

Events Reference

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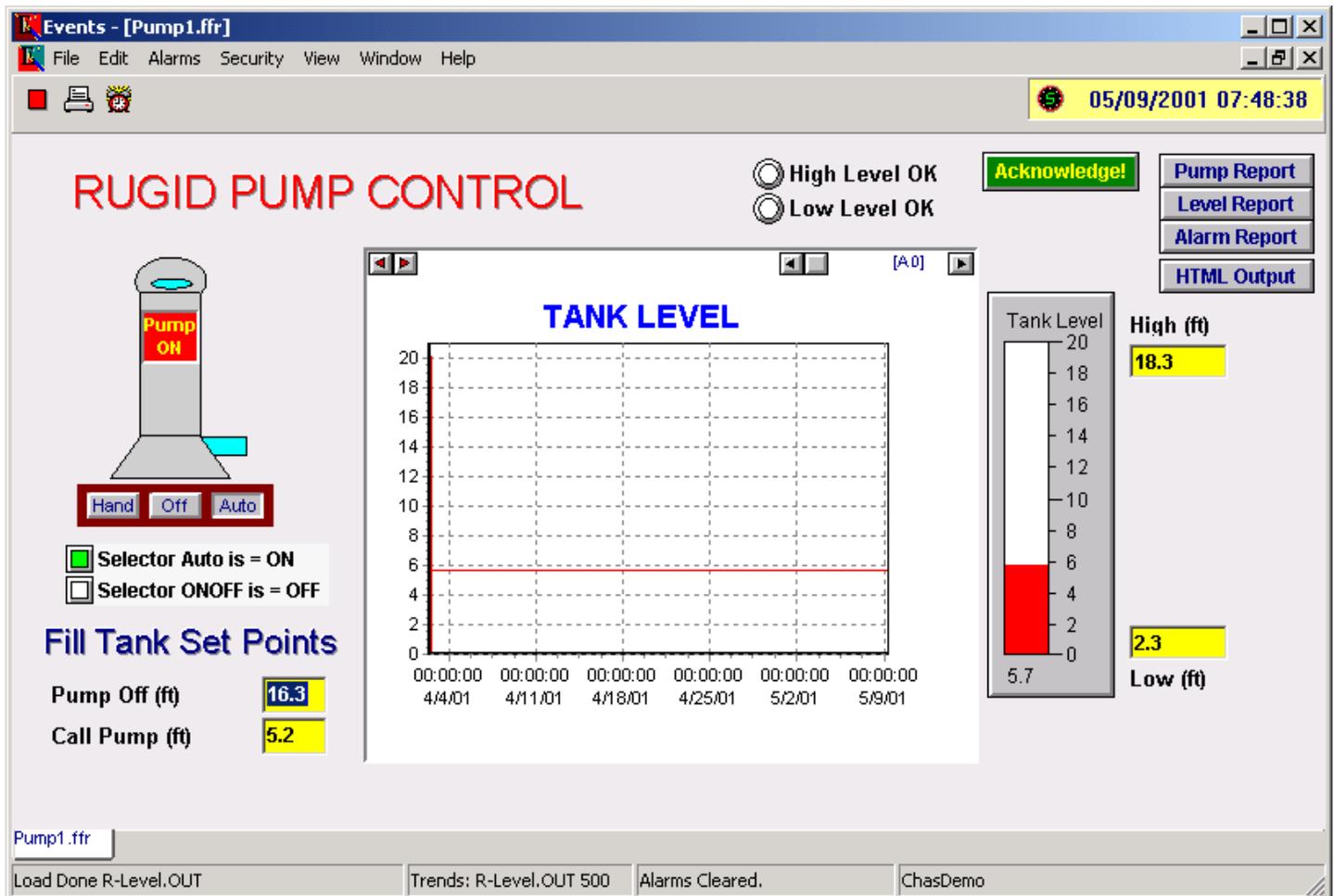
1. Startup

1.1. Welcome

Welcome to EVENTS

EVENTS is a Windows 95, 98, NT or 2000 software program for ALERT and MODBUS applications. EVENTS communicates with Modbus RTUs and ALERT decoders for monitoring and control of sensors and devices. EVENTS provides a graphical display interface, alarms, binary database, SQL editor, report generator, security, and scheduler. EVENTS includes the design and runtime interface in one package. There are no limits on the number of sensor data points you can set or use. EVENTS standard window's interface and setup tools make it easy to design new screens and reports for your application.

The scheduler tasks are triggered by timers, buttons, alarms or other inputs. Database reports, forms, statistics, alarms can be output as an HTML file or as a CSV or TAB text file. If the email option has been enabled, these reports can be sent to your office via email.



EVENTS screen display

General Description

EVENTS is written for Windows 95, 98 or NT operating systems. Windows 95, 98 or NT was chosen as the base platform because of its multitasking capability and handling of computer resources. EVENTS is an object-oriented program: each visual component is an object (Trends, Tanks, Valves, Pumps, Annunciators, LED Displays, Images, Labels, etc.). Every component stores its own display properties and sensor data properties. Once you have created a new component and set its properties, the program updates the component whenever a change is measured.

Run Mode vs. Edit Mode

The program can be toggled from run mode to edit mode by selecting the Edit | Run menu item, or by clicking the red square, run button. Clicking this button changes the state of the program from Edit Mode to Run Mode. When in the edit mode certain functions are disabled until you go back to the run mode. To switch back to the run mode, click the green arrow, run button.

Toolbar

Creating new display objects are easy. Click once on a component button in the toolbar to create a new component. A

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1.2. Installation

Installing EVENTS

1. Insert the disk(s) into your floppy disk drive.
2. Press the Windows 95, 98 or NT Start Button.
3. Select the Run Command.
4. Type A:.\EXE and press Enter.
5. Follow the dialog prompts.
Install EVENTS in a directory of your choice.
Note: If you use the default directories, updates will install directly without directory changes.
7. Enter EVENTS into your program directory.
8. Run EVENTS.

Install Events in the default directories.
Upgrades will install to the proper location and overwrite the files needed.

1.3. Quick Start

Starting:

Start Events:

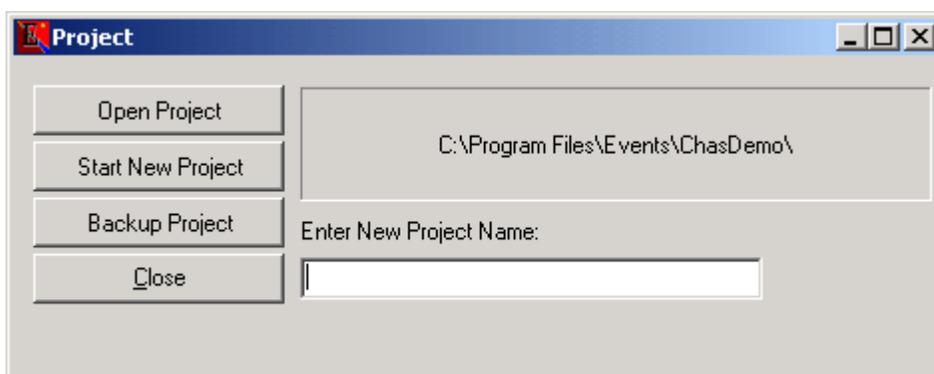
1. Find the Events folder on your hard disk. Normally C:\Program Files\Events\Events.EXE
2. Double Click on the Events Icon.
3. Events opens that last project or the demo project.

Changing Projects or Open Existing Project:

1. To open an existing project, you select the menu item File | Project.
2. Click on the Open Project button.
A dialog box will be shown which is asking you to select a project initialization file.
3. This project initialization file will be in a previously created project folder.

If you try to open the EVENTS.ini or the current project initialization file, you will be asked to select another file. The project folder can be anywhere on your hard drive.

typical project folder: C:\Program Files\Events\Atlanta\
typical file to open: C:\Program Files\Events\Atlanta\Atlanta.INI



Note: the current project will saved automatically when a new project is opened.

Security:

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Status bar at bottom shows the current user: superuser, then alarm messages and project name.

You must be logged on to make changes in Events. The default user is superuser (all lowercase letters) with no password. After 1 hour of no use, Events will automatically log off. You must log back on to go into editing mode.

Logging On the First Time:

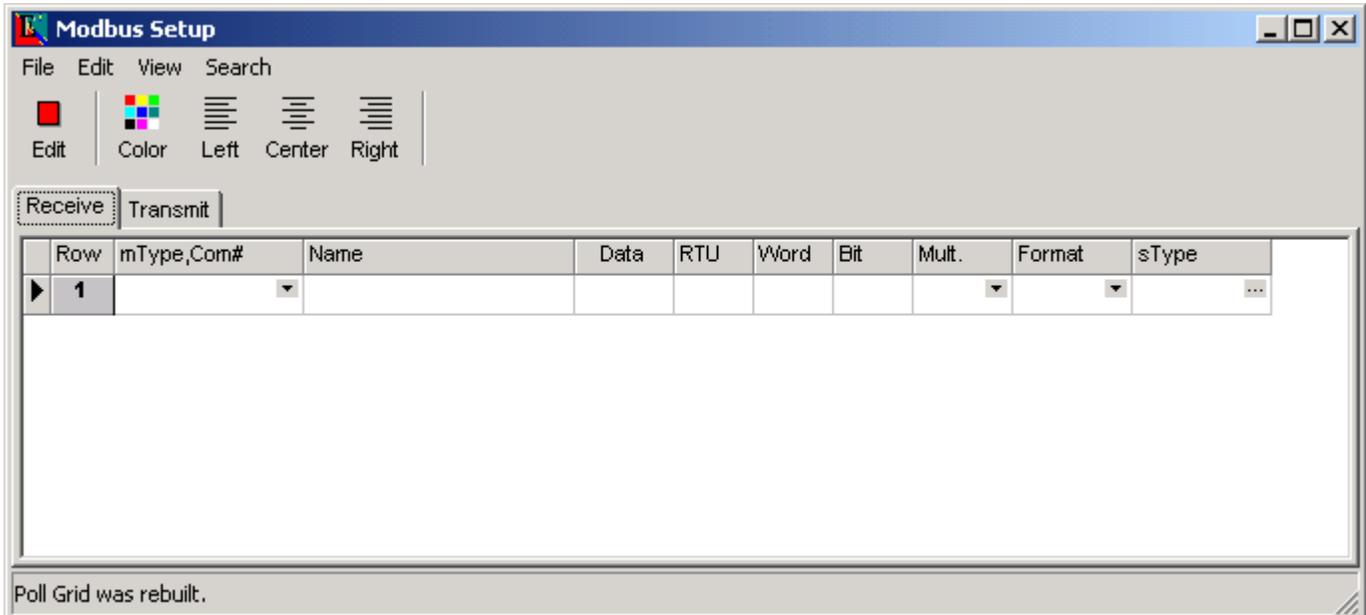
1. Select: the menu item Security | Log On
2. Type: superuser (in lowercase) in the Name edit box.
3. Don't enter a password.
4. Press return or the OK button.
5. Current User: superuser should be shown in the status bar.

Do the Background Work FIRST!:

Data displays, SQL statements, reports, and the scheduler references data in the Modbus Setup grids and Files and Alarm Grids.

Define I/O (Inputs/Output)

1. You should try to define the Modbus grid first and then Files and Alarms.
2. Files and Alarms includes your database, statistics, alarms, rate of changes, messages, and defined sensors.



Empty Receive Modbus setup grid in run mode.

Build the Receive Grid

1. First get into the Edit Mode by clicking on the Red Button.
2. A toolbar will be shown.



Toolbar for Modbus setup in edit mode.

3. Add several rows by clicking on the Add button.
4. Enter in the top row 1st and then use Edit | Fill Down to speed up your work. You must first select the cells and then fill down. See Grid Editing.
5. [Column 2: mType,Com#]: Enter RUG9,Com1

RUG6,Com1..RUG6,Com10 or RUG9,Com1..RUG9,Com10. Click on the down arrow combo box to select one of these choices .

note: RUG6 is a modbus binary protocol that has offsets and is used with Rigid Computers older product line (RUG6, RUG7 and RUG8). The RUG9 is a standard binary MODBUS protocol used by most RTUs including the Rigid's RUG5 and RUG9 RTUs. The receive grid defines the polls to a master RTU. Events uses a MODBUS type 3 message to poll the master. It is setup to poll 60 words at a time, until all messages are done. Status or bit information is defined as words and bits. Events polls for the status word (register) and breaks the word into 16 status bits (0 or 1). If you want to poll a coil, you just poll the register address and have the status bit defined in the Modbus grid.

6. [Column 3: Name]: Enter a unique Sensor Name (upto 48 characters): Level1
7. [Column 4: Data]: Enter 0 for now.

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8. [Column 5: RTU]: Enter the Modbus Slave Address (normally 1).

note: The PC is the Master and the Master RTU is the Slave.

9. [Column 6,7: Word & Bit]: The word is the Master RTU's register address.

note: The Word and Bits must be entered in sequence, lowest number to highest number. Be sure to click the Check Button to test for errors in this grid.

10. [Column 8: Multiplier]: 1 for units or 0.1 for tenths or 0.01 for hundreds. The Master RTU should multiply this register by 1 or 10 or 100 to match these settings.

11. [Column 9: Format]: Decimal display format, 0 for units, 0.0 for tenths, 0.00 for hundreds.

12. [Column 10: sType]: Integer or Status

note: MODBUS transmits data as small integers (-36768 to 36767). In Events Integers are converted to real numbers by the multiplier and format columns. Status Registers are 1 bit out of 1 register (word). Events reads the register and converts the status bit information into a 0 or 1.

13. Add as many rows as needed. Don't leave any blank rows. Delete blank rows by selecting a cell in the row and pressing the delete key.

14. Press the check button to check the grid for errors.

15. Goto the edit menu and select Edit | RebuildPollGrid.

16. The communications grid will be build from the Modbus Grid.

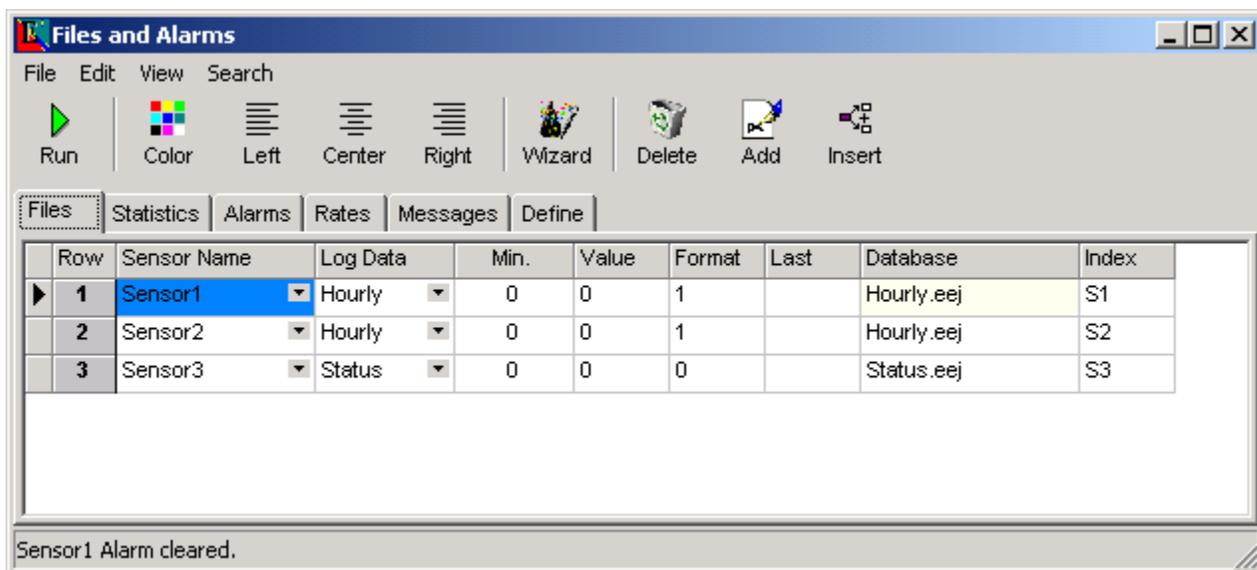
Build the Transmit Grid

The transmit grid is used to send set points and commands to the master RTU. You can send integers and status bits. Events sends single messages in a type 6 MODBUS format and multiple messages in a type 16 format. If you select from the main edit menu to Write Form Setpoints, Events will write all assigned transmit setpoints to the transmit grid and ask you if you want to send them to the master RTU. If yes, Events writes a type 16 message to the master RTU. Events also writes a type 16 message to the RTU on start up.

Go to Files and Alarms

The databases, alarms, statistics, rates of change, text messages, and defined sensors are configured in the Files and Alarms Form. There is a wizard to help configure the database, alarms and statistics. You should use the wizard first to see what is required for each. Then by using the grids fill down feature, you can copy cells quickly and make minor changes to make each row unique.

Build your databases



Files tab is for setting up your databases. See Files and Alarms for more information.

1. Databases should include sensors of like types.

note: The SQL editor only works on one database at a time. One sensor can be stored in more than one database if needed. If a sensor is going to have alot of data in it, you may want a database to store one senosrs data only.

2. Enter the Sensor Name. Click on the drop down arrow to select a sensor name.

3. Enter the Log Data Type. The choices are OnMin, Hourly, Daily, OnChange, and Status. See Database

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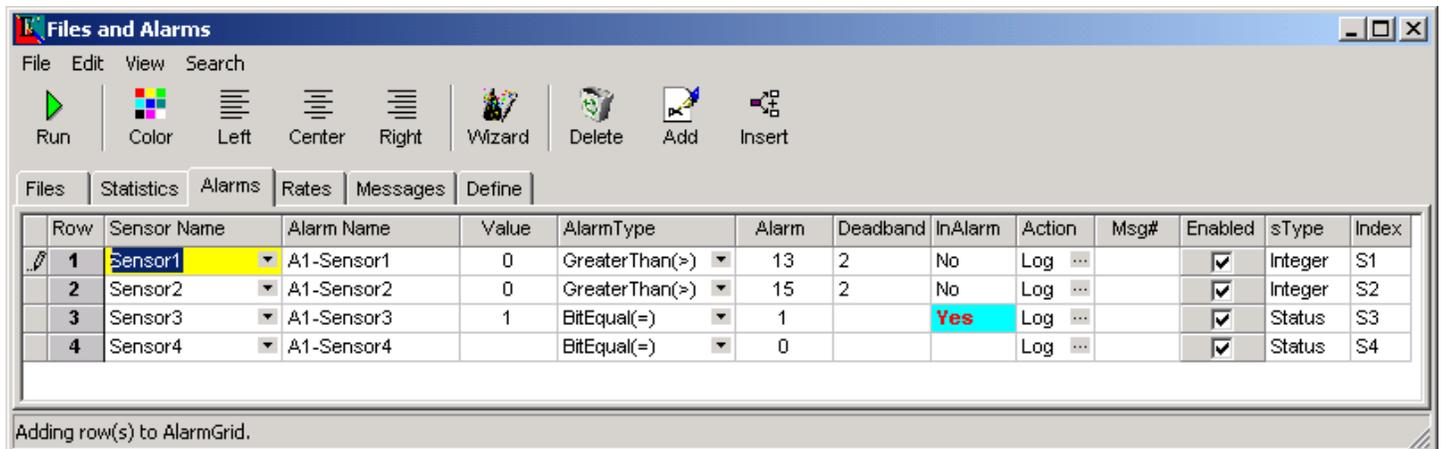
recommendations for this item.

4. Enter the minute you want to store the data. If OnMin is selected and the Min = 15 then you will be storing data every 15 minutes. If Hourly is selected and Min = 15 then you will store data once an hour on the 15th minute. Status and OnChange databases don't use the Min. column.
5. The Value is inserted by the program. Skip Value.
6. The Format column is the number of decimal places to store the data. OnChange will use the format column where Status only stores 0s or 1s.
7. The Last column is used by the program. Skip Last.
8. The Database column is the database name used to store data. The extension ".eej" must be appended to the database name for Events to store and retrieve data from a database. Typical examples are: Battery.eej, Levels.eej, Pressures.eej, Flows.eej, PumpRun.eej.
9. When your done, delete empty rows by selecting them and pressing the delete button.

Build statistics

Use the wizard to build statistics. Select the sensors in the order you want then shown in the grid. The scheduler can output statistics as an HTML file or other text formats when needed.

Set Alarms



Alarms are configured in the Alarms tab of the Files and Alarms. The Alarm output can be used in the scheduler as a trigger. It triggers when in alarm and resets when it goes out of alarm.

1. Enter the Sensor Name. Click on the drop down arrow to select a sensor name. Sensor1 could have multiple alarms if needed. Only the alarm name needed to be unique.
2. Enter the Alarm Name. The wizard defaults to A1- (Alarm1) plus the sensor name. You can enter any name needed. These names need to be unique.
3. Skip the Value column.
4. Enter the Alarm Type: Click on the drop down arrow to select an Alarm Type.
5. Enter the Alarm Setpoint: Status sensors should only have alarm setpoints of 0 or 1. All other types can have any numerical value.
6. Enter the deadband for analog type alarms. The deadband is used after an alarm condition exists. When a greater than (>) alarm condition is met. The alarm condition will continue until it drops below the set point plus the deadband. The purpose of the deadband is to eliminate alarms that might be at the threshold of alarming causing multiple alarms.
A stream could be near the alarm set point, setting an alarm and then clearing right away. You can eliminate this condition by setting a deadband where the stream has to drop below the set point plus the deadband, before the alarm condition is cleared.
7. Skip the InAlarm column.
8. Each alarm can be assigned separate alarm actions. These actions include log, blink, show, sound and message. See Alarms for further details on the actions. All actions must include the log action. If the log action is not included the alarm will be disabled.
9. Skip the remaining columns. The enable column allows you to enable or disable the alarm as needed. The default is enabled.

