AV-Trend

Agilaire LLC

Produced by Agilaire LLC

2904-B Tazewell Pike, Suite A
Knoxville, TN 37918
www.agilaire.com
info@agilaire.com

Support:
865-927-9440
support@agilaire.com

July 2019

Chapter 1 Installing AV-Trend 6
Installing Microsoft .NET Framework 6
Installing SQL Server 7
Installing the AV-Trend Database 8
First-time Installation of the AV-Trend Database 8
Installing AV-Trend 9
Logging In to AV-Trend 14
Accessing Profiles After Logging In 15
Chapter 2 Configuring AV-Trend 16
Configuring System Preferences 17
Site and Parameter Setup 18
Adding and Editing Sites 18
Adding and Editing Parameters 21
Configuring Parameter Templates 25
Adding Loggers to Sites in Logger Channels 27
Text Strings in Digital I/O 28
Logger Properties Tabs 28
Adding an Instrument 30
Channel Configuration 31
Basic Channel Information 31
Basic Channel Types 32
Meteorological Channel Types 36
CEM Channel Types 39
Adding Channels to Data Loggers 41
Special Case- External Channels 44
Validation and Flags 45
Parameter Tag Editor 48
Database Export 48
Adding Communication Routes 49
Adding TCP/IP Routes 49
Adding Serial Routes for Direct Communication 51
Configuring Communication Routes 52
Adding Remote Modems 53
Adding a Modem Route for Central Modem 55
Associating an Existing Route to a Logger 56
Testing Your Connection 57

Logger Download (Model 8816 / 8832 / 8864 only) 58
Downloading Channel Configurations (8816 / 8832 / 8864 Loggers) 59
Setting Up Calibrations 60
Calibration Expected Values Editor 61
Configuring Automatic Calibrations 62
Configuring Phases 63
Externally Initiated Calibration 64
Configuring Instrument Controlled Calibrations 66
Configuring Interactive (Menu) Calibrations 67
Configuring User-Initiated Calibrations 68
Configuring Input/Output Lines for Digital Events 69
Configuring Digital Timed Events 69
Configuring Digital Triggered Events 70
Configuring DI-Triggered GSI Events 73
Setting Up Email Services and Alarms 74
Scheduling Tasks 78
Task Scheduler 78
Schedule Task Wizard 90
Task Display 93
Favorites Editor 95
Creating a Favorite 95
Favorite Detail Tab 95
Favorite Query Tab 95
Configuring Security 97
User Editor 97
My User Settings 98
Groups Editor 99
Group Permissions 100
GSI Driver Editor 101
Chapter 3 Reports 102
Criteria Pane 103
Filters 104
Additional Fields for Specific Reports 106

Basic Reports 107
Daily Summary Report 107
Daily Parameter Report 109
Monthly Report 110
Calibration Reports 112
Calibration Results 112
Calibration Trend Graph 113
Configuration Reports 116
Calibration Configuration Report 116
Channel Configuration Report 117
Parameter Configuration Report 118
Scheduled Tasks Report 119
Site Configuration Report 120
Internal Reports 121
Journal Message Log 121
Software Version Report 122
Logger Reports 123
Alarm Journal 123
Input Line Status Report 124
Power Failure Report 125
Other Reports 126
Annotations Report 126
LogBook Report 127

Chapter 4 Data Editors 128

Average Data Editor 129
Linear Data Editor 130
Cell Color Codes 131
Right-Click Options 132
Cross-Tab Data Editor 134
Matrix Data Editor 135
Time Series Graph 136
Scatter Plot Graph 140
Histogram 141
LogBook Entry Editor 142

Chapter 5 Realtime Display Programs 143

Realtime Trend Display 144
Tabular Display 146
Site Node Logger Tool Box 150
Realtime Trend 152
Right Click Data 155
Agilaire Support 156
AV-Trend Manual 156
Video Tutorials 156
Software Release Info 156

Chapter 1

Installing AV-Trend

AV-Trend software is part of the AirVision family, fulfilling the role where basic air quality reporting is sufficient. (AirVision provides more in-depth reporting of agency-level reports, such as AQI, AQS, Violation of Standards, and some statistical reports.) AV-Trend can be licensed in single or multiple site versions, and supports both direct and remote connections like AirVision.

AV-Trend is required to be installed on Windows 7 / Server 2008 or better with a recommended 8GB of RAM or more, under the administrative login of the system, with 500GB hard drive minimum with Intel 5 processor, but Intel 7 is recommended. Before AV-Trend can be installed, the following software must be installed on your computer: **SQL Server 2008R2 SP3** or better, or **SQL Express** with all available service packs, as well as **.NET Framework includes versions 4.5.2**. SQL will request that the Windows Component **Internet Information Services (IIS)** be added, but IIS is NOT necessary for AV-Trend and does not have to be enabled.

Installing Microsoft .NET Framework

If you don't already have .NET Framework versions 4.5.2 installed on your computer, you can download it from the Microsoft website. Follow the instructions in the installation wizard.

Installing SQL Server

Before SQL Server can be installed, .NET Framework versions 3.5SP1, 4.0, and 4.5.2 must be installed.

⇨ **Important!** Although AV-Trend will operate with either SQL Server or SQL Express, SQL Express has a file size limit of 10G, so if you convert files from E-DAS Ambient to AV-Trend (i.e., to SQL files) you will run out of room quickly in SQL Express, especially if you are converting and collecting minute data. Even though SQL Express is a free download, Agilaire recommends that you start with the full version of SQL Server 2008R2 SP3 or better to avoid upgrading later. SQL Express will stop functioning when it has reached its capacity of 10G.

To install SQL Server or SQL Express, insert the media with the installation set and follow the instructions in the wizard. In the first screen check the box to accept the license agreement and click **Next**.

The default features are sufficient in the **Feature Selection** screen, but you can select the program features you want installed. The most important feature to install is **Client Tools**. Click **Next**.

- Selecting the 'default' install instance is acceptable.
- System and Local Service accounts should be selected if not prepopulated.
- A desired user should be added as **admin.**

Agilaire recommends **Mixed Authentication Mode** for AV-Trend as well as AirVision (if you intend to use remote synchronization functions). You must enter and confirm a **password** for the System Administrator. Click **Next** to continue.

The remaining setup screens are self-explanatory. Follow the directions and click **Finish** in the **Completing Microsoft SQL Server Setup** screen.

▶ **Note:** If you set up SQL in **Windows Authentication mode**, you must must log in to SQL with Windows Authentication, not SQL Server Authentication, or the AirVision Service won't start.

▶ **Note:** If you install **SQL ServerExpress**, **Management Studio** (free download) is a separate installation. SQL Express must be installed first, before Management Studio. Management Studio will not work without SQL.

⇨ **Important!** If SQL Express is installed on the same computer as AirVision Server, **the SQL Express login name** must be **.\SQLExpress** instead of your computer name.

SQL will request that the Windows Component **Internet Information Services (IIS)** be added, but IIS is not necessary for AV-Trend at this time and does not have to be enabled.

Installing the AV-Trend Database

First-time Installation of the AV-Trend Database

1. If you are installing AV-Trend for the first time, browse to open the **AVTrend** folder and open the folder **AV Database_Freshinstall**. Within the folder **Database_ Freshinstall** double-click **AVReleaseCreator.sql**. The script should open in the **AVData** folder in SQL.

2. Click **! Execute** to run the query. The query will install the SQL tables needed to run AV-Trend. The bottom of the query screen will display the results of the query. Any error messages will be listed by line number. Be sure to save any error messages in case you need to call Agilaire Support for help.

▶ **Note:** If you are upgrading AV-Trend from version 2.1 or higher, you no longer need to uninstall the old version before you run the new installation.

1. If the AV-Trend installation does not open automatically after you insert the installation CD, double-click to open **My Computer**, then right-click the **CD drive** and select **Open**. Double-click the **Setup** icon to begin.

2. Accept the license agreement and click **Next**.

3. Enter your **User Name**, **Company Name** (optional), and the unique **Product ID** (required) supplied by Agilaire. Click **Next**.

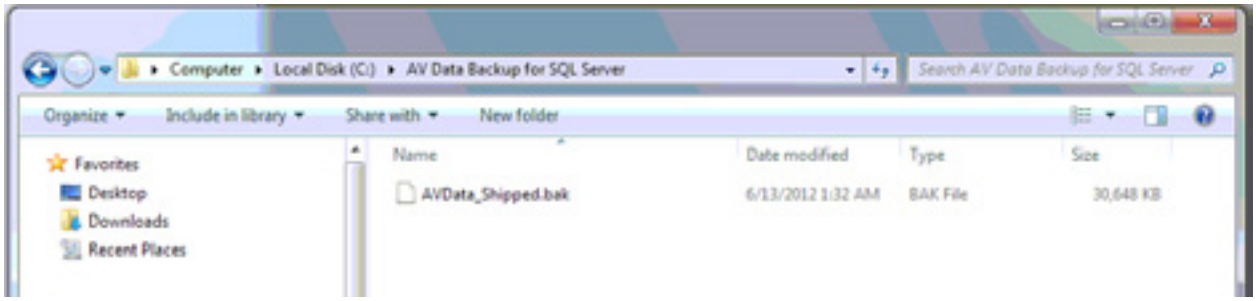
4. Click **Next** to accept the default destination directory (C:\Program Files\Agilaire LLC\ Server) or browse to change the directory and then click **Next**.

5. The final screen will say AV-Trend has been successfully installed. Click **Finish**.

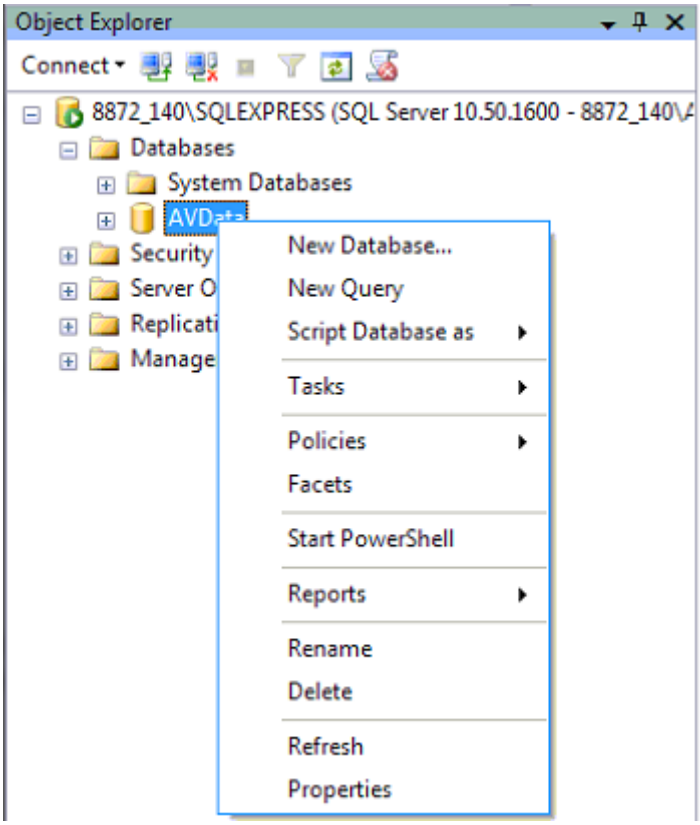
Installing AV-Trend

After you have installed SQL Server:

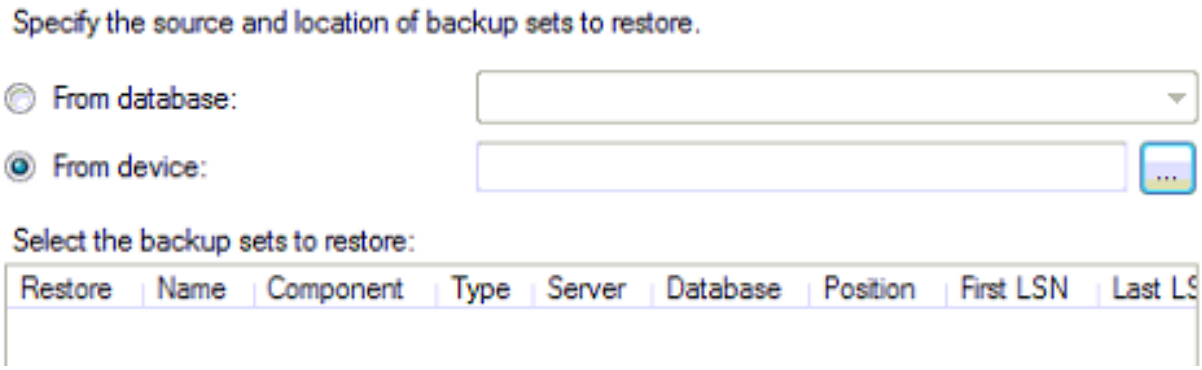
1. From the Windows **Start** menu, select **All Programs** > **Microsoft SQL Server** (or **Microsoft SQL Server 2008R2**) > **SQL Server Management Studio**.
2. Right-click the **Databases** folder and select **New Database**. For the **Database name**, enter **AVData** and click **OK**.
3. **Click** to select the database you just created (AVData).
4. Confirm you have an 'As Shipped' database backup.



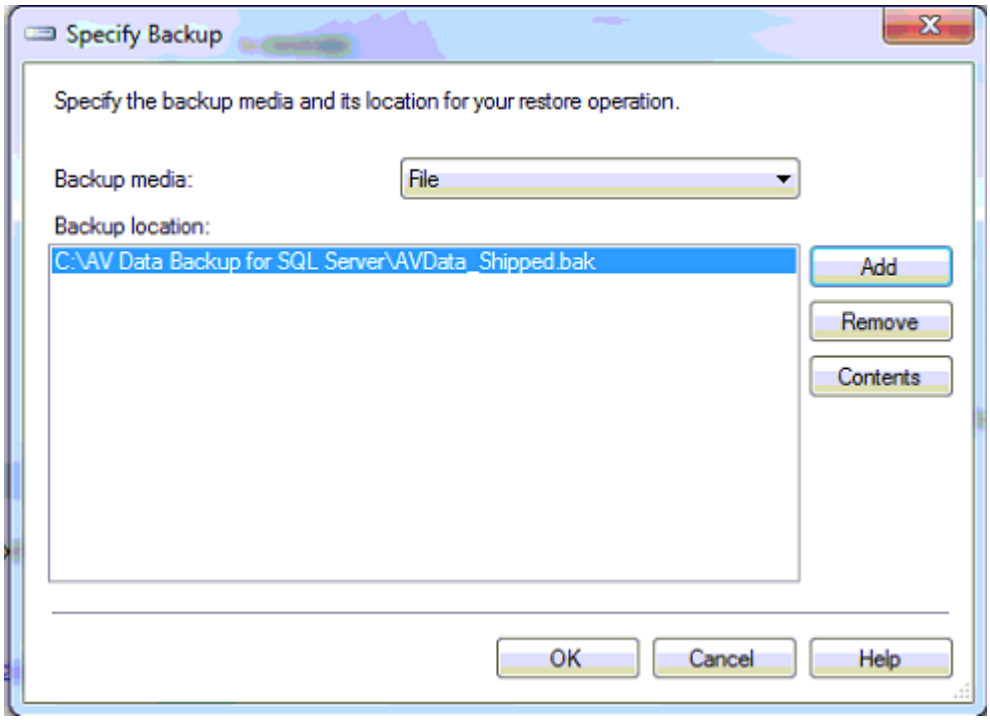
5. Open SQL Server, log in, expand "Databases" on the left, right click on the AVData database and choose **Tasks->Restore Database**.



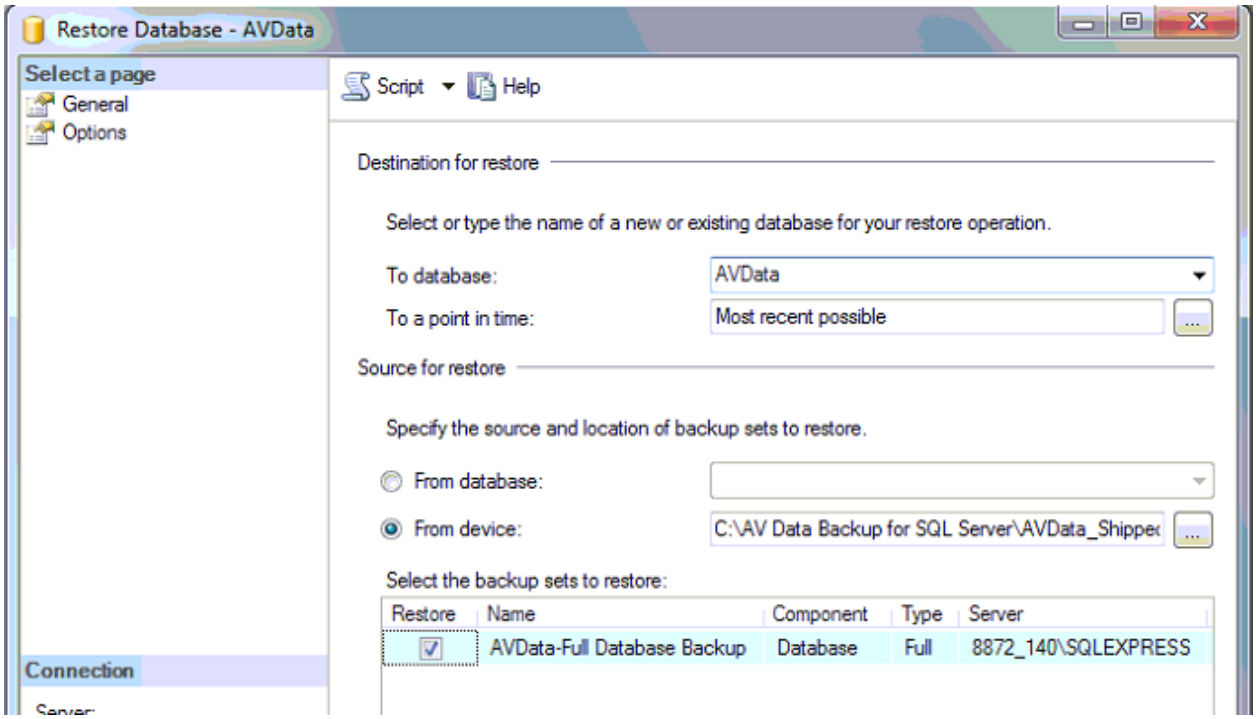
6. Select '**From device**' and click the '**…**' button. The '...' button is called the ellipsis button. So it should say Select '**From device**' and click the ellipsis button.



7. Click the **Add** button and select the AVData_Shipped.bak file provided by Agilaire, then click **OK**.

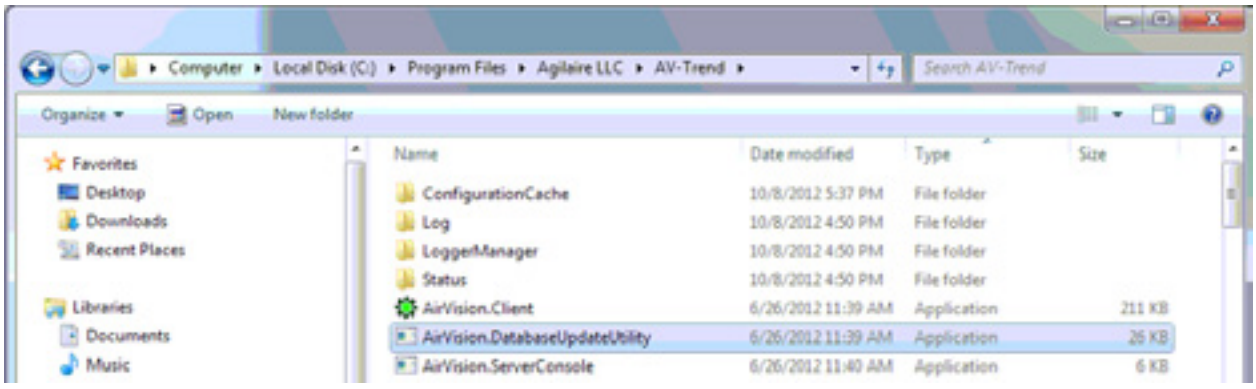


8. Set the 'To database' as AVData, place a check mark in the box next to the .bak file you selected, then click **OK**.

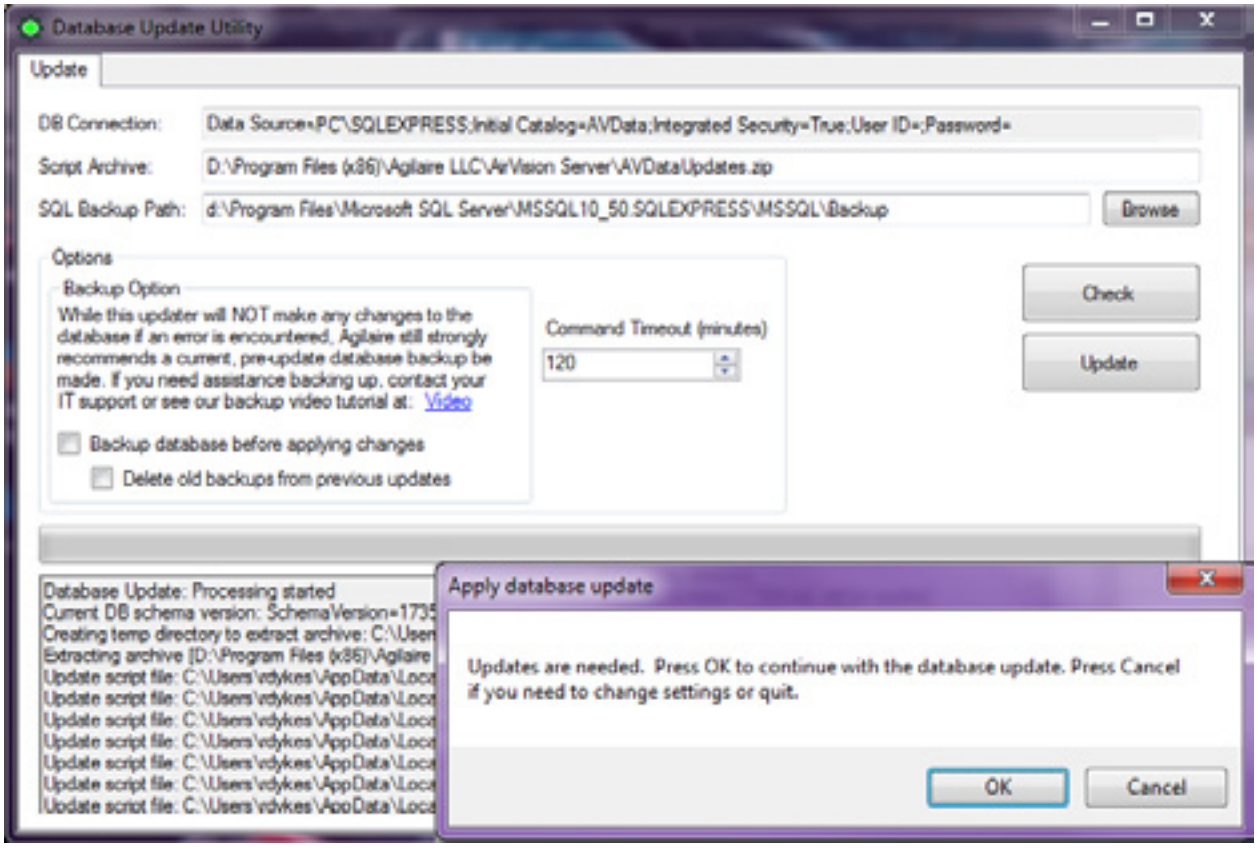


9. Once the restore completes, start the AirVision Server service that you stopped in step 3.

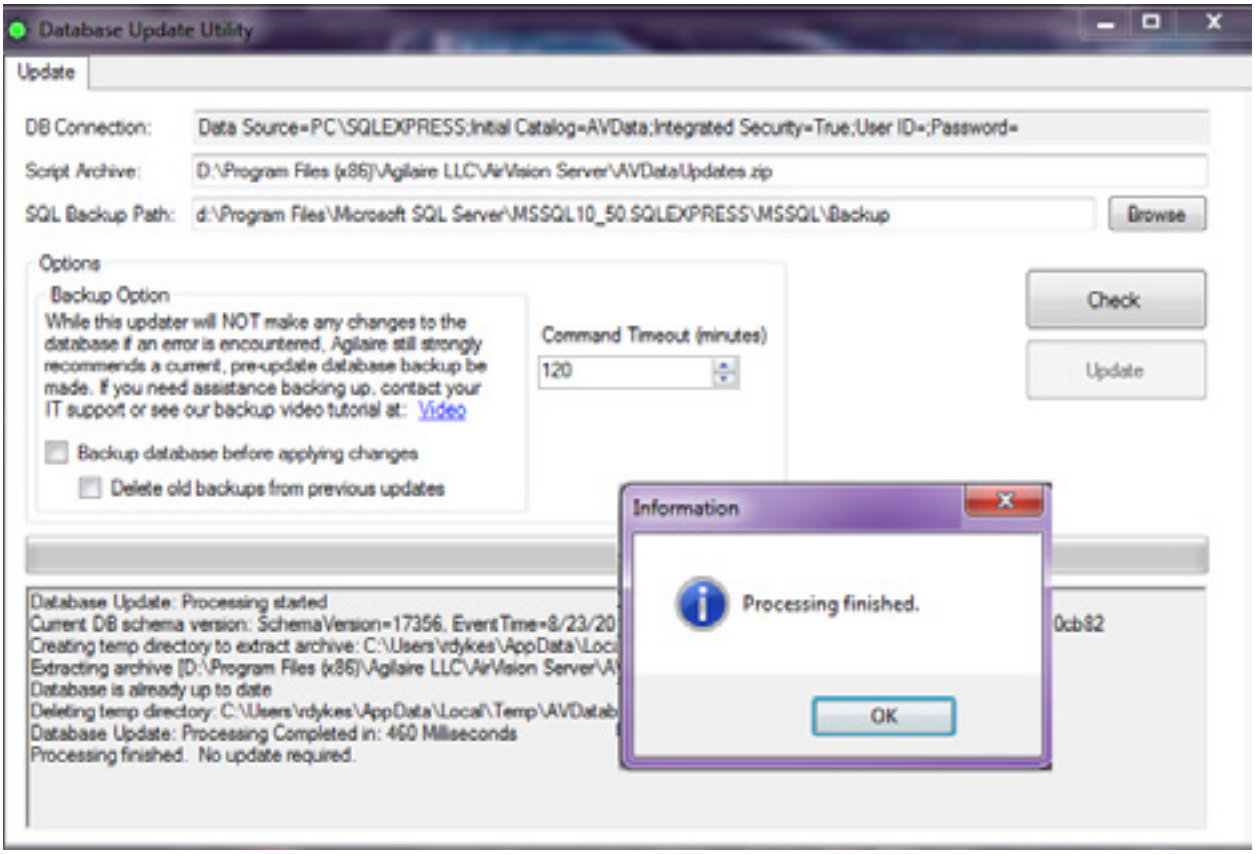
10. If you are not 100% certain that your database matches the version of the software you are running, navigate to **C:\Program Files\Agilaire LLC/AV-Trend** and launch the **AirVision.DatabaseUpdateUtility**.



11. If you have a newer version of AV-Trend installed than what was originally loaded on the system, the Database Update Utility will open. Click the **OK** button to update the database.



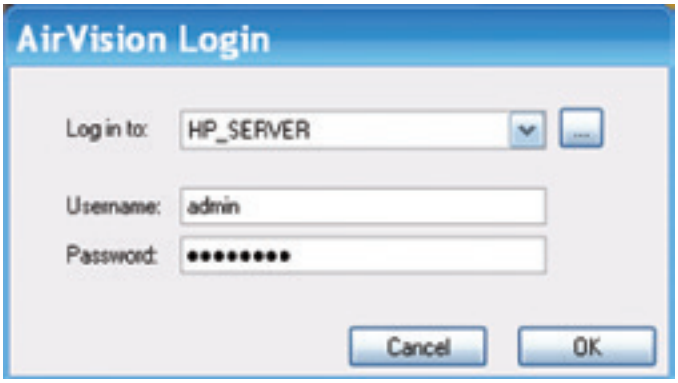
12. When the updates complete, you should see the following message:



13. Click **OK** and the Database Update window will close.
14. Restart the AirVision Service.
15. SSMS and the Windows Services window can both be closed as well.

Logging In to AV-Trend

Double-click the AV-Trend icon on your desktop and log in to the AV-Trend Client. If you are logging in for the first time click the ellipsis button to open the **Profiles** screen.

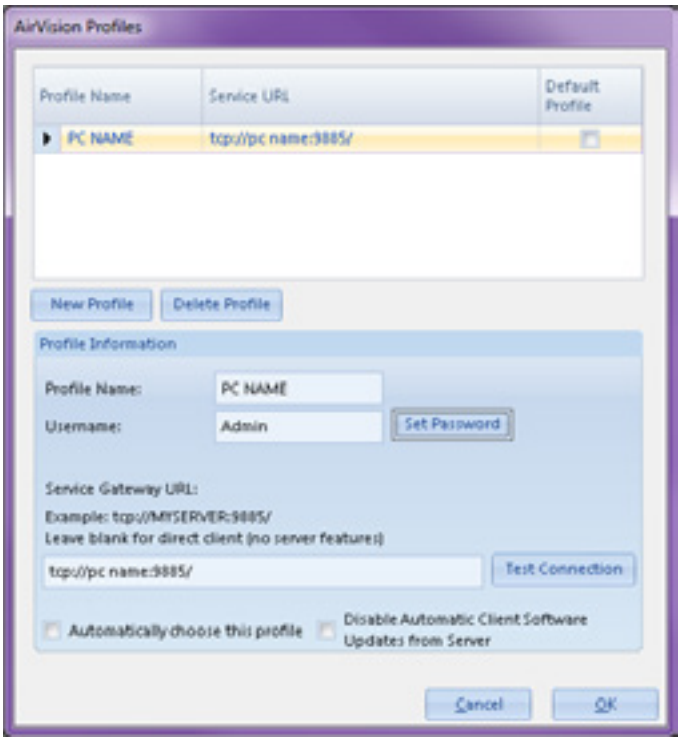


AV-Trend Login

In the profiles screen, click the **Add Profile** button and accept the default Server name that is shown in the Add Profile box by clicking **OK**.

Enter **admin** as the **Username**, click **Set Password** and enter **Agilaire**.

Click the **Test Connection** button to see if AV-Trend is communicating with the database.

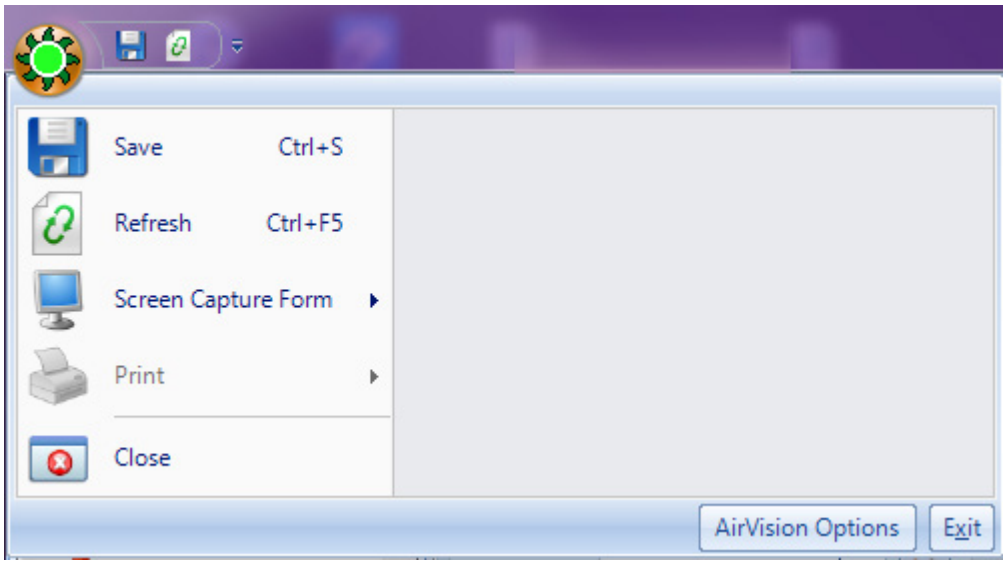


AV-Trend Profiles

Accessing Profiles After Logging In

After you are logged into AV-Trend, you can access the Profiles screen by clicking the AV-Trend icon in the upper left corner of the screen (beside the **Save** icon). From this Profiles screen you can:

- **Save**
- **Capture** the AV-Trend screen
- **Print**
- **Close** the Profiles screen.
- You can also open **AV-Trend Options**, which brings up the same Profiles screen you saw when you logged in.
- You can close AV-Trend altogether by selecting the **Exit** button.



AV-Trend Profiles seen by clicking the AV-Trend icon in the upper left corner of the AV-Trend screen after you have logged in

Chapter 2

Configuring AV-Trend

AV-Trend provides nearly unlimited flexibility in setting up systems and configuring servers. This chapter explains how to set up the following parts of AV-Trend:

- Configuring System Preferences
  Configuration Editors > Parameter Settings
- Configuring Server Preferences
  Configuration Editors > PC Configuration
- Setting up Sites and Parameters
  Configuration Editors > Parameter Settings
- Configuring Parameter Templates
  Configuration Editors > Parameter Template Editor
- Adding Loggers to Sites
  Configuration Editors > Logger Channels
- Adding Channels to Data Loggers
  Configuration Editors > Logger Channels
- Adding Communication Routes
  Configuration Editors > PC Configuration
- Testing Your Connection
  Utilities > Link to Logger
- Downloading Channel Configurations
  Utilities > Logger Download
- Setting up Calibrations
  Configuration Editors > Logger Channels
- Scheduling Tasks
  Configuration Editors > Task Scheduler
- Adding Users
  Configuration Editors > Security > User Editor
- Adding Favorites
  Configuration Editors > Favorites Editor

For information about starting the AirVision Service and logging in to AV-Trend, see “Chapter 1 Installation.”

Configuring System Preferences

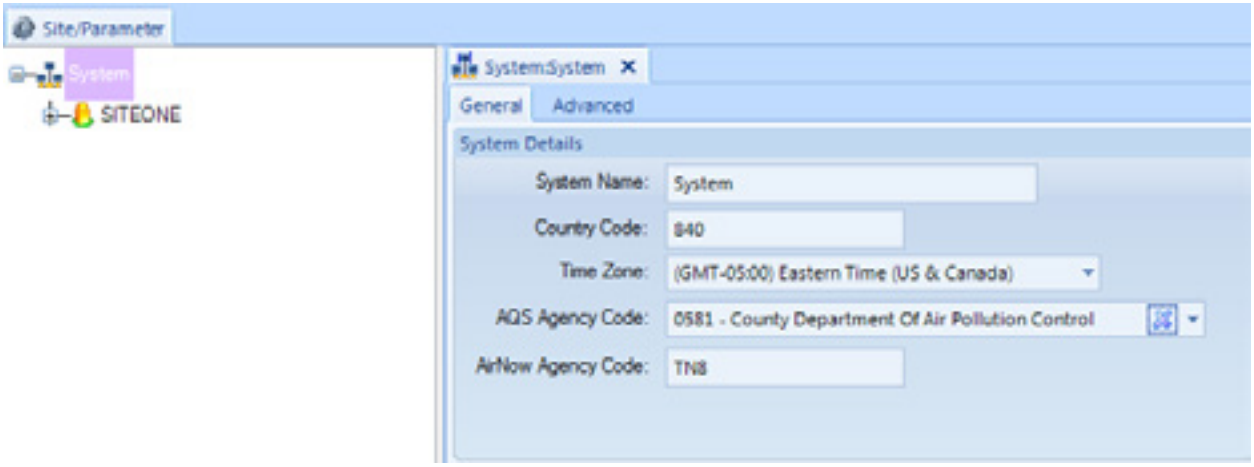
To set up system preferences, open the **Site/Parameter** screen from **Configuration Editors** and double-click the **System** icon. The System is the agency or area, such as county name or state name. Typically, each agency setup will only have one System, but it is possible to set up more than one by clicking the **Add System** button. (A second system could be used to help separate, for example, air toxics or water quality data from the other quality data).

Enter the following:

System Name can be left defaulted to System.
Country Code is defaulted to 840 for the United States.
Time Zone is the zone where the central polling PC is located.

AQS Agency Code (four digit numerical code provided by EPA, used for AQS reporting of 1-point QC checks) and can be selected from the drop down list.

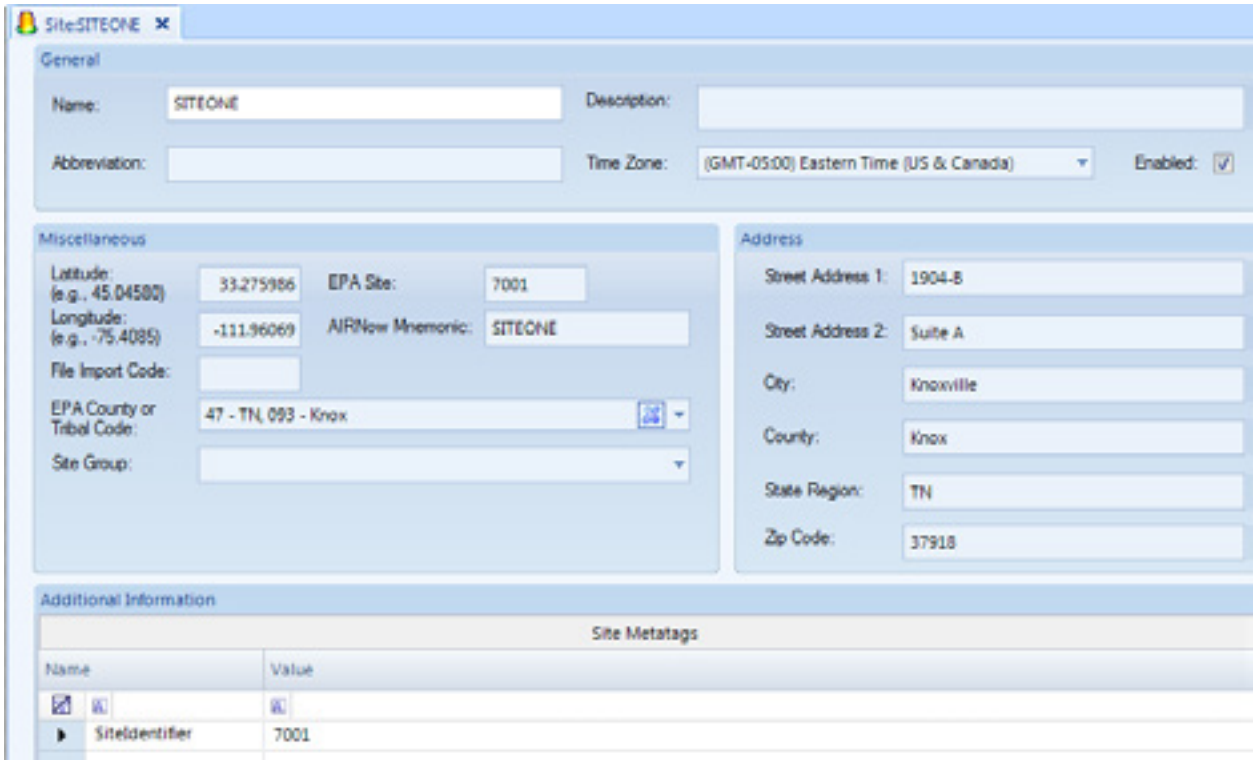
AirNow Agency Code (three digit alpha numeric code provided by STI, used for hourly AQCSV reports to AirNow).



System Configuration from Parameter Settings Editor

Site and Parameter Setup

The **Site/Parameter Editor** from the **Configuration** menu allows administrators to add, edit, and delete sites and parameters. In AV-Trend, a Site is NOT a single data logger as it was in E-DAS. A **Site** is a logical organization of a physical monitoring area and can contain data from several sources, such as data loggers, PM samplers, and directly polled analyzers.



Site Configuration from the Site/Parameter Editor in Configuration Editors

Adding and Editing Sites

To add a site, select **Configuration Editors** > **Site/Parameter**, and highlight your **System name**. Click the **Add Site** button and enter a **Name** for the **Site**.To edit a Site, double-click a **Site** from the Site/Parameter tree.

To save new or edited sites, click the **Save** icon from the upper left-hand corner of the AV-Trend screen, or click the Agilaire icon and select **Save**. Fields in the Site Configuration Editor are described below.

The Site Editor contains the following fields for information about the site:

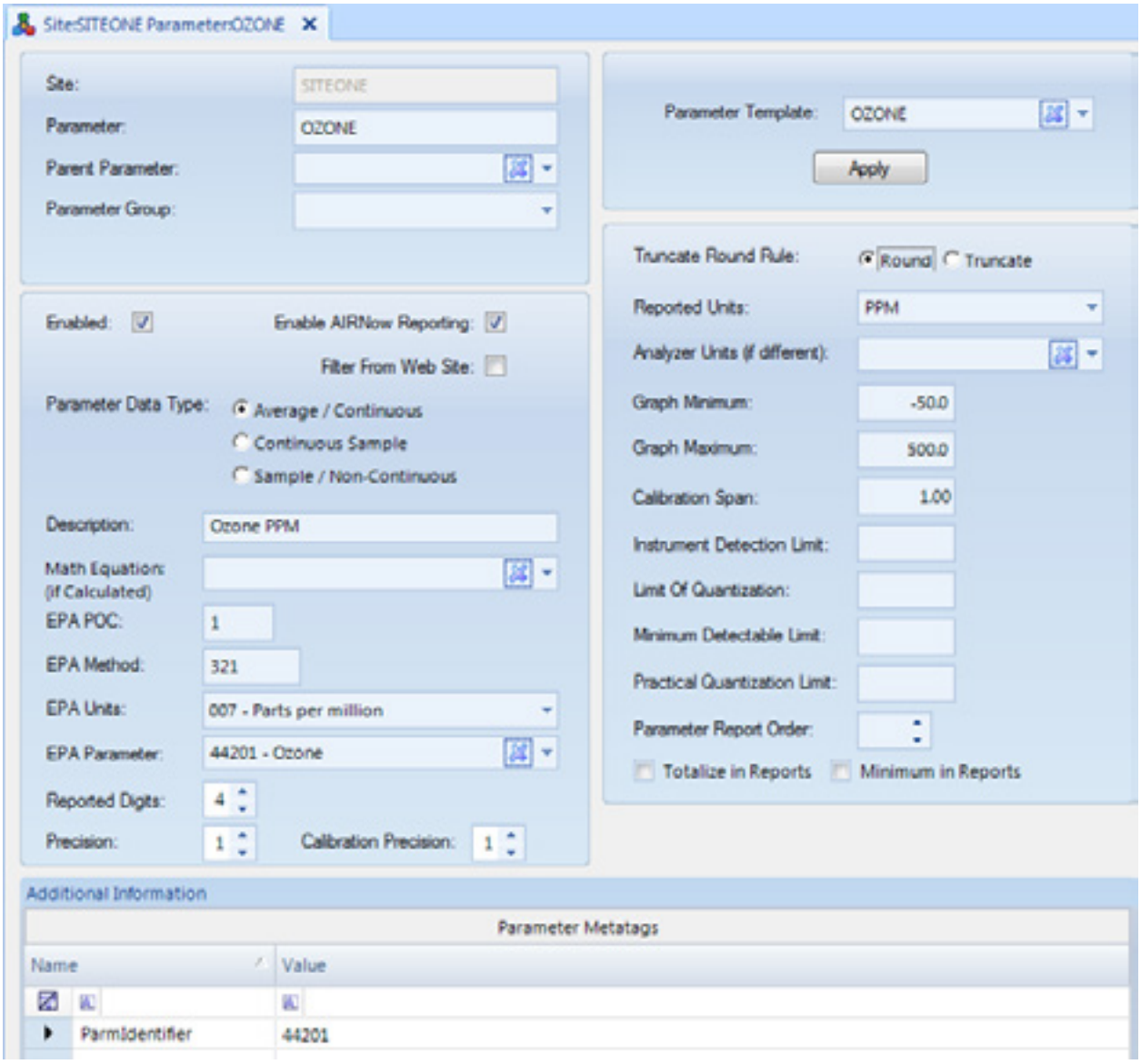
- **Name (Required)** — Alphanumeric characters to refer to the site, e.g., NKnox
- **Description (optional)** — Brief description of the site, e.g., North Knoxville
- **Abbreviation** — This field is used for special formats only. (File Import is not available in AV-Trend.)
- **Time Zone (Required)** — Select from drop-down list the zone where the site is located..
- **Enabled (Required for polling & reporting))** — Check the box to enable the site. If this box is not selected the site will not be polled or appear in report/editor selections.
- **Latitude** — To comply with EPA standards, enter latitude in decimal format. For example, 75 degrees, 15 minutes, and 0 seconds would be entered as 75.250000. Enter up to 2 places and a minus sign if needed to the left of the decimal and up to 6 places to the right of the decimal.
- **Longitude** — To comply with EPA standards, enter longitude in decimal format. For example, 75 degrees, 15 minutes, and 0 seconds would be entered as 75.250000. Enter up to 2 places and a minus sign if needed to the left of the decimal and up to 6 places to the right of the decimal
- **EPA Site** — Type in the four-digit site code provided by EPA
- **AIRNow Mnemonic** — Optional, used only by the now obsolete OBS format.
- **Surrogate Slope** — Used to calculate a projected (forward rolling) eight-hour average for ozone if needed, computed with the slope/intercept formula required by EPA
- **Surrogate Offset** — Used to calculate a projected (forward rolling) eight hour average for ozone if needed, computed with the slope/intercept formula required by EPA

- **EPA County or Tribal Code** — Select from the drop down list the county or Tribal code provided by EPA.
- **Site Group - (Optional)** — Allows user to organize sites into user-defined groups (e.g., “Rural”, “Downtown”, “NCore”). Names of parameter groups must first be entered into the **Site Groups Editor** in Configuration->List Editors. Normally, this is an AirVision Server-Side function, and is only shown in the 8872 / Site AV-Trend PCs for display purposes.
- **Address** — Physical address of the Site
- **Additional Information** — You can add notes at the bottom of the Site Editor by clicking on the asterisk at the bottom of the screen. Enter a **Name**, for example “Distance to tree line,” and a **Value**, for example “70 feet.” When you have completed your entry press the **Enter** key on your computer keyboard. Your entry will be moved to the next row in the Additional Information section.

These "meta data" fields may also be used by some specialized reports or instrument polling programs. Consult your specific application notes for details and syntax.

Adding and Editing Parameters

To add a parameter configuration, select a **Site** from the **Site/Parameter** tree and click the **Add Parameter** button near the top of the AV-Trend screen. To edit a parameter select a **Site** and then double-click a **Parameter**.



Parameter Configuration from the Parameter Settings menu under Configuration Editors

The **Parameter** screen displays the following fields. Some of the EPA Code fields are used only if your license supports full Ambient Reporting.

◆ Site	The Site you selected in the Parameter Settings tree diagram will automatically be displayed.
◆ Parameter	Alphanumeric characters to identify the Parameter
◆ Parent Parameter	A Parent Parameter can be designated to form relationships that can be used for drill-down in the Data Editor. For example, a primary analyzer pollutant such as NOx could be a parent and designated diagnostic parameters such as sample flow or box temperature could be children. Another example would be to assign particulate parameters as parents and metals for XRF (X-ray fluorescence) analysis as children. If the parameter has a parent parameter, select it from the drop-down list.
◆ Parameter Group - (Optional)	Allows user to organize parameters into user-defined groups (e.g., “Gases”, “Met”, “Particulate”, “PAMS”). Names of parameter groups must first be entered into the **Parameter Groups Editor** in Configuration->List Editors. Normally, this is an AirVision Server-Side function, and is only shown in the 8872 / Site AV-Trend PCs for display purposes.
◆ Parameter Template	Parameter information can be filled in automatically by selecting a Parameter Template, which will set up EPA codes and units. Basic Parameter Templates are provided in AV-Trend. They can also be configured in the **Parameter Template Editor**, which defines basics like units, EPA reporting codes, and graph limits. (See “Configuring Parameter Templates.”) Must be unique to each site. If you want to automatically fill in parameter information using a template, select a parameter template from the drop-down list and click **Apply**. If you have converted your data from E-DAS and the information is already filled in, you can still select a template but no NOT click Apply or AQS codes will be overwritten.
◆ Enabled	Check the box to enable the parameter.
◆ Enable AIRNow Reporting	Not used by AV-Trend
◆ Filter from Web Site	Check the box to filter data from website
◆ Parameter Data Type	Note: Existing Parameter Templates that have the Parameter Data Type marked as Sample/Non-continuous should not be changed to Average/Continuous.
◆ Description	Enter a brief description of the parameter (optional).

- **EPA POC** — Enter an EPA Parameter Occurrence Code if needed POC is used for different monitors measuring the same parameter at one site.
- **EPA Method** — EPA sampling Method Code
- **EPA Units** — Select EPA Units (including the EPA unit code) from the drop-down list (e.g., 007-parts per million, 015-degrees Fahrenheit).
- **EPA Parameter** — Select a parameter (including EPA parameter codes) from the drop-down list (e.g., 44201 - Ozone).
- **Reported Digits** — Total number of digits, including decimal places, that will be reported to the EPA.
- **Precision** — Number of decimal places for reporting precision. X's and Y's to the right of the reporting precision field illustrate the format of the digits/precision, e.g., XX.YY indicates a total of four Reported Digits with a Reporting Precision of two.
- **Calibration Precision** — Number of decimal places to the right to use for calibration report, calibration error calculations, and AQS reporting of 1-Point Precision Checks. This will allow users to specify more or less precision as desired for calibration data. It applies to calibration reports, calibration calculations, and the AQS output for 1 Point QC records. ***NOTE- the logic to truncate ozone ppb to zero precision has been removed***
- **Truncate/Round Rule** — Determines whether data in reports will be rounded or truncated
- **Reported Units** — Units that will be used for reports e.g., PPM
- **Analyzer Units** — If the analyzer units are different from the primary parameter, select analyzer units from the drop-down list. If this field is selected, the system will automatically try to determine a conversion factor based on the units and convert values during polling of a logger or import via the File Import Tool.
- **Graph Minimum** — Lower y-axis limit for graph display
- **Graph Maximum** — Upper y-axis limit to for graph display
- **Calibration Span** — This field is determined by the instrument. Enter the configured calibration span value for the parameter to determine the parameter's calibration error (at the data logger).
- **Instrument Detection Limit (DL)** — Minimum concentration of an analyte that can be measured by an instrument. The DL is an estimate of concentrations at where you can be fairly certain that the compound is present. Concentrations below this limit may not be detected. Used for air toxics measurements only (can be blank if not needed).

- **Limit of Quantization (LOQ)** — A minimum criterion or region for quantization that should be clearly above the detection limit. The lowest concentration of an analyte in a sample that can be determined (quantitated) with acceptable precision and accuracy under the stated operational conditions of the method. Traditionally, this is approximated as 10 times the signal-to-noise (S/N) ratio.
- **Minimum Detectable Limit (MDL)** — EPA defines the MDL as the minimum concentration of a substance that can be measured and reported with a 99% chance that the analyte concentration is greater than zero. Must be filled in for reporting Violation of Standards report for ozone.
- **Practical Quantization Limit (PQL)** — The lowest concentration of an analyte that can be reliably measured within specified limits of precision and accuracy during routine laboratory operating conditions.
- **Parameter Report Order** — Parameters in reports are printed in the same order that they are shown under each site. Select Parameter Report Order to change the order parameters appear in reports. Report Order only applies to Daily Summary and Monthly Reports.
- **Totalize in Reports** — If this option is selected, Monthly Reports will show a total of data rather than an average. Totalize in Reports is most commonly used for rainfall.
- **Minimum in Reports** — If this option is selected, Monthly Reports will show a minimum of data rather than a Maximum. Minimum in Reports is most commonly used for temperature.
- **Additional Information** — You can add notes at the bottom of the Parameter Editor by clicking on the asterisk at the bottom of the screen. Enter a **Name**, for example “Data Last Certified,” and a **Value**, for example “9/1/2008.” To add another row when you have completed your entry, press the **Tab** key on your computer keyboard. A blank row will be displayed.

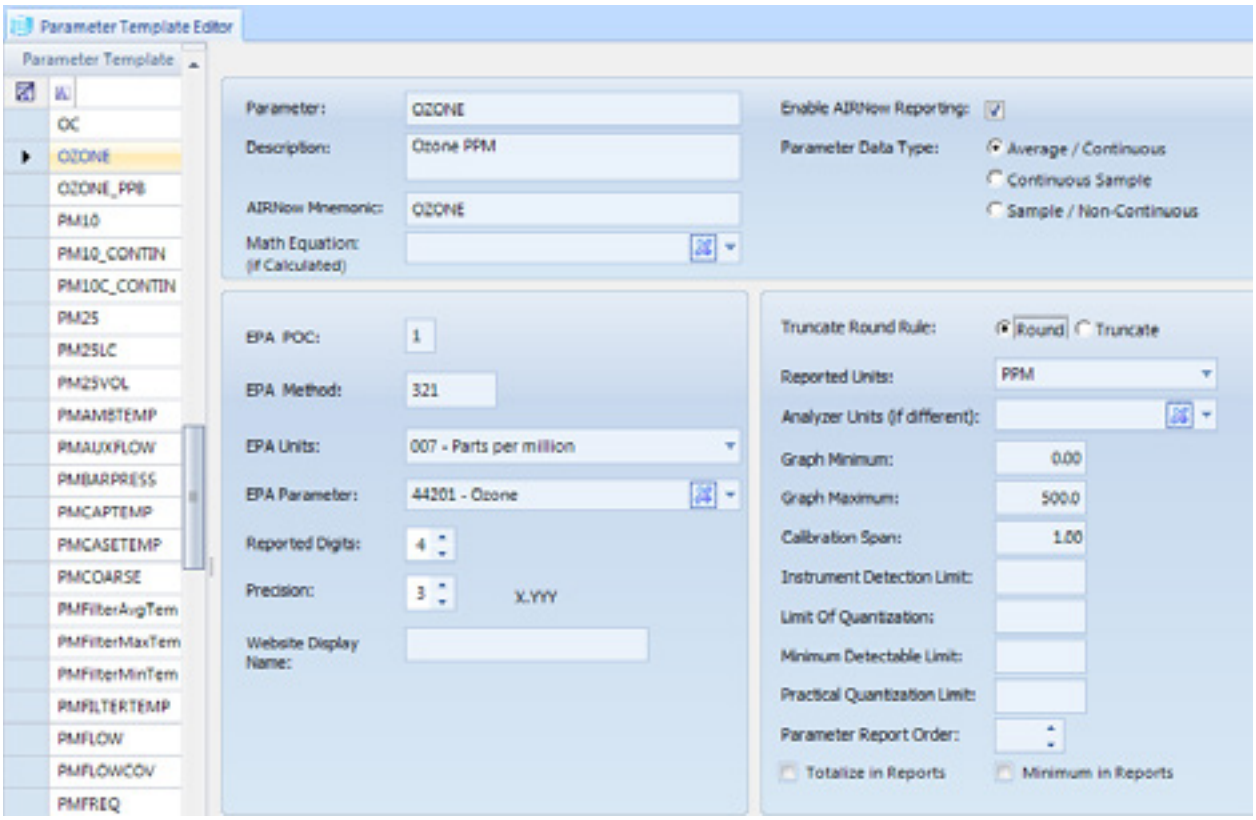
Configuring Parameter Templates

Basic **Parameter Templates** are provided by AV-Trend, such as ozone, PM10, PM25, NO2. You should not have to make changes to the standard Parameter Templates unless the defaults become outdated by changing EPA regulations, but if you have unique setups you can configure new templates in **Configuration Editors** > **Parameter Template Editor**. The Parameter Template Editor defines basics like units, EPA reporting codes, and graph limits, and allows you to configure details for an EPA parameter type.

