalog is completing a change. The keyboard buffer is cleared when the icon disappears.
6	Time	Current time displayed as military time (24 hour clock).
7	Navigation Arrow	Direction of these arrow icons correspond to active arrow keys for each screen.

Figure 5 AquaTrend Interface Graph Fields

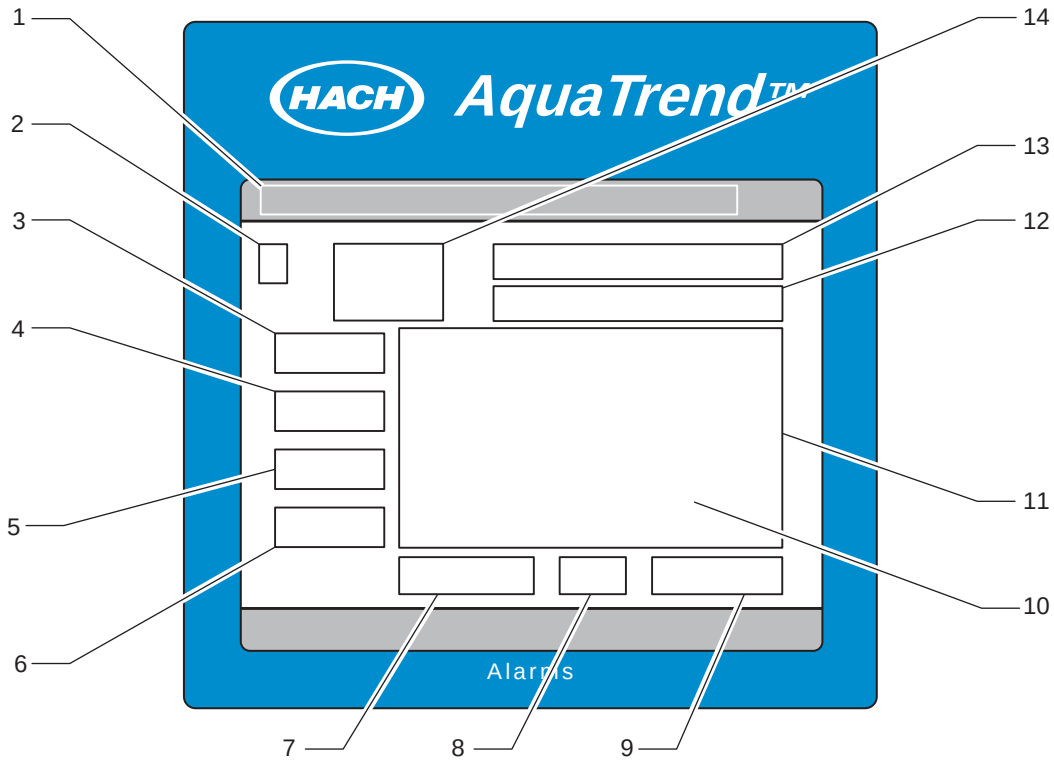


Table 6 Graph Field Descriptions

Number	Field	Information Shown in Graph Field	
1	Status Bar	Shows REVIEW MEASUREMENTS	
2	Channel assignment	Channel number of the measurement shown in the graph	
3	Graph Data — Y-axis upper limit	Upper numeric limit of trend graph data. (Ymax)	
4	Cursor Y-data	Y value of data at cursor position	
5	Units/Species	Units and chemical form (where appropriate) of the measurement on the displayed channel	
6	Graph data — Y-axis lower limit	Lower numeric limit of trend graph data (Y-min)	
7	Graph time — X-axis lower limit	Lower time limit (oldest data).	If data is being reviewed in the 24 hour or 30 day mode, this field is replaced with the date.
8	Cursor Time/Date	Time or date value of data at cursor position	
9	Graph time — X-axis upper limit	Current time (latest data).	If data is being reviewed in the 24 hour or 30 day mode, this field is replaced with the date.
10	Graph Cursor	Retrieves value of data at cursor position	
11	Graph Area	Graph of 60 minutes, 8 hours, 24 hours, 7 days, or 30 days of data. These settings are selectable in the DISPLAY SETUP menu (section 3.5.2 on page 32).	
12	Sensor name	Depending on the sensor type and configuration, the display shows measurement name or the sensor location, or a combination of both.	
13	Units and chemical form	Units and chemical form of the measurement on the channel	
14	Current Data	Most recent measurement (same as numeric display)	

1.5 AquaTrend Interface Menu Organization

The AquaTrend Interface main menu can be accessed at any time by pressing the MENU key. The main menu categories are described in the following sections.

1.5.1 Alarm Log

The alarm log menu provides a historical account of sensor specific alarm information as well as AquaTrend Interface network alarm information.

1.5.2 AquaTrend Interface Menu

The AquaTrend Interface menu provides access to AquaTrend Interface display and status settings. Display settings, language selection, time and date settings, and security settings all reside in the AquaTrend Interface menu. Access this menu to change the way information appears on the AquaTrend Interface screen.

1.5.3 Sensor Menu

The sensor menu contains all sensor specific information including calibration, alarm and recorder setup, measurement options, and sensor diagnostics. The contents of this menu will change based on the sensor you are working with. Since all of these menu items are stored within the sensor, they are designed to be sensor specific. Access this menu to change sensor settings or information.

1.5.4 Other Device Menu

The other device menu contains information specific to accessory devices that are not sensors. Such examples include Signal Output Modules, Serial I/O Modules and Digital Display Modules. Access this menu to change settings or information for non-sensor devices.

1.5.5 Network Menu

The network menu contains information specific to performing network operations. This includes adding, removing, and replacing devices on the network. In addition, it contains menu items needed to establish communications between devices. For example, once a sensor and Digital Display Module are added to the system via the AquaTrend Interface, you must instruct the sensor to attach its reading to the Digital Display Module.

Because many underlying network connections occur when performing network operations, it is important to have all existing devices on the network powered and operating normally when network operations are conducted.

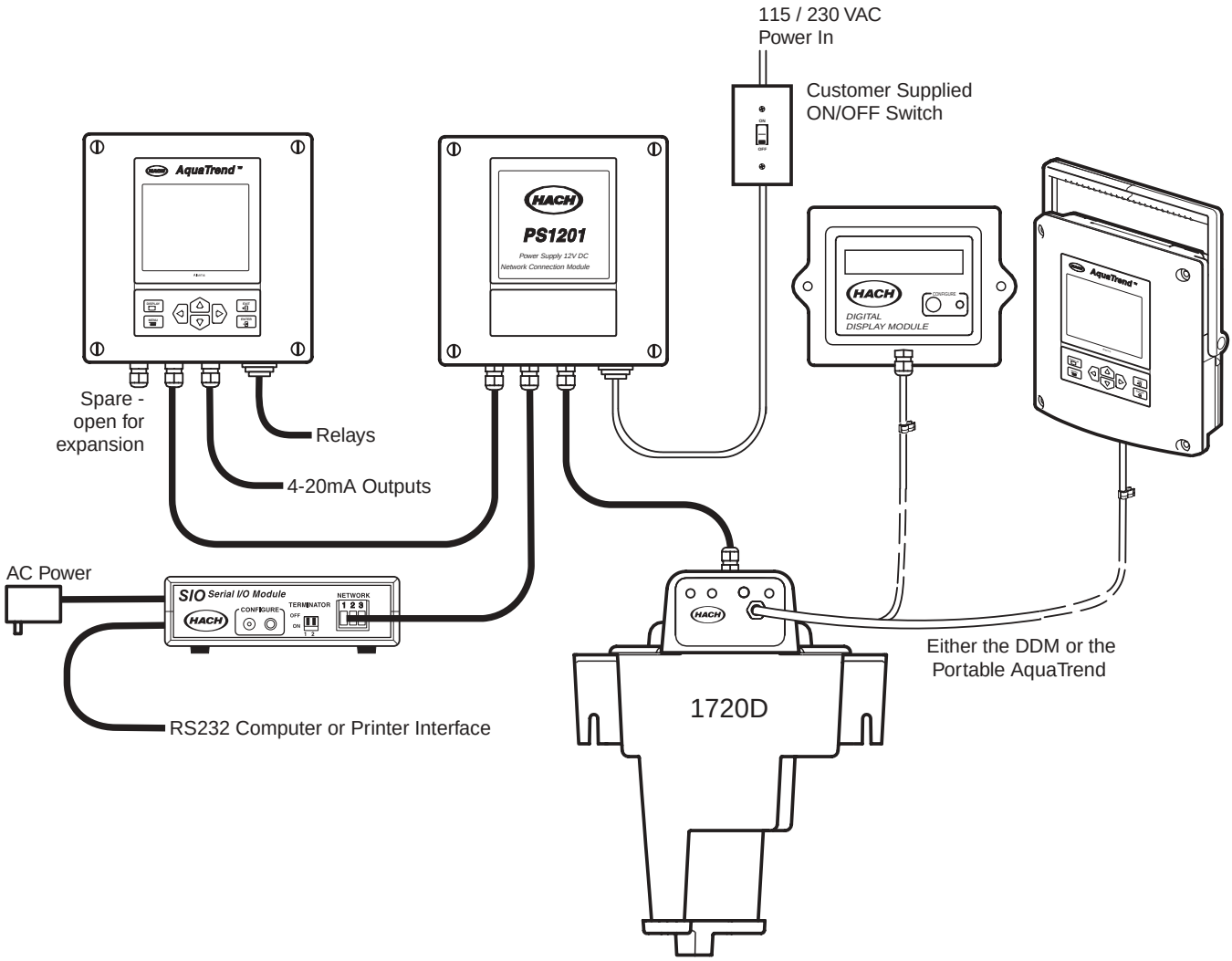
Section 3 and Section 4 of this manual describe how to use these menus together to build and configure your network.

2.1 Network Description

This section describes requirements and options for setting up the AquaTrend Interface Network System. A “network” is the connection of one or more devices (of which at least one is a sensor) to a Master AquaTrend Interface. This Master AquaTrend Interface serves as the network control panel. Devices can include Signal Output Modules (SOM), Digital Display Modules (DDM), Serial I/O Modules (SIO), Remote AquaTrend Interfaces and Portable AquaTrend Interfaces.

Figure 6 shows an example of a single-sensor AquaTrend Interface Network System. An example of a multi-sensor system is shown in Figure 7.

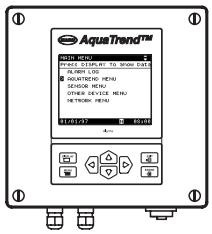
Figure 6 Single-Sensor AquaTrend Interface Network



Each sensor (i.e., the 1720D Turbidimeter) manual provides instructions for setup of the single-sensor network. Each of the other device manuals, (AquaTrend/SOM, AquaTrend Interface, Digital Display Module, Serial I/O Module, Signal Input Module and Signal Output Module) provides setup instructions for their components. *Section 2.3* describes the maximum number of devices that can be managed by one Master AquaTrend Interface on a system.

2.2 Device Descriptions

2.2.1 AquaTrend Interface Module



The two primary functions of the AquaTrend Interface are network management and data display. Network management functions are required only when performing modifications to the network such as adding or removing devices. Multiple AquaTrend Interfaces (up to nine) can exist on a network at any given time. Remote AquaTrend Interfaces serve to display data from one or more sensors and access sensor menus.

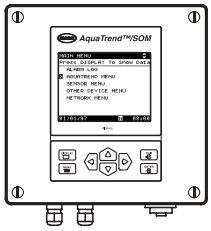
- **Master AquaTrend Interface** – Acts as the main network data control center for setup and operation of the network. The network can contain as many as nine AquaTrend Interfaces but only one can be the Master AquaTrend Interface. Only through the Master AquaTrend Interface can network operations be performed.

- **Remote AquaTrend Interface** – Any AquaTrend Interface on a network that is not a Portable or Master AquaTrend Interface. Remote AquaTrend Interfaces can control and monitor all sensors on the network. Remote AquaTrend Interfaces cannot perform network operations such as adding and removing devices.

- **Portable AquaTrend Interface** – Mobile device designed for set up and calibration of sensors already on the network. Portable AquaTrend Interfaces can communicate with one sensor at a time and cannot perform network operations. See section 2.2.3 and 5.2 for more information about the Portable AquaTrend Interface.

All AquaTrend Interfaces have the capability of functioning as a Master or Remote however, only the Master AquaTrend Interface is allowed to perform network management functions. All AquaTrend Interfaces are shipped from the factory in an undefined (neither Master or Remote) state. When an individual AquaTrend Interface is defined as the Master, any other AquaTrend Interface on the network must be defined as a Remote. An AquaTrend Interface can be redefined (i.e., Remote to Master or Master to Remote); however, existing network connection information will be lost. After changing a Remote to a Master AquaTrend Interface, you must rebuild the network and reestablish communications between devices.

2.2.2 AquaTrend/SOM with Integrated Signal Output Module



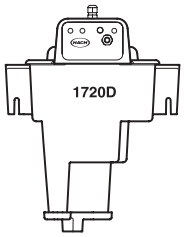
The AquaTrend/SOM Module is a combined AquaTrend Interface and SOM in one enclosure. See section 2.2.1 for information concerning the functions and options for the AquaTrend Interface portion of the combined AquaTrend/SOM and section 2.2.5 for more details about the SOM.

2.2.3 Portable AquaTrend Interface Module



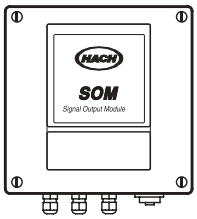
The Portable AquaTrend Interface can access sensor menus for setup and calibration but cannot perform network management functions. The Portable AquaTrend Interface communicates directly to the sensor that it is attached to without interpreting network commands from the Master AquaTrend Interface. Once a network is configured using a Master AquaTrend Interface, the Portable AquaTrend Interface can be used to display and log data from that sensor in the absence of a Master AquaTrend Interface.

2.2.4 Sensor



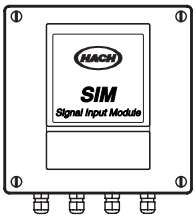
The sensor, such as the 1720D Turbidimeter (shown at left), is the device that analyzes the sample. Sensors may or may not contain an AquaTrend Interface.

2.2.5 Signal Output Module (SOM)



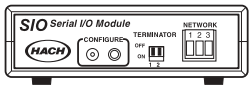
Each SOM provides two relays, each with normally open and normally closed contacts rated at a maximum of 5A/250 VAC, and two analog outputs, selectable through the AquaTrend Interface keypad at either 4-20 or 0-20 mA. Signal Output Module functionality can be provided either in an AquaTrend/SOM or in a separate Signal Output Module. See the *Signal Output Module Manual* for detailed information.

2.2.6 Signal Input Module



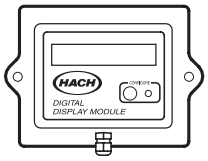
The Signal Input Module (SIM) is configured as a sensor on the network system and provides two 4-20mA analog inputs. These inputs can be used to bring measurements from non-networked sensors into the network. The SIM allows the user to set the value for zero and full-scale inputs and to define the measurement names, units, and species. Two configurable setpoint alarms can be set to trigger relays in a Signal Output Module. Refer to the *Signal Input Module (SIM) Manual* for additional information.

2.2.7 Serial I/O Module (SIO)



The AquaTrend Interface allows the review of data collected over the last 60 minutes, 24 hours, or 30 days. To download the data to a computer or printer, a Serial I/O (SIO) Module must be installed. The SIO provides two-way communication with a computer (PC) or one-way communication with a printer. Use an SIO to permanently log measurement and diagnostic data to a printer or computer. See the *Serial I/o Module Manual* for detailed information.

2.2.8 Digital Display Module (DDM)



The Digital Display Module (DDM) is an eight-character display that can be attached to sensors to provide a local digital reading. Once the display is added to the network and assigned to the sensor by the Master AquaTrend Interface, it will automatically display data from the sensor. For sensors that have multiple parameters (measurements), you can choose which parameter you want to display on the DDM. See the *Digital Display Module Manual* for detailed information.

2.2.9 Repeater Module

The AquaTrend Repeater module is a physical layer repeater used to extend the length of the AquaTrend Network by a maximum of 500 meters. A total of three such devices can be installed on the AquaTrend Network to extend the total length of the network to 2000 meters.

2.3 Network Design

Based on Wiring Topologies on page 83, determine the appropriate configuration for your operation by considering the following criteria; descriptions of each device is given in section 2.2.

Table 7 Maximum Network Capabilities

Device	Number of devices that can be maintained on one AquaTrend Interface Network
Signal Output Module (SOM)	8
Serial I/O Module (SIO)	2
Digital Display Module (DDM)	8
Sensors (A SIM is seen by the network as a sensor. Maximum sensors + SIMs = 8)	8
AquaTrend Interface	1 Master, 8 Remotes

Note: *All AquaTrend Interfaces on a system display measurements and menus, but only the Master AquaTrend Interface can perform network operations through the Network Menu.*

The system can contain as many as nine AquaTrend Interfaces but only one can be the Master AquaTrend Interface. Each AquaTrend Interface is programmed in an undetermined state when shipped from the factory and must be designated as a Master or Remote when initially attached to the network.

If more than one AquaTrend Interface is to be attached to the network, the Master AquaTrend Interface will be designated before other AquaTrend Interfaces are added. Additional AquaTrend Interfaces will be designated as Remotes.

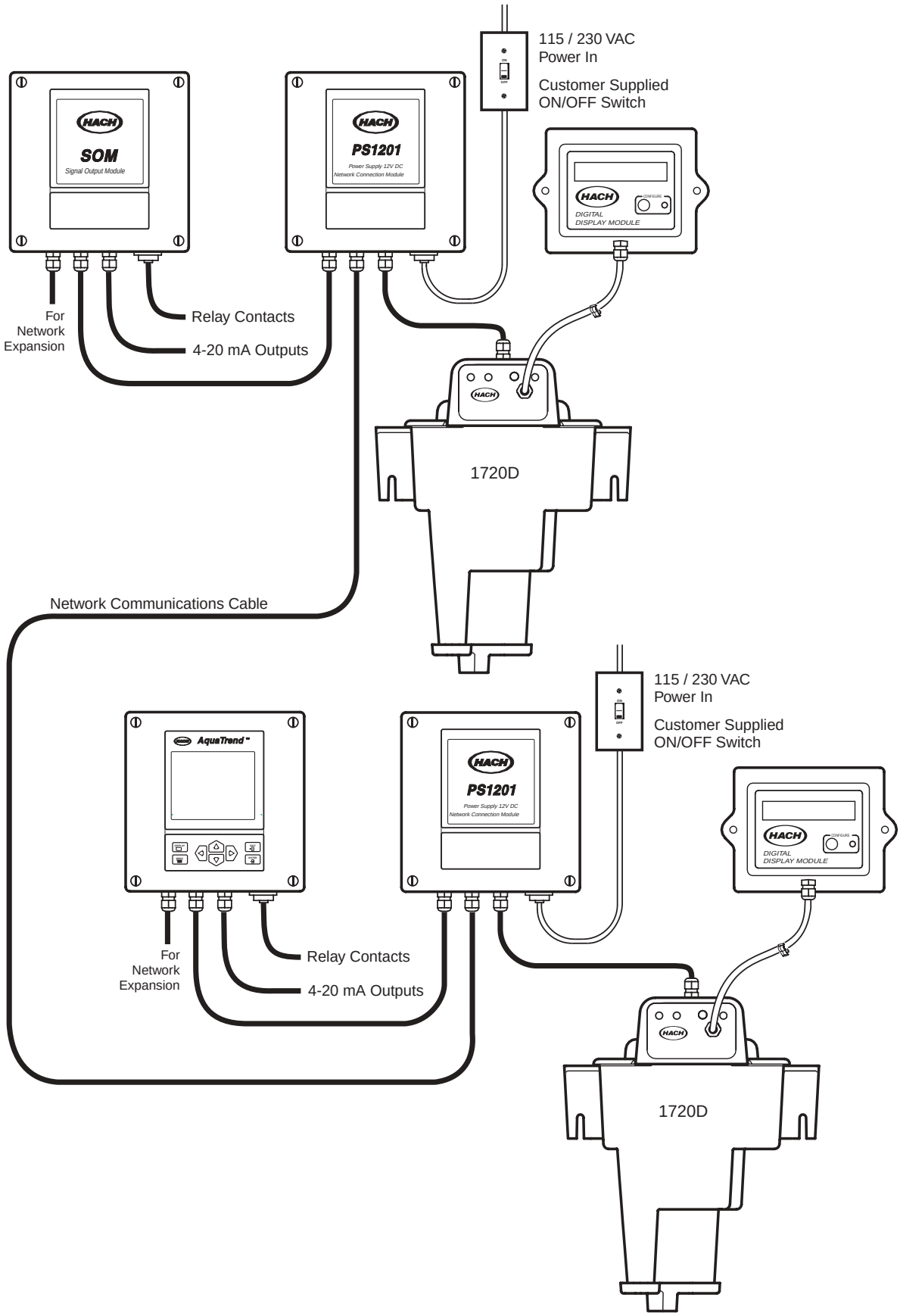
Select the number of PS1201s based on the wattage needed and the distance between the power supplies and the devices. Each PS1201 Power Supply provides 25 watts. Available devices and their wattages are listed below and in the PS1201 manual.