Define Derived Sensors

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Row	Defined Name	Equation/Table	Data	Format
1	IF_Then_Else1	=Equ(IF([Sensor3]+[Sensor4]>0,1,0))	1	0
2	Capture1	=Equ(CAPTURE(NOW,[Sensor1]>4.3))		Y
3	Sum1	=Equ(SUM([Sensor1],[Sensor2]))	14.0	0.0
4	Max1	=Equ(MAX([Sensor1],[Sensor2],[Sensor3],[Sensor4]))	13.0	0.0
5	IF2	=Equ(IF([Sensor1]>0 AND [Sensor2]>0,1,0))	1	0

Special functions can be defined in the Define tab. Examples above show some If_Then_Else, Capture, Sum and Max equations. See Equation Editor for more information.

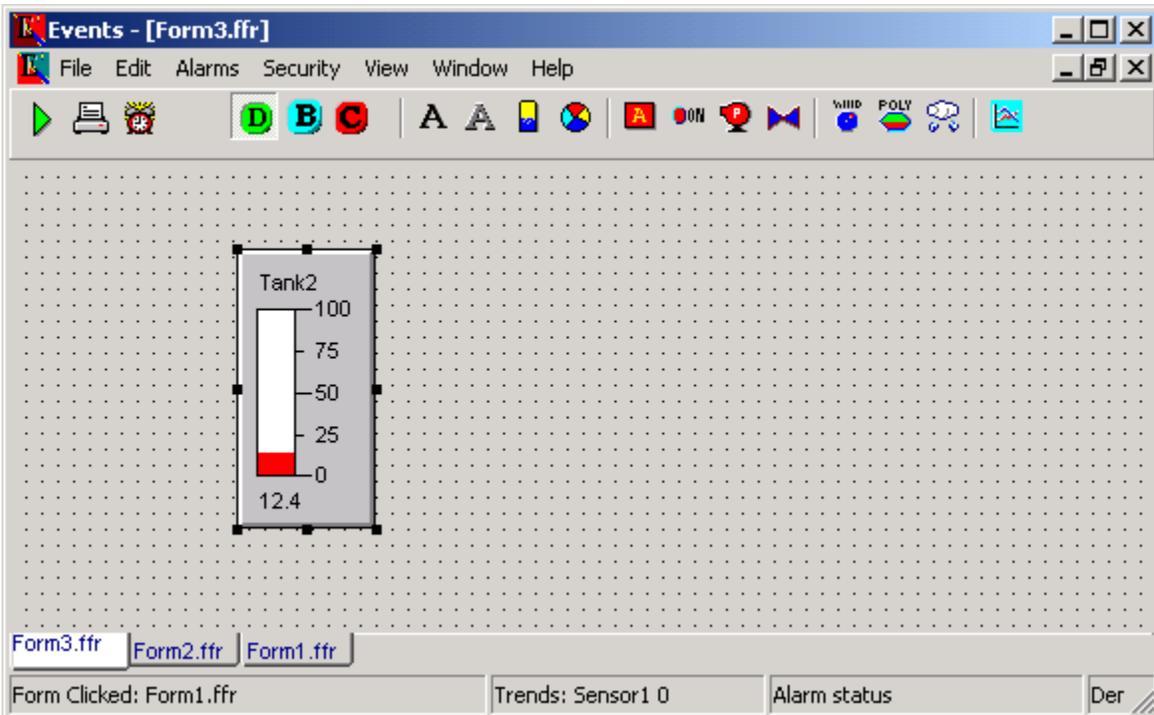
Now Do Your Displays:

Creating New Display Components



Display components include labels, special labels, tanks, chart buttons, annunciator displays, LEDs, pumps, valves, windrose, polygon, rain buttons, and trends

First click on the form where you want the component's top left corner.
Then click on the tank component once.



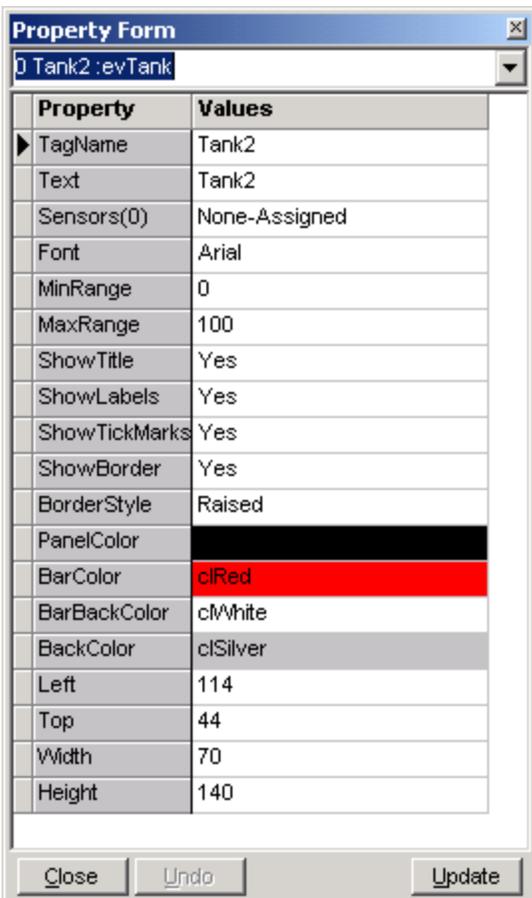
A new tank component is shown and already selected.

Setting Properties

Double click on the component or right click on the component and select properties. Right clicking on a component will not move the component where left double clicking sometimes moves the component. We use right click and selecting properties from the menu.

A property form is shown.

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Make changes to the properties of the component here.

Once you have changed some properties, Click the Update Button. If you select another component before updating it your changes will be lost. Be sure to click update.

You don't have to close the property form between components. Just select the component and its properties will be shown. Make your changes, click update and close the property form.

Resize Components

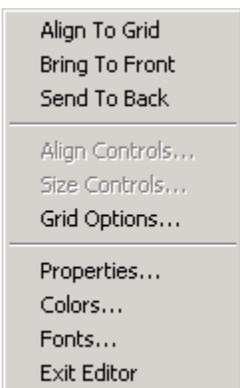
Select one of the sizing handles (8 black dots) by moving the mouse over it until it changes to a double arrow. Press the leftmouse button down and move it to a new position. The tank component should be resized to the new position.

Moving Components

Move the component by selecting it with the mouse, hold the mouse button down and drag it to a new position. Move it anywhere on the form.

Pop Up Menu Commands

Right mouse click on the tank.



A popup menu will be shown.

You can align the component to the grid, bring to the front, send to the back, select it properties, set its background color and font.

If more than one component is selected you can align all the components (on the left side, or right side), you can make the size of the components all the same (to the largest or smallest) or adjust the widths or heights of all the components.

Nudging Components

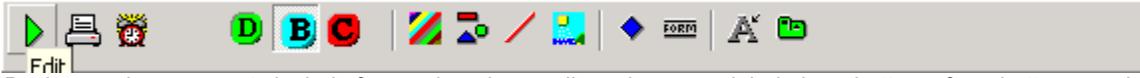
When the component is selected you can nudge it into position with the keyboard. Use the Ctrl + Arrow keys to move the component(s) one pixel at a time (nudge).

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Use the Shift + Arrow keys to resize the component(s) one pixel at a time.

If multiple components are selected you can nudge all of them at once.

Creating New Background Components



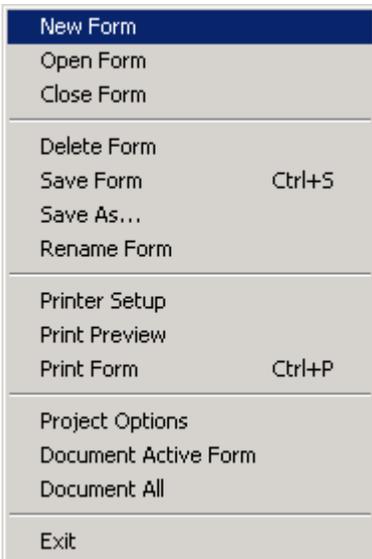
Background components include form color, shapes, lines, images, global alarm buttons, form buttons, and click labels. First click on the form where you want the component's top left corner. Then click on the selected component once.

Creating New Control Components



Control components include set point edit box, check boxes, bit buttons, hoa buttons, and on/off buttons. First click on the form where you want the component's top left corner. Then click on the selected component once.

Adding a New Form



Select the Mainform menu File | New Form

A new form will be shown with the name Form + (form count). You should select File | Rename Form to rename the form to a more meaningful name.

Open an Existing Form and Renaming

Once a form has been saved to your project, use File | Save Form, you can open it again. Another copy of the form will be created with all the existing components. The name of the new form will be Copy of Form1.fpr. You should rename the form right away so you can identify the new form's components.

Opening an existing form is an easy way to duplicate components and form pages. Many applications have remote sites that look the same and have similar equipment. Just open the existing form, rename it and change the properties of the sensors to the new sensors.

Copy and Paste Components between Forms

You can copy and paste components on one form and between forms. To copy a component or component(s), select the component(s) and press Ctrl + C. Now select the new form from the bottom tabs and press Ctrl + V. The selected components will be pasted to the new form.

If you go out of the edit mode the copied components will not be saved and you will not be able to paste them. Just stay in the edit mode while doing copy and paste.

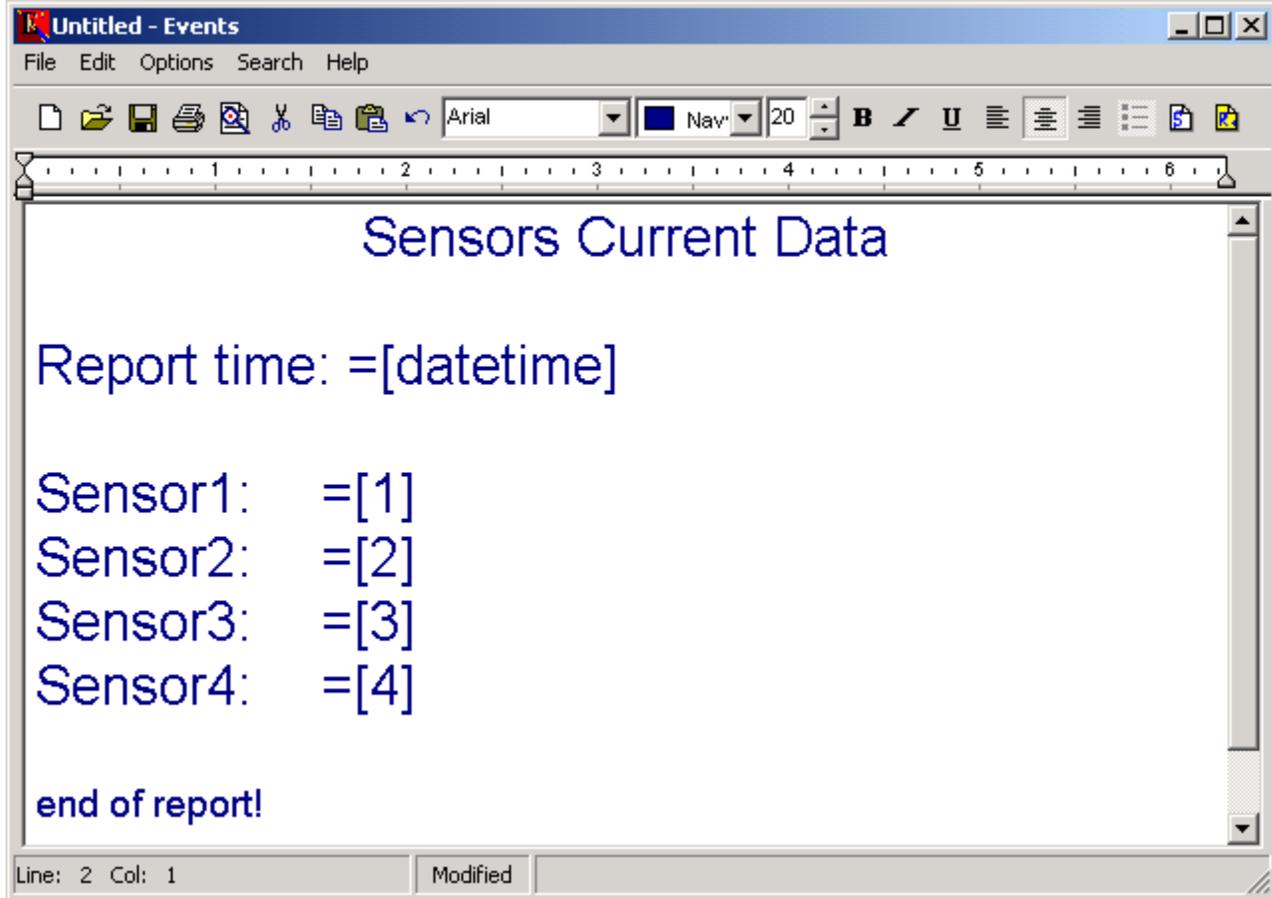
Now Do Your Reports:

Reports can pull data from the modbus grids, defined grids and from the database. The report editor uses data placeholders (=[1]) to insert data into your reports. You format the report using the fonts, styles, colors, titles and subtitles needed. Then add the desired sensors or SQL statements by selecting them from the sensor list.

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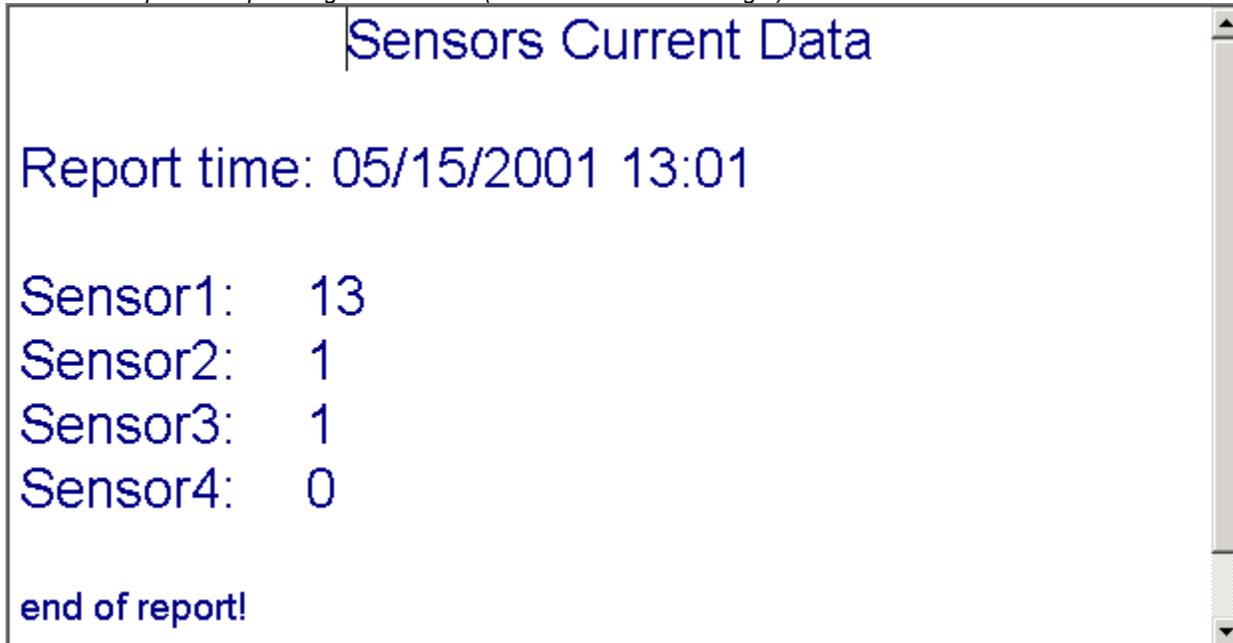
Build Your Reports

Heres a small report.



The report is formatted as show with placeholders for datetime, sensors 1,2,3, and 4.

Heres the Report after pressing the R Button (Run Button on toolbar right)

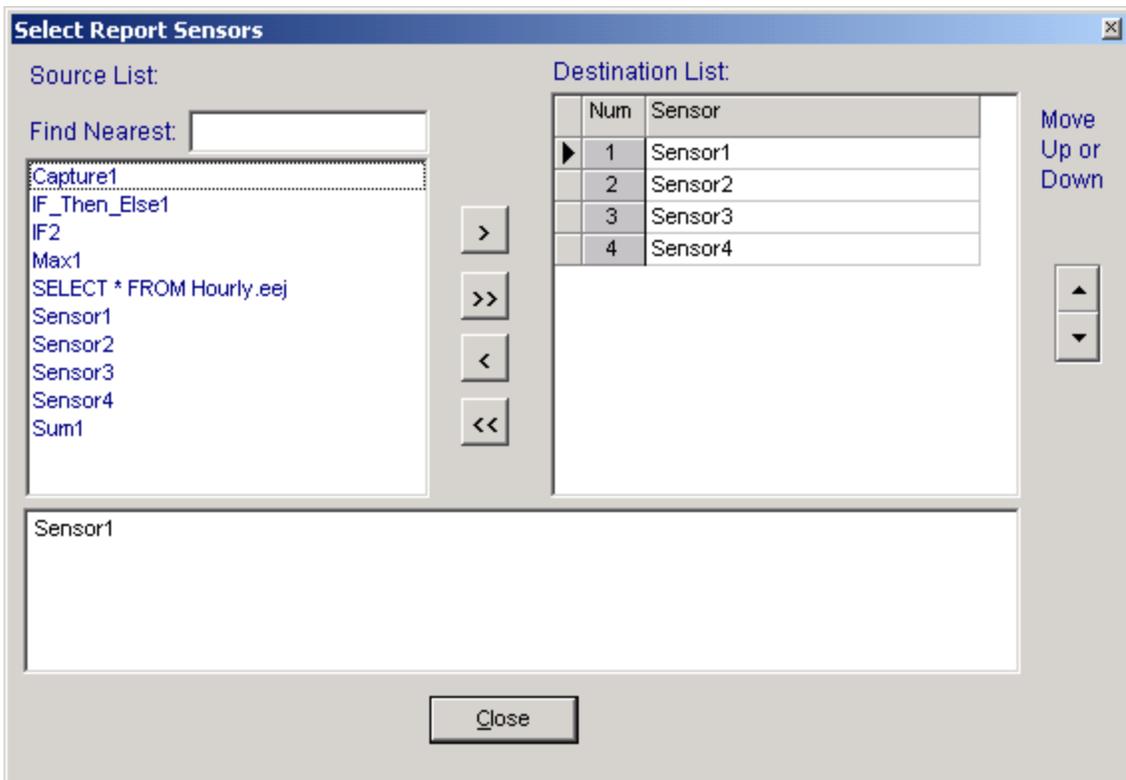


The Sensors data was pulled from the Modbus Receive Grid.
Now Press the R Button (Run Button on toolbar right) again to go back to the editing screen.
Save the Report using an " *.rtf " extension.

note: If you save the report in the data mode it only saves the finished report and not the setup information.
Be sure to save the report in the edit mode.

Sensors are assigned by pressing the S Button (Sensor Button on toolbar right)

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The Destination list shows the Sensors that will be used for placeholders 1,2,3,4. When SQL statements have been made they are available for these reports also.

Define Your SQL Statements

SQL (Structured Query Language) is a means of pulling data from the databases. You can pull data for the last day, last week, last month using the between statements. You can do functions on columns of data (Max, Min, Sum, Ave) and you can select which sensors you want to show.

See Database and SQL Editor for an explanation of the tools you use for the SQL editor.
See Build SQL Statements for reports using the Wizard.
See SQL Examples.

Set Your Schedules

The scheduler is a powerful tool to make reports on time or on an event change. You can output form reports, alarm reports, data reports in HTML format and you can trigger an email of these reports to any URL address. You can also print the reports or display the reports.

The task scheduler is based on three elements:

1. Triggers
2. Task
3. Output

You must have all three assign for a task to work.

Triggers

Triggers include:

1. Timers
2. Buttons
3. Alarms
4. Defined Sensors
5. Receive Grid Status Sensors

Tasks

Tasks include:

1. Forms
2. Reports
3. AlarmReport
4. SQL statements
5. Project
6. Click

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7. Write
8. Email (if registered)

Outputs

Forms Outputs include:

1. Displayed
2. Printed
3. HTML file.

Reports, Alarm Reports, SQL commands have the most output options. Outputs include:

1. Displays
2. Printing
3. HTML files
4. TAB files
5. CSV files
6. append as TAB or CSV files.

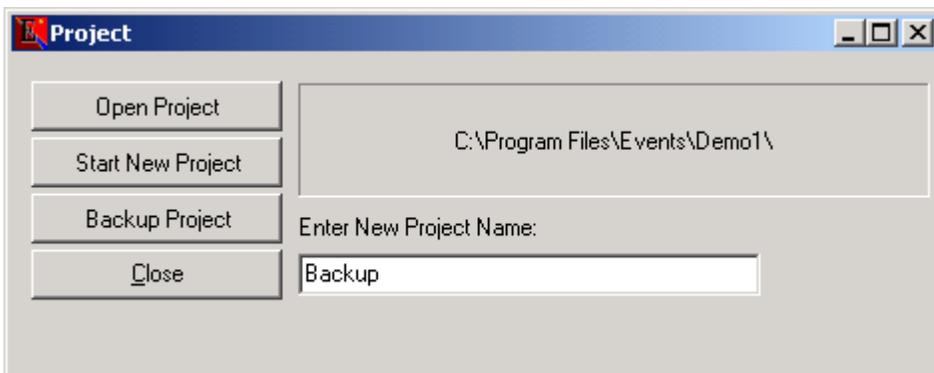
note: (CSV is a comma-delimited file; TAB is a tab-delimited file).