Parameter templates allow you to avoid repeating configurations for the same parameter at multiple sites, for example, file import templates, report setups, ADVP rules. The Parameter Template Editor allows you to enter or modify a list of parameter types that each parameter can be referenced to, so AV-Trend can correlate parameters with different names (e.g., O3 , OZ, OZONE). Linking parameters to parameter types makes reporting easier and eliminates the necessity to link individual site/parameter selections together (e.g., for AIRNow reporting).

All fields in the Parameter Template Editor were explained in the previous section "Adding and Editing Parameters."

- **Note**: A Parameter Template is required for any parameter imported with the File Import Tool, E-Mail Alarms, or ADVP. File Import is the the most common reason for a user to add to the Parameter Template table.



Configuring Parameter Templates

- **Note**: The values in the template editor are only used when the "Apply" button is used in the Parameter Editor to do a one-time copy from the template. Afterwards, the values here have no effect on reports or system operation.

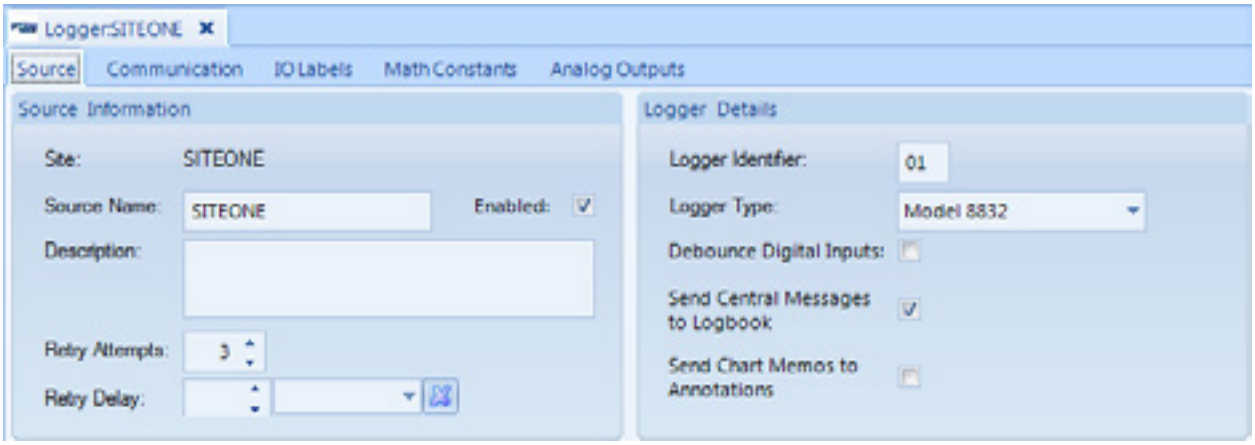
Adding Loggers to Sites in Logger Channels

The next step, after configuring sites and parameters, is to add **Loggers** to sites.

▶ **Note:** Data loggers must be added to sites **BEFORE** the channels can be configured.

Still in the **Configuration Editor**,

- single-click **Logger Channels**,
- highlight a **Site**,
- click the **Add** button and
- select **Logger**.
- enter a **Source Name**, e.g., 01Logger,
- enter the **Logger ID** e.g., 01 (This field is required),
- select a **Logger Type** from the drop down list, e.g., 8832,
- and click **Enabled**.
- optionally, you can enter a **Description** and select **Debounce Digital Inputs**.
- Click the **Save** button.

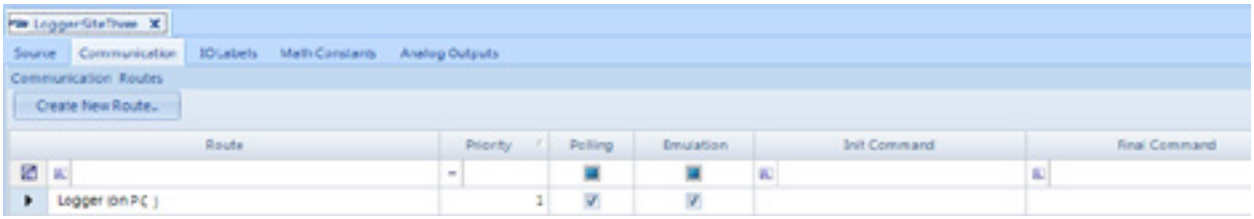


Logger Configuration from Logger Channels in Configuration Editors

Text Strings in Digital I/O

Logger Properties Tabs

Communications - This tab is used in AirVision and AV-Trend to set the method by which the software communications with an external logger (see "Adding Communication Routes"). It is not used in an 8872 for the base logger properties, and should remain blank.



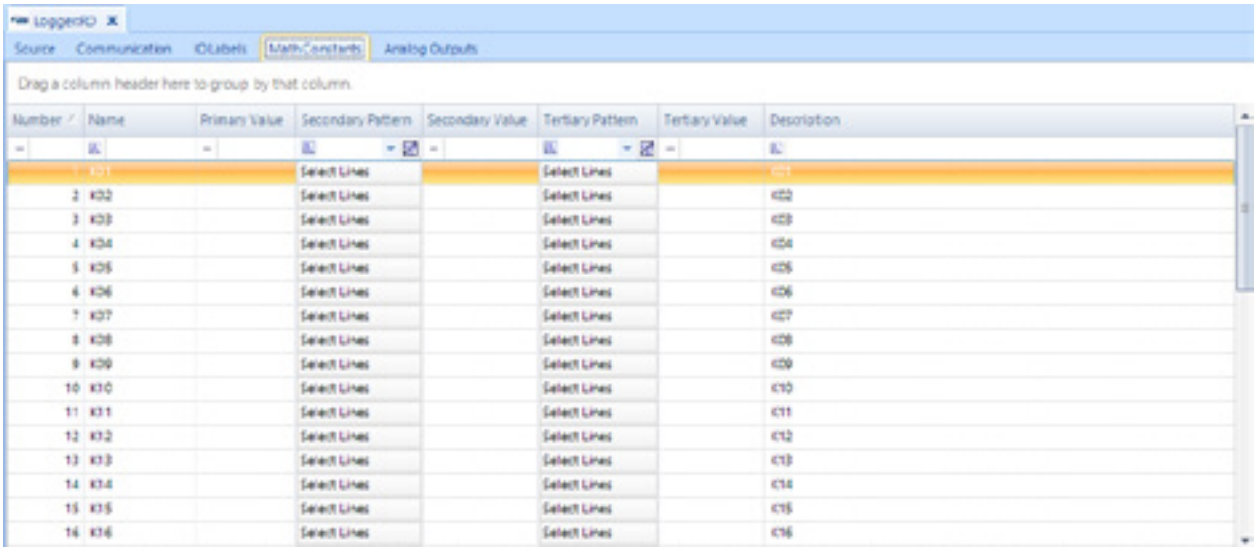
IO Labels - This tab is used in to set the properties of the digital inputs and output lines in the data logger, and how they relate to other elements of the software. Properties include.

- **Physical Inputs / Physical Outputs:** This is only used in AirVision and AV-Trend in association with ESC 8816/8832/8864 loggers, and can help avoid download errors associated with pseudo inputs and outputs when the number of input and output cards do not match. They can be blank in most cases, and is not used with the Model 8872.
- **IO Number:** 1 through 88 inputs and outputs downloaded to the data logger.
- **Name:** 20-character label downloaded to the data logger.
- **Description:** Optional, allows for a longer description.
- **Modbus Instrument / Coil:** Leave blank for physical inputs/outputs in ESC loggers. Set for internal modules on the 8872 and for any external Modbus-capable instrument or calibrator to map pseudo-inputs and pseudo-outputs to analyzer/calibrator control or status monitoring functions. See tutorial videos under "Training" at Agilaire.com for more details on connecting to commonly used calibrators.

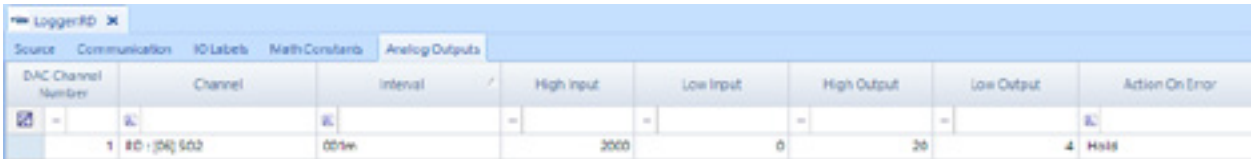
▶ **Note**: When mapping pseudo-outputs in ESC loggers to analyzers/calibrators, the corresponding psudo-input must be unused (and vice-versa for mapped pseudo-inputs).

- **Line State Triggering Alarm / Alarm Definition:** Used for the Advanced Alarm Feature in AirVision/CEM. See AirVision/CEM manual, Digital Alarm Trigger for details. Not used in regular ambient applications.
- **Enabled:** Check the enabled box if the label is to be downloaded to the logger.

Math Constants - This tab is used to set primary values and, optionally, secondary or tertiary values (switched by physical or pseudo digital inputs) of math constants (K01-K32) used by the data loggers in math equations. The math equation will use the primary value, unless the status input pattern matches that set for either the secondary or tertiary value, and a secondary/tertiary value has been set. This feature is used commonly in CEM applications for fuel factor / GCV value switching, but can also be used in ambient applications as holding registers for values updated by channel averages (e.g., holding end of hour BAM values) or values written during the calibration process (e.g., expected values read back from calibrators). See the "write to math constant" functions in the Channel Configuration->Validation and in the Calibration configuration sections.

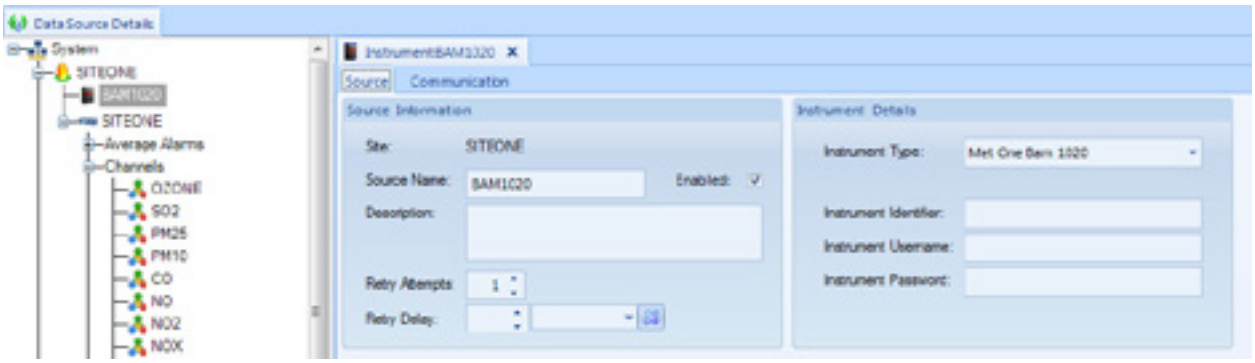


Analog Outputs - This tab is used to set analog output settings for the Model 8816, 8832, 8864, or 8872 loggers. Consult the Analog Outputs section/appendix in the relevant logger manuals for more details on usage.



Adding an Instrument

If AV-Trend is licensed to poll and instrument directly (without using a data logger), select **Configuration Editors/Logger Channels** and highlight the **site name** in the **Logger Channels** configuration tree diagram. Click the **Add button** and select **Instrument**. The **Instrument Type** (ID) field is required and can be selected from the drop-down list. Enter a **Source Name**, an **Instrument Identifier** and **Instrument Password**, and click the **Enabled** box. Click the **Save** icon.



Instrument Configuration from Logger Channels in Configuration Editors

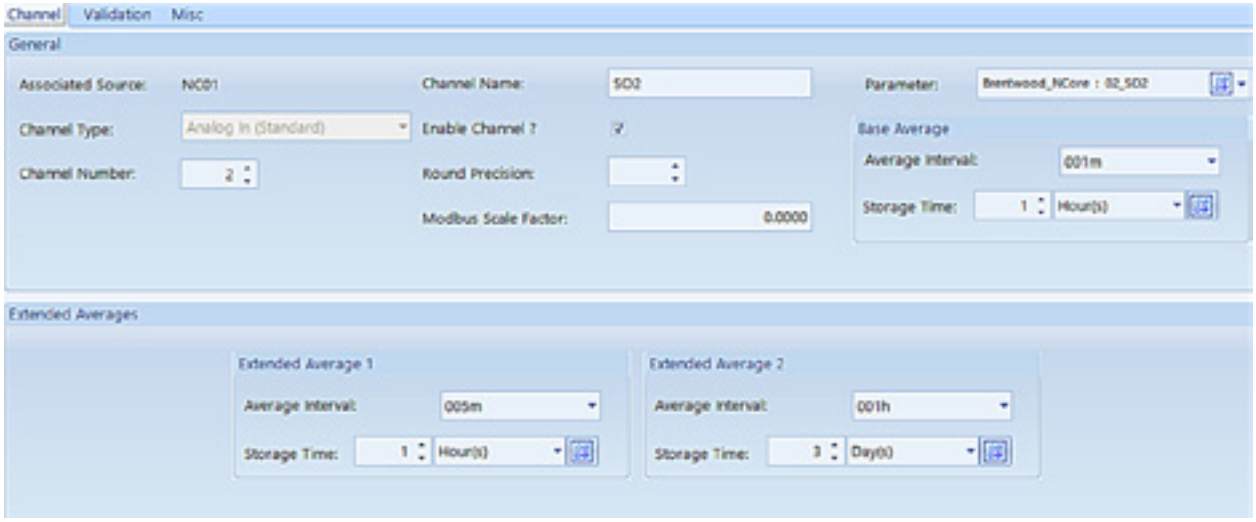
Channel Configuration

"Channels" are the entities that tell a data logger (8832, 8872) how to acquire data in real-time from an instrument to form averages, that are then passed on to *Parameters* in AV-Trend to store the data. Channels represent the physical side (instruments, wires, RS-232 connections, etc), while Parameters represent the logical side or "slots in the database." It's possible to have *Parameters* but not *Channels* if the data comes from some source other than being averaged by the data logger, such as the File Import Tool, or direct instrument polling.

The information for *Channels* is set up in Data Source Details in AirVision (or "Logger Channels" in AV-Trend and in the 8872 menu).

Basic Channel Information

In the setup of most of the channel types the Channel tab will have identical fields on the Channel tab as the Standard channel setup has, except where noted in descriptions below in this document.



Do not use spaces in the channel names and avoid using equation symbols in the channel names as these can cause problems with math channels if such channel names are used in a math equation.

When a Channel is first created the Channel Name will be displayed as Chan1, Chan2, etc. If you have already configured a parameter (recommended), when you select the associated Parameter in the top right, the name will automatically propagate over to the Channel Name field once the next field has been selected. However, channel names are limited to 8 characters (as a holdover from 8816s and 8832s), but the Channel Name can be edited.

The Channel Number will automatically be filled in with the next available number, but it can be changed by using the radio buttons to select the logical number of the channel being configured.

Set the Average Intervals for the Base, Extended1, and Extended 2 and their Storage Times. 001M data is usually setup on the Base Average. The data logger will average instantaneous readings over the Base Avg Interval, and then those base intervals are used to build the two extended intervals. To change the interval click the down arrow and select another interval type from the drop down list.

The Extended Average 1 is usually used for auxiliary data, the most common being 005M or 015M data. If the Base Average Interval is 1 minute, then the first extended average may be an auxiliary, hourly, or daily interval type (of which have to be divisible by 60 and a multiplier of the base). To change the interval click the down arrow and select another interval type from the drop down list.

The Extended Average 2 is usually used for hourly data, but can be used for daily data as Average 1 is set to hourly data. Average 2 must use a higher interval type than Average 1, and must be a multiplier of the base average. To change the interval click the down arrow and select another interval type from the drop down list.

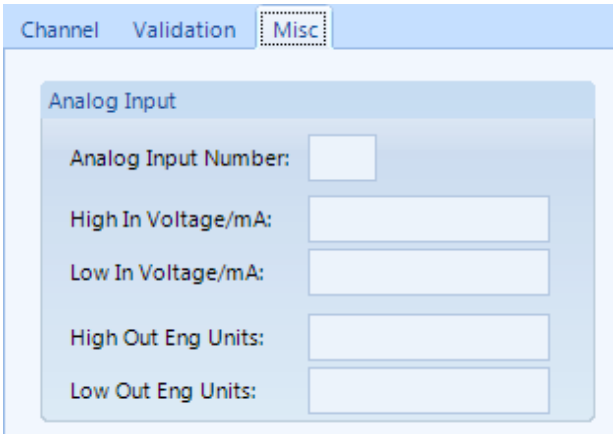
Storage Time for all three intervals is the length of time the 8816 or 8832 data logger will store the averages (not used/visible for the 8872). Each interval has its own storage time setting which can be set between 0 to 999. Click the down arrow and select from the from down list the time span of: S = seconds, M = minutes, H = hours, D = days.

Basic Channel Types

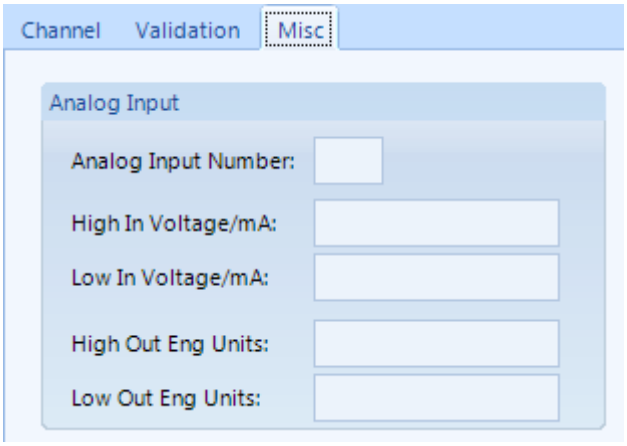
Channel "types" define the methodology for either acquiring the data (e.g., what kind of input) and/or how the resultant average is to be calculated. The channel types supported are as follows.

The **Analog In (Standard)** channel takes readings from a physical analog input, scales the voltage (or current) to an engineering value, and then performs a simple arithmetic average of all the values. The settings under the Misc. tab define the information required:

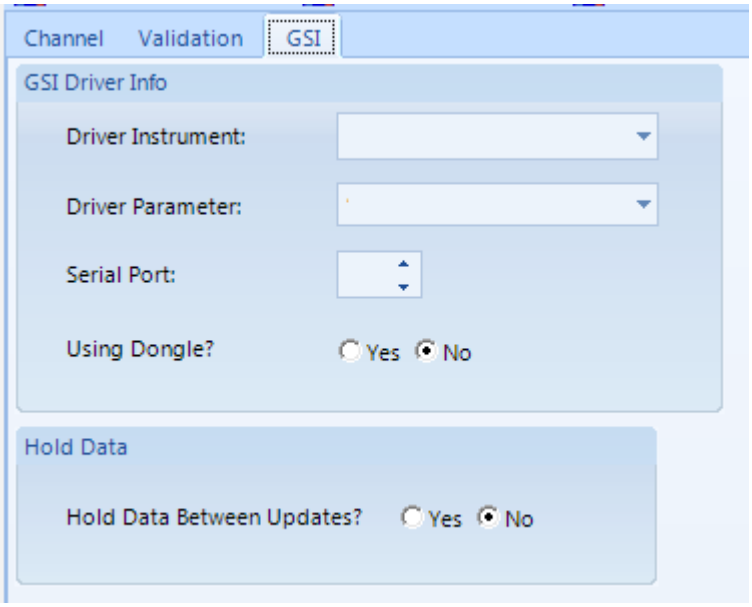
- The Analog Input Number specifies the physical input that the analyzer wires are connected to. The analog input number does not have to be the same as the channel number.
- For Model 8816 or 8832, The High and Low In Voltage/mA are where the Voltage or Milliamps are entered. Typical values are -10 to +10 V for a voltage card and 4 to 20 mA for a current card. For the Model 8872, the High and Low In are assumed to be the full voltage/current range set on the input module (e.g., 0-5V or 4-20mA) for that input.
- The High and Low Out Eng Units of the instrument corresponding to the High or Low Input are entered.



For example: If the high input to the data logger from the instrument is 10V when the output reading of the instrument is 50°C, then a High Input of 10V indicates a corresponding High Output of 50°C.
Or if the low input to the data logger from the instrument is 0V when the low output reading of the instrument is 0ºC, then a Low Input of 0V indicates a corresponding Low Output of 0ºC

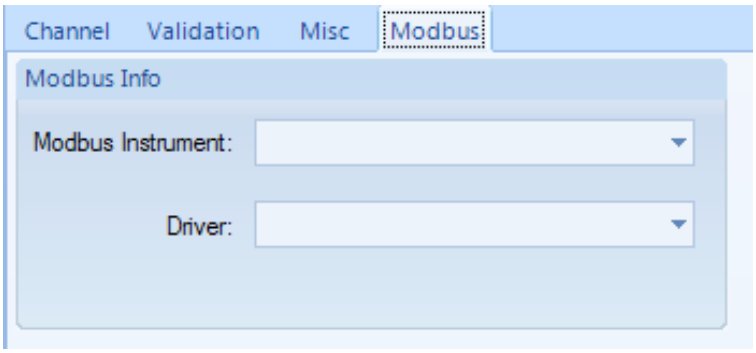


The **GSI or RS-232 channel** uses a serial communications interface used by the data logger to retrieve data from devices such as analyzers and digital control systems. The interface can receive data strings and stores values into GSI Channels for data collection. For these channel types, the "Misc" screen allows the user to define which RS-232 port is to be used, the type of instrument being connected, and the value within that instrument that is desired. Note that the baud rate of the RS-232 port is set in the PC Settings editor.



On the Misc tab an option is given for Hold Data Between Updates? is set to Yes or No. If Yes is selected it will use the last value received until the next value arrives, for instruments that send data infrequently. Normally, this is set to "No."

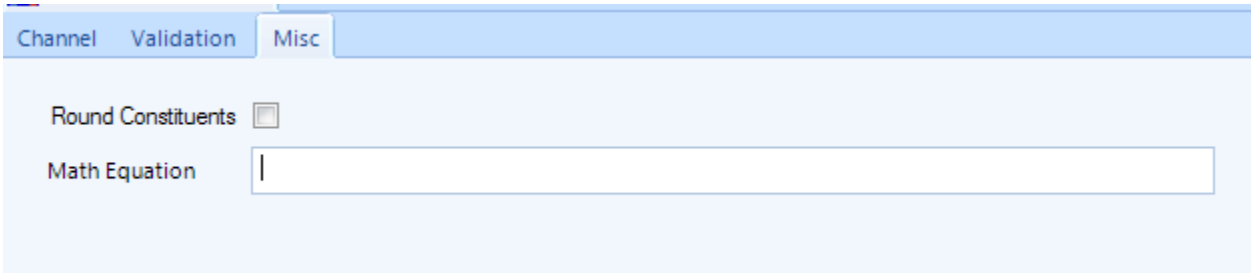
The **Modbus channel** is used to take data from a Modbusused to take data from a Modbus-capable instrument via an Ethernet connection.A Logger Modbus Instrument needs to first be created before the Modbus channel is created so that the instrument that was created will show in the drop down list for the Modbus Instrument on the Modbus tab (similar to the GSI/ RS-232 channel).



The **Math Pack channel** is useful when special functions are required. Math pack channels are used to calculate results by combining information from other channels and/or constants according to user-defined equations, such as “SO2 * 1.3”. The allowed syntax is defined in Section X.X

On the Misc. tab Round Constituents will round to the number of places specified in the Decimal Positioner field, before the equation and average are calculated (used primarily in special CEM applications). Channel names that contain spaces cannot be used in a math pack formula.

The **Average math pack** channels function like math pack channels except instead of performing calculations on instantaneous readings and then averaging the results, these channels wait until the end of an averaging interval and perform calculations on the averages. The Average Math Channel configuration screen is identical to the Math Channel configuration screen except for the channel type.



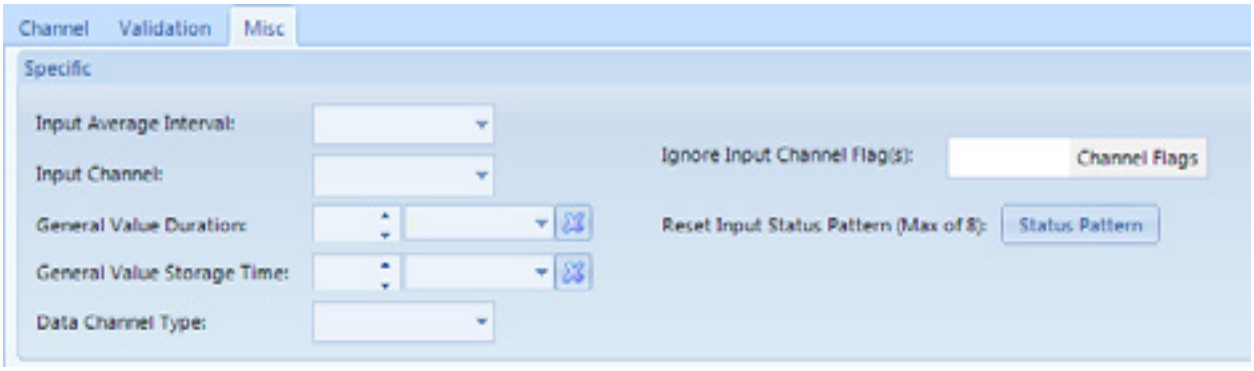
The **General channel** is used to run special calculations based on the input of another channel that is already configured (e.g., analog input, Modbus, etc). The different calculation types include:

- Maximum (find highest sub-interval in a given interval, e.g., highest minute in hour)
- Minimum (same, but finding the lowest)
- Accumulate (totals sub-intervals into final average)
- Number of Valid Averages (number of sub-intervals that are valid)
- Percent Valid (similar, but result expressed as a percentage 0-100)
- Difference (calculate difference of current average from previous average)

The Maximum method is commonly used on SO2 channels to find the highest 5 minute average in an hour, or for peak wind speeds. The Difference method is often used against a "raw" rainfall analog input to calculate the difference in the voltage to determine rainfall in an hour.

On the Misc. tab:

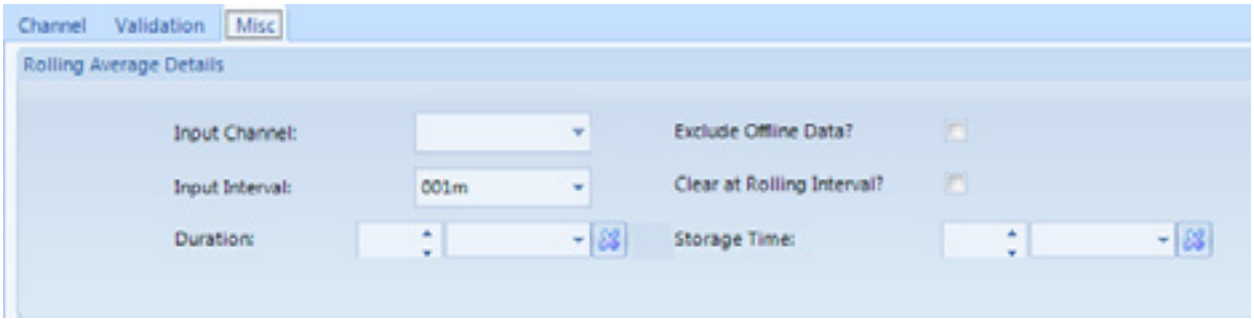
- Input Average Interval is the data type the general channel is to be based on, such as minute or hourly data (e.g., the "sub-interval" for the calculation.
- Input Channel Number is the channel number of the configured channel that will be the data source.
- General value Duration is the average basis for the General Channel Result.
- The Data Channel Type sets the calculation type; accumulative, maximum, minimum, number of valid runs, percent complete number of runs, or difference.
- Ignore Input Channel Flags are the flags to be ignored when verifying the validity of the current data point.
- Reset Input Status Pattern allows the user to set a digital status input pattern that, if observed, a reset will be generated to the calculation so far (e.g., previous sub-intervals will be ignored). This is not commonly used.



The **Rolling channel** calculates an extended rolling average from another channel's average, such as hourly averages rolling on the minute. The rolling average is updated when the base average is updated. For example, if the base average interval is one minute and the rolling average interval is one hour, the rolling average channel will store a new data point every minute; each data point will be an average of the previous 60 one-minute averages.

On the Misc. tab:

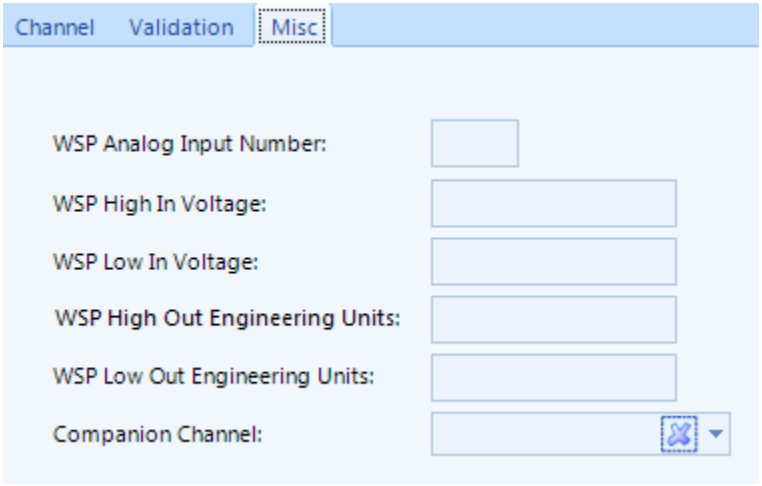
- Input Channel is the input channel number used for the rolling channel average.
- Input Interval is the data used to input into the rolling channel averages, and is the frequency at which the rolling average channel will create data.
- Duration is the length of the 'buffer' of input intervals used to calculate each average.



Meteorological Channel Types

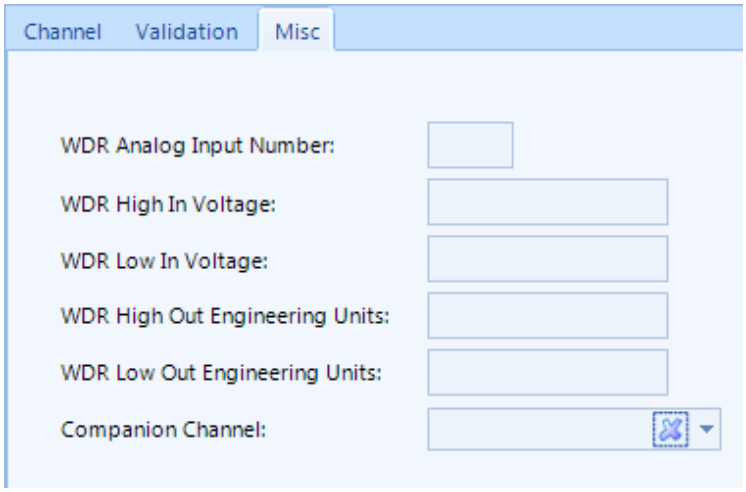
The **Vector Wind Speed channel** computes average wind speed as a vectored average. A corresponding Vector Wind Direction Channel must also be configured to support the Vector Wind Speed Channel. Input types can be analog inputs, or GSI (RS-232) based sensors, with a specific channel type for each approach. For the analog input type, the "Misc" tab is similar to the Analog Input Channel, while for the GSI version, the "Misc" tab looks like the GSI channel. The main difference is the manner of calculation, handling zero crossover, 0-360 and 0-540 degree instruments, etc.

For vector wind channels, an additional input is given for the companion channel (e.g., the Vector Wind Direction Channel for VWSP, and the Vector Wind Speed Channel for VWDR). The selection is the channel number for 8816s and 8832s, while 8872s use a pick list from already configured channels.

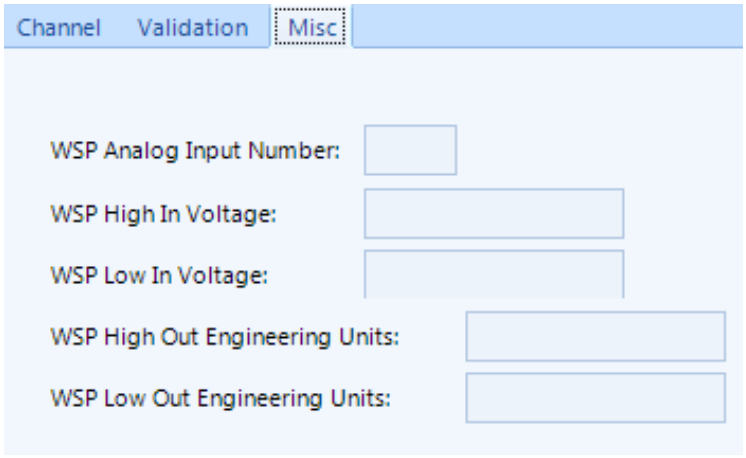


Before this field can be filled in both the vector wind and vector speed channels have to be created and saved, then you can go back and fill in the companion channel field. Once this field has been filled in, it is very important to click out of the field so that SQL sees the field has been completed, otherwise it will not save the setting and will blank out the field when the save button is selected.

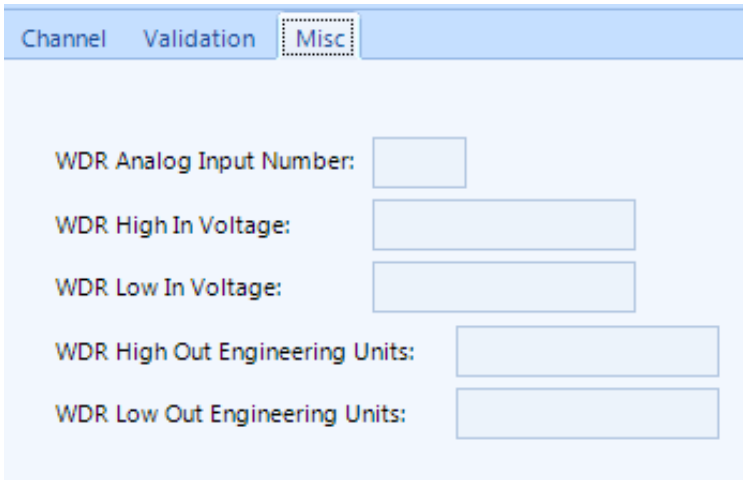
The **Vector Wind Direction channel** performs the direction part of the vector calculation, and is similar to the Vector Wind Speed channel listed above, including the Companion channel field.



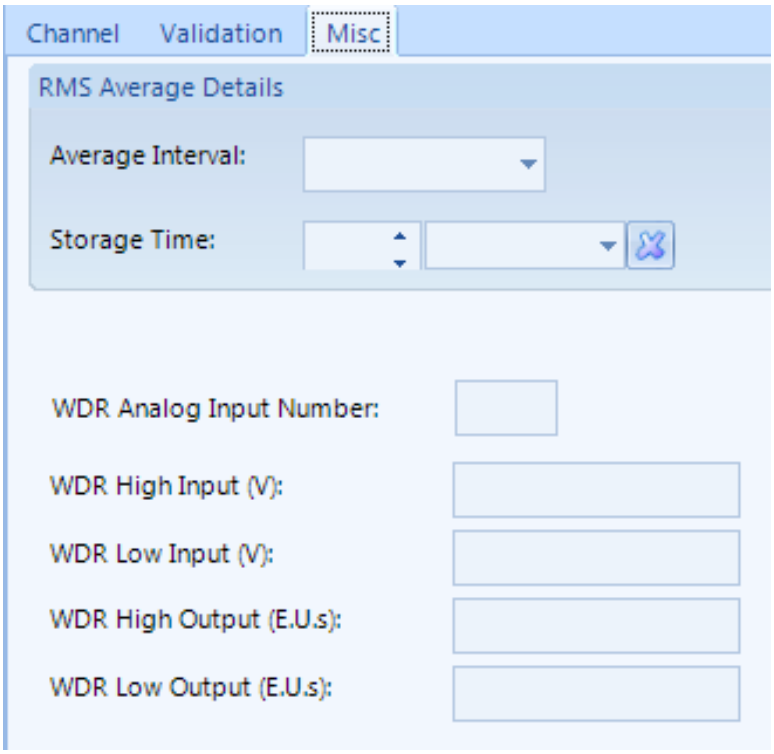
The **Wind Speed channel** is configured the same as the Vector Wind Speed channel minus the Vector Wind Direction channel companion field.



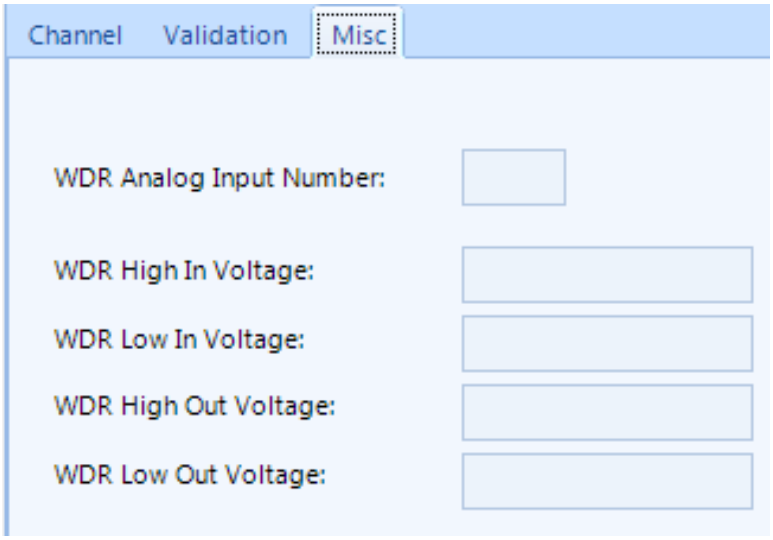
The **Wind Direction channel** is configured the same as the Vector Wind Direction channel minus the Vector Wind Speed channel companion field.



The **Sigma Theta** takes the input of a wind direction channel and calculates a USEPA sigma theta (Yamartino method). For a Model 8816 or 8832, the input must be designated as an analog input, while in an 8872, the input is set to a Wind Direction or Vector Wind Direction channel. The RMS interval is the sub-interval for the root-mean-square combination of sub-intervals, and for most applications is set to 15 minutes.

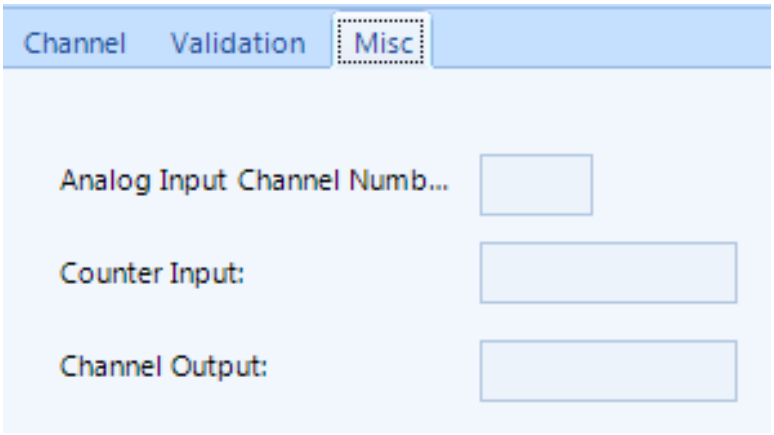


The **Linear Sigma** channel takes data from an analog input to calculate a standard deviation/mathematical sigma (measure of standard deviation) of an analog input or another channel.



The **Rainfall channel** uses the meteorological input card in the 8832 logger or a status input in an 8872 (set to "Counter" mode), and calculates accumulation by counting the number of pulses received during the averaging interval, typically received from a tipping bucket rain gauge. This count is then scaled to engineering units, usually inches of rain per hour.

- The Counter Input is the number of pulses that will equal one engineering unit (normally 1).
- Channel Output is the engineering units corresponding to the number of pulses counted.



CEM Channel Types

The **Stream-Switched Averaging channel** allows the data logger to monitor one analyzer that is time-shared between two sampling trains. It forms a base average and two extended averages from another channel, and accepts data from that input channel only when an on-line digital input status is met. If this condition is not met, the data can be designated as invalid, or the data (last good reading, base average, extended average, or average) over the previous on-line period may be "held" until the on-line status condition is met.When stream switch channels are controlled by digital event programs or are calibrated using automatic calibration programs, the digital program or calibration timing may not line up exactlywith the stream switch channels averaging periods. Calibrations and event programs should be configured to end a few seconds before the start of the next base average.

On the Misc. tab:

- On-Line pattern defines the status input pattern (physical or pseudo-inputs) used to define when the stream is "on" for data collection purposes.
- Offline Action defines how to handle data when the on-line pattern is <u>not</u> active:
  - Hold Last (instantaneous) Reading
  - Hold Last Base Average
  - Invalid (invalidate data)
- Purge Time defines how long to continue with the "offline" action when the status inputs transition from the off-line condition to the on-line condition.

The **Time On-Line and Multi-Condition TOL (Time Online) channels** allow the data logger to record when a process or generating unit is online for CEM reporting purposes. The resultant 'average' is typically a count of the base intervals (e.g., base average = 0 or 1, hourly averages range from 0-60, counting the number of online minutes, etc).

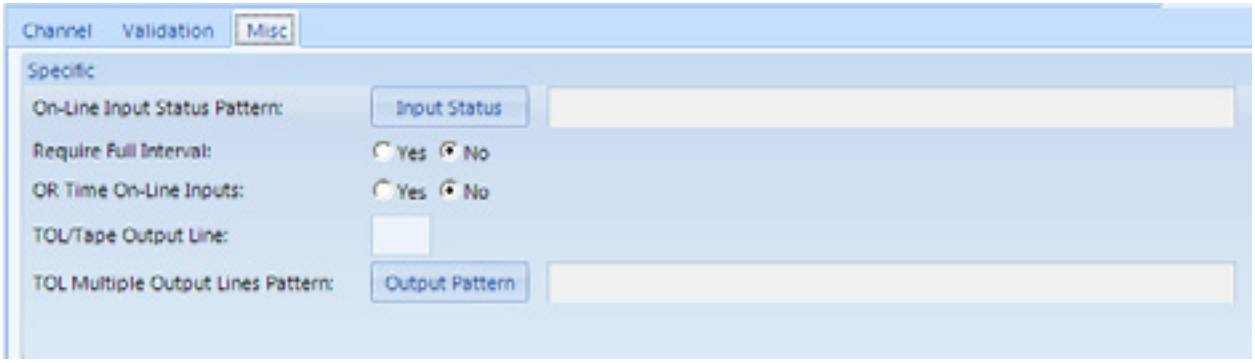
The basic Time On-Line channel allows the user to define an "Online Input" (status input pattern of physical and/or pseudo-inputs). When that pattern is seen as true, the TOL channel counts the process as on.

The Multi-Condition Time On-Line channel allows a more complex definition of up to three conditions, each of which can be a status input or a threshold of a channel value, for example:

"Flame On" (status input #01) is true (closed) AND

"Fuel Flow" (Modbus channel #7) is > 4 gallons/minute AND

"Stack Temperature" (analog input #7) is > 300 degF.



Adding Channels to Data Loggers

Still in the **Configuration Editor**, **Data Source Details**,

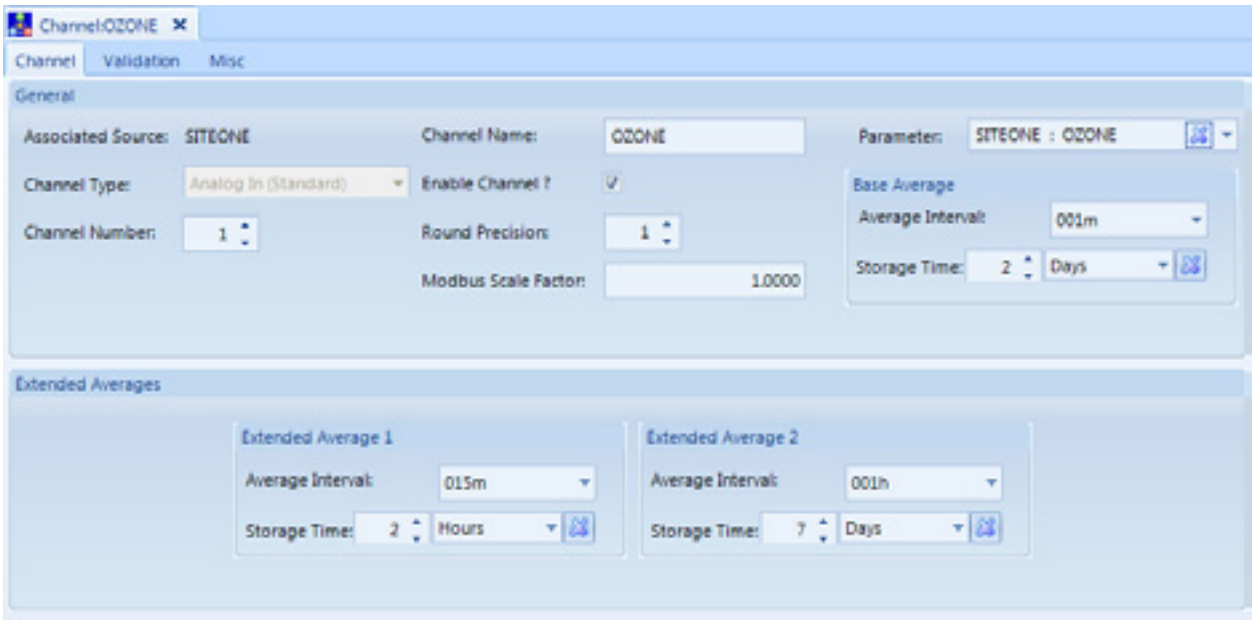
- select a **Logger** that has already been added to a **Site** (see "Adding Loggers to Sites")
- click the **Add** button.
- select **Add Channels** and
- select a **Channel Type**, e.g., Standard Averaging, GSI, VWS, etc.
- select a **Channel Number** (a channel number will automatically be added in order)
- select a **Parameter.** When you select a parameter, the Channel Name will automatically be changed to match the Parameter name.

For the remainder of the prompts on the form, consult the ESC Model 8816/8832 User Manual.

▶ **Note:** When you first open the Channel editor the **Channel Name** will be displayed as Chan1, Chan2, etc. When you select a Parameter, the Channel Name will automatically be changed to match the Parameter name; however, you can edit the Channel Name if you choose. After the channel is downloaded to the data logger, the Channel Name will be displayed as the **Instrument Name** in the logger.

- select an **Average Interval** and **Storage** for the **Base Average**, **Extended Average 1**, and **Extended Average 2**.
- Click the **Save** button

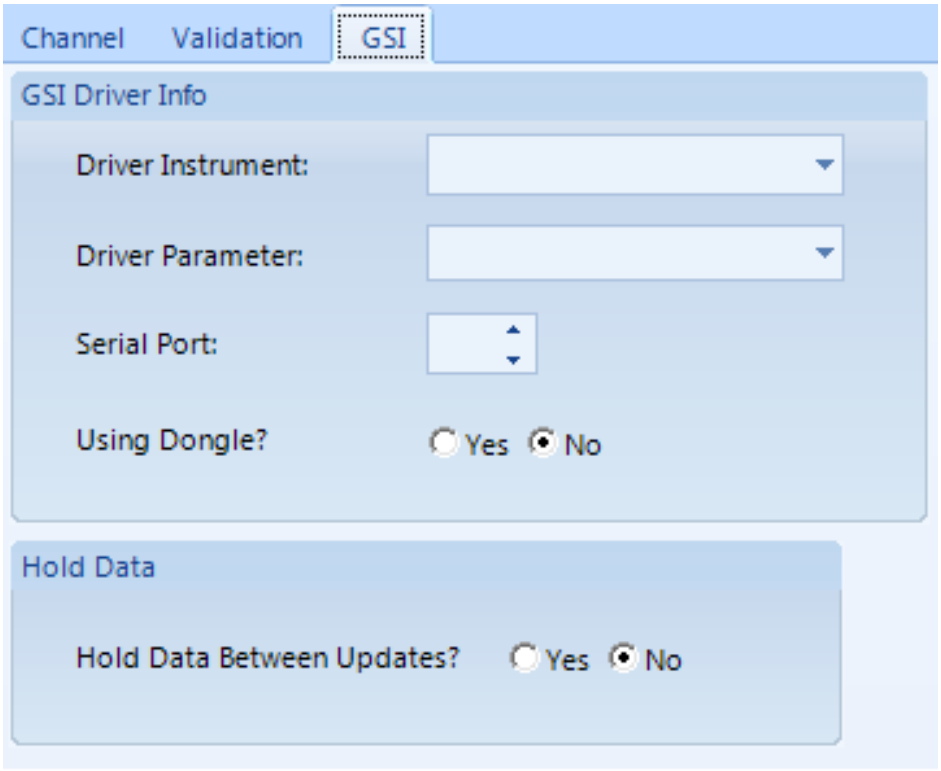
Follow the same procedure to add calibrations, average alarms, and digital event triggers, as explained later.



Adding channels to loggers in the Logger Channels from Configuration Editors

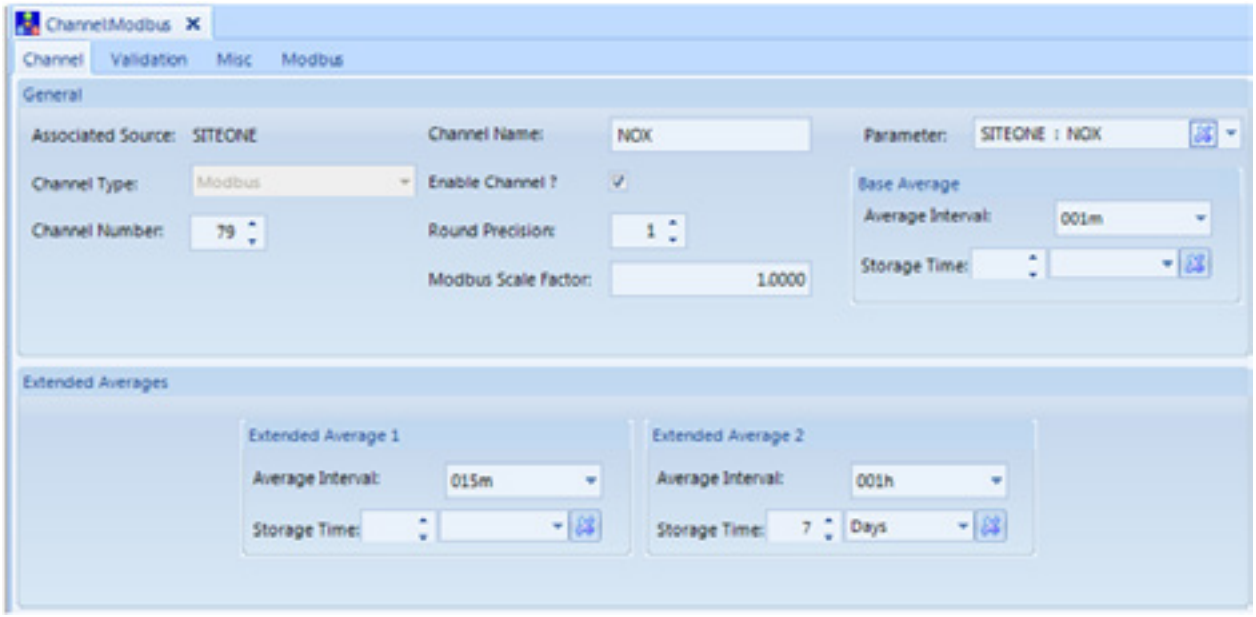
Two channel types are handled differently in AV-Trend than in previous systems; both improve on digital data acquisition integration.

- The first channel type, the GSI (Generic Serial Interface) channel, is used for RS-232 based instruments. AV-Trend includes a library of GSI drivers for a wide variety of instruments. Choose the instrument, the parameter, and designate which serial port is connected. Using a dongle can be designated if the instrument connection requires a hardware dongle (e.g., C-Series Analyzers in a daisy-chain configuration, or Ecotech analyzers).



GSI channel configuration

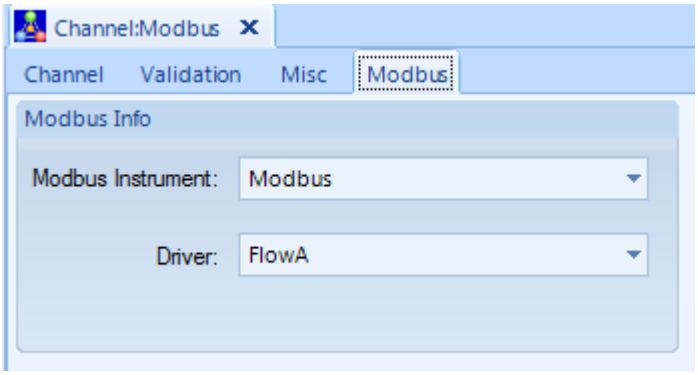
- The second channel type (and a better approach for digital data acquisition) is the Modbus channel. Designate an Instrument that has been previously configured in the Data Source Details editor, and select a parameter.



Modbus channel configuration

Like the GSI channel, AV-Trend simplifies the configuration process by automatically creating and downloading the data logger's server configuration file in the background. Since Modbus instruments have additional networking information that needs to be known, you must create an instance of the Modbus instrument in the Data Source Details editor before creating the Modbus channels for that instrument (this prevents the need to repeat entry of the networking information for each channel).

To create the instrument, go to the Data Source Details editor, select the appropriate data logger object in the tree, and select **Add** > **Logger Modbus Instrument** on the ribbon.



Misc tab in Add Modbus

You must then enter the following fields:

- **Modbus Instrument Name**--a user-defined label for the instrument
- **Instrument Model**--select from picklist of known analyzers
- **Modbus Device ID/Code**--this is set in the analyzer, and is some value from 1-255
- **Modbus Command Type**--defines which Modbus command is used to read data from the analyzer (3 for TECO, 4 for API, consult instrument documentation for other brands)
- **Poll Interval (seconds)**--how often data should be requested from the instrument, in tenth of a second increments. Recommended values are 20 to 30 (2 to 3 seconds), perhaps longer if analyzer has CPU limitations.
- **Timeout (MS)**--Designates the time the logger will wait on an instrument for a Modbus response. Typical values are 250-750 MS if an instrument starts to encounter problems with dropped readings (otherwise leave as blank/default). It is recommended this field be left blank unless analyzer communication issues are encountered.
- **TCP Ip Address**--IP address of the instrument, as viewed from the logger's perspective
- **TCP Ip Port**--Port used by the instrument for Modbus requests, usually "502".

Once the instrument is configured and saved, you can then use the **Add Channe**l > **Modbus** in the **Data Source Details** editor. Under the **Modbus** tab, select the **Modbus Instrument** and the Driver from a picklist. If you need a driver that does not exist in the picklist, contact Agilaire Support (support@aglaire.com) and we will add it to your system.

Special Case- External Channels

The Model 8872 supports a new channel type "E" for External Channels. These allow the user to create a 'fake' channel associated with parameter from a directly polled instrument (e.g., BAM, E-Sampler, etc), where the logger is not doing real-time acquisition (e.g., directly polled instruments in an 8872). It exists ONLY to create a channel number for use with logger polling. The External type channel requires no other special configuration, and is ignored by the Site Node Logger process.