If a system larger than 35 nodes is needed, refer to the information on assigning subnet addresses in Appendix A Use of Subnets on page 75.

Table 8 Wattage Requirements for AquaTrend Interface Devices

Device	Power Required (watts)
AquaTrend/SOM	5
AquaTrend Interface	2
Portable AquaTrend Interface	2
Digital Display Module (DDM)	2
Signal Output Module (SOM)	3
Signal Input Module (SIM)	2
Serial I/O Module (SIO)	Provides its own AC (wall plug) power supply.
1720D Turbidimeter (sensor)	See the 1720D Turbidimeter manual

Figure 7 Example of Multi-Sensor Setup



3.1 Identifying the Master AquaTrend

Every AquaTrend® Interface Network System requires a network manager to perform network operations, such as adding or removing devices. The AquaTrend and AquaTrend with SOM can perform network management functions when set to Master AquaTrend status through the AquaTrend software; however, only one Master AquaTrend can be present on the network at a time. All other AquaTrends must be set to Remote AquaTrend status. Care should be taken when determining the location of the Master AquaTrend Interface.

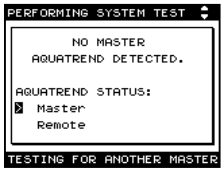
Every AquaTrend Interface is shipped in an undefined state. When connecting only one AquaTrend Interface to the network, it must be designated as the Master AquaTrend Interface.

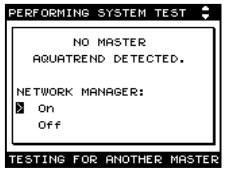
Set the system AquaTrend Interface to Master status as follows:

1. Upon initial power-up, select MASTER and press the ENTER key.

2. Press Enter to select Network Manager to ON. After a brief delay, the display will show the data display screen (CHANNEL NOT ASSIGNED).

3. Press the Menu key to proceed to the Main Menu.







3.1.1 Adding Remote AquaTrend Interfaces to the Network

Upon power up, new AquaTrend Interfaces on the network will search for a Master AquaTrend Interface. (The exception is when installing an AquaTrend Interface that has previously been installed as part of another AquaTrend network. In this case, the AquaTrend that is new to this network will not automatically check for a master. To force it to check, press the EXIT key when instructed to install the remote from the network manager.)

Once a master is identified, the additional AquaTrend Interfaces will assume remote AquaTrend Interface status and can be added to the network using the instructions in section 3.4.2, Adding a Device to the Network.

The Master AquaTrend Interface should not be changed to a remote unless you want to change the location where network operations are performed. A change from Master to Remote AquaTrend Interface status will erase all network information, requiring you to restore network connections.
See section 3.12 on page 41.

3.2 Language Setting

English is the default language of the AquaTrend Interface Network System. To display another language, follow the instructions below:



1. Press the MENU key to begin at the Main Menu.
2. Use the up or down arrow key to select AQUATREND MENU and press ENTER.
3. Select LANGUAGE and press ENTER.
4. Use the up or down arrow keys to move the pointer to the desired language and press ENTER. All screens will be displayed in the selected language.

3.3 Time/Date Setting

Verify the time and date are correct. If necessary, change them as instructed in the following sections.

3.3.1 Setting the Time

1. Press the MENU key to access the Main Menu.
2. Use the up or down arrow key to move the pointer to AquaTrend Menu and press ENTER.
3. Select the SET TIME/DATE option and press ENTER.

Note: *The AquaTrend Interface uses a 24-hour clock (military time), so there is no selection for a.m. and p.m. For example, if the current time is 4:00 p.m., enter the 24-hour format equivalent of 16:00.*

   a. Select SET TIME.
   b. A pop-up box will prompt you to enter the new time. The numbers representing the hour will be highlighted.
   c. Press the up arrow key to increase the hour setting and press the down arrow key to decrease the setting.
   d. When the proper hour is displayed, press the right arrow key and set the minutes as in step c above.
   e. Press ENTER to accept the displayed value, or press EXIT to cancel.









3.3.2 Setting the Date

1. Press the MENU key to access the Main Menu.
2. Use the up or down arrow key to move the pointer to AquaTrend Menu and press ENTER.
3. Select the SET TIME/DATE option and press ENTER.
   a. Select the SET DATE option and press ENTER.
   b. A pop-up box will prompt you to enter the new date.









   c. Press the up and down arrow keys to increment through the available digits. Press the right or left arrow key to move to another character field within the date.
   d. When the proper date is displayed, press ENTER to accept or press EXIT to cancel.

3.3.3 Changing the Date Format

   a. To change the date format, select DATE FORMAT from within the Set Time/Date Menu. A pop-up box will appear requesting SELECT DATE FORMAT.
   b. Select the preferred date format – MM/DD/YY is month/day/year, and DD/MM/YY is day/month/year.









3.3.4 Setting the Correct Day of the Week

The internal calendar programs the day of the week to correspond to the set date. If it is necessary to change the day, proceed as follows:

   a. To change the day of the week, select DAY from within the SET TIME/DATE menu. To change the day setting, which shows the current day of the week, select DAY.
   b. Move the pointer to the correct day and press the ENTER key. The day will move forward automatically with the clock at 24:00 hours.









3.4 Network Setup

A “network” is the connection of one or more devices (at least one must be a sensor) to one or more AquaTrend Interfaces. A “device” can be an additional 1720D sensor, Digital Display Module (DDM), Serial I/O module (SIO), Signal Output Module (SOM), or a remote AquaTrend Interface.

Up to eight sensors, eight Digital Displays, eight remote AquaTrend Interfaces, eight Signal Output Modules, two Serial I/O Modules and all necessary power supplies may be attached to the network.

The two procedures for adding device(s) to the network are presented in section 3.4.1 and section 3.4.2.

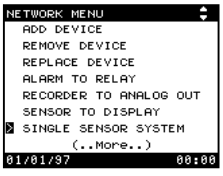
3.4.1 Single Sensor System

Use this feature when installing a complete system with no more than (1) Sensor (the 1720D Turbidimeter is being used in this example), (1) Master AquaTrend Interface, (1) SOM (as an integral part of an AquaTrend Interface or as a separate device), (1) SIO, (1) DDM, and (1) remote AquaTrend Interface. During this procedure, the default device settings are accepted and sensor measurements are automatically assigned to appropriate channels.

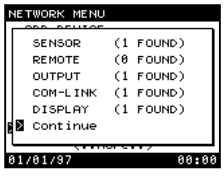


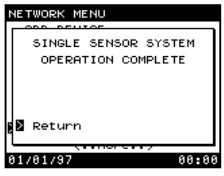
1. Press the MENU key to access the Main Menu.
2. Choose Network Menu.
3. Select SINGLE SENSOR SYSTEM.

   A pop-up box will appear stating SINGLE SENSOR SYSTEM SEARCHING FOR UNCONFIGURED DEVICES.
4. If the system is correctly installed, the display will next show a pop-up box listing all devices found. Press ENTER to install the single sensor system.
5. After configuration, the display will show OPERATION COMPLETE.
6. Press the DISPLAY key to show sensor data.









3.4.2 Adding a Device to the Network

Table 9 presents available device types. Follow the procedure below to add a device. Repeat as many times as is necessary to add all needed devices to the network.

1. Press the MENU key to start from the AquaTrend Interface Main Menu.
2. Press the down arrow key to move the pointer to NETWORK MENU and press ENTER.

Table 9 AquaTrend Interface Device Types

Device Type	Devices
Sensor	1720D Turbidimeter, any APA6000 Analyzer or SIM
Com-Link	Serial I/O Module (SIO)
Outputs	Signal Output Module (SOM)
AquaTrend Interface	Remote AquaTrend Interface
Display	Digital Display Module (DDM)

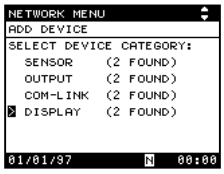
3. Select ADD DEVICE and press ENTER.

A pop-up box will show: SEARCHING FOR UNCONFIGURED DEVICES...PLEASE WAIT.









4. If only one unconfigured device type is connected to the network it will be selected automatically; if more than one type of unconfigured devices is found, select the device type to be added.

Note: *Press the Configure button on the device to be added (press the ENTER key on the AquaTrend Interface) or continue with Step 5 and 6 to make the device selection via the AquaTrend Interface software.*

5. If only one unconfigured device of the selected type is available, it will be selected automatically; if two or more devices of the same type are available, the AquaTrend Interface will ask you to press the configure button on the device you want to add.

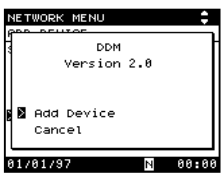
6. Press the configure button on the device to be added, if necessary. Refer to the device's manual if you do not know where to find its configure button.

7. Select ADD DEVICE and press ENTER.

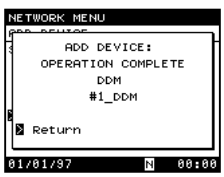
8. The AquaTrend Interface will configure the device and suggest a name. Change the name if necessary, see section 3.7 on page 33. Press ENTER to confirm the name.

The pop-up screen will confirm that the operation is complete.









3.4.3 Removing or Replacing a Device

The remove device procedure is used to remove a device from the network. Doing so will lose all information related to the device.

The replace device procedure is used to replace an existing device with an identical new device. The replace device procedure loses device-specific settings, such as alarm level, measurement options, calibration, and sensor diagnostic settings. The procedure retains network settings, such as alarm to relay connections, and the device name.

3.4.3.1 Removing a Device from the Network

Before physically removing a device from the system, this remove device software procedure must be performed. This assures that all network communications associated with the device are properly removed to avoid miscommunication from other devices on the network. Proceed as follows:

1. Press the MENU key to access the Main Menu.

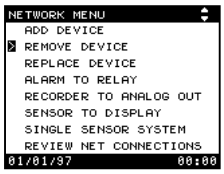
2. Use the up or down arrow key to move the pointer to NETWORK MENU and press ENTER.

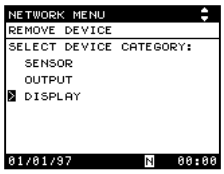
3. Select REMOVE DEVICE and press ENTER.

4. From the list of device categories, select the device type to be removed and press ENTER.

Note: *Press the Configure button on the device to be removed (press the ENTER key on the AquaTrend Interface) or continue with Step 5 and 6 to make the device selection via the AquaTrend Interface software.*



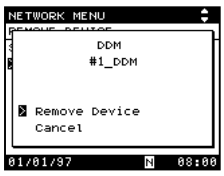




5. Select the specific device to remove and press the ENTER key.

6. Press ENTER to remove the device or move the pointer to CANCEL to end the operation without changes.



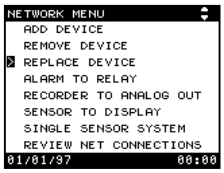


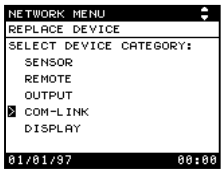
3.4.3.2 Replacing a Device on the Network

Before beginning the replace device procedure, the new device must be physically attached (wired) to the network and powered. Refer to the installation section in the device manual for information.

1. Press the MENU key to access the Main Menu.
2. Use the up or down arrow key to move the pointer to Network Menu and press ENTER.
3. Select REPLACE DEVICE and press the ENTER key. A list of devices to replace will appear.
4. Select the type of device to replace and press ENTER.
5. Select the device to replace (if more than one device is available for replacement) and press ENTER. Or, press the configure button on the device you want to replace (press the ENTER key on a remote AquaTrend Interface). If only one device to replace is available, it will be selected automatically.

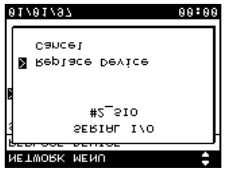


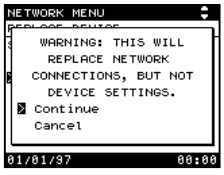






6. A pop-up box will appear showing the device to be replaced. If it is correct, choose REPLACE DEVICE.
7. A warning pop-up box will appear. Select CONTINUE and press the ENTER to continue with the replacement.









8. A search for available replacement devices will begin. If more than one is found, press the configure button on the replacement device (press the ENTER key on a remote AquaTrend Interface).
9. When the replace procedure is complete, a status screen appears. Press the ENTER key to acknowledge and continue normal operations.
10. Now that the device has been replaced you must verify and/or replace all device specific settings.

3.4.4 Attaching a Measurement to a Channel

Although sensors may have been added to the network, readings will not be displayed until a measurement is attached to a channel. AquaTrend Interface sensors can report one or more measurements, depending on the type of sensor. Attach each sensor measurement to one of the eight AquaTrend Interface channels when setting up a new sensor.

1. Press the MENU key to begin at the Main Menu.
2. Use the up or down arrow key to select the AquaTrend Menu and press ENTER.
3. Select DISPLAY SETUP and press ENTER.
4. Select MEASUREMENT TO CHANNEL and press ENTER.



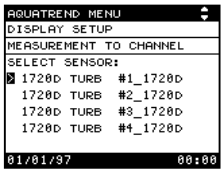


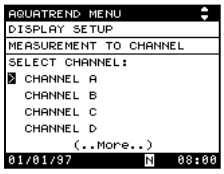


5. Select ATTACH, and press ENTER. A list of available sensors will appear.
6. Select the sensor of interest and press ENTER.
7. Select the channel of interest and press ENTER.
   - If the sensor has more than one measurement available, select the desired measurement and press ENTER.
8. Select ATTACH and press ENTER to continue, or select Cancel to cancel the attachment.

The message OPERATION COMPLETE will appear. The screen will return to the display setup menu upon completion of the measurement to channel setup. To see the data display, press the DISPLAY key.









3.4.5 Detaching a Measurement from a Channel

Proceed as follows to detach a measurement from a channel:

1. Press the MENU key to begin at the Main Menu.
2. Use the up or down arrow key to select the AquaTrend Menu and press ENTER.
3. Select DISPLAY SETUP and press ENTER.

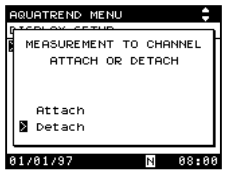
4. Select MEASUREMENT TO CHANNEL and press ENTER.

5. Select DETACH, and press ENTER. A list of attached channels will appear.









6. Select the channel of interest and press ENTER. A detailed description of the channel will appear on the screen.

7. Select DETACH and press enter to continue, or select CANCEL to cancel the operation.

The message OPERATION COMPLETE will appear. The screen will return to the display setup menu upon completion of the measurement to channel setup.





3.5 Additional AquaTrend Interface Menu Features

3.5.1 Display Setup

The DISPLAY SETUP menu lets you adjust the contrast setting and customize several display options.

3.5.1.1 Contrast Adjustment

1. Press the MENU key to access the Main Menu.

2. Select AQUATREND MENU and press ENTER.

3. Select DISPLAY SETUP and press enter. Adjust screen contrast by selecting CONTRAST LEVEL.
   A pop-up box then provides a choice of settings between 0 and 24 (0 = lowest contrast; 24 =highest contrast). Press ENTER to accept.









3.5.1.2 Flash Backlight on Alarm

When an alarm is active, the display can flash to bring attention to the alarm condition. Enable/Disable the Backlight on Alarm as follows:

1. Press the MENU key to access the Main Menu.
2. Select AquaTrend Menu and press ENTER.
3. Select DISPLAY SETUP and press ENTER.
4. Move the pointer to FLASH ON ALARMS. YES or NO will be displayed to the right of that line.
   - If the displayed option is correct, press the EXIT key to return to the previous menu level.
   - If the displayed option is not correct, press enter. A pop-up window will appear. Use the arrow keys to move the pointer to the desired option and press the enter key to accept it. Press the EXIT key to return to the previous menu.









3.5.2 Channel Graph Time Settings

Press the **DISPLAY** key to view the data graph screen. The AquaTrend Interface can display the data collected in graph form over the past 2 hours, 8 hours, 30 hours, 7 days, or 30 days. Graph time appears on the x-axis (horizontal axis), the range of recent sensor readings are shown on the y-axis (vertical axis). The default graph time is 60 minutes for all channels.

Enable the graph cursor by pressing the ENTER key. The cursor will appear in the center of the graph; use the right and left arrow keys to move the cursor. The data field on the left of the screen will show the reading at the graph cursor position. Disable the graph curser by pressing the EXIT key.

3.5.2.1 Setting the Graph Time (x-axis)

1. Press the DISPLAY key until a graph is displayed.
2. Press the up or down arrow keys to select the channel of interest.
3. Press the right or left arrow key to change the time base. The time base will cycle through 2 hours, 8 hours, 30 hours, 7 days, and 30 days. The time scale is shown below the X-axis.

3.5.2.2 Scaling the Graph Y-axis

This function is used to set the graph range (span) for the units of the measurement being displayed.

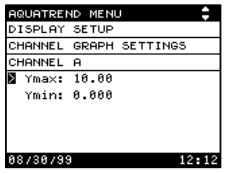
1. Press the MENU key to access the Main Menu.
2. Select AquaTrend Menu and press ENTER.

3. Select Display Setup and press ENTER.









4. Select CHANNEL GRAPH SETTINGS from the Display Setup Menu and press ENTER. A list of available channels will appear.

5. Select the channel of interest and press ENTER.

6. Select YMAX: and press ENTER.

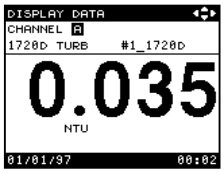
7. Use the arrow keys to change the displayed value.

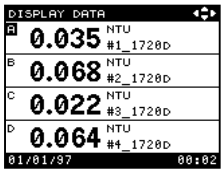
Repeat Steps 6 and 7 to change the YMIN: displayed value.
Negative numbers may be entered by changing the first character to a negative sign with the arrow keys.

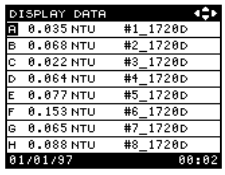
3.6 Display Setup

The AquaTrend Interface can display data from a single sensor or from up to eight sensors at one time. Viewing additional channels reduces the amount of information shown for each channel.

Access the display mode by pressing the DISPLAY key. Use the right arrow key to increase the number of channels displayed on the screen. Press the left arrow key to decrease the number of channels displayed. The up and down arrow keys move the active channel designation.







3.7 Edit Name

Change the name of the AquaTrend Interface as follows:

1. Press the MENU key to access the Main Menu.

2. Move the pointer to AQUATREND MENU and press the ENTER key.

3. Select EDIT NAME and press the ENTER key.

4. Use the arrow keys (right or left arrows to move to another character space in the name and up or down arrows to scroll through the available

characters) to create a new name (up to 12 characters). Press ENTER to accept the displayed name.







3.8 Security Setup

The AquaTrend Interface system may be protected from changes using the security options provided in the software. To limit access to the AquaTrend Interface Network setup features, set security options by entering a password and designating the security level or by accessing a temporary lockout option. This can control unauthorized changes to system setups. The factory default password is HACH and the default security level is NONE. A security level of NONE allows access to all functions.

3.8.1 Setting the Password

Enter a new four digit password as follows:

1. Press the MENU key to access the Main Menu.
2. Select the AquaTrend Menu option, and press ENTER.
3. Select SECURITY SETUP and press ENTER.





4. Select SET PASSWORD and press ENTER.
5. Use the arrow keys (right or left arrows to move to another character space and the up or down arrows to scroll through the available characters) to enter the current four-digit password (the factory default password is HACH) and press the ENTER key.
6. Use the arrow keys to enter a new four digit password and press ENTER.
7. Re-enter the new password and press ENTER to confirm or press EXIT to cancel.









3.8.2 Setting the Security Level

The security level may be set to restrict the functions which may be accessed via the AquaTrend Interface. The security level options are None, Partial, or Total.

Select NONE to allow changes to all menu items.

Select PARTIAL to allow only the following to be accessed without a password:

- All of the Display Setup Menu
- LANGUAGE

Select TOTAL to make all menus visible but with no option to change settings (except CONTRAST LEVEL) without a password.

Change the security level as follows:

1. Press the MENU key to access the Main Menu.

2. Select AquaTrend Menu, and press ENTER.

3. Select SECURITY SETUP and press ENTER.







Move the pointer to SECURITY LEVEL and press ENTER.

4. Use the arrow keys (right or left arrows to move to another character space and the up or down arrows to scroll through the available characters) to enter the current four-digit password (the factory default password is HACH) and press the ENTER key.

5. Move the pointer to one of the displayed options (NONE, PARTIAL or TOTAL) and press the ENTER key to accept the selection.