See Task Scheduler.

Also see Email for a step by step example of using the scheduler.

Back Up Your Work:

Select from the MainForm menu: File | Project Options and the project dialog will popup. Enter a name in the new project name editbox and click Backup Project. All your files and data will be backed up to this new directory.



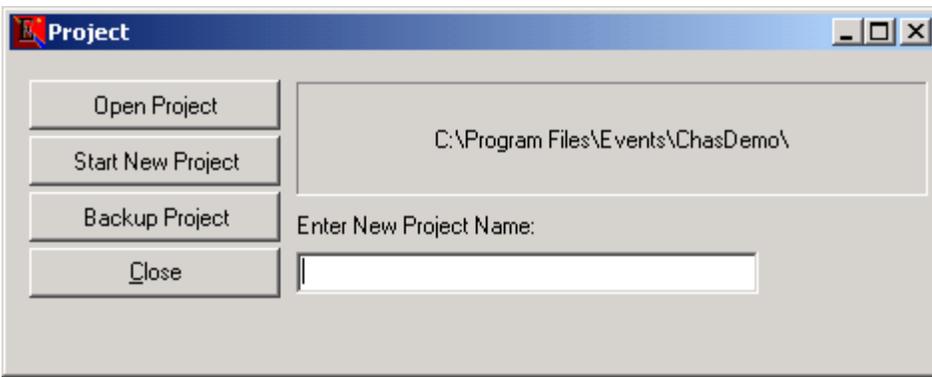
Backup your project when your work is done. Press the backup button.

1.4. Projects

The Project menu item allows you to backup your current project to a new directory, open a new project, or open existing project. If you backup or open a new project, you must enter a name in the New Project Folder edit box.

If you open an existing project, a dialog box will open which allows you to select which project to open. Select an existing project initialization file in the EVENTS directory. Don't select your current project or the EVENTS.ini file (a dialog box will ask you to select another project).

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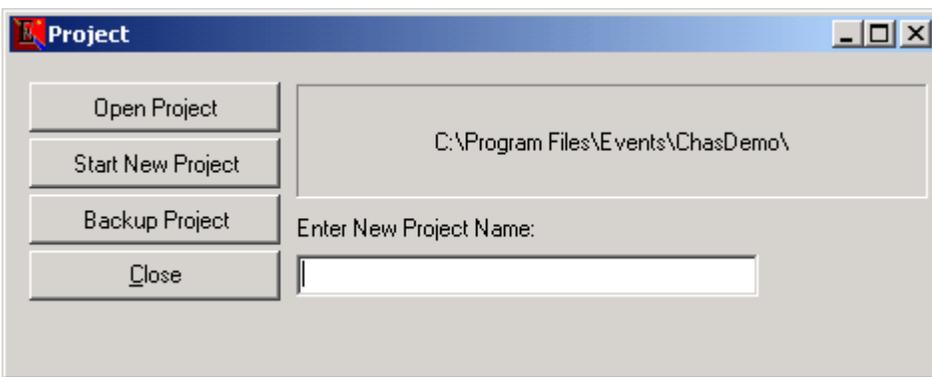


Open an existing project, start a new project or backup your existing project

Open Existing Project

To open an existing project, you select the menu item File | Project. Click on the Open Project button. A dialog box will be shown which is asking you to select a project initialization file. This project initialization file will be in a previously created project folder.

If you try to open the EVENTS.ini or the current project initialization file, you will be asked to select another file. The project folder must be in a sub directory of the EVENTS folder.



Note: the current project will saved automatically when a new project is opened.

Create New Project

Create a new project command is found by selecting the File | Project menu item.

The Project menu item creates a new project. Enter a new project name in the edit box. This becomes your folder and initialization file name. Click on the Start New Project button and you will be asked if you want to close this project and start a new project. Click OK and a new project will be started.

Note: The current project will be saved when it is closed. No changes will be lost.

Backup Project

The backup command is found by selecting the File | Project menu item. Enter a new project name and then click the Backup Project button. Your current project will be saved to the new backup folder.

The Backup command backs up the form files, the alarm setup files, the password files, data files and the initialization files for your new directory.

Note: Back up your data files by using windows explorer to copy these files to a new directory. These files may become very large, and may need to be removed to make room for new data files.

1.5. Main Initialization

The main initialization file is used to remember the main form screen location and which project to open. You can manually change the Project Folder by editing this file. Just rename the ProjectDir = New Project Folder.

New Project Name must be a sub folder in the EVENTS folder and it should contain a Project initialization File with the same name as the folder (ie. NewProjectName.ini).

The Events.INI file points to the Atlanta project in the Events folder. In the Atlanta folder there will be another INI file called Atlanta.INI. See Project Initialization for details of this file.

Events Reference

EVENTS.INI

```
[ProjectDir]
ProjectDir=C:\Program Files\Events\Atlanta\
```

```
[Mail]
evMail=C:\Program Files\evMailer
Mail=C:\Program Files\Events\Atlanta\Mail\
```

```
[CurrentUser]
User=superuser
```

```
[Project]
Project=1
```

The [Mail] option (if registered) will enable the user to email alarm conditions and other events to anyone who needs to receive it.

1.6. Project Initialization

The project initialization file stores information about the project being opened. A typical example is shown below. The main initialization file references the project initialization file.

Removing Forms on startup

Forms can also be removed from the application by doing the following:

1. Change the Form Count to the number of forms being opened.
2. Delete the form name reference in the [ChildForms] section.
3. Renumber the forms starting with 0.

If a form becomes corrupted you can remove the form from your project to enable the rest of the forms to load properly.

Note: The project initialization file may reference many forms but only have a form count of 2. The Count = number determines how many form files are opened. If the Count is 0, then no files will be opened. The forms are opened starting with 0, then 1, etc.

Atlanta.INI

```
[ProjectForm]
Left=122
Top=140
Width=473
Height=186
```

```
[AlarmForm]
HistoryGridCol1=30
HistoryGridCol2=25
HistoryGridCol3=110
HistoryGridCol4=120
HistoryGridCol5=90
HistoryGridCol6=80
HistoryGridCol7=110
HistoryGridCol8=50
HistoryGridCol9=110
LogGridCol1=30
LogGridCol2=110
LogGridCol3=130
LogGridCol4=100
LogGridCol5=110
LogGridCol6=100
```

```
[ImageVisible]
ButtonVisible=0
```

Events Reference

IsVisible=1

[GMT]
GMT=1

[ALERT]
ALERT=0

[Modbus]
Modbus=1

[FormTabs]
TabsVisible=1
Position=0
FontSize=8
Height=19
FontName=Arial
FontColor=clNavy
FontStyle=0

[MainForm]
Left=143
Top=44
Width=820
Height=570

[FormCount]
Count=3

[CycleTime]
CycleTime=30
[CycleCount]
CycleCount=1

[ReportForm]
Left=67
Top=77
Width=740
Height=482

[SetTimerForm]
Left=234
Top=158
Width=603
Height=341

[ListboxColumns]
0=70
1=135
2=60
3=50
4=50
5=50
6=75
7=50
8=300

[TasksForm]
Left=63
Top=321
Width=607
Height=345

[TriggersDlg]
Left=248
Top=98
Width=298
Height=426

[TaskForm]
Trigger=Button.SetPoints.ffr.Alarm.trg
Path=C:\Program Files\Events\Atlanta\Data\HTML
Email=
FTP=
Hangup=1
Close=1
SendAuto=1

Events Reference

Minimize=1

[TasksDlg]
Left=243
Top=133
Width=632
Height=510

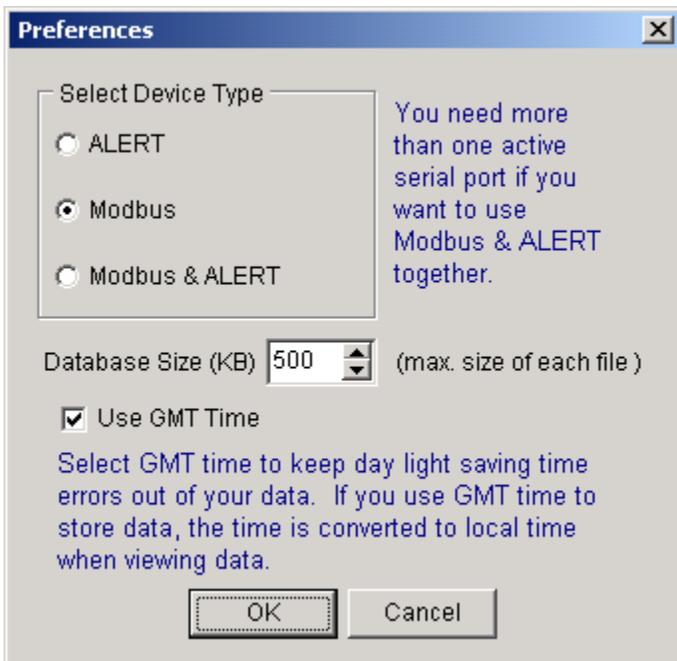
[Timers]
Count=2
0=RTClock#RTC630.trg##30#6###
1=RTClock#RTCMidnite.trg###0###

[ChildForms]
2=SetPoints.ffr
1=Site 2.ffr
0=Site 1.ffr

[CycleForms]
0=SetPoints.ffr

1.7. Preferences

The Preference form allows you to select the type of communications you are using. The types are ALERT and MODBUS. You can also select the database size before it starts another file as well as the use of GMT time for data logging.



Preference Form selection

The Select Device Type selection defines the type of device being used. Events then loads the proper communication files and protocol required.

If ALERT is selected, the control toolbar is not shown and the default ALERT setup file is loaded. i.e. PROJECTDIR+aFiles.fft.

If MODBUS is selected, the control toolbar is shown and the default MODBUS setup file is loaded. i.e. PROJECTDIR+mFiles.fft.

If both are selected, then the default setup file is maFiles.fft.

Note: Be sure to have 2 serial ports available for multiple communications.

If the security level of the current user does not allow form editing, the edit button and the preference menu item will be disabled.

The database size defaults to 500 KB. EVENTS indexes each database to link multiple files together. No data will be lost and EVENTS will handle the opening of older files when required. Using this size will keep your report speed and SQL statement results faster.

Events Reference

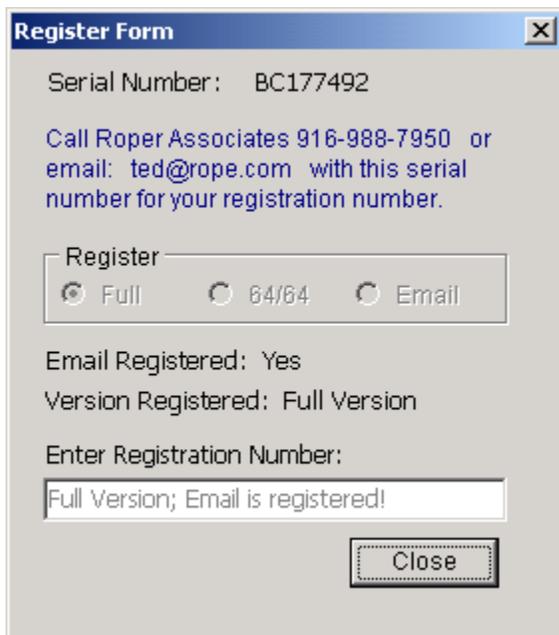
Use GMT time is recommended for all systems. There will be no data overlaps when your time changes from daylight savings to normal time. The data is stored using the GMT time but displayed using the local time.

1.8. Register

EVENTS software requires registration by the user.

You can register the following versions for Events:

1. 64/64 Lower cost, 64 inputs, 64 outputs no networking
2. Full Unlimited inputs, outputs, includes networking
3. Email You must be registered for 64/64 or Full 1st, then register for email.



Help|Register

EVENTS software starts out as an unregistered program. After the program is installed and running on your computer the user needs to register it. You can register the program by calling Roper Associates with your serial number. The registration number will only be valid for the computer EVENTS is installed on. You can also email the serial number to us and we will email the registration number back to you. Your product must be paid for before the registration number will be sent back to you.

Roper Associates
916-988-7950
email: ted@rope.com
web: www.rope.com

You need to have the serial number, which is found in the Help | Register screen. If you copy the program to other computers a new serial number is generated for each program. Your license is for one copy on one machine.

When a product is not registered it is still a fully functional program. But after four (4) hours, the communications will be disabled. All other functions remain active. At that time, you should close the program and reopen it to start the communications again. You can still develop screens and test your program in the unregistered mode.

LEGAL ISSUES

Technical Support Policy

Licensed users of EVENTS may contact Roper Associates for technical support at:

Email ted@rope.com
FAX 916-988-7994
Phone 916-988-7950

User License

Registered users of EVENTS are licensed to use the EVENTS program on one computer. Additional UNREGISTERED

Events Reference

copies of the program can be used on as many computers as needed. These additional copies will be unregistered unless a multiple license is purchased.

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Events Reference

2. Forms

2.1. Grid Editing

The Modbus and Files grids have several editing features to help identify sensors you want to review and see easily. You can select cells when the **arrow turns to the right**. Select and drag down to select multiple cells.

R-ResvDI2.2	0	1
R-ResvTrigger.2	1	1
R-ResvStreamHiAlrm.2	0	1
R-ResvStreamLoAlrm.2	0	1
R-ResvResvHiAlrm.2	0	1

When the cursor changes to the right arrow, you can select cells.



Toolbar is shown in the edit mode and it used for making changes to the grid showing.

COLORS

Select cells or rows or columns and click on the color button. A color dialog will allow you to set colors for the selected cells. The colors are saved when the program closes. You can also save the grids at any time by using the File | Save menu command.

ALIGNMENT

Align Left, Align Center, Align Right for any selected cells or columns. Align commands do not work with selected rows. Align the columns for easier viewing. The alignment for each cell is saved along with the colors.

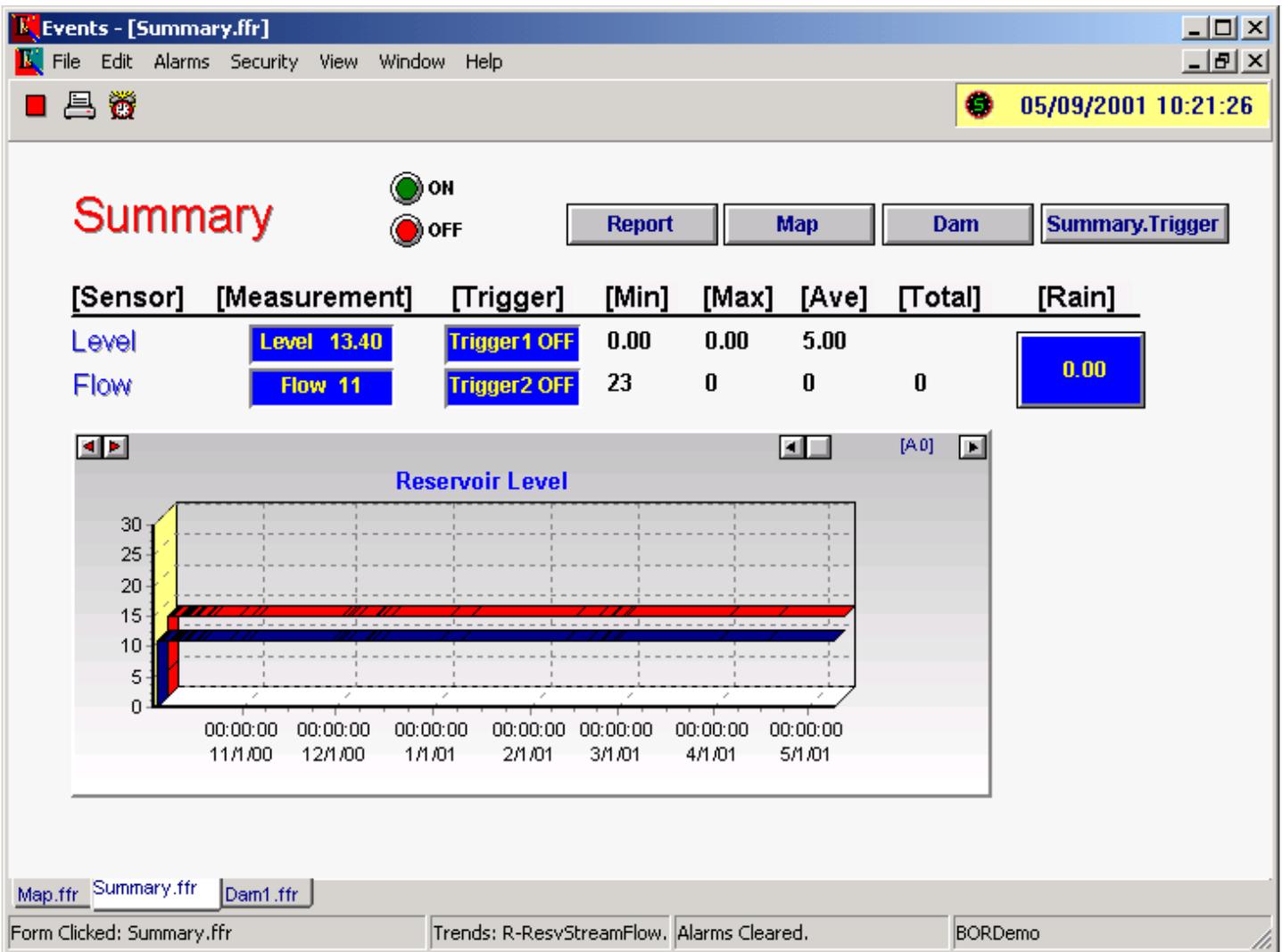
ROW HEIGHT

You can change the row height, which changes all the row heights in the grid. Increase or decrease as needed. The row height is saved to file on close.

2.2. Forms

Form Files are saved as binary files with a *.ffr extension. Form files are child windows which are created by selecting File | New Form from the menu. See Editing Forms for more information on building forms.

Events Reference



EVENTS Form displays

The form files are stored in the project directory and referenced by name in the project initialization file.

The tabs at the bottom of the forms provide another means of accessing each form in the project. The selected form will be shown in white and the other forms will be in gray. Just click on any of the tabs to see that form.

See Editing Forms.

2.3. Editing Forms

To edit a form you can click on select the Edit | Edit Form menu item or press F9, or click on the red square in the tool bar.



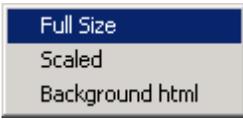
Edit Form or F9 menu item

SubMenus

Events Reference



Reset



Make Form Bitmap



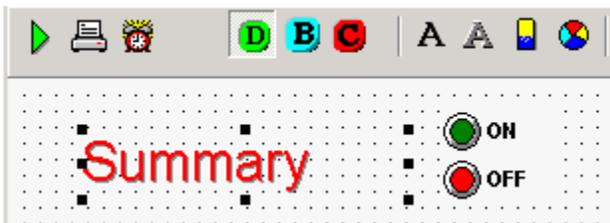
Set Tab Order



Preferences

FORM EDITING

The background shows a grid in edit mode and the green arrow is showing with the toolbar. Click the green arrow to go back into the run mode.

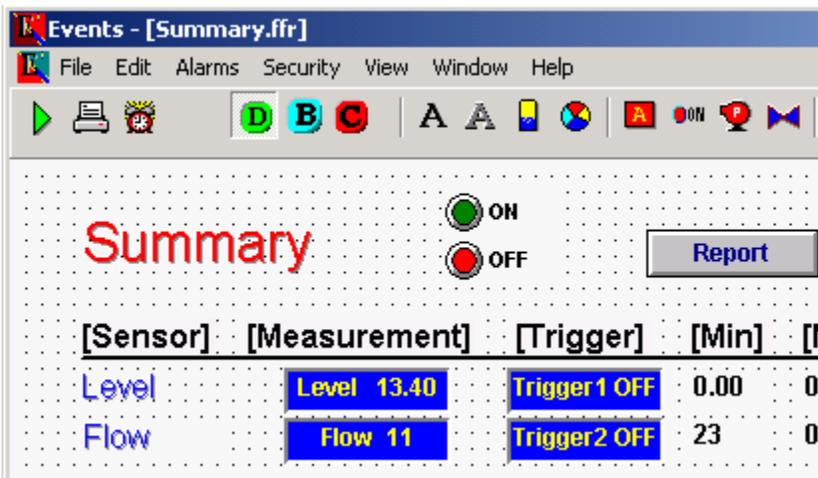


Select a component in the edit mode by clicking on it. Selected components have handles around them.