Validation and Flags

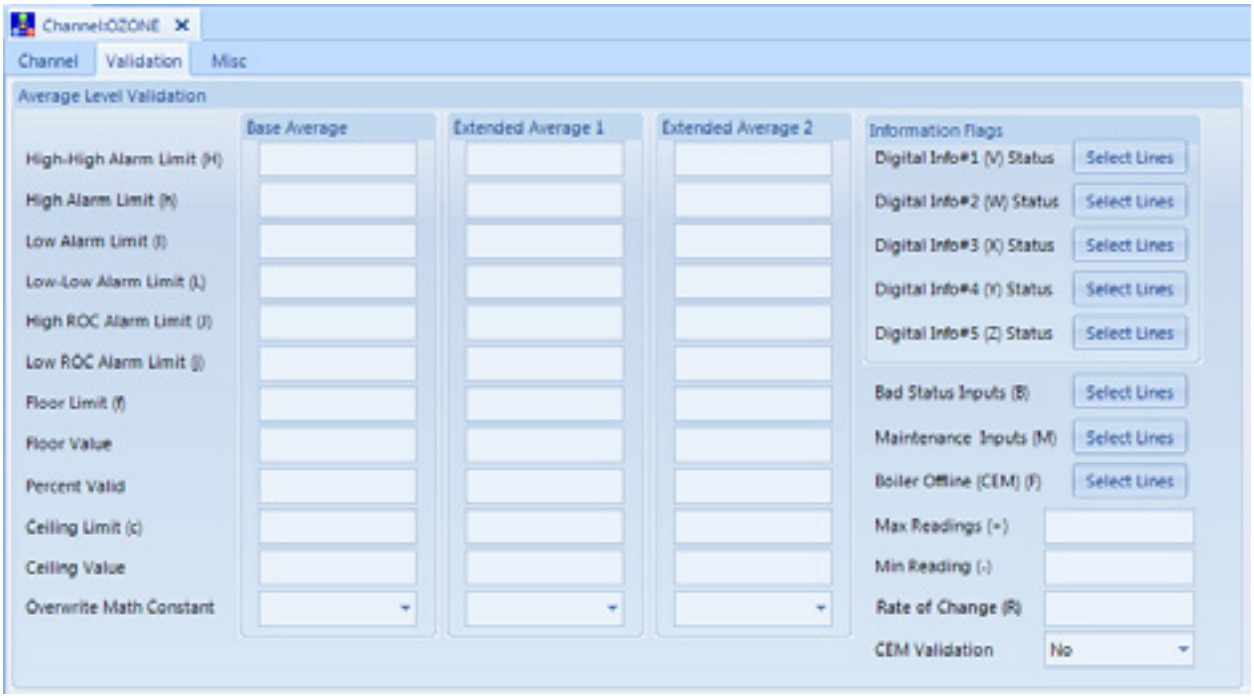
Flags in AV-Trend can generally come from the data source (data logger, instrument), or applied later via data editing.

For data coming from data loggers (8816, 8832, or 8872), the flag list and sources of the flags are as follows. Flags are listed below in order of priority (from the data logger's perspective). Some flags are 'instantaneous' flags applied to readings (and visible on all resultant averages), while some flags are only applied to the particular average interval they are set for, like a high or low limit. Flags in **red** will invalidate the readings for the period the condition exists.

FLAG	TYPE	DESCRIPTION	SOURCE OF FLAG
<	**Validation**	**Insufficient data for valid average**	Automatically applied by logger if less than 75% or defined % valid in Validation Settings.
>	Data	Sufficient data for valid average, but some data missing	Automatically applied by logger if > 75% (or user defined threshold) but < 100% of readings valid.
P	**Validation**	**Power failure**	Power failure experienced (invalidates one base average).
D	**Validation**	**Channel Offline**	Channel disabled via user interface (Logger Toolbox in 8872).
T	**Validation**	**Out Of Control due to bad Cal**	Normally a CEM feature, if cal drift > OOC limit set in Calibration program, then channel invalid until a good cal is passed.
F	**Validation**	**Boiler Offline (CEM)**	Normally CEM feature, boiler is considered offline based on status input pattern configured in Validation settings.
B	**Validation**	**Bad Instrument Stations**	Instrument is considered offline based on configured status input pattern. Will also appear during periods of Modbus or RS-232 communication 'dropouts' between logger and instrument.
C	**Validation**	**Instrument in Calibration**	Logger running calibration program affecting this instrument/channel.
M	**Validation**	**Instrument in Maintenance**	Channel disabled via user interface (Logger Toolbox in 8872) or via configured status input.
O	**Validation**	**Analog Overrange**	Single reading > full scale of analog range, invalidates the base average.

FLAG	TYPE	DESCRIPTION	SOURCE OF FLAG
U	**Validation**	**Analog Underrange**	Single reading < negative end of full scale of analog range, invalidates the base average.
A	**Validation**	**Math Error**	Error executing math pack channel equation, most commonly divide by zero.
+	**Validation**	**Maximum Reading Error**	Reading > configured “Maximum Reading”, invalidates the base average.
-	**Validation**	**Minimum Reading Error**	Reading < configured “Minimum Reading”, invalidates the base average.
R	**Validation**	**Rate of Change Error**	Reading changed from one reading to another > the configured rate of change limit.
H	Information	High High Limit Exceeded	Average (e.g., 1m, 1h) value > configured limit.
L	Information	Low-Low Limit Exceeded	Average (e.g., 1m, 1h) value > configured limit.
h	Information	High Limit Exceeded	Average (e.g., 1m, 1h) value, configured limit.
l	Information	Low Limit Exceeded	Average (e.g., 1m, 1h) value < configured limit.
J	Information	High High Rate of Change	Change from previous average > set limit.
j	Information	High rate of change	Change from previous average > set limit.
V	Information	Digital Information#1	Configured status input pattern detected.
W	Information	Digital Information#2	Configured status input pattern detected.
X	Information	Digital Information#3	Configured status input pattern detected.
Y	Information	Digital Information#4	Configured status input pattern detected.
Z	Information	Digital Information#5	Configured status input pattern detected.
f	Information	Floor limit exceeded	Average < configured Floor Limit, value changed to floor value.
c	Information	Ceiling limit exceeded	Average > configured Ceiling limit, value changed to ceiling value.

The Validation settings can be found in Data Source Details (or Logger Channels in AV-Trend and in the 8872):



When settings are made in the AirVision central server and in AV-Trend, they must be downloaded to the 8816/8832 or Sync'd with the 8872 to take effect. The software ONLY stores these settings for download/sync, and does not act upon the settings in the Validation screen itself. They are used in real-time by the logger's real-time data processing engine.

Other Notes:

Note also that flags may be applied by the Automatic Data Validation Processor (ADVP) or in the Data Editor (although any data edited in the Data Editor will also have an "E" editing flag).

Other status flags that appear in the Flags Detail and that can be applied via the Editor or ADVP are as follows. None of these invalidate data (unless set to do so in the Flags Editor):

I = Invalidated Via Edited

? = Suspect Data

> = Exceedance Data

z = Zero Adjusted

Q = Quality Assured

m = Maintenance Data

a = Audit

p = Precision Check

E = Edited Data (automatically applied via any edit via Average Data Editor)

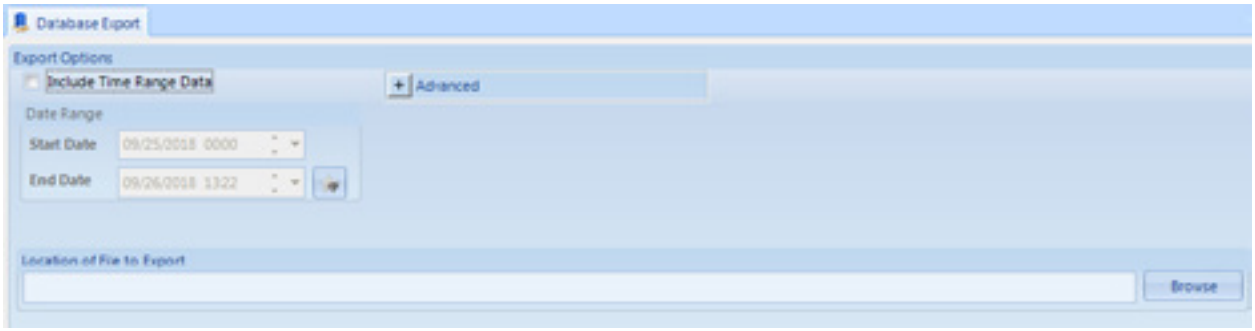
Note that some users may change the definition/label of these "Server Side Flags".

Parameter Tag Editor

The Parameter Tag Creation Tool (**List Editors>Parameter Tag Editor**) is used only to create entries in the database for parameter / average interval combinations if you want to use the Average Data Editor as the sole means of data input or to create tags for the Data Rollup Utility. It is not necessary to use this tool for parameters that are polled, imported using the File Import Tool, or manually entered through the Sample Data Editor, as AV-Trend creates the database tag entries automatically.

Database Export

The **Database Export tool** (**Utilities>Table Import/Export>Database Export**) allows a sample of the AV-Trend database to be exported in XML format for use by Agilaire in support and troubleshooting efforts. Select the **Browse** button in the **Location of File to Export** field and browse to the location of the XML file to be exported. The path to the file and the file name will be displayed in the export field. Click the **Process Export** button on the Ribbon. The configuration will be exported to an XML file. Keep in mind that the export only gets basic essential settings and does not export the complete configuration of the system and should not be used as a primary backup file.



Database Export tool (Utilities>Table Import/Export>Database Export)

Adding Communication Routes

The next step is to identify to the AV-Trend how to communicate with each logger by setting up Communication Routes. After you configure the **Source** in **Logger Channels** from **Configuration Editors**, click **PC Configuration** to configure a Communication Route for each logger.

TCP/IP Routes

Highlight the **Executive** and click the **Add TCP** button to establish the communication route described below:

▶ **Note:** TCP/IP connections are easier and faster than modems.

For sites with a TCP/IP connection,

- Click the **Add TCP Route** button
- Enter a **Route Name**, e.g., Agilaire,
- Enter a **Network Address**, e.g., 172.16.1.240

The defaults are set for 8832 defaults, but can be changed based on your network/route definitions:

- **Polling Port** at 9881
- **Emulation Port** at 9887. (Emulation ports are only used with the Model 8816 and 8832 data loggers.)

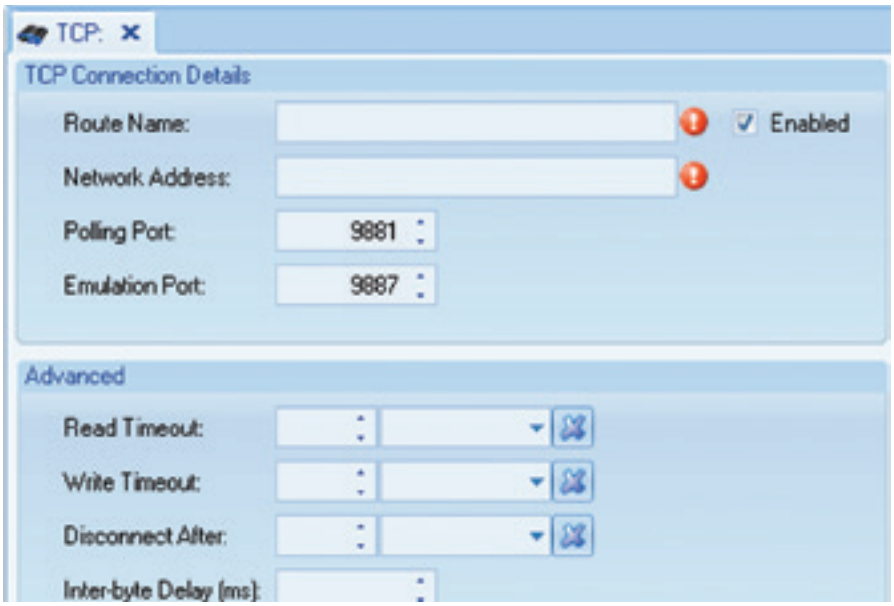
▶ **Note:** **Advanced Settings** should **ONLY** be modified when recommended by Agilaire support (865-927-9440 press 2 for support or email support@agilaire.com). AV-Trend is designed with defaults that are best for most applications.

- **Read Timeout**- This setting overrides the default timeout period for a TCP data read.
- **Write Timeout**- This setting overrides the default timeout period for a TCP data transmission.
- **Disconnect After**- This setting controls the closing of a TCP connection after a period of inactivity. Normally, AV-Trend assumes the TCP connection should remain open for optimum polling efficiency; however, some wireless IP modems will close the connection from their end, and TCP does not allow the server to automatically detect this drop. In these cases, AV-Trend can be set to forcibly close and re-open the connection.

▶ **Note:** **For wireless modems**, we recommend a setting of 10-15 seconds for most applications.

- **Inter-byte Delay (ms)**- This feature can be used to slow the inter character transmission speed, if needed.

Click the **Save** button.



Adding a TCP Route in Configuration Editors > PC Configuration

Adding Serial Routes for Direct Communication

For sites with a serial route for a direct connection,

- Highlight the **Executive** and click the **Add Serial** button in **PC Configuration**
- Enter a **Route Name**, e.g., Direct,
- Enter a **Comm Port**, e.g., COM4

▶ **Note:** This must be in the format of 'COMx' or 'COMxx', with uppercase "COM", no spaces, the same name as found in Windows for the COM port.

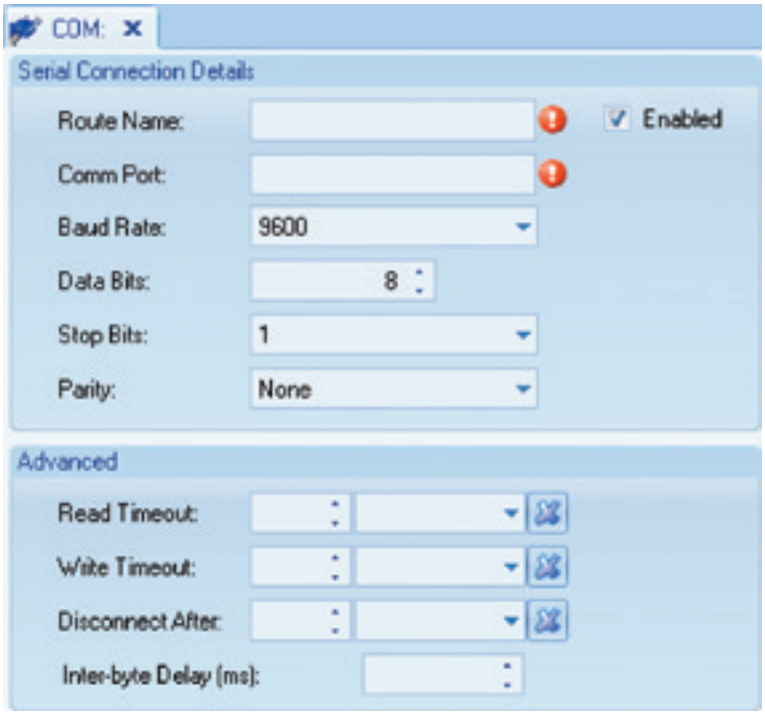
- Enter a **Baud Rate** or accept the default 9600
- **Data Bits** should be 8
- **Stop Bits** should be 1
- **Parity** should be None.

▶ **Note: Advanced Settings** should **ONLY** be modified when recommended by Agilaire support (865-927-9440 press 2 for support or email support@agilaire.com). AV-Trend is designed with defaults that are best for most applications.

- **Read Timeout** overrides the default timeout period for data read..
- **Write Timeout** overrides the default timeout period for a data transmission.
- **Disconnect After** controls the closing of a connection after a period of inactivity. Normally, AV-Trend assumes the direct connection should remain open for optimum polling efficiency; however, AV-Trend can be set to forcibly close and re-open the connection.
- **Inter-byte Delay (ms)** can be used to slow the inter character transmission speed.

Click the **Save** button.

▶ **Note:** Communication Routes can also be added in **Configuration Editors** > **PC Configuration** by highlighting the **Server** icon and clicking one of the **Add** buttons.



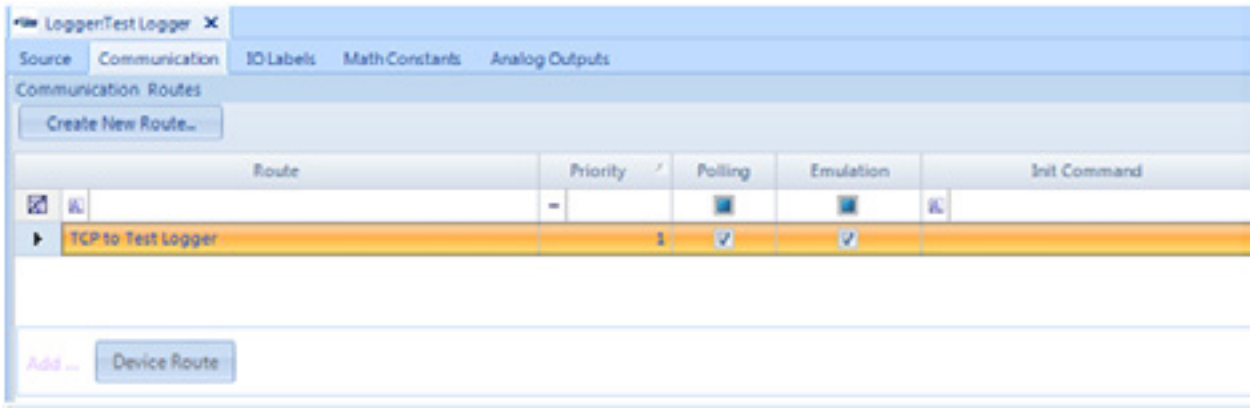
Adding a Serial (Direct) Route in Configuration Editors > PC Configuration

Configuring Communication Routes

⇨ **Important:** Communication routes must be added **AFTER** TCP or Serial Routes are configured in **Configuration Editors**>**PC Configuration**.

To add a **Communication Route**, open **Configuration Editors**/**Logger Channels**, double-click the **Source** (data logger or instrument) in the tree diagram, and click the **Communication tab**.

- Click the **Add Device Route** button at the bottom.
- Highlight the empty row.
- Click the arrow in the first column to select a **Route**.
- Assign a **Priority** number.
- Select **Polling** and/or **Emulation** if applicable.
- Optionally, enter an **Initialization Command and** and a **Final Command.**
- Click the **Save** button.



Associating Data Logger with TCP/IP connection to Driver in Configuration Editors > Logger Channels > Communication tab

Adding Remote Modems

For sites with a modem route, for the remote modem:

- Open **Server Communication** and click the **Add Modem Route** button in and select **MODEM**
- Enter a **Route Name**, e.g., Modem1
- Enter a **Phone number**, e.g.,865-927-9440
- Select a **Modem** from the drop-down list or leave the default of **Use any available modem**
- **Preferred Modem Baud Rate**. If set, AV-Trend will first seek a modem whose max baud rate matches this preferred speed. If none is available, it will use any of the other modems in the pool.
- Enter a number of **Redial attempts** (default is 1)
- Enter **Time between redial attempts** (default is 1 minute).
- Click the **Save** button.

Adding a Remote Modem Route in Configuration Editors > Data Source Details

▶ **Note: Advanced Settings** should **ONLY** be modified when recommended by Agilaire support (865-927-9440 press 2 for support or email support@agilaire.com). AV-Trend is designed with defaults that are best for most applications.

- **Over ride Serial Baud Rate**- If set, AV-Trend will force the COM port connection to a specific speed when communicating with the modem.
- **Over ride Serial Read Timeout**- Overrides the default timeout period for a serial transmission from the server to the remote.
- **Over ride Serial Write Timeout**- Overrides the default timeout period for a serial response from the remote after a command has been sent.
- **Connection Timeout**- Sets the time before a dialing attempt is aborted if the modem does not provide a valid response code indicating a connection. We recommend a setting of 10-15 seconds for most applications.
- **Hangup Idle Time**- Sets the time before an idle modem connection is considered ready for disconnection Defaults to 5 seconds (this would be five seconds in addition to the Serial Read Timeout), but can be extended if responses from loggers are slow.

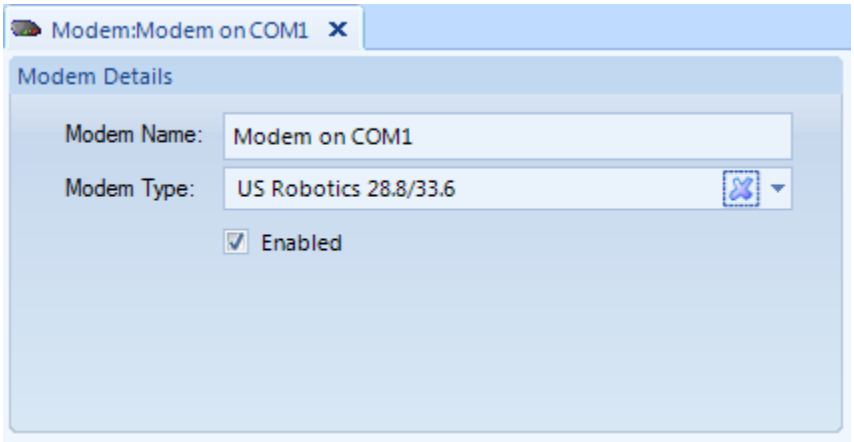
Adding a Modem Route for Central Modem

For communication via modem, add a **Modem Route** to dial out from the **Central modem** attached to your Executive PC. From **Configuration Editors** > **Server Configuration**:

- highlight the **COM1** icon (or COM2, COM3, etc.)
- click the **Add Modem** button.
- enter a **Modem Name** (such as Central modem)
- select a **Modem Type** from the drop down list, e.g., U.S. Robotics 28.8-33.6.

Click the **Save** button. The modem will be added below the COM icon in the menu tree.

▶ **Note:** Communication Routes can also be added in **Configuration Editors** > **Server Configuration** by highlighting the **Server** icon and clicking one of the **Add** buttons.



Central Modem Configuration from Configuration Editors > PC Configuration

Associating an Existing Route to a Logger

Each **logger** must be associated with a **Communication Route**. Open **Configuration Editors** > **Data Source Details** > **Logger** and select the **Communication tab**:

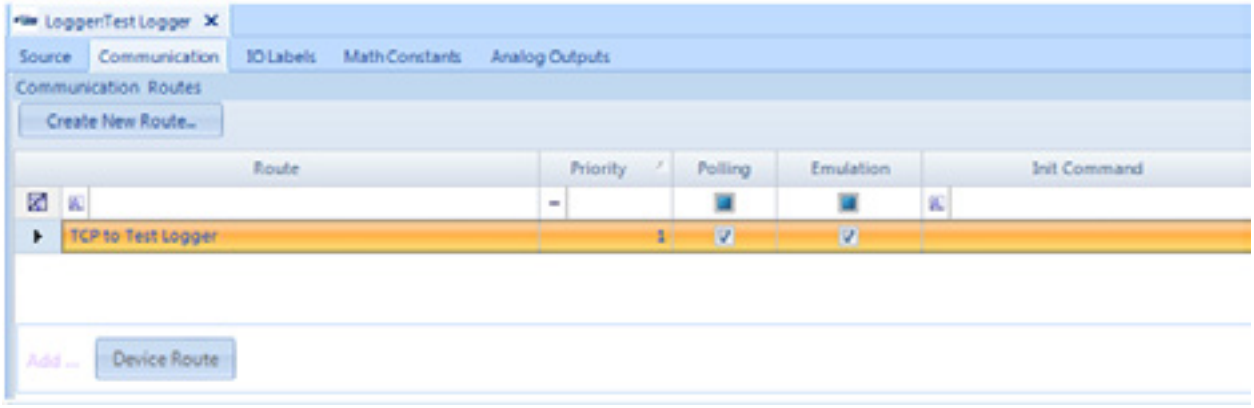
- Highlight the **Route** row
- Assign a **Priority** number
- Select **Polling** and/or **Emulation** if applicable (Emulation is for linking to the logger.)
- Optionally, enter an **Initialization Command and** and a **Final Command**
- Click the **Save** button.
- Click the **Save** button.

To add a new Route, click the **Create New Route** button.

⇨ **Important:** Some configuration changes require you to restart the the AirVision Server service. If a **System Restart** is necessary, you will be prompted by AV-Trend when you click **Save**. If you click **Yes** at the prompt, AV-Trend will restart the service automatically. If a required system restart is not done, you will not be able to link to logger. (Two system restarts may be necessary to synchronize the network for IP-based connections.)

▶ **Note:** If you need to restart the system manually, open the **Utilities** menu and select **Server Restart**. The Executive will be already be selected by default in the **Server Restart** screen, then click the **Restart Executive Service** icon in the upper left corner.

The logger can also be associated with the Communication Route through the Server Configuration menu by selecting the Devices tab on the Device Route, and clicking the **Add Device Route** button at the bottom of the screen.



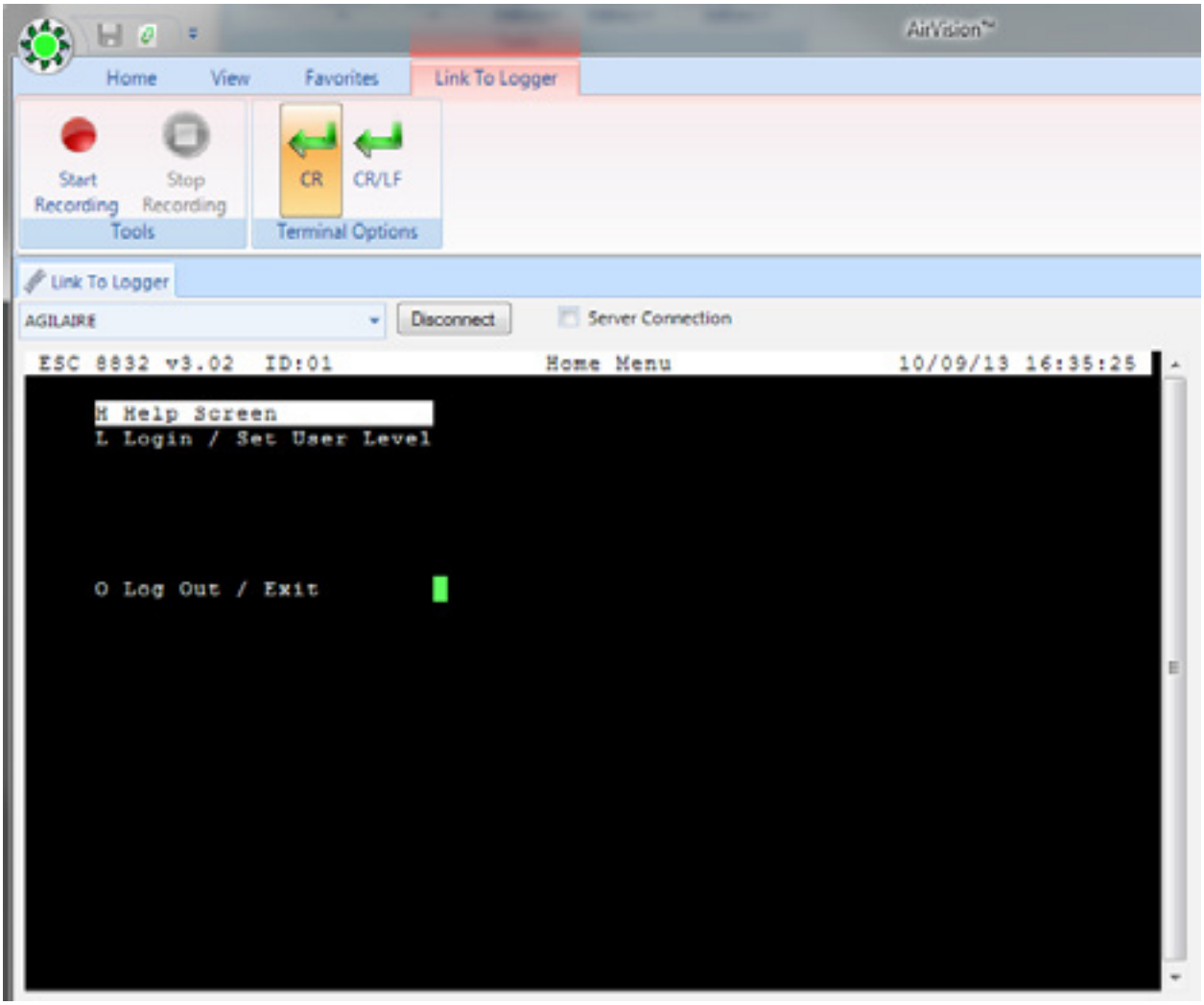
Associating Data Logger with TCP/IP connection to Driver in Configuration Editors > Logger Channels > Communication tab

Testing Your Connection

To test your connection, select **Link to Logger** from the **Utilities** menu. Select a logger from the drop-down list and click **Connect**. Linking to the logger means that your connection is good but does not ensure that you will be able to download or poll. Be sure to always select **O Log Out / Exit** on the Link to Logger screen before clicking the **Disconnect** button.

⇨ **Important:** Some configuration changes require you to restart the the AV-Trend System. If a **System Restart** is necessary, you will be prompted by AV-Trend when you click **Save**. If you click **Yes** at the prompt, AV-Trend will restart the system automatically. If a required system restart is not done, you will not be able to link to logger. (Two system restarts may be necessary to synchronize the network for IP-based connections.)

▶ **Note:** If you need to restart the system manually, open the **Utilities** menu and select **System Restart**. Select an **Executive** in the **System Restart** screen, then click the **Restart Executive Service** icon in the upper left corner.



Testing your connection from Utilities > Link to Logger

Logger Download (Model 8816 / 8832 / 8864 only)

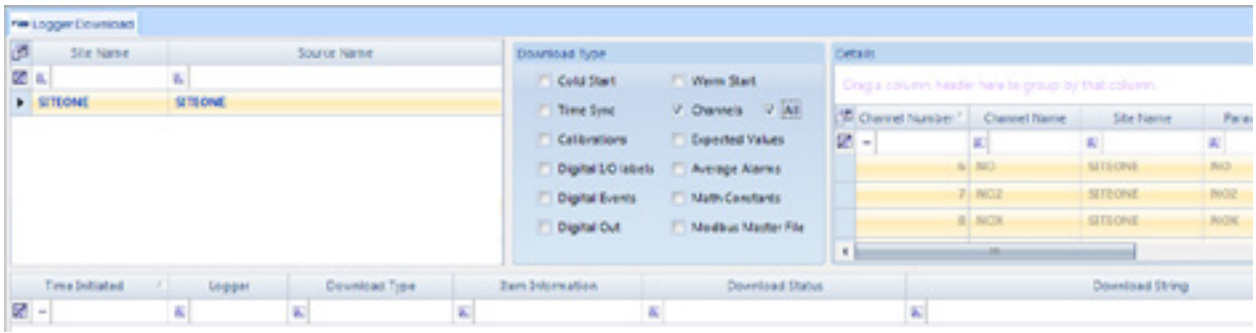
To download channel configurations:

- Open **Utilities** > **Logger Download**. Configuring channels was explained in the section "Adding Channels to Data Loggers."
- Select the **Site**/**Source Name**
- Select the **Download Type(s)** from the following check list:
  Cold Start
  Time Sync
  Calibrations
  Digital I/O Labels
  Digital Events
  Digital Out
  Warm Start
  Channels. If you select Channels, the option to select All will be activated.
  Expected Values
  Average Alarms
  Math Constants
  Modbus Master File
- In the Details section, select rows from a table with the following columns: Channel Number, Channel Name, Site Name, Parameter Name, Source Name, Channel Enabled, and Channel Type.
- click **Download**.

The **Log Viewer** will display details of the download in the bottom section of the screen.

▶ **Note:** The **Log Viewer** can also be accessed directly from the **Status Displays** menu.

▶ **Note:** Multiple loggers can be downloaded at the same time without a cold start.



Logger Download in Utilities > Logger Download

Downloading Channel Configurations (8816 / 8832 / 8864 Loggers)

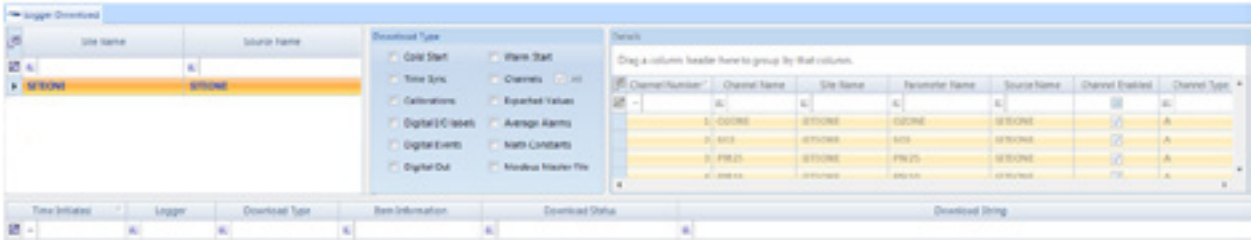
To download channel configurations:

- Open **Utilities** > **Logger Download**. Configuring channels was explained in the section "Adding Channels to Data Loggers."
- Select the **Site**/**Source Name** and **Channels** for the **Download Type.**
- Click **Download**.

The **Log Viewer** will display details of the download in the bottom section of the screen.

▶ **Note:** The **Log Viewer** can also be accessed directly from the menu.

▶ **Note:** Multiple loggers can be downloaded at the same time without a cold start.



Channel Download in Utilities > Channel Download

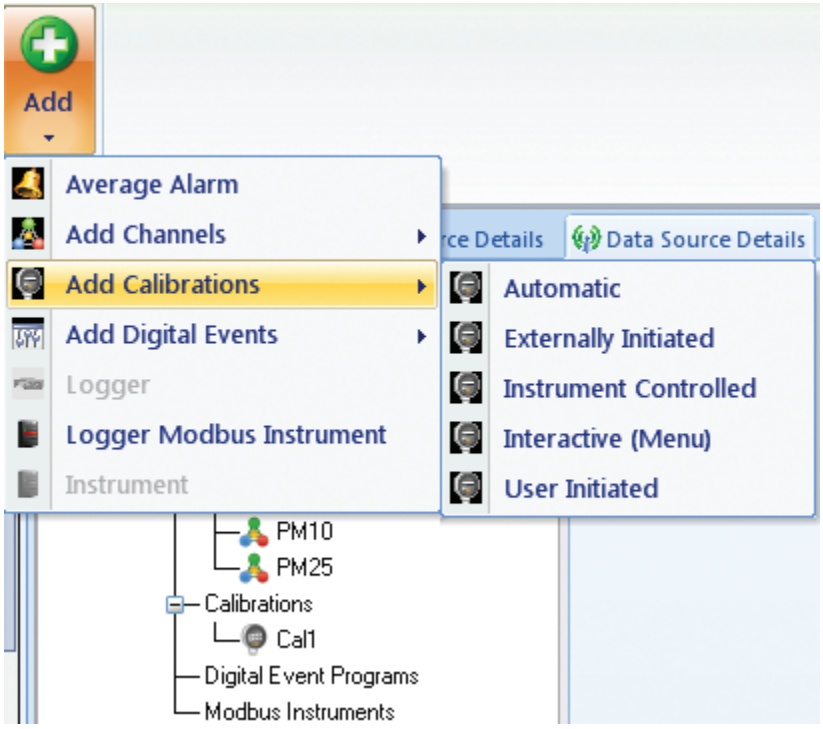
Setting Up Calibrations

To configure calibrations:

- open **Configuration Editors** > **Data Source Details**
- highlight the **Logger** in the tree menu
- click the small arrow under the **Add** button
- select **Calibrations** from the drop-down list
- select one of the following calibration types:
  Automatic
  Externally Initiated
  Instrument Controlled
  Interactive (Menu)
  User Initiated

For details about the remaining prompts, Consult the ESC Model 8816/8832 Data Logger Manual.

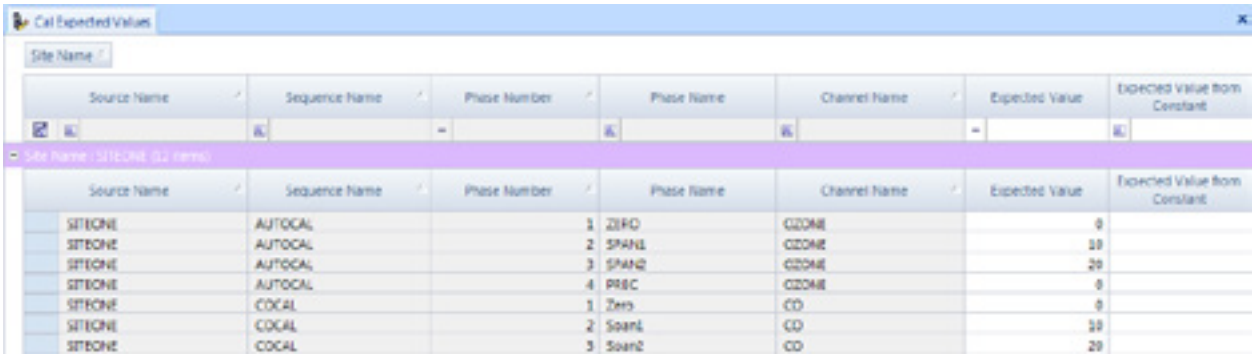
▶ **Note:** Configuration information must be downloaded to the data logger before a new sequence can be initiated.



Adding calibrations in Configuration Editors > Logger Channels

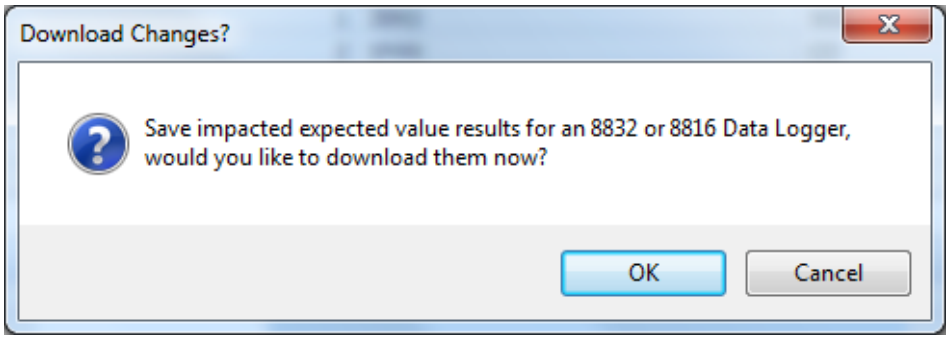
Calibration Expected Values Editor

This mimics the "Quick Expected Values" editor in the Model 8832 data logger that allows the user to quickly update target values for the calibration without sorting through the Calibration configuration editor. The system shows all configured calibrations as expandable/collapsible boxes. Once opened, columns headers can be clicked to sort by phase name, expected value, etc. for easier data entry.



Calibration Expected Values Editor

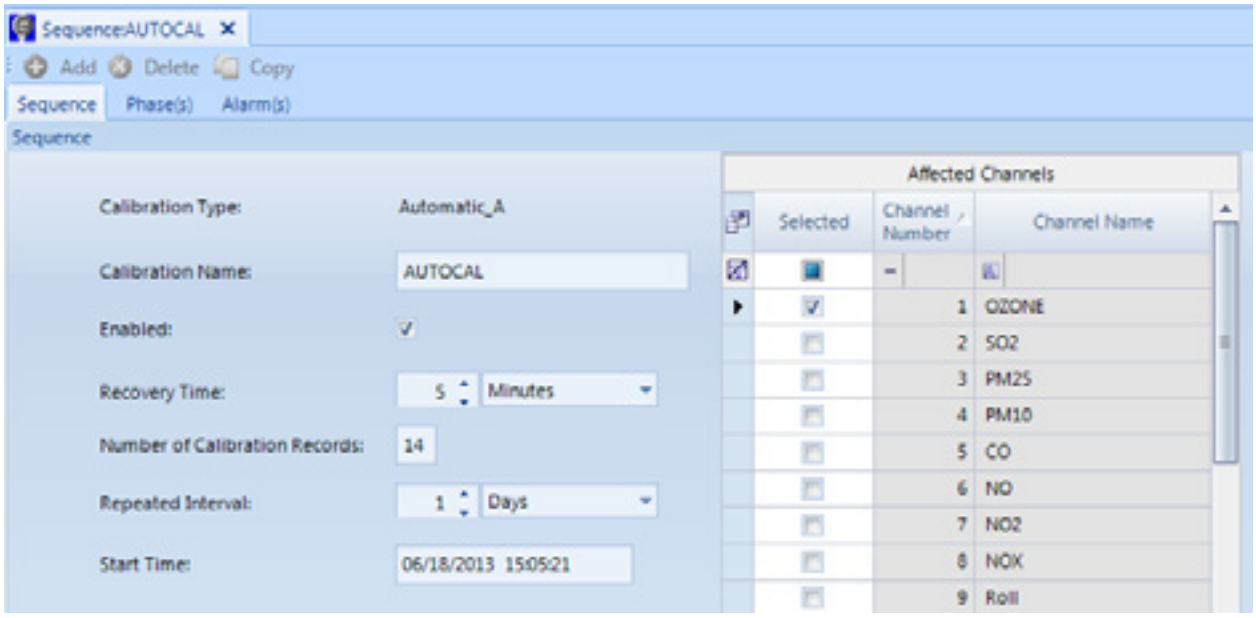
When values are saved, a pop-up window will prompt you to download changes to the data logger (8816 and 8832 only). Clicking **OK** will take you to the Logger Download form, where you can select the checkbox to only download the expected values.



Configuring Automatic Calibrations

If you configure **Automatic** Calibrations, the cal you enable will be automatically initiated by the data logger's internal clock. The Automatic Cal Sequence configuration screen has the following fields :

- **Calibration Type** will be already filled in (Automatic_A).
- **Calibration Name** is required to identify the cal program.
- Check **Enabled** if the calibration is to run.
- **Number of Calibration Records** determines how many cals the data logger will store before overwriting.
- **Recovery Time** specifies the time required to purge cal gas after phases.
- **Repeated Interval** determines how often cal sequence will repeat.
- **Start Time** determines what time cal sequence will start.
- **Affected Channels** determines which channels will be taken off-line during cal. Select from a list of previously configured parameters.

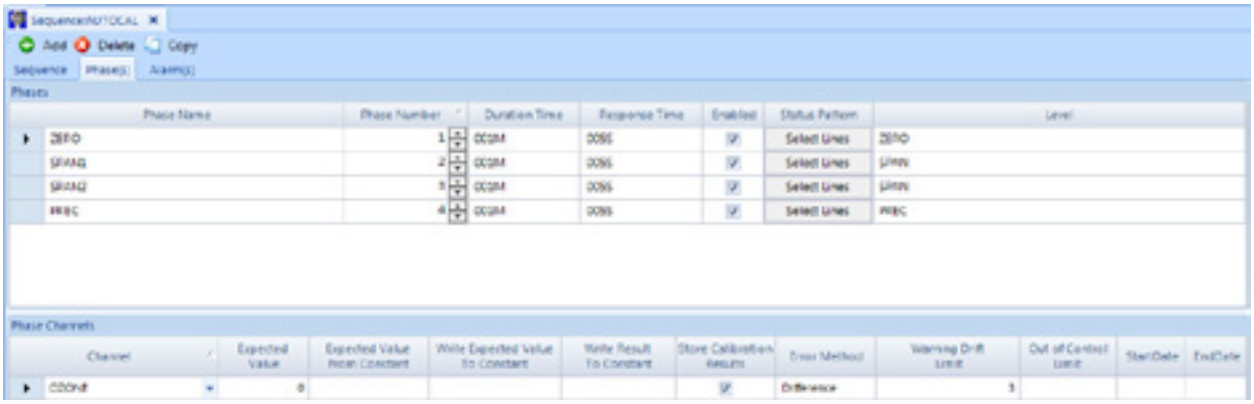


Automatic Calibration configuration in Configuration Editors > Logger Channels

Configuring Phases

To set up Phases:

- Click the **Phase(s)** tab behind the Sequence Cal tab.
- To enter a phase name, click the click the green **Add** button above the tabs and select **Phase** from the drop-down list. .
- Enter a **Phase Name**, **Phase Number**, **Duration Type**, **Recovery Time**, and click to **Enable**.
- To configure a Status Pattern, click the row in **Status Pattern** column and a check list of **Output Control Patterns** will come up. Note that you can only "Activate" output lines, so any lines with the "off" status will be ignored.
- After the Phase table is configured, click the green **Add** button again and select **Phase Channels**.
- Select a **Channel** from a drop-down list, and optionally enter an **Expected Value**, **Drift Limit**, **Auto Correct** (click to enable), **Store Cal Results** (click to enable), **Write Result to Constant**, **Error Method**, **Write Expected Value to Constant**, and **Out of Control Limit (CEM)**.



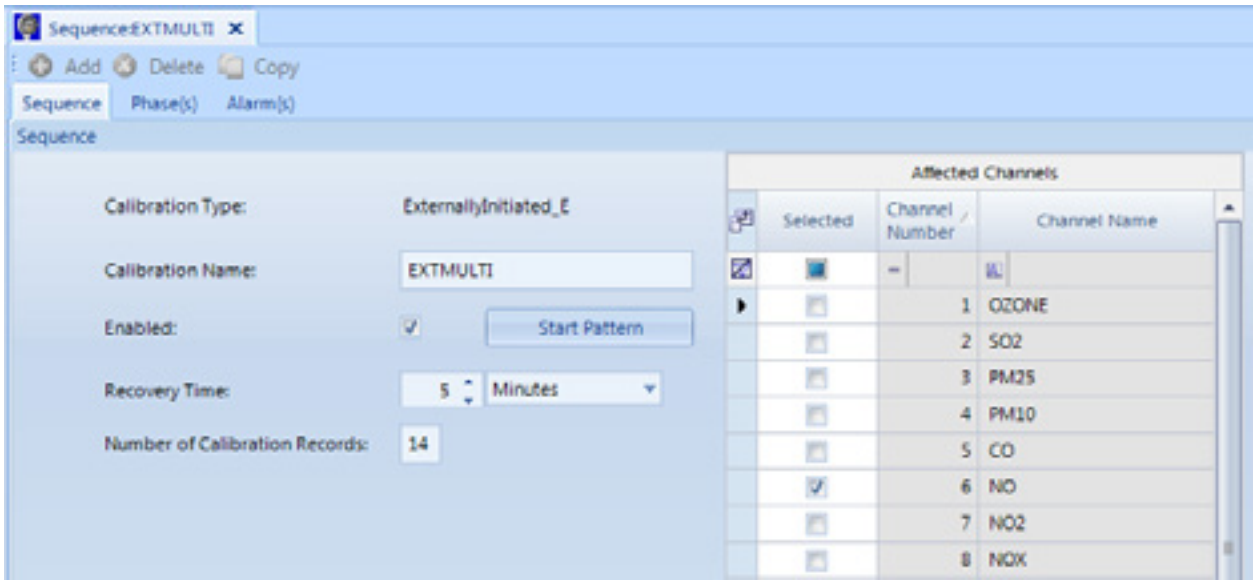
Configuring calibration phases in Configuration Editors > Data Source Details

Optionally, the user can define the Cal Level for each calibration phase using a picklist (ZERO, PREC, SPAN, 20%, etc). These levels are used by the Calibration Adjustment Tool and the AQS Precision Reporting for Gases functions, but designation of the levels are not required.

Externally Initiated Calibration

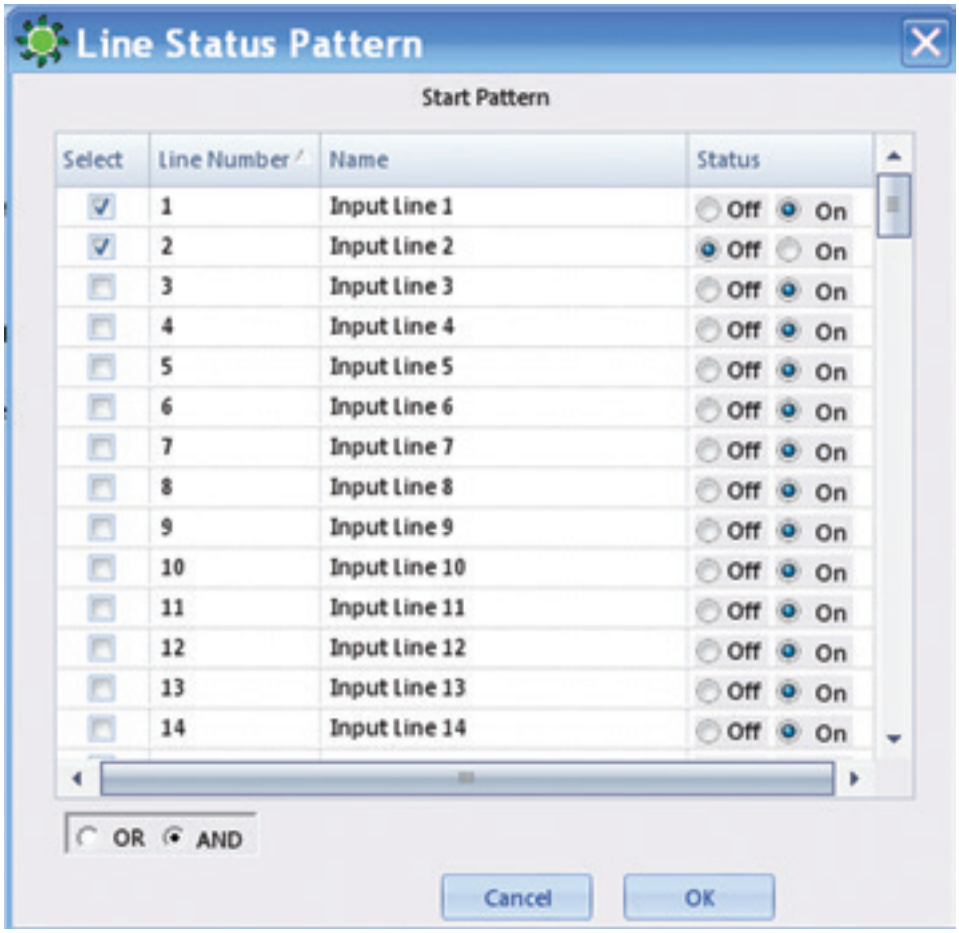
Externally initiated calibration is identical to an automatic calibration except for the way it is initiated. The sequence is started when a specified pattern of input control lines is met. To configure the **Start Pattern** (Line Status Pattern), click the **Start Pattern button**.

Individual phases are then initiated sequentially. As with an automatic calibration, the duration of each phase in the sequence can be specified.



Configuring Externally Initiated Calibrations in Configuration Editors > Logger Channels

When you click the **Start Patter**n button in the **Externally Initiation Calibration** screen, you **will see a Line Status Pattern** screen. Check the **Select** box to select an **Input Line** and select a **Status** of **On** or **Off**. The Externally Initiated Cal will begin when the **Start Pattern** is met.

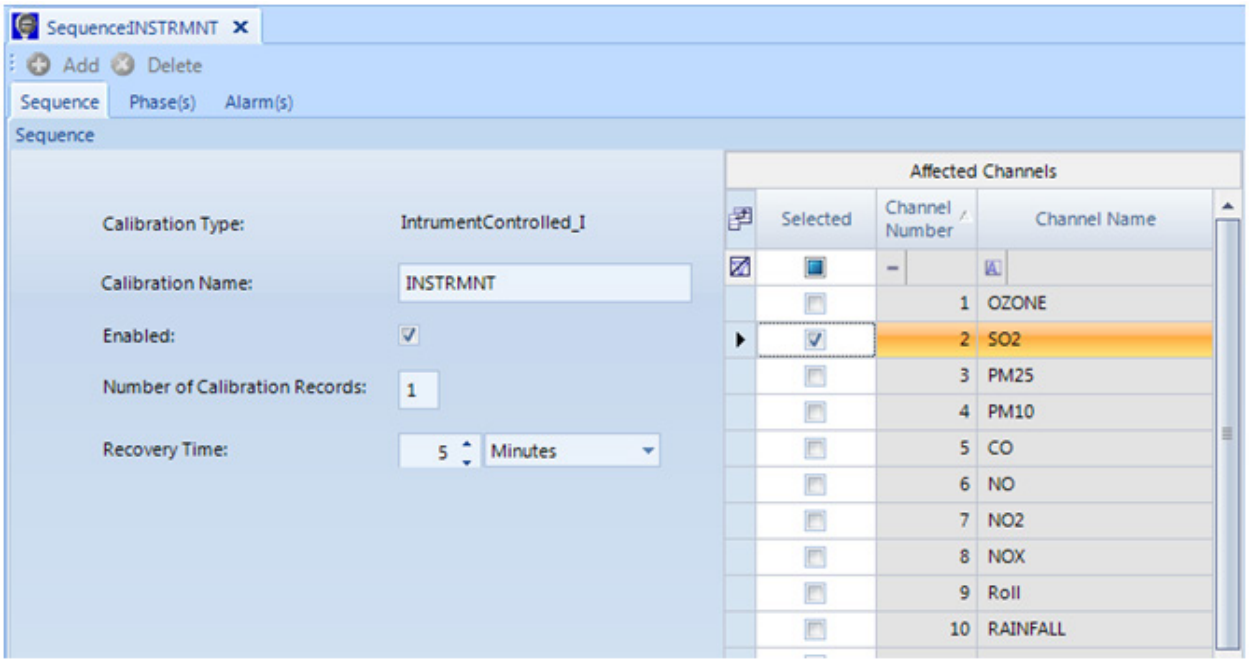


Configuring Start Pattern (Line Status Pattern) in Externally Initiated Calibrations in Configuration Editors > Logger Channels

Configuring Instrument Controlled Calibrations

If you configure **Instrument Controlled** Calibrations, enabled calibrations will be initiated by the data logger when it detects a specified digital input pattern. Each phase will continue until the input line pattern changes. The Instrument Controlled Cal screen has the following fields:

- **Calibration Type** will be already filled in (InstrumentControlled_I).
- **Calibration Name** is required to identify the cal program.
- Check **Enabled** if the calibration is to run.
- **Number of Calibration Records** determines how many cals the data logger will store before overwriting.
- **Recovery Time** specifies the time required to purge cal gas after phases
- **Affected Channels** determines which channels will be taken off-line during cal. Select from a list of previously configured parameters.