3.8.2.1 Temporary Unlock

If the Security level is set to Partial or Total, unlock the keypad for a chosen duration of time as follows:

1. Press the MENU key to access the Main Menu.
2. Move the pointer to Aquatrend Menu and press the ENTER key.
3. Select SECURITY SETUP and press the ENTER key.



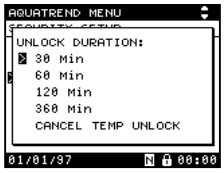


4. Select TEMPORARY UNLOCK and press the ENTER key.
5. Enter the current password and press the ENTER key.
6. Use the arrow keys to move the pointer to the required unlock duration and press the ENTER key.

To cancel temporary unlock, perform steps 1- 5 and select CANCEL TEMP UNLOCK and press ENTER.









When the temp unlock mode is activated, the time remaining in the unlock period alternatively displays with the real-time clock in the lower, right-hand corner of the display.

3.9 Additional Network Menu Features

3.9.1 Review Net Connections

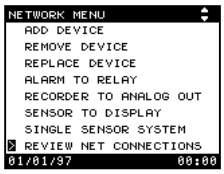
This feature allows the user to review of all the device connections on the network.

Access the menu as follows:

1. Press the MENU key to access the Main Menu.
2. Move the pointer to NETWORK MENU and press the ENTER key.
3. Use the up or down arrow keys to move the pointer to REVIEW NET CONNECTIONS and press the ENTER key.

Proceed with the following sections to access LIST NETWORK DEVICES, ALARM TO RELAY, REC TO ANALOG OUT, and SENSOR TO DDM CONNECTIONS.

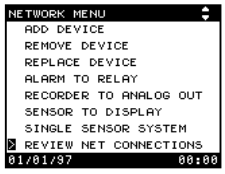


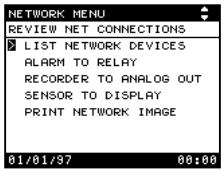


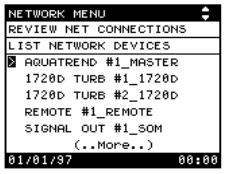
3.9.1.1 List Network Devices

1. Press the MENU key to access the Main Menu.
2. Move the pointer to NETWORK MENU and press the ENTER key.
3. Use the up or down arrow keys to move the pointer to REVIEW NET CONNECTIONS and press the ENTER key.
4. Select LIST NETWORK DEVICES and press the ENTER key. If necessary, select the device category you would like to review.









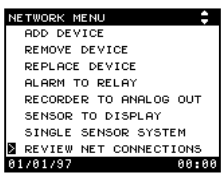
3.9.1.2 Displaying Alarm to Relay Connection Information

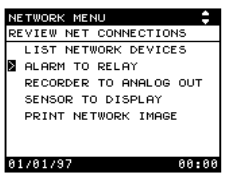
The Alarm to Relay connections identify which sensor alarm is attached to which SOM relay.

1. Press the MENU key to access the Main Menu.
2. Move the pointer to NETWORK MENU and press the ENTER key.
3. Use the up or down arrow keys to move the pointer to REVIEW NET CONNECTIONS and press the ENTER key.
4. Select ALARM to RELAY and press ENTER.

All alarm to relay connections will be displayed.





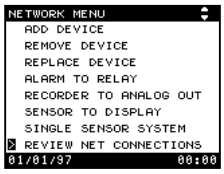


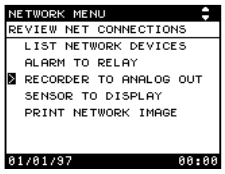
3.9.1.3 Displaying Recorder to Analog Out Information

The information identifies which sensor alarm is attached to each individual SOM recorder.

1. Press the MENU key to access the Main Menu.
2. Move the pointer to Network Menu and press the ENTER key.
3. Select REVIEW NET CONNECTIONS and press the ENTER key.
4. Use the up or down arrow keys to move the pointer to RECORDER TO ANALOG OUT and press the ENTER key. All recorder to analog out connections will be displayed.





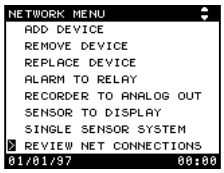


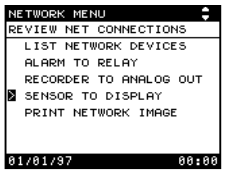
3.9.1.4 Sensor to Display

The sensor to display connections identify which sensor is attached (via the software) to which Digital Display Module (DDM). The setup procedure for the DDM allows the user to send the data from any sensor to any DDM on the system, even if the DDM is not physically connected to that sensor. To determine which sensor the DDM is attached to (via the software), proceed as follows:

1. Press the MENU key to access the Main Menu.
2. Move the pointer to NETWORK MENU and press the ENTER key.
3. Select REVIEW NET CONNECTIONS and press the ENTER key.
4. Select SENSOR TO DDM and press ENTER.





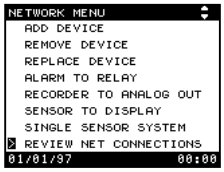


Sensor to DDM connection information will be displayed.

3.9.1.5 Print Network Image

The Print Network Image function will output the Master AquaTrend Interface database, via the Serial Input/Output (SIO) module(s) on the system.





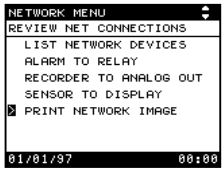


Figure 8 Sample Printout

```
[0] PRINT NETWORK IMAGE
[0] 12/18/97  08:53:32
[0]
[0] AQUATREND #1_MASTER
[0] 1720D TURB #1_1720D
[0] REMOTE #1_REMOTE
[0] SIGNAL OUT #1_SOM
[0] SERIAL I/O #1_SIO
[0] DDM #1_DDM
[0]
[0] 1720D TURB #1_1720D
[0] ALARM 1
[0] SIGNAL OUT #1_SOM
[0] RELAY 1
[0]
[0] 1720D TURB #1_1720D
[0] ALARM 2
[0] SIGNAL OUT #1_SOM
[0] RELAY 2
[0]
[0] 1720D TURB #1_1720D
[0] RECORDER 1
[0] SIGNAL OUT #1_SOM
[0] ANALOG OUT 1
[0]
[0] 1720D TURB #1_1720D
[0] RECORDER 2
[0] SIGNAL OUT #1_SOM
[0] ANALOG OUT 2
```

3.10 Print Data Log

An SIO Module is required for computer/printer interface to enable logged data to be printed. Access the menu as follows:

1. Press the MENU key to access the Main Menu.
2. Use the up or down arrow key to move the pointer to AquaTrend Menu and press ENTER.
3. Select PRINT DATA LOG and press ENTER.

4. Choose the channel (A–P) for which the data is to be printed by moving the pointer to the appropriate channel and pressing ENTER.



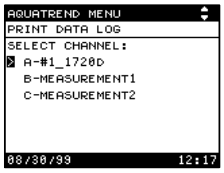


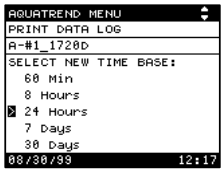
5. Choose the timebase of the data to be printed.

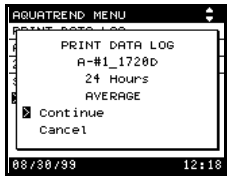
   a. Select TIME BASE and press ENTER.

   b. Move the pointer to the appropriate time base and press ENTER.

6. A pop-up display will show the instrument, timebase and type of values to be printed. Press ENTER to continue.







3.11 External Network Manager

If an external network manager is used, internal network management of the AquaTrend must be disabled.

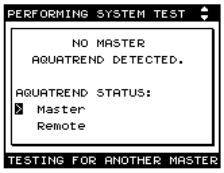
Access the Network Manager function and disable AquaTrend network management as follows:

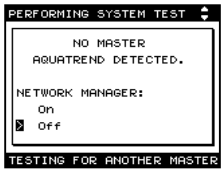
1. Perform the AquaTrend cold start procedure. Refer to section 6.2.6 on page 72 for instructions.

2. Select MASTER and press the ENTER key.

3. Select NETWORK MANAGER OFF and press the ENTER key.

An external manager may now access the Master AquaTrend Interface.





3.12 Restore Net Connections

The Restore Net Connections Menu option is used to restore all device connections previously on the network to a Master AquaTrend Interface functioning as the Network Manager. The data log information will be lost; that information should be recorded or down loaded to a printer or personal computer via an SIO (with appropriate software, such as Windows 3.1 Terminal or Windows 95 Hyperterminal) before the Restore Net Connections procedure is initiated.

Begin the Restore Net Connections procedure as follows:

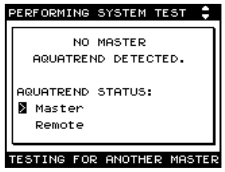
1. Perform a cold start on the AquaTrend Interface to remove any residual information which may affect the recovery process. Refer to section 6.2.6 on page 72 for instructions. If a replacement AquaTrend Interface is being installed, physically attach the AquaTrend Interface to power and to the network.

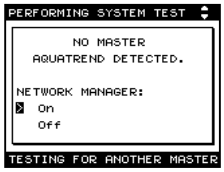
2. From the initial AquaTrend Interface screens, select MASTER and press ENTER.

3. Select NETWORK MANAGER and press ENTER.

4. Press the MENU key to return to the Main Menu.

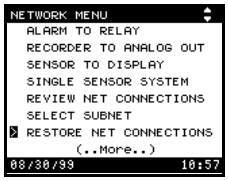
5. Use the arrow keys to move the pointer to Network Menu.

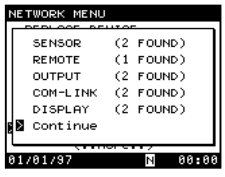




6. Select RESTORE NET CONNECTIONS and press the enter key. A list of devices found will be shown. If the list of devices appears correct, press the ENTER key.

Note: *If the list of devices is incomplete, press the EXIT key. Make sure all devices are on-line and powered and repeat Step 6. If all expected devices are still not found, press ENTER and continue this procedure. Missing devices may be added later using the Add Device procedure in section 3.4.2 on page 26.*









7. A progress indicator screen will appear as the network is restored. Press the ENTER key to complete the procedure.

8. Select REVIEW NET CONNECTIONS and press the ENTER key.

9. Select LIST NETWORK CONNECTIONS and press the ENTER key. All connected devices will be shown in the resulting display. Scroll through the list and ensure all devices were restored onto the network.

Note: *If a device still is not shown on the display, add it using the Add Device procedure given in section 3.4.2 on page 26.*

10. Press the EXIT key to return to the previous menu. Select ALARM TO RELAY and check/correct all displayed information.

11. Press the EXIT key to return to the previous menu. Select RECORDER TO ANALOG OUT and check/correct all displayed information.

12. Press the EXIT key to return to the previous menu. Select SENSOR TO DISPLAY and check/correct all displayed information.

After the Restore Net Connections procedure is completed and all devices are present on the network, you must:

1. Reset the date and time (see section 3.3 on page 24).

2. Reattach measurements to channels (see section 3.4.4 on page 30).

3. Redefine graph settings (see section 3.5.2 on page 32*)*

4. If SOM parameters such as comm loss, range, and trim (if range is set to other than the default) were customized, those custom parameters will need to be reestablished. Please refer to the *SOM Manual*, Cat. No. 51250-18.

4.1 Alarm to Relay Connections

Sensors allow you to set up a number of alarms for various conditions. If a sensor measurement is attached to a channel on the AquaTrend® Interface, and an alarm is activated on that sensor, a number appears at the bottom of the display. That number corresponds to the channel with the active alarm (see number 4 in Table 5 on page 14).

After setting up the sensor alarm parameters as specified in the sensor manual(s), the next step is to attach the alarm signals to an electrical relay in a Signal Output Module (SOM). The AquaTrend Interface system allows you to attach one alarm from a sensor to one relay on any SOM on the network. See section 4.1.1 and section 4.1.2 below.

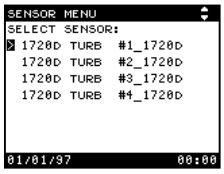
Each SOM (stand-alone unit or built into the AquaTrend Interface) provides two analog outputs and two relays to the network. As many as eight SOMs can be added to the network.

4.1.1 Setting Alarm Parameters

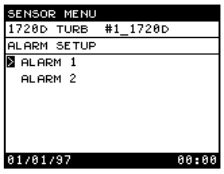
Sensors have various numbers and types of alarm signals available. Define the conditions under which an alarm signal will be triggered through the Alarm Setup menu of the sensor containing that alarm.

1. Press MENU to access the Main Menu.
2. Select Sensor Menu and press ENTER.
3. Select the sensor of interest (choose a sensor shown on the display and press the ENTER key or press the configure button on the sensor).
4. Select ALARM SETUP and press ENTER.
5. Select ALARM 1 or 2 and press enter. Configure the alarm according to instructions in the sensor or analyzer's manual. Each sensor or analyzer contains its own alarm parameters.









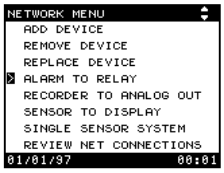
4.1.2 Attaching an Alarm to a Relay

To control a relay in an output device with the alarm signal, the alarm must be attached to the relay of interest. Proceed as follows:

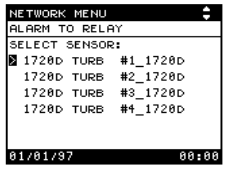
1. Press the MENU key to access the Main Menu.
2. Select the Network Menu option and press ENTER.
3. Select ALARM TO RELAY and press ENTER. A pop-up box will ask whether you want to attach or detach an alarm to/from a relay.
4. Select ATTACH and press ENTER.

5. Select the sensor of interest and press ENTER.







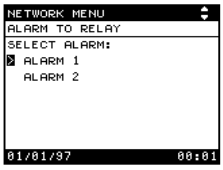


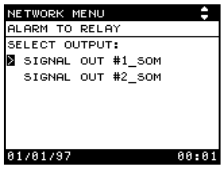
6. Select the desired alarm and press ENTER.

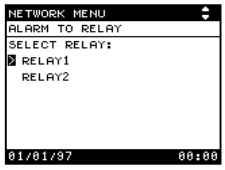
7. Select the SOM of interest and press ENTER.

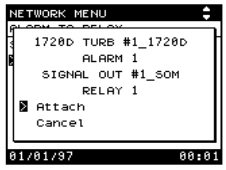
8. Choose the relay to attach to the alarm selected in step *6* and press ENTER.

9. A screen showing the proposed connections will then appear. Select ATTACH ALARM TO RELAY and press enter to confirm the setting. Select CANCEL then press ENTER to exit without making changes.









The message CONFIGURING NETWORK...PLEASE WAIT will appear, followed by OPERATION COMPLETE when the alarm has been attached.

4.1.3 Detaching an Alarm from a Relay

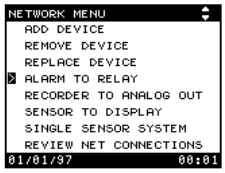
1. Press the MENU key to access the Main Menu.

2. Select the NETWORK MENU option and press ENTER.

3. Select ALARM TO RELAY and press ENTER.

4. Select DETACH from the resulting pop-up box and press ENTER.





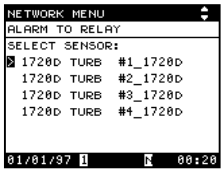


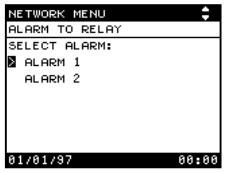
5. A list of sensors from which to choose will be displayed. Select the sensor of interest from the list and press the ENTER key or press the configure button on the sensor of interest.

6. Select the alarm of interest and press ENTER.

7. A screen showing all of your selections will appear. Select DETACH ALARM FROM RELAY and press enter to confirm the setting or select CANCEL then press ENTER to exit without making changes.

The message CONFIGURING NETWORK...PLEASE WAIT, followed by OPERATION COMPLETE will appear when the alarm has been detached.







4.1.4 Connecting a Recorder Signal to an Output Device

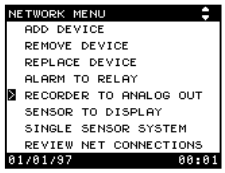
The output device must be properly configured before attempting to configure the sensor's recorder signals. Refer to the *Signal Output Module Instruction Manual* for more information.

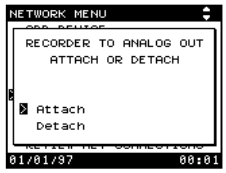
1. Press the MENU key to access the Main Menu.

2. Select Network Menu and press ENTER.

3. Select RECORDER TO ANALOG OUT and press ENTER.

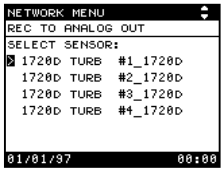


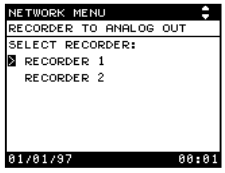




4. Select ATTACH and press ENTER.

   - If only one sensor is available for relay attachment, go to step *5*.
   - If two or more sensors are found on the network, the AquaTrend Interface will present a list of sensors from which to choose. Select the sensor of interest and press ENTER
   - If two or more recorders are available, a menu showing available recorders will appear. Select the recorder of interest and press ENTER.
   - If two or more Signal Output Modules are available, select the SOM of interest and press ENTER.

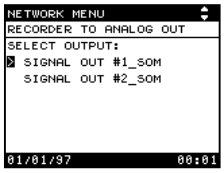


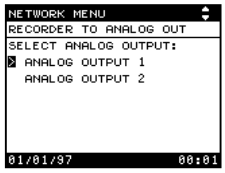


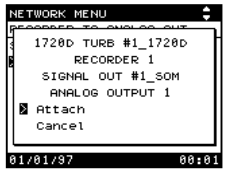
5. Select RECORDER 1 or RECORDER 2 and press ENTER.

6. A screen showing all of your selections will then appear. Select ATTACH RECORDER TO ANALOG OUTPUT and press ENTER to confirm the setting or select CANCEL and press ENTER. The message CONFIGURING NETWORK...PLEASE WAIT will appear.

The OPERATION COMPLETE message will appear when the attachment is complete.







4.1.5 Detaching Recorder from Analog Output

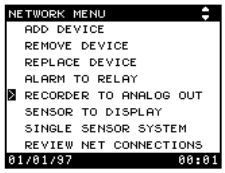
1. Press the MENU key to access the Main Menu.

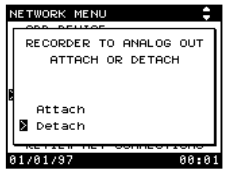
2. Select Network Menu and press ENTER.

3. Select RECORDER TO ANALOG OUT and press ENTER.

4. Select DETACH and press ENTER.



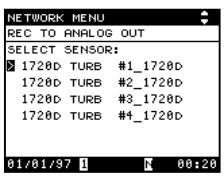


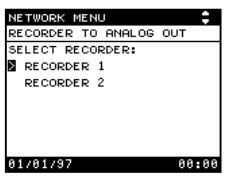


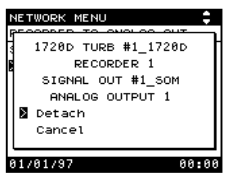
- If two or more sensors are found on the network, the AquaTrend Interface will present a list of sensors from which to choose. Select the sensor from the list.
- If two or more recorders are attached, a menu showing Attached Recorders will appear. Select the recorder of interest and press ENTER.
- If two or more Signal Output Modules are available, a menu of SOMs will appear. Select the SOM of interest and press ENTER.

5. A screen showing all of your selections will then appear. Select DETACH RECORDER FROM ANALOG OUTPUT and press ENTER to confirm the setting or select CANCEL to exit without making changes. The message CONFIGURING NETWORK...PLEASE WAIT will appear.

The OPERATION COMPLETE message will appear when the detachment is complete.





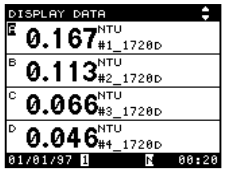


4.2 Alarm Log

This section explains how to obtain information concerning active alarms in addition to a history of each alarm on the system.

When an alarm becomes active on a sensor or analyzer, a number from 1 to 8 will become visible on the bottom of the screen (see Figure 4, item 4, on page 14) and if the FLASH BACKLIGHT option has been enabled, the entire display will flash. The alarms may suggest an over- or under-range condition, or a Sensor Warning.

"N" will appear on the bottom of the screen for an AquaTrend or network alarm. AquaTrend or network alarms may appear when there has been a loss of power or network communication.



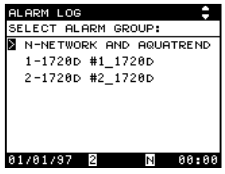
If an alarm annunciator shows up at the bottom of the screen, follow these steps to review the alarm:

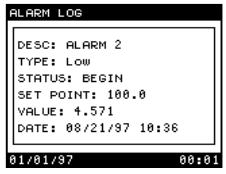
1. Press the MENU key to begin at the Main Menu.
2. Press the up arrow key to move the pointer to the ALARM LOG option and press ENTER.
3. Select the alarm group you want to review and press ENTER.
4. Select any alarm and press ENTER to review information about that alarm.