Edit Component Nudging

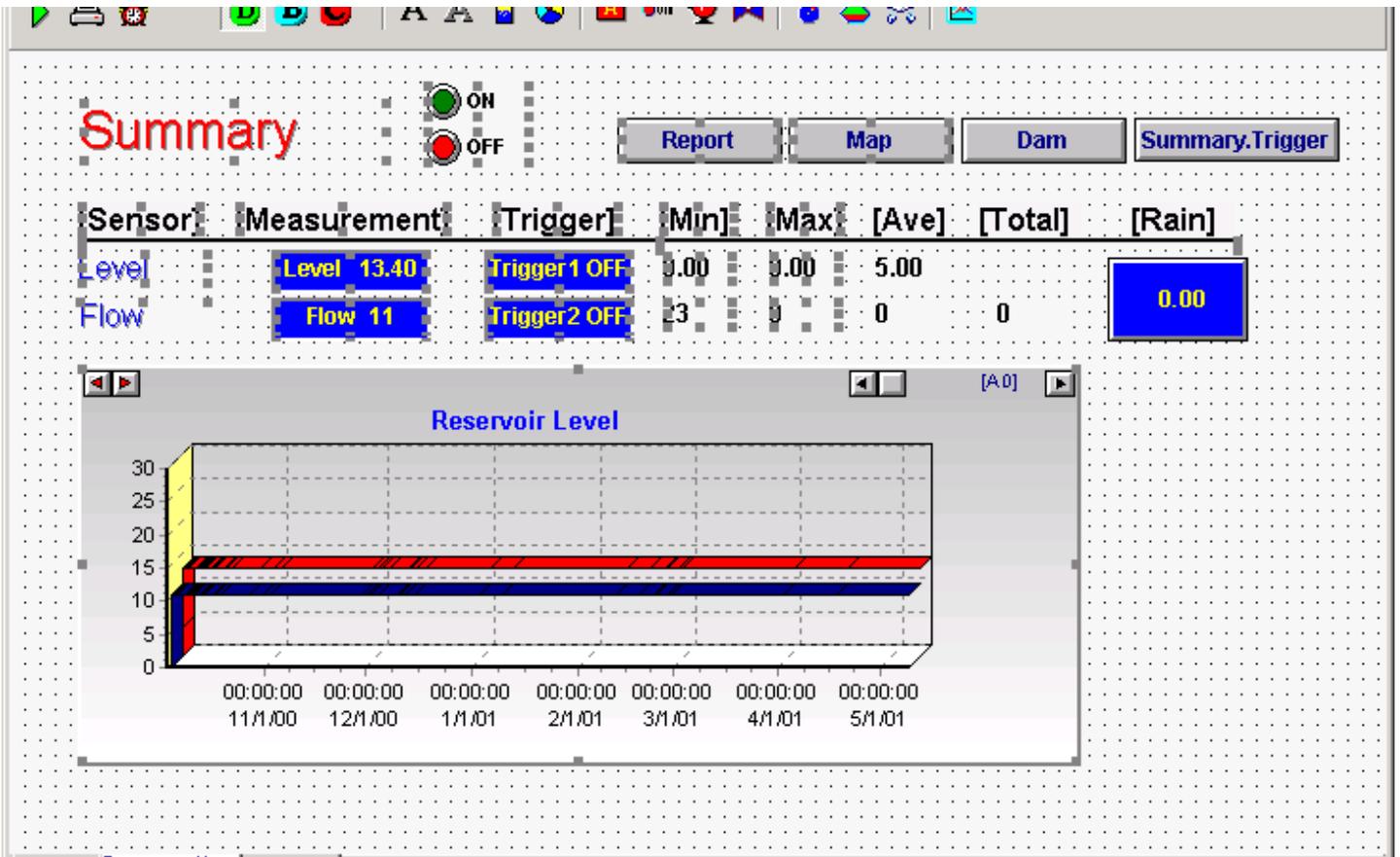
You can nudge components if they are selected. Just press the Ctrl + Arrow Keys. You can also resize the component (pixel by pixel) by using the Shift + Arrow Keys. If multiple components are selected, all components will be moved or resized.

When in the edit mode, the form background changes to a dotted background. If a bitmap image is covering the background, there will be no visible change.



Form in edit mode. Press the Green Arrow Button to back to run mode.

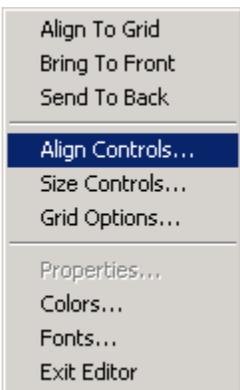
Events Reference



Select multiple components by clicking the form with the left mouse and dragging until a rectangle is shown. The components touched by the rectangle will become selected. You can also click on one component and then shift-click to add or subtract components to the group.

The editing mode allows you to edit the forms and components. If the current user has permission to edit forms, the Red Square Button on the toolbar will be enabled and the menu item, Edit | Edit Forms will be enabled.

Click the Red Square Button or select the menu item and you will be in the edit mode. The Red Square Button has changed to a green arrow. Clicking on the green arrow starts the communications again and the program goes back into run mode.



Use the right mouse button to click on one of the selected components. A popup menu will allow you to align controls, size controls, bring to the front, or send to the back. Use the right click to select the properties of one component without moving it on the form.

Note: The cut, copy and paste commands are only enabled when the form is in edit mode. If you go back to the run mode, components that have been copied or cut will be removed from clipboard.

Edit Menu Commands

Events Reference

Edit Form	F9
Cut	Ctrl+X
Copy	Ctrl+C
Paste	Ctrl+V
Reset	▶
Make Form Bitmap	▶
Show Image Visible Btn	
Set Tab Order	▶
Write Form Setpoints	Ctrl+W
Run Polygon Editor	
Preferences	▶

Edit menu

Edit Form F9

If you are logged on click on the Edit Form Menu item or Click on F9 to go into the form edit mode.

Cut

The Cut menu item or `Ctrl+X` can be used to remove a component from the form in the edit mode. When you cut a component from a form it can be pasted back to the same form or to any other form. Multiple components can be cut, copied or pasted.

Copy

The Copy menu item or `Ctrl+C` is very similar to the Cut command. To copy a component to the clipboard, select the component and press `Ctrl+C` or select the menu Edit | Copy. This is done only in the Edit Mode. You can then paste `Ctrl+V` the component back to the form as many times as needed.

Paste

The Paste menu item or `Ctrl+V` is used along with Copy and Cut. When a component is copied to the clipboard (by the Copy or Cut command), that component can be pasted back to the form by pressing `Ctrl+V` or selecting the menu item. Multiple copies of one component can be pasted to one or more forms. Just use the `Ctrl+V` command to paste the copied component as many times as needed.

Reset

You can reset your real time trends and rain buttons from this menu item. You can also rename the edit controls to unique names. You may need to do this when using the scheduler to write an edit control.

Make Form Bitmap

(Full Size: Normal)

Make form bitmaps copies the current form into the clipboard for pasting into reports. The main problem with this method may be the width of the bitmap (usually too big). Use this method if you want to paste the bitmap into a paint program or other program for editing.

(Scaled)

Make form bitmap scaled copies the current form into the clipboard and resizes the bitmap to fit into an existing report width (about 7"). Use this option if you want to make a report with the form image as part of the report.

(HTML Output)

Make an HTML form output. The new output file will be stored in the Data\HTML directory. The HTML jpeg image is created and stored in an image file referenced by the Form.htm file.

Set Tab Order

Components that take focus (like edit controls) can be set for vertical or horizontal tab order. Pressing the tab key goes to the next edit control.

Write Form Setpoints

Write Form Setpoint writes all the edit controls, HOA controls, and other controls to modbus transmit grid. You can then update the master RTU if you need to.

Run Polygon Editor

This menu command opens the polygon editor for making polygons that can be inserted into your forms. See the Polygon Editor for details.

Preferences

This menu opens the preferences for file settings and for report layout defaults. The file setting preferences are already set to default settings. You can change them if needed. The report layout defaults allow you to enter titles and subtitles for form reports that are printed or output to a file.

Events Reference

2.4. Email

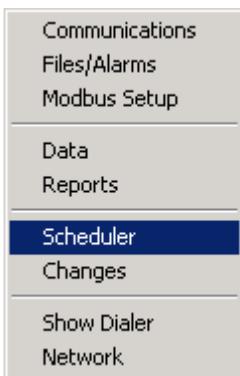
Email must be registered separately if you want to use this feature.

Email requires two separate programs to be installed on your computer. You can download these programs from our web page: www.rope.com.

The two programs are evMail.EXE and evDialer.EXE. evMail is an SMTP mail program and evDialer is a RAS dialer program. If your computer does not have RAS installed, you will have to installed it for the dialer program to load and work. If you do not require RAS to do email, the evMail program will still work.

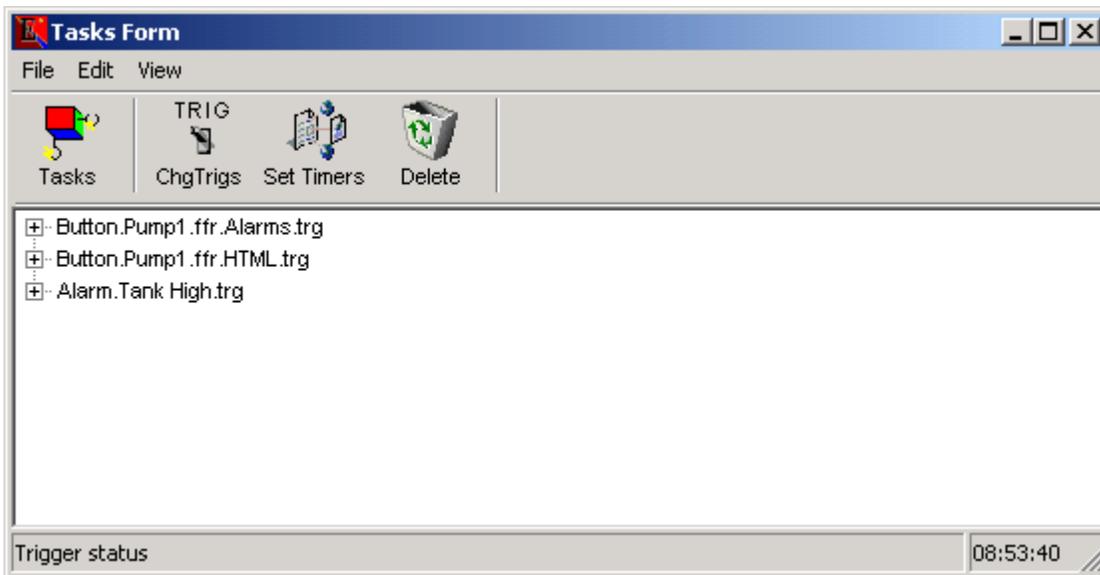
Below is step by step instructions on how to setup an email task

1. Email is setup from the Mainform menu: View | Schedule



Select Scheduler for email tasks

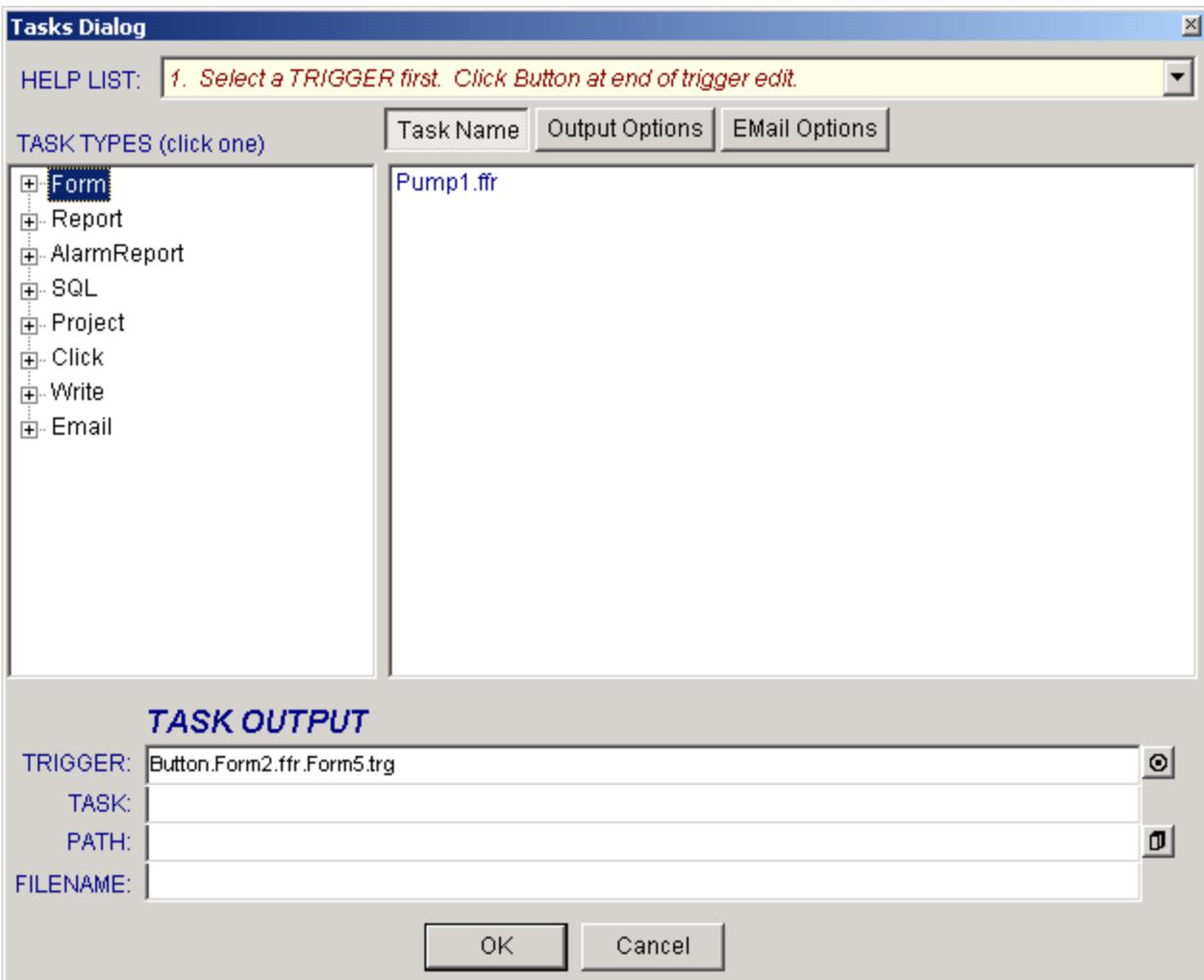
2. Selecting this option opens the task window.



Tasks form is used to schedule email and other reports.

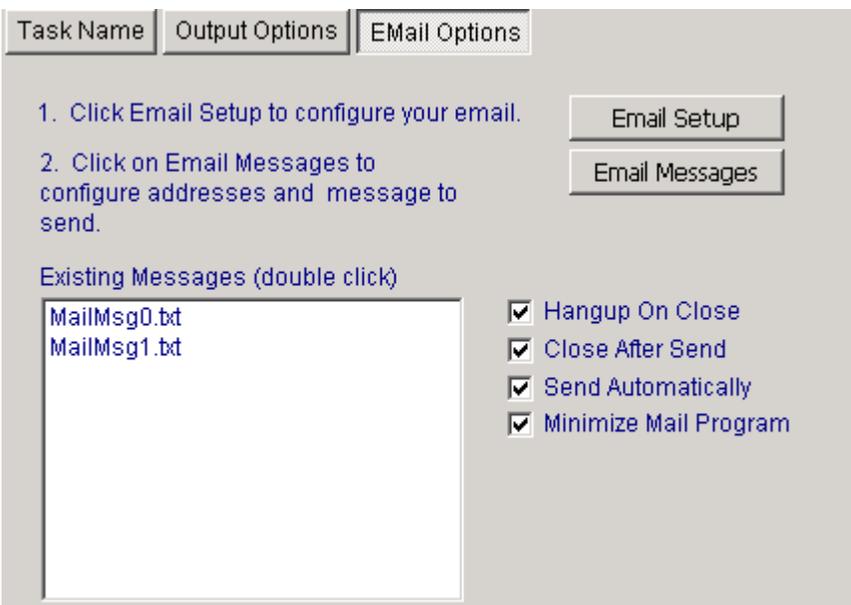
3. Click on the Tasks Button to open the Tasks Dialog. This form allows you to configure email messages and to select email tasks.

Events Reference



Triggers, tasks and outputs are selected from this form. The output is listed at the bottom.

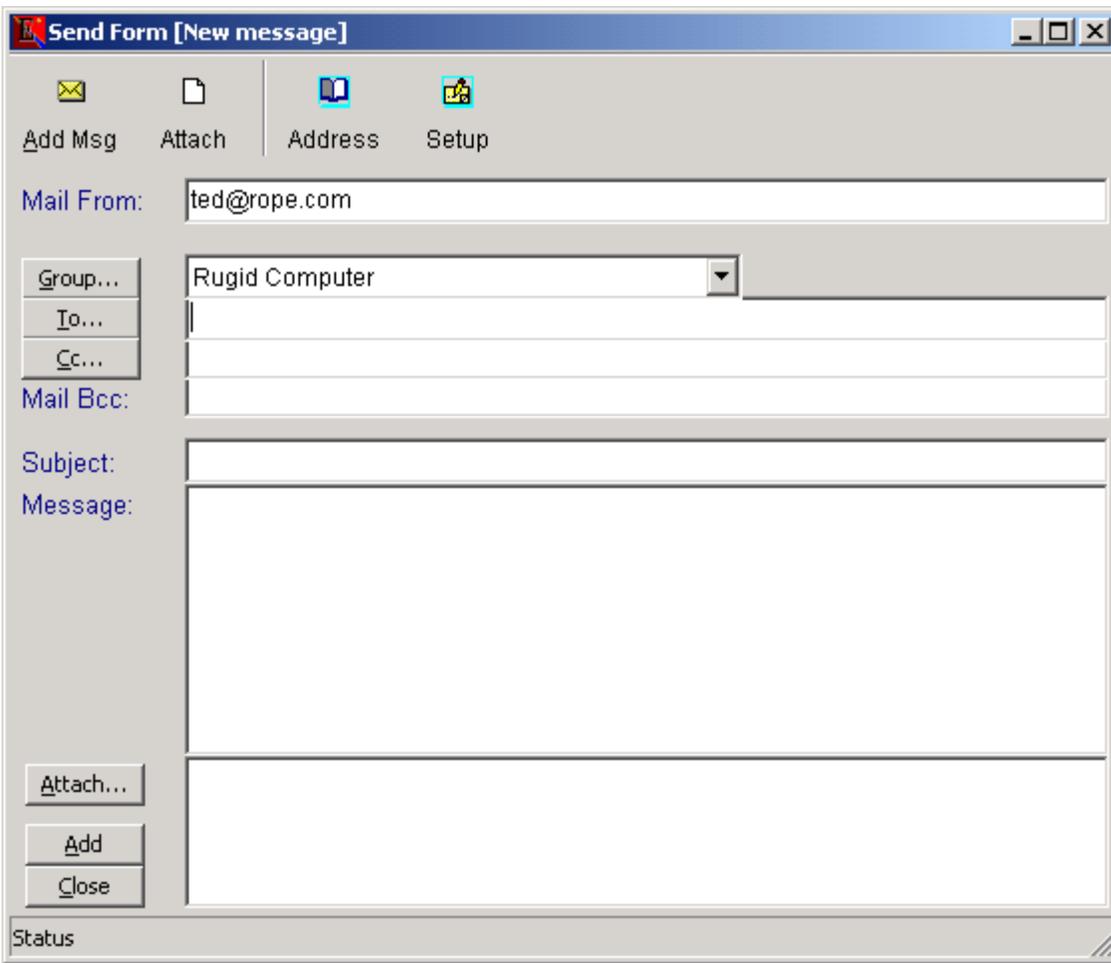
4. Click on the Email Options button to configure email messages, setup email address, and the RAS dialer.



Email messages are configured and stored in the Existing Messages.
Double click to open an existing message or click the Email Messages Button for a new message.

5. Click on the Email Messages Button to configure a new message.

Events Reference



Send Form [New Message] configuration. Press Add when message is complete.