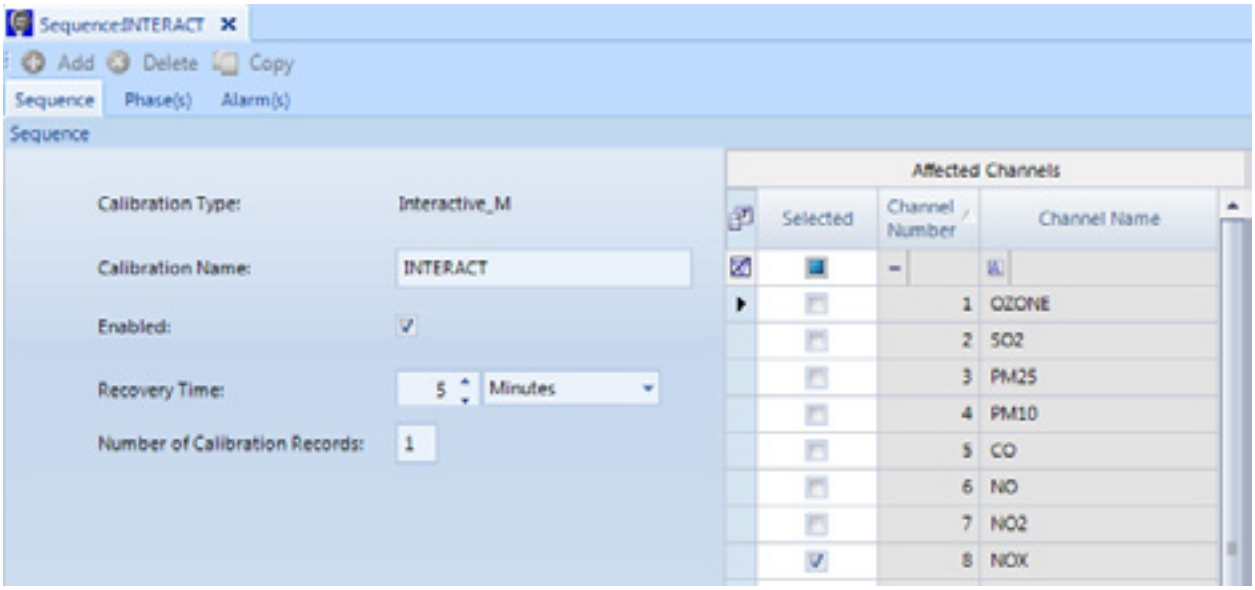


Configuring Instrument Controlled Calibrations from Configuration Editors > Logger Channels

Configuring Interactive (Menu) Calibrations

If you configure **Interactive** Calibrations, enabled cals will be controlled by a user via a menu interface. Interactive cals are often used for highly manual procedures, such as testing opacity instruments against standard filter. Interactive Cal configuration screen has the following fields :

- **Calibration Type** will be already filled in (Interactive_M)
- **Calibration Name** is required to identify the cal program.
- Check **Enabled** if the calibration is to run.
- **Number of Calibration Records** determines how many cals the data logger will store before overwriting.
- **Recovery Time** specifies the time required to purge cal gas after phases
- **Affected Channels** determines which channels will be taken off-line during cal. Select from a list of previously configured parameters.



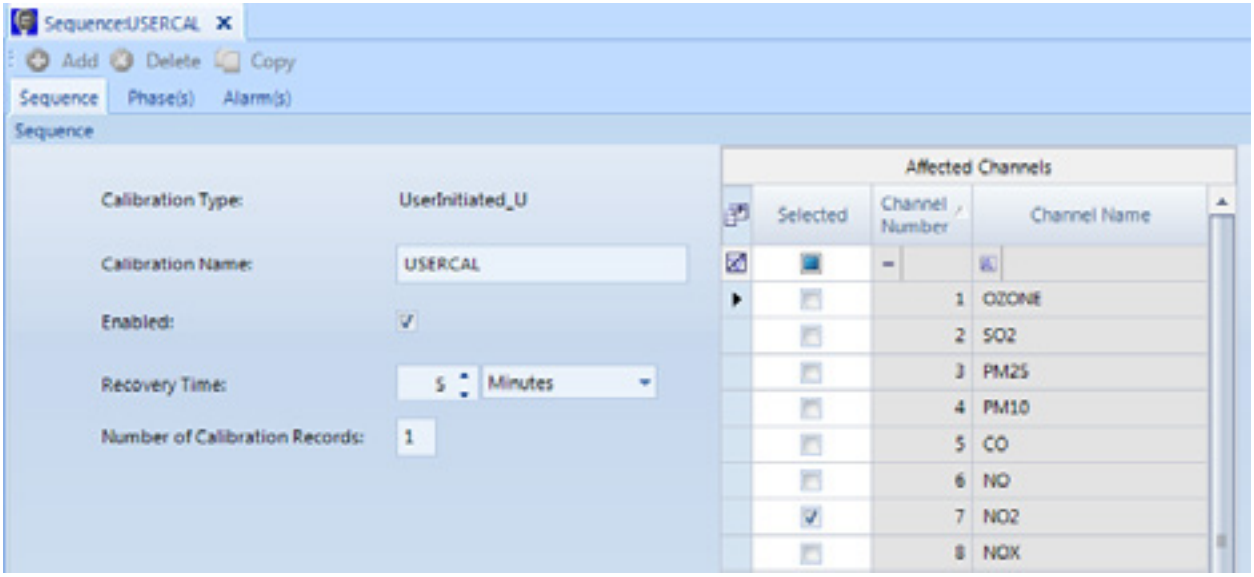
Configuring Interactive (Menu) Calibrations

Configuring User-Initiated Calibrations

Suer-initiated calibrations are started manually by linking to the data logger. When the cal sequence is started, each phase will be initiated in order. The duration of each phase is configured with the same fields as automatic cals.

The User-Initiated Cal configuration screen has the following fields :

- **Calibration Type** will be already filled in (UserInitiated_U).
- **Calibration Name** is required to identify the cal program.
- Check **Enabled** if the calibration is to run.
- **Number of Calibration Records** determines how many cals the data logger will store before overwriting.
- **Recovery Time** specifies the time required to purge cal gas after phases.
- **Affected Channels** determines which channels will be taken off-line during cal. Select from a list of previously configured parameters.



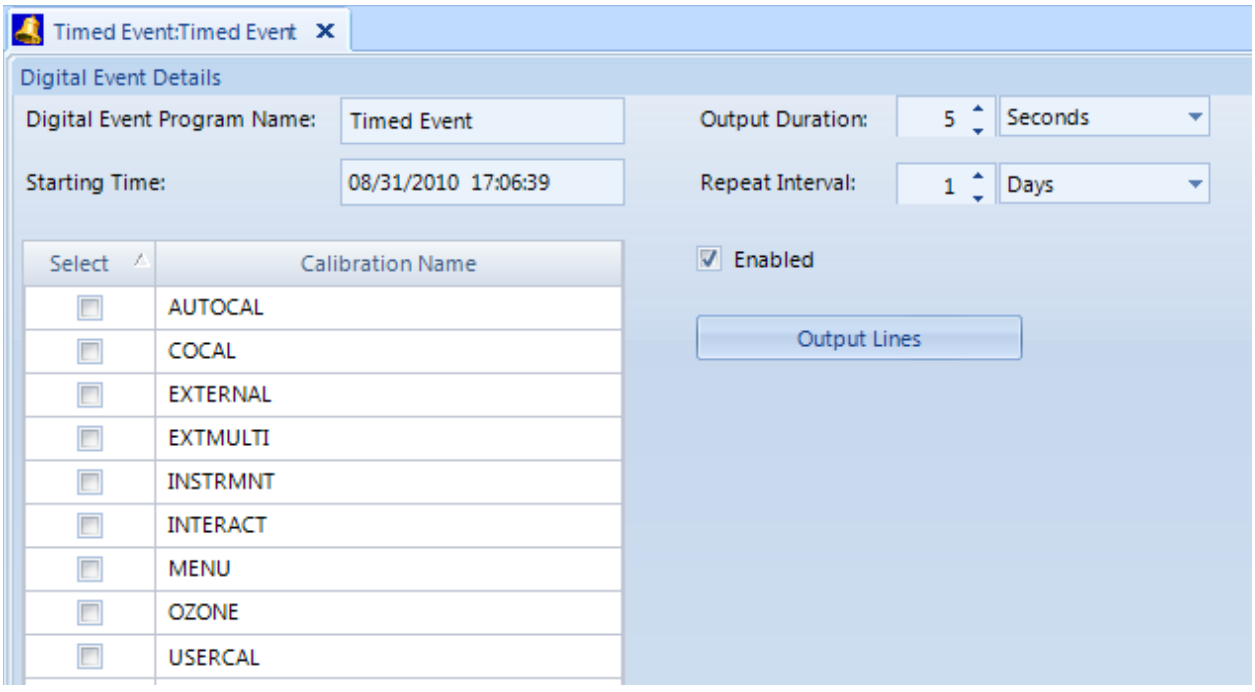
Configuring User-Initiated Calibrations

Configuring Input/Output Lines for Digital Events

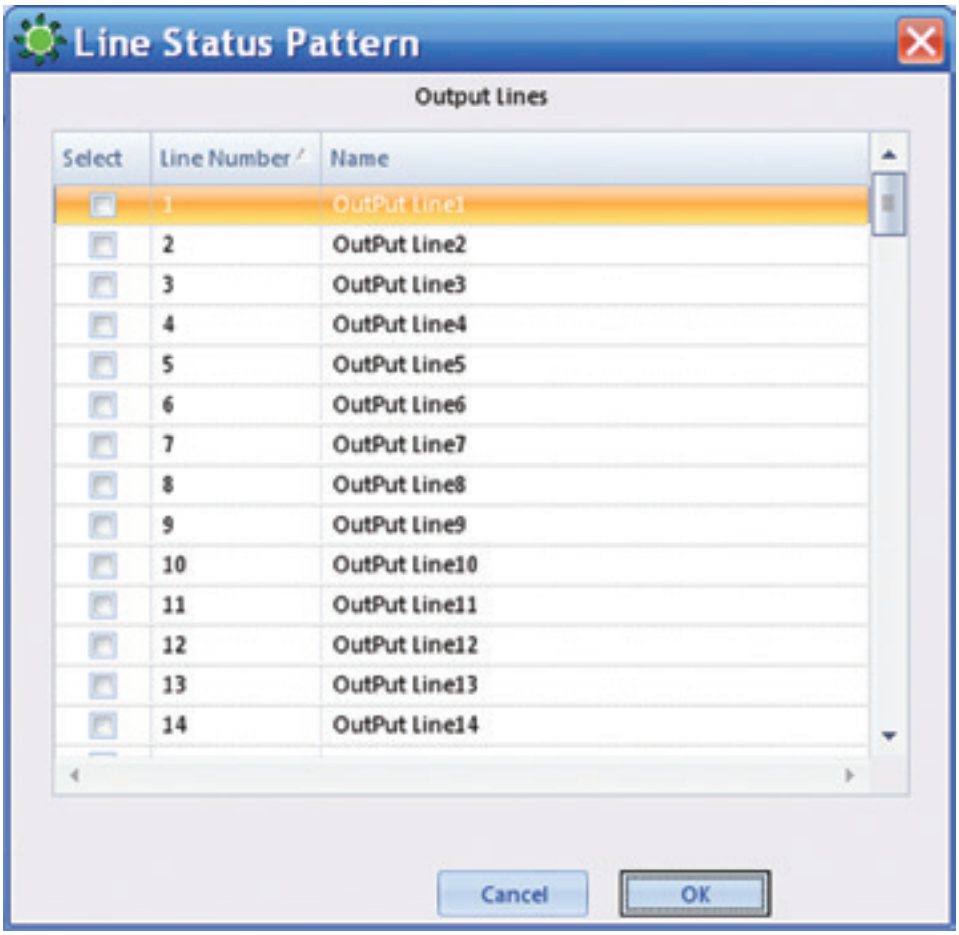
The purpose of digital event programs is to control processes from 8816 or 8832 Data Loggers. **Digitally Timed Events** will turn on specified **Output Lines** for the configured **Starting Time**, **Duration**, and **Repeat Interval**. **Digitally Triggered Events** are initiated by a digital input pattern that will turn on one or more digital output lines. The output lines will remain active for the specified duration; at the end of this time, the output lines will be turned off unless the triggering digital input pattern still matches.

Configuring Digital Timed Events

1. Highlight the **Data Logger** in **Configuration Editors > Logger Channels** tree menu.
2. Click the green **Add** button in the ribbon and select **Add Digital Events > Timed Event**.
3. Enter a **Digital Event Program Name**, a **Starting Time**, **Output Durations**, **Repeat Interval**, and check **Enabled**.
4. If the Digitally Timed Even is for a calibration, select a **Calibration Name** from the drop-down list.
5. Click the **Output Lines** button to bring up the **Line Status Pattern** screen and select a **Line Number**. Click **OK**.



Configuring Digitally Timed Events



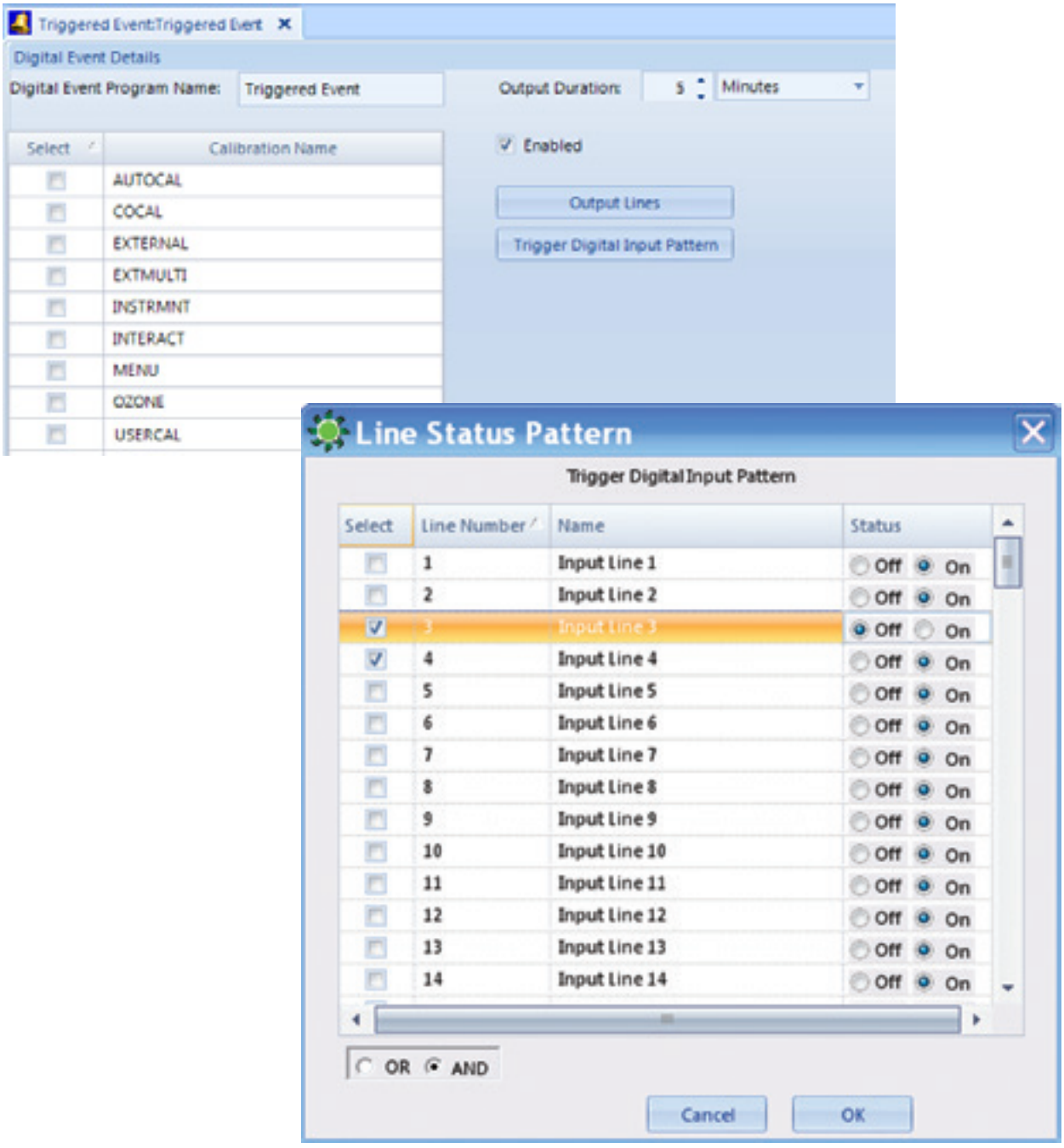
Line Status Pattern for Output Lines

Configuring Digital Triggered Events

1. Highlight the **Data Logger** in **Configuration Editors > Logger Channels** tree menu.
2. Click the green **Add** button in the ribbon and select **Add Digital Events > Triggered Event**.
3. Enter a Triggered **Digital Event Program Name**, an **Output Duration** and check **Enabled**. After the output duration time period, the program will check the digital input pattern to see if it still matches. If not, the output control lines will be switched off. If the pattern still matches, the output relays will remain on, and the duration time will begin again.
4. If the Digitally Triggered Event is for a calibration, select a **Calibration Name** from the drop-down list.
5. Click the **Output Lines** button to bring up the output **Line Status Pattern** screen and select which **Output Line or Lines** will be switched on when the triggered digital input pattern occurs. Click **OK**..

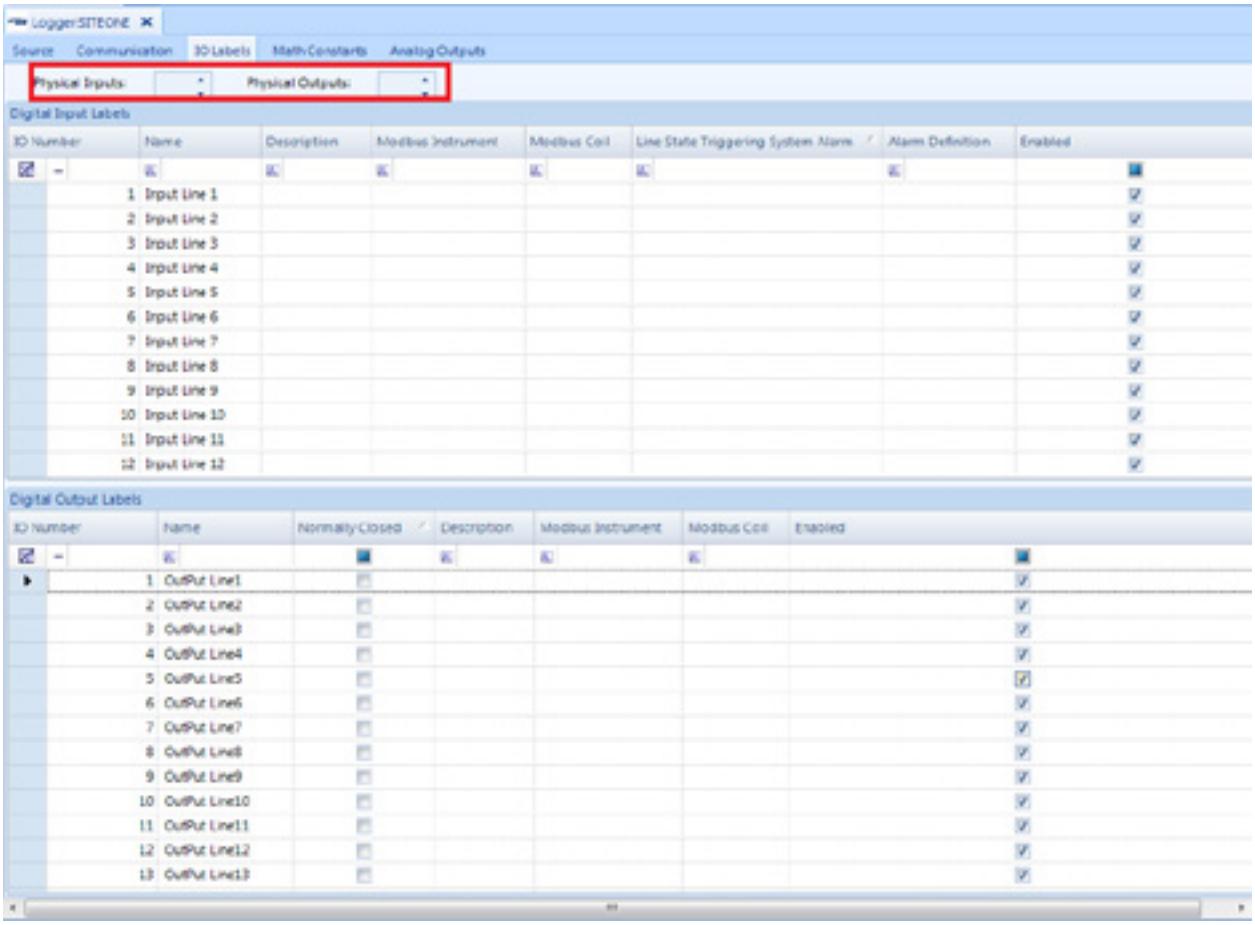
6. Click the **Trigger Digital Event Pattern button** to bring up the **Line Status Pattern** screen for Trigger Digital Input Pattern and select which **Input Line**.or **Lines** turned **On** or **Off** will trigger the event and switch on the specified **Output Line(s)**.

7. In the lower left corner of the screen, select **And** or **Or**. If you select **And** (the default), the digital event program will be triggered **only if ALL** the specified conditions occur. If you select **Or**, the digital event program will be triggered if **ANY** of the specified conditions occur. Click **OK**.



Trigger Digital Input Line Status Pattern with OR/AND selection

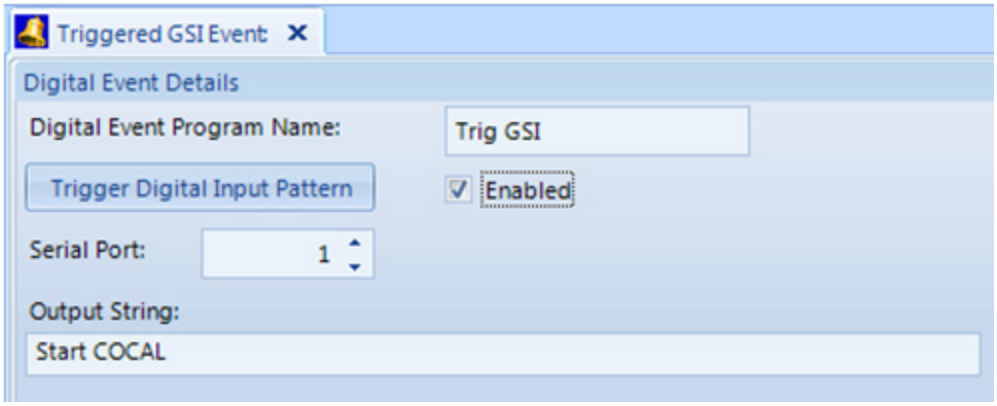
- **Note:** AV-Trend (version 2.1 and up) supports download of logger I/O labels with a different number of inputs and of outputs.. If the number of input and output cards on your data logger are not equal, you may encounter some download errors when downloading the labels. If this happens, define the actual number of physical inputs and outputs using the **IO Labels** tab. If you are using pseudo inputs/outputs, do NOT accept allowing the system to change the number of labels.



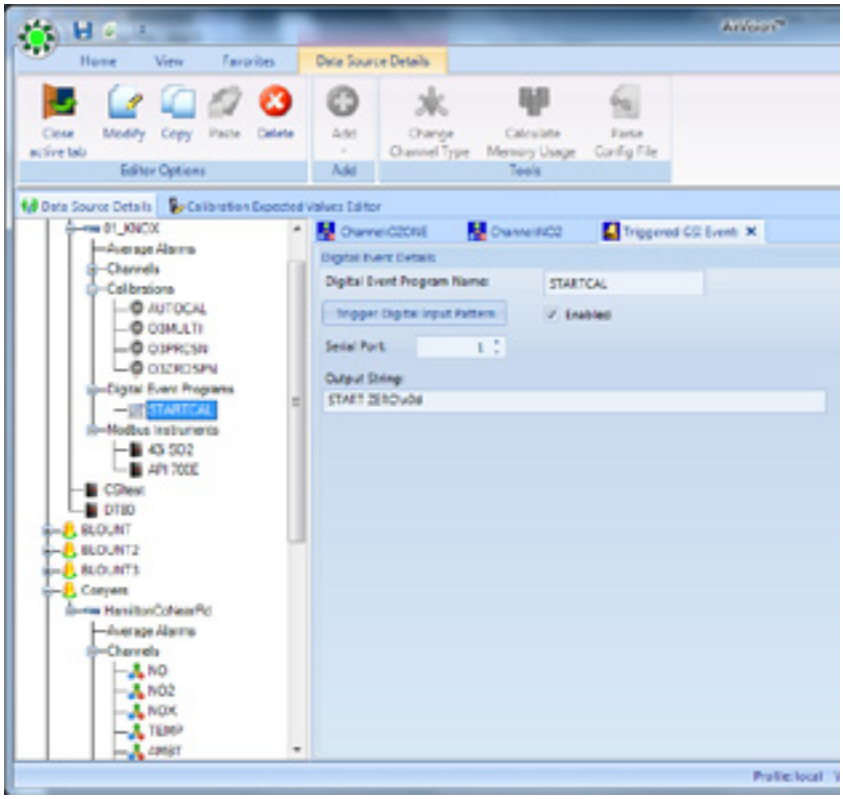
Different number of Inputs and Outputs Configuration Editors > Logger Channels > double-click Logger in tree menu > I/O Labels tab

Configuring DI-Triggered GSI Events

These events are used to send GSI strings based on the transition of a digital input (or of a pseudo DI-DO pair in the logger). Commonly, these are used to control RS-232 based calibrators or other devices. For this device, a digital input pattern is defined. When the logger sees the digital input transition to match this pattern, the GSI string is sent out the designated serial port (just once). The string is not resent until the logger goes to a non-matching input state, and then back to the matching state.



Triggered GSI Event



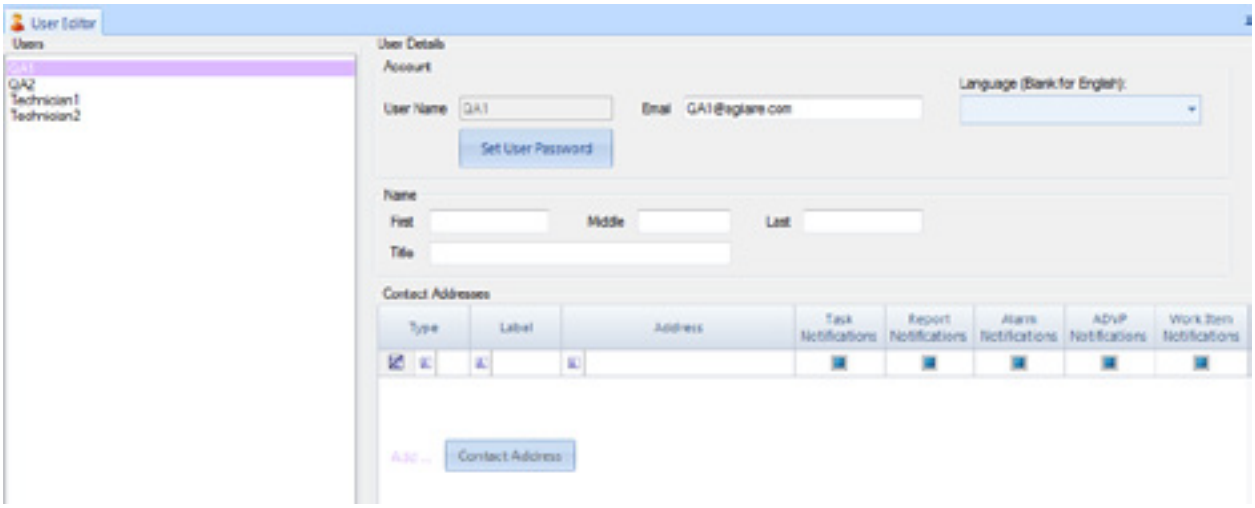
Digital Event details

Setting Up Email Services and Alarms

AV-Trend can email specific flag information (alarms), ADVP rule notices, or scheduled reports to selected recipients. To set up the email service, follow these steps:

1. Enable Email Service:
   Open **Configuration Editors > PC Configuration** and double-click the **Executive** in the tree menu. Click the **Service Components** tab and be sure **Email Service is listed and Enabled** and **Auto Start** are selected. If you make changes, click **Save**.

2. Add Users and Email Addresses:
   In **Configuration Editors** > **Security** > **User Editor**, click the **Add User** button and enter a **User Name**, **Email Address**, and click **Set User Password**. **Name** and **Title** are optional. Click **Save**.

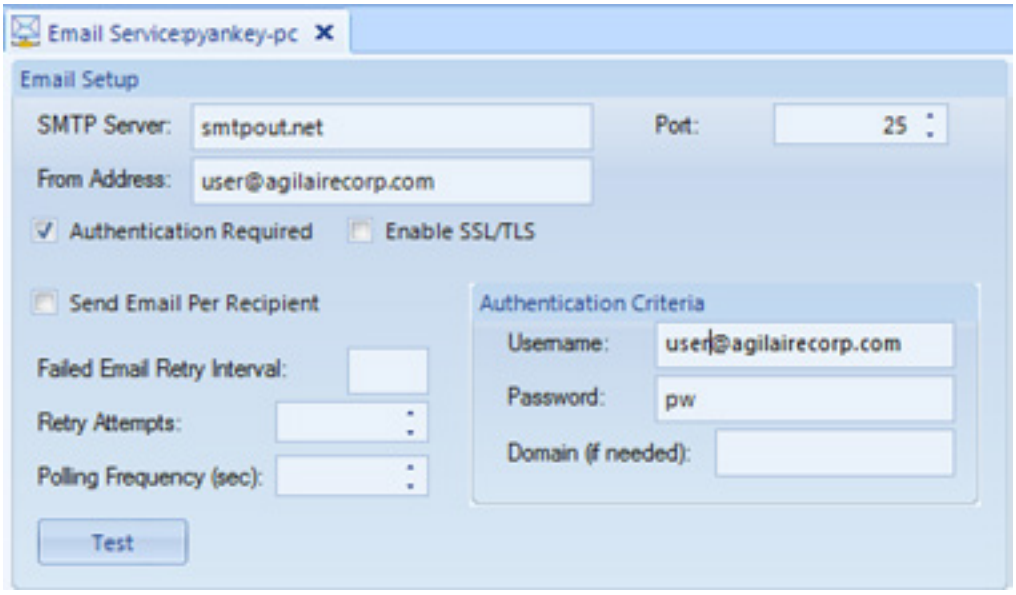


Adding Users in Configuration Editors > Security > User Editor

3. Configure SMTP settings:

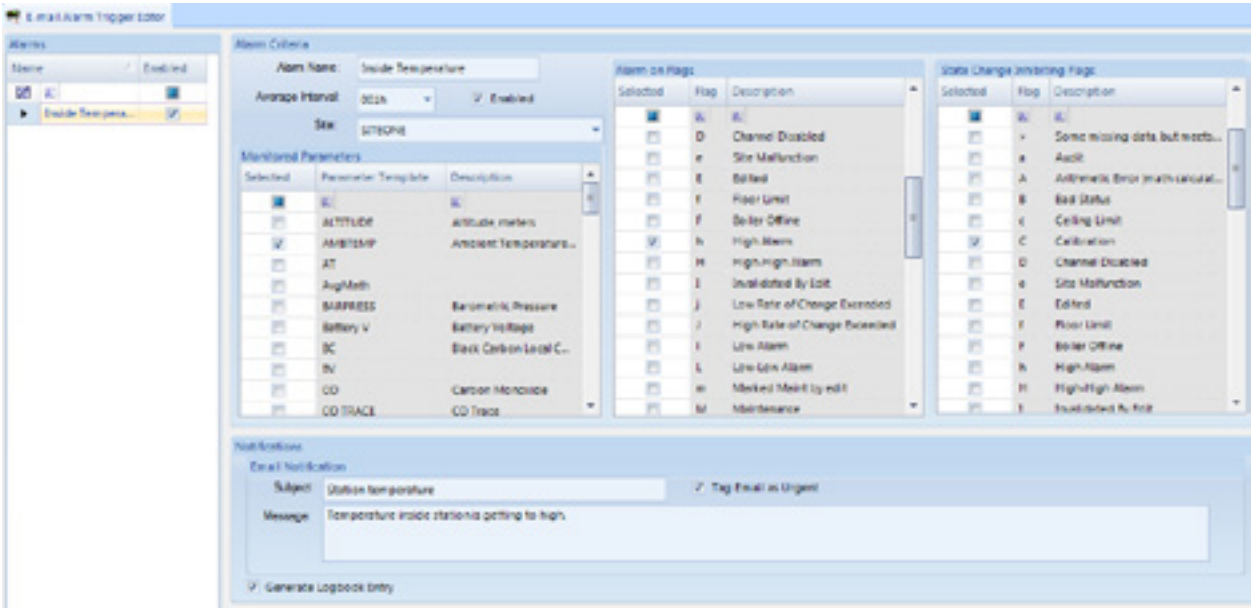
In **Configuration Editors** > **PC Configuration**, double-click the **Email Service** icon under **Service Configuration** in the tree menu and enter the following information):

- **SMTP Server**, for example, smtpout.secureserver.net
- **Port** number
- **From Address** for the sender of email, e.g., ErrorReporting@agilaire.com
- If **Authentication** is **Required**, check the box and enter a **Username** and **Password**.
- If your mail server requires **SSL/TLS**, check the box next to **Enable SSL/TLS**.
- Check **Send email per recipient** if each recipient will receive email alarms, or leave unchecked for one email with multiple recipients shown.
- **Failed Email Retry Interval** (in seconds, minutes, or hours)
- Number of **Retry Attempts**
- **Polling Frequency** in seconds



Setting up Email Service in Configuration Editors > PC Configuration > Email Service

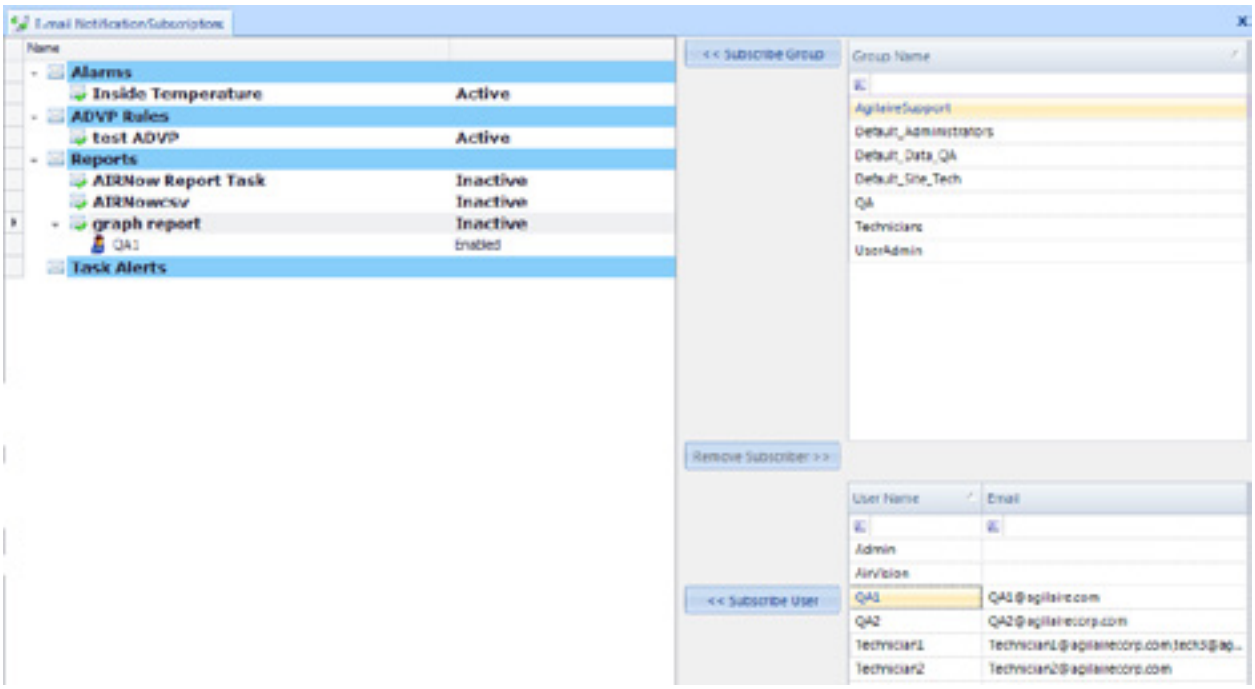
4. Define Email Alarms:
   In **Configuration Editors** > **Email Alarm Trigger Editor**, enter an **Alarm Name**, **Average Interval**, and a **Site**.
   Select which **Parameters** to **Alarm On** (send an email alarm), which **Flags** to use as a **Trigger** for those parameters, and which **Flags to Inhibit**. For example, you could configure an email alarm to be sent for the **Parameter** ozone when an Invalid flag is set except when a Calibration is set at the same time.
   For the **Email Notification**, enter a **Subject** with or without an **Urgent Tag**, and a text **Message**.



Defining Email Alarms in Configuration Editors > Email Alarm Trigger Editor

5. Add Recipients to Notification Subscriptions: (**Configuration Editors** > **Email Notification Subscriptions**. Either entire User Groups, Individual Users, or a combination can be defined for each alarm.

   Click the **Save** icon.



Adding recipients for email alarm notification from Configuration Editors > Email Notification Subscriptions

6. To Schedule Alarm Checks, see “Scheduling Tasks.”

Scheduling Tasks

All automatic actions in AV-Trend are managed by the **Task Scheduler** (**Configuration Editors** > **Task Scheduler**), which runs as part of the background AirVision service. The following tasks can be configured in the Task Scheduler, depending on your licensed options:

- Alarm Processing Task
- Average Data Purge Task
- Average Rollup Task
- Instrument Poll Task
- Journal Message Purge Task
- Logger Poll Task
- Scheduled Command Line Task
- Scheduled Report Task
- SQL Execution Task
- New Task Group

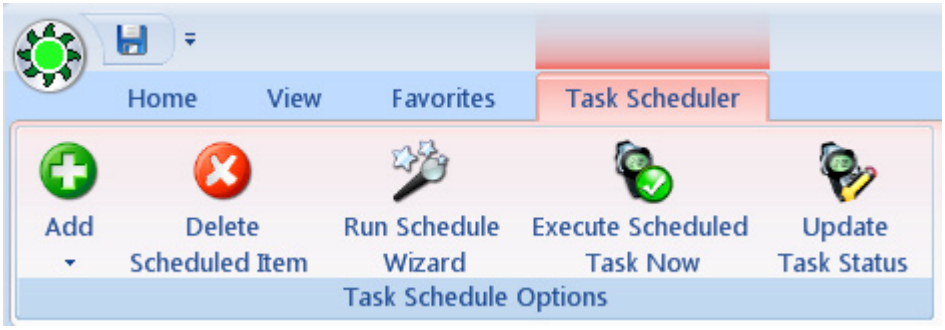
Some automatic actions in AirVision are managed by the **Task Manager**, which runs as part of the background AirVision service. The Task Manager has three user interfaces:

- **Task Scheduler** (**Configuration Editors** > **Task Scheduler**) allows you to add, review, and edit individual and grouped task events.
- **Task Wizard** (**Configuration Editors** > **Task Scheduler** >**Run Schedule Wizard** button in ribbon at top of screen) allows you to create grouped polling events as well as events triggered by polling .
- **Task Display (Utilities** > **Scheduled Task Status**) is a constantly updating display of all tasks within the system, including the last time run, next execution time, and errors experienced during the last run.

Task Scheduler

The Task Scheduler has five **Task Schedule Options**:

- Click the **Add** button to add a scheduled task from the list above.
- Click the **Delete Scheduled Item** button to delete a selected scheduled task.
- Click **Run Schedule Wizard** button to bring up the **Task Wizard**, which guides you through scheduling new tasks.

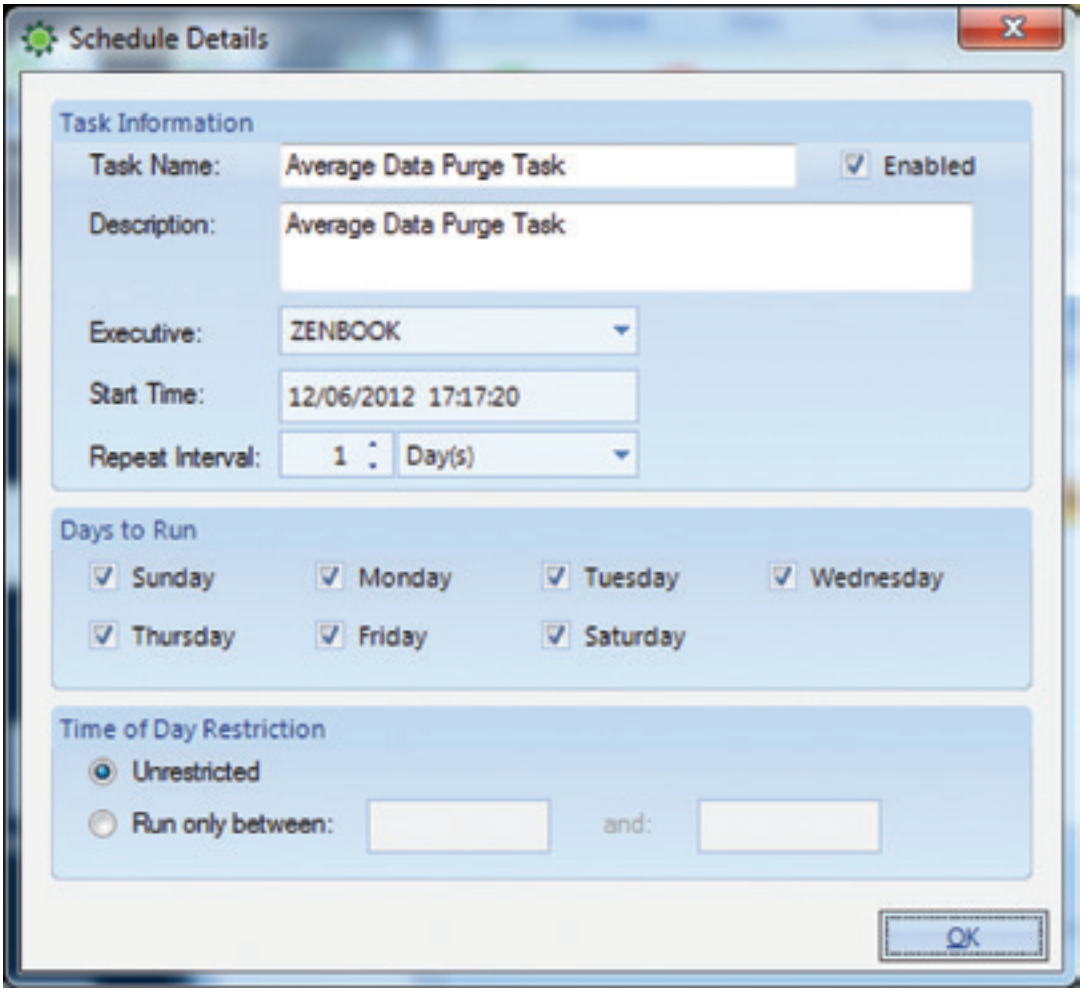


Task Schedule Options (Configuration Editors > Task Scheduler)

- Click **Execute Scheduled Task Now** if you don't want to wait until the next time a selected task is scheduled to run.
- Click **Update Task Status** to bring up a utility screen that allows you to to update the last polled data time for polling tasks, which determines what the start time of the next poll will be. This utility has no effect on non-polling based tasks.

The number of sections in the **Task Scheduler** varies according to the displayed task. The following sections are displayed when a **Logger Poll Task** is selected:

- **Task Schedule** displays all scheduled tasks and cannot be edited.
- **Task Schedule Details** section is where **Executive**, **Start Time**, and a **Repeat Interval** are selected.
    - An **Advanced** tab is provided next to the repeat interval to allow the user to specify if the task is only to run on certain days of the week, or only in a 'window' of certain hours of the day. This is especially useful for polling tasks.

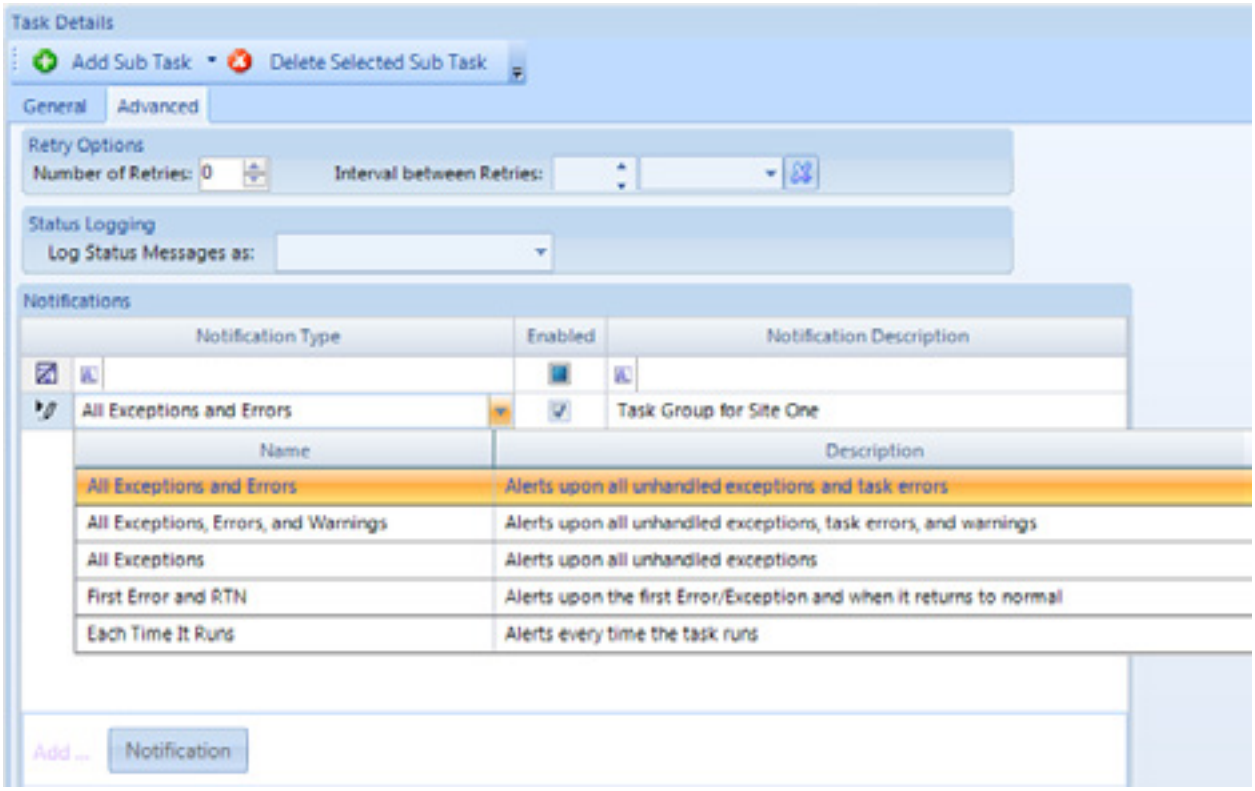


Task Scheduler showing the Advanced screen for a task
(Configuration Editors > Task Scheduler)

- The **General Tab** in the **Task Details** section is where you enter a **Task Name** and a **Task Description**. **Task Enabled** must be checked in this section before you can select **Enabled** in the **Scheduled Task Selection** section.

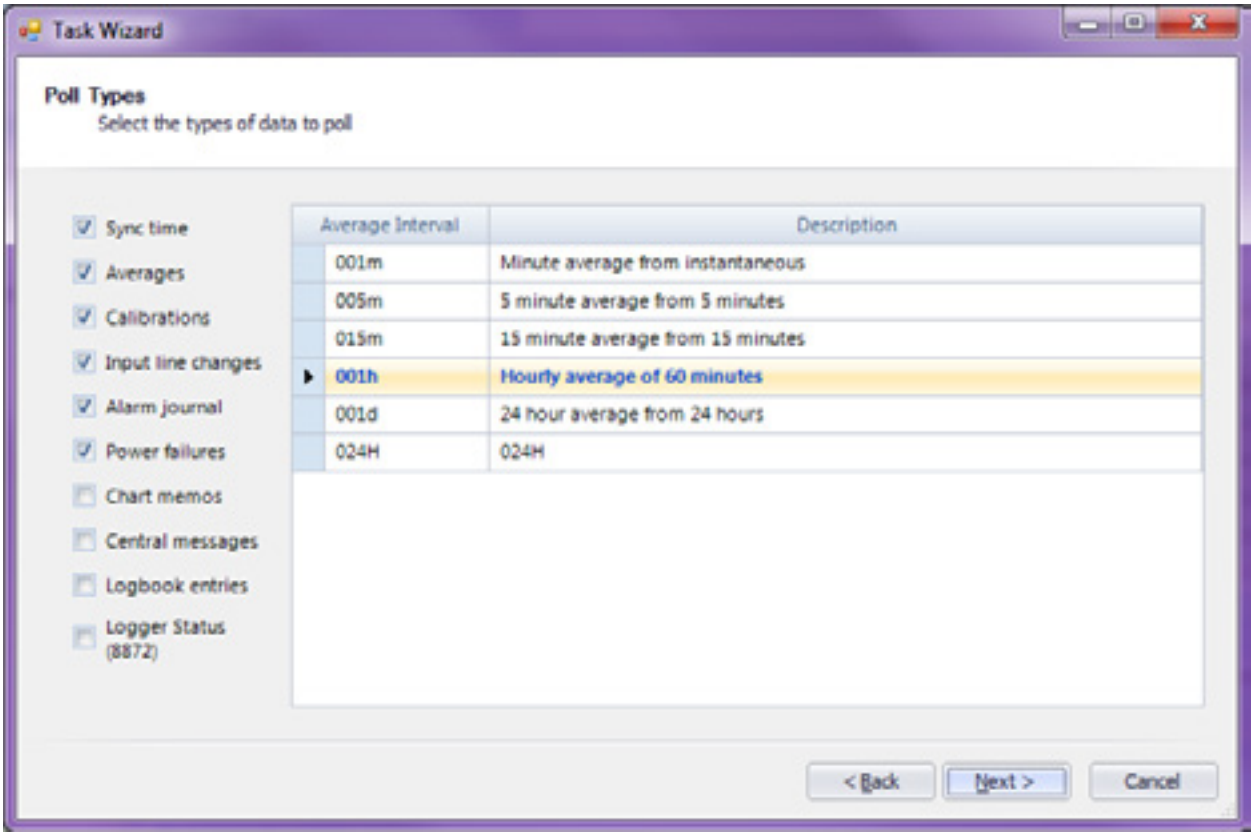
  The **Advanced Options** tab in the **Task Details** section defines the **Number of Retries**, the **Interval between Retries**, and whether to **Log Status Messages** as **Off**, **Information**, **Verbose** (for a problematic task), or **Debug**.

  The **Notifications** part of the **Advanced** tab allows configuration of **Notification Type** (All Exceptions and Errors; All Exceptions, Errors, and Warnings; All Exceptions; First Error and RTN (Return to Normal); or Each Time it Runs) followed by a **Description** of each Notification Type.



Task Details section of Task Scheduler showing Notification selections (Configuration Editors > Task Scheduler)

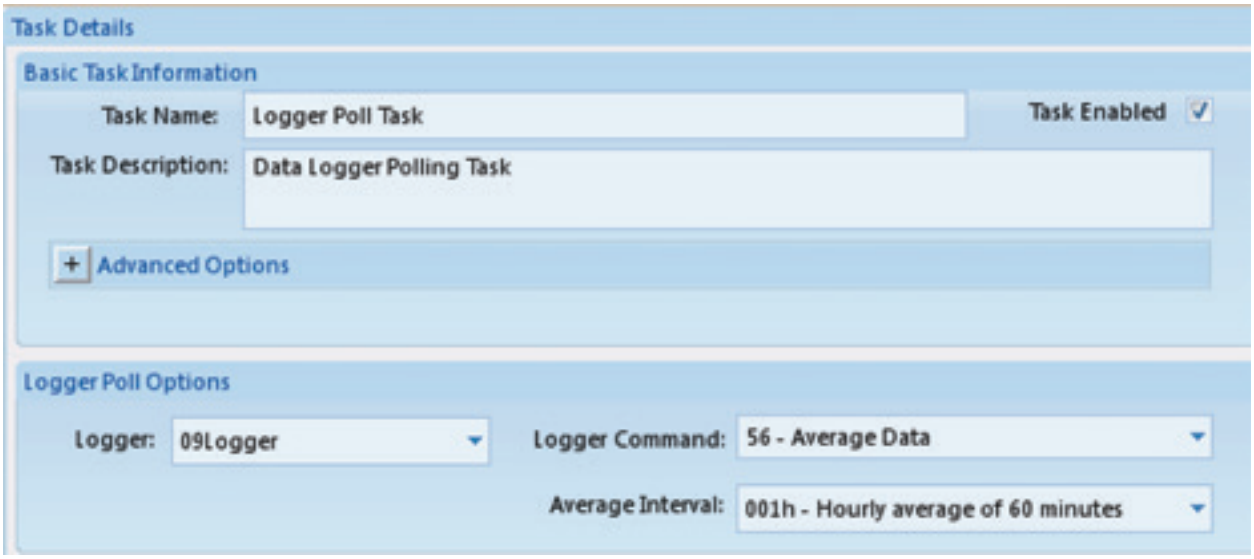
- The **Logger Poll Options** section defines the **Logger**, the **Logger Command** (e.g., Average Data), and the **Average Interval**.



Task Scheduler showing a Logger Poll Task (Configuration Editors > Task Scheduler)

To configure an individual task in the **Task Scheduler** (**Configuration Editors** > **Task Scheduler**), click the **Add** button in the ribbon at the top of the screen and select one of the following categories:

- **Alarm Processing Task** reviews alarm Triggers for matches, creates email alerts, and tells AV-Trend when to process a particular alarm rule. If you use task groups and designate tasks to run in sequence, you can designate alarms to be processed immediately after a data poll.



Logger Poll Task in Configuration Editors > Task Scheduler

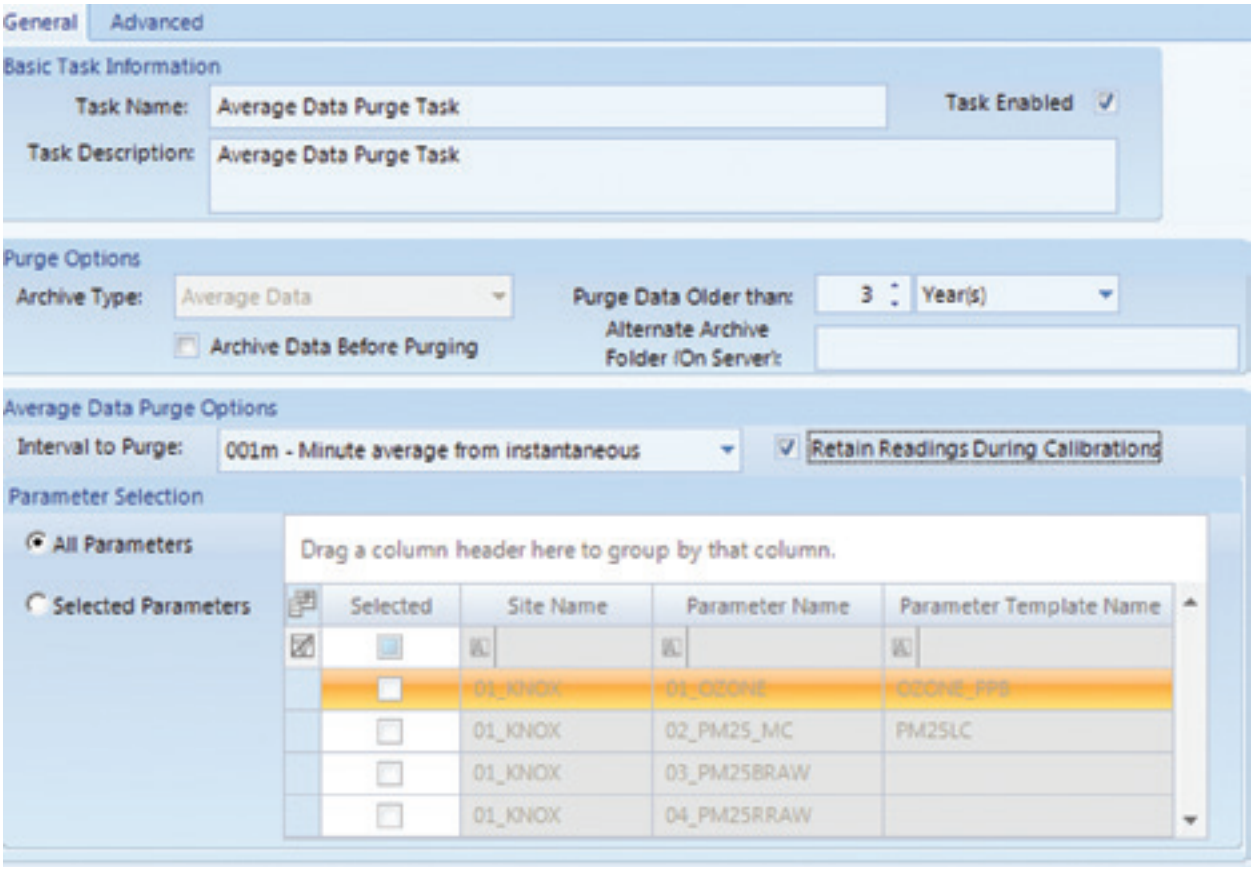
- **Average Data Purge Task** purges or archives old data from the database. Eventually, the AV-Trend database will become so big that it takes a long time to back it up, so it is helpful to remove and/or save old data, in particular minute data.