Note: *The AquaTrend Interface can display up to 14 alarms for each alarm group.*

5. Details of the selected alarm including the date and time the alarm occurred will appear on the screen.







Installation and Maintenance

DANGER

Some of the following manual sections contain information in the form of warnings, cautions and notes that require special attention. Read and follow these instructions carefully to avoid personal injury and damage to the instrument. Only personnel qualified to do so, should conduct the installation/maintenance tasks described in this portion of the manual.

DANGER

Certains des chapitres suivants de ce mode d'emploi contiennent des informations sous la forme d'avertissements, messages de prudence et notes qui demandent une attention particulière. Lire et suivre ces instructions attentivement pour éviter les risques de blessures des personnes et de détérioration de l'appareil. Les tâches d'installation et d'entretien décrites dans cette partie du mode d'emploi doivent être seulement effectuées par le personnel qualifié pour le faire.

PELIGRO

Algunos de los capítulos del manual que presentamos contienen información muy importante en forma de alertas, notas y precauciones a tomar. Lea y siga cuidadosamente estas instrucciones a fin de evitar accidentes personales y daños al instrumento. Las tareas de instalación y mantenimiento descritas en la presente sección deberán ser efectuadas únicamente por personas debidamente cualificadas.

GEFAHR

Einige der folgenden Abschnitte dieses Handbuchs enthalten Informationen in Form von Warnungen, Vorsichtsmaßnahmen oder Anmerkungen, die besonders beachtet werden müssen. Lesen und befolgen Sie diese Instruktionen aufmerksam, um Verletzungen von Personen oder Schäden am Gerät zu vermeiden. In diesem Abschnitt beschriebene Installations- und Wartungsaufgaben dürfen nur von qualifiziertem Personal durchgeführt werden.

PERICOLO

Alcune parti di questo manuale contengono informazioni sotto forma d'avvertimenti, di precauzioni e di osservazioni le quali richiedono una particolare attenzione. La preghiamo di leggere attentivamente e di rispettare quelle istruzioni per evitare ogni ferita corporale e danneggiamento della macchina. Solo gli operatori qualificati per l'uso di questa macchina sono autorizzati ad effettuare le operazioni di manutenzione descritte in questa parte del manuale.

DANGER
This instrument should be installed by qualified technical personnel to ensure adherence to all applicable electrical codes.

PELIGRO
Este instrumento debe ser instalado por personal técnico capacitado para asegurar el cumplimiento con todos los códigos eléctricos y de plomería aplicables.

PERIGO
Este instrumento deve ser instalado por pessoal técnico qualificado para asegurar o cumprimento de todas as normas elétricas e de canalização aplicáveis.

DANGER
Cet appareil doit être installé par du personnel technique qualifié, afin d'assurer le respect de toutes les normes applicables d'électricité et de plomberie.

GEFAHR
Um zu gewährleisten, daß alle elektrischen und sanitärinstallationstechnischen VDE-Vorschriften und gegebenenfalls die Zusatzvorschriften der zuständigen Elektrizitäts- und Wasserwerke erfüllt werden, darf dieses Gerät nur von geschultem Fachpersonal installiert werden.

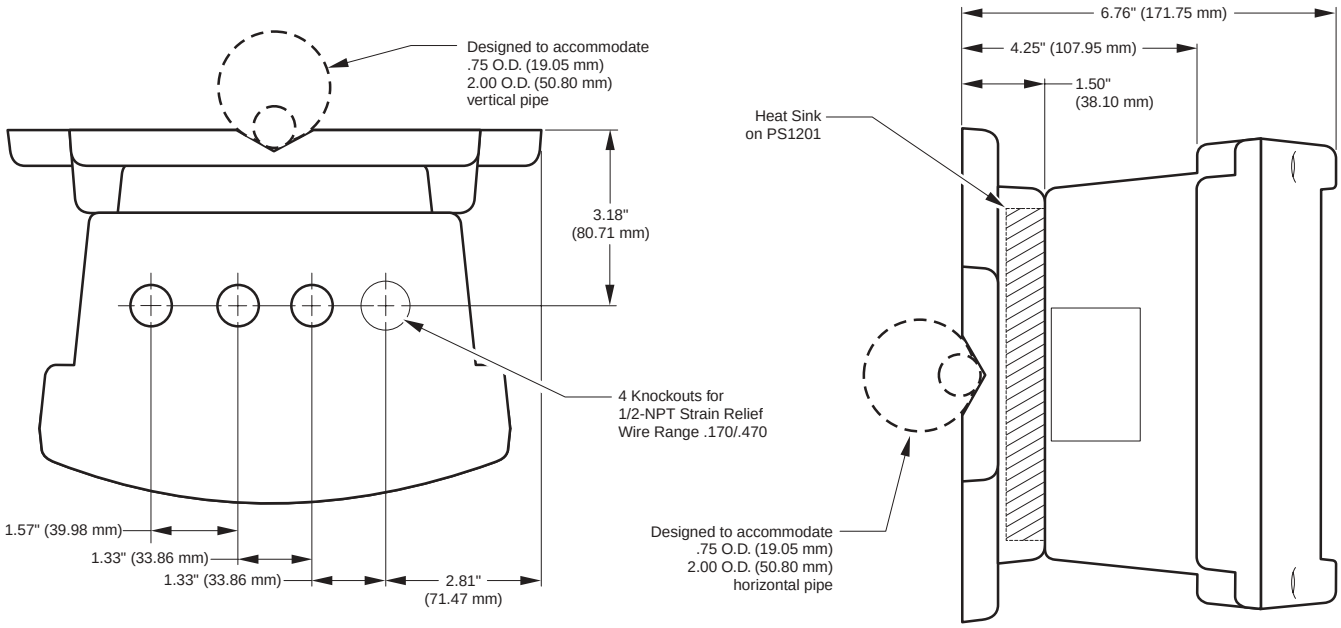
5.1 Mounting Instructions for the AquaTrend® Interface

The AquaTrend Interface was designed to mount easily to a wall, pole, or panel (see Figure 9). Allow at least one inch clearance from other object on the top and sides and a minimum of six inches on the bottom. Disassembly is not required for pole or wall mounting, and minimal disassembly is required for panel mounting. A floor stand is also available, see Replacement Parts and Accessories on page 86.

A mounting bracket is supplied (see Figure 14 on page 55) for securing the AquaTrend Interface to a horizontal or vertical pole (or similar structure) or to a wall. When pole mounting, the pole must have an outside diameter of ¾ to 2 inches and must be capable of supporting at least five (5) pounds.

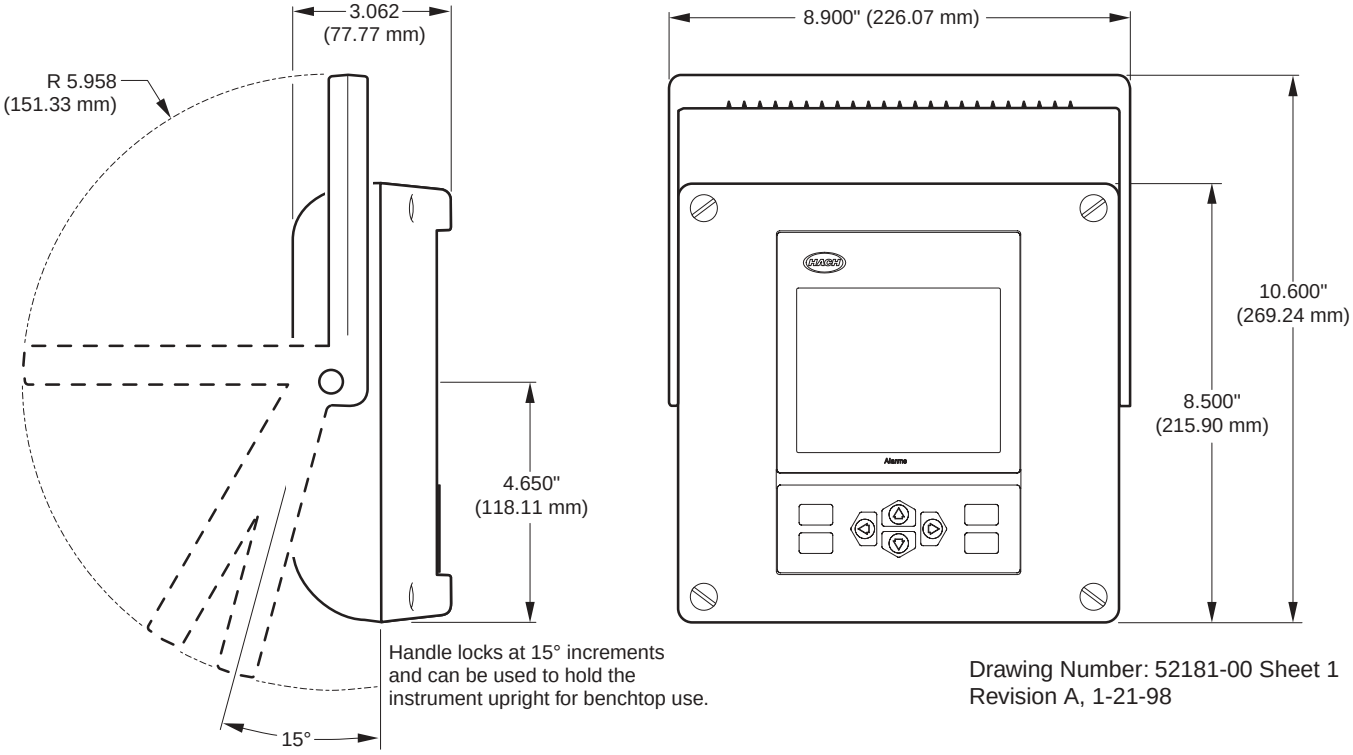
For easier wiring installation, determine which knockouts will be used for network and power connections and remove them before mounting the AquaTrend Interface enclosure.

Figure 9 AquaTrend Interface Dimensions



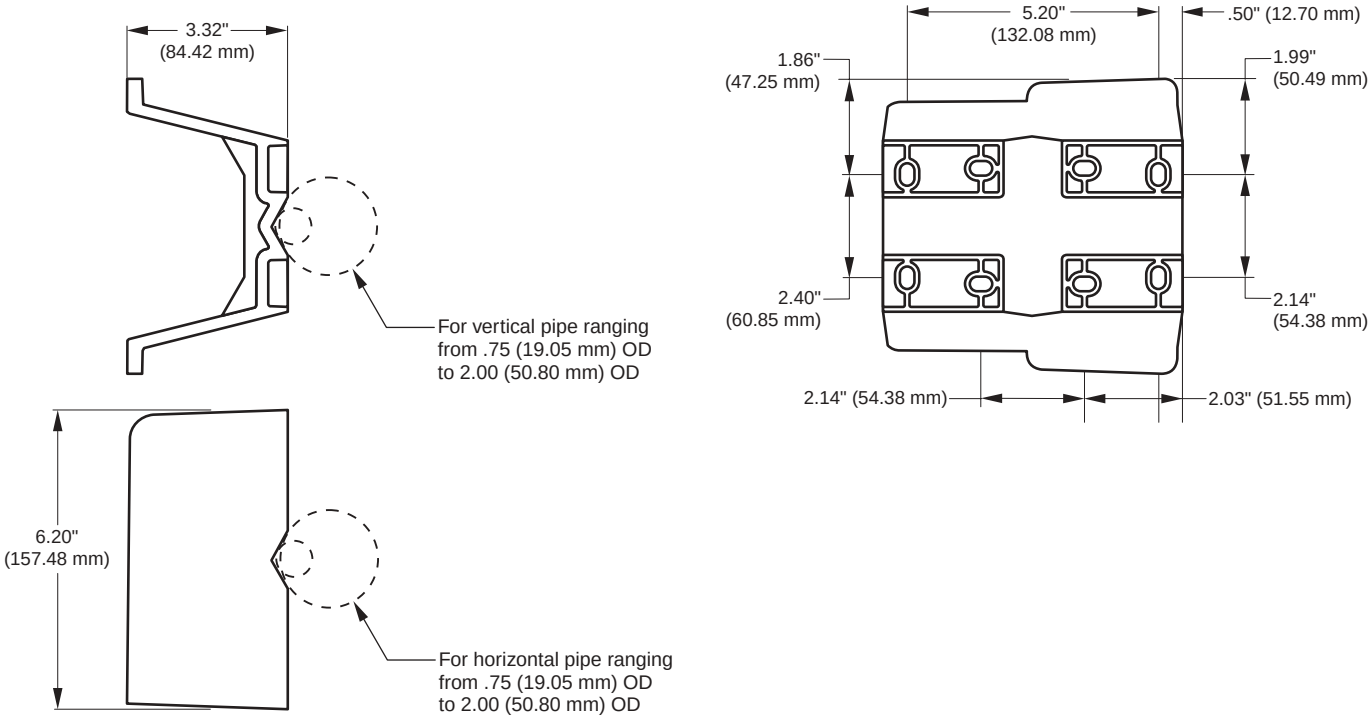
Drawing Number: 52181-00 Sheet 2
Revision A, 1-21-98

Figure 10 Portable AquaTrend Interface Dimensions



Drawing Number: 52181-00 Sheet 1
Revision A, 1-21-98

Figure 11 Portable AquaTrend Interface Bracket Dimensions



5.1.1 AquaTrend Interface Pole Mounting

Note: *For easier wiring installation, determine which knockouts will be used for network and power connections and remove them before mounting the AquaTrend Interface enclosure.*

1. Obtain two ¼-20 x 2.843 U-bolts and nuts (Cat. No. 51410-00).
2. Press the back of the mounting bracket against a pole in the proper mounting position, either vertically or horizontally.
3. Place the curve of one U-bolt behind the pole, and insert the threaded ends of the bolt through two of the center holes on the mounting bracket. See Figure 12.
4. Secure the two nuts with a wrench, and repeat steps 1-3 on the opposite end of the bracket.

5.1.2 AquaTrend Interface Wall Mounting

Note: *For easier wiring installation, determine which knockouts will be used for network and power connections and remove them before mounting the AquaTrend Interface enclosure.*

1. Remove the mounting bracket from the back of the AquaTrend Interface.
2. Use the bracket as a template or use the dimension information shown in Figure 14 to mark positions on the wall for four of the eight screw holes – either the vertical or horizontal pair (see Figure 14).
3. Reconnect the mounting bracket to the device if necessary, see Figure 13.
4. Drill pilot holes in the marked positions for four ¼-inch screws.