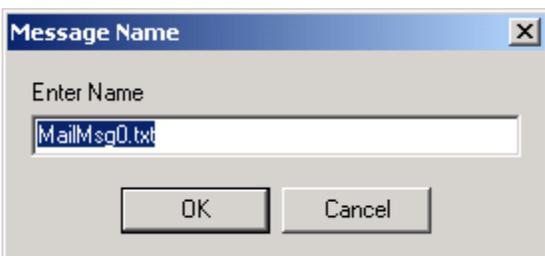
The Send Form requires:

1. fill in the To: editbox
2. fill in the Subject: editbox
3. fill in the Message: memo

Optional items are:

1. Cc: Bcc: and Attach: lists

6. When you click on Add the following dialog box will appear.



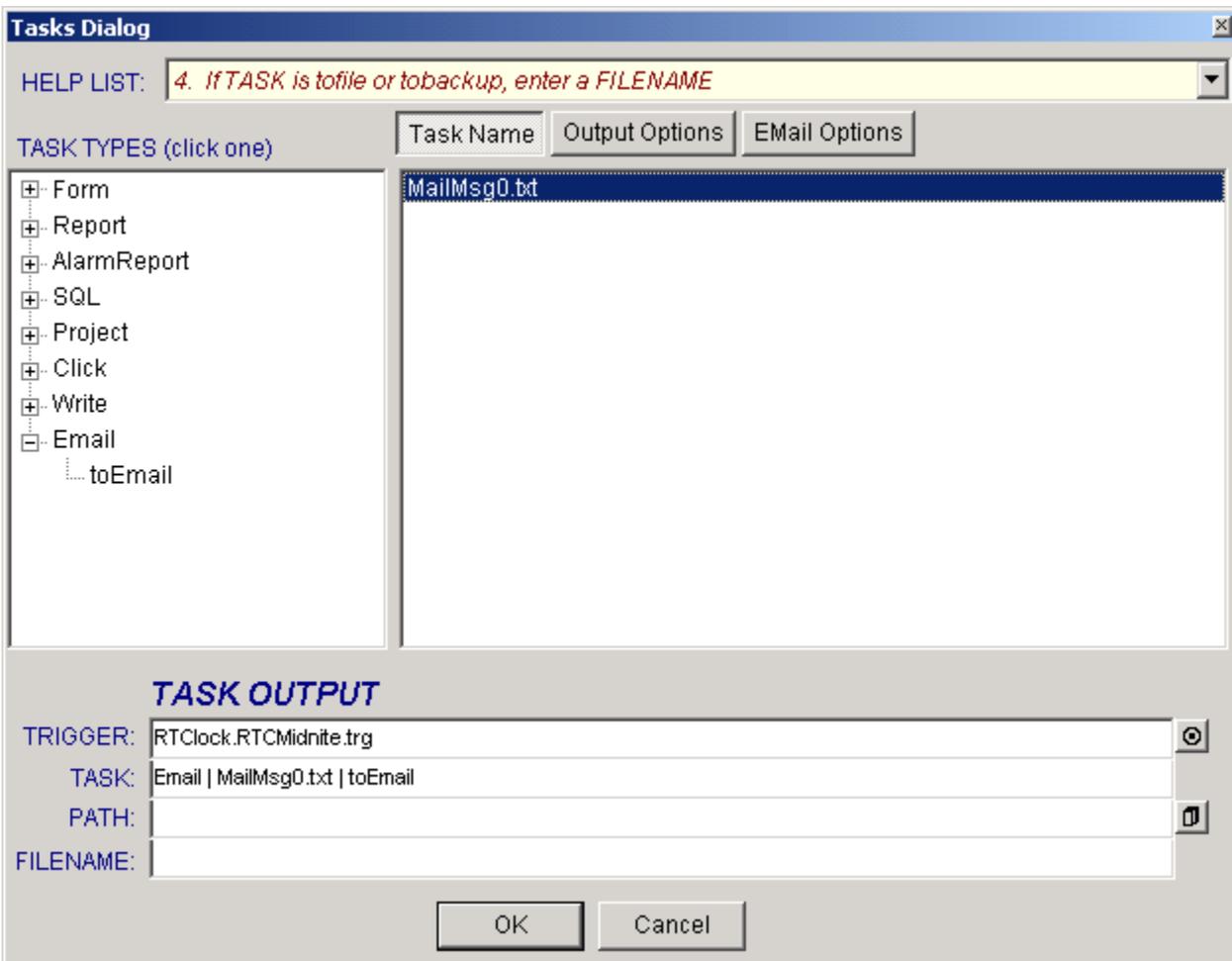
Press the OK button to add the message name.

The Send Form will save MailMsg0.txt in the listbox.
You can now enter a new message or close the Send Form.



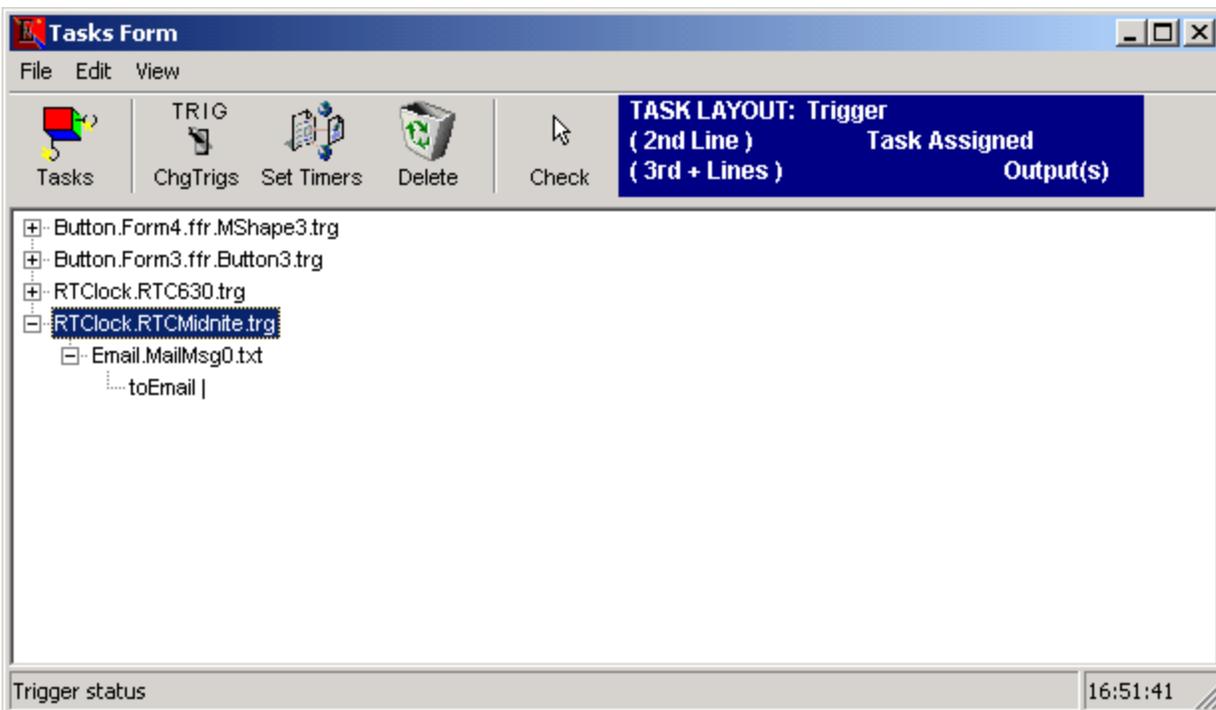
Saved messages

Events Reference



Task Dialog with the MailMsg0.txt being sent by the RTCMidnite.trg trigger.

7. Press the OK button when done.



Task Form showing the new task sending Email.MailMsg0.txt.

Email messages can be triggered by any of triggers in the system. You should test the email program separately before triggering the Email from Events. If the email program works alone it will work with Events.

Events Reference

2.5. Equation Editor

Defining new sensors by building equations and adding table lookups.

Clicking on the dotted button in the Defined Grid, column 3, labeled "Equation/Table", opens the tables and equation selection options. The form must be in the edit mode first.

The equation editor and the table maker is available from the selection options displayed below.

The equation editor is available by selecting Equation and then click the Build Equation

Tables lookup value can be assigned from this form.

Select a table name in the list and click the Build Table Button.

Click the edit button from the property box to show the equation builder form.

Equations, functions, IIF(), Capture, SUM, MAX and other equations for specially defined sensors.

The equation editor allows you to build a special function to display a calculated value. You can use data from other sensors in the system by selecting a Sensor Name in the analog dropdown box and then clicking on the Use Sensor Button. You can also type in the sensor name with brackets around the sensor name.

The equation does not have to have any sensor value in the equation. You can type in the equation you require using existing sensors or other defined sensors.

Press the test button to see the results of your equation. When you are done testing your equation, press the Save & Close button. The new equation will be written to the equation box on the selector form. Click the OK Button on the selector form with the equation checked. Your new equation will be entered into the defined form.

If you click the exit button to close the form, no changes from the equation builder will be saved.

Events Reference

Note: Defined sensors are evaluated from top to bottom in the defined grid. If you reference a defined sensor in another defined location, be sure the new sensor references a sensor above it.

Defining a table assigned to a sensor.

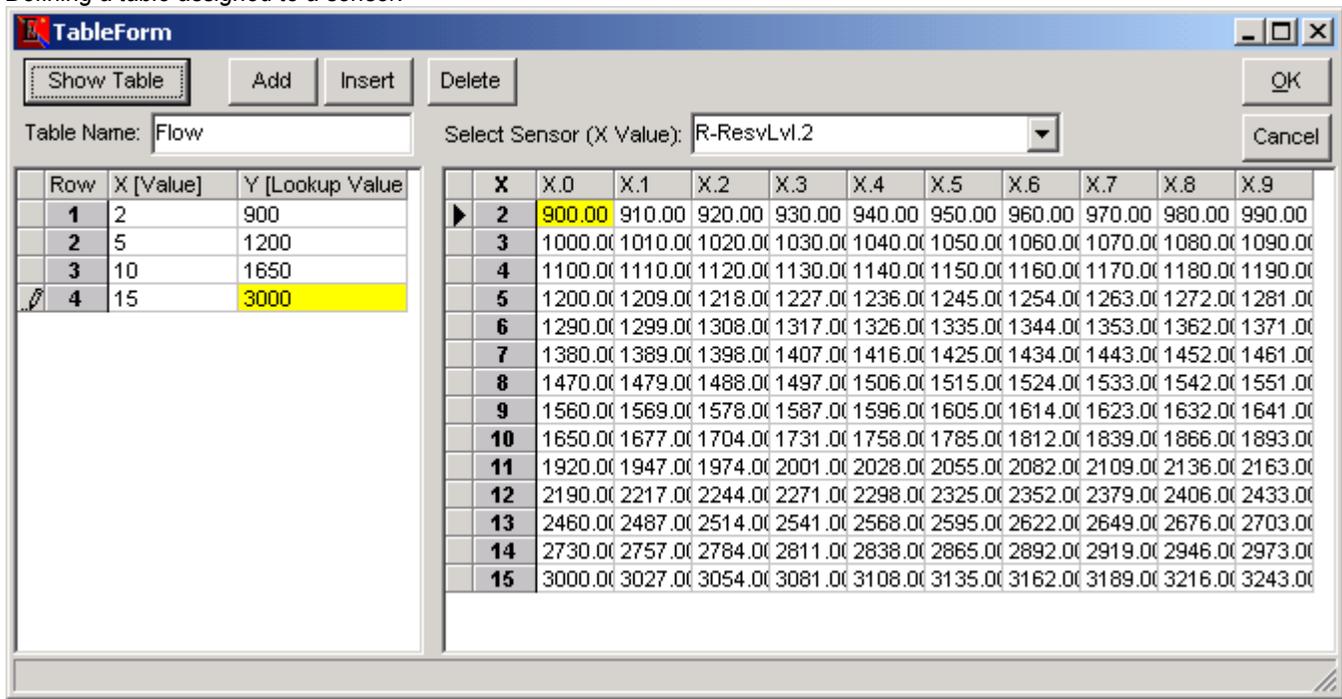


Table editor: Assign Table Name, and select a sensor for the X value. The Y value is the calculated output.

Select the sensor for the X value lookup. The new defined sensor will be updated when this sensor changes value.



Table controls: Show, Add, Insert, and Delete

The show button calculates the result table and shows the data in tenths. You can add rows, insert rows or delete rows as needed. The table ends at the last row.

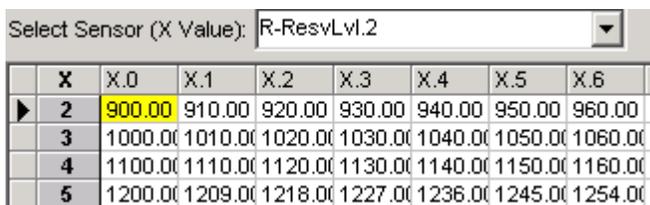


Table show form: Values are calculated for according to the X and Y set points.

Check the values in the table to see if they are correct. Adjust your X and Y values to change the results. X values that are greater than the last value in the table will use the last 2 data points in the table to calculate the new value. X values lower than the first value return 0 as a result.

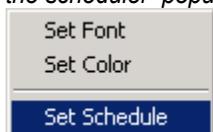
2.6. Task Scheduler

The scheduler is a task manager used to trigger some action or report.



Scheduler: Click on the schedule (S) button to the left of the date time label. The current schedule is shown.

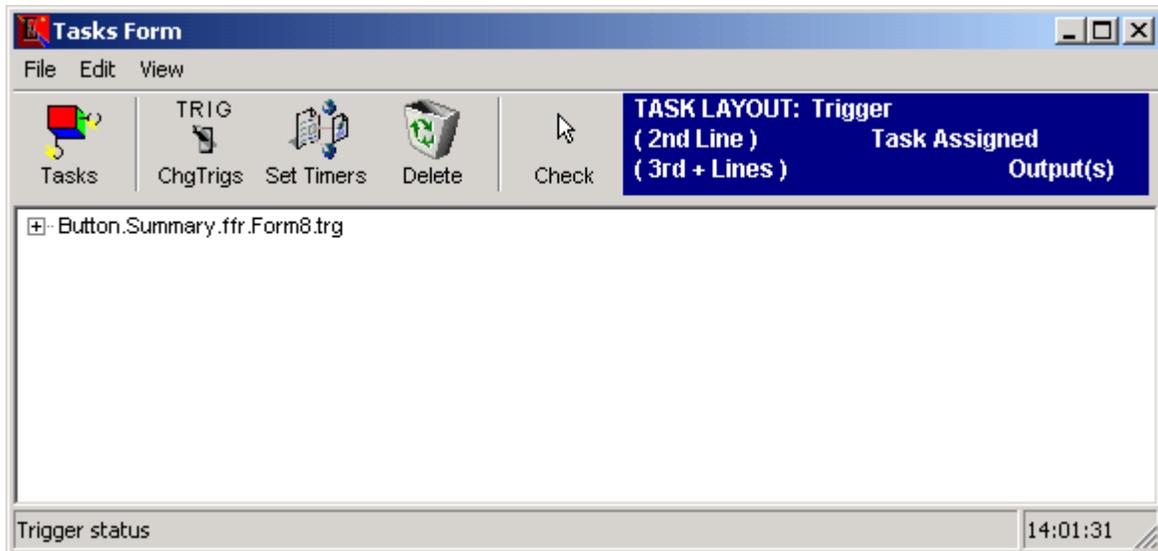
Right Mouse Click on the clock to show the scheduler popup menu.



Select set font or set color to change to clock display.

Events Reference

To set a schedule a new task, click on the popup menu Set Schedule or select the menu item: View | Scheduler in the main form or click on the schedule button in the clock panel. That will open the Tasks Form.



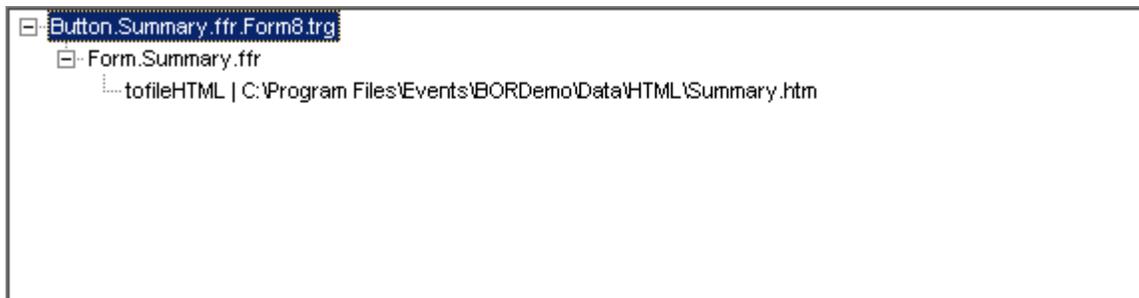
Scheduled tasks are include a trigger, task assignment, and an output.

Scheduling Tasks

There are 3 important steps to defining a new task.

Each task consists of the following: A trigger, a task and an output.

1. Assign a trigger.
2. Select a task.
3. Assign an output.



Tasks are expanded chicking the + to show the following.

The trigger is Button.Summary.ffr.Form8.trg.

The task is Form.Summary.ffr.

The output is tofileHTML | File location.

Each trigger can have multiple tasks and a task can have multiple outputs.

There is only one trigger per set of tasks and outputs.

To set a task or trigger or timer use the toolbar buttons below:

1. Tasks.
2. TRIG: Change triggers for a group of tasks.
3. Set timers.
4. Deleting a selected task.
5. Check your task list to see if it is complete and without errors.



Click on the Tasks button to add a new task. The toolbar provides the access to adding tasks and timers.

Moving Tasks: Drag and drop, Copy & Paste

Tasks can be moved by drag and drop operations or by copy and pasting. The difference is as follows: Drag

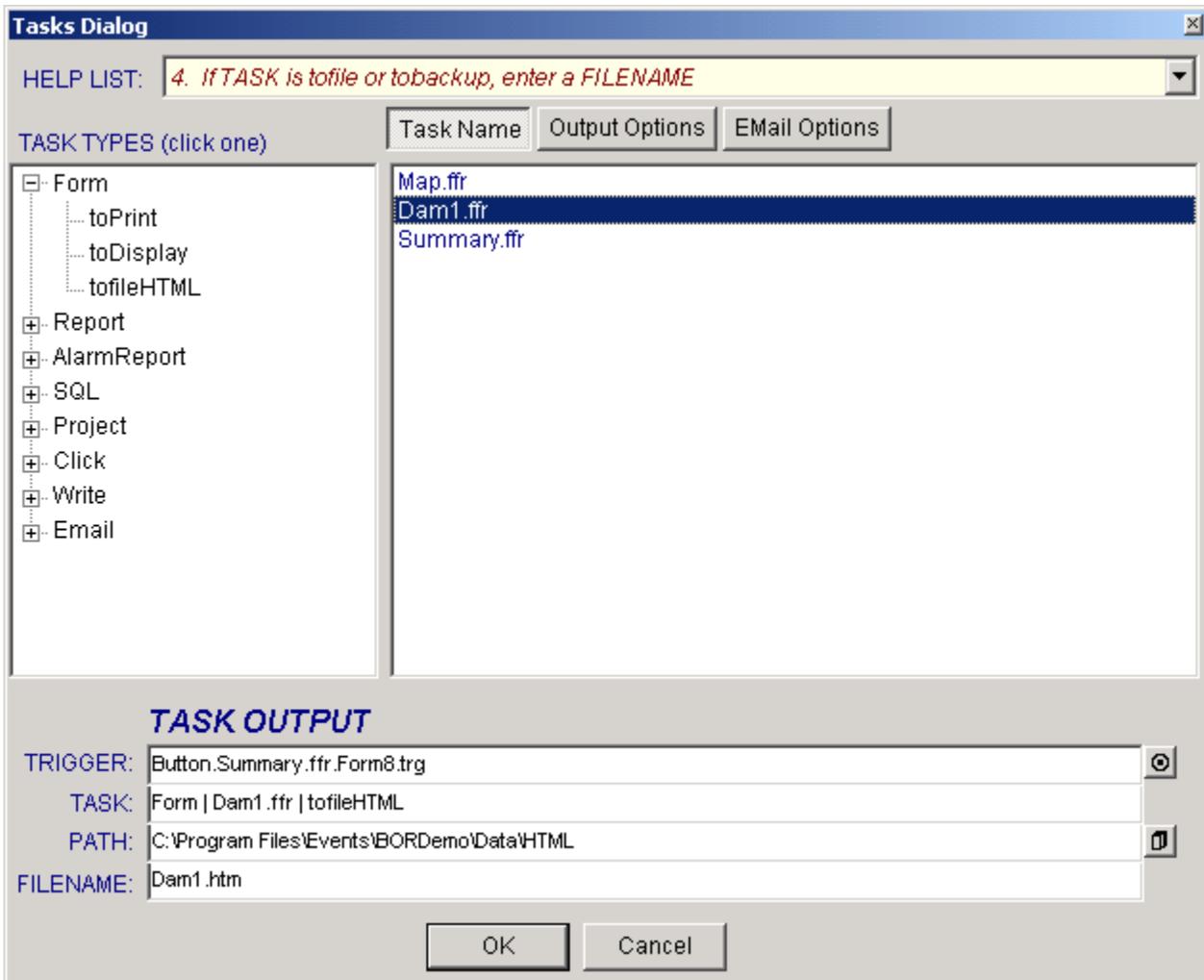
Events Reference

and drop moves the task and its children (outputs). Copy and paste only copies the selected text and pastes the selected text. The children of the copied task are not moved or copied.

To drag a task, select a task with the left mouse button, hold it down and move the mouse to the new location. Drop the task by releasing the mouse button.

Copy the task's text by selecting an item (click on it), press Ctrl C (copy to clipboard), move to the desired new location, select the text to be replaced and press Ctrl V (paste from clipboard).

Assigning Tasks



Assign tasks

(1) by adding a trigger,

(2) by selecting a task type Form | toPrint and

(3) then selecting a task name. If the output is to a file, you need to select a path and filename for the task output.

Tasks are assigned by clicking on the list items shown. The TASK OUTPUT at the bottom of the page is the result of your task selections.

Common tasks are:

1. Forms
2. Reports
3. AlarmReport
4. SQL statements
5. Project
6. Click
7. Write
8. Email (if registered)

Forms can be displayed, printed or output as an HTML file.

Reports, Alarm Reports, SQL commands have the most output options. Outputs include:

1. Displays,
2. Printing
3. HTML files,
4. TAB files
5. CSV files or to
6. append as TAB or CSV files.

Events Reference

note: (CSV is a comma-delimited file; TAB is a tab-delimited file).

Project commands are for automatically backing up your project and to make an HTML index file for the specified folder.

Click tasks are used to click buttons already assigned on your forms. The task scheduler can:

1. Click an HOA button to (Hand or Auto or Off)
2. Click a bit button to do a poll or
3. Click on a form button to change forms and do a report.