⇨ **Important:** When deleting data 24 hours or more has to be selected for the deletion to be successful.

You can choose any average interval to be scheduled for Purge or Archive. Purged data will be permanently deleted from the database. Archived data is copied to an external file before purging. Archived data is stored with all flags and annotations and can be re-imported later. AV-Trend uses specialized data keys so sites and channels can be renamed or renumbered and archived data can still be correctly imported. Select the age of the data to purge: **Purge Data Older Than** a specified number of seconds, minutes, hours, days, weeks, or years. We recommend purging 1-minute data older than 1 year to keep the database within allowable size.

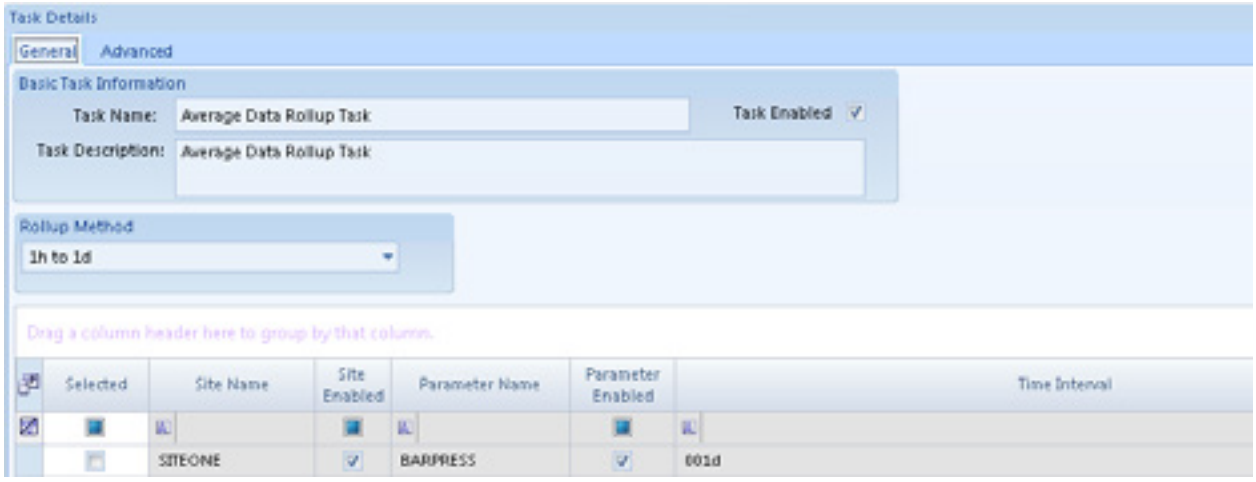
▶ **Note:** Average Data can be purged manually via the **Utilities menu>Purge Average Data**.

A checkbox option allows you to **retain data during calibrations**. If selected, any data flagged with the **C** flag will not be purged. This allows you to retain minute data from calibrations (e.g., for use in the Calibration Trend Graph's Response Plot) while still removing old minute data.



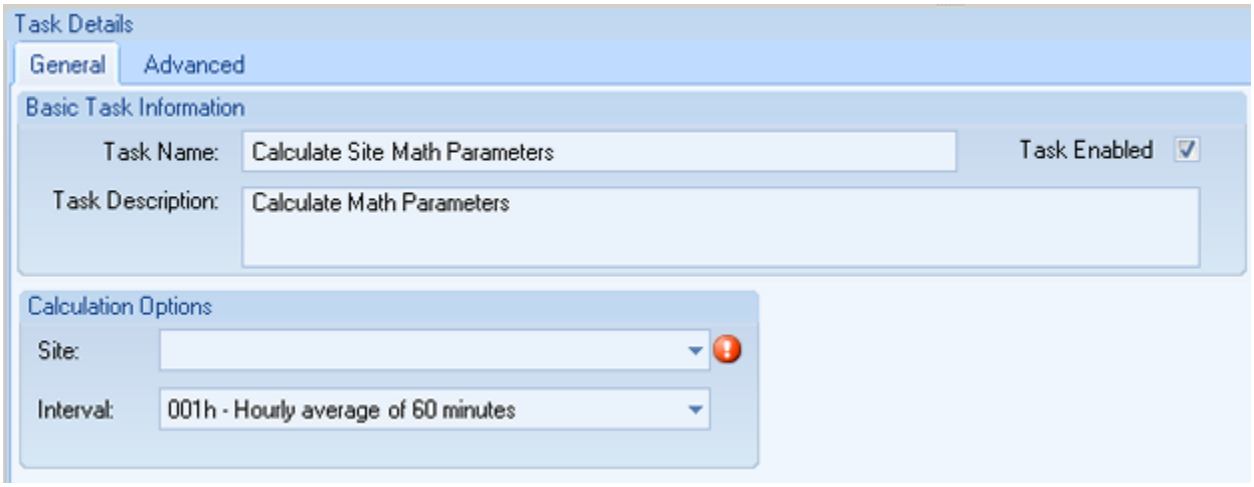
Purge or archive data in Configuration Editors > Task Scheduler

- **Average Data Rollup Task** allows shorter term averages to be rolled up into larger block or rolling averages. For more information, see "Data Rollup Processor" in Chapter 7 "Optional Features."



Automatic Rollup Task in Configuration Editors>Task Scheduler>Add Average Rollup Task

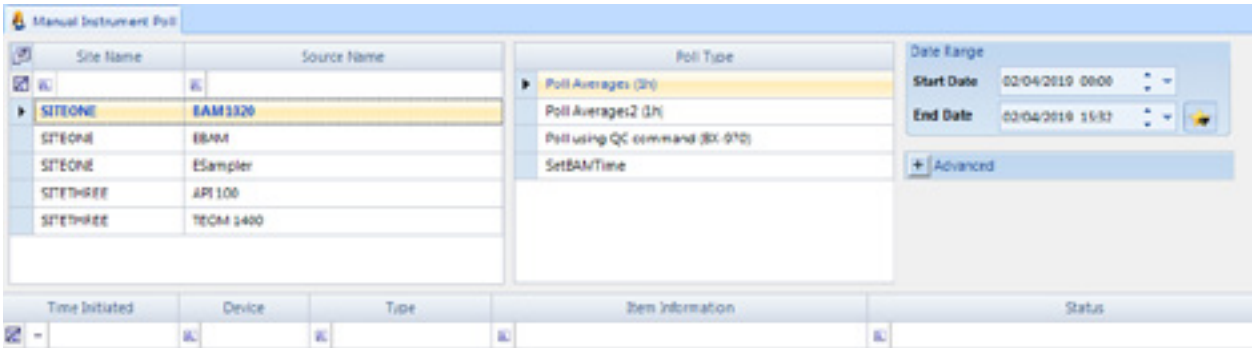
- **Math Task Scheduler**
  The task scheduler can execute equations automatically using the **Calculate Math Parameters Type** task. This task operates on a particular site and interval combination, and seeks out all equations for which there are fully matching parameter templates. If an equation in the table can't be executed on that site for lack of parameter templates or available data, the equation is skipped.



Math Task Scheduler Details

- **Instrument Poll Task** directly polls PM Samplers and Instruments such as BAMs without using data loggers.

▶ **Note:** Instruments can be polled manually by selecting **Manual Instrument Poll** from the **Utilities Menu**.



Manual Instrument Poll from Utilities Menu

- **Journal Message Purge Task** removes Event Log journal messages (internal error logs) that are older than a specified age in seconds, minutes, hours, days, weeks, or years. The purge occurs at a specified **Repeat Interval**. An option is available to **Archive Data Before Purging**.

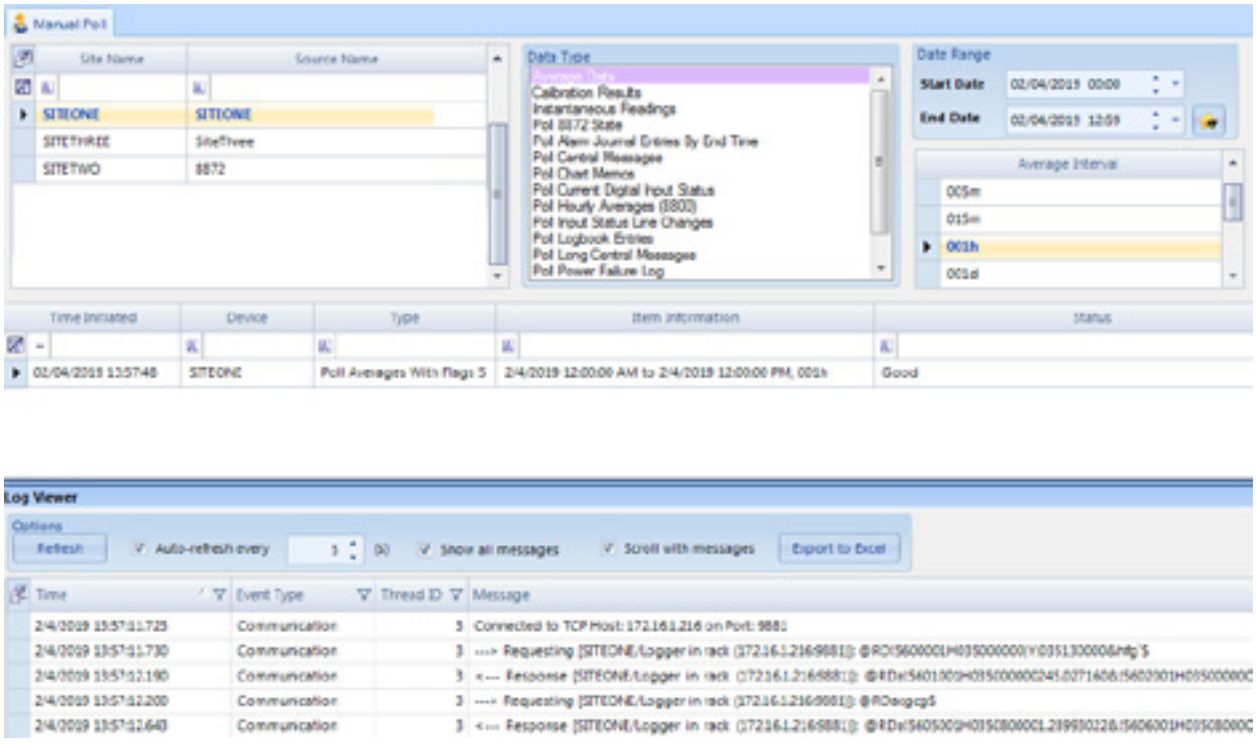
▶ **Note:** Journal messages can be purged manually via the **Utilities menu>Archive/Purge Data>Purge Journal Messages**.

▶ **Note:** The Advanced tab can be used to set particular variables of some poll commands, like a number of records for instruments that do not support polling start/end times.

- **Logger Poll Task** polls a data logger at a specified Repeat Interval in seconds, minutes, hours, or days. The Task must be named and a data logger must be selected. Select a Logger Command from the following drop-down list:

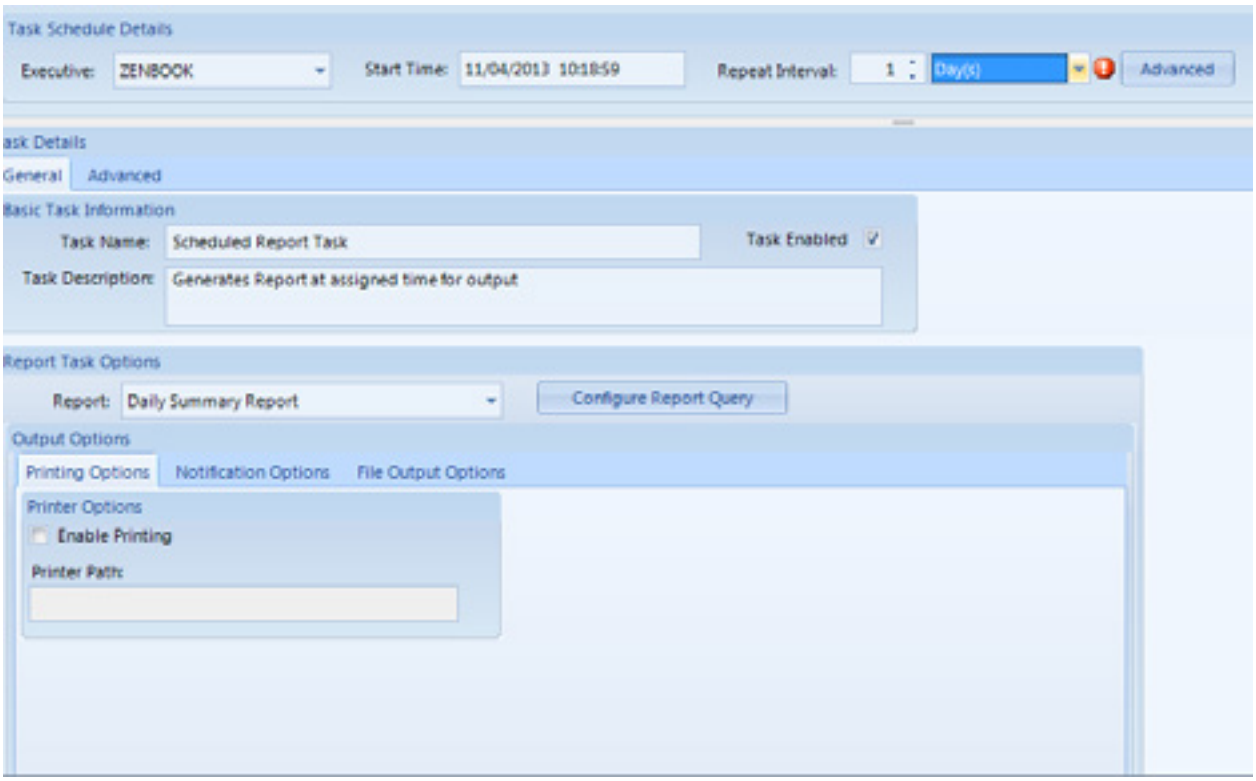
  56 Average Data
  46 Calibration Results
  IJ Instantaneous Readings
  NP Poll Alarm Journal Entries
  JJ Poll Central Messages
  KK Poll Chart Memos
  23 Poll Current Digital Input
  11 Poll Hourly Averages (8800)
  DD Poll Input Status Lind
  JL Poll Log Book Entries
  JK Poll Long Central Messages
  EF Power Failure Log
  BB Synchronize Logger Time
  LL Poll Current Time

▶ **Note:** The logger also can be polled manually via **Utilities >Manual Poll**. Results are displayed in the **Log Viewer** below the query screen.



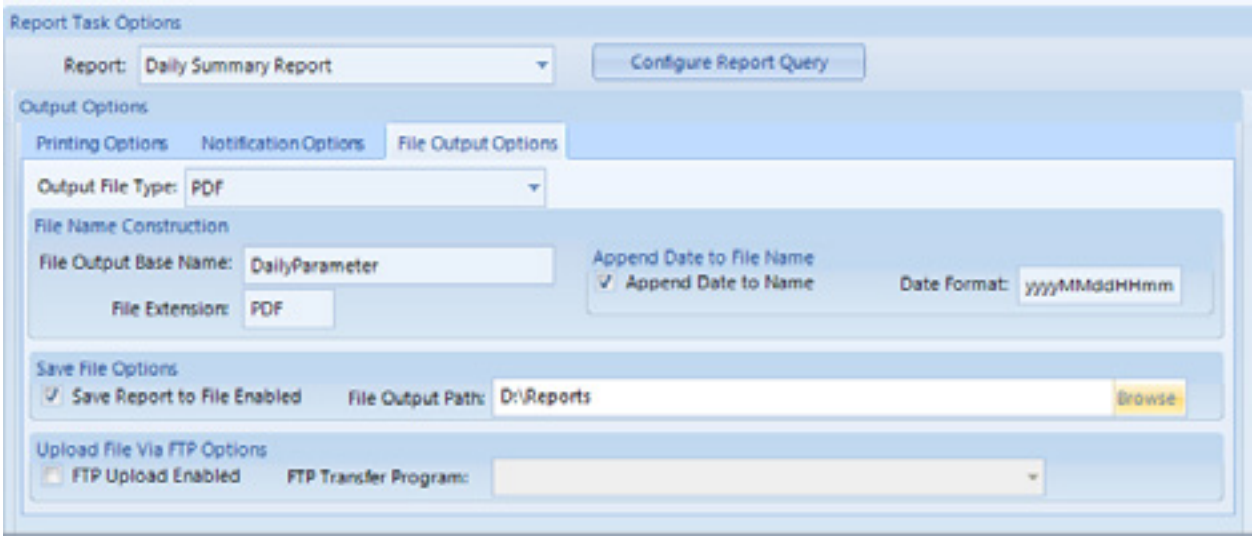
Manual Poll in Utilities Menu

- **Scheduled Command Line Task** can be used to automate any Windows command line function, such as NTBackup.
- **Scheduled Report Task** handles automatically printed or emailed reports. Any system can be scheduled for distribution to a designated printer and/or email recipients.
  1. Select a **Report** from the list of available reports
  2. Configure a Report Query (select average interval, sites, parameters, and time range). (This feature functions like the Favorites Editor.)
  3. If the report will be printed, select the Printing Options tab, check the **Enable Printing box**, and designate the **Printer Path**.
  4. If the report will be emailed, select the Notification Options tab, check the **Enable Email Notification box** and give the report a name that will appear in the Notification Subscriptions Editor. (Users and/or User Groups must be designated in **Configuration > Notification Subscriptions Editor**.)



Scheduling printing and email notification of scheduled report in Configuration Editors > Task Scheduler

You must select the output file type (CSV, HTML, PDF, etc), and the base file name:



File Output Options tab in Scheduled Reports

You can optionally have the scheduled task append the current date/time to the file name (e.g., DailyParm200906271900). Note that Windows does not allow "/" or ":" characters in file names. This option ensures that new files do not overwrite existing files in the directory. If this option is left off, the task will overwrite the file each time the tasks runs.

You can then select either of two options:

Write to File Enabled-- select/browse to a directory folder for the destination file

- **SQL Execution Task**

  To add a **SQL Execution Task,** click the green **Add** button and select **SQL Execution Task.**

  Select the Executive, Start Time, and Repeat Interval.

  Name the SQL task or use the default name.

  Enter the **SQL Command Text**.

  Click the **Save** button.

▶ **Note:** SQL commands can be executed manually via **Utilities>SQL Execution Tool**.

- **New Task Group**

  Task Groups allow multiple tasks to be grouped together in one polling process instead of multiple individual tasks. Tasks can be defined to run groups in parallel, sequentially, or as sub-tasks of other task groups to allow mixing of parallel and sequential operations. To add a new sub task to the Task Group click **Add Sub Task** button and select the task from the drop-down list. The Sub Task drop-down list has the same options as the Add task button at the top of the Task Scheduler. When you select a Sub Task, a screen will pop up asking for the following information:

  Task Name displays the name of the sub task that was selected. The Task Name can be modified.

  Task Description is automatically filled in.

  Task Enabled must be selected if the sub task is to run under the Group Task.

  Advanced Options (not required) allows the configuration of **Number of Retries** and the **Interval between Retries**.

  Other fields vary according to which sub task is selected.

  When you click **OK** in the pop-up screen the new sub task will be added in the **Sub Tasks** section.

  Select **Execute Tasks In Parallel** in the **Group Options** section if all sub tasks are to run at the same time.

  If the sub tasks are to be run sequentially, enter a number in the **Execution Order** column in the **Sub Tasks** section.

  Select the **Fail Group on Error** column if you want the whole Task Group to stop running if an error occurs.

  Task Type indicates the sub tasks that are part of one group task.

  Edit Task allows you to make changes in the same pop-up window that came up when the **Add Sub Task** button was clicked.

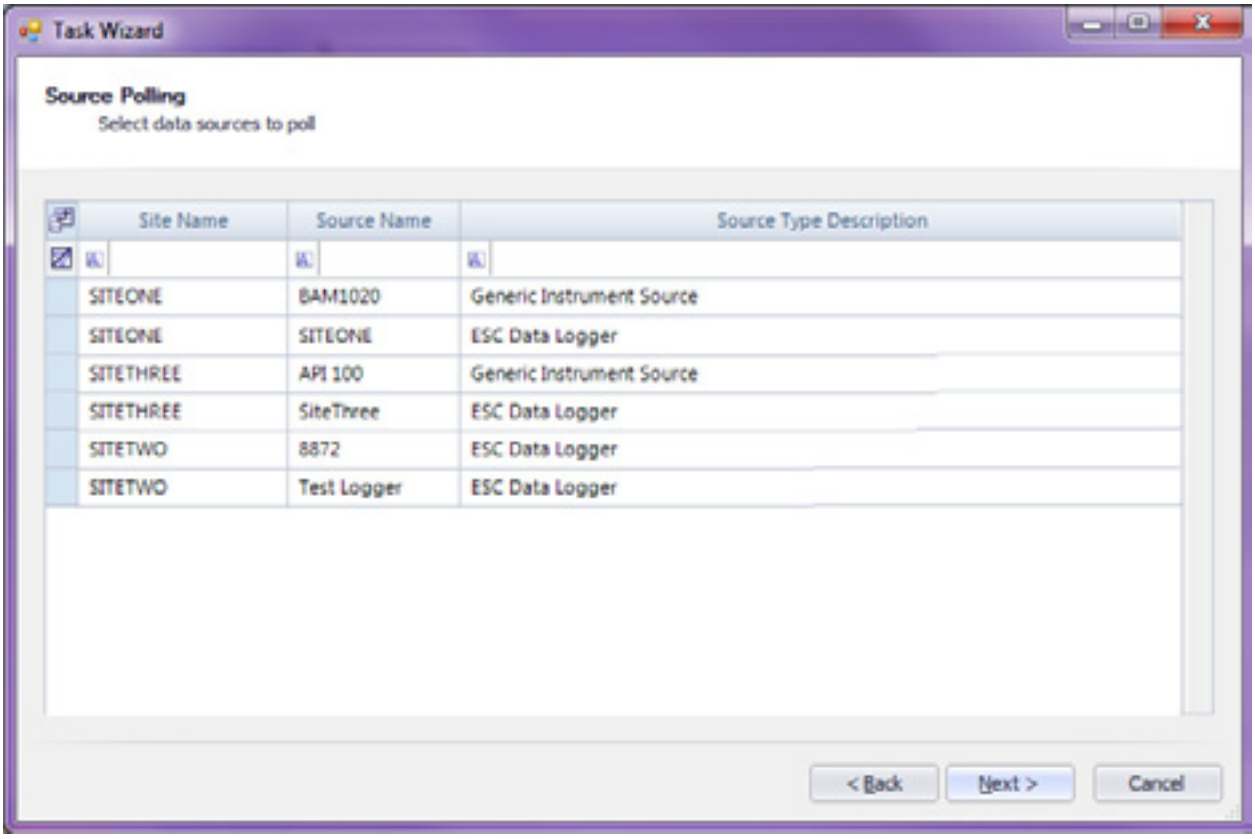
  To remove a task from the Task Group select the task in the **Sub Task** section and click the **Delete Selected Sub Task** button.

Schedule Task Wizard

The Task Wizard can be used to manage dozens of polling tasks running in a single system. To set up task groups:

Open the **Task Wizard** (**Configuration Editors** > **Task Scheduler** > **Run Schedule Wizard** button on the Ribbon at the top) and click **Next**

Select **Site** and **Source** (including **Source Type Description**) and click **Next**.

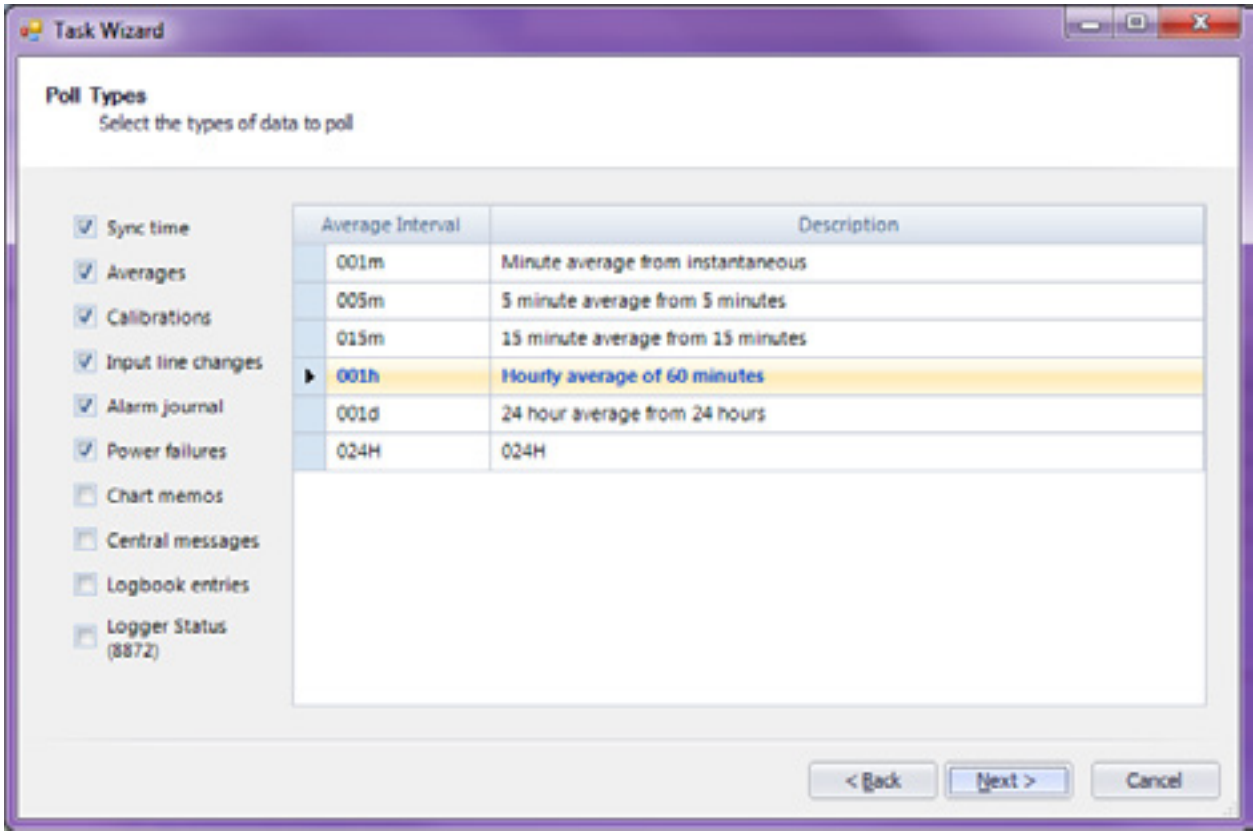


Selecting Site and Source Name in Task Scheduler Wizard (Configuration Editors > Task Scheduler > Run Schedule Wizard)

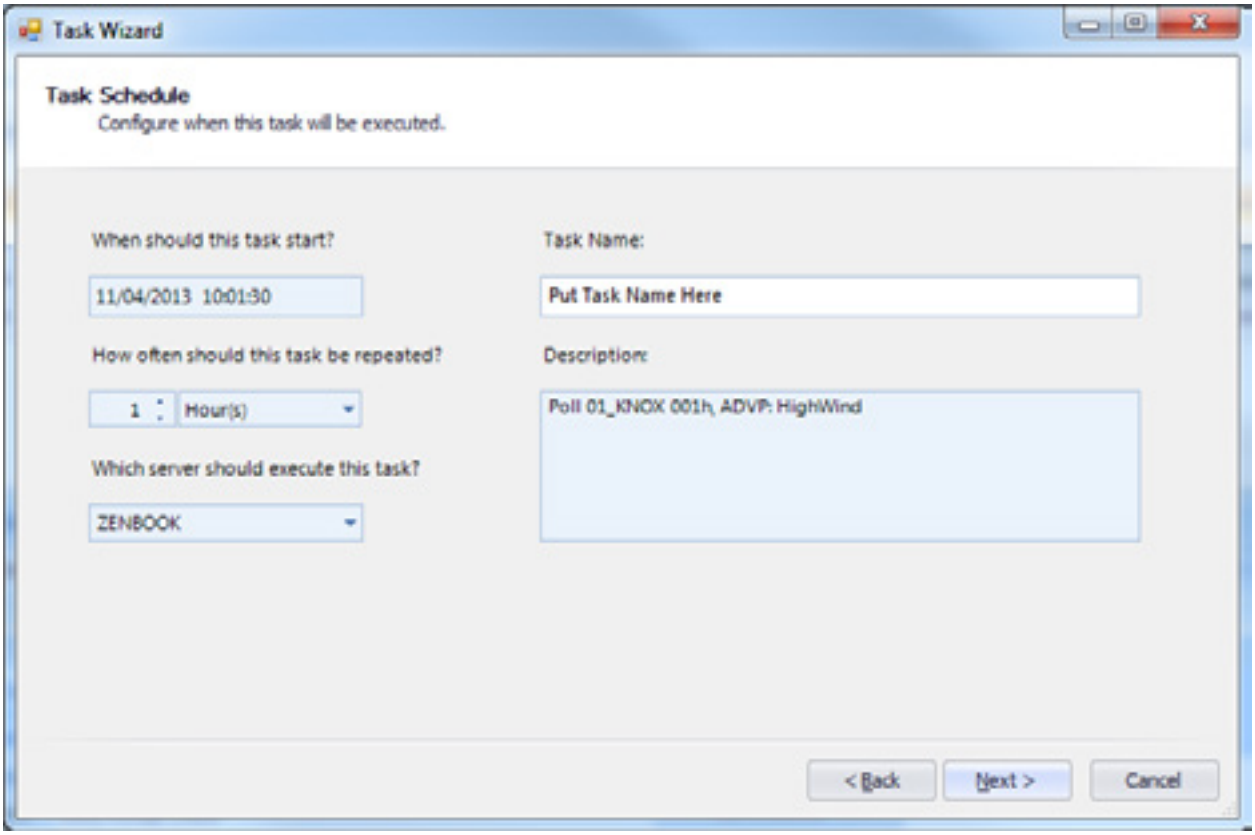
Select **Poll Types** (types of data to poll) from the following checklist

Sync time,
Averages,
Calibrations,
Input line changes,
Alarm journal,
Power failures,
Chart memos,
Central messages,
Logbook entries,
Logger Status (8872).

Click **Next**.



Poll Types in Task Scheduler Wizard (Configuration Editors > Task Scheduler > Run Schedule Wizard)



Task Schedule in Task Scheduler Wizard (Configuration Editors > Task Scheduler > Run Schedule Wizard)

Select the following configurations from drop-down lists:
when the task should start,
how often it should be repeated,
and which server should execute the task.

The next screen will ask you to **Confirm Task Creation**. Click **Next** to save new task to database.

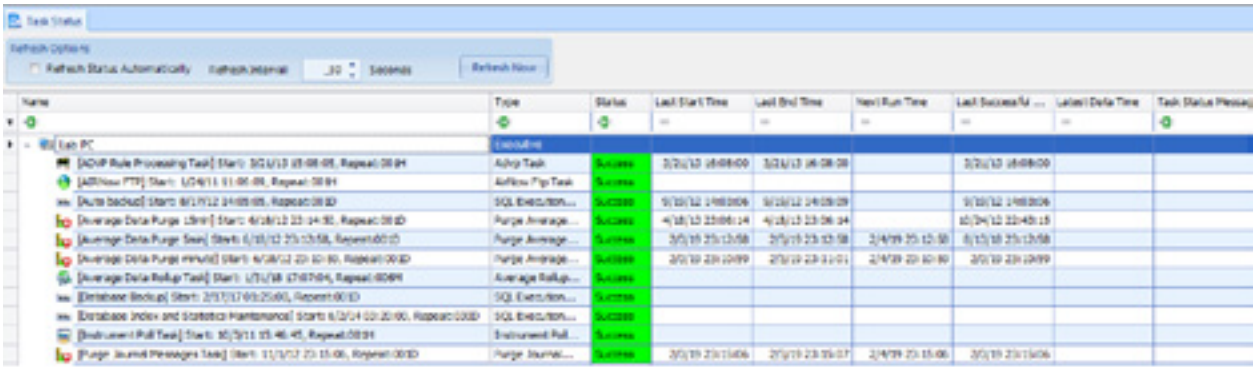
The last screen will say you have successfully completed the wizard. Click **Finish**.

▶ **Note:** The **Task Wizard** can also be accessed directly from the **Utilities** menu.

Task Display

Task Display (Status Displays > **Task Status**) is constantly updating the display of all tasks within the system, including the last time run, next execution time, and errors experienced during the last run.

By default, the display will not refresh, but **Refresh Status Automatically** can be selected at the top of the screen.



Task Display from Status Displays > Task Status

The user can select a particular row / task / subtask and perform certain actions with the ribbon controls:

Execute Scheduled Task Now - run the selected task, task group, or subtask immediately

Update Task Status - reset the last successful run time for the task

Edit Task - change the task settings

View Log Messages - show a filtered system log of events related only to that task

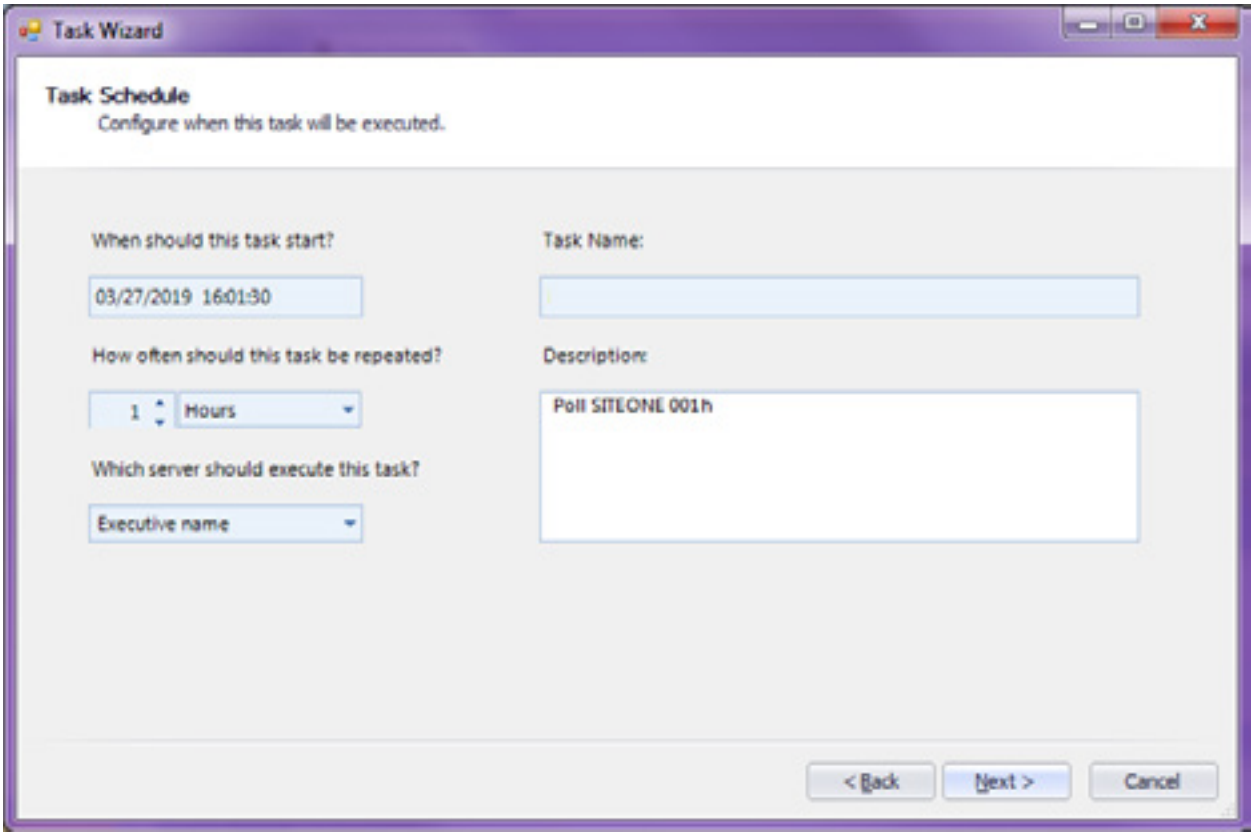
Print/Export - print / export the current task status screen.

Select the following configurations from drop-down lists:

when the task will start,
how often it will be repeated,
and which server will execute the task.

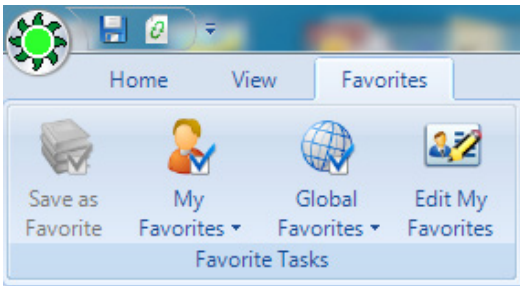
The next screen will ask you to **Confirm Task Creation**. Click **Next** to save new task to database.

The last screen will say you have successfully completed the wizard. Click **Finish**.



Favorites Editor

AV-Trend simplifies regular tasks with a list of user-defined **Favorites**, which function like Favorites in Internet browsers. Favorites can be created for most menu items, including reports, editors, configurations, journals, calibration functions, file import, security settings, logger functions, emails, and task scheduling. Favorites can be saved for different sites, parameters, average intervals, and date ranges. They can be saved for all users or for one user.



Favorites menu

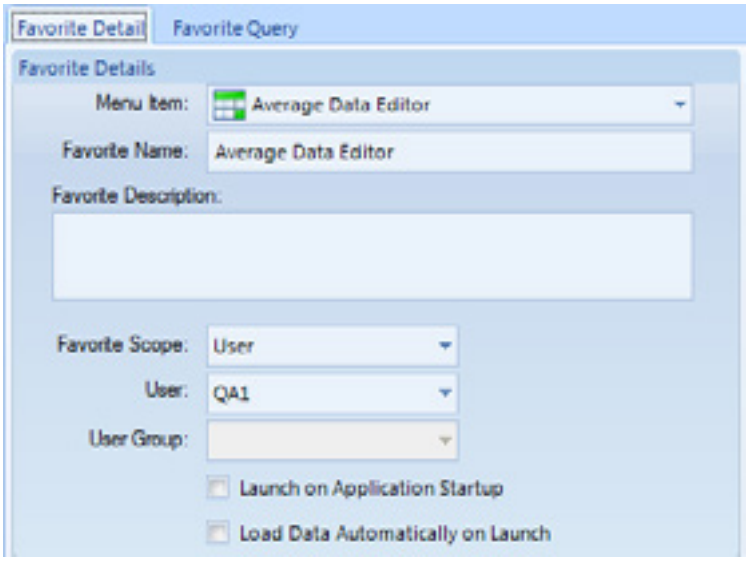
Creating a Favorite

To create a favorite, open **Configuration Editors > My Favorites Editor**. Click the red **Add Favorite button** on the left side of the ribbon.

Favorite Detail Tab

Under the **Favorite Detail** tab of the Favorites Editor: select a **Menu Item** from the drop-down list, enter a **Favorite Name**, enter a **Favorite Description** (optional), select a **Favorite Scope** from the drop-down list (**User** or **All Users**) and select from the following options:

- **Launch on Application Startup** to run the Favorite upon logging in to AV-Trend.
- **Load Data Automatically on Launch** to execute data retrieval when the Favorite is selected.



Add a Favorite screen

Favorite Query Tab

Next, open the **Favorite Query** tab if it is available.

▶ **Note:** The Favorite Query tab will only be in the Favorites Editor after a Menu Item is selected that requires a time range, interval, and parameter(s), such as the Average Data Report and the Average Data Editor.

Select a **Date Range**, choose an **Average Interval** and select a **Parameter**. To select more than one parameter, drag the arrow in the blue left column or hold down the **Ctrl** key while you select parameters.

To save a favorite when you're in any data editor or report, complete a query, and select **Favorites** from the top menu. The ribbon bar will change to show the favorites menu.

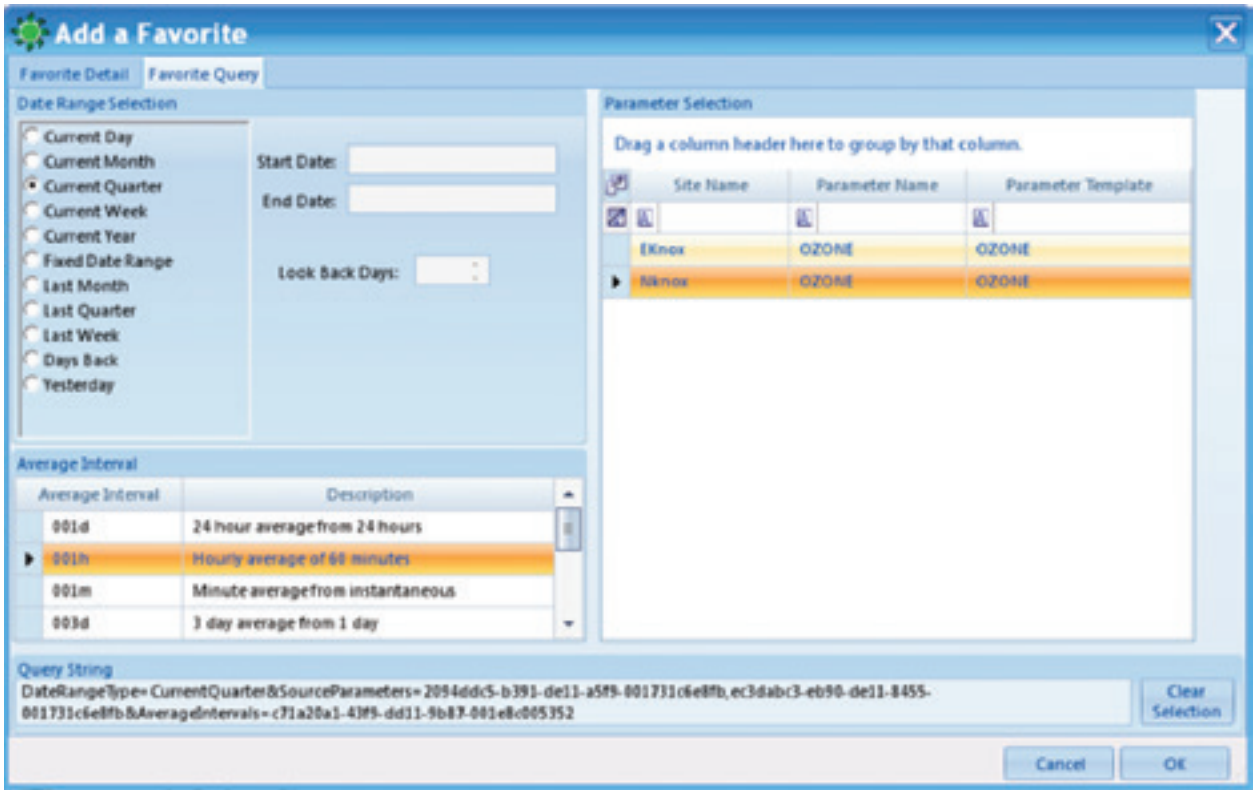
Select **Save as Favorite** to bring up the **Add a Favorite** screen.

You can also configure the **Favorite** by selecting the **Favorite Query** tab after you select **Save as Favorite**. From this screen you can adjust the site/parameter list, date range, or average interval. These values can also be adjusted later in the **Favorites Editor** in the **Configuration menu**.

To return to the ribbon controlling the current application, select the top menu function (above the ribbon), for example, Average Data Editor.

To use an existing Favorite, select **Favorites** from the top menu (above the ribbon bar), select **User Favorite** or **Global Favorites**, and the saved **Favorite**.

A copy button on the ribbon allows you to copy an existing favorite for slight modification, if needed.



Favorite Query tab from Add a Favorite

Configuring Security

User security in AV-Trend is set up by administrative personnel and is similar to Microsoft Windows:

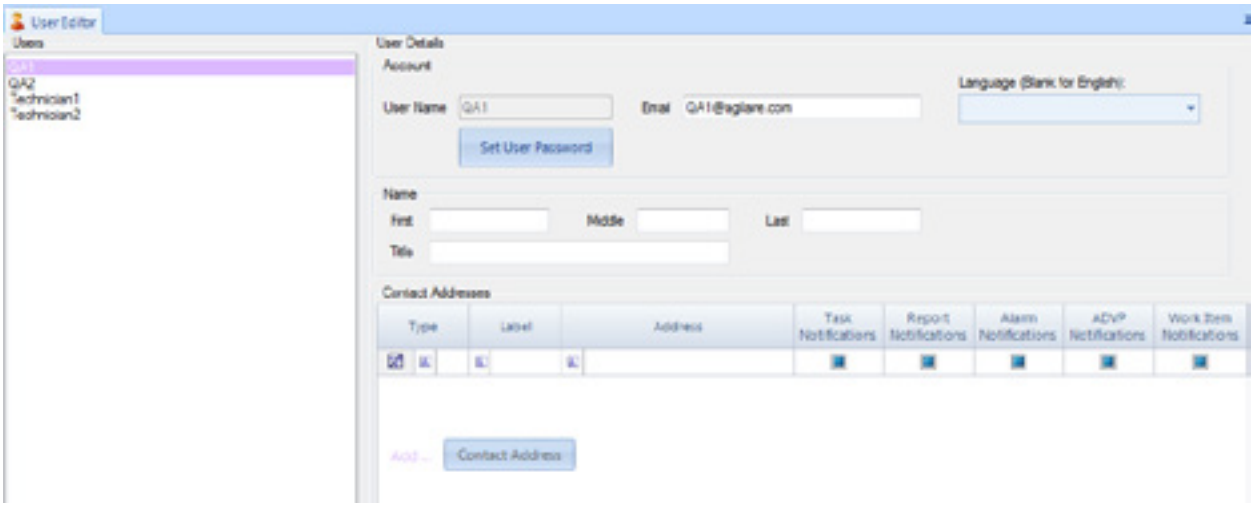
- Each system user has an identity, including a username and password
- A User may be a member of one or more User Groups
- Access and rights are assigned to User Groups

User Groups in AV-Trend are usually assigned by job responsibility (e.g., Data QA, Site Technicians, System Administrators). A group can optionally have its access limited to only certain monitoring sites. Users can be members of more than one **Group**, and each site can have a different access group.

User Editor

Administrators can add or delete users: open **Configuration Editors** > **Security** > **User Editor** and click **Add User** (or **Delete User**) button. Enter an **Email** address (optional). Click **Save**.

In the **Contact Addresses** section of the screen you can click **Add Contact Addresses** and enter multiple email addresses for the same user to receive different notifications at different email addresses. Check the notifications to be emailed to each email address: Task, Report, or Alarm. Each **Label** must have a different name or the database will not accept it.

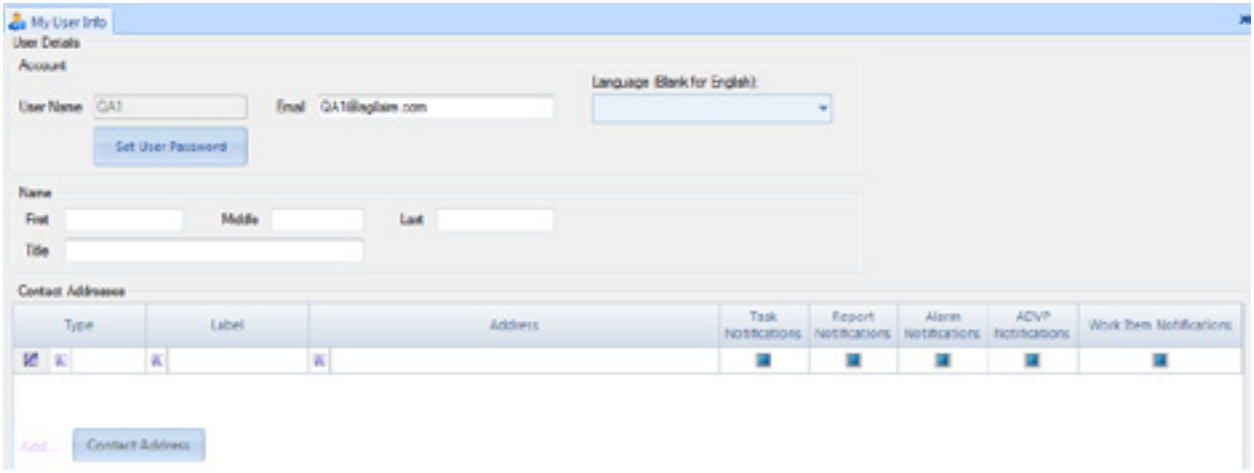


User Editor from Configuration Editors > Security > User Editor

My User Settings

Non-administrative personnel can change their own Password, Email, and Name, but not their User Name in the **My User Info** screen in **Configuration Editors** > **Security**. If a User Name needs to be changed (for example, if a name is misspelled), an Administrator would have to delete the original User Name and add a new one.

In the **Contact Addresses** section of the screen you can click **Add Contact Addresses** and enter multiple email addresses for the same user to receive different notifications at different email addresses. Check the notifications to be emailed to each email address: Task, Report, or Alarm. Each **Label** must have a different name or the database will not accept it. Click **Save**.

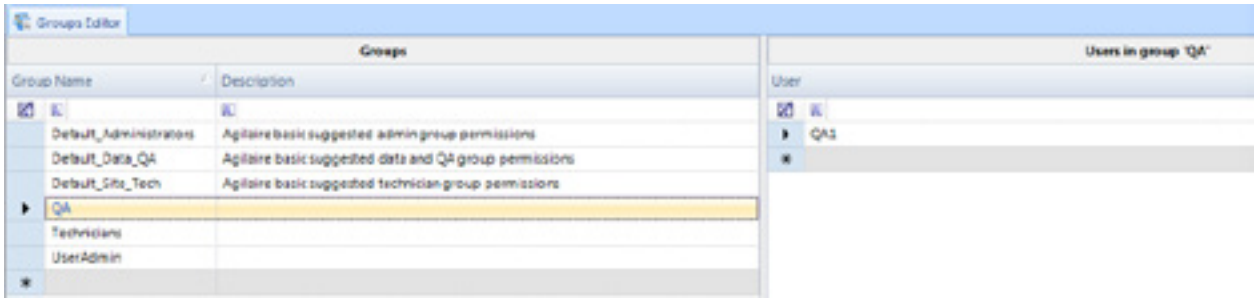


My User Info screen in Configuration Editors > Security > My User Info

Groups Editor

Next, create or modify groups with the **Groups Editor**. To add or delete groups, click the **Add Group** or **Delete Group** button. Select a group and add Users to that group as members of an existing or newly created group. To add a user, click on the asterisk (*) line in the right (gray) area to get a pick list of currently created users.

Click **Save**.



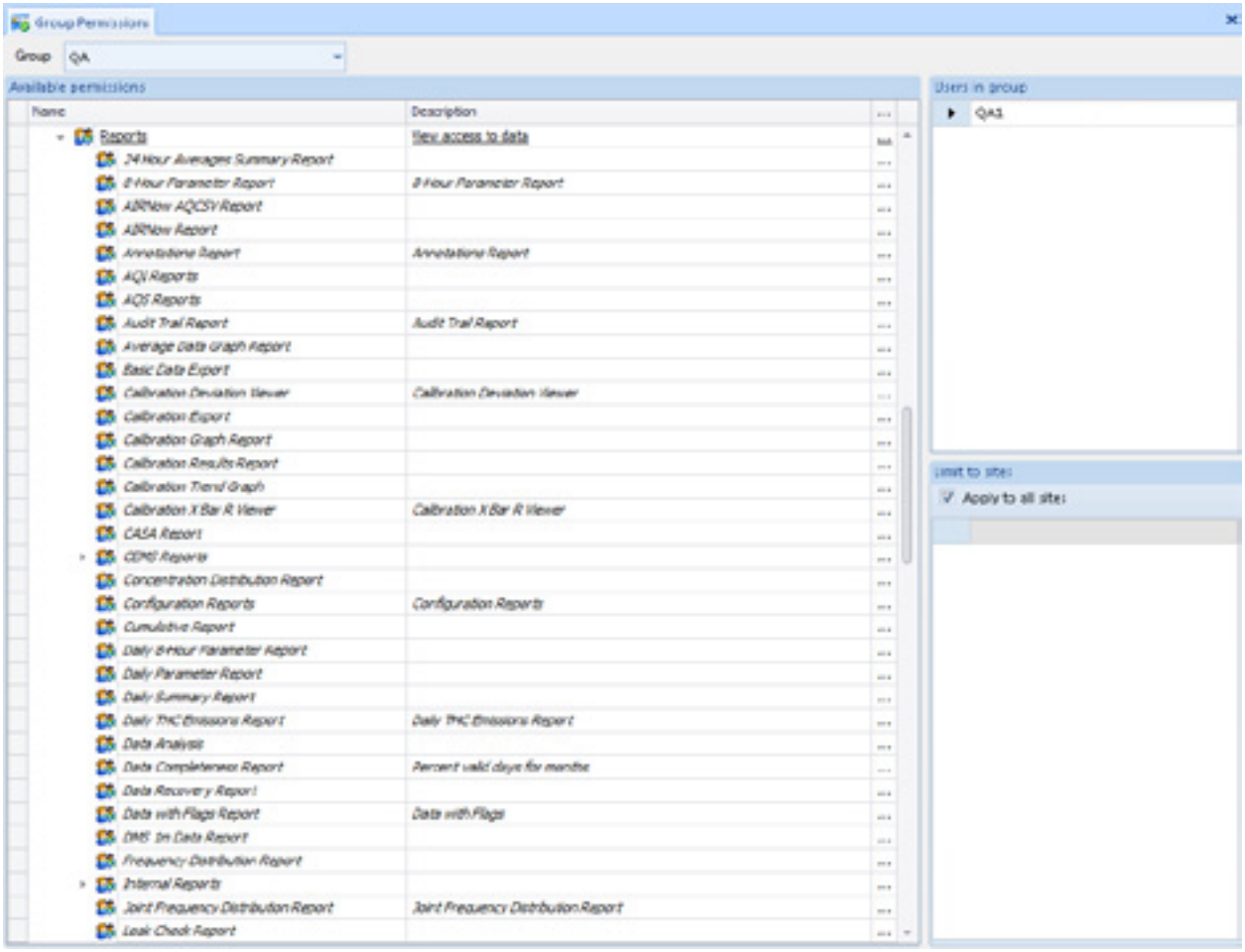
Groups Editor from Configuration Editors > Security > Groups Editor

Group Permissions

Finally, define the permissions for each **User Group** using the **Configuration Editors** > **Security** > **Group Permissions Editor**. Select a Group in the drop-down list. The list of configured users is displayed (and users can be added here as well). The right panel shows the various rights available in the system, and the status for the current group:

- Grayed = access disabled
- Black, underlined = access enabled
- Black, italic = access enabled by inheriting from another granted access.