5. Use four ¼-inch, hex-head or pan-head screws to secure the bracket and device to the wall.

Figure 12 Pole Mounting the AquaTrend Interface

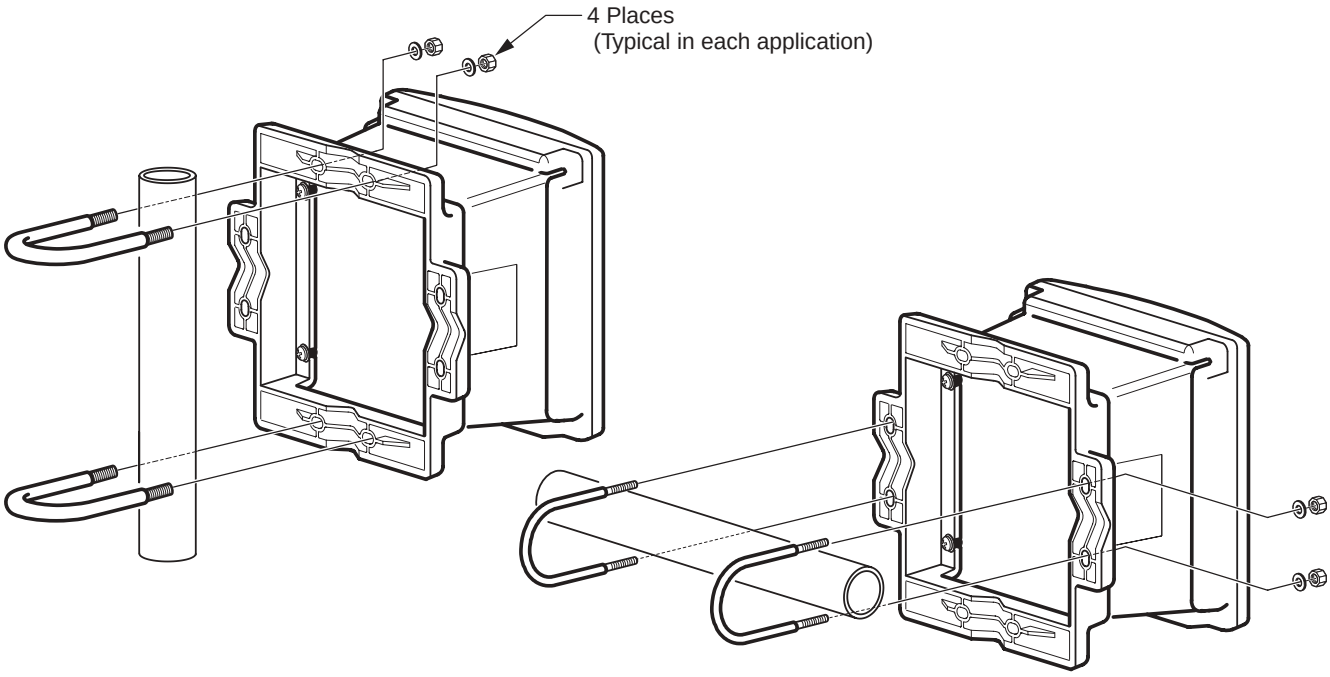


Figure 13 Attaching the Mounting Bracket

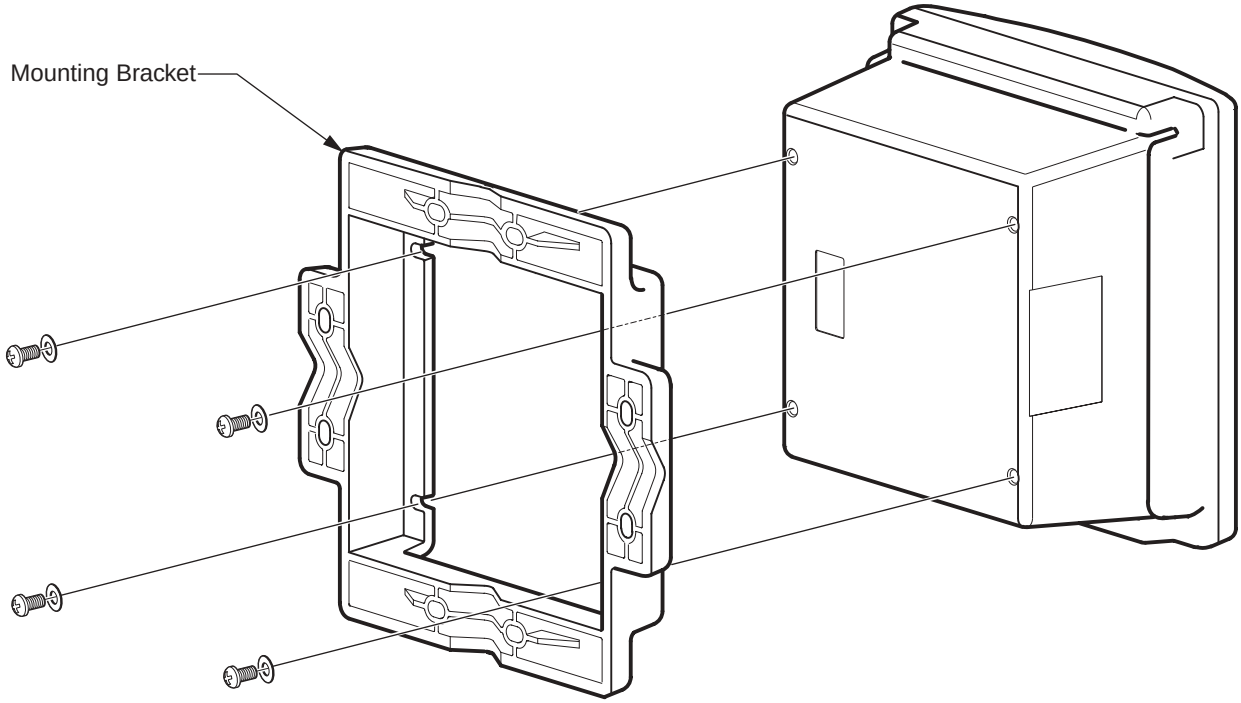
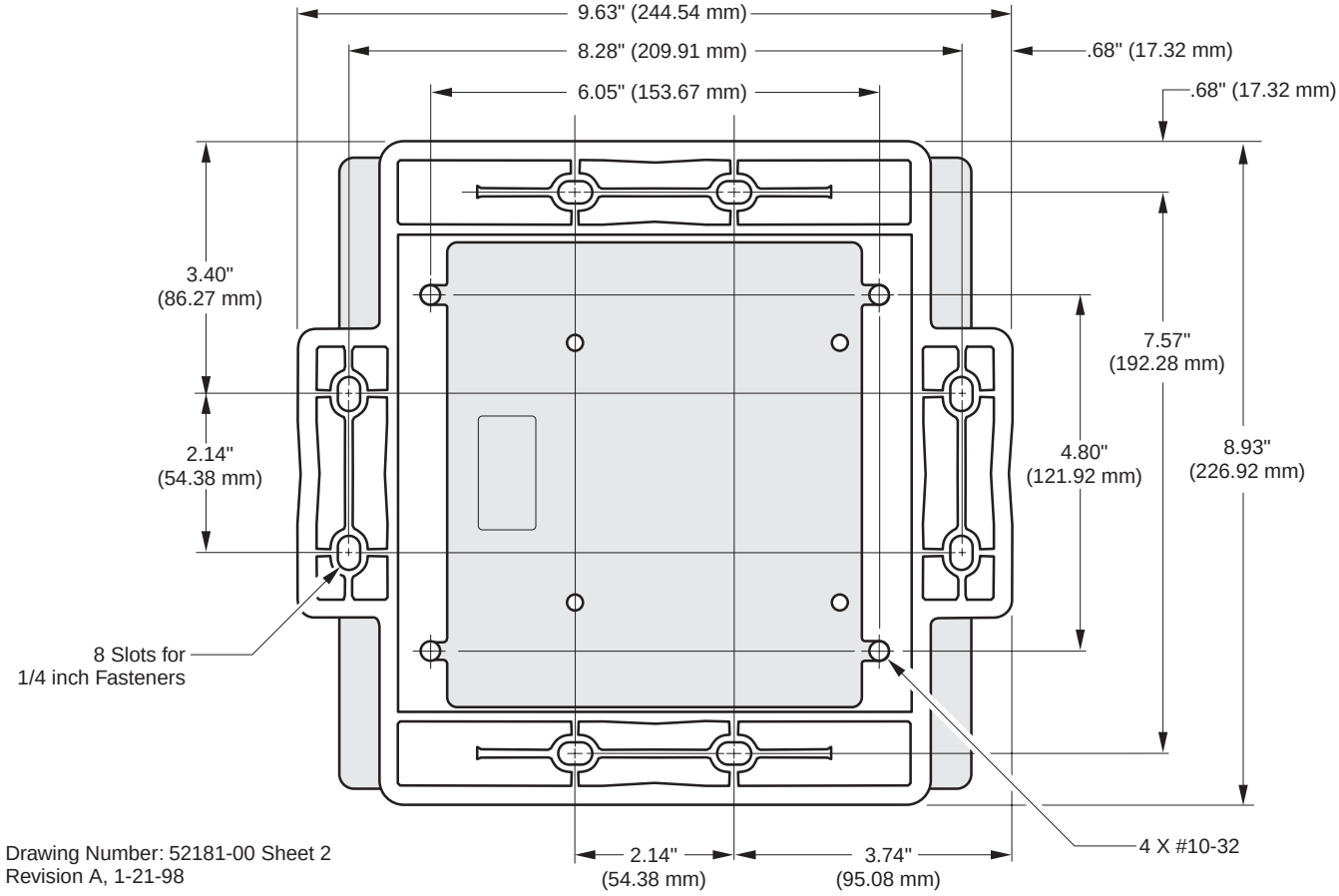


Figure 14 AquaTrend Interface Mounting Bracket Dimensions



5.1.3 AquaTrend Interface Panel Mount

Note: *For easier wiring installation, determine which knockouts will be used for network and power connections and remove them before mounting the AquaTrend Interface enclosure.*

1. Turn off all power to the AquaTrend Interface and disconnect all cables if necessary.
2. Use a Phillips screwdriver to remove the four screws holding the mounting frame onto the back of the device. The wall mount frame is not needed for panel mounting.
3. Use a flat-blade screwdriver to loosen the screws of the device face.
4. Lift the face off the device and set it aside. Or, store it by screwing the right side of the face to the left side of the back enclosure.
5. Use a punch and hammer to remove the three knockouts on the inside rim of the back enclosure. Position the punch in the center of the knockout for best results.
6. Measure the panel hole using the dimension information given in Figure 15. Mark the panel for placement of three #10 pan-head screws.
7. Cut out the panel hole and drill three pilot holes for the screws.

8. Fit the AquaTrend Interface into the panel hole and secure it with three #10 pan-head screws.

9. Make all wiring connections as described in the following sections.

10. Ensure that the gasket is properly seated in the AquaTrend Interface face and tighten the screws (10 in-lb (1.1 n-m) maximum). Do not overtighten the screws.

Figure 15 Panel Mount Dimensions

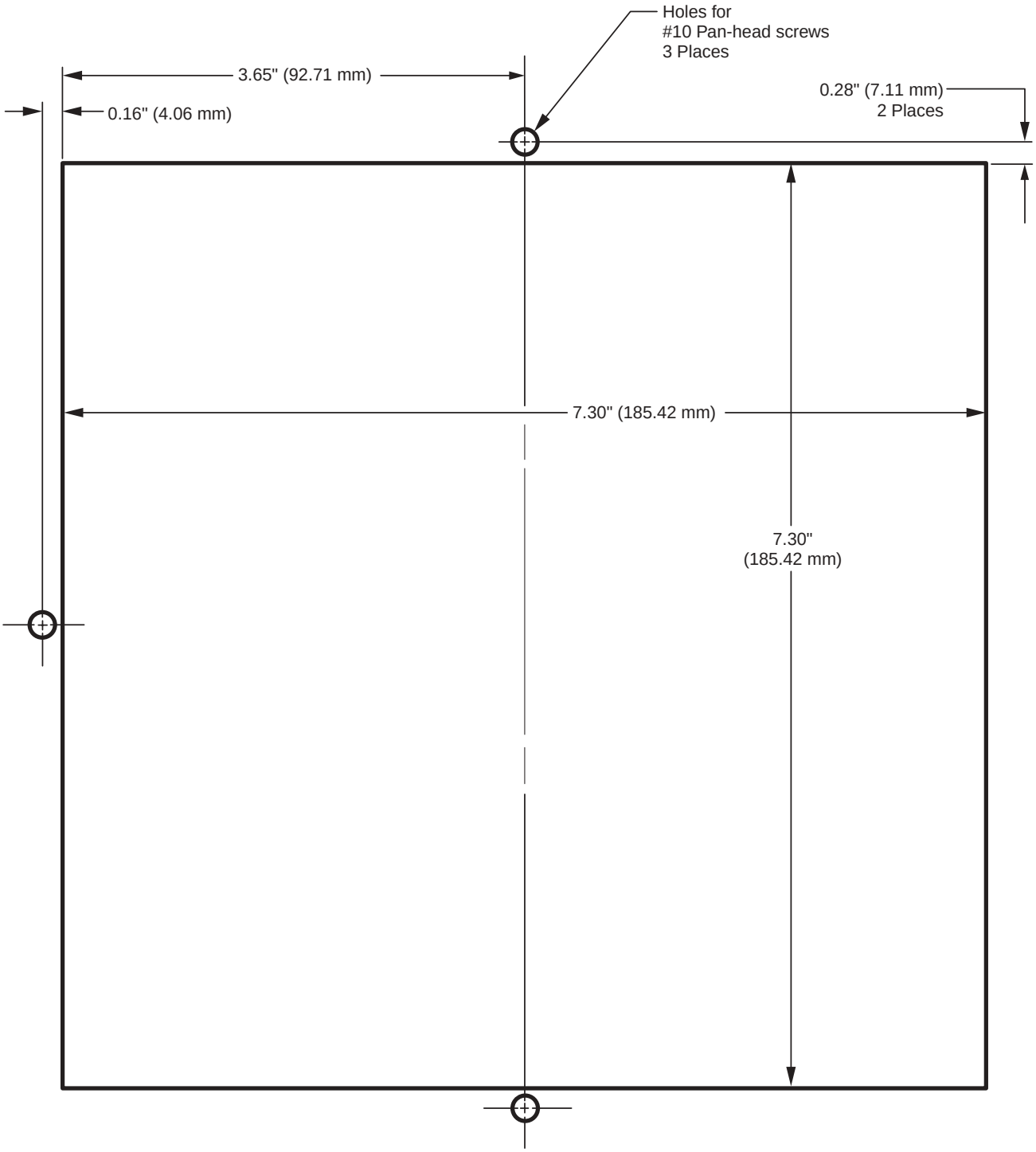
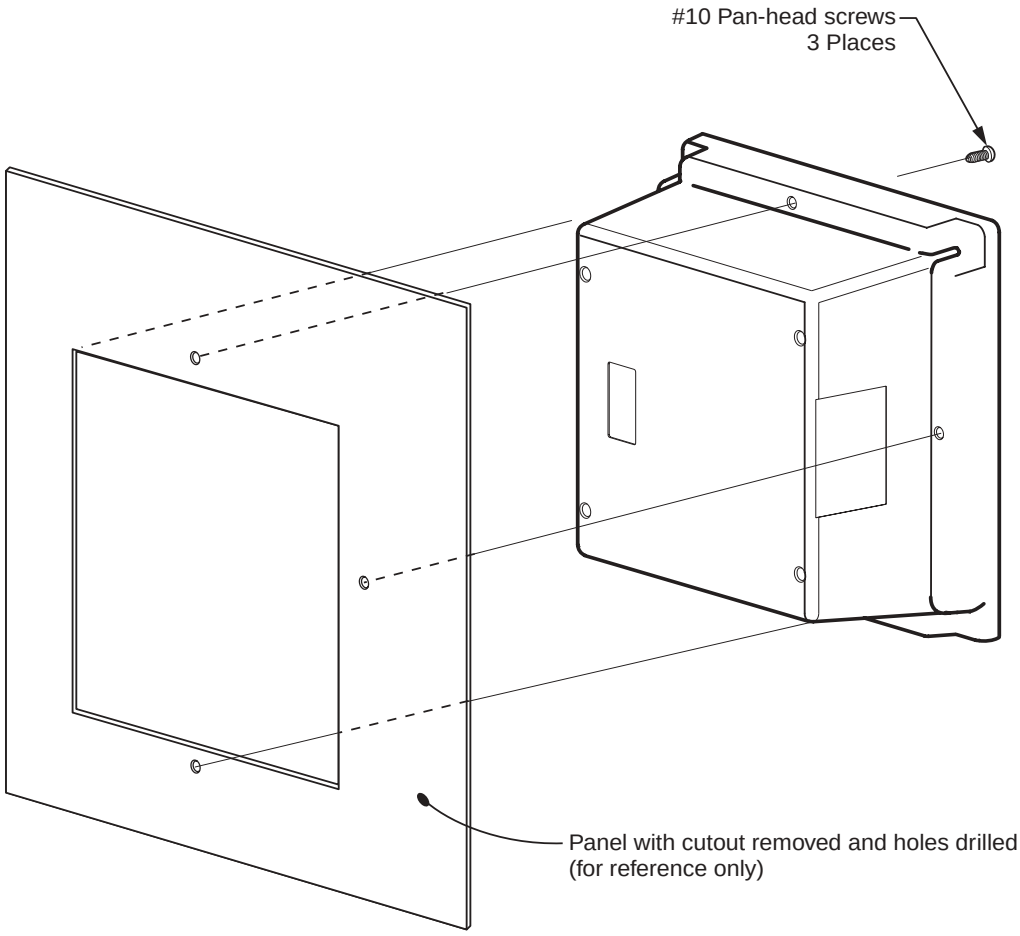


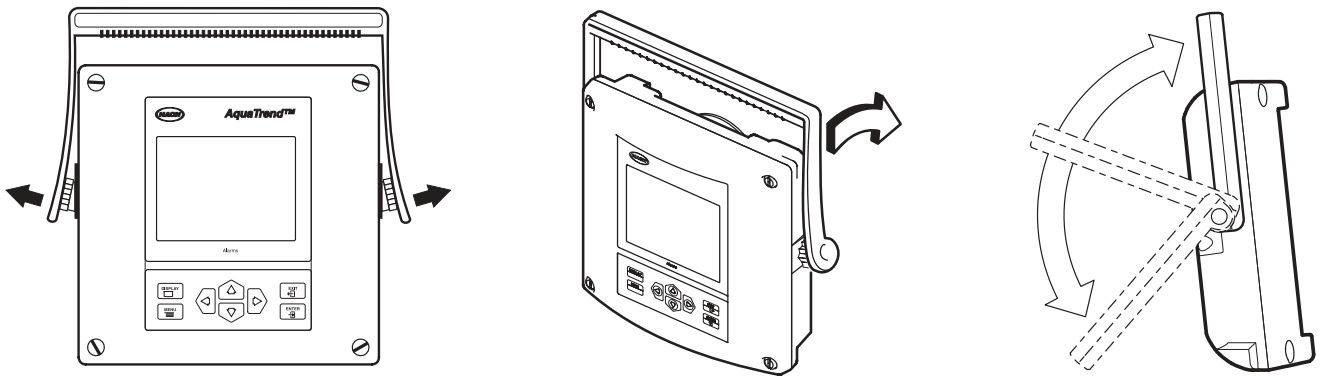
Figure 16 Panel Mounting



5.2 Portable AquaTrend Interface Installation and Mounting

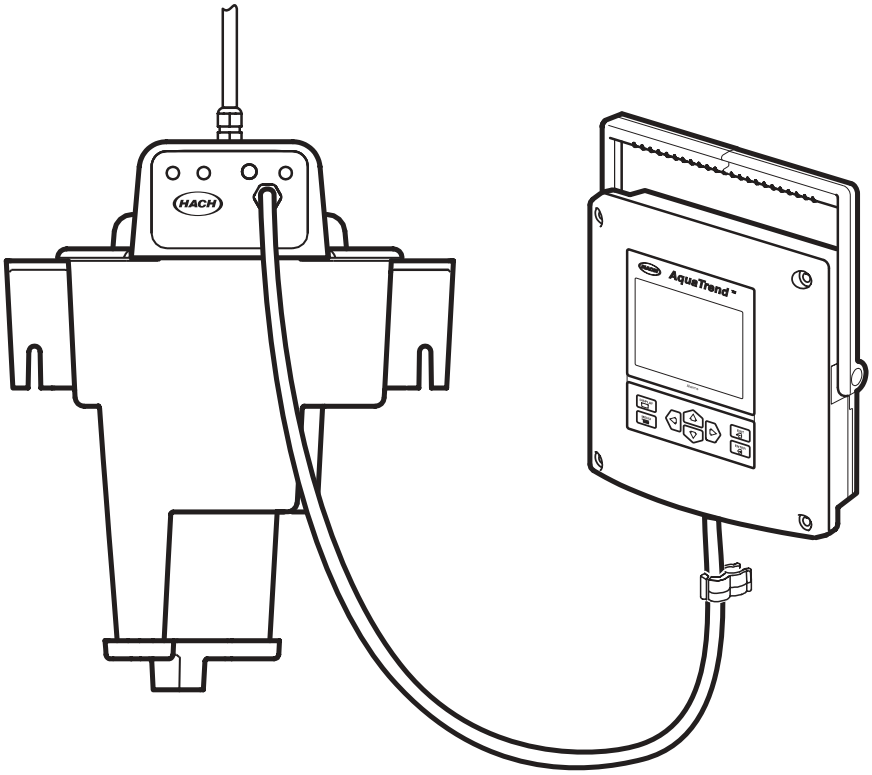
The rotary handle on the Portable AquaTrend Interface provides a stand for placement on a flat surface. To position the handle, pull the handle out on both sides of its base and rotate the handle to the position desired (see Figure 17). Place the Portable AquaTrend Interface on a surface near the sensor where the display is visible and the keypad is easily accessible.

Figure 17 Portable AquaTrend Interface Handle/Stand



The Portable AquaTrend Interface can be easily connected to a sensor by plugging the cord jack on the Portable AquaTrend Interface into the receptacle provided on the sensor. See Figure 18.

Figure 18 Attaching Portable AquaTrend Interface to Sensor



The Portable AquaTrend Interface's mounting kit provides an easy way to mount the device to a wall or pole. See Figure 19 and Figure 20 and the instructions which follow.

For wall mounting:

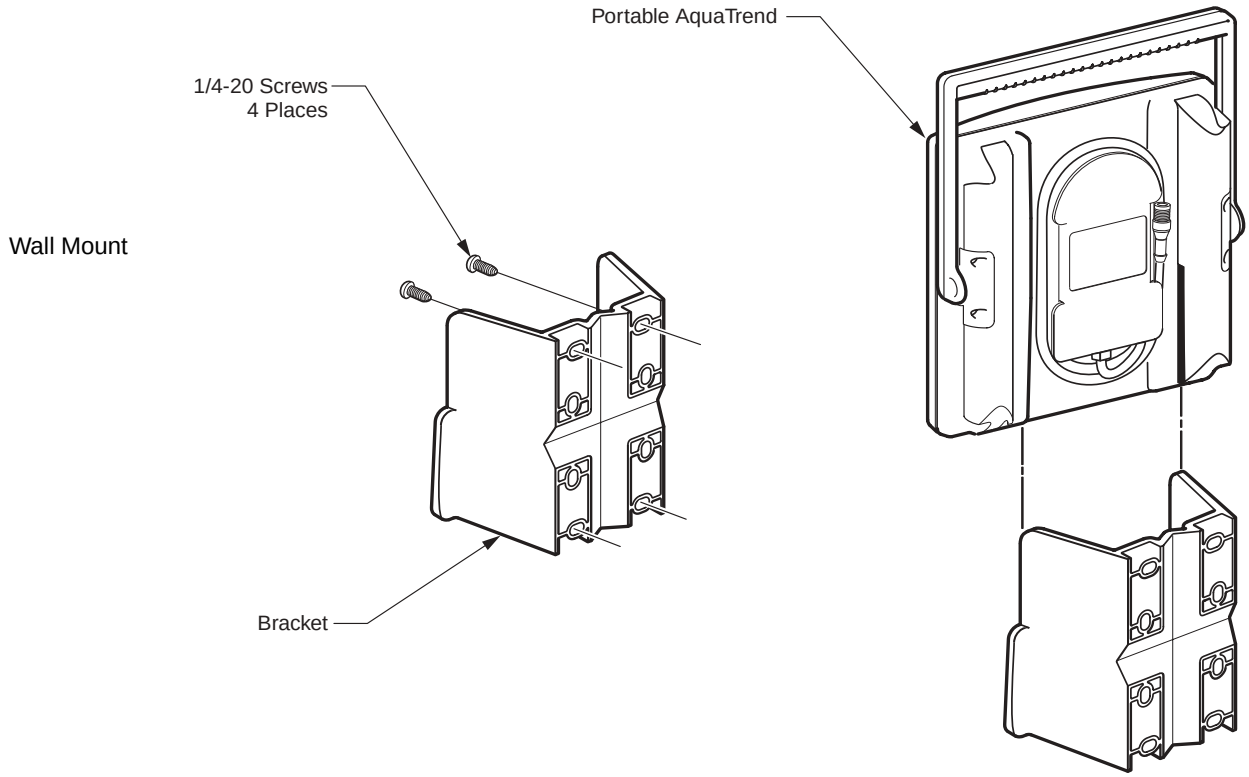
1. Use the bracket as a template to mark positions on the wall for four of the eight screw holes – either the vertical or horizontal pair.

2. Drill the marked positions for four ¼-20 screws.

3. Use four ¼-20 hex-head or pan-head screws to secure the bracket to the wall (10 in-lb (1.1 n-m) maximum).

4. Fit the bracket lip into the slot on the back of the Portable AquaTrend Interface and push down until the device fits securely in the bracket.