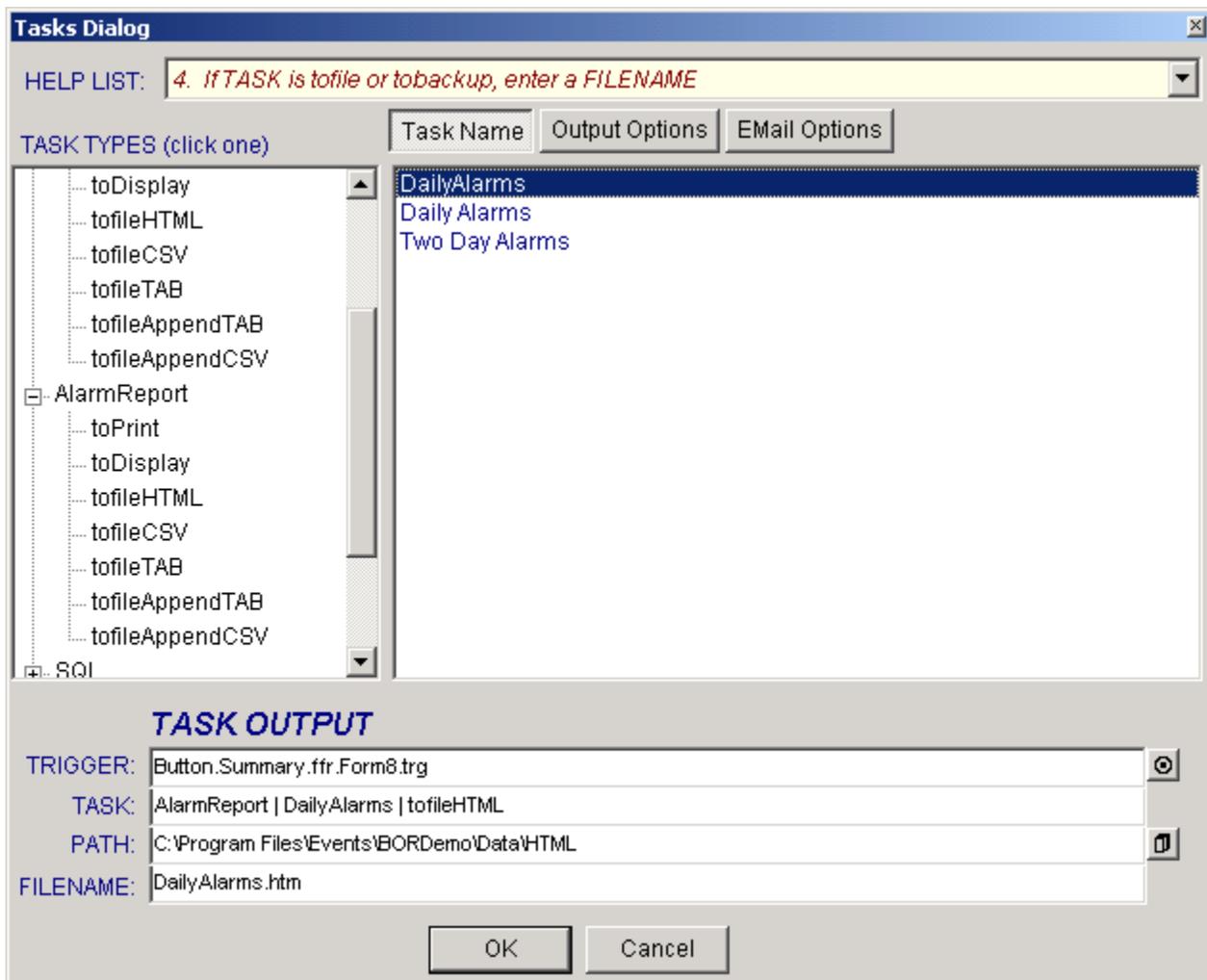
The button clicked may be assigned as a trigger or assigned to show a form or run a statistical report.

Write tasks allow you to write values to set point controls or write directly to the transmit grid. If you write directly to the transmit grid, any edit controls assigned to this transmit value is also updated. You can use the write controls to send new set points to your remote sites based on some condition (trigger). The conditions can be alarms, receive values, timers, or defined values.

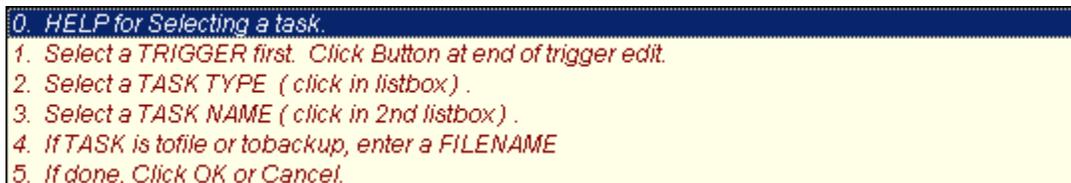
Email tasks are used to email messages and attachments to a list of users. The help list at the top provides a quick list of the tasks to-do when assigning a new task. See below for a list of the help commands.

In Summary:

1. Assign a trigger first.
2. Select a task to do. Be sure to expand the tasks by double clicking it or by pressing on the + symbol. Click on a subitem in the task type.
3. Now select a task name. Every task will have a task name to select.
4. Edit the path and filename if needed. If you are writing a value or clicking a control, you need to enter the value to be written.



An alarm report task has been selected, triggered at midnight and output as an html file.



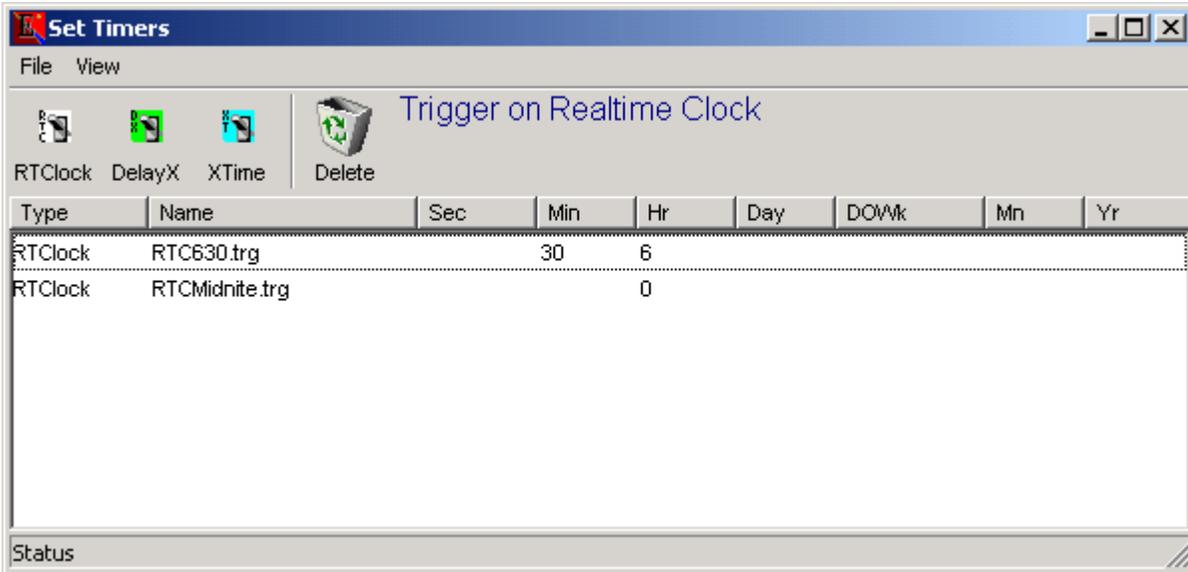
A quick help list will pop down if you click on the down arrow.

Assigning Timers

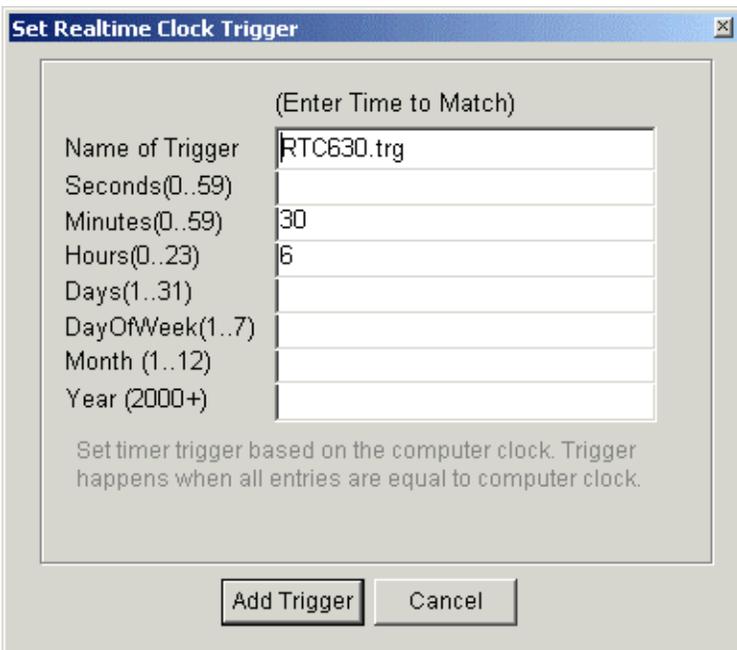
Timers are assigned by clicking the timer button from the tasks dialog. You can set 3 types of timers; real time clock

Events Reference

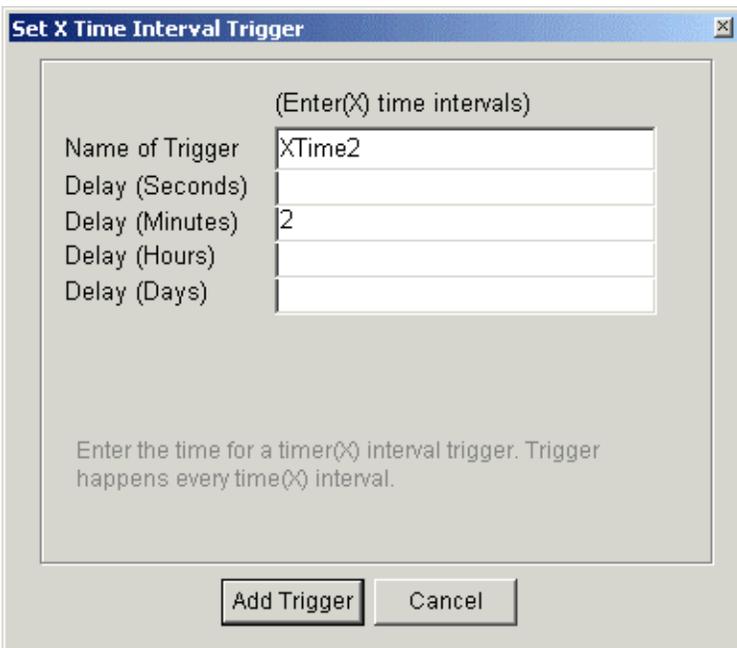
timers, trigger on every x time, and delay timers.



Double click on an existing timer to change it or to assign a timer like the one listed.
 Click on the toolbar buttons to assign the type of timer needed.
 Once a timer is assigned it will become available as a task trigger.



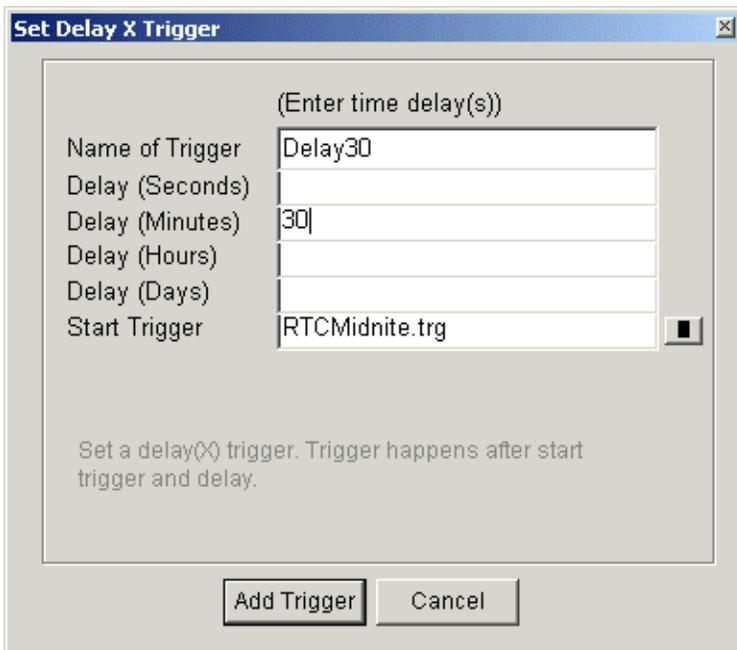
The real time clock timer selections are entered in the edit boxes shown.
 A midnight trigger would be set by putting a 0 in the hours box.
 Every hour trigger could be set by entering a 0 in the minutes box.



X time intervals are started when Events is loaded.
 The delay value is calculated in seconds.
 A one hour trigger could be assigned by setting the hours to 1 or minutes to 60 or seconds to 3600.

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The timer shown will trigger every 2 minutes.



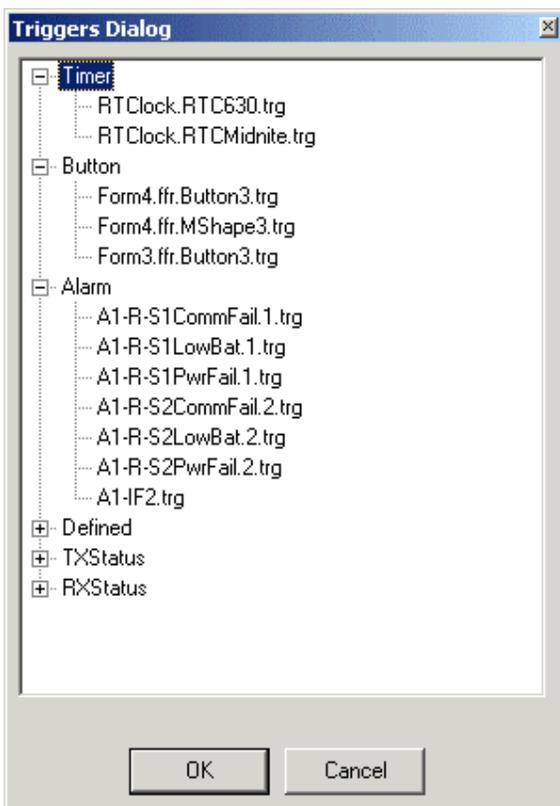
The dialog box is titled "Set Delay X Trigger" and contains the following fields:

- (Enter time delay(s))
- Name of Trigger: Delay30
- Delay (Seconds):
- Delay (Minutes): 30
- Delay (Hours):
- Delay (Days):
- Start Trigger: RTCMidnite.trg

At the bottom, there are two buttons: "Add Trigger" and "Cancel".

The delay time is started by another trigger and then delays by the number of seconds specified. A 1 hour delay could be assigned by entering a 1 in the hour box. Be sure to select the start trigger for this timer. Once the delay trigger is started it will not be reset until it triggers.

Selecting a Trigger



The dialog box is titled "Triggers Dialog" and shows a tree view of triggers:

- Timer
 - RTClock.RTC630.trg
 - RTClock.RTCMidnite.trg
- Button
 - Form4.ffr.Button3.trg
 - Form4.ffr.MShape3.trg
 - Form3.ffr.Button3.trg
- Alarm
 - A1-R-S1CommFail.1.trg
 - A1-R-S1LowBat.1.trg
 - A1-R-S1PwrFail.1.trg
 - A1-R-S2CommFail.2.trg
 - A1-R-S2LowBat.2.trg
 - A1-R-S2PwrFail.2.trg
 - A1-IF2.trg
- Defined
- TXStatus
- RXStatus

At the bottom, there are two buttons: "OK" and "Cancel".

Triggers are selected from the task form or task dialog. The triggers show are assigned dynamically. When you add a timer trigger or a button trigger on a form, it will be available for selection.

Triggers are selected from the triggers dialog box. Triggers are added when they are assigned. When a button is assigned as a trigger it will become available in this list. Triggers that assigned from the receive status, transmit status, defined sensors and alarms have to go from a 0 state to a non zero state for it to trigger. When any of these sensors go to 0 it will be reset. The next time it is a non zero (positive or negative) it will trigger.

Assigned alarms can be used as triggers directly. These triggers could be used to trigger alarm reports or other reports when they happen. You may want to add several receive sensors together as a group (like all communication fail sensors). You would add these sensors in the define tab of the Files and Alarms Form. If the value is greater than 0 then there is alarm condition. The new defined sensor is available to the alarms tab or used directly as a trigger for the scheduler.

Defined sensors also provide special triggers. You can add calculated sensors and logic sensors in the define grid. You can use an immediate if-then-else statement to evaluate a condition that outputs either a 1 or 0 for true or false. This new

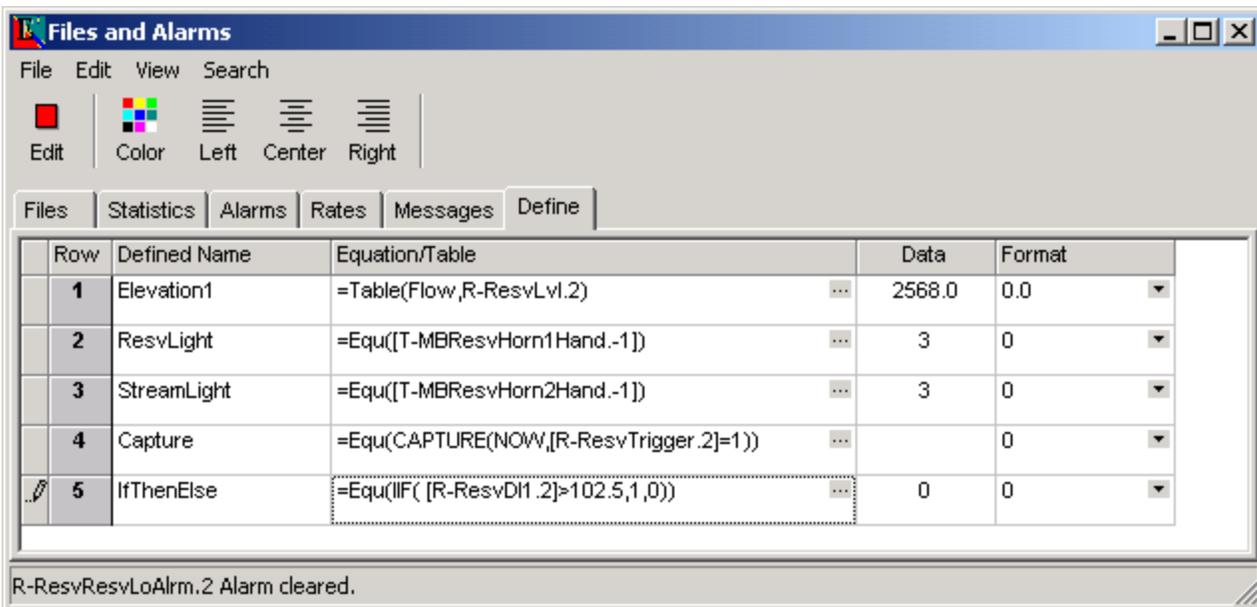
Events Reference

sensor can be used as a trigger in the tasks assignments.

The Capture equation captures a value or date time when a sensor meets or exceeds a specified condition. Certain alarm conditions could trigger the capture equation to capture the date and time of the alarm. On and off status conditions are candidates for capturing data. In an event reporting system, you may want to capture the date and time when a remote site last reported in.

Go to the View | Files and Alarms Form from the main window and select the Define tab to add new calculated sensors and triggers. Triggers are reset here only when the data column goes to 0. If a sensors value is always non zero it would not be a good trigger.

You can define alarms by using the wizard or by selecting the alarms tab and entering the new alarms manually. The wizard is available when you are in the edit mode only.



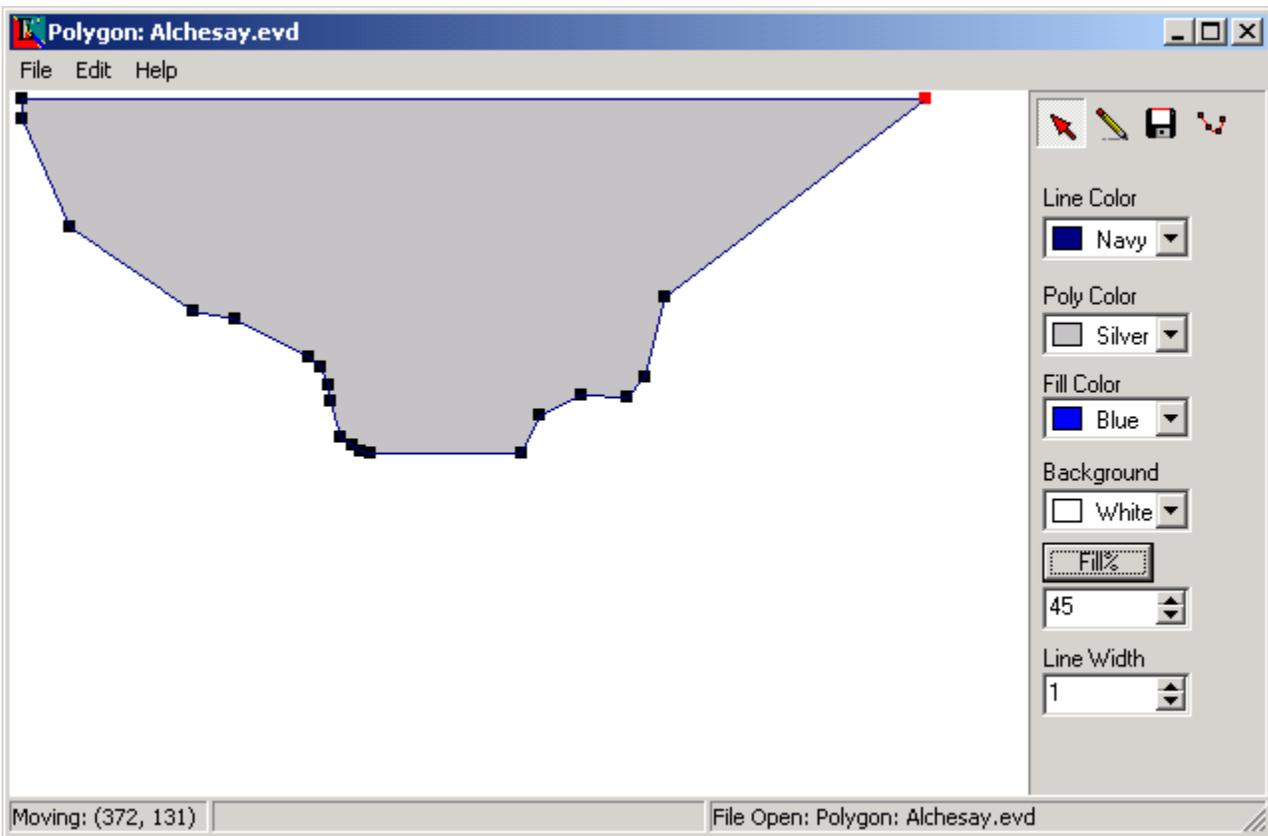
The define tab is used for special calculations using existing sensors in the system. You can assign table look ups, do if-then-else statements, add sensors together, capture a value or date based on some condition.