In this example, access has been granted to certain Security permissions (Groups, Users, and User Groups, but not Edit Tasks). Access is granted to all configuration items at the topmost level, and all sub-tasks are permitted by inheritance. For example, to turn off Edit ADVP Rules, first remove the overall Edit Configurations permission and then add the individual permissions that we need. Expand and Collapse the tree using the buttons on the ribbon. To define a group as having site-specific access, uncheck the **Apply to All Sites** in the lower left panel, and then add sites using the list form below.



Group Permissions from Configuration Editors > Security > Group Permissions

GSI Driver Editor

The purpose of the GSI Driver Editor (**Editors>GSI Driver Editor**)is to provide a way to add, delete, or modify GSI driver entries in an editor similar to the Parameter Template editor for GSI entries and GSI instruments.

The GSI Driver Editor consists of an alphabetized pick-list of existing GSI entries for modification. Two editors may be required, one for instruments and one for entries, or two sections/tabs of the forms.

Fields in the GSI Driver Entry tab include:

- GSI Entry
  - Associated GSI Instrument and GSI Entry (pick-list of configured instruments)
  - Send Name (string)
  - Parse Name (string, up to 8 char)
  - AutoSend String (string up to 8 char)
  - Autosend Repeat Interval (1..60 seconds)
  - Parse Sync String
  - Modbus Register
  - Fixed or Delimited Parsing
    - Fixed:
      - Number of Chars to Data (int, up to 3 digits)
      - Data Field Width (int, up to 2 digits)
      - Number of Chars in string (int, up to 3 digits)
    - Delimited:
      - Number of Delimiter Chars (string)
      - Number of Delimiters of Delimiters to Data (int, up to 3 digits)
      - Number of Delimiters In String (int, up to 3 digits)
      - Data Field Type (pick-list- Hex, Binary, Float)
- In the GSI Driver Instrument tab:
  - GSI Instrument Name
  - Default TCP Port (integer, up to 6 digits)
  - Default Modbus Code (integer, 0-255)
  - Default Modbus Command Type.(3 or 4)

Contact info@agilaire.com for more information about GSI drivers and the definitions of these fields.

Chapter 3

Reports

After data has been polled, either by a scheduled task (**Configuration Editor>Task Scheduler**) or manually (**Utilities>Manual Poll**) AV-Trend can run the following reports after the Criteria Pane has been configured:

Basic Reports

- Daily Summary Report
- Daily Parameter Report
- Monthly Report

Calibration Reports

- Calibration Results
- Calibration Trend Graph
- Calibration X-Bar-R Chart

Configuration Reports

- Calibration Configuration Report
- Channel Configuration Report
- Parameter Configuration Report
- Scheduled Tasks Report
- Site Configuration Report

Internal Reports

- DB Modification History
- Exception Journal
- Journal Message Log
- Software Version Report
- Table Size Information

Logger Reports

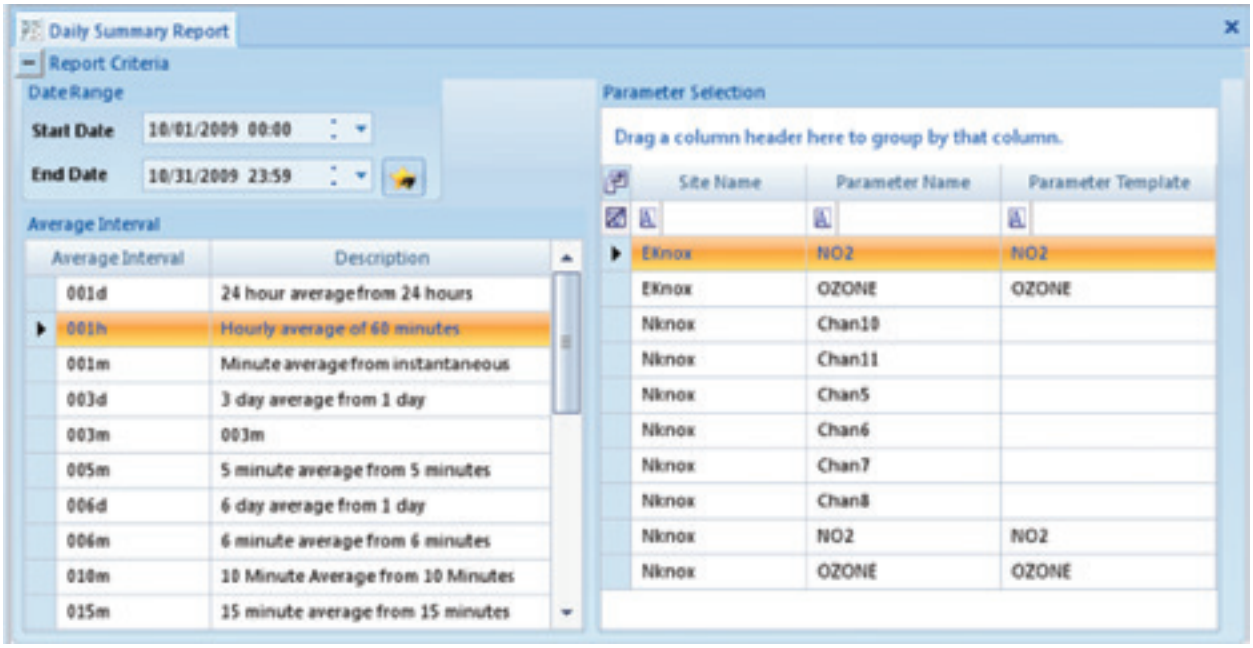
- Alarm Journal
- Input Line Status Report
- Power Failure Report

Other Reports

- Annotations Report
- LogBook Report

Criteria Pane

All reports use a Criteria Pane to select a time range and list of pollutants for the report.



Report Criteria pane in Reports > Daily Summary Report

You can select the Date Range any of the following ways:

- Manually type in a month, day, year, and time.
- Click in a date field (the month, date, year, hour, minute) and click the small up or down arrow keys to raise or lower that field (month, day, year, hour, minute). (It isn't necessary to highlight the field, just put the cursor in it.)
- Use the down arrow at the right end of the field to bring up a **Calendar.** You can click the arrows to change the month, or click the name of the month or year to bring up a list.
- Use the **Star** button to select from a pre-defined date range:

  Current Day
  Yesterday
  Current Week
  Last Week
  Current Month
  Last Month
  Current Quarter
  Last Quarter
  Current Year
  Number of days back from current day

In addition, the time criteria (e.g., the star icon button) allows you to choose "shift forward one day" or "shift backward one day." If you select one of these and hit apply, it acts similar to the "Data Forward" or "Data Backward" buttons, except always shifting by 24 hours, rather than the size of the data window. This is useful for reviewing calibration minute data for several days, where the calibration falls on the same time each day.

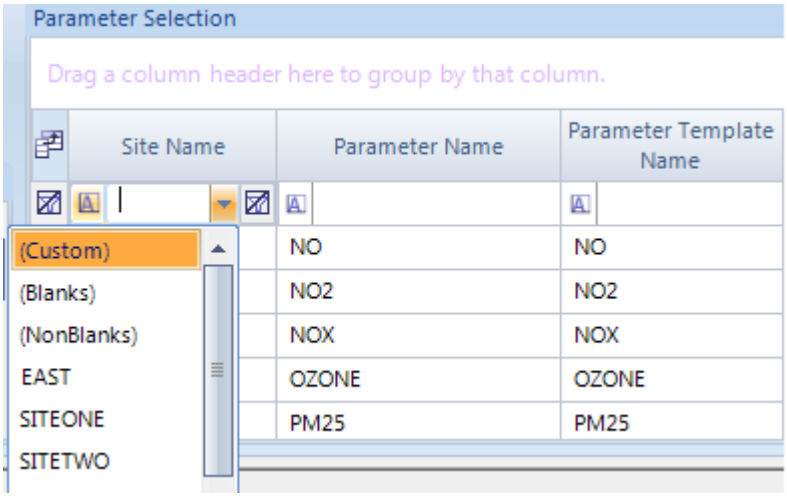
Scroll to select an **Average Interval** (most reports only support one average interval at a time).

Click to select a site and parameter; use standard Windows Shift-Click and Control-Click conventions to select multiple parameters.

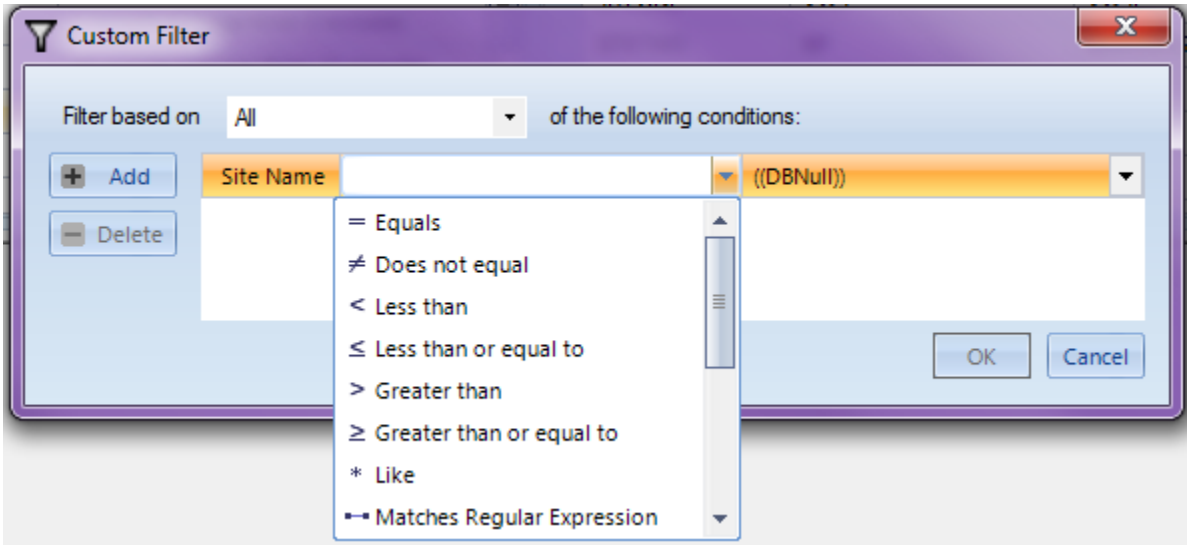
Filters

Filter fields are available in the top row of each column. Click in the row to use the filter to list a single site, parameter, or parameter template.

Click the down-arrow to the right of each filter field to select a particular entry in the column. Choices in the drop-down list will be Custom, Blanks, Non-blanks, plus each entry in the column (site name, parameter names, or parameter templates).



To write your own criteria, select **Custom** and configure the screen that pops up.

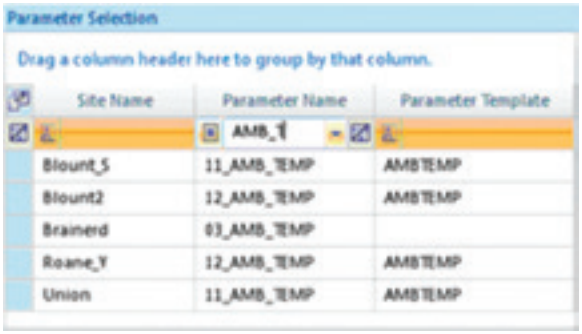


Custom filter criteria screen

Click the box with the letter **A** in the left side of each filter field to change the filter field from the default of **Starts With** to one of the following:

Equals
Does not equal
Less than
Less than or equal to
Greater than or equal to
Like
Matches Regular Expression
Starts with
Contains
Ends with
Does not start with
Does not contain
Does not end with
Does not match
Not like

For example, if you imported E-DAS data and used the option to put the channel number in front of the channel name, you might end up with some ozone channels that were "01_OZONE" while others were "03_OZONE" and "04_OZONE". Using the boxed "A" filter, you could search for all parameters names that contain ""Ozone" and more easily select them from a large list of parameters.

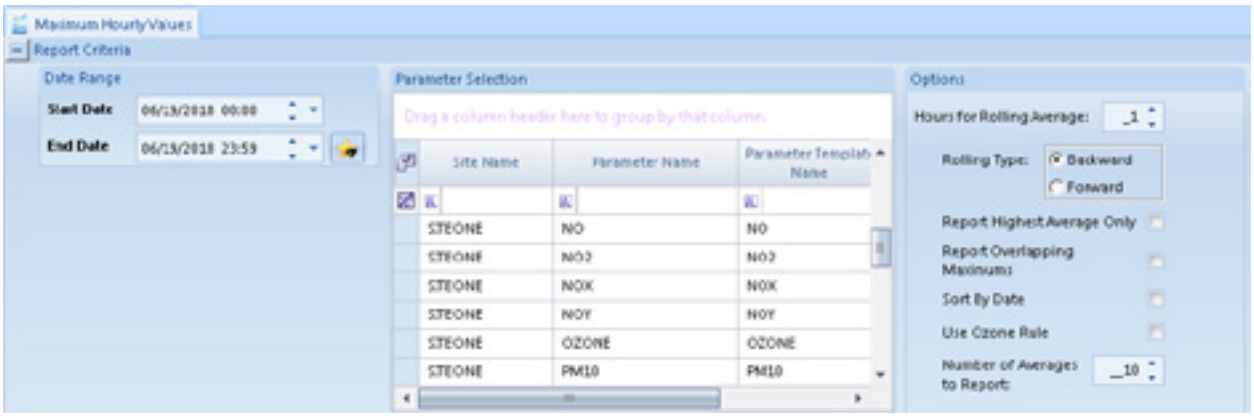


Using a filter to determine which parameters don't have a template

Additional Fields for Specific Reports

For some reports, the Criteria Panel is expanded with additional fields. For the Maximum Hourly Values report, additional information is needed on how the data in the report should be filtered and calculated:

- Rolling hours, and time-tagging type
- Report highest average only for any day
- Allow report of overlapping maximums (for multiple hour rolling averages)
  - Sort by the date
  - Use Ozone rule
- Number of maximum averages to report



Additional Report Criteria required for Maximum Hourly Values report

Other reports with additional criteria include:

- Monthly Reports allows you to designate an N-hour rolling average as an option.

Basic Reports

Daily Summary Report

The **Daily Summary Report** is usually for the daily summary of hourly data for all parameters at a site or sites, but it can also be used to report any time range or average interval. Statistics (average, maximum, minimum, and count) are at the bottom of each column. If **Totalize in Reports** is selected in the Parameter configuration, a **Total** will be displayed in the **Daily Summary Report**.

To generate a **Daily Summary Report** (**Reports > Daily Summary Report**), select **Start** and **End Dates**, an **Average Interval**, **Site Name o**r Names, and **Parameter Name** or Names. Click the **Generate Report icon** on the Ribbon.

Current Time: 1:38 PM

Daily Summary Report

Site: logger01 3/1/2012 Interval: 001h

	CO	NO	OZONE	SO2
Hour	PPM	PPM	PPM	PPM
00:00	1.19	4.528	150.000	8.595
01:00	1.19	4.535	150.000	8.597
02:00	1.19	4.543	150.000	8.598
03:00	1.19	4.553	150.000	8.599
04:00	1.19	4.561	150.000	8.601
05:00	<	4.570	150.000	8.602
06:00	1.20	4.584	150.000	8.606
07:00	1.20	4.604	150.000	8.612
08:00	1.20	4.622	150.000	8.619
09:00	1.20	4.614	150.000	8.616
10:00	1.20	4.594	150.000	8.609
11:00	1.20	4.601	150.000	8.612
12:00	1.19	4.569	150.000	8.602
Avg	1.19	4.575	150	8.605
Max	1.20	4.622	150.000	8.619
Min	1.19	4.528	150.000	8.595
Count	12	13	13	13
Total	14.34	59.478	1950	111.868

Daily Summary Report with Total

Report options are available to:

- Add Flag description page to end of report.
- Add Cal report to end of report.
- Show null codes instead of flags if invalid.
- Show qualifier codes, if present.
- Show report in landscape mode.

The Basic Data Export Report is like the Daily Summary Report, but without page breaks or summary statistics, which makes it better for Excel or database imports.

	SITEONE	SITEONE	SITEONE
	NO	NO2	NOX
Date			
25-Feb-2019 00:00	6.175	1.285	0.599
25-Feb-2019 01:00	6.346	1.276	0.598
25-Feb-2019 02:00	6.366	1.275	0.597
25-Feb-2019 03:00	6.36	1.276	0.596
25-Feb-2019 04:00	6.356	1.274	0.596
25-Feb-2019 05:00	6.395	1.267	0.588
25-Feb-2019 06:00	6.489	1.263	0.585
25-Feb-2019 07:00	6.408	1.265	0.583
25-Feb-2019 08:00	6.408	1.255	0.576
25-Feb-2019 09:00	6.3	1.254	0.563
25-Feb-2019 10:00	6.385	1.245	0.568
25-Feb-2019 11:00	6.198	1.259	0.577
25-Feb-2019 12:00	6.291	1.246	0.572
25-Feb-2019 13:00	6.251	1.241	0.567
25-Feb-2019 14:00	6.258	1.238	0.565
25-Feb-2019 15:00	6.286	1.234	0.562
25-Feb-2019 16:00	6.007	1.245	0.569
25-Feb-2019 17:00	6.273	1.222	0.573
25-Feb-2019 18:00	6.236	1.237	0.552
25-Feb-2019 19:00	6.233	1.233	0.568
25-Feb-2019 20:00	6.262	1.24	0.57
25-Feb-2019 21:00	6.304	1.247	0.573
25-Feb-2019 22:00	6.356	1.254	0.574
25-Feb-2019 23:00	6.427	1.253	0.571

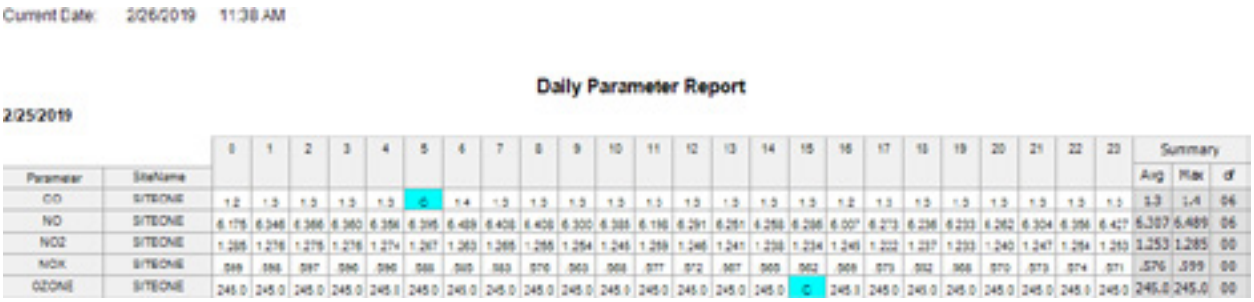
Basic Reports

Daily Parameter Report

The **Daily Parameter Report** shows a single day summary of hourly date for the entire monitoring network, grouping parameters together by the Parameter Template, but showing all sites sharing that parameter template.

Parameters that do not have a parameter template designated are not reported.

To generate a **Daily Parameter Report** (**Reports > Daily Parameter Report**), select **Start** and **End Dates**, an **Average Interval**, **Site Name o**r Names, and **Parameter Name** or Names. Click the **Generate Report icon** on the Ribbon.



Current Date: 2/26/2019 11:38 AM

Daily Parameter Report

2/25/2019

		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Summary		
Parameter	SiteName																									Avg	Max	cf
CO	SITEONE	1.2	1.3	1.3	1.3	1.3	C	1.4	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.4	06
NO	SITEONE	6.175	6.346	6.366	6.360	6.356	6.395	6.489	6.408	6.408	6.300	6.385	6.190	6.291	6.251	6.258	6.286	6.007	6.273	6.236	6.233	6.262	6.304	6.356	6.427	6.307	6.489	06
NO2	SITEONE	1.285	1.278	1.276	1.278	1.274	1.267	1.263	1.265	1.255	1.264	1.245	1.259	1.246	1.241	1.238	1.234	1.245	1.222	1.237	1.233	1.240	1.247	1.264	1.269	1.253	1.285	00
NOX	SITEONE	999	999	997	996	996	998	995	993	979	993	998	977	972	967	965	962	969	973	992	966	979	973	974	971	.976	.999	00
OZONE	SITEONE	245.0	245.0	245.0	245.0	245.0	245.0	245.0	245.0	245.0	245.0	245.0	245.0	245.0	245.0	245.0	C	245.0	245.0	245.0	245.0	245.0	245.0	245.0	245.0	245.0	245.0	00

Daily Parameter Report

A report option is available to show null codes for invalid hours.

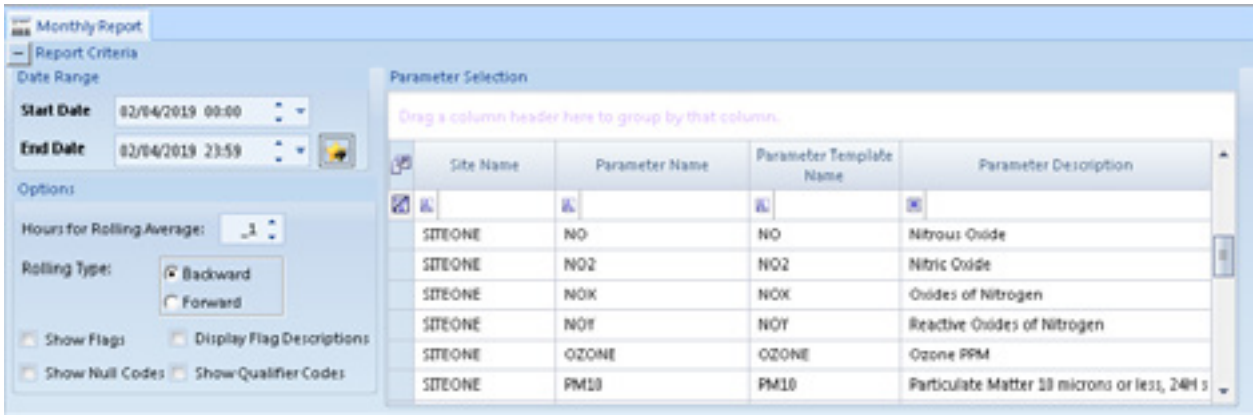
Basic Reports

Monthly Report

Monthly reports provide a matrix view of a single parameter, showing values for the entire month. Invalid or flagged data is shown with a color background or font change defining the data condition. Statistics are provided for each row (day) and column (hour).

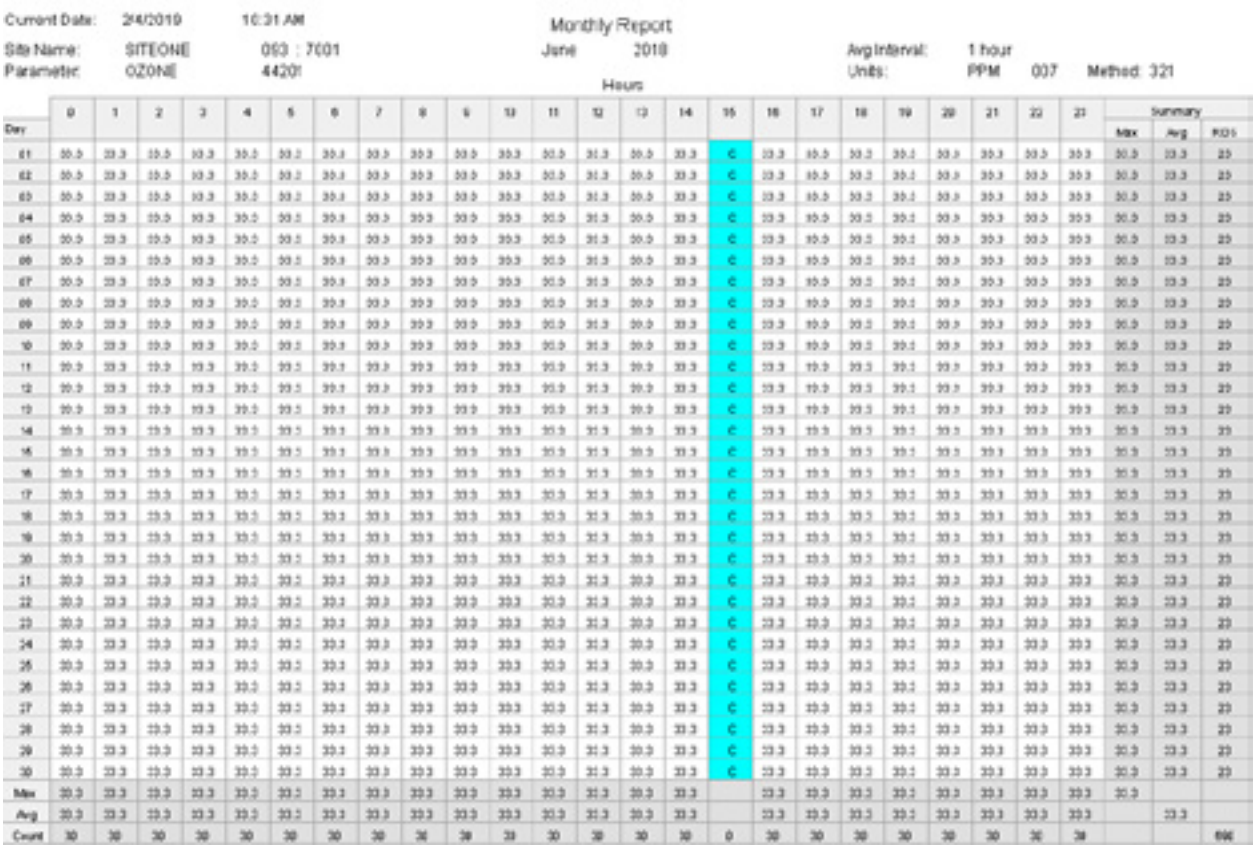
To run a **Monthly Report:**

1. Select **Reports > Monthly Report.**
2. Select a **Start** and **End** date
3. Select number of **Hours for Rolling Average**
4. Select a **Rolling Type** (**Backward or Forward**)
5. Select the **Parameters** that will be displayed in the report
6. If you want the **Flags Legend** to be shown in the report, click to select **Flags**. (You may have to scroll down to see the Flags option. If you want the **Null Codes** to be shown in the report, click to select **Show Null Codes**. If you want the **Qualifier Codes** to be shown in the report, click to select **Show Qualifier Codes**.



7. Click the **Generate Report** button on the Ribbon.

▶ **Note:** If **Totalize in Reports** was selected in **Configuration Editors > Parameter Settings**, Monthly Reports will show a total of data rather than an average.
If **Minimum in Reports** was this option was selected in **Configuration Editors > Parameter Settings**, Monthly Reports will show a minimum of data rather than an average or a total. Totalize in Reports and Minimum in Reports are most commonly used for rainfall.



Current Date: 2/4/2019 10:31 AM

Monthly Report

Site Name: SITEONE 063 : 7001 June 2018 Avg Interval: 1 hour

Parameter: OZONE 44201 Units: PPM 007 Method: 321

Hours

Day	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Summary		
																									Max	Avg	RDS
01	33.3	33.3	33.3	33.3	33.3	33.2	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	C	33.3	33.3	33.3	33.1	33.3	33.3	33.3	33.3	33.3	33.3	23
02	33.3	33.3	33.3	33.3	33.3	33.2	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	C	33.3	33.3	33.3	33.1	33.3	33.3	33.3	33.3	33.3	33.3	23
03	33.3	33.3	33.3	33.3	33.3	33.2	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	C	33.3	33.3	33.3	33.1	33.3	33.3	33.3	33.3	33.3	33.3	23
04	33.3	33.3	33.3	33.3	33.3	33.2	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	C	33.3	33.3	33.3	33.1	33.3	33.3	33.3	33.3	33.3	33.3	23
05	33.3	33.3	33.3	33.3	33.3	33.2	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	C	33.3	33.3	33.3	33.1	33.3	33.3	33.3	33.3	33.3	33.3	23
06	33.3	33.3	33.3	33.3	33.3	33.2	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	C	33.3	33.3	33.3	33.1	33.3	33.3	33.3	33.3	33.3	33.3	23
07	33.3	33.3	33.3	33.3	33.3	33.2	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	C	33.3	33.3	33.3	33.1	33.3	33.3	33.3	33.3	33.3	33.3	23
08	33.3	33.3	33.3	33.3	33.3	33.2	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	C	33.3	33.3	33.3	33.1	33.3	33.3	33.3	33.3	33.3	33.3	23
09	33.3	33.3	33.3	33.3	33.3	33.2	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	C	33.3	33.3	33.3	33.1	33.3	33.3	33.3	33.3	33.3	33.3	23
10	33.3	33.3	33.3	33.3	33.3	33.2	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	C	33.3	33.3	33.3	33.1	33.3	33.3	33.3	33.3	33.3	33.3	23
11	33.3	33.3	33.3	33.3	33.3	33.2	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	C	33.3	33.3	33.3	33.1	33.3	33.3	33.3	33.3	33.3	33.3	23
12	33.3	33.3	33.3	33.3	33.3	33.2	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	C	33.3	33.3	33.3	33.1	33.3	33.3	33.3	33.3	33.3	33.3	23
13	33.3	33.3	33.3	33.3	33.3	33.2	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	C	33.3	33.3	33.3	33.1	33.3	33.3	33.3	33.3	33.3	33.3	23
14	33.3	33.3	33.3	33.3	33.3	33.2	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	C	33.3	33.3	33.3	33.1	33.3	33.3	33.3	33.3	33.3	33.3	23
15	33.3	33.3	33.3	33.3	33.3	33.2	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	C	33.3	33.3	33.3	33.1	33.3	33.3	33.3	33.3	33.3	33.3	23
16	33.3	33.3	33.3	33.3	33.3	33.2	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	C	33.3	33.3	33.3	33.1	33.3	33.3	33.3	33.3	33.3	33.3	23
17	33.3	33.3	33.3	33.3	33.3	33.2	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	C	33.3	33.3	33.3	33.1	33.3	33.3	33.3	33.3	33.3	33.3	23
18	33.3	33.3	33.3	33.3	33.3	33.2	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	C	33.3	33.3	33.3	33.1	33.3	33.3	33.3	33.3	33.3	33.3	23
19	33.3	33.3	33.3	33.3	33.3	33.2	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	C	33.3	33.3	33.3	33.1	33.3	33.3	33.3	33.3	33.3	33.3	23
20	33.3	33.3	33.3	33.3	33.3	33.2	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	C	33.3	33.3	33.3	33.1	33.3	33.3	33.3	33.3	33.3	33.3	23
21	33.3	33.3	33.3	33.3	33.3	33.2	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	C	33.3	33.3	33.3	33.1	33.3	33.3	33.3	33.3	33.3	33.3	23
22	33.3	33.3	33.3	33.3	33.3	33.2	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	C	33.3	33.3	33.3	33.1	33.3	33.3	33.3	33.3	33.3	33.3	23
23	33.3	33.3	33.3	33.3	33.3	33.2	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	C	33.3	33.3	33.3	33.1	33.3	33.3	33.3	33.3	33.3	33.3	23
24	33.3	33.3	33.3	33.3	33.3	33.2	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	C	33.3	33.3	33.3	33.1	33.3	33.3	33.3	33.3	33.3	33.3	23
25	33.3	33.3	33.3	33.3	33.3	33.2	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	C	33.3	33.3	33.3	33.1	33.3	33.3	33.3	33.3	33.3	33.3	23
26	33.3	33.3	33.3	33.3	33.3	33.2	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	C	33.3	33.3	33.3	33.1	33.3	33.3	33.3	33.3	33.3	33.3	23
27	33.3	33.3	33.3	33.3	33.3	33.2	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	C	33.3	33.3	33.3	33.1	33.3	33.3	33.3	33.3	33.3	33.3	23
28	33.3	33.3	33.3	33.3	33.3	33.2	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	C	33.3	33.3	33.3	33.1	33.3	33.3	33.3	33.3	33.3	33.3	23
29	33.3	33.3	33.3	33.3	33.3	33.2	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	C	33.3	33.3	33.3	33.1	33.3	33.3	33.3	33.3	33.3	33.3	23
30	33.3	33.3	33.3	33.3	33.3	33.2	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	C	33.3	33.3	33.3	33.1	33.3	33.3	33.3	33.3	33.3	33.3	23
Max	33.3	33.3	33.3	33.3	33.3	33.2	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3		33.3	33.3	33.3	33.1	33.3	33.3	33.3	33.3	33.3		
Avg	33.3	33.3	33.3	33.3	33.3	33.2	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3		33.3	33.3	33.3	33.1	33.3	33.3	33.3	33.3		33.3	
Count	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	0	30	30	30	30	30	30	30	30			696

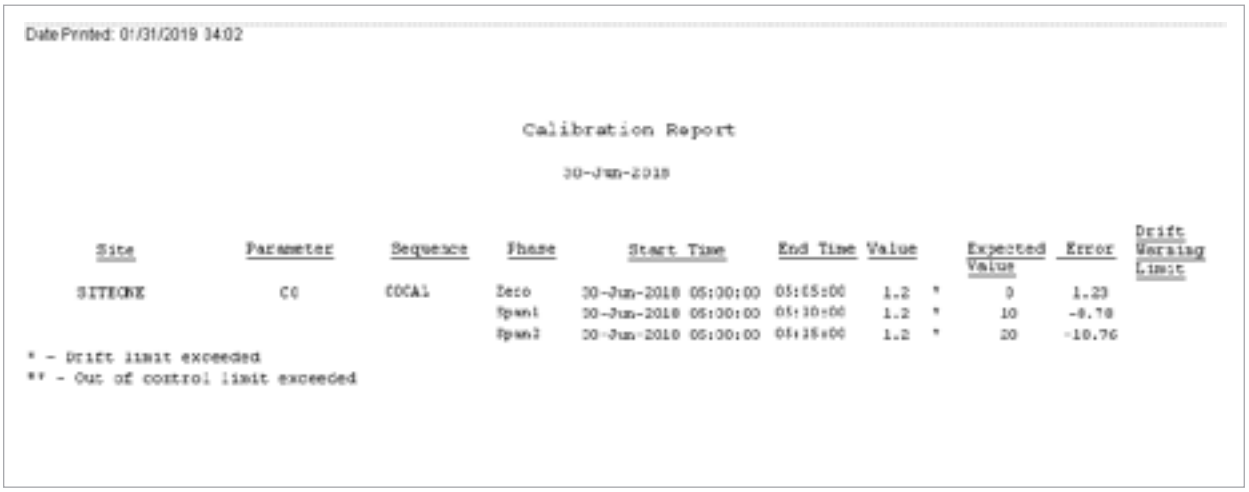
Monthly Report

If Site Codes, and/or Parameter codes have been selected in the Configuration Menu they will be included in the Header. Options are provided to show null codes or flags when an invalid hour is shown on the report. These options are also available in the Scheduled Task (options). Report options are also available to add the flag legend page, show null or qualific codes, and whether to show flags for invalid date.

Calibration Reports

Calibration Results

Calibration reports show the calibration event and results for any zero/span, precision check, or other calibration program.



Date Printed: 01/31/2019 14:02

Calibration Report

30-Jun-2018

Site	Parameter	Sequence	Phase	Start Time	End Time	Value		Expected Value	Error	Drift Warning Limit
SITECNE	CO	COCAL	Zero	30-Jun-2018 05:00:00	05:05:00	1.2	*	0	1.23	
			Span1	30-Jun-2018 05:30:00	05:30:00	1.2	*	10	-8.78	
			Span2	30-Jun-2018 05:00:00	05:35:00	1.2	*	20	-10.76	

* - Drift limit exceeded
** - Out of control limit exceeded

Calibration Report

The percentage of error is calculated as follows:

- If the **Cal Span** has not been set in the **Parameter Editor**, zero error is shown as an absolute difference, while span precision errors are shown as a % of the expected value.
- If the Cal Span has been set in the **Parameter Editor** the errors are all shown as a % of the **Cal Span** value.

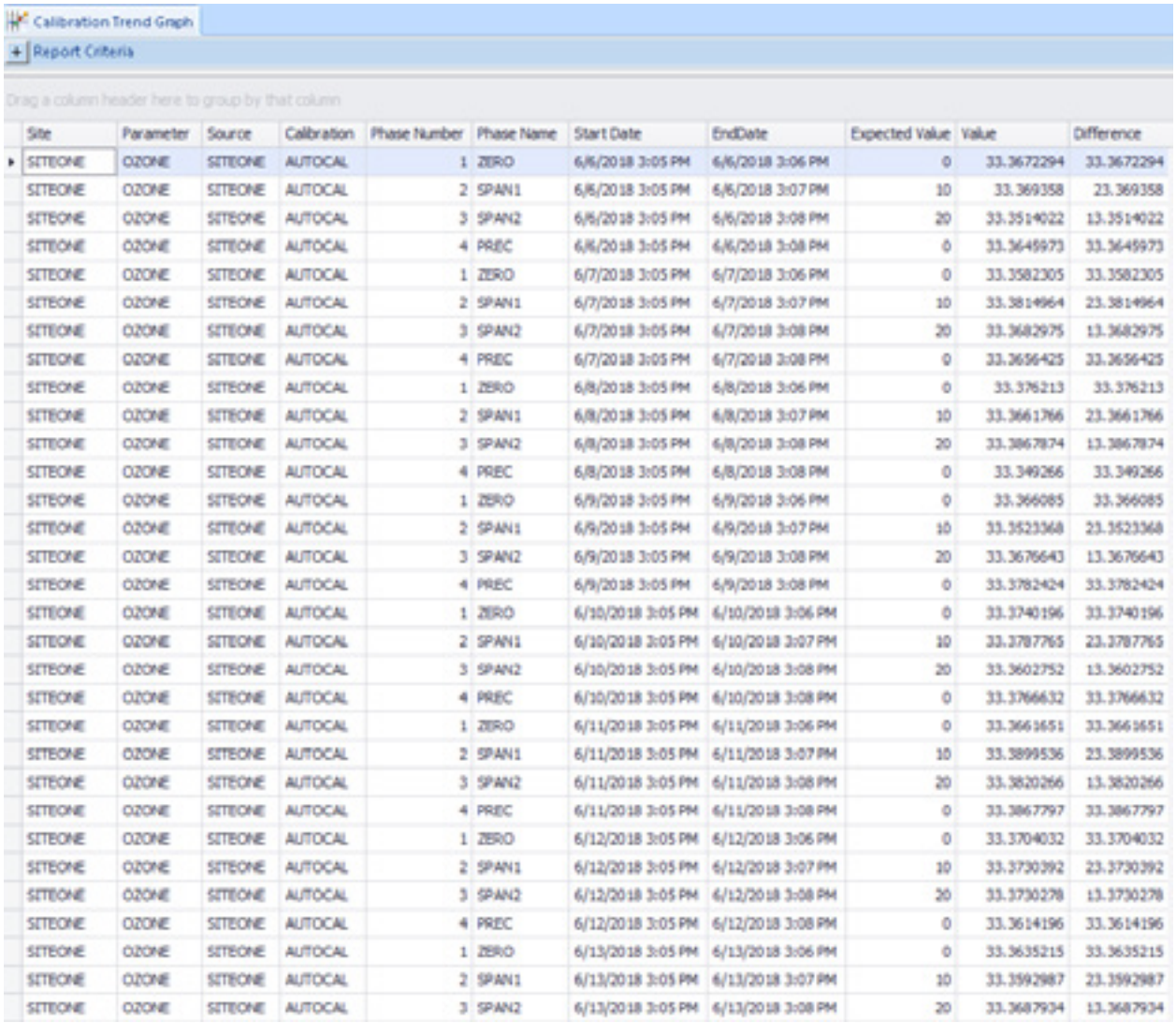
▶ **Note:** There are some internal options available to control the rounding/truncation logic for expected values. Contact support@agilaire.com if the % error is not showing the desired result.

Calibration Reports

Calibration Trend Graph

Calibration Trend Graphs provide a long-term view of calibration zero/span results over a user-defined period of time (month, quarter, etc). Select a **Start** and **End Date** and a **Parameter**. Click the **Generate Report** icon on the ribbon.

If you select **Raw Data Graph** from the ribbon at the top of the screen, you can view calibration data in a text table.


Calibration Trend Graph

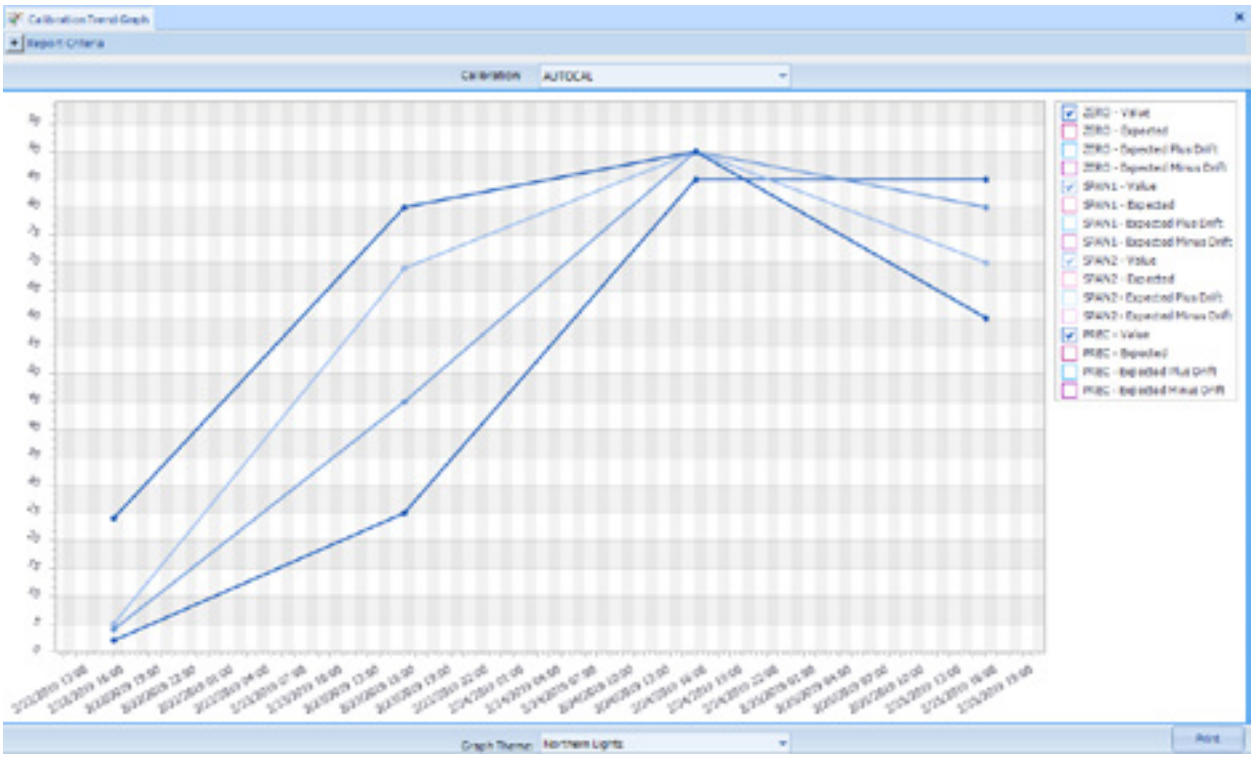
Report Criteria

Drag a column header here to group by that column

Site	Parameter	Source	Calibration	Phase Number	Phase Name	Start Date	EndDate	Expected Value	Value	Difference
SITEONE	OZONE	SITEONE	AUTOCAL	1	ZERO	6/6/2018 3:05 PM	6/6/2018 3:06 PM	0	33.3672294	33.3672294
SITEONE	OZONE	SITEONE	AUTOCAL	2	SPAN1	6/6/2018 3:05 PM	6/6/2018 3:07 PM	10	33.369358	23.369358
SITEONE	OZONE	SITEONE	AUTOCAL	3	SPAN2	6/6/2018 3:05 PM	6/6/2018 3:08 PM	20	33.3514022	13.3514022
SITEONE	OZONE	SITEONE	AUTOCAL	4	PREC	6/6/2018 3:05 PM	6/6/2018 3:08 PM	0	33.3645973	33.3645973
SITEONE	OZONE	SITEONE	AUTOCAL	1	ZERO	6/7/2018 3:05 PM	6/7/2018 3:06 PM	0	33.3582305	33.3582305
SITEONE	OZONE	SITEONE	AUTOCAL	2	SPAN1	6/7/2018 3:05 PM	6/7/2018 3:07 PM	10	33.3814964	23.3814964
SITEONE	OZONE	SITEONE	AUTOCAL	3	SPAN2	6/7/2018 3:05 PM	6/7/2018 3:08 PM	20	33.3682975	13.3682975
SITEONE	OZONE	SITEONE	AUTOCAL	4	PREC	6/7/2018 3:05 PM	6/7/2018 3:08 PM	0	33.3656425	33.3656425
SITEONE	OZONE	SITEONE	AUTOCAL	1	ZERO	6/8/2018 3:05 PM	6/8/2018 3:06 PM	0	33.376213	33.376213
SITEONE	OZONE	SITEONE	AUTOCAL	2	SPAN1	6/8/2018 3:05 PM	6/8/2018 3:07 PM	10	33.3661766	23.3661766
SITEONE	OZONE	SITEONE	AUTOCAL	3	SPAN2	6/8/2018 3:05 PM	6/8/2018 3:08 PM	20	33.3867874	13.3867874
SITEONE	OZONE	SITEONE	AUTOCAL	4	PREC	6/8/2018 3:05 PM	6/8/2018 3:08 PM	0	33.349266	33.349266
SITEONE	OZONE	SITEONE	AUTOCAL	1	ZERO	6/9/2018 3:05 PM	6/9/2018 3:06 PM	0	33.366085	33.366085
SITEONE	OZONE	SITEONE	AUTOCAL	2	SPAN1	6/9/2018 3:05 PM	6/9/2018 3:07 PM	10	33.3523368	23.3523368
SITEONE	OZONE	SITEONE	AUTOCAL	3	SPAN2	6/9/2018 3:05 PM	6/9/2018 3:08 PM	20	33.3676643	13.3676643
SITEONE	OZONE	SITEONE	AUTOCAL	4	PREC	6/9/2018 3:05 PM	6/9/2018 3:08 PM	0	33.3782424	33.3782424
SITEONE	OZONE	SITEONE	AUTOCAL	1	ZERO	6/10/2018 3:05 PM	6/10/2018 3:06 PM	0	33.3740196	33.3740196
SITEONE	OZONE	SITEONE	AUTOCAL	2	SPAN1	6/10/2018 3:05 PM	6/10/2018 3:07 PM	10	33.3787765	23.3787765
SITEONE	OZONE	SITEONE	AUTOCAL	3	SPAN2	6/10/2018 3:05 PM	6/10/2018 3:08 PM	20	33.3602752	13.3602752
SITEONE	OZONE	SITEONE	AUTOCAL	4	PREC	6/10/2018 3:05 PM	6/10/2018 3:08 PM	0	33.3766632	33.3766632
SITEONE	OZONE	SITEONE	AUTOCAL	1	ZERO	6/11/2018 3:05 PM	6/11/2018 3:06 PM	0	33.3661651	33.3661651
SITEONE	OZONE	SITEONE	AUTOCAL	2	SPAN1	6/11/2018 3:05 PM	6/11/2018 3:07 PM	10	33.3899536	23.3899536
SITEONE	OZONE	SITEONE	AUTOCAL	3	SPAN2	6/11/2018 3:05 PM	6/11/2018 3:08 PM	20	33.3820266	13.3820266
SITEONE	OZONE	SITEONE	AUTOCAL	4	PREC	6/11/2018 3:05 PM	6/11/2018 3:08 PM	0	33.3867797	33.3867797
SITEONE	OZONE	SITEONE	AUTOCAL	1	ZERO	6/12/2018 3:05 PM	6/12/2018 3:06 PM	0	33.3704032	33.3704032
SITEONE	OZONE	SITEONE	AUTOCAL	2	SPAN1	6/12/2018 3:05 PM	6/12/2018 3:07 PM	10	33.3730392	23.3730392
SITEONE	OZONE	SITEONE	AUTOCAL	3	SPAN2	6/12/2018 3:05 PM	6/12/2018 3:08 PM	20	33.3730278	13.3730278
SITEONE	OZONE	SITEONE	AUTOCAL	4	PREC	6/12/2018 3:05 PM	6/12/2018 3:08 PM	0	33.3614196	33.3614196
SITEONE	OZONE	SITEONE	AUTOCAL	1	ZERO	6/13/2018 3:05 PM	6/13/2018 3:06 PM	0	33.3635215	33.3635215
SITEONE	OZONE	SITEONE	AUTOCAL	2	SPAN1	6/13/2018 3:05 PM	6/13/2018 3:07 PM	10	33.3592987	23.3592987
SITEONE	OZONE	SITEONE	AUTOCAL	3	SPAN2	6/13/2018 3:05 PM	6/13/2018 3:08 PM	20	33.3687934	13.3687934

Historical Calibration Trend Graph

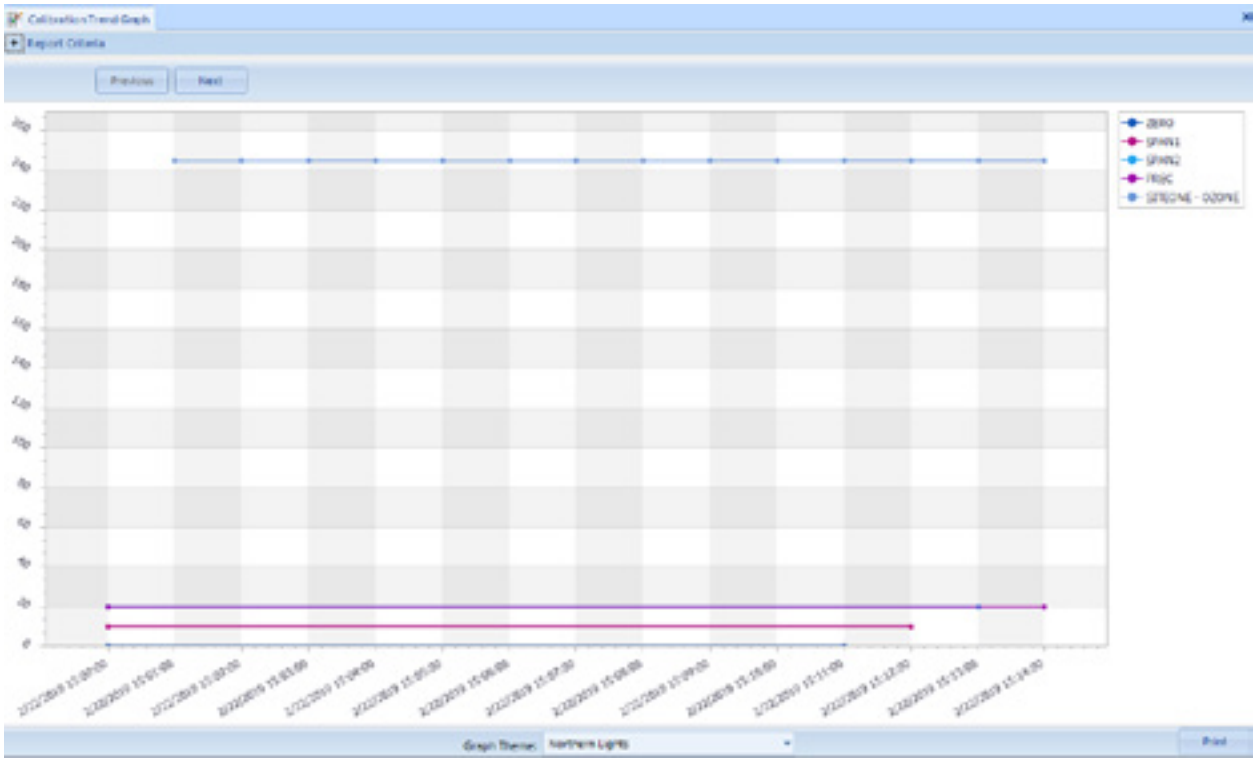
If you select **Historical Graph** you can view data in a graph. Each color represents a different phase, as shown in the legend. You can change the color scheme by selecting a **Graph Scheme** from the drop down list at the bottom of the screen.



Historical Calibration Trend Graph

If you select **Response Graph** from the ribbon at the top of the screen, you can review fine-resolution data during each calibration cycle to see instrument response. Each cal can be cycled through using the **Forward**/**Back** button. You can change the color scheme by selecting a **Graph Scheme** from the drop down list at the bottom of the screen.

The graph has a filter at the top to define the specific calibration program to be graphed, in the event that a parameter has more than one calibration program associated with it.



Calibration Trend Response Graph

Configuration Reports

Calibration Configuration Report

To run a Calibration **Configuration Report** (**Reports > Configuration folder > Calibration Configuration Report**), select a site or sites and click the **Generate Report icon** on the Ribbon.

Calibration Configuration Report

SITEONE

Calibration Name	Start Time	Repeat Interval	Recovery Time	Phase Name	Phase Number	Duration	Response Time	Status Pattern	Affected Channel
AUTOCAL	06/18/13 15:06	001d	006M	ZERO	1	001M	006S		OZONE
	06/18/13 15:06	001d	006M	SPAN1	2	001M	006S		OZONE
	06/18/13 15:06	001d	005M	SPAN2	3	001M	005S		OZONE
	06/18/13 15:06	001d	006M	PREC	4	001M	006S		OZONE
COCAL	07/13/10 05:00	001D	005M	Zero	1	005M	001M		CO
	07/13/10 05:00	001D	005M	Span1	2	005M	001M		CO
	07/13/10 06:00	001D	006M	Span2	3	006M	001M		CO

Calibration Configuration Report (Reports > Configuration folder > Calibration Configuration Report)

Configuration Reports

Channel Configuration Report

To run a Channel Configuration Report (**Reports > Configuration folder > Channel Configuration Report**), select a **Site** or Sites and a **Parameter Name** or Parameter Names. Click the **Generate Report icon** on the Ribbon.

Channel Configuration Report

SITEONE

Parameter Name	Source Name	Logger Id	#	Channel Name	Units	Type	Intervals			Storage			Analog Input Channel	Input Channel	Input		Output		Hold Midnight Updates	Secondary Input Channel	Input Interval Name	Rolling Interval Name	General Value	
							Base	Ext 1	Ext 2	Base	Ext 1	Ext 2			High	Low	High	Low					Duration Interval	Storage Interval
OZONE	SITEONE	80	1	OZONE	PPM	Analog In (Standard)	001m	015m	001h	2D	2H	7D	01		10	3	100	0	False					
CO	SITEONE	80	5	CO	PPM	Analog In (Standard)	001m	015m	001h	1H	2H	5D	05		5	3	100	0	False					
NO	SITEONE	80	6	NO	PPM	Analog In (Standard)	001m	015m	001h	1H	2H	5D	06		1	3	100	0	False					
NO2	SITEONE	80	7	NO2	PPB	Analog In (Standard)	001m	015m	001h	1H	2H	5D	07		5	3	100	0	False					
NOX	SITEONE	80	8	NOX	PPM	Analog In (Standard)	001m	015m	001h	1H	2H	5D	8		1	3			False					

Validation

SITEONE

Parameter Name	#	Channel Name	High-High Alarm Limit			High Alarm Limit			Low Alarm Limit			Low-Low Alarm Limit			High ROC Alarm Limit			Low ROC Alarm Limit		
			Base	Ext 1	Ext 2	Base	Ext 1	Ext 2	Base	Ext 1	Ext 2	Base	Ext 1	Ext 2	Base	Ext 1	Ext 2	Base	Ext 1	Ext 2
OZONE	1	OZONE																		
CO	5	CO						1.297												
NO	6	NO						100												
NO2	7	NO2																		
NOX	8	NOX																		

Validation, Part 2

SITEONE

Parameter Name	#	Channel Name	Floor Limit			Floor Value			Percent Valid			Ceiling Limit			Ceiling Value			Overwrite Math Constant		
			Base	Ext 1	Ext 2	Base	Ext 1	Ext 2	Base	Ext 1	Ext 2	Base	Ext 1	Ext 2	Base	Ext 1	Ext 2	Base	Ext 1	Ext 2
OZONE	1	OZONE																		
CO	5	CO																		
NO	6	NO																		
NO2	7	NO2																		
NOX	8	NOX																		

Channel Configuration Report (Reports > Configuration folder > Channel Configuration Report)

Configuration Reports

Parameter Configuration Report

To run a **Parameter Configuration Report**, (**Reports > Configuration folder > Parameter Configuration Report**), select a **Site** or Sites and a **Parameter Name** or Parameters Names. Click the **Generate Report icon** on the Ribbon.