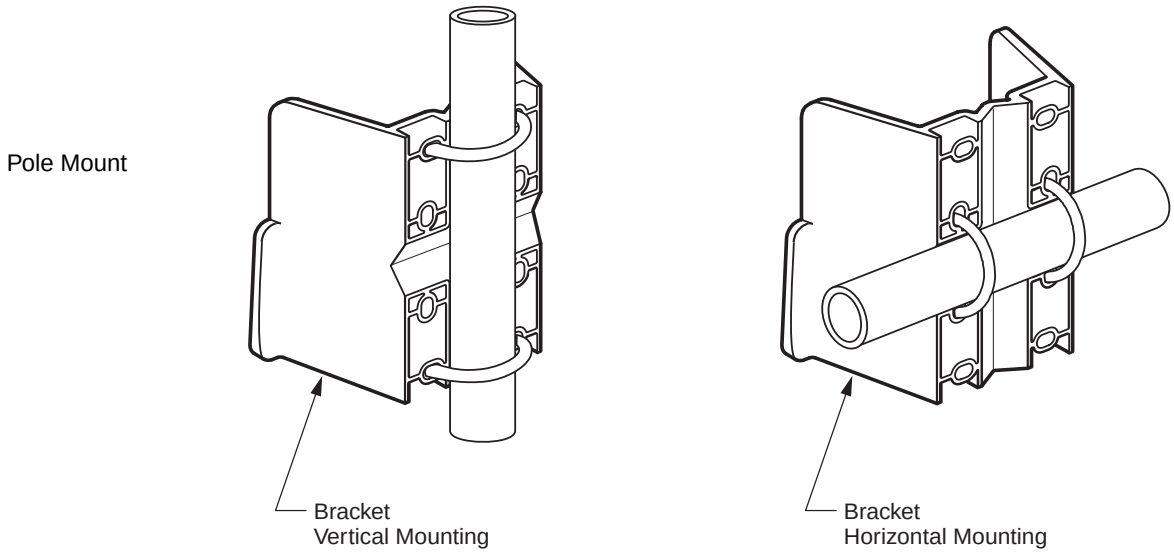
Figure 19 Wall Mount for the Portable AquaTrend Interface



For pole mounting:

1. Obtain two ¼-20 x 2.843 U-bolts and nuts (Cat. No. 51410-00).
2. Press the back of the mounting bracket against a pole in the proper mounting position (indentations on the back of the bracket fit the pole either horizontally or vertically).
3. Place the curve of one U-bolt behind the pole, and insert the threaded ends of the bolt through two of the holes on the mounting frame. The center holes are for vertical mounting and outside holes are for horizontal mounting.
4. Secure the two nuts with a wrench, and repeat steps 1-3 for the second U-bolt.
5. Fit the bracket lip into the slot on the back of the Portable AquaTrend Interface and push down until the device fits securely in the bracket.

Figure 20 Pole Mount for the Portable AquaTrend Interface



5.3 AquaTrend Interface Power and Network Connections

5.3.1 ⚠ AquaTrend Interface with Signal Output Module (SOM) to PS1201 Power Supply Connections

DANGER
This instrument should be installed by qualified technical personnel to ensure adherence to all applicable electrical codes.

PELIGRO
Este instrumento debe ser instalado por personal técnico capacitado para asegurar el cumplimiento con todos los códigos eléctricos y de plomería aplicables.

PERIGO
Este instrumento deve ser instalado por pessoal técnico qualificado para asegurar o cumprimento de todas as normas elétricas e de canalização aplicáveis.

DANGER
Cet appareil doit être installé par du personnel technique qualifié, afin d'assurer le respect de toutes les normes applicables d'électricité.

GEFAHR
Um zu gewährleisten, daß alle elektrischen VDE-Vorschriften und gegebenenfalls die Zusatzvorschriften der zuständigen Elektrizitäts- und Wasserwerke erfüllt werden, darf dieses Gerät nur von geschultem Fachpersonal installiert werden.

Note: *The maximum cable length from the PS1201 to the most distant device is 100 ft. (30 m).*

Order enough cable (Cat. No. 52158) from Hach to suit the specific installation parameters. Connections are made at both ends of the cable; at the AquaTrend using the connection information in the first two columns of Figure 21, and to the PS1201 Power Supply using the information presented in the third and fourth column of Table 10)

A Cable Termination Kit (Cat. No. 52156-00) is also supplied for the connections at the PS1201 end.

Make the connections at the PS1201 end as follows:

1. Turn off all power to the PS1201 Power Supply and disconnect all cables if necessary.

2. Unscrew the four screws securing the PS1201 face using a flat-bladed screwdriver.

3. Lift the face off the PS1201 and set it aside. Or, store the front cover by screwing the right side of the front cover to the left side of the back enclosure.

4. If necessary, carefully use a punch and hammer from the outside of the enclosure to remove one of the left three unused knock-outs on the bottom of the PS1201 enclosure. Position the punch in the center of the knockout for best results.

5. Install the cable with the strain relief fitting provided in the hole described in Step 4, above. Make sure the outer cable insulation is just captured by the strain relief fitting.

6. Strip six inches (15 cm) of outer insulation from the cable (Cat. No. 52158).

7. Strip ¼ inch of insulation from each wire and insulate the shield wire with tubing (Cat. No. 40825-00). Tin the end of each wire if desired.

8. Insert the wires into an available connector in a six-position terminal block of the PS1201. Refer to Figure 21 and the second two columns of Table 10 for wire position.

9. Tighten the strain relief fitting using the supplied washer and locknut until the cable no longer slides in the strain relief.

Note: *To ensure the PS1201 continues to meet NEMA 4X, I.P.66 enclosure ratings, use only the supplied NEMA-style enclosure strain relief fittings.*

10. If other power or network connections are to be made at this time, refer to the appropriate section in this manual or the individual device manual. If no other connections need to be made, continue with the remainder of this procedure.

11. Ensure that the gasket is properly seated in the PS1201 face and tighten the screws to 10 in-lb (1.1 n-m) maximum. Do not overtighten the screws.

To connect the cable at the AquaTrend with SOM end:

1. Make sure no power is being supplied to the power supply.

2. Use a flat-blade screwdriver to loosen the screws of the AquaTrend Interface face.

3. Lift the face off the AquaTrend Interface. Disconnect the ribbon cable from the circuit board in the back enclosure and set the face aside. Or, store it by screwing the right side of the face to the left side of the back enclosure.

4. Use a punch and hammer to remove one knock-out on the inside rim of the bottom housing. Position the punch in the center of the knockout for best results.

Note: *To assure the AquaTrend Interface continues to meet NEMA 4X, I.P.66 enclosure ratings, use only the supplied NEMA-style enclosure strain relief fittings.*

5. Refer to the first two columns in Table 10 and connect the cable wires to the six-position terminal block (J2) as shown in Figure 21. Use a small flat-blade screw driver to depress each nylon lever, then insert the appropriate wire into the terminal block.

Note: *If any color wire is not present in the terminal block, skip that connection.*

Note: *Although conduit is generally not required for low voltage network wiring, conduit, if used, must be bonded together by the customer. This product does not provide automatic conduit bonding.*

6. Make other wiring connections at this time if necessary, then attach the AquaTrend Interface face with the four screws removed earlier. Tighten the screws to 10 in-lb (1.1 n-m) maximum. Do not overtighten the screws.

Figure 21 AquaTrend with SOM to PS1201 Power Supply Connections

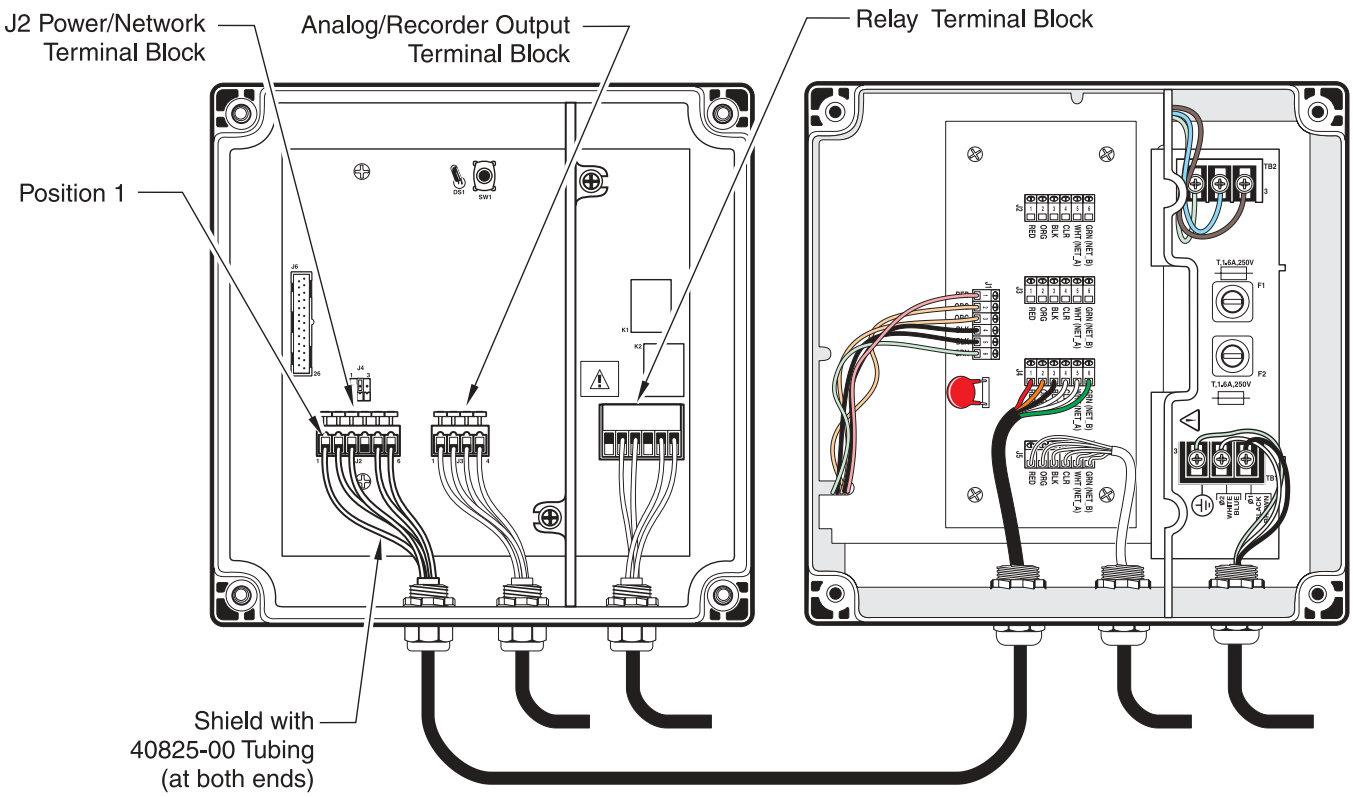


Table 10 AquaTrend with SOM to PS1201 Power Supply Connections

AquaTrend with SOM J2 Terminal Connections in the AquaTrend with SOM		PS1201 Connections to PS1201 Terminal Block	
Position on J2 Terminal	**Wire Color/Function**	**Position on PS1201 Terminal**	**Wire Color**
POSITION 1	Clear/shield, left-most terminal	POSITION 1	RED
POSITION 2	Green/Network A	POSITION 2	No Connection
POSITION 3	White/Network B	POSITION 3	BLACK
POSITION 4	No Connection	POSITION 4	SHIELD (Insulate with appropriate tubing, Cat. No. 40825-00)
POSITION 5	Red/+12	POSITION 5	WHITE
POSITION 6	Black/right-most terminal	POSITION 6	GREEN

5.3.2 SOM Recorder Output and Relay Connections

Please refer to the *SOM Manual* (Cat. No. 51250-18) for detailed connection (wiring) information for recorder outputs and relays.

5.3.3 AquaTrend Interface without SOM to PS1201 Power Supply Connection

Order enough cable (Cat. No. 52158) from Hach to suit the specific installation parameters. Connections are made at both ends of the cable; at the AquaTrend (using the connection information in the first two columns of Table 11), and to the PS1201 Power Supply (using the information presented in the third and fourth column of Table 11). Refer also to Figure 22.

A Cable Termination Kit (Cat. No. 52156-00) is also supplied for the connections at the PS1201 end.

Make the connections at the PS1201 end as follows:

1. Turn off all power to the PS1201 Power Supply and disconnect all cables if necessary.
2. Unscrew the four screws securing the PS1201 face using a flat-bladed screwdriver.
3. Lift the face off the PS1201 and set it aside. Or, store the front cover by screwing the right side of the front cover to the left side of the back enclosure.
4. If necessary, carefully use a punch and hammer from the outside of the enclosure to remove one of the left three unused knock-outs on the bottom of the Power Supply enclosure. Position the punch in the center of the knockout for best results.
5. Install the cable with the strain relief fitting provided in the hole described in Step 4, above. Make sure the outer cable insulation is just captured by the strain relief fitting.
6. Strip six inches (15 cm) of outer insulation from the cable (Cat. No. 52158).
7. Strip ¼ inch of insulation from each wire and insulate the shield wire with tubing (Cat. No. 40825-00). Tin the ends of the wires if desired.
8. Connect the cable wires to a terminal block of the PS1201 according to the position information given in the third and fourth column of Table 11 on page 65. Tighten the screws and tug gently on the wires to check the connections.
9. Tighten the strain relief fitting using the supplied washer and locknut until the cable no longer slides in the strain relief.

Note: *To ensure the PS1201 continues to meet NEMA 4X, I.P.66 enclosure ratings, use only the supplied NEMA-style enclosure strain relief fittings.*

10. If other power or network connections are to be made at this time, refer to the appropriate section in this manual or the individual device manual. If no other connections need to be made, continue with the remainder of this procedure.
11. Ensure that the gasket is properly seated in the PS1201 face and tighten the screws to 10 in-lb (1.1 n-m) maximum. Do not overtighten the screws.

Figure 22 AquaTrend Interface without SOM Network and Power Cable Connections

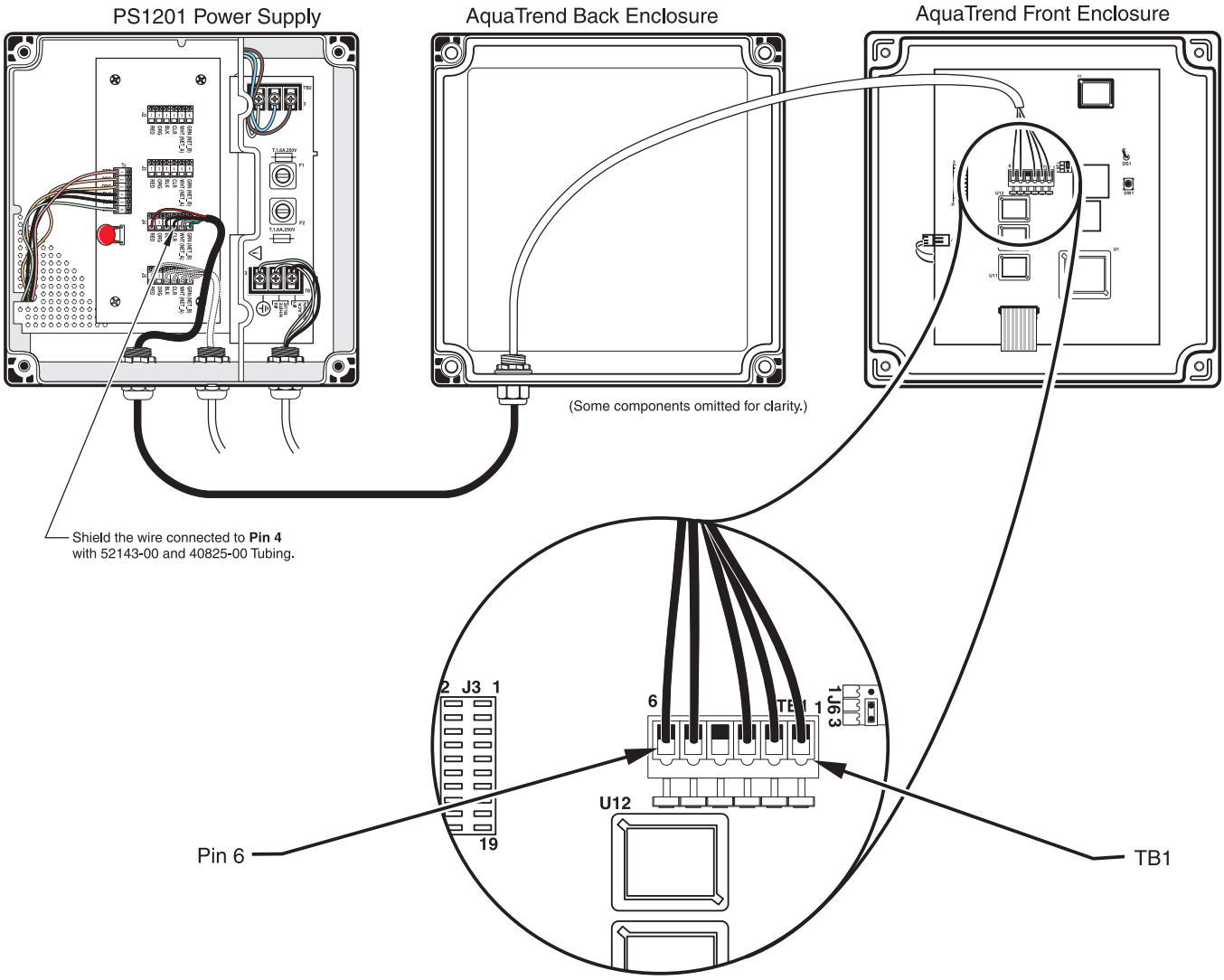


Table 11 AquaTrend Interface without SOM to PS1201 Power Supply Connections

AquaTrend Interface without SOM Connections to TB1		PS1201 Connections to PS1201 Terminals (J1-J5)	
Terminal	**Wire Color/Function**	**Terminal**	**Wire Color**
TB1-6	Black/GND, left-most terminal	Pin 1	Red
TB1-5	Red/ +12	Pin 2	No Connection (orange)
TB1-4	No Connection	Pin 3	Black
TB1-3	Green/ Network B	Pin 4	Shield
TB1-2	White/Network A	Pin 5	White
TB1-1	Clear/Shield, right-most terminal	Pin 6	Green

Make the connections at the AquaTrend Interface without SOM as follows:

1. Make sure no power is being supplied to the power supply.
2. Use a flat-blade screwdriver to loosen the screws of the AquaTrend Interface face.
3. Lift the face off the AquaTrend Interface and set it aside. Or, store it by screwing the right side of the face to the left side of the back enclosure.
4. Use a punch and hammer to remove one knock-out on the inside rim of the bottom housing. Position the punch in the center of the knockout for best results.

Note: *To assure the AquaTrend Interface continues to meet NEMA 4X, I.P.66 enclosure ratings, use only the supplied NEMA-style enclosure strain relief fittings.*

5. Refer to the first and second column of Table 11 and connect the cable wires to the six-position terminal block (TB1) as shown in Figure 22. Use a small flat-blade screw driver to depress each nylon lever, then insert the appropriate wire into the terminal block.

Note: *If any color wire is not present in the terminal block, skip that connection.*

Note: *Although conduit is generally not required for the low voltage network wiring, conduit, if used, must be bonded together by the customer. This product does not provide automatic conduit bonding.*

Make other wiring connections at this time if necessary, then attach the AquaTrend Interface face using the four screws.

5.4 Network Termination

Note: *To avoid damaging the instrument, remove power to the instrument before removing the front cover.*

The network signals require a terminator for proper operation. As shipped from the factory, the terminator is disabled on all devices.

IMPORTANT NOTE:*Failure to properly terminate the network may cause total network failure.* ***Only one device must have the network terminator enabled.***

5.4.1 Network Termination at the AquaTrend with SOM or at the SOM

Follow the steps below to enable the terminator.

1. Make sure no AC power is connected to the AquaTrend with SOM.
2. Verify if the system Master AquaTrend Interface is equipped with an SOM by checking the front label and the catalog number on the Serial Number label. It should show: Catalog Number 51350-60.
3. Remove the front face of the AquaTrend with SOM and locate J4 (a white, three-pin connector) on the circuit board in the back enclosure of the device (see Figure 23). A jumper connected only to pin 2 should be present as shown in Figure 24.
4. To enable the terminator, lift the jumper off of pin 2 and move the jumper so that it connects pins 2 and 3 as shown in Figure 24.