2.7. Polygon Editor

Run Polygon Editor

The Polygon Editor is separate application that can be started from Windows Explorer or from this menu item. The polygon editor allows you to draw custom shapes that can be saved as a bitmap or as a polygon file. The polygon file can be filled to show the current level and the bitmap can be used as background images.

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Polygon editor allows you to make new polygons to be used in EVENTS

The polygon editor has menu commands and button commands that do the same action. The four button commands above the Line Width selection box are:

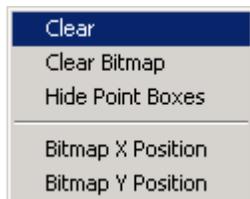
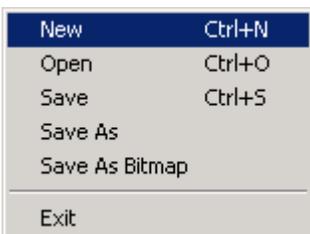
- Select polygon.
- Add points or draw polygon.
- Save the polygon. File is named: FileName.evd
- Show the point boxes toggle.

You can also insert a bitmap as a background to draw around. Use the File | Open command and select the file type as *.bmp to open a bitmap. Move the bitmap by changing the X position (left) and Y position (top) in the Edit menu.

The selection boxes are used to select different polygon properties. You can select:

- Line width of the polygon object.
- Line color of the polygon.
- The polygon color inside the object.
- The fill color when filled (0 to 100%).
- Background color or form color.

When a selection box is changed, the polygon shows the change. The polygon is drawn in the top-left of the screen because the (0,0) point is at the top-left. By keeping to polygon near this point you will use less space on your form when you select a polygon object.



File menu shows you can save the normally, save as and save as a bitmap.

The Edit menu

CREATING A NEW POLYGON

When you open the polygon editor, you can either start drawing points on the screen or load an existing file by selecting: File | Open command.

Polygons are closed objects and need at least three points to be complete. You can save the polygon at anytime as a bitmap if you want an open polygon object. The first polygon point is also the last polygon point. To complete the polygon, click the first polygon red dot.

SELECTING A POLYGON

When a polygon has been created or loaded from a file, you can select the polygon and move it on the form. When you select the polygon, the cursor will change to a hand. You move the polygon with the by pressing the left mouse button

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down and dragging the object or by pressing the Ctrl key with the Up, Down, Right, or Left arrows. If the cursor shows a hand, you can move the polygon.

ADDING NEW POINTS

You can add new points to your existing polygon by selecting the pencil tool (draw polygon) and clicking on the form. The last point will be moved to the new click location. Be sure to finish the polygon again by clicking on the first point.

MOVING POINTS

After a polygon is finished, you can move the polygon and you can move the points. When the cursor changes to a plus symbol, you are over a point. You can select the point and move it by pressing the left mouse button down and dragging the point. You can also use the Ctrl key with the arrow keys to move the point. To use the keyboard keys, position the mouse over a point with the plus cursor showing. Then press the Ctrl key and Up, Down, Left or Right arrows. The point will be moved in the arrow direction.

SAVING POLYGONS

Save the polygon by selecting the save or save as menu commands. If it is a new polygon, you will be prompted with a dialog box to select the file name and directory. Be sure to save the polygon in the "project directory" if it is being used by EVENTS. EVENTS looks in the project directory for polygon files being used by a form. The file is saved as a *.evd file (i.e. reservoir.evd). The polygon component in EVENTS will use this file when opening and closing.

If you have loaded a polygon file into the editor and press Ctrl S or press the save menu item, the current polygon file will be overwritten. You may want to use the "Save As" command first if you want to modify an existing file.

SAVING BITMAPS

You can also save your drawing as a bitmap file. This file can then be loaded into EVENTS using the Add Image tool. The bitmap file can be saved at any time. You can save a file when the polygon is open or when it is filled or empty. Bitmap files are not filled and used only as background files in EVENTS.

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3. Tools

3.1. Tools

Run Mode Buttons:

Green Button (Arrow): EVENTS is in the Edit Mode, click on to enter the run mode.



Red Button (Square): EVENTS is in the Run Mode, click on to enter the edit mode.

Toolbar

Toolbar: Display Tab Selected



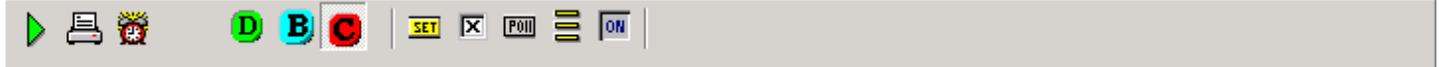
Labels, Special Labels, Tanks, Chart Buttons, Annunciators, LED, Pumps, Valves, Wind Speed & Direction, Polygon, Rain Button, and Trends

Toolbar: Background Tab Selected



Form Color, Shapes, Lines, Images (bitmaps, wmf, ico), Global Alarm Button, Buttons, Click Labels, Tabs

Toolbar: Control Tab Selected



Edit control, Checkbox, Bit Button, HOA Button, On/Off Button

BACKGROUND TAB

Form Color, Shapes, Lines, Images (bitmaps, wmf, ico), Global Alarm Button, Buttons, Click Labels, Tabs

Properties	Display	Analog	Bits
Background Color	yes	no	no
Shape	yes	no	no
Line	yes	no	no
Image	yes	no	no
Global Alarm Buttons	yes	yes	yes
Form Button	yes	no	no
Click Label	yes	yes	no
Form Tabs	yes	no	no

DISPLAY TAB

Labels, Special Labels, Tanks, Chart Buttons, Annunciators, Pumps, Valves, LEDs, Polygon, Rain Button and Wind Speed & Direction, Rain Button, Trends

Properties	Display	Analog	Bits
Label	yes	yes	yes
Special Label	yes	yes	yes
Tank	yes	yes	no
Button Chart	yes	yes	yes
Annunciator Display	no	yes	yes
LED Display	yes	no	yes
Pump	yes	no	yes
Valve	yes	no	yes
Wind Display	yes	yes	no
Polygon	yes	yes	no
Rain Button	yes	yes	no
Trends	yes	yes	yes

CONTROL TAB

Controls include Set Point edit box, check box, bit button and HOA button, On/Off button

Properties	Display	Analog	Bits
Set Points (Edit box)	yes	yes	no
Check box	yes	no	yes

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Bit button (Poll)	yes	no	yes
HOA button	yes	no	yes
On/Off button	yes	no	yes

Change Background

The Change Background Color button allows the user to change the background color on the current form. A color dialog box will be displayed to select and change colors.

Select the form and click on this button to change its background color.

Special TagName Properties

The TagName property is an identifier that originally had to be unique for every component. When Events went to the grid configuration for Modbus settings, the TagName property no longer had to be unique. The TagName property became available for special purposes.

We are using the TagName to set special properties for some components. The Annunciator uses the TagName property to show the data value as well as a text message. The Edit box and other controls use the TagName property for limiting access and allowing access to this control when no user is logged on.

These special properties were add to the TagName property so that older systems would still be compatible with newer changes. If a special property is defined it will be listed in the component's definition.

3.2. Properties

The Property Form is shown when the program is in edit mode and an object or component is double clicked. Right clicking on the component, and then selecting Properties from the pop up menu will also bring up the Property Form.

Property	Values
▶ TagName	Led1
Sensors(1)	R-ResvDI2.2
Font	Arial
OnMsg	ON
OffMsg	OFF
OnColor	clGreen
OffColor	clRed
BackColor	\$00F4F4F4
Shape	Circle
SetPoint	0
Operator	NotEqual(<=>)
UseBits	Yes
Left	218
Top	40
Width	58
Height	21

Typical property box

The property form allows you to change the display characteristics of each component. You can move it to a new location, change its font, change its text, set a sensor, etc. You can edit these properties, update the component changes on the form, undo the changes, and press Close button.

Some standard component properties:

Left - This is the component's left position on the form.

Top - This is the component's top position on the form.

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Width - This is the component's width.

Height - This is the component's height.

Font - This is the font for the components text. Set the size, style and color.

Back Color - This is the background color for the current component.

Other common properties are:

Title Color- set the color of the title text on the component.

On Color- the color the component becomes when the status bit is on or the bit is equal 1.

Off Color- the color the component becomes when the status bit is off or the bit is equal 0.

Fail Color- the color the component becomes when the status bit is equal 1.

Title- the component title. This value will help the user to know which component represents which part in the system

On Message- this message is displayed when the component status bit is on.

Off Message- this message is displayed when the component status bit is off.

Fail Message- this message is displayed when the component status bit is on

Style- this option is for image components. Choose Normal, Transparent, or Masked.

Line Width- set the width of the line in pixels.

Line Slant- the line can be either Horizontal, Vertical, Slant Right, or Slant Left. Choose the orientation for each line with this setting.

Line Color- set the color of the line here.

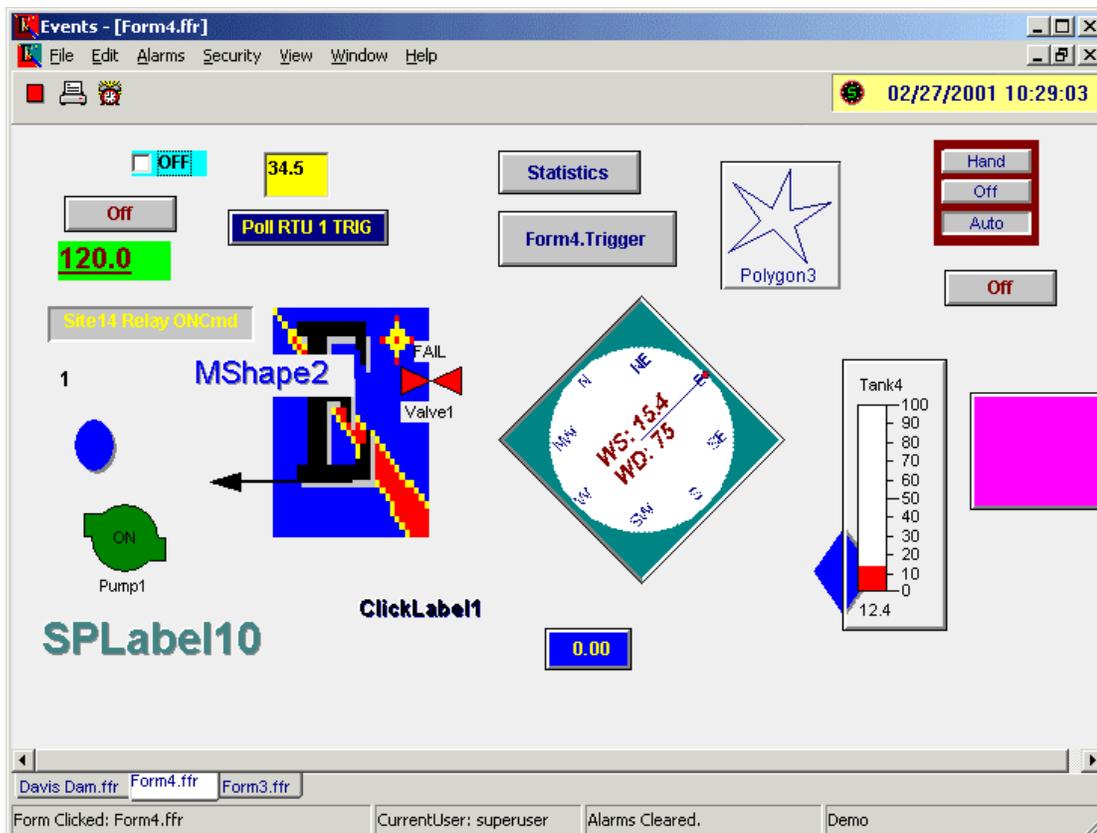
Angle- some components can be rotated; this setting determines how many degrees the component is rotated

One of the best ways to set properties is to configure one component first. If the component has the look you want, copy it and then paste it back to your form. The pasted component will have its properties set the same as the others.

Sensor Improvements

Several sensors have been improved by adding transparency to it. The polygon, the tank, and the shape sensor will be transparent if you select the background color to be the same as the form color. This is useful for showing a map or picture background through the sensor.

The windrose component has been improved by rotating it to match a map's north position. The display below shows the windrose being rotated by 45 degrees. This is done by entering rotate(45) (in lowercase) in the tagname property. The tagname is special placeholder for assigning commands that were added after the component has been used. This makes it compatible with older displays.



Several components are shown on this test form.

The tank4 and polygon3 are transparent.

The buttons have been assigned as triggers and as a statistics report generator.

The blue ellipse is a global alarm button that is assigned as a trigger when clicked.

The on click buttons were tested with different triggers to make sure they were toggled and that the data was written to the correct place.

Html output was test with all the components to be sure they were written in the background

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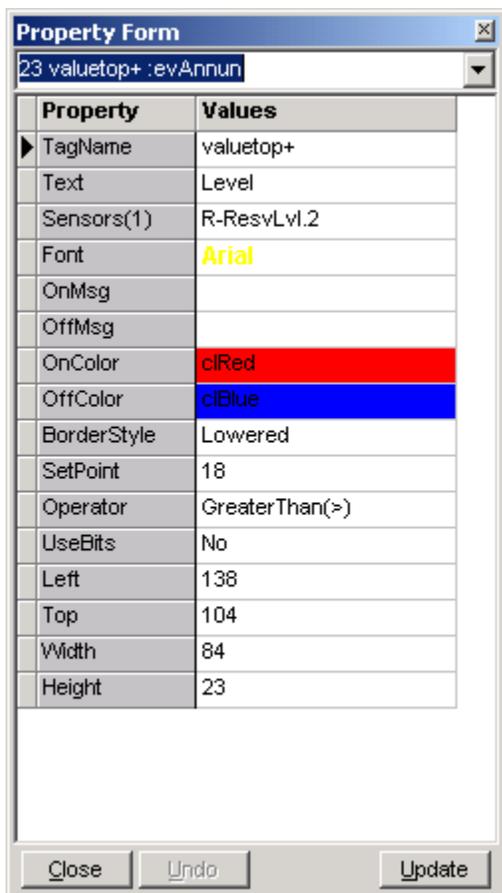
3.3. Annunciator

Use the annunciator display to show bit changes or analog value alarms. The back color changes and the message changes. The annunciator display can be shown using only the top message (half size). Just delete the text message and leave the alarm messages. Then resize the component smaller. Click on the annunciator button is the display tab to add it to the form.

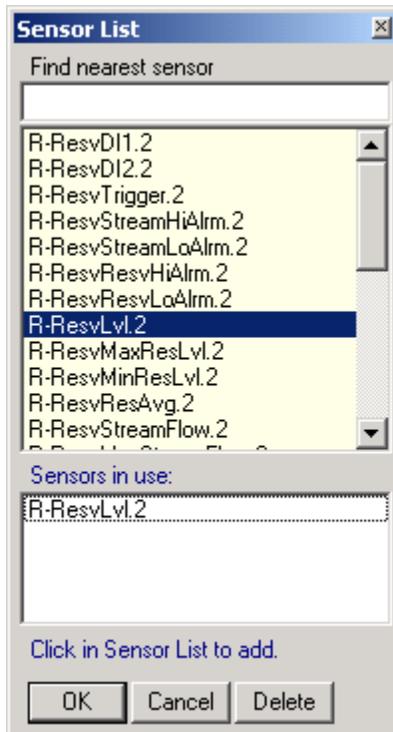


Two line annunciator and one line annunciator with alarm messages.

The annunciator component changes colors based on analog set points or status bit on-off values. Use it to display on, off, or fail conditions for triggers, pumps, valves, or other bit values. The annunciator can also compare an analog value to a set point value. Analog comparisons include less than <, greater than >, or not equal <>. The text message is shown in the top line and the OnMsg/OffMsg is displayed in the bottom line.



List of Annunciator properties.



Sensor list selection

Annunciator Special TagName Properties (put in the TagName property (use lowercase))

- 1. valuetop (shows value only, top line) value (shows value only, bottom line)
- 2. valuetop+ (shows text message and value) value+ (shows On/Off message and value)
- 3. Blank text line for bottom line message only.

3.4. Bit Buttons

Bit buttons are used to toggle a bit on and send to the master. The bit button looks just like a normal button. The button should be assigned to a data sensor that is a status sensor with a bit assigned. This controls is available only when Modbus is selected in the preferences.

When the button is press the bit is toggled on the word is transmitted to the Master RTU. The bit button is normally used to poll remote sites or to turn on a pump or open a valve. The bit button can be set by the scheduler to be activated on time.

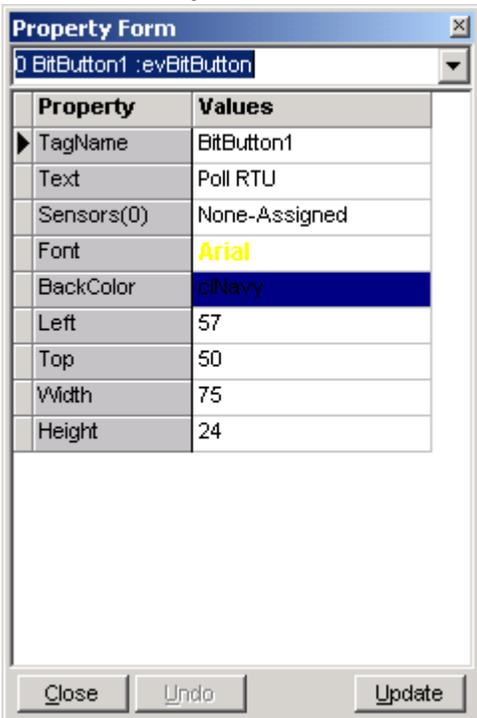
Events Reference



Bit Button Control

To modify the properties of any component, double click it, and the Property Form will open.

Bit Control Properties

A screenshot of a "Property Form" window. The title bar says "Property Form". Below the title bar is a dropdown menu showing "BitButton1 :evBitButton". The main area is a table with two columns: "Property" and "Values".

Property	Values
▶ TagName	BitButton1
Text	Poll RTU
Sensors(0)	None-Assigned
Font	Arial
BackColor	clNavy
Left	57
Top	50
Width	75
Height	24

At the bottom of the form are three buttons: "Close", "Undo", and "Update".

Select a status sensor from the transmit list

BitButton special TagName Properties (put in the TagName property (use lowercase))

1. controlok [any user can transmit value, even when no users are logged on: i.e. acknowledge]
2. controlok(mike, bob) [only mike & bob can transmit value, user must be logged on]

If a user doesn't have form editing privileges, the user will not be able to send controls unless you use the controlok(username) in the TagName property.