Parameter Configuration Report

SITEONE

			AQS Codes							Graph							
Name	Description	Template	Method	Units	Parameter	Reported Digits	Prec.	Trunc Rnd.	Units	Minimum	Maximum	Instrument Detection Limit	Totalize In Reports	Minimum In Reports	Report in AirNow	Enabled	POC
CO	Carbon Monoxide	CO	321	007	42101	4	1	R	PPM	0	360		True	False	True	True	1
OZONE	Ozone PPM	OZONE	123	007	44201	4	1	T	PPM	0	600		False	False	True	True	1
NO	Nitrous Oxide	NO	656	007	42601	4	3	T	PPM	1	2		False	False	True	True	1
NO2	Nitric Oxide	NO2	042	008	42602	4	3	T	PPB	0	500		False	False	True	True	1
NOX	Oxides of Nitrogen	NOX	321	007	42603	4	3	T	PPM	0	600		True	False	True	True	1

Parameter Configuration Report, (Reports > Configuration folder > Parameter Configuration Report)

Configuration Reports

Scheduled Tasks Report

To run a **Scheduled Tasks Report**, open **Reports > Configuration folder > Scheduled Tasks Report** and the report will be displayed automatically. No query is necessary.

Scheduled Tasks Report

Task Name	Description	Enabled	Start Time	Repeat Interval
Average Data Rollup Task	Average Data Rollup Task	False	1/31/2018 5:07:04 PM	6M
AIRNow FTP	AIRNow FTP Transfer Task	False	1/24/2011 11:06:09 AM	1H
Instrument Poll Task	Instrument Polling Task	False	10/3/2011 3:46:45 PM	1H
Task Group for Site One	Processes tasks contained in task group	True	3/11/2013 11:05:05 AM	1H
Hourly	Processes tasks contained in task group	True		
Hourly	Processes tasks contained in task group	True		
Hourly	Processes tasks contained in task group	True		
Hourly	Processes tasks contained in task group	True		
Hourly	Processes tasks contained in task group	True		
Hourly	Processes tasks contained in task group	True		
Hourly	Processes tasks contained in task group	True		
ADVP Rule Processing Task	ADVP Rule Processing Task	False	3/21/2013 3:00:05 PM	1H
AIRNow Report Task	Generates Report at assigned time for output	False	4/8/2015 10:59:58 AM	1H
Calculate Site Math Parameters	Calculate Math Parameters	False	4/23/2015 11:03:07 AM	1H
Average Data Purge minute	Average Data Purge Task	True	6/18/2012 11:10:59 PM	1D
Average Data Purge 5min	Average Data Purge Task	True	6/18/2012 11:12:58 PM	1D

Wednesday, January 30, 2019 Page 1 of 2

Scheduled Task Report (Reports > Configuration folder > Scheduled Tasks Report)

Configuration Reports

Site Configuration Report

To run a **Site Configuration Report**, (**Reports > Configuration folder > Site Configuration Report**), select a **Site** or Sites and click the **Generate Report icon** on the Ribbon.

Site Configuration Report

Agilaire:

Description:	main site
Abbreviation:	01
Address:	2904-B
City:	Knoxville
County:	Knox
Zip Code:	37918

Latitude:	35.9605
Longitude:	-83.9208
Time Zone:	EST
Agency Code:	0581
State Code:	47
CountyCode:	093
Site Code:	

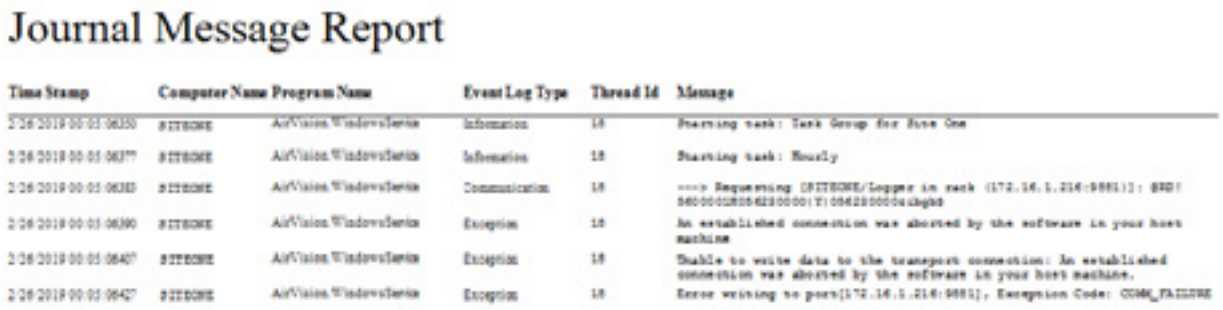
Thursday, March 17, 2011 *Page 1 of 1*

Site Configuration Report, (Reports > Configuration folder > Site Configuration Report)

Internal Reports

Journal Message Log

The **Journal Message Log** displays detailed messages about the Logging Types you select. Type selections are: **Fatal**, **Exception**, **Error**, **Warning**, **Startup**, **Shutdown**, **Information**, **Communication**, **Verbose**, **Debug**, **Timed Event**, or **Select all**.



Journal Message Report

Time Stamp	Computer Name	Program Name	Event Log Type	Thread Id	Message
2/26/2019 00:05:06350	SITEONE	AirVision.WindowsService	Information	18	Starting task: Task Group for Site One
2/26/2019 00:05:06377	SITEONE	AirVision.WindowsService	Information	18	Starting task: Hourly
2/26/2019 00:05:06383	SITEONE	AirVision.WindowsService	Communication	18	---> Requesting [SITEONE/Logger in rack (172.16.1.216:9881)]: $RD!5600001R056230000(T)056230000sibgb$
2/26/2019 00:05:06390	SITEONE	AirVision.WindowsService	Exception	18	An established connection was aborted by the software in your host machine
2/26/2019 00:05:06407	SITEONE	AirVision.WindowsService	Exception	18	Unable to write data to the transport connection: An established connection was aborted by the software in your host machine.
2/26/2019 00:05:06427	SITEONE	AirVision.WindowsService	Exception	18	Error writing to port[172.16.1.216:9881], Exception Code: COMM_FAILURE

Journal Message Log (Reports>Internal Reports)

Internal Reports

Software Version Report

The **Software Version Report** (**Reports>Internal Reports**) displays Timestamps for **Database Schemata and Builds**, **Version IDs**, and **Software Version**.

Software Version Report

Database Schema Timestamp	1/8/2019 10:27:56 AM
Database Schema Version Id	1f59bd78-092a-4750-a062-ebda10b20dac
Database Schema Version Number	17706
Client Database Schema Timestamp	12/11/2018 4:21:18 PM
Client Database Schema Version Id	af784d68-4b37-465e-b3f9-19488e259ade
Client Database Schema Version Number	17705
Client Build Timestamp	1/10/2019 2:14:10 PM
Client Build Version	2019.01.102
Client Product Version	4.0.36
Server Database Schema Timestamp	12/11/2018 4:21:18 PM
Server Database Schema Version Id	af784d68-4b37-465e-b3f9-19488e259ade
Server Database Schema Version Number	17705
Server Build Timestamp	1/10/2019 2:18:26 PM
Server Build Version	2019.01.102
Server Product Version	4.0.36

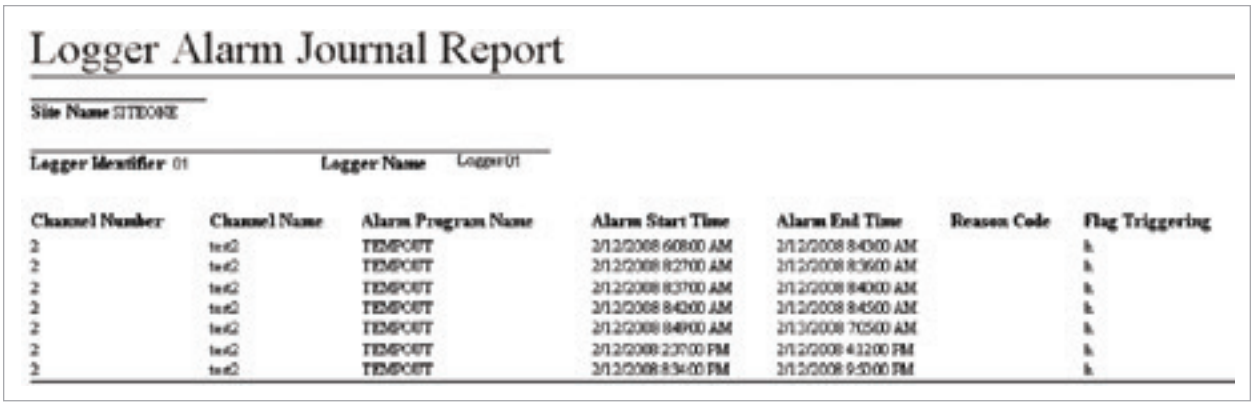
Software Version Report (Reports>Internal Reports)

Logger Reports

Alarm Journal

The **Alarm Journal** displays the Site Name, Channel Number, Channel Name, Alarm Program Name, Alarm Start/End Time, Reason Code, and Triggering Flag.

To run an **Alarm Journal**, select **Reports** > **Logger Reports** > **Alarm Journal**. In the **Report Criteria** screen, select a **Start/End Date** and a **Site/ Source Name**. Click the **Generate Report** icon. A Logger Alarm Journal Report will be displayed in the bottom section of the screen.



Logger Alarm Journal Report

Site Name SITECODE

Logger Identifier 01 Logger Name Logger01

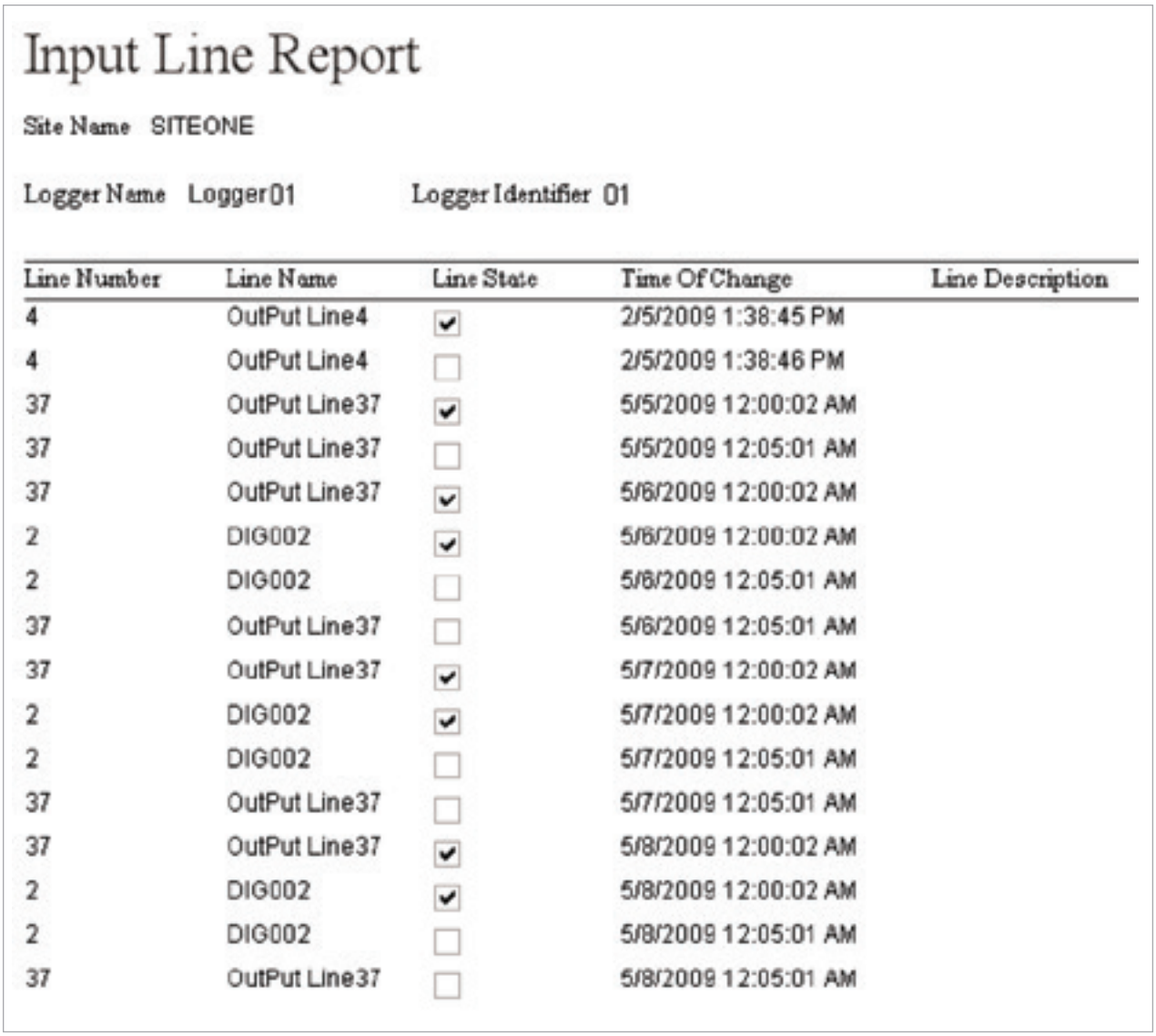
Channel Number	Channel Name	Alarm Program Name	Alarm Start Time	Alarm End Time	Reason Code	Flag Triggering
2	test2	TEMPOUT	2/12/2008 6:08:00 AM	2/12/2008 8:45:00 AM		h
2	test2	TEMPOUT	2/12/2008 8:27:00 AM	2/12/2008 8:36:00 AM		h
2	test2	TEMPOUT	2/12/2008 8:37:00 AM	2/12/2008 8:40:00 AM		h
2	test2	TEMPOUT	2/12/2008 8:42:00 AM	2/12/2008 8:45:00 AM		h
2	test2	TEMPOUT	2/12/2008 8:49:00 AM	2/13/2008 7:05:00 AM		h
2	test2	TEMPOUT	2/12/2008 2:37:00 PM	2/12/2008 4:12:00 PM		h
2	test2	TEMPOUT	2/13/2008 8:34:00 PM	2/13/2008 9:53:00 PM		h

Logger Reports

Input Line Status Report

The **Input Line Status Report** displays Site and Logger Name, Logger ID, Line Number, Line Name, Line State, Time of Change, and Line Description.

To run an **Input Line Status Report**, select **Reports** > **Logger Reports** > **Input Line Status Report**. In the **Report Criteria** screen, select a **Start/End Date** and a **Site/Source Name**. Click the **Generate Report** icon. An **Input Line Status Report** will be displayed in the bottom section of the screen.Each site/logger is shown in a separate page.



Input Line Report

Site Name SITEONE

Logger Name Logger01 Logger Identifier 01

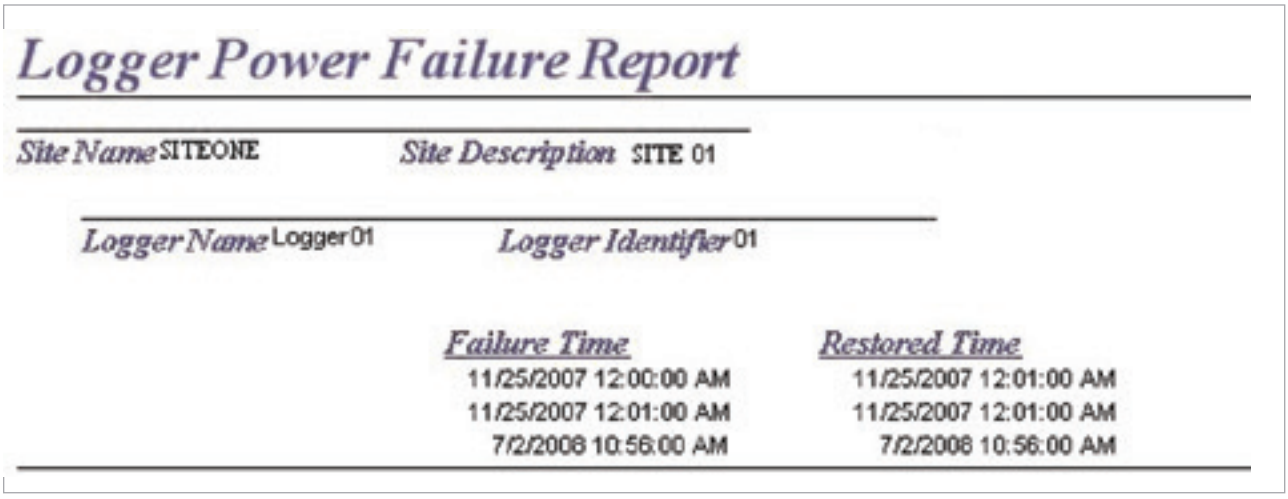
Line Number	Line Name	Line State	Time Of Change	Line Description
4	OutPut Line4	☑	2/5/2009 1:38:45 PM	
4	OutPut Line4	☐	2/5/2009 1:38:46 PM	
37	OutPut Line37	☑	5/5/2009 12:00:02 AM	
37	OutPut Line37	☐	5/5/2009 12:05:01 AM	
37	OutPut Line37	☑	5/6/2009 12:00:02 AM	
2	DIG002	☑	5/6/2009 12:00:02 AM	
2	DIG002	☐	5/6/2009 12:05:01 AM	
37	OutPut Line37	☐	5/6/2009 12:05:01 AM	
37	OutPut Line37	☑	5/7/2009 12:00:02 AM	
2	DIG002	☑	5/7/2009 12:00:02 AM	
2	DIG002	☐	5/7/2009 12:05:01 AM	
37	OutPut Line37	☐	5/7/2009 12:05:01 AM	
37	OutPut Line37	☑	5/8/2009 12:00:02 AM	
2	DIG002	☑	5/8/2009 12:00:02 AM	
2	DIG002	☐	5/8/2009 12:05:01 AM	
37	OutPut Line37	☐	5/8/2009 12:05:01 AM	

Logger Reports

Power Failure Report

The **Power Failure Report** displays Site and Logger Name, Logger ID, Failure Time and Restored Time.

To run a **Power Failure Report**, select **Reports** > **Logger Reports** > **Power Failure Report**. In the **Report Criteria** screen, select a **Start/End Date** and a **Site/ Source Name**. Click the **Generate Report** icon. A **Power Failure Report** will be displayed in the bottom section of the screen.Each site/logger is shown in a separate page.



Logger Power Failure Report

Site Name SITEONE Site Description SITE 01

Logger Name Logger 01 Logger Identifier 01

Failure Time	Restored Time
11/25/2007 12:00:00 AM	11/25/2007 12:01:00 AM
11/25/2007 12:01:00 AM	11/25/2007 12:01:00 AM
7/2/2008 10:56:00 AM	7/2/2008 10:56:00 AM

Power Failure Report

Other Reports

Annotations Report

The **Annotations Report** may be run on any list of parameters, for any time range. It provides a summary of all annotations it finds.

To see a report of annotations made in the **Average Data Editor**, open the **Reports** menu, expand Notation Reports and select **Annotations Report**. Make the usual query selections of **Start/End Date**, **Average Interval**, and **Parameter(s)**. Click the **Generate Report** icon on the ribbon.

Date Printed: 01/30/2019 02:58

Annotation Report

01-Jan-2018 00:00 - 31-Mar-2018 23:59

Site: SITEONE

Parameter: CO

Category	Date Annotated	User Name	Start	End	Annotation
Audit	16-Jan-18 15:37	Admin	16-Jan-18 00:00	16-Jan-18 00:00	Reading Value Changed from: 1.25667406 to: 2
Audit	16-Jan-18 15:37	Admin	16-Jan-18 01:00	16-Jan-18 01:00	Reading Value Changed from: 1.22007139 to: 2
Audit	16-Jan-18 15:37	Admin	16-Jan-18 02:00	16-Jan-18 02:00	Reading Value Changed from: 1.218464 to: 2
Audit	16-Jan-18 15:37	Admin	16-Jan-18 03:00	16-Jan-18 03:00	Reading Value Changed from: 1.27755557 to: 2
Audit	16-Jan-18 15:37	Admin	16-Jan-18 04:00	16-Jan-18 04:00	Reading Value Changed from: 1.27038039 to: 2

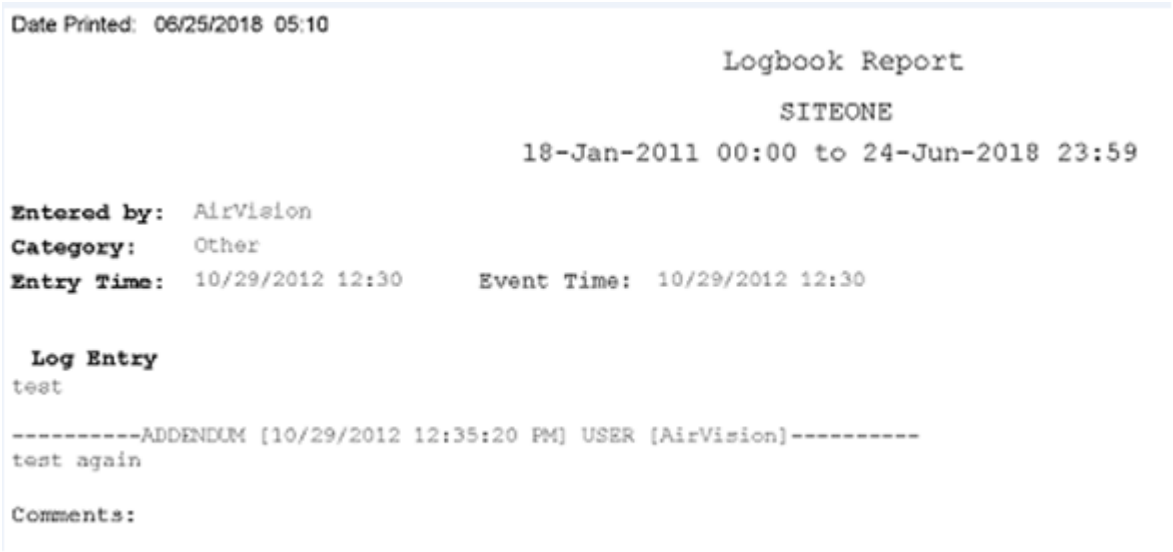
Annotations Report

Other Reports

LogBook Report

The **LogBook Report** generates reports of logbook entries that were made in the **LogBook Entries Editor**. To query a LogBook Report select LogBook Report from Notation Reports under the **Reports** menu. Select **Start** and **End Dates** and a **Site Name** from the top section of the screen and click the **Generate Report icon** in the upper left section of the screen. The user may also choose one or all **Logbook Categories** as a filter for the report.

The logbook report will be displayed in the lower section of the screen.



Date Printed: 06/25/2018 05:10

Logbook Report

SITEONE

18-Jan-2011 00:00 to 24-Jun-2018 23:59

Entered by: AirVision
Category: Other
Entry Time: 10/29/2012 12:30 **Event Time:** 10/29/2012 12:30

Log Entry
test

----------ADDENDUM [10/29/2012 12:35:20 PM] USER [AirVision]----------
test again

Comments:

LogBook Report

Chapter 4

Data Editors

AV-Trend provides the following Data Editors:

- **Average Data Editor**
- **Linear Data Editor**
- **Cell Color Codes in Flags Editor**
- **Right-Click Options**
- **Cross-Tab Data Editor**
- **Matrix Data Editor**
- **Time Series Graph**
- **Scatter Plot Graph**
- **Histogram**
- **Logbook Entry Editor**

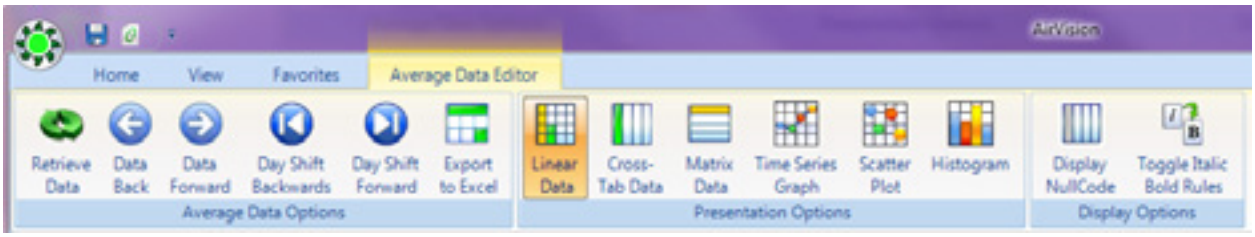
Average Data Editor

The AV-Trend **Average Data Editor** (**Data Editors** > **Average Data Editor**) combines multiple functions into a single tool:

- Editing details of data points
- Batch editing
- Comparison of current data with historical minimum, maximum, and mean
- Analyze/Exported

In addition, you can toggle between the following six formats by clicking buttons in the ribbon at the top of the screen:

- Linear Table (the default display)
- Cross Tab Table
- Matrix Table
- Time Series Graph (can be used for single or multiple parameters, but the historical comparison tools in this X-Y scatter plot only appear in single- parameter queries)
- Scatter Plot graph (requires queries of two or more parameters)
- Histogram (for single parameter queries)



Ribbon bar to toggle between Data Editor displays; arrows to scroll backward and forward through data

Control-Keys can also be helpful for navigating when using the editor:

- **CTRL-N** for Next (Data Forward)
- **CTRL-P** for Previous (Data Back)
- **CTRL-L** to Reload data set.

To edit data in the **Average Data Editor**, enter

- **Start** and **End Date** (type dates or use arrow keys to select)
- **Average Interval** (for example, 001h Hourly average of 60 minutes)
- **Parameter Selection** (for example, **Site Name** NKNOX, **Parameter Name** NO2, **Parameter Template** NO2)
- Click the **Retrieve Data** button in the ribbon at the top of the screen

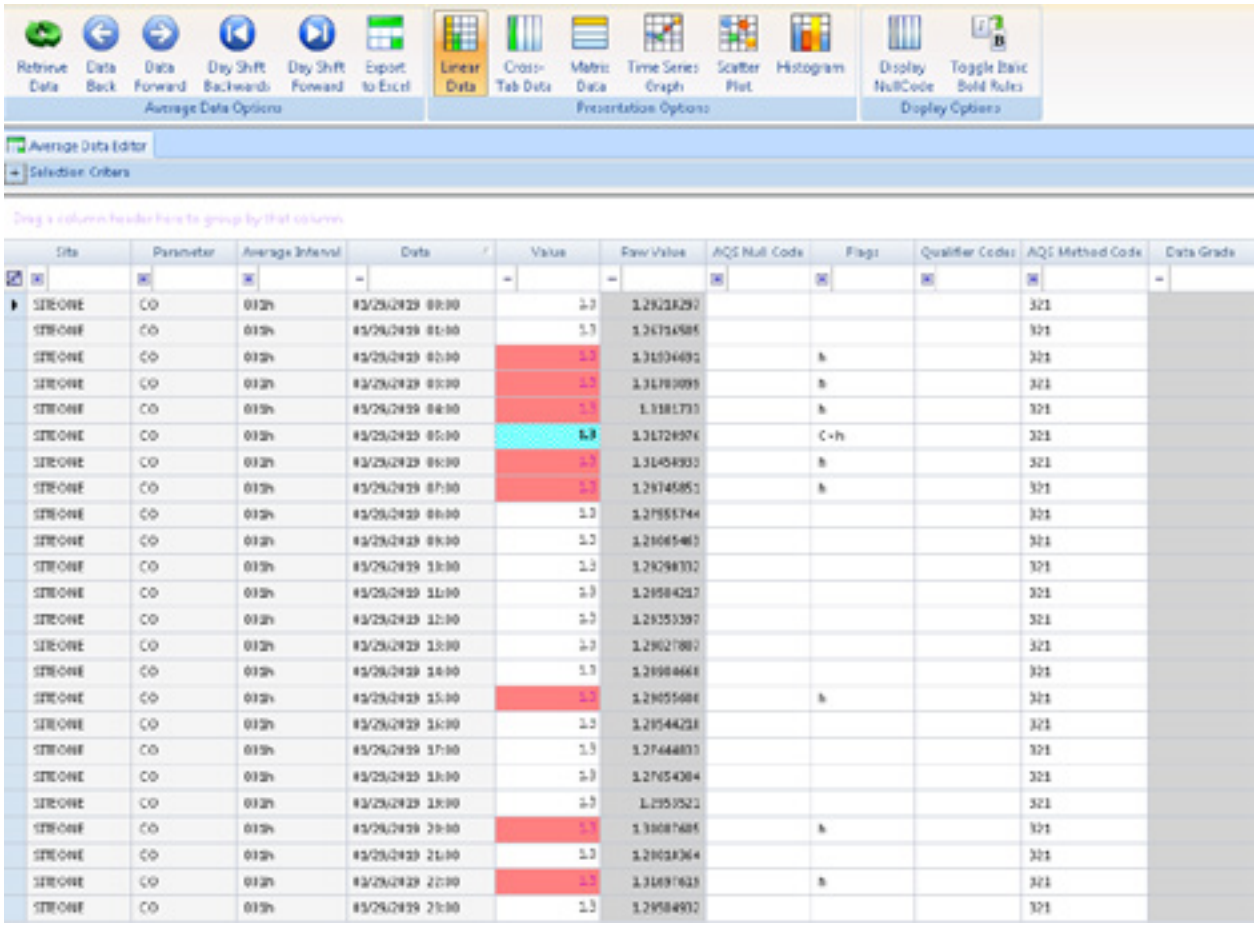
The Average Data Editor will open the **Linear Data Editor** by default. Click buttons in the ribbon to change formats. Click the **Data Back** or **Data Forward** button to jump scroll to either the previous or following data set. For example, if your initial query was for a week of data, the scroll buttons will take you backward or forward to a week of data.

Linear Data Editor

The Linear Data Editor

- Site Name, Parameter Name, Parameter Template Name
- Average Interval
- Start and End Dates
- Value (Hover the mouse pointer over data values to see any annotations.)
- Raw Value (can't be edited)
- AQS Null Codes
- Data Logger Flags
- Qualifier Codes
- AV-Trend Data Grade (used by ADVP or multi-level data validation tracking)

To edit data values, double-click in the Value cell or right-click to bring up a pop-up menu.



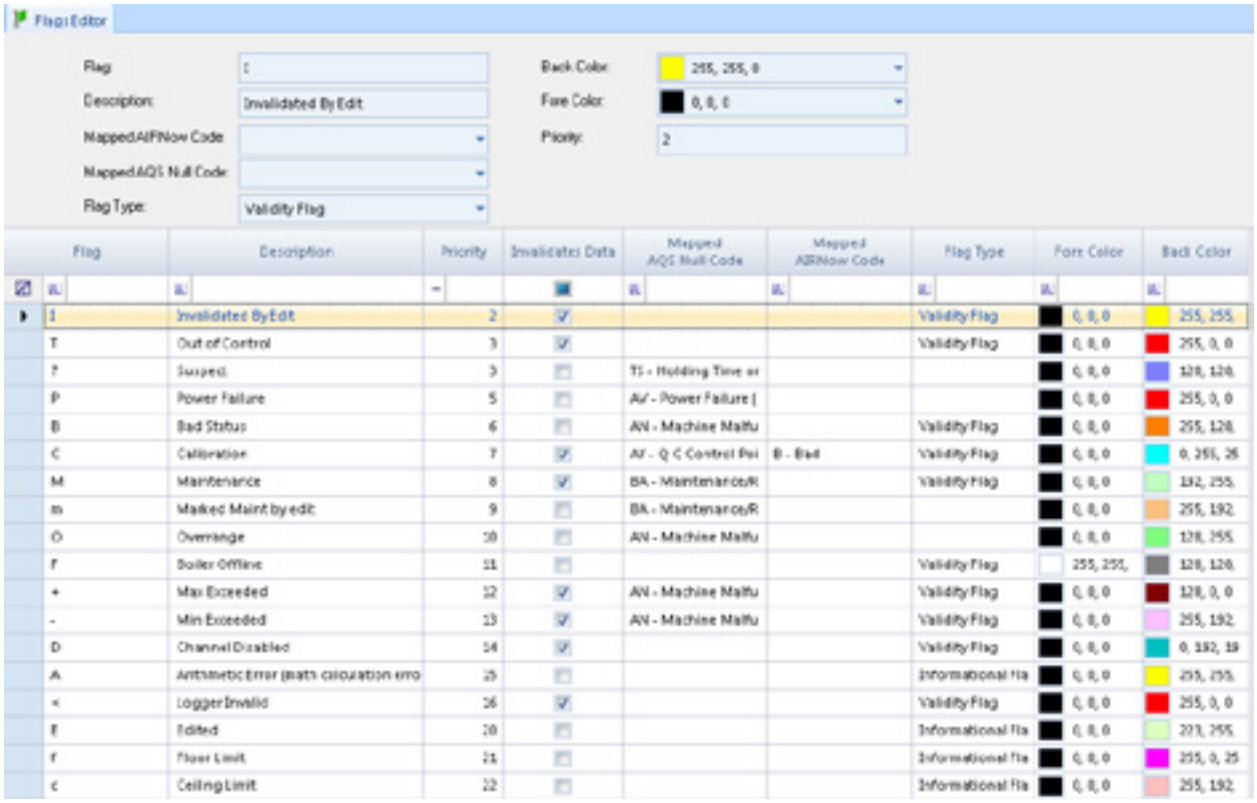
Average Data Editor from Data Editors menu

Cell Color Codes

All data is color-coded based on the flag-to-color mappings listed in the **Flags Editor**. AV-Trend is loaded with some default mappings, but you can customize this for your system. The color mappings are global to all users for consistency.

In addition, AV-Trend uses two font changes to represent data in the data editor:

- **Bold** values represent data that does not match the raw database (edited values)
- *Italics* values represent data that has an annotation. Hover the mouse pointer over data values to see details of annotations.



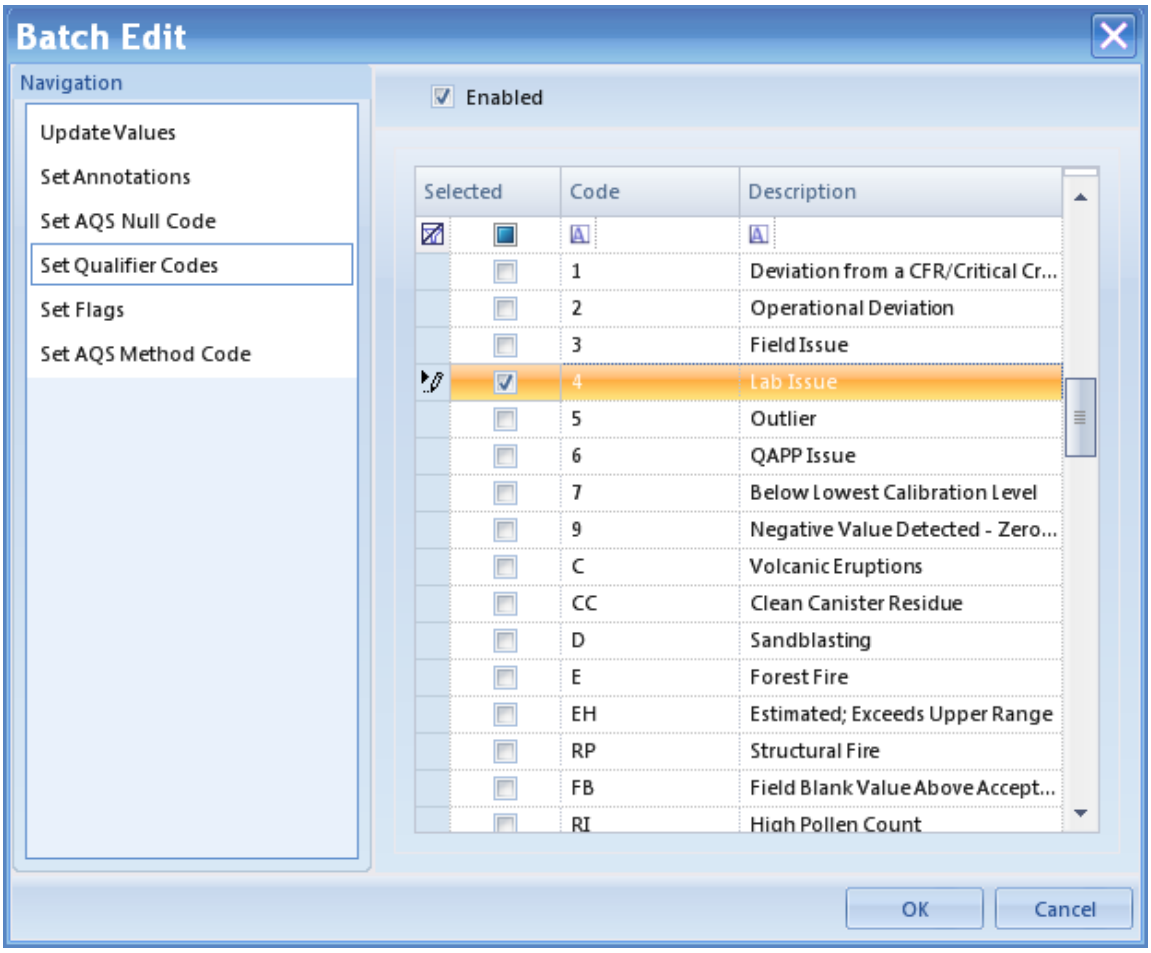
Flags Editor in Configuration Editors

▶ **Note:** Many reports and editors show only the highest priority flag, so some users find it preferable to reduce the "<" flag priority to a lower value (like 15 or 100) to make other flags more visible.

Right-Click Options

Each of the three non-graphical data editors support select, shift-select, CTRL-select, click and drag selection capabilities, and a right-click menu option. Right-click a data point in the **Value** column to bring up the following menu options:

- **Restore from Raw** copies value from the raw database to the final **Value** and resets flags
- **Set to Minimum Detectable Limit** sets data value to MDL configured in Parameter Editor
- **Set AQS Code** brings up a pick list to apply new AQS null codes
- **Set Qualifier Code** brings up a selection box for AQS qualifier (exception) codes
- **View All Flags** (for single data points only) shows all data logger and system flags and allows you to change or clear flags. Multiple flags can be displayed in each cell.
- **Set Annotations** brings up an annotation screen so you can add an annotation
- Before you can use the **Batch Editor**, two or more data **Values** must be selected. In the **Batch Edit** screen. **Enabled** must be selected for each option to activate that option.



Batch Edit with Set Qualifier Codes Enabled

Batch Edit provides the following functions:

Update Values
Scale two or more selected data values as **mX+b** (Original Value times a Multiplier plus a Constant Value), for example, divide by 10 and clear the suspect flag.

Set Annotations

Set AQS Null Code

Set Qualifier Codes

Set Flags
If you select **Set Flags**, you have the option to **Update Children Flags**.

Set AQS Method Code

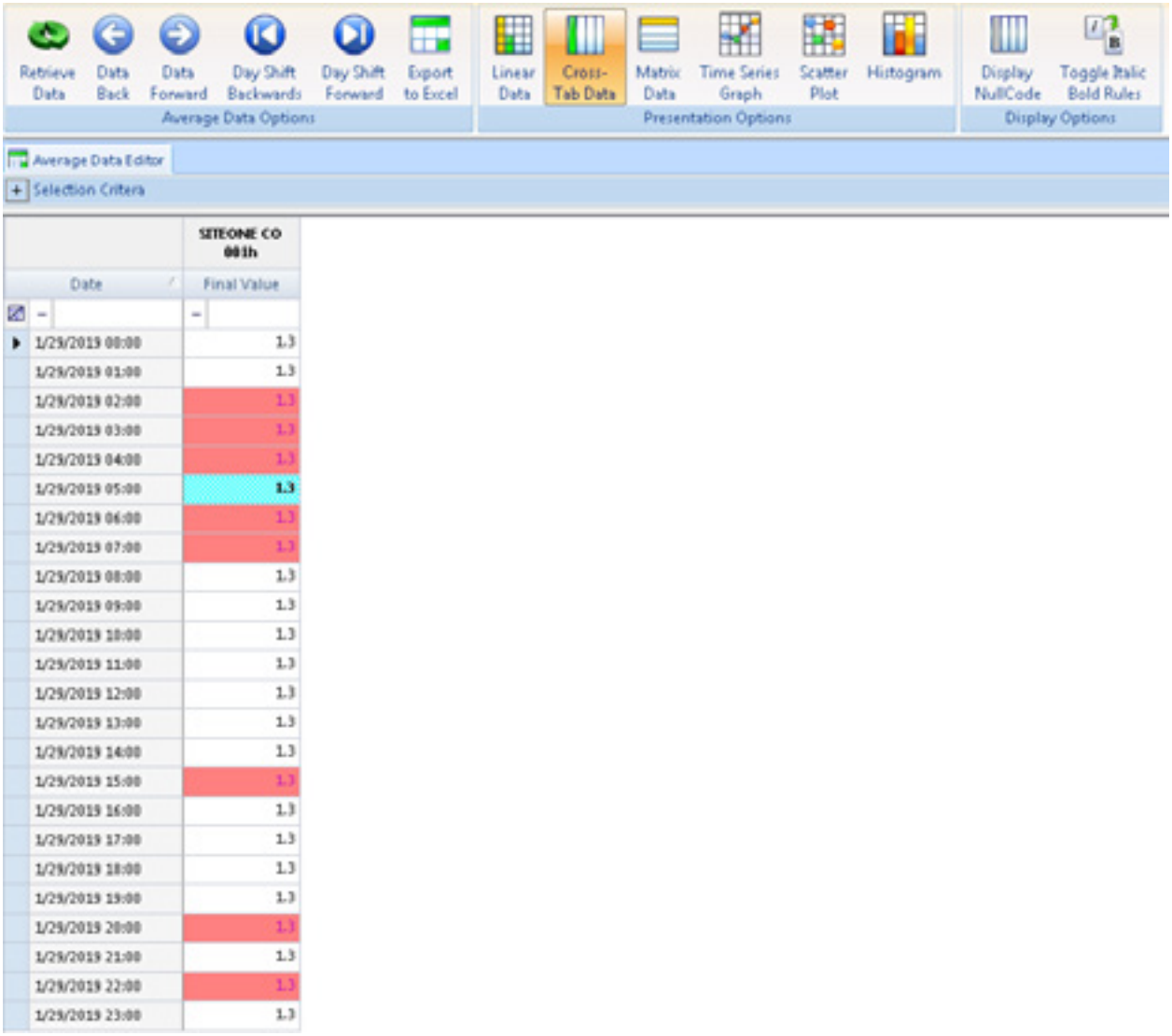
- **Show Children** brings up another instance of the Data Editor with the selected parameters and time range for the **Child** parameter(s) of the selected parameter. This function requires that **Parent-Child Parameter** relationships are configured in **Configuration Editors** > **Site/Parameter**.
- **Drill Down Interval** allows you to drill down to minute averages from hourly averages.
- **Export to Excel** exports the selected data range to an Excel document, including color, font, and layout details. This right-click option is different from the Export to Excel button in the ribbon at the top of the screen because the button on the ribbon exports the entire data set in the data editor and the right-click option exports only selected data.

Click a column heading to sort data by a different heading, for example to group data according to flags. Default is to sort by date.

Click-hold-drag columns to change the order of columns or to drag a column heading to the **Drag a column header here to group by that column** area.

Cross-Tab Data Editor

The **Cross-Tab Data Editor** shows Parameters as columns and sequences rows by date/time in ascending order and provides the same right-click menu as the Linear Data Editor.



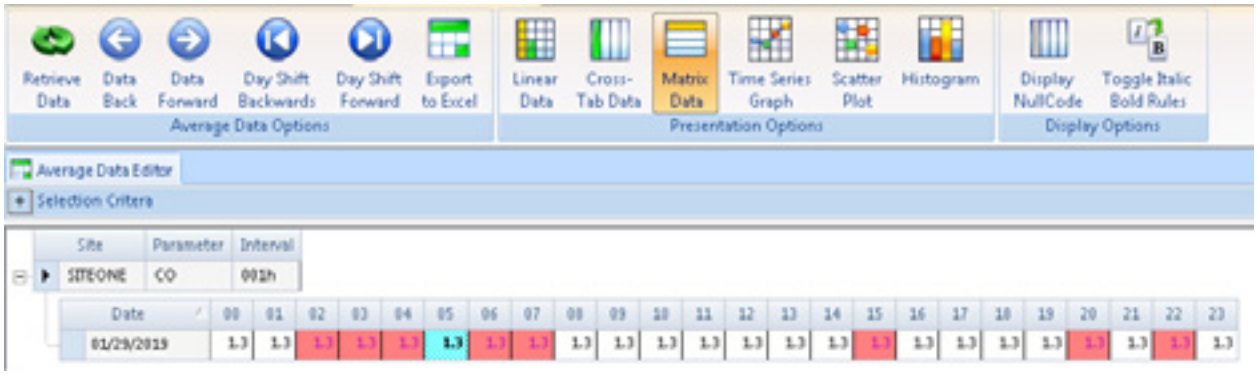
Cross-Tab Data Editor from Data Editors menu

▶ **Note:** You can sort data by any column by clicking on a column header You can find all flagged data easily, for example data grouped by data logger flag. Each group can then be expanded and individually sorted. When you change editor modes, the groupings are not kept.

Also, you can click-hold-and-drag columns to change the order, and click-drag columns to the **Drag a column header here to group** area to group data. If you do this accidentally or change your mind, you can drag it back.

Matrix Data Editor

The Matrix Data Editor presents data in a format similar to the monthly report. If you select multiple parameters, they are grouped with a plus (+) symbol for expansion.

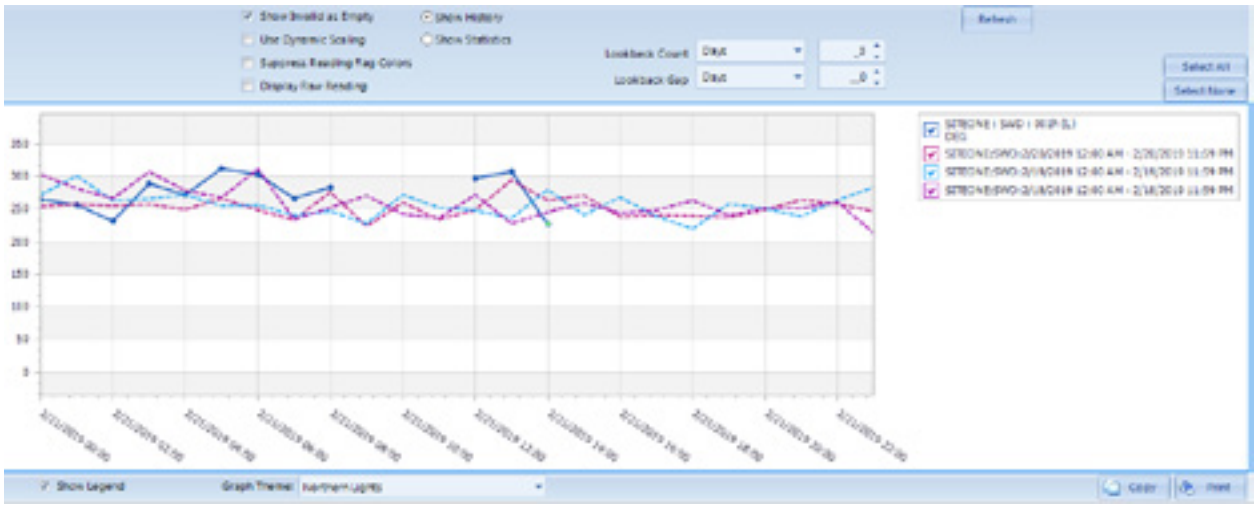


Matrix Data Editor from Data Editors menu

Time Series Graph

You can generate the **Time Series Graph** in two modes, for one or more parameters. In multi-parameter mode, you can group different parameters together for any time period. With the tools at the bottom or the screen, you can change the color scheme, remove or restore the legend, and print the graph.

The minus (-) sign in the upper left corner of the screen minimizes the selection criteria to make more room for the graph.



Time Series from Data Editors menu with multiple parameters selected

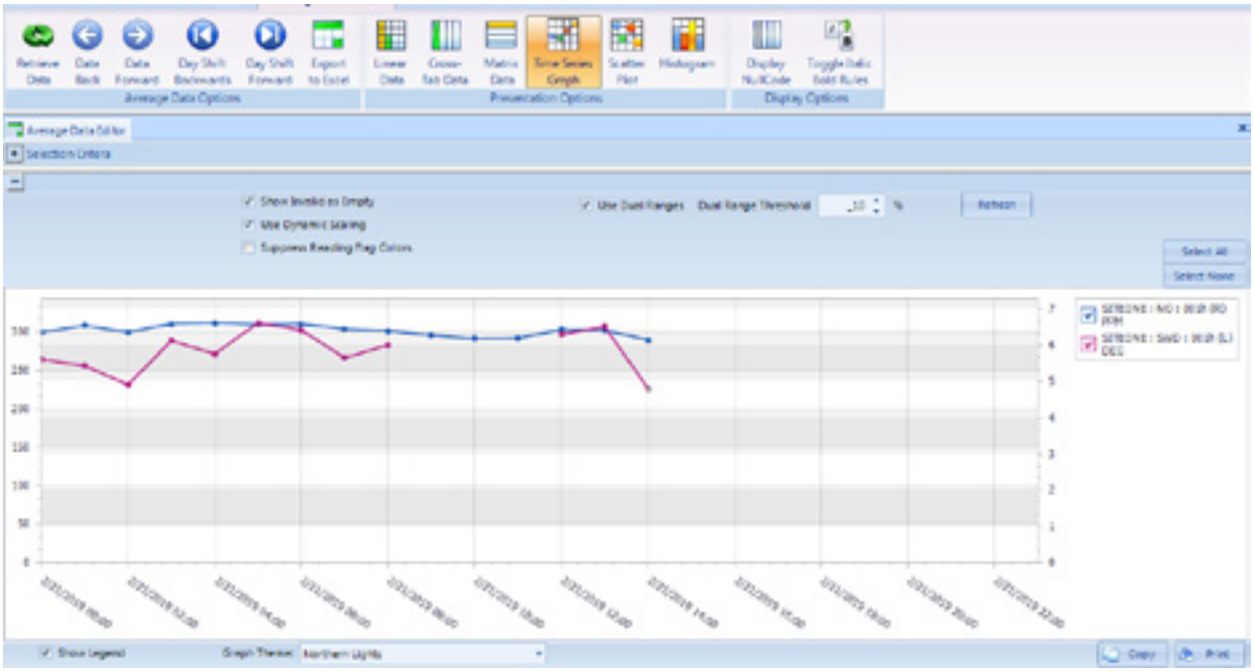
Use the mouse scroll wheel to zoom in or out; right-click and hold to drag the zoomed graph to a different data area.

Hover the cursor over a data point to see the specific date, time, and data value. If there is a flag on the data point the flag will also be displayed.

You can toggle between hiding or showing invalid data (e.g., data during calibration, maintenance, or analyzer failures).

When graphing parameters with two dramatically different full scale ranges, you may choose to use the **Dual Y-Axis Scale** option. When choosing this option, you must also choose the percentage (e.g., 10%, 20%) of the full scale range that is used as the 'breakpoint' for the secondary Y-axis. A value of 20% is common. Note that this function requires that Graph Maximum and Graph Minimum be set in the Parameter configuration. Graphs that have any parameters without limits configured cannot use the Dual Y-Axis function.

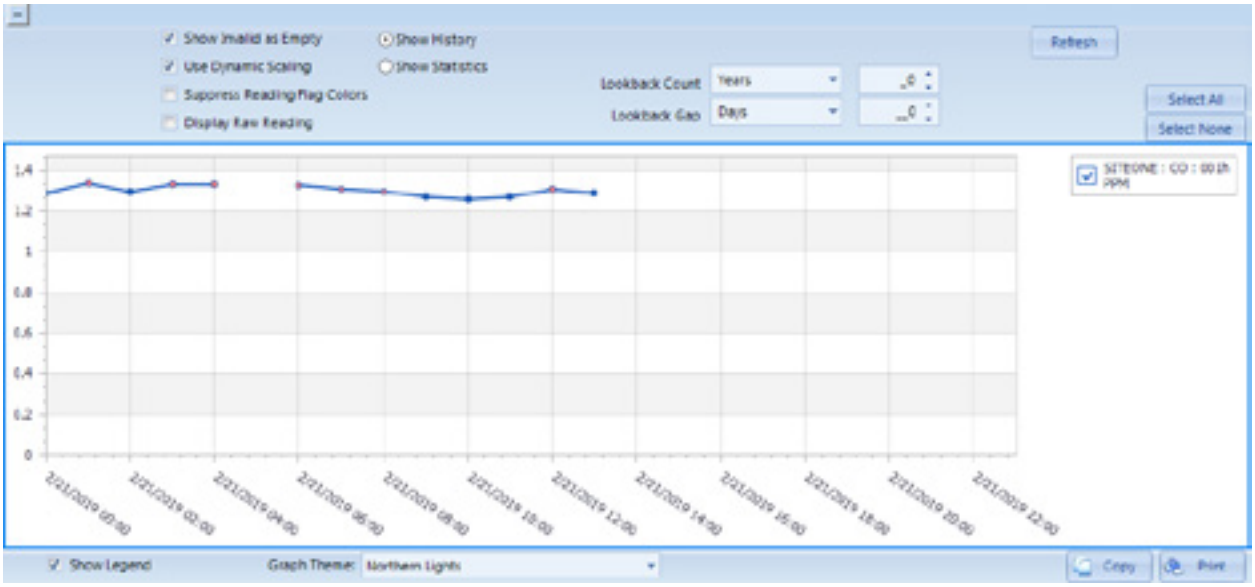
Suppress Flag Colors - If not selected, flagged data will be shown with “dots” with colors based on the Flag configuration. If selected, data will just be shown as the trend graph color. In both cases, hovering the cursor over the point will always show the flag, and the flag colors are still represented in the tabular/grid display.