5. Replace the front face of the AquaTrend/SOM.

Figure 23 AquaTrend with SOM Network Termination at the J4 Connector

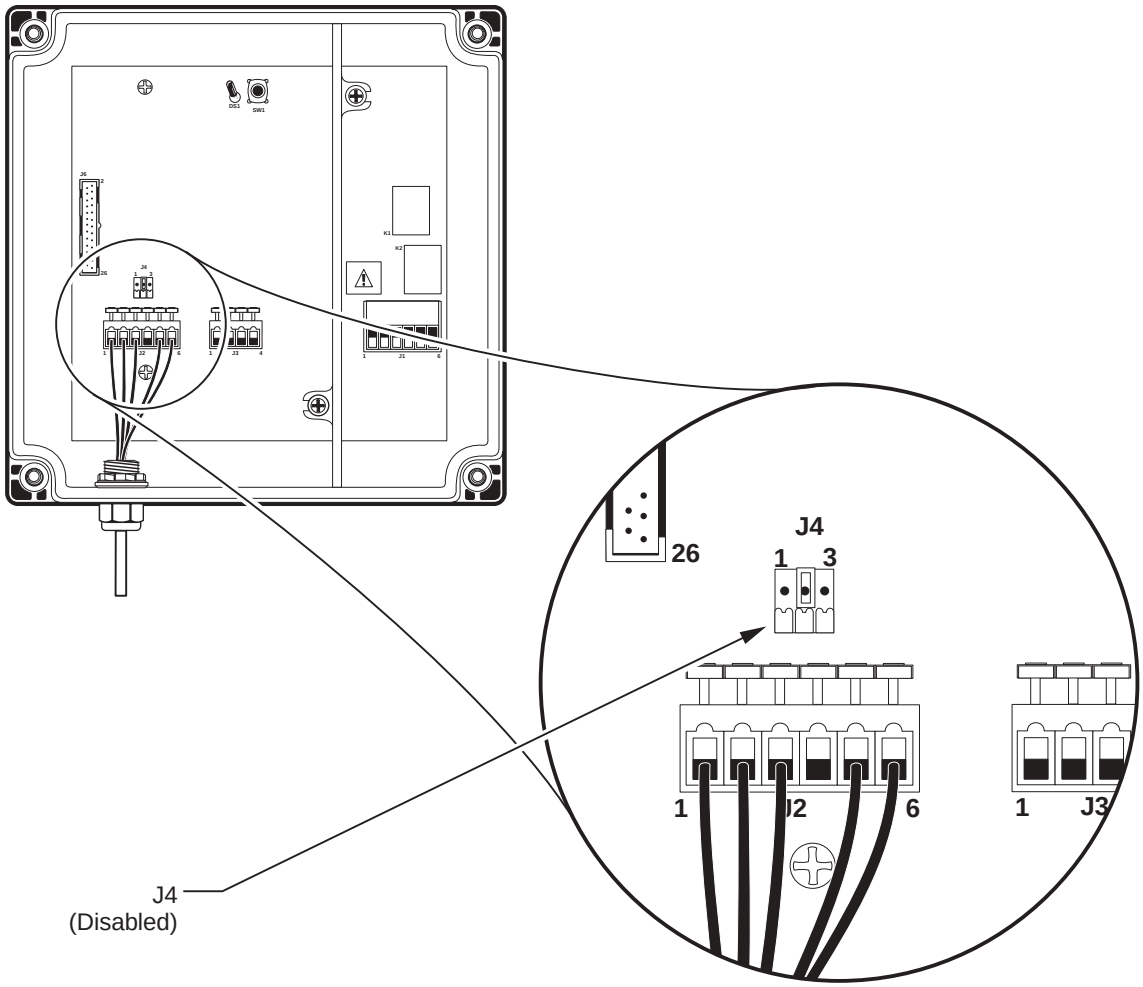
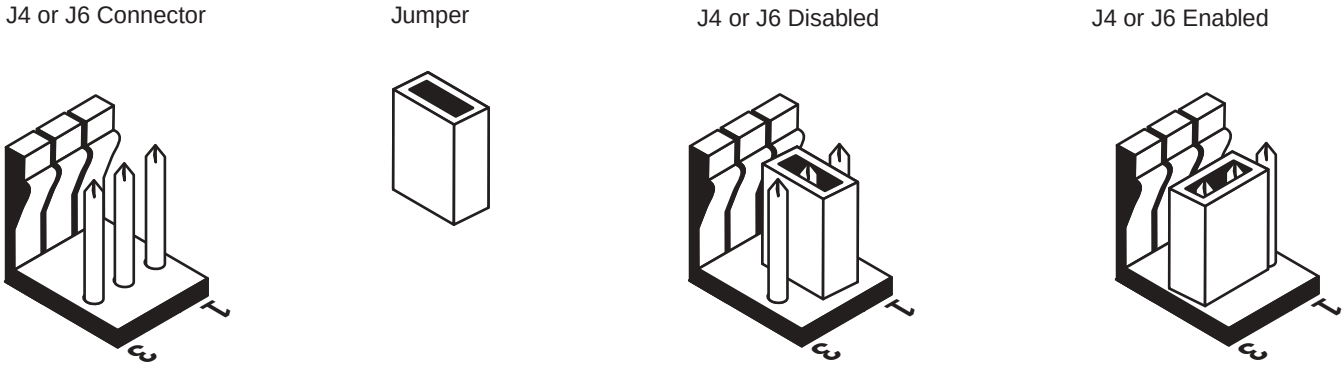


Figure 24 Network Termination.



5.4.2 Network Termination at the AquaTrend Interface without SOM

The following instructions apply only to the AquaTrend Interface without SOM, Cat. No. 51200.

Note: *To avoid damaging the instrument, remove power to the instrument before removing the front cover.*

The network signals require a terminator for proper operation. As shipped from the factory, the terminator is disabled on all AquaTrend Interfaces as shown in Figure 24.

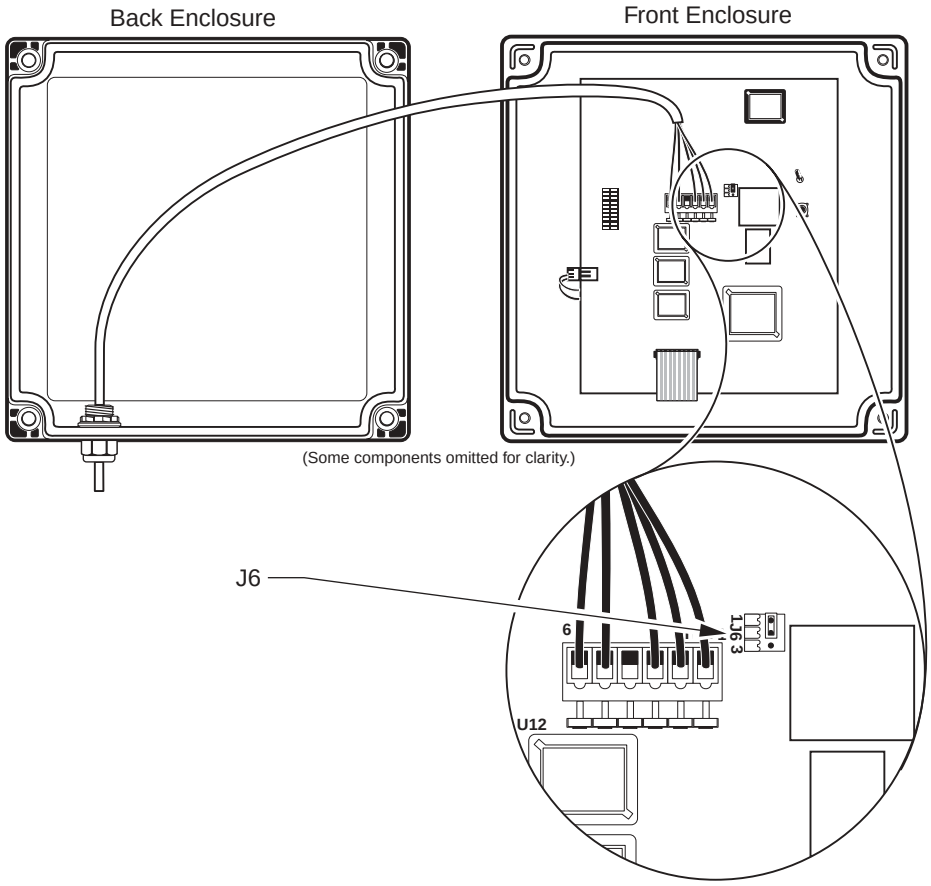
IMPORTANT NOTE:*Failure to properly terminate the network may cause total network failure.* ***Enable the network terminator at only one device.***

Follow the steps below to enable the terminator and complete the installation of the stand alone AquaTrend Interface.

1. Remove the front panel of the AquaTrend Interface and locate J6 on the circuit board in the back housing of the device. J6 is a white, three-pin connector. A jumper connected only to pin 2 should be present as shown in Figure 24.

2. To enable the terminator, lift the jumper off of pin 2 and move the jumper so it connects pins 2 and 3 as shown in Figure 25.

Figure 25 Network Termination at the AquaTrend Interface Jumper Position Enabled



5.5 Interconnecting other Devices on the Network

If all of the available access holes and/or wiring terminals in a PS1201 or sensor's power supply have been used, preventing the connection of other new devices into the AquaTrend Interface network system, it may be possible to use an existing device (AquaTrend Interface or Signal Output Module) to provide network and/or power connections for a new device.

Before connecting a new device to an existing device instead of directly to a PS1201 consider the following questions:

1. Is the total power consumed by the existing devices, plus the new device, within the capabilities of a single PS1201? (Refer to the PS1201 manual for instructions on calculating this.) Failure to confirm this could result in failure of the existing PS1201 due to thermal overload. Such failure is NOT covered by warranty.

2. Is there an unused knockout on the existing device, so that the new connections can be made while preserving network integrity?

If the answers to BOTH of the above questions are yes:

The new device can be connected to an existing device using its existing PS1201. To connect both power and network signals to the new device via an existing device, proceed as follows:

1. Procure the required length of 4-conductor, shielded cable (Cat. No. 52158) to make both the power and network connections.

2. Route the cable in accordance with local building codes. Remove AC input power from the PS1201 that supplies power to all of the devices involved.

3. Strip approximately six inches of insulation from the 4-conductor cable.

4. Insulate the shield using Cat. No. 40825-00 heat-shrink tubing.

5. Remove about ½ inch of insulation from each of the remaining wires.

6. Remove, one at a time, each wire from the terminal block of the existing device. Match that wire with the same color wire from the new device.

7. Twist the ends of the two wires together and insert them both into the terminal block position where the original wire originated.

8. Connect the other end of the new cable to the new device, following the instructions in the manual supplied with that device.

9. After all connections have been verified, reapply input AC power to the PS1201, and follow the instructions in the new device's manual for configuring the new device to function on the network.

If the answer to question 1 was no, but the answer to question 2 was yes:

Connect only the cable which sends network signals from the existing device to the new device. Connect the new device power connections to an additional PS1201 or sensor power supply. Follow the instructions in the PS1201 or sensor manual.

To connect AC power to the new device, proceed as follows:

1. Procure the length of 4-conductor, shielded cable (Cat. No. 52158) needed between the new power supply and the new device.

2. Using a Cable Termination Kit (Cat. No. 52156-00), install this cable between the new power supply and the new device in accordance with their respective manuals.

To connect the network signals to the new device from the existing device, proceed as follows:

1. Determine the length of cable needed between the new device and the existing device which will provide network signals. Procure this length of 2-conductor, shielded cable (Cat. No. 52157) plus a Cable Termination Kit (Cat. No. 52156-00).

2. Route the 52157 cable in accordance with local building codes, and proceed as follows to connect one end of this cable at the existing device:

   a. Remove input AC power from the PS1201 or sensor that is powering the existing device.

   b. Connect the white and green wires in the new cable to the correct terminals in the existing device, if the device has the white and green wires. Refer to the existing device's manual for which terminals get which color wire.

IMPORTANT NOTE: *DO NOT connect the shield of the new cable to any terminal in the existing device. It must only be connected at the new device.*

3. Connect the other end of the 52157 cable to the new device as follows:

   a. Refer to the new device's manual for proper terminal connections.

   b. Connect the white and green wires to the correct terminals in the new device.

   c. Insulate the shield using the tubing supplied in the Cable Termination Kit, then connect it to the appropriate terminal in the new device.

After all connections have been verified, apply input AC power to both the existing and new PS1201, and follow the instructions in the new device's manual for configuring the new device to function on the network.

6.1 Maintenance

No scheduled maintenance is required for the AquaTrend® Interface.

6.1.1 Cleaning the AquaTrend Interface

Wipe the external surface of the enclosure with a cloth and warm soapy water as needed. Stronger solvents can damage the labels and housing.

6.2 AquaTrend Interface Diagnostics

This menu provides diagnostic information specific to the AquaTrend Interface Module.

6.2.1 Display Test

This menu choice illuminates the pixels in the display to verify the display is working correctly. Access as follows:

1. Press the MENU key to access the Main Menu.
2. Move the pointer to AquaTrend Menu and press the ENTER key.
3. Move the pointer to AQUATREND DIAGNOSTICS and press the ENTER key.
4. Select DISPLAY TEST and press the ENTER key.
5. Press the EXIT key to return to the AquaTrend Interface Configuration Menu.

6.2.2 Keyboard Test

This test is used to verify the correct function of each key on the keypad. Access as follows:

1. Press the MENU key to access the Main Menu.
2. Move the pointer to AQUATREND MENU and press the ENTER key.
3. Move the pointer to AQUATREND DIAGNOSTICS and press the ENTER key.
4. Select KEYBOARD TEST and press the ENTER key.
5. Press each key in turn. The display will show a verification of each key press.
6. Press the EXIT key twice to exit.

6.2.3 Memory Test

This menu line tests the RAM memory. Access as follows:

1. Press the MENU key to access the Main Menu.
2. Move the pointer to AquaTrend Menu and press the ENTER key.

3. Move the pointer to AQUATREND DIAGNOSTICS and press the ENTER key.

4. Select MEMORY TEST and press the ENTER key.

6.2.4 Verify Program Checksum

This function enables the user to verify that the processor and the software are operating correctly. Access as follows:

1. Press the MENU key to access the Main Menu.

2. Move the pointer to AQUATREND MENU and press the ENTER key.

3. Move the pointer to AQUATREND DIAGNOSTICS and press the ENTER key.

4. Select VERIFY CHECKSUM and press the ENTER key.

6.2.5 Clear Alarm Log

Use this function to clear all AquaTrend and Network alarm log entries. Access as follows:

1. Press the MENU key to access the Main Menu.

2. Move the pointer to AQUATREND MENU and press the ENTER key.

3. Move the pointer to AQUATREND DIAGNOSTICS and press the ENTER key.

4. Select CLEAR ALARM LOG and press the ENTER key.

5. Select Yes from the resulting pop-up box to remove all AquaTrend and Network alarm log entries.

6. Press the EXIT key to return to the Aquatrend Diagnostics menu.

6.2.6 AquaTrend Interface Cold Start

This procedure will reset an AquaTrend Interface to factory defaults.

Use with caution, the cold start will erase all network information in the Master AquaTrend Interface.

Access as follows:

1. Press the MENU key to access the Main Menu.

2. Move the pointer to AquaTrend Menu and press the ENTER key.

3. Move the pointer to AQUATREND DIAGNOSTICS and press the ENTER key.

4. Select AQUATREND COLD START and press the ENTER key.

5. Select CONTINUE and press the ENTER key.









6.2.7 Service Menu

Access as follows:

1. Press the MENU key to access the Main Menu.
2. Move the pointer to AquaTrend Menu and press the ENTER key.
3. Move the pointer to AQUATREND DIAGNOSTICS and press the ENTER key.
4. Select Service Menu and press the ENTER key.
5. The screen will prompt for the service password. The service password is not the same as the network security password. Contact Hach Service for additional assistance.

6.3 Network Diagnostics

This menu provides information specific to the AquaTrend Interface Network. This includes menus and information which are dictated by the Network.

6.3.1 Print Network Image

This function sends information for all connected devices to a connected printer; the information includes software attachments between devices.

1. Press the MENU key to access the Main Menu.
2. Move the pointer to Network Menu and press the ENTER key.
3. Move the pointer to NETWORK DIAGNOSTICS and press the ENTER key.
4. Select PRINT NETWORK IMAGE and press the ENTER key.

6.3.2 Query Device Status

This function is intended as an aid for Service Personnel. Contact Hach Service for additional information.

6.3.3 Test for Duplicate or Wrong Node

This function removes any node not recognized by the network database.

6.4 Troubleshooting

The AquaTrend Interface Modules have been engineered to operate efficiently with a minimum of errors. The following error messages have been programmed into the AquaTrend Interface software to help you correct minor operating problems and identify hardware and software problems. If problems persist, contact Hach Service Center at 1-800-227-4224.

Table 12 AquaTrend Interface Error Messages

Displayed Error Message	Possible Cause	Remedy
Any error message with an error code starting with 110. For example, 11001.	An internal AquaTrend Interface software or hardware error occurred. For example: interrupt, divide by zero, break point errors.	If problem persists, call service.
Data Memory Failed	AquaTrend Interface battery-backed RAM memory failure	If problem persists, call service.
DEVICE DID NOT RESPOND	A device didn't respond to a message. This message is logged in the AquaTrend Interface Alarm log.	Make sure device(s) are connected properly and powered up. If problem persists, call service.
Device Not Responding	A device didn't respond to a message. For example, a menu was not received.	A possible solution is presented on screen.
Duplicate Node Removed	System identifies a preconfigured device that was not recognized by the system and removes it from the network.	Reinstall device.
Invalid Device Category	During ADD DEVICE, the configure button was pressed on a device that doesn't match the category	Repeat the procedure, this time pressing the correct configure button
Invalid Device Message	Internal or communication error between a device and an AquaTrend Interface	Make sure device(s) are connected properly and powered up. If problem persists, call service.
Invalid Queue Value	A problem occurred when a message requested an invalid message queue.	If problem persists, call service.
Keyboard Not Responding	System busy. Hourglass shown in Status Bar of display.	Wait for hourglass to disappear and repeat keystrokes.
Main RAM Failed	AquaTrend Interface main RAM failure	If problem persists, call service.
MEMORY TEST FAILED	One of the AquaTrend Interface memory components failed during power up/reset	If problem persists, call service.
MIP Buffer Overrun	An uplink message could not get a buffer.	If problem persists, call service.
Neuron Failed To Sync	The neuron on the AquaTrend Interface failed to sync	If problem persists, call service.
NEURON NOT RESPONDING	The Neuron on the AquaTrend Interface is not responding	If problem persists, call service.
NODE(S) NOT RESPONDING	A device didn't respond to a message. This message is logged in the AquaTrend Alarm log.	Make sure device(s) are connected properly and powered up. If problem persists, call service.
Program FLASH 1 Failed	AquaTrend Interface Flash #1 failure	If problem persists, call service.
Program FLASH 2 Failed	AquaTrend Interface Flash #2 failure	If problem persists, call service.

Appendix A Use of Subnets

The AquaTrend system allows multiple AquaTrend systems to communicate on one set of network wires. The largest advantage to installing multiple systems on one set of network wires is the need for fewer wires (particularly for long wire runs between the sensors and the control room). The number of systems which can be installed on one set of wires is installation dependent, but typically is limited to 5-6 systems. Contact Hach Customer Service for specific applications.

Note: *An AquaTrend system is defined as 1 Master AquaTrend and up to 8 sensors, 8 SOMs, 8 DDMs, 8 Remote AquaTrends, and 2 SIOs.*

When multiple systems are installed on a single set of network wires, each system (and each device within that system) must have a subnet address assigned to it. The instructions below explain how to change the subnet.

Changing the Subnet Address

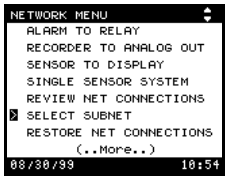
1. Start with all of the devices unconfigured.

2. Select the AquaTrend that is to be the Master for the first system. Install this AquaTrend as a Master (see section 3.1 on page 23).

3. From the Network Menu choose SELECT SUBNET.

Note: *This entry will only appear if there have not been any devices added by this AquaTrend.*

4. Change the subnet number (2-9) to an unused number and press ENTER.





Note: *Record this subnet number to avoid installing an additional Master AquaTrend on the same subnet.*

5. Install other devices (sensor, etc.) on this AquaTrend system in the usual way (see section 3.4.2 on page 26).

6. Repeat this procedure for additional AquaTrend systems.

Appendix B Aquatrend RS232 Commands

The following RS232 remote command set is available when an SIO is attached to the AquaTrend network. Window's Terminal or a SCADA program may be used to send/receive these commands. Refer to the *SIO Manual* (Cat. No. 52074-18) for more information on setting the baud rate, stop bits, etc.

Each command must be prefixed with 0 or the SIO returns BAD CHANNEL. AquaTrend replies are prefixed with [0].

RS232 Instrument Name

This command sets or recalls the instrument name.

To set the name to FILTER 1, enter the following:

```
0RIN=FILTER 1
[0] OK
```

To recall the name:

```
0RIN?
[0] FILTER 1
```

RS232 Instrument ID

This command recalls the instrument ID string.

To recall the ID, enter the following:

```
0RID
[0]AQUATREND (TM) Version 3.0
```

RS232 Data Log

This command recalls min, max, or average data from a particular channel's data log. Three parameters must be specified after the "=".

To recall a data log, enter the following:

```
ORDL=AA24
```

where:

"A" is the channel letter.

Valid entries are A through P.

"A" is the required value for compatibility with older instruments.

Valid entries are X, N, or A.

"24" is the time base. Valid entries are 60 (sixty minutes), 8 (eight hours), 24 (twenty-four hours), 7 (seven days), or 30 (thirty days).

Refer to section 3.10 on page 39 for more information.