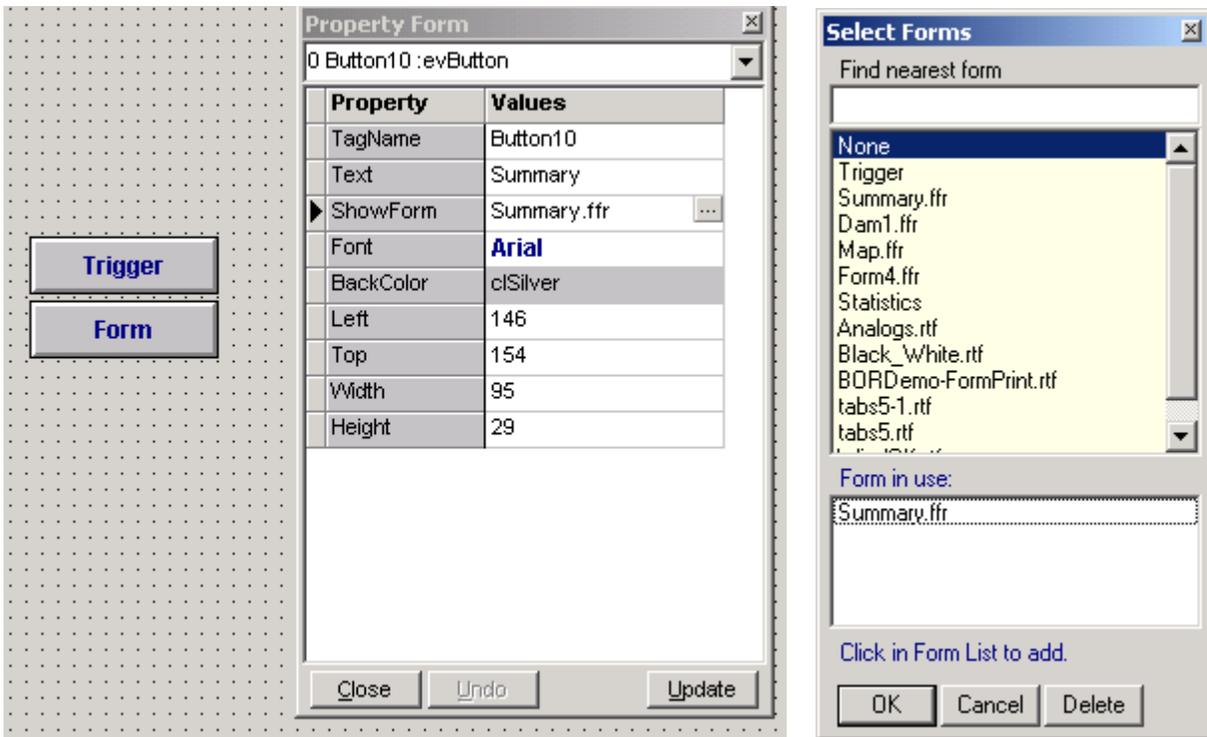
3.5. Button

Button (Show Form, Reports or Trigger)

The button component is used to go to another form in the project.

To add a button to the current form, click on the 'Add Button' button on the Controls tab of the toolbar. The button is a component that allows the user to switch between forms in Run Mode. Simply select a form in the Buttons tab, and in Run Mode, the user can switch between forms. This is useful for making a main form and links to the main form and other forms.

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Click a button to go to another form, do a report, or trigger an action.
Button properties forms

Selecting the button action.

To modify the properties of any component, double click it, and the Property Form will open.

No Special TagName Properties

3.6. Checkbox

The Checkbox component is a bit control. The checkbox writes to the master RTU with a new word value. The word value is changed according to reflect the assigned bit being on or off. The checkbox is only available when Modbus is selected in preferences.

To add a bit control to the current form, click on the Add Bit Control button on the Controls tab of the toolbar. The bit control is a component capable toggles a bit on or off and keeps it in that state. Once a sensor is assigned to the component, if the current user has permission, they can toggle the bit from ON to OFF.

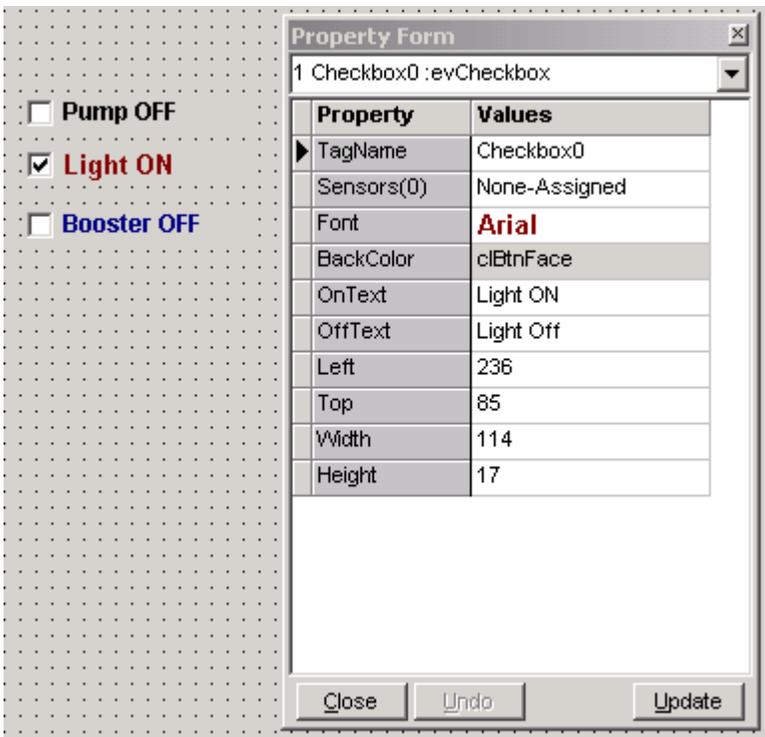
Checked bit control shows one message.

Unchecked bit control shows another message.

Three bit controls

Bit Control Properties

Events Reference



To modify the properties of any component, double click it, and the Property Form will open.

Checkbox special TagName Properties (put in the TagName property (use lowercase))

1. controlok [any user can transmit value, even when no users are logged on: i.e. acknowledge]
2. controlok(mike, bob) [only mike & bob can transmit value, user must be logged on]

If a user doesn't have form editing privileges, the user will not be able to send controls unless you use the controlok(username) in the TagName property.

3.7. Edit Box

The edit boxSet Point ControlEdit box is used to send new set point values to remote RTUs. Set point changes are done by editing a set point and pressing the enter key or by tabbing out of the set point edit box.

To add a set point control to the current form, click on the Add Set Point Box button on the Controls tab of the toolbar. The set point control displays values, as well as displaying user-defined text value. Select the component's sensor from the property form. The sensors shown will listed will be from the Modbus transmit grid in setup.

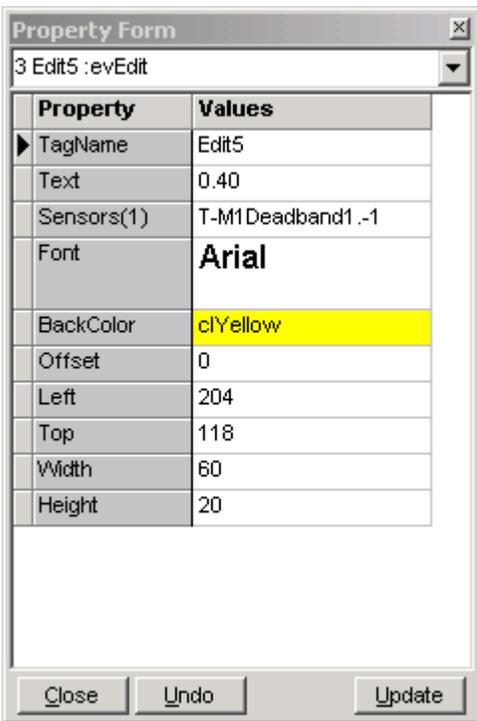
After assignment, new values will be written to the master RTU and then send to the remote site specified by the sensor. If the current user has permission, they can change set points in the system. When no user is logged on, the set point controls will be disabled. See the special properties below for other options.

Deadband Site 1	0.40
High Level Site 1	31
Deadband Site 2	0.25
High Level Stie 2	30

Change a set point by editing a value and pressing the enter key.

Set Control Properties

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Edit box properties

Offset Property

Use the offset when you want to send a set point where the integer value is greater than 32767. If you want to set the elevation of a reservoir to 6845.2, you can enter 6845.2 in the edit box with an offset of -6000. If the Multiplier is 10, the value sent to the RTU will be $6845.2 - 6000 = 45.2 * 10 = 452$. The 6000 offset will need to be added at the RTU end to show the correct reading.

Edit special TagName Properties (put in the TagName property (use lowercase))

1. controlok [any user can transmit value, even when no users are logged on: i.e. acknowledge]
2. controlok(mike, bob) [only mike & bob can transmit value, user must be logged on]

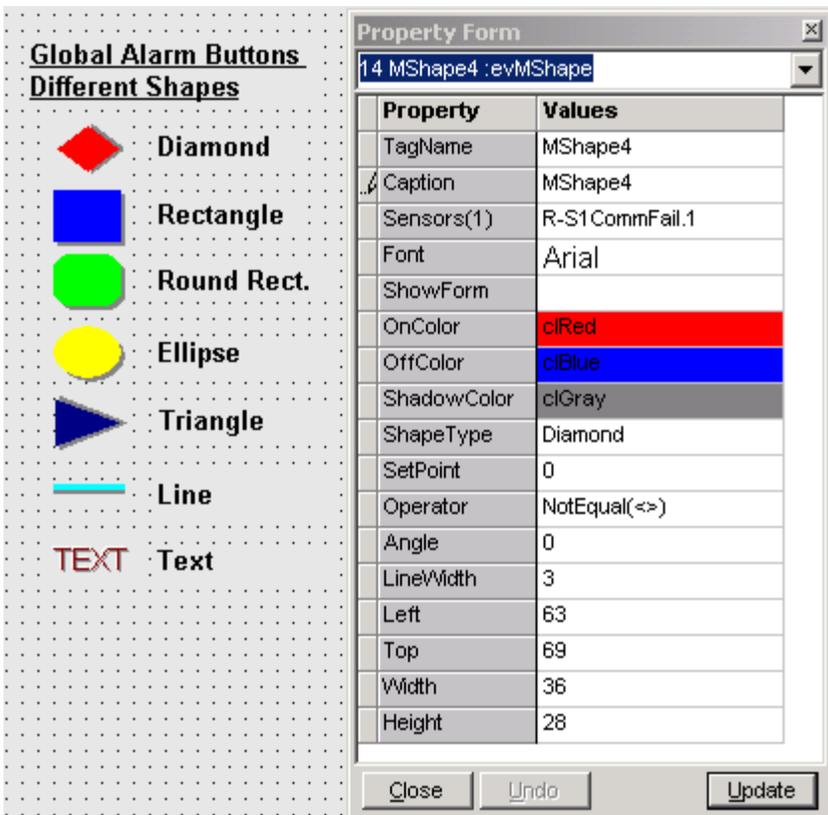
If a user doesn't have form editing privileges, the user will not be able to send controls unless you use the controlok(username) in the TagName property.

3.8. Global Alarm Button

The global alarm button serves three purposes.

1. It can be used as a display item.
2. It can be used as a button.
3. It can be used as an alarm button.

Events Reference



Global alarm button shapes and properties.

Display Only:

The global alarm button can be configured in 7 different shapes. The shapes are rectangle, rounded rectangle, Ellipse, Diamond, Triangle, Line and Text. To use the component as a display only, don't enter a show form name and select none for the data source. You can change the shapes and colors of the component to show the effect needed.

Display and Button Only:

The global alarm button can be configured to open any form or window that has been created. Just select one of the form.fpr names in the Show Form selection box. Now when you click on it, you will bring a new form to the front of the screen.

Display, Button and Alarm:

The global alarm button can be configured to have a sensor address that changes colors when the value is greater than, or less than, or not equal to a set point.

In many systems, there is an alarm word that is divided into 16 bits. Each bit is an individual sensor alarm for that site. If all the bits are off, the word will have a value of zero (0). If any bit is on or in alarm, the bit will be non zero and the data will be a value greater than zero (>0). By selecting a sensor and the operator (< >) and a set point, the global alarm button will change colors when the sensor is not equal to the set point.

This feature can be used with any analog value. The global alarm button is handy on system maps or overviews where you want to see if there are any alarms in the system, if there is an alarm, the button will change to the On Color and you can click on it to go to the selected form.

To add a global alarm button to the current form, click on the Add Global Alarm Button on the Controls tab of the toolbar.

Once a sensor is assigned to the component, along with the operator (< or >) and set point, the component will display the On Color and Off Colors. The normal button color is the Off Color.

To modify the properties of any component, double click it, and the Property Form will open.

Show Form- select which form will be brought to the front when this button is clicked in Run Mode

On Color- this property is for Global Alarm Buttons. The component will be this color when the specified alarm is on.

Off Color- this property is for Global Alarm Buttons. The component will be this color when the specified alarm is off.

Shape- set the shape for the global alarm button (Circle, Diamond, Ellipse, Rectangle, Round Rectangle, Triangle, Line, Text).

Border Width- set the width of the outline of the button.

Operator- this operator is used to determine an analog alarm. Choose whether the alarm state of the component is when its value is less than the set point (<), or greater than the set point (>) or (<>) not equal to the set point.

Set Point- the analog value with which the current value will be compared to determine alarms.

The alarms are for display only. Use the file and alarms to log historical alarms.

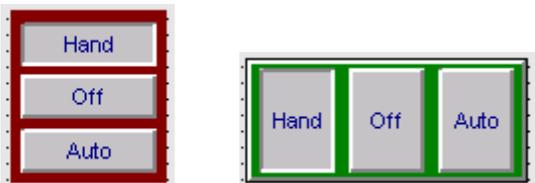
No Special TagName Properties

Events Reference

3.9. HOA

This is a bit control HOA controlling 2 transmit status bits. The assigned bits are toggled on and off when the HOA buttons are pressed. The new words are then sent to the master RTU.

The HOA (hand off auto) button is used to manually control pumps from the master RTU. This button uses two assigned data sensors. There are three modes of operation (Hand, Off and Auto) which are described below. If the RTU is configured properly, you can control the pump manually or you can set the pump to auto for control by the system on and off set points.



HOA switches, Hand is selected

The sensors selected for the HOA switch should have the same RTU number. Normally only one transmit word is used for the HOA control. 2 bits in the word are used. This control will also work if you use one transmit word for On-Off and another transmit word for Auto.

Auto Operation

When the HOA (hand off auto) button is in Auto position, the process controls the selected pump. In this mode, the auto bit is toggled on and the manual bit is not changed. The RTU ignores the manual bit setting when the auto bit is on.

Manual Operation

When the HOA button is in the hand position or off position, the auto bit is turned off, which turns on the manual mode. If the Hand button is pressed, then the manual bit is turned on. If the Off button is pressed, then the manual bit is set to zero.

In General

The HOA switch uses bits to control your equipment. The bit combination is as follows:

Hand Button Selected	Hand bit on	Auto bit off
Off Button Selected	Hand bit off	Auto bit off
Auto Button Selected	Bit ignored	Auto bit on

To add a HOA (hand off auto) button to the current form, click on the Add HOA Switch button on the Controls tab of the toolbar.

Just set data sensors for the hand and auto modes.

To modify the properties of any component, double click it, and the Property Form will open.

The recommended way to use this control is as follows:

The selected word has 16 bits. The first 8 bits are used for hand/off. Bits 9 through 16 are used for auto/manual mode.

pump one is assigned:	Bit	(0 means)	(1 means)
1. hand/off bit	= 1	0 = off	or >0 = on (hand)
2. auto/manual bit	= 9	0 = manual	or >0 = auto
pump two is assigned			
3. hand/off bit	= 2	0 = off	or >0 = on (hand)
4. auto/manual bit	= 10	0 = manual	or >0 = auto
and....			
pump eight is assigned			
5. hand/off bit	= 8	0 = off	or >0 = on (hand)
6. auto/manual bit	= 16	0 = manual	or >0 = auto

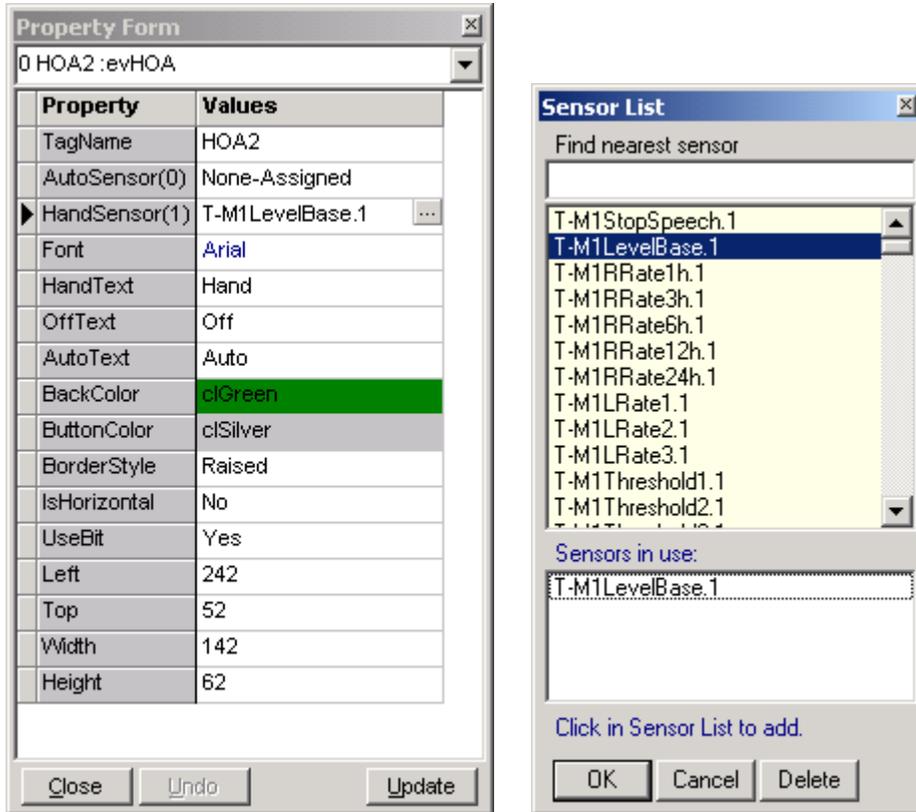
Events Reference

With this scheme, you can control 8 pumps with one word.

This is the way it works: The RTU is programmed to operate in either the manual mode or automatic mode. If the RTU auto mode bit is greater than zero (>0), then the pump ignores the manual settings, and operates the system based on the system set points.

If the RTU auto bit is equal to zero (=0), then the RTU goes into a manual mode, ignoring the set points. In the manual mode, it checks to see if the manual bit is equal to zero (0). If it is zero, the pump is turned off. If the manual bit is greater than zero then the pump is turned on.

HOA Control Properties



The image shows two overlapping dialog boxes. The 'Property Form' dialog on the left is titled '0 HOA2 :evHOA' and contains a table of properties and values. The 'Sensor List' dialog on the right is titled 'Sensor List' and shows a list of sensors with 'T-M1LevelBase.1' selected. Below the sensor list is a section for 'Sensors in use' which also contains 'T-M1LevelBase.1'.

Property	Values
TagName	HOA2
AutoSensor(0)	None-Assigned
HandSensor(1)	T-M1LevelBase.1
Font	Arial
HandText	Hand
OffText	Off
AutoText	Auto
BackColor	clGreen
ButtonColor	clSilver
BorderStyle	Raised
IsHorizontal	No
UseBit	Yes
Left	242
Top	52
Width	142
Height	62

Sensor List

Find nearest sensor

- T-M1StopSpeech.1
- T-M1LevelBase.1**
- T-M1RRate1h.1
- T-M1RRate3h.1
- T-M1RRate6h.1
- T-M1RRate12h.1
- T-M1RRate24h.1
- T-M1LRate1.1
- T-M1LRate2.1
- T-M1LRate3.1
- T-M1Threshold1.1
- T-M1Threshold2.1

Sensors in use:

- T-M1LevelBase.1

Click in Sensor List to add.

OK Cancel Delete

HOA Properties

Selecting transmit sensors

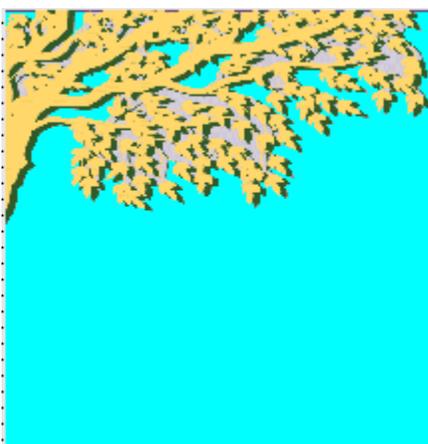
HOA special TagName Properties (put in the TagName property (use lowercase))

1. controlok [any user can transmit value, even when no users are logged on: i.e. acknowledge]
2. controlok(mike, bob) [only mike & bob can transmit value, user must be logged on]

If a user doesn't have form editing privileges, the user will not be able to send controls unless you use the controlok(username) in the TagName property.

3.10. Images

Use Images for form backgrounds. Special image effects are masking and transparent modes. Try these looks to see what looks the best. Right Click an image to select it and then select **SendToBack** command. Other components will come on to the front.



Events Reference

Use Images for backgrounds to enhance your screen display

To add an image to the current form, click on the Add Image button on the Displays tab of the toolbar. This will open up the Select Image Window. Three types of files may be opened by EVENTS: .bmp, .ico (icon), and .wmf files. Only these files will be displayed in the file selection boxes. Use a map image as the background of a screen, or any other image to graphically enhance your screens.

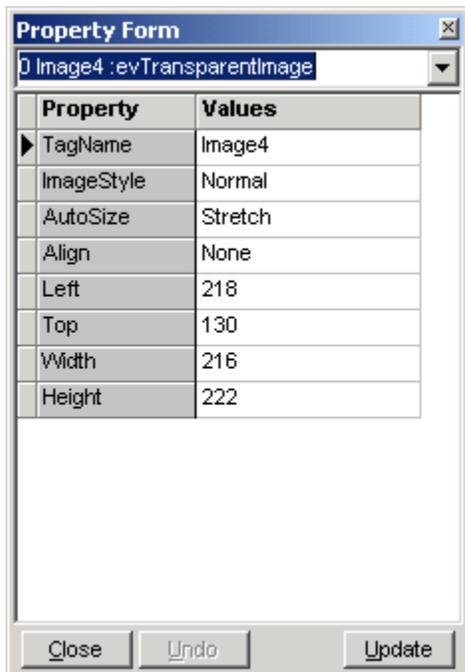


Image Properties

Display Left, Top, Width, Height, Style, Stretch, AutoSize, Image Masked