Dual Y-Axis function

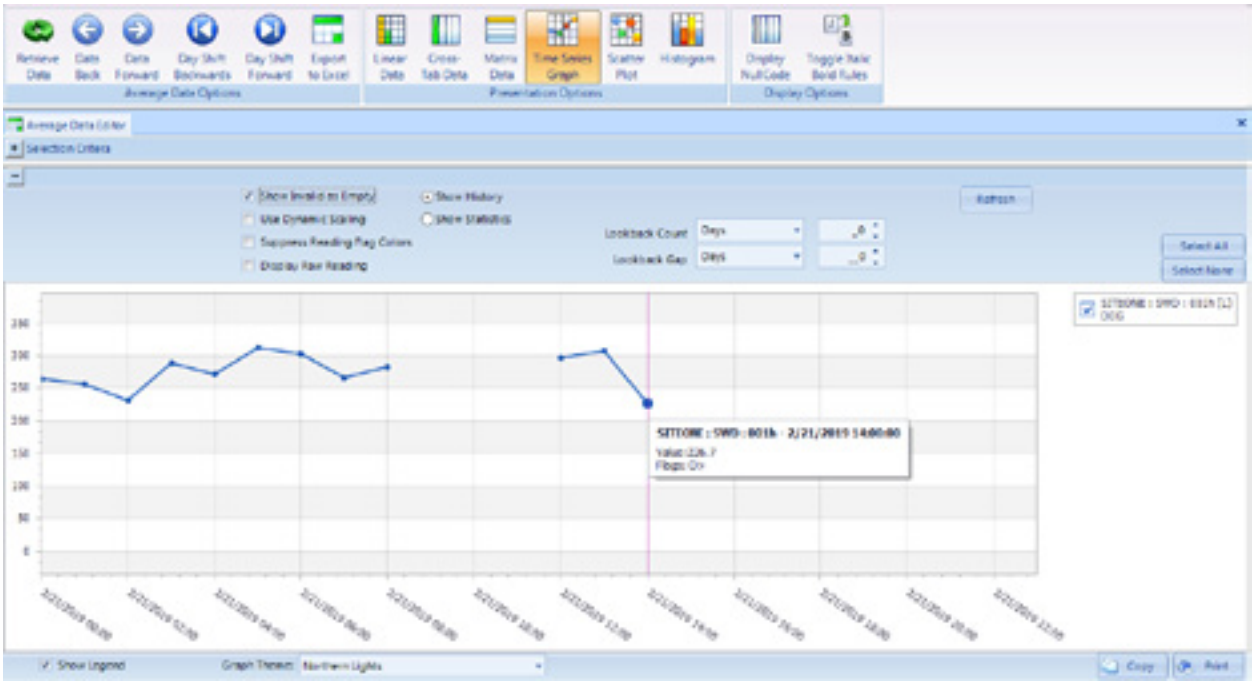
For one parameter, you can choose previous intervals to be other than one year by selecting **Show History** from the options above the graph. If you bring up the Time Series Graph in single parameter mode, you get additional options at the top of the graph:

- **Show Invalid as Empty**
- **Use Dynamic Scaling**
- **Show History** displays N previous years of data alongside main graph
- **Show Statistics** displays cumulative statistics of N previous years--min, max, avg
- **Lookback Count** select number of years, months, or days from the drop-down list
- **Lookback Gap** select number of years, months, or days from the drop-down list
- **Refresh** button must be clicked to show any changes to selections.



Time Series Graph with a single parameter selected

If the database contains data from previous years for the same parameter, those previous years can be graphed in the Time Series Graph alongside the current data by selecting **Show History** and the number of years you want to graph. Each previous year is graphed individually. Select **Refresh** to update the graph.



Time Series Graph with a single parameter and Show History option and hover over displaying date, and time data value

The **+/- Days** selector can be used to compile nearby days for the same hour into the comparison statistics. An example of how this is applied would be:

Current Data = 1/15/09,. Number of Years = 3, +/- Days = 1

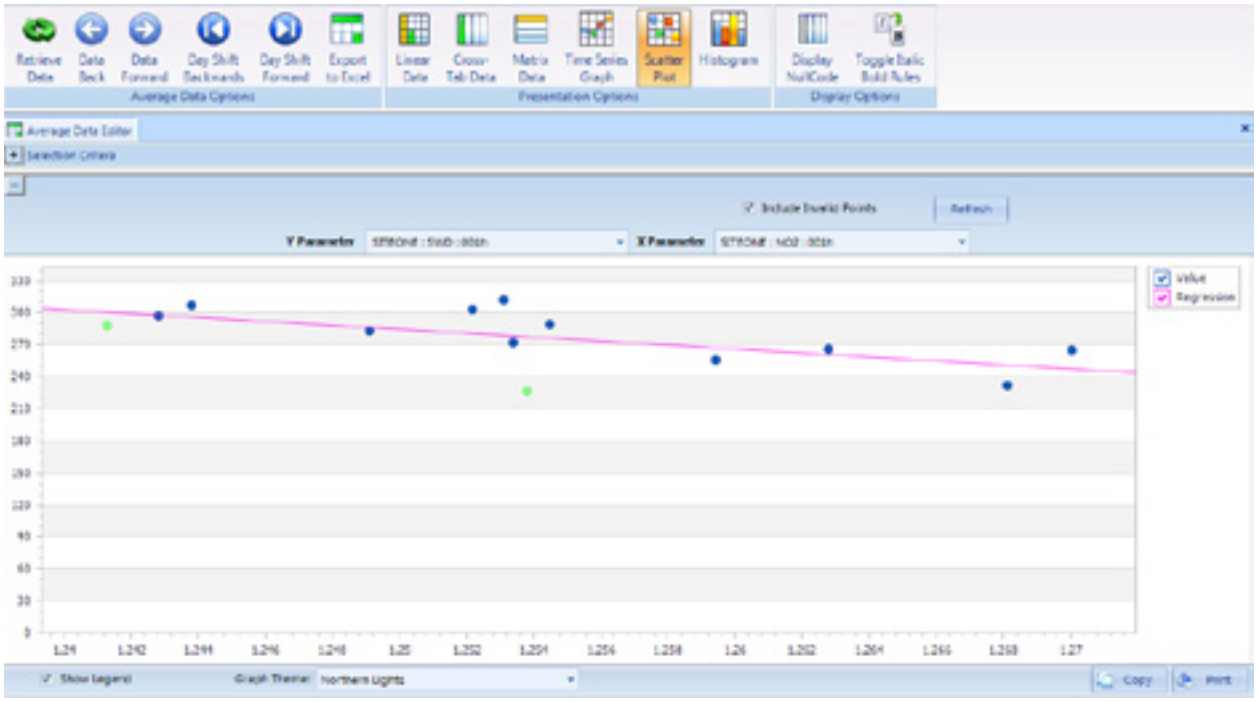
1/5/09 data at hour 00 would be compared against statistics using the following points:

1/4/06, hour 00
1/5/06, hour 00
1/6/06, hour 00
1/4/07, hour 00
1/5/07, hour 00
1/6/07, hour 00
1/4/08, hour 00
1/5/08, hour 00
1/6/08, hour 00

Obviously, selection of a large data set with a long look back period and large skews can be very processor intensive for the client and the SQL server for large data sets. Agilaire recommends this tool be used for data sets of roughly a week or less.

Scatter Plot Graph

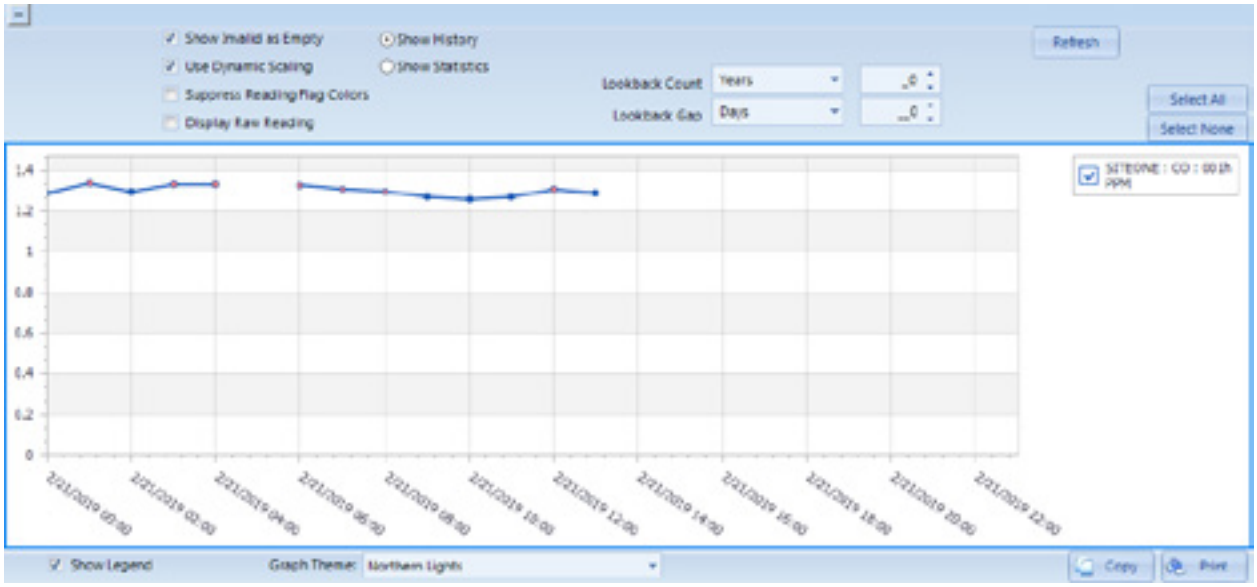
The **Scatter Plot Graph** allows any two parameters in the existing chart to be plotted in an X-Y chart. The Y axis parameter is the primary parameter and all data points are color coded according to the Data Flags color mappings to help distinguish outliers that have already been flagged.



Scatter Plot Graph from Data Editors menu with hover over displaying date, time and data value

Histogram

The **Histogram** provides a graph of the distribution of values for the entire data set, but it is designed to display only one parameter at a time, so be careful not to use multiple parameters. The default graph uses the graph maximum/minimum from **Configuration Editors** > **Site/Parameter**, but you can check **Override** to set a custom max/min specifically for the X axis of this graph.



Histogram from Data Editors menu with hover over displaying date, time and data value

LogBook Entry Editor

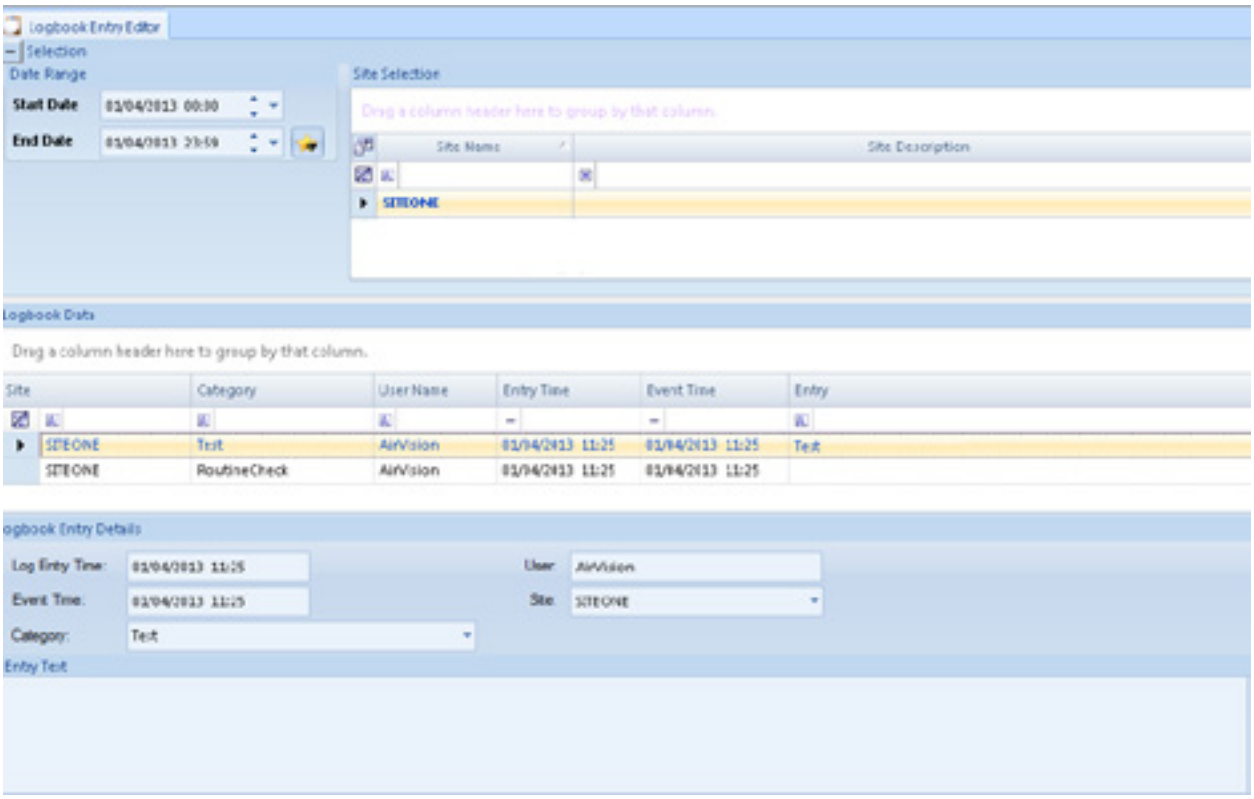
The **LogBook Entry Editor** allows you to make entries in a logbook that can then be seen in LogBook Reports. To make a logbook entry, open **LogBook Entry Editor** from the Editors menu.

Click the **New Log Entry** button in the upper left corner of the screen

In the bottom section of the screen enter a **Log Entry Time**, **User Entry Time**, select a **Category** from the drop-down list or select **New Category** and enter a different category, select a **User** and a **Site** from the drop-down lists

Enter the LogBook message in the **Entry Text** box and click **Save**.

The new entry information will be displayed in a row in the top section of the screen.



Adding LogBook entries in the LogBook Entry Editor from the Editors menu

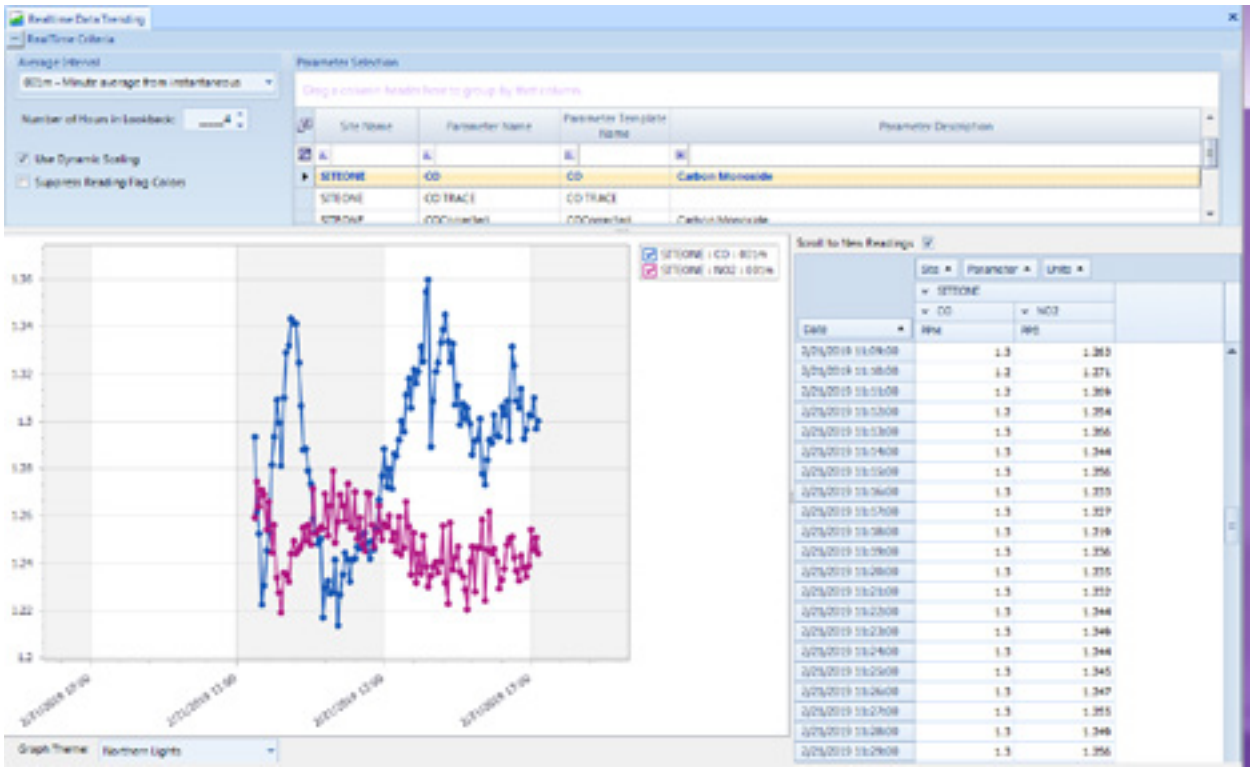
Chapter 5

Realtime Display Programs

AV-Trend has three main realtime display programs to keep you informed of the realtime status of the readings, calibrations, I/O status, and averages:

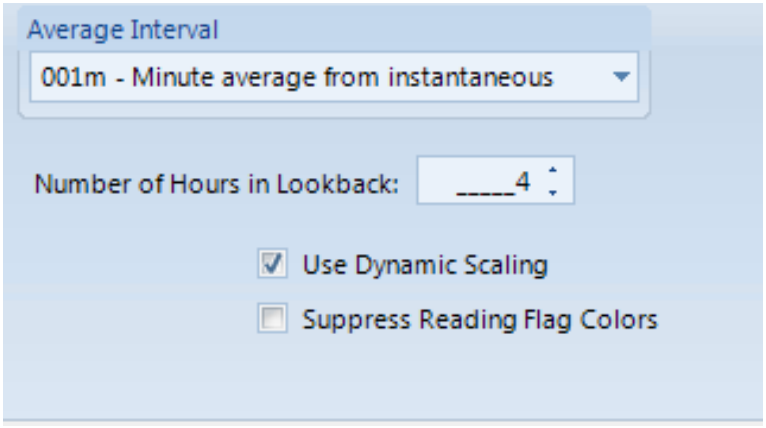
- **Realtime Trend** is the same display used by AV-Trend to provide strip-chart likes trends and basic tabular displays.
- **Tabular Display** provides a series of LED-like displays, which can be zoomed in to time-series charts. This display is very useful for mixing of multiple display averages (instantaneous, minute, hourly, etc) on the same page.
- **Site Node Logger Tool Box** is a blend of three tools:
  - **Readings** – current readings, and buttons to control / display maintenance or offline status of the channels; used to mark channels online/offline, or in/out of maintenance.
  - **Calibration** – shows the current status of calibrations, and allows you to start or abort a calibration program.
  - **Digital I/O** – show the current status of all physical or remote (Modbus) digital input/output points.

Realtime Trend Display



Status Displays>RealTime DataTrending, showing both Chart and Grid

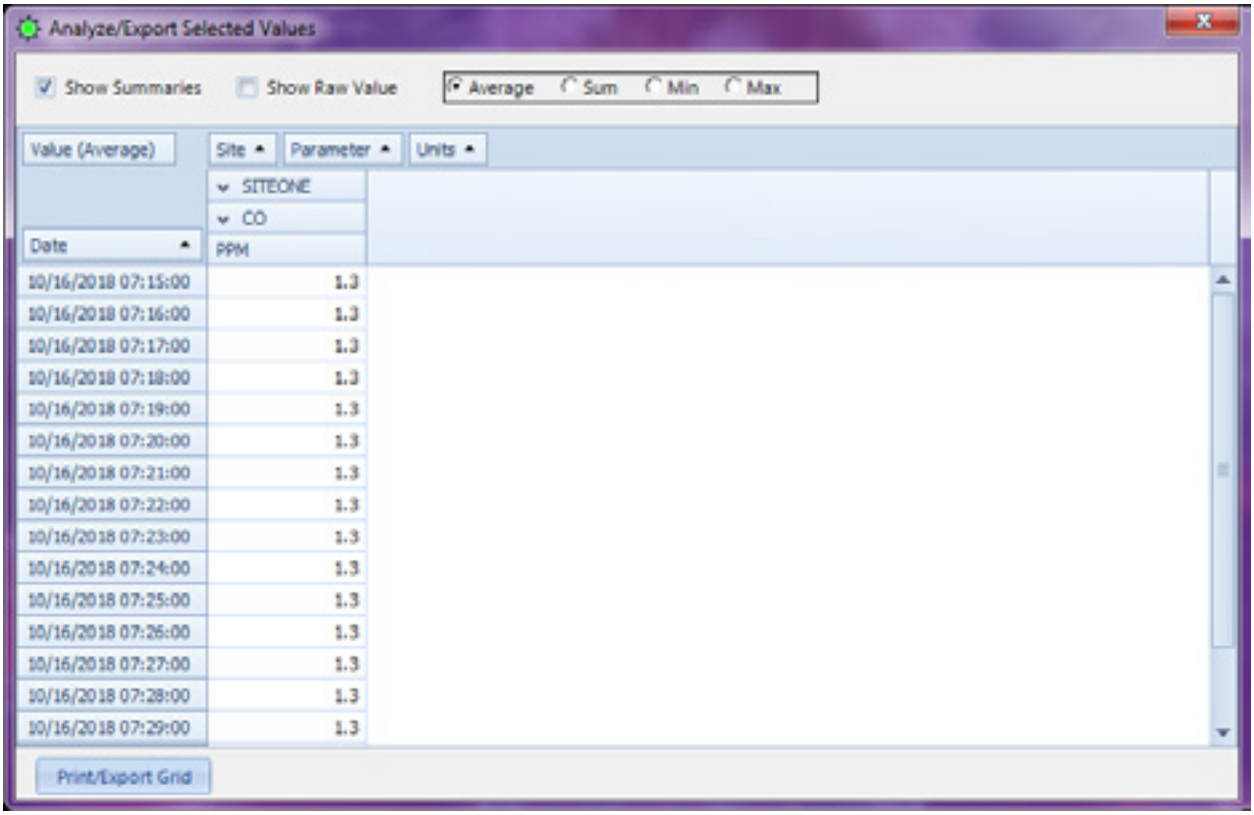
In the graph criteria, the user may select several customizations:



- **Number of Hours in Lookback** - This allows the user to dynamically define the width of the graph. After changing, the user should select "Manual Refresh" from the ribbon to take effect. This preference is stored with any Favorite created.
- **Use Dynamic Scaling** - If selected, the data graph min/max is set based on the range of data, rather than the graph min/max configured in the Parameter settings editor.
- **Suppress Flag Colors** - If not selected, flagged data will be shown with "dots" with colors based on the Flag configuration. If selected, data will just be shown as the trend graph color. In both cases, hovering the cursor over the point will always show the flag, and the flag colors are still represented in the tabular/grid display.

Within the Real-Time Trend the user may right-click a data point or a highlighted batch of data points, and select between two options:

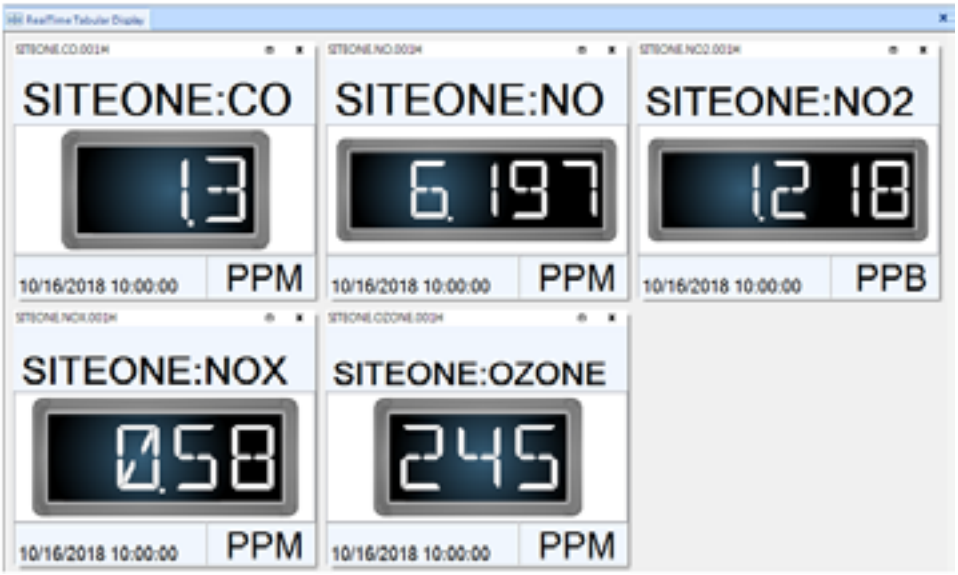
- **Annotate Selected** - this will allow the user to add a text annotation to the data, which will appear in future use of the Data Editor, or can be recalled in the Annotations Report.
- **Analyze Selected** - this will bring up a box, allowing the user to see an average, or other statistics of only the selected data points. This is commonly used to average calibration or test "runs" of data. The results can also be printed or saved using the "Print/Export Grid" button.



Analyze/Export Selected

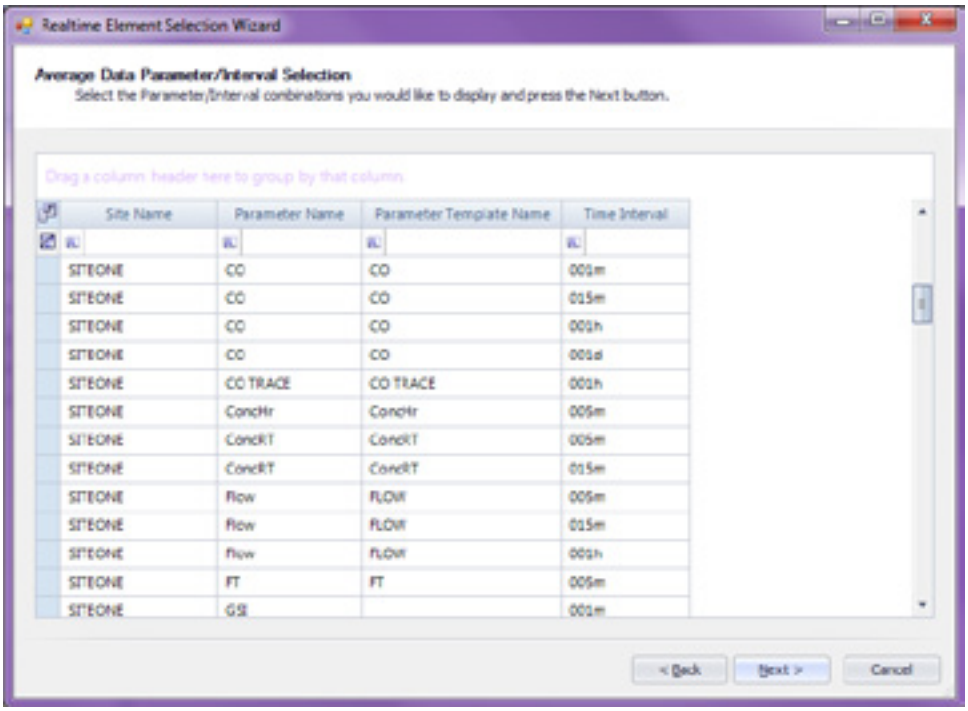
Tabular Display

The **Tabular Display** provides a series of LED-like displays, which can be zoomed in to time-series charts. The chart display is very useful for mixing multiple display averages (instantaneous, minute, hourly, etc) on the same page. Boxes can be dragged to create a custom layout, and the layout can be saved for future recall. Because of the complexity of the elements in the layout, they are stored separately than the regular Favorites system.

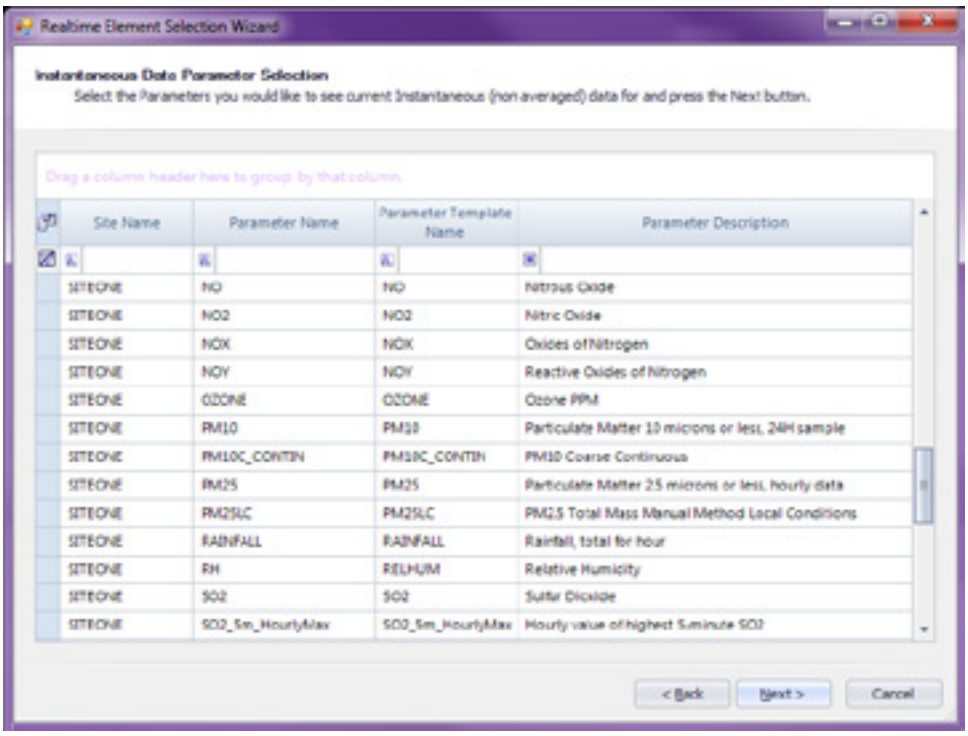


Create a new layout by clicking the Select Display Elements icon from the ribbon

You can use the filter fields to narrow parameter names and, more importantly, average intervals, if needed. The form supports standard Windows drag-select, shift-select, and CTRL-select actions. Note that the display will support multiple average intervals, so it is possible to mix minute and hourly data (e.g., analyzers and BAMs) on the same screen. Instantaneous data panels are selected on the next page.

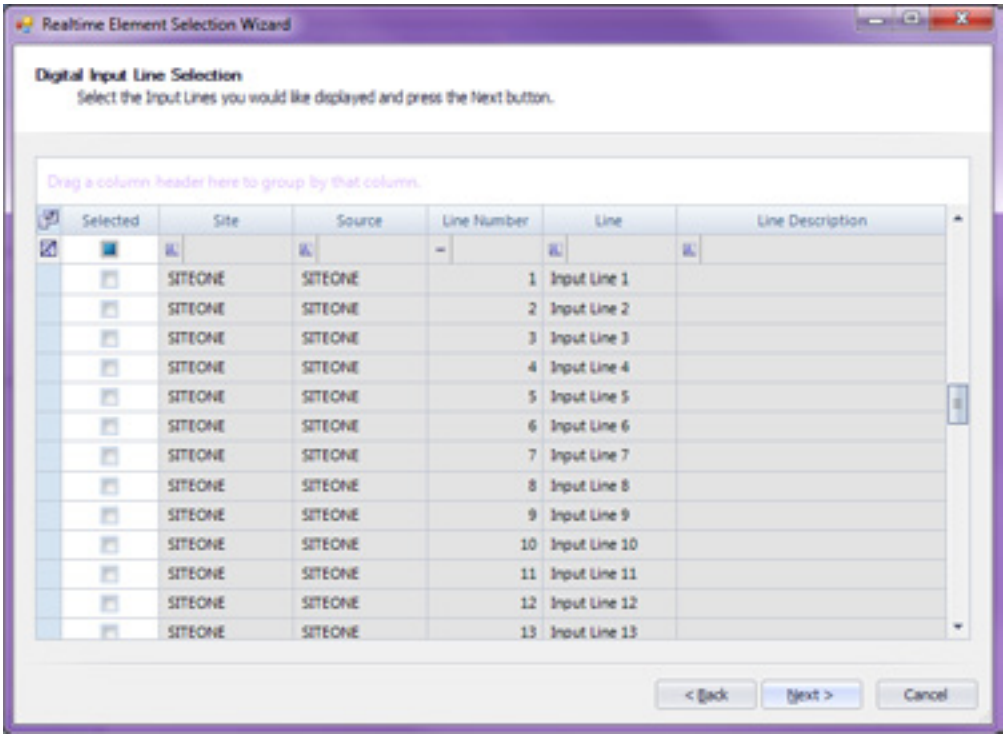


Realtime Element Selection Wizard--Average Data Parameter / Interval Selection



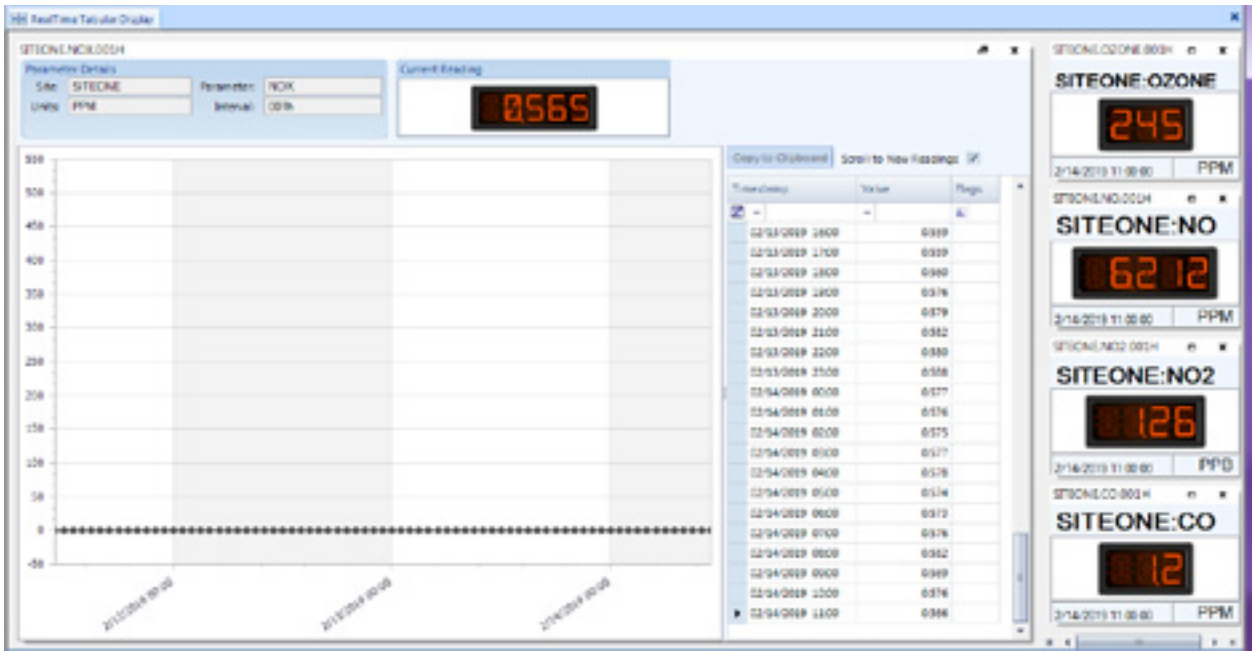
Realtime Element Selection Wizard--Instantaneous Data Parameter Selection

Finally, the Wizard asks if you want to view the realtime status of any digital input status lines. Select lines by clicking the left-side check boxes.



Realtime Element Selection Wizard--Digital Input Line Selection

Once the wizard is finished, the display will start and begin updating. Panels can be dragged into any desired order/arrangement by click-drag (click and drag from the **title bar** area at the top, above the large-font name). Panels can be eliminated by clicking the **X** box in the upper right. To zoom into a particular reading, click the expand box to the left of the **X**.



Updating Display with movable Panels

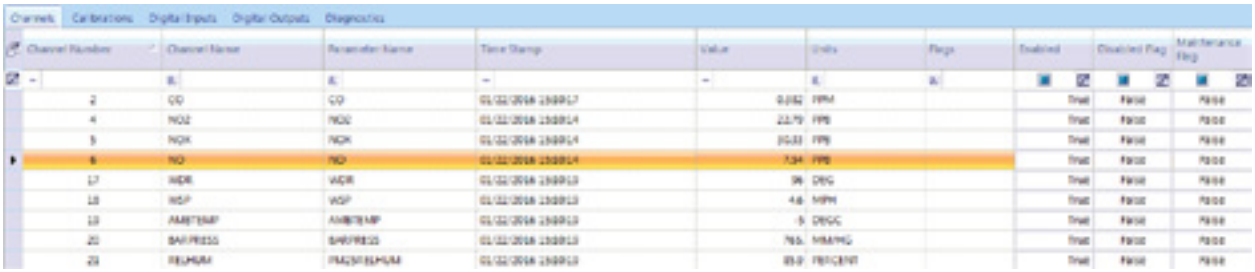
The other panels will minimize, and the selected parameters will expand into a trend chart, with an LED panel, still updating the current reading / average. For instantaneous data, the duration of the display can be modified if needed. Instantaneous readings default to show the previous 5 minutes, while charts of averages are longer. Instantaneous readings also have an option to show a trendline of the general direction of the newest readings.

To return the display to its previous mode, click the resize button (two stacked windows) next to the **X** close box.

Site Node Logger Tool Box

The **Site Node Logger Tool Box** contains four tabs:

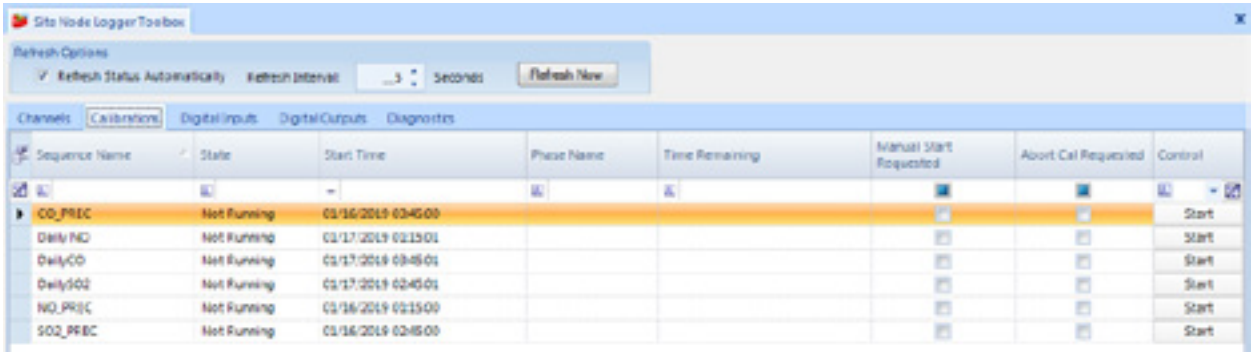
- **Channels Tab** shows the current of readings of all channels (analog input, serial, or Modbus), as well as provide buttons to control and display the disabled (**D**) and maintenance (**M**) status of each channel. To mark a channel in/out of maintenance or to mark/unmark disabled, click the button.



Channels Tab

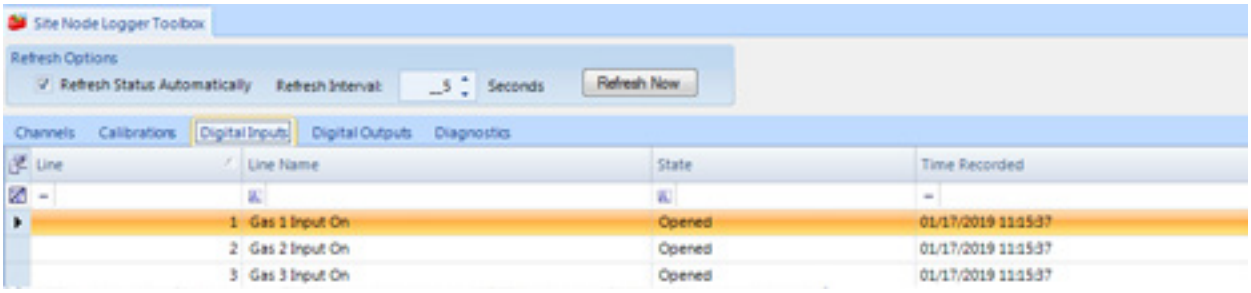
The **Enable** button can be used to enable or disable all data acquisition to an instrument - this is the recommended approach for a Modbus/GSI instrument that is removed or powered off.

- **Calibrations Tab** shows the current status of all configured calibration programs, as well as provide buttons to start or abort those calibrations.



Calibrations Tab

- **Digital Input and Output Tab** shows the current status of all status input output lines, both for physical inputs and remote (Modbus) lines. No control functions exist in these displays.



Digital Input and Output Tab

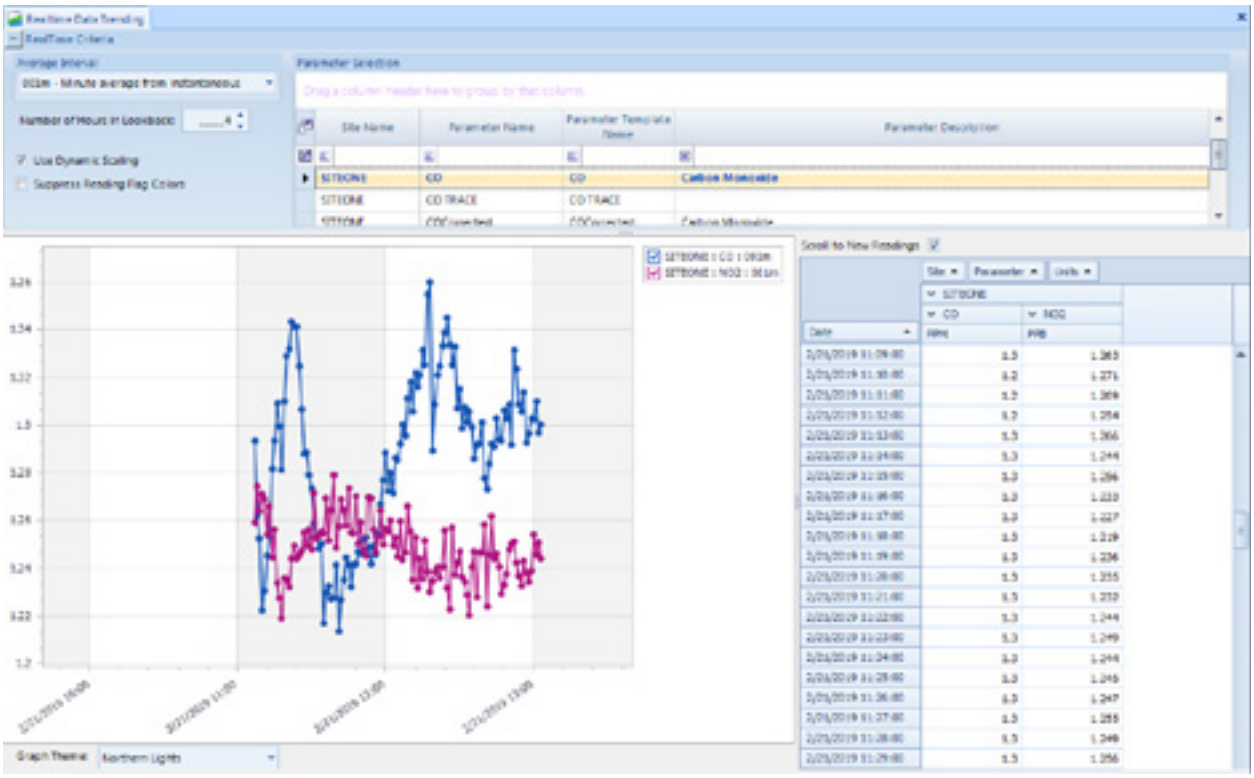
Realtime Trend

The Realtime Trend provides a time-series view of data that continuously updates. Any number of Realtime Trend tabs may be opened, and they can graph any average interval available in the system (most commonly 10 second and 1-minute trends).

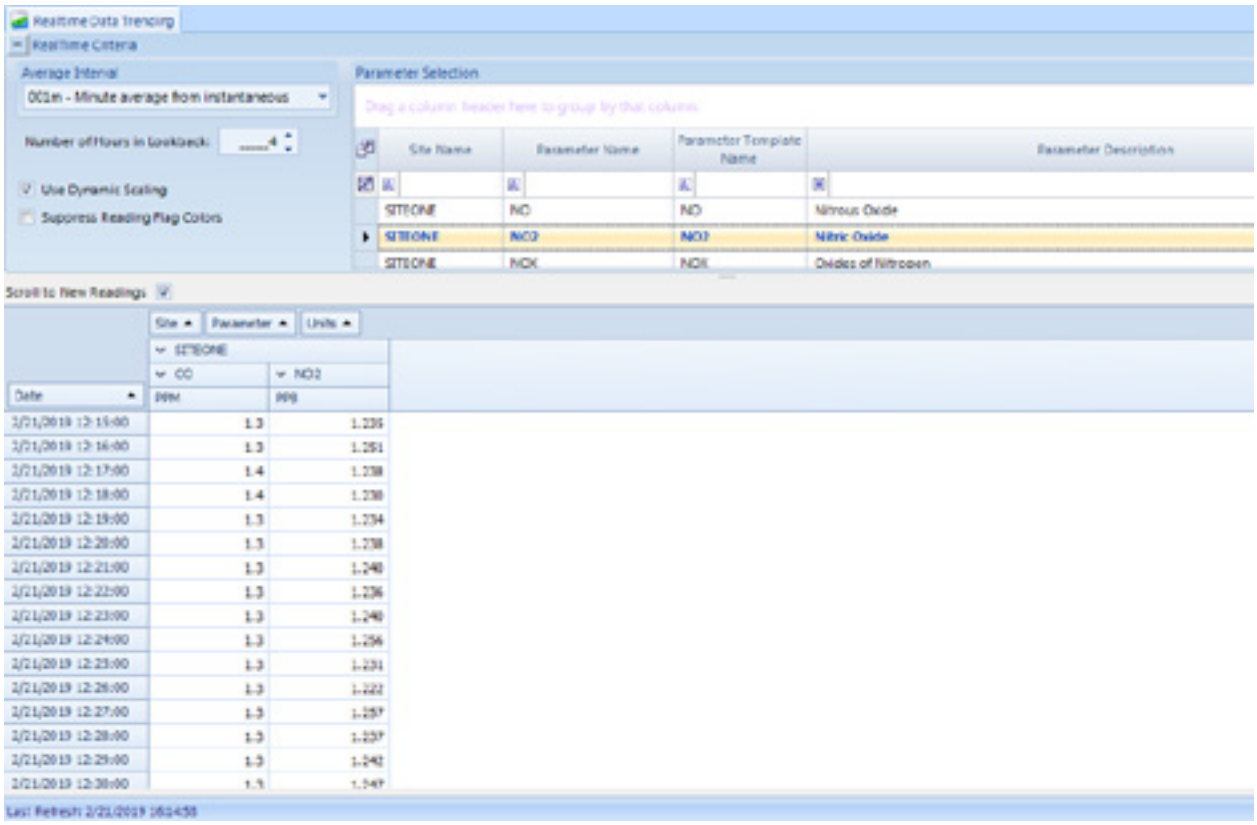
▶ **Note:** Because Favorites can be used to store Realtime Trend settings, and can be set to automatically open on startup, it is simple to define some screens to open automatically on the client launch (and by putting the Client in the startup folder and storing the login username and password), the PC can be set to start up the client and the default trends on PC reboot.

To create a new trend, select **Status Displays>Real Time Trending** in the menu. To query a report, select parameters and averaging interval. Select **Automatic Refresh** from the menu for a continuously updating trend.

By default, the screen will show both a time-series plot and a grid list of data points on the right side. By using the **Show Grid** and **Show Chart** ribbon buttons, you can define whether you want a chart (a list of numeric readings, good for a large number of parameters), or both a chart and grid.

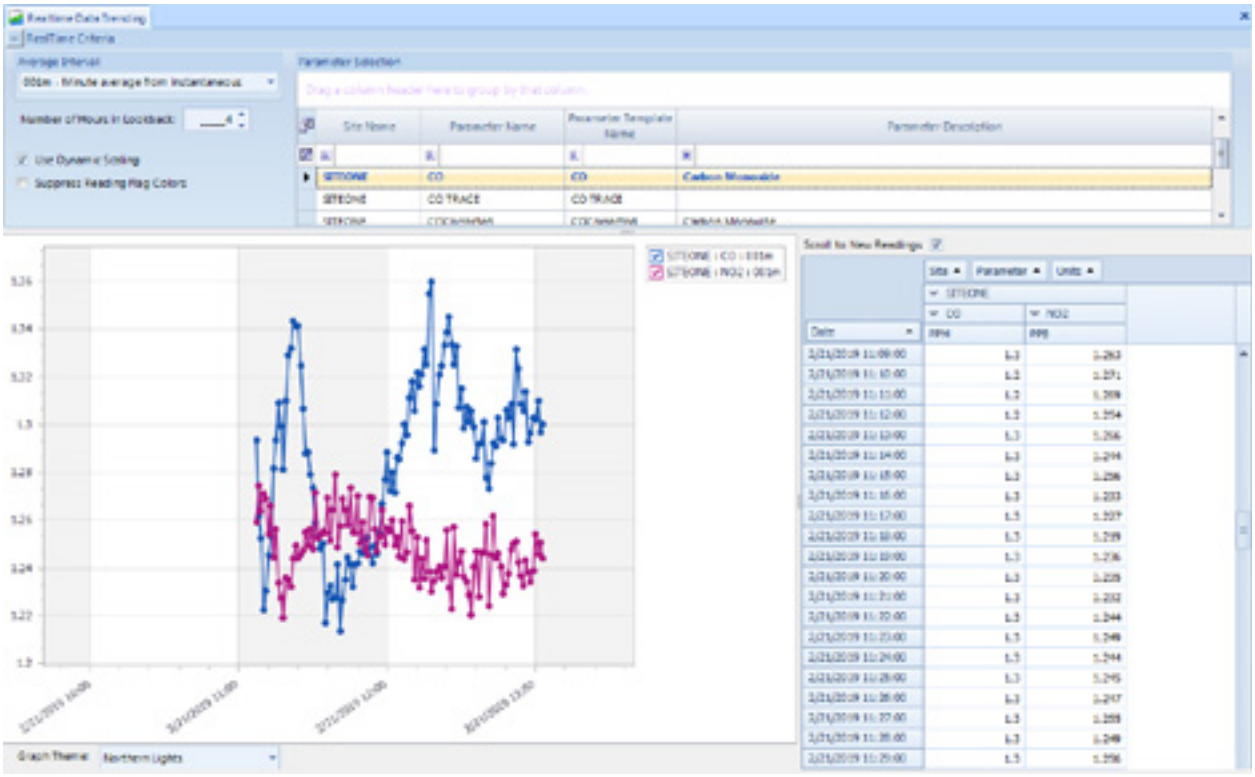


Status Displays>Real Time Trending Graph showing both Chart and Grid



Status Displays>Real Time Trending Graph showing Chart only

Hover the mouse pointer over a data point on the graph to see details of exact time and value.



Status Displays>Real Time Trending Graph with mouse hover on data point

Additional Ribbon functions:

Print or Export the Chart or the Grid (HTML, CSV, XLS, BMP, JPG, etc)

Select a range of data in the grid and open that data in the Data Editor.

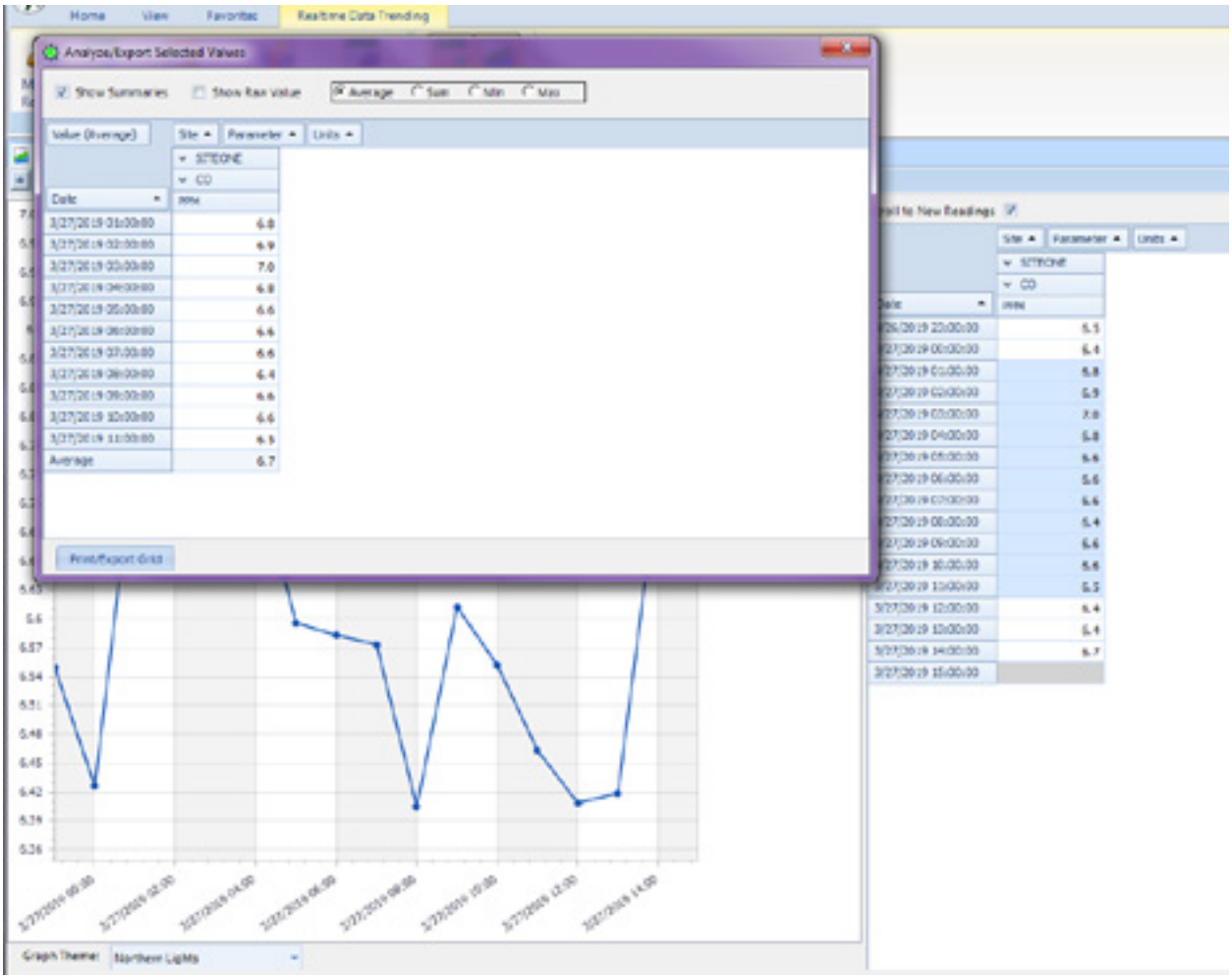
Adding Annotations

To add an annotation to the realitme graph, first make sure **Show Grid** is enabled, then right-click to select a range of data and add your comment.

Right Click Data

Within the Real-Time Trend, the user may drag-select and right-click a list of data points. The user is then presented with two options:

- **Annotate Selected** - this will allow the user to add a text annotation to the data, which will appear in future use of the Data Editor, or can be recalled in the Annotations Report.
- **Analyze Selected** - this will bring up a box, allowing the user to see an average, or other statistics of only the selected data points. This is commonly used to average calibration or test "runs" of data. The results can also be printed or saved using the "Print/Export Grid" button.



Right Click example

Agilaire's Help and Support menu offers these four options:

Agilaire Support

Agilaire Support is a link to the Agilaire website, www.agilaire.com. You can reach our support staff at: email: support@agilaire.com
Phone: 865-927-9440, press 2

AV-Trend Manual

If you select AV-Trend Manual, you will see a pdf of the latest User's Manual. You can also download the manual from our website, www.agilaire.com.

Video Tutorials

On the web, visit: agilaire.com/training/video-training-resources

Software Release Info

This option directs you to a website with information pertaining to new releases of Agilaire software.

© 2019 Agilaire, LLC All rights reserved. All other trademarks are the property of their respective holders. Specifications, product configuration, and availability are subject to change without notice.