The response is:

```
[0] OK
[0] PRINT DATA LOG
[0] MAXIMUM: CHANNEL A
[0] TIME BASE: 24 HOURS
[0] SENSOR TYPE: 1720D TURB
[0] LOCATION: #1_1720D TURB
[0] UNITS: NTU
[0] 12/11/97 09:44:15 0.133
[0] 12/11/97 09:56:15 0.134
[0] 12/11/97 10:08:15 0.133
[0] 12/11/97 10:20:15 0.133
[0] 12/11/97 10:32:15 0.144
[0] 12/11/97 10:44:15 0.156
[0] 12/11/97 10:56:15 0.158
[0] 12/11/97 11:08:15 0.160
[0] 12/11/97 11:20:15 0.166
[0] 12/11/97 11:32:15 0.168
[0] END OF PRINT
```

Printed Reports

Print Data Log

The data log of the selected channel is printed by selecting PRINT DATA LOG from the AquaTrend menu. Note that at least one SIO must be connected to the network to print a channel catalog. The report contains the header PRINT DATA LOG, the channel letter, time base, sensor type, location, units, measurement type, and species (if appropriate). Each data point (up to 2880) is displayed on a separate line, and is preceded by the date and time.

Table 13 Print Data Log Information

Time Base	Interval	Number of Data Points
60 minutes	1 minute	60
8 hours	1 minute	480
24 hours	15 minutes	96
7 days	15 minutes	672
30 days	15 minutes	2880

The report ends with the footer: End of Print.

A sample printout:

```
[0] PRINT DATA LOG
[0] AVERAGE: CHANNEL A
[0] TIME BASE: 24 HOURS
[0] SENSOR TYPE: 1720D TURB
[0] LOCATION: #1_1720D TURB
[0] UNITS: NTU
[0] 12/11/97 09:44:15 0.133
[0] 12/11/97 09:56:15 0.134
[0] 12/11/97 10:08:15 0.133
[0] 12/11/97 10:20:15 0.133
[0] 12/11/97 10:32:15 0.144
[0] 12/11/97 10:44:15 0.156
[0] 12/11/97 10:56:15 0.158
[0] 12/11/97 11:08:15 0.160
[0] 12/11/97 11:20:15 0.166
[0] 12/11/97 11:32:15 0.168
[0] END OF PRINT
```

Print Network Image

A printed report of the network can be generated by selecting PRINT NETWORK IMAGE from the Review Net Connections Menu. Note that at least one SIO must be connected to the network to print the network image. This report contains the same information that is displayed in LIST NETWORK DEVICES, ALARM TO RELAY, RECORDER TO ANALOG OUT, and SENSOR TO DISPLAY.

The report starts with the header line Print Network Image. The next line contains the date and time of the report. A list of all network devices and the location of each follows the date and the time. Next, each alarm to relay connection, recorder to analog out connection, and sensor to display connection is disPlayed with a blank line separating connections. The report ends with the footer line END OF PRINT.

For alarm to relay connections, the first line contains the sensor type (1720D TURB in the sample below) and the sensor location (#1 1720D). The second line contains the alarm number within the sensor (ALARM 1). The third line contains the output type (SIGNAL OUT) AND THE OUTPUT LOCATION (#1_SOM). The fourth line contains the relay number within the output device (RELAY 1). The same format is used for the recorder to analog output connections.

For sensor to display connections, the first line contains the sensor type (1720D TURB) and the sensor location (#1_1720D). The second line contains the display type (DDM) and the display location (#1_ DDM).

A sample printout of a fully connected single sensor system is shown below:

```
[0] PRINT NETWORK IMAGE
[0] 12/12/97 09:36:18
[0]
[0] AQUATREND #1_MASTER
[0] 1720D TURB #1_1720D
[0] SIGNAL OUT #1_SOM
[0] SERIAL I/O #1_SIO
[0] DDM #1_DDM
[0]
[0] 1720D TURB #1_1720D
[0] ALARM 1
[0] SIGNAL OUT #1_SOM
[0] RELAY 1
[0]
[0] 1720D TURB #1_1720D
[0] ALARM 2
[0] SIGNAL OUT #1_SOM
[0] RELAY 2
[0]
[0] 1720D TURB #1_1720D
[0] RECORDER 1
[0] SIGNAL OUT #1_SOM
[0] ANALOG OUT 1
[0]
[0] 1720D TURB #1_1720D
[0] RECORDER 2
[0] SIGNAL OUT #1_SOM
[0] ANALOG OUT 2
[0]
[0] 1720D TURB #1_1720D
[0] DDM #1_DDM
[0] END OF PRINT
```

AquaTrend Network System - A system which provides a digital interface link between sensors and communication devices and can receive data from these devices at a maximum distance of up to 500 meters (1640 feet.). The fieldbus communications that makes such configuration possible is provided by Echelon® LonWorks® technology.

The network software may configure up to 35 devices including: one Master AquaTrend, as many as two Serial I/O Modules, and up to eight sensors, eight Signal Output Modules, eight Digital Display Modules, and eight Remote AquaTrends.

channel - Where data is displayed and logged on the AquaTrend. The AquaTrend has eight channels (represented by the letters A through H) to which you can attach measurements from sensors.

configure - Setting up a Hach network device for operation after hardware installation is complete. This involves selecting various software options and establishing communications between devices.

device - Any of the Hach network instruments, including sensors, communications modules, display modules, outputs, and AquaTrends.

Digital Display Module (DDM) - An eight-character display that can be used with sensors or analyzers to display a single measurement. It can be mounted as far away as 400 meters (1310 feet) from the sensor.

Echelon® technology - communications technology used by the AquaTrend Network System and developed by Echelon Corporation, producers of LonWorks® fieldbus technology.

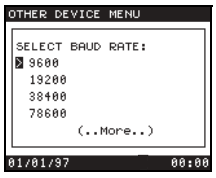
fieldbus - Any of several techniques allowing multiple devices to be connected on a single set of wires.

LonWorks - The fieldbus protocol used by the AquaTrend Network System.

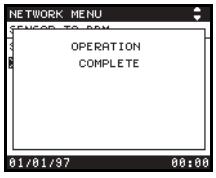
Master AquaTrend - Acts as the main network data control center for setup and operation of the network. The network can contain as many as nine AquaTrends but only one can be the Master AquaTrend. Only through the Master AquaTrend can you perform network operations.

network - The connection of one or more devices (of which at least one is a sensor or analyzer) to a Master AquaTrend.

pop-up box - Refers to a selection or message box at the end of a menu chain. This box either provides a choice of options, selectable by moving the cursor and pressing ENTER, or allows you to use the arrow keys to enter an alphanumeric response, or it states the status of the current operation. These three possibilities are respectively shown below.







Portable AquaTrend - Mobile device designed to setup and calibrate sensors already setup on the network. Portable AquaTrends can access all menus except the network menu and can not perform network operations.

PS1201 - A power supply that provides 25 watts to AquaTrend network devices.

Remote AquaTrend - Any AquaTrend on a network that is not a Portable or Master AquaTrend. Remote AquaTrends can display all sensor readings and access all sensor menus.

repeater - A device capable of amplifying signals when total cable distance is exceeded in order to extend the network's capabilities.

SCADA - Supervisory Control and Data Acquisition. General term for any automated (and usually PLC or computer-controlled) system for control and data acquisition.

sensor - Any one of the Hach devices designed to take measurements for specific parameters and for use with the AquaTrend Network System (*e.g.* the 1720D Turbidimeter)

Serial I/O Module (SIO) - Communication device for two-way communication with a PC or one-way communication with a printer.

Signal Input Module (SIM) - The Signal Input Module (SIM) provides two 4-20mA analog inputs which can be used to bring measurements from non-networked sensors into the network.

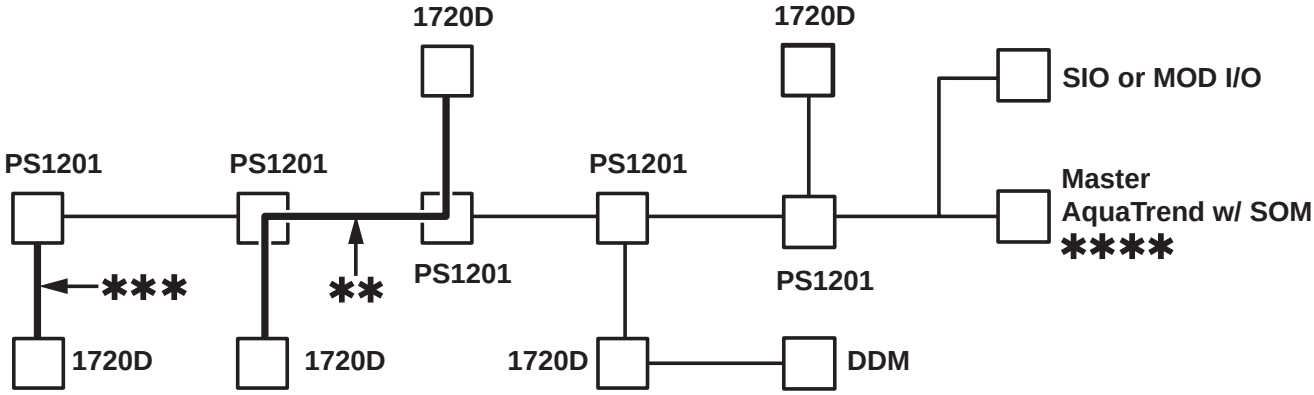
Signal Output Module (SOM) - Network device that provides two relays, each with normally open and normally closed contacts rated at a maximum of 5A/250 VAC, and two analog outputs, selectable through the AquaTrend keypad at either 4-20 or 0-20 mA. Sensor alarms can be configured to trigger one the relays in the SOM and/or a recorder or controller signal from a sensor can be attached to the analog outputs of the SOM.

The SOM can either be a stand-alone device (model 51250) or can be internal to the AquaTrend/SOM (model 51350).

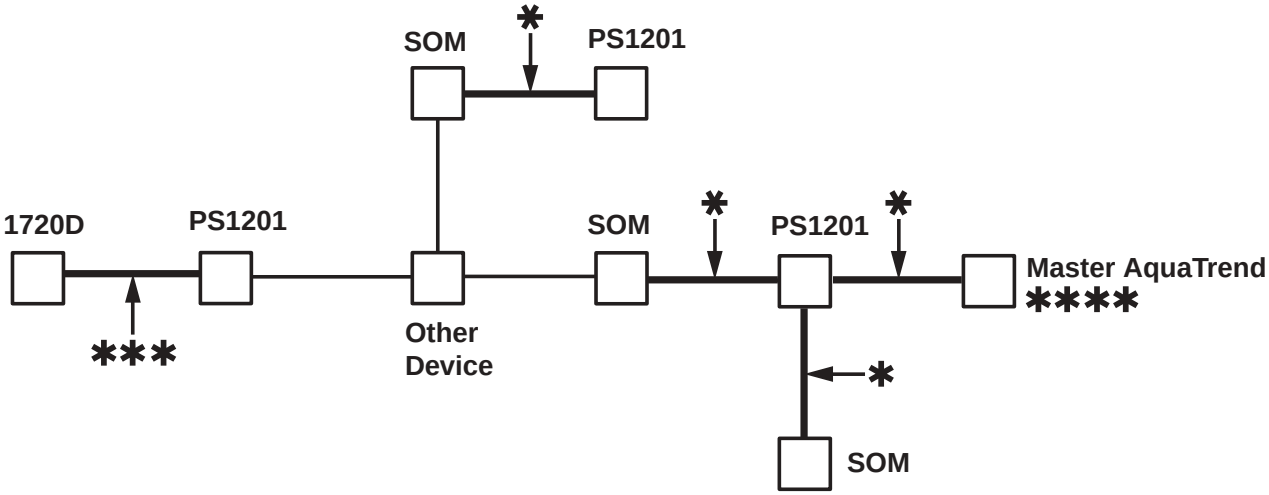
terminator - Impedance stabilizing component that maintains network signal integrity. One terminator is required for proper network operation, either on an AquaTrend (without SOM) or on a stand-alone SOM.

topology - Any wiring configuration. See Figure 26 for examples.

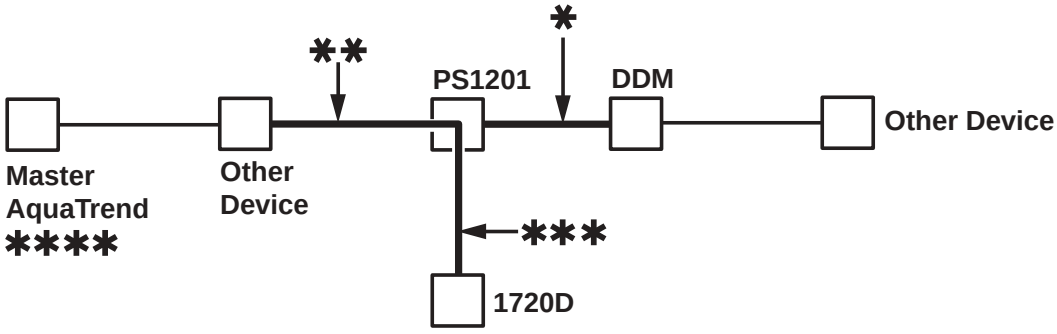
Figure 26 Wiring Topologies



1650 feet (500 meters) Total maximum distance for network communication.



1650 feet (500 meters) Total maximum distance for network communication.



1650 feet (500 meters) Total maximum distance for network communication.
Distances in excess of 1650 feet (500 meters) require a repeater.

*** 100 feet (30.3 meters) Maximum distance between the power supply and the device it is powering.**

**** 1320 feet (400 meters) Maximum distance between two network devices.**

***** 20 feet Fixed distance between power supply and 1720D.**

****** Only one enabled terminator is allowed for network.**
(Terminators are located in SOMs, AquaTrends, and SIOs)

General Information

At Hach Company, customer service is an important part of every product we make.

With that in mind, we have compiled the following information for your convenience.

Replacement Parts and Accessories

AquaTrend/SOM

Description	Cat. No.
Instruction Manual	51350-18
PS1201 Power Supply	52010-00
Cable Termination Kit - includes:	52156-00
Strain Relief (4)	52025-00
Heat Shrink Tubing (1 ft.)	40825-00
Locknut, ½-inch (4)	10596-12
Washer (4)	10338-14
Cable, 4 Wire, 20 AWG, Shielded (by the ft.)	52158-00
Cable, 2 Wire, 22 AWG, Shielded (by the ft.)	52157-00
Connector, Internal 6-Position Terminal Block (for relay contacts)	52088-00

AquaTrend

Instruction Manual	51350-18
PS1201 Power Supply	52010-00
Cable Termination Kit - includes:	52156-00
Strain Relief (4)	52025-00
Heat Shrink Tubing (1 ft.)	40825-00
Locknut, ½-inch (4)	10596-12
Washer (4)	10338-14
Cable, 4 Wire, 20 AWG, Shielded (by the ft.)	52158-00
Cable, 2 Wire, 22 AWG, Shielded (by the ft.)	52157-00

Portable AquaTrend

Portable AquaTrend	51400-00
Instruction Manual	51350-18
Handle	51402-00
Mounting Kit, Retainer, wall	51413-00

Optional Accessories

Digital Display Module	each	51250-00
Floor Stand Assembly, 1720D/AquaTrend® System	each	52160-00
Mounting Hardware (2 U-Bolts) for floor stand or pole mounting	each	51410-00
PS1201 Power Supply	each	52010-00
Signal Input Module	each	51450-00
Signal Output Module	each	51250-00
Signal Input/Output Module, 115 V 50/60 Hz with 120 V power supply	each	52074-00
Signal Input/Output Module, 230 V 50/60 Hz with 230 V power supply	each	52074-02

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By Telephone:
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Monday through Friday
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By Fax:
(970) 669-2932

By Mail:
Hach Company
P.O. Box 389
Loveland, Colorado 80539-0389 U.S.A

Ordering information by E-mail:
orders@hach.com

Information Required

- Hach account number (if available)
- Your name and phone number
- Purchase order number
- Brief description or model number
- Billing address
- Shipping address
- Catalog number
- Quantity

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Hach maintains a worldwide network of dealers and distributors. To locate the representative nearest you, send E-mail to **intl@hach.com** or contact:

Hach Company World Headquarters; Loveland, Colorado, U.S.A.
Telephone: (970) 669-3050; Fax: (970) 669-2932

Repair Service

Authorization must be obtained from Hach Company before sending any items for repair. Please contact the HACH Service Center serving your location.

In the United States:
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Ames, Iowa 50010
(800) 227-4224 (U.S.A. only)
Telephone: (515) 232-2533
FAX: (515) 232-1276

In Canada:
Hach Sales & Service Canada Ltd.
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Winnipeg, Manitoba
R3H 0X4
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Hach Company World Headquarters,
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Loveland, Colorado, 80539-0389 U.S.A.
Telephone: (970) 669-3050
FAX: (970) 669-2932
E-mail: intl@hach.com

Hach warrants most products against defective materials or workmanship for at least one year from the date of shipment; longer warranties may apply to some items.

HACH WARRANTS TO THE ORIGINAL BUYER THAT HACH PRODUCTS WILL CONFORM TO ANY EXPRESS WRITTEN WARRANTY GIVEN BY HACH TO THE BUYER. EXCEPT AS EXPRESSLY SET FORTH IN THE PRECEDING SENTENCE, HACH MAKES NO WARRANTY OF ANY KIND WHATSOEVER WITH RESPECT TO ANY PRODUCTS. HACH EXPRESSLY DISCLAIMS ANY WARRANTIES IMPLIED BY LAW, INCLUDING BUT NOT BINDING TO ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

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This warranty applies to Hach products purchased and delivered in the United States.

Catalog descriptions, pictures and specification, although accurate to the best of our knowledge, are not guarantee or warranty.

For a complete description of Hach Company's warranty policy, request a copy of our Terms and Conditions of Sale for U.S. Sales from our Customer Service Department.

Certification

Hach Company certifies this instrument was tested thoroughly, inspected and found to meet its published specifications when it was shipped from the factory. The standard AquaTrend® Interface has been tested and is certified as indicated to the following instrumentation standards:

Product Safety

(Included in the safety report with the PS 1201 Power Supply)

UL 3101-1 (ETL Listing # H0492805390)

CSA C22.2 No. 1010.1 (ETLc Certification # H0492805390)

Certified by Hach to EN 61010-1 (IEC1010-1) per 73/23/EEC, supporting test records by Intertek Testing Services.

Immunity

The AquaTrend was tested with the Hach PS2401 and the PS 1201 Power Supplies in a Portable AquaTrend configuration.

EN 61326 (EMC Requirements for Electrical Equipment for Measurement, Control and Laboratory Use) **per 89/336/EEC EMC:** Supporting test records by Hach Company, certified compliance by Hach Company.

Standards include:

IEC 1000-4-2:1995 (EN 61000-4-2:1995) Electro-Static Discharge Immunity (Criteria B)

IEC 1000-4-3:1995 (EN 61000-4-3:1996) Radiated RF Electro-Magnetic Field Immunity (Criteria A)

IEC 1000-4-4:1995 (EN 61000-4-4:1995) Electrical Fast Transients/Burst (Criteria B)

IEC 1000-4-5:1995 (EN 61000-4-5:1995) Surge (Criteria B)

IEC 1000-4-6:1996 (EN 61000-4-6:1996) Conducted Disturbances Induced by RF Fields (Criteria A)

IEC 1000-4-11:1994 (EN 61000-4-11:1994) Voltage Dip/Short Interruptions (Criteria B)

Additional Immunity Standard/s include:

ENV 50204:1996 Radiated Electro-Magnetic Field from Digital Telephones (Criteria A)

Emissions

The AquaTrend was tested for Radio Frequency Emissions with both the PS1201 and PS2401 Power Supplies as follows:

Per **89/336/EEC** EMC: **EN 61326:1998** (Electrical Equipment for measurement, control and laboratory use—EMC requirements) Class “A” emission limits. Supporting test records by Hewlett Packard, Fort Collins, Colorado Hardware Test Center (A2LA # 0905-01) and certified compliance by Hach Company.

Standards include
(applied only to the PS 1201 and 2401 Power Supplies)

EN 61000-3-2 Harmonic Disturbances Caused by Electrical Equipment

EN 61000-3-3 Voltage Fluctuation (Flicker) Disturbances Caused by Electrical Equipment

Additional Emissions Standard/s include:

EN 55011 (CISPR 11) Class “A” emission limits

Canadian Interference-causing Equipment Regulation, IECS-003, Class A:

Supporting test records by Hewlett Packard, Fort Collins, Colorado Hardware Test Center (A2LA # 0905-01) and certified compliance by Hach Company.

This Class A digital apparatus meets all requirements of the Canadian Interference- Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

FCC Part 15, Class A Limits

Supporting test records by Hewlett Packard, Fort Collins, Colorado Hardware Test Center (A2LA # 0905-01) and certified compliance by Hach Company.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user’s authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

The following techniques of reducing the interference problems are easily applied:

1. Disconnect the AquaTrend Interface from its power source to verify that it is or is not the source of the interference.
2. If the AC power supply for the AquaTrend Interface is connected into the same outlet as the device with which it is interfering, try another outlet.
3. Move the AquaTrend Interface away from the device receiving the interference.
4. Reposition the receiving antenna for the device receiving the interference.
5. Try combinations of the above.

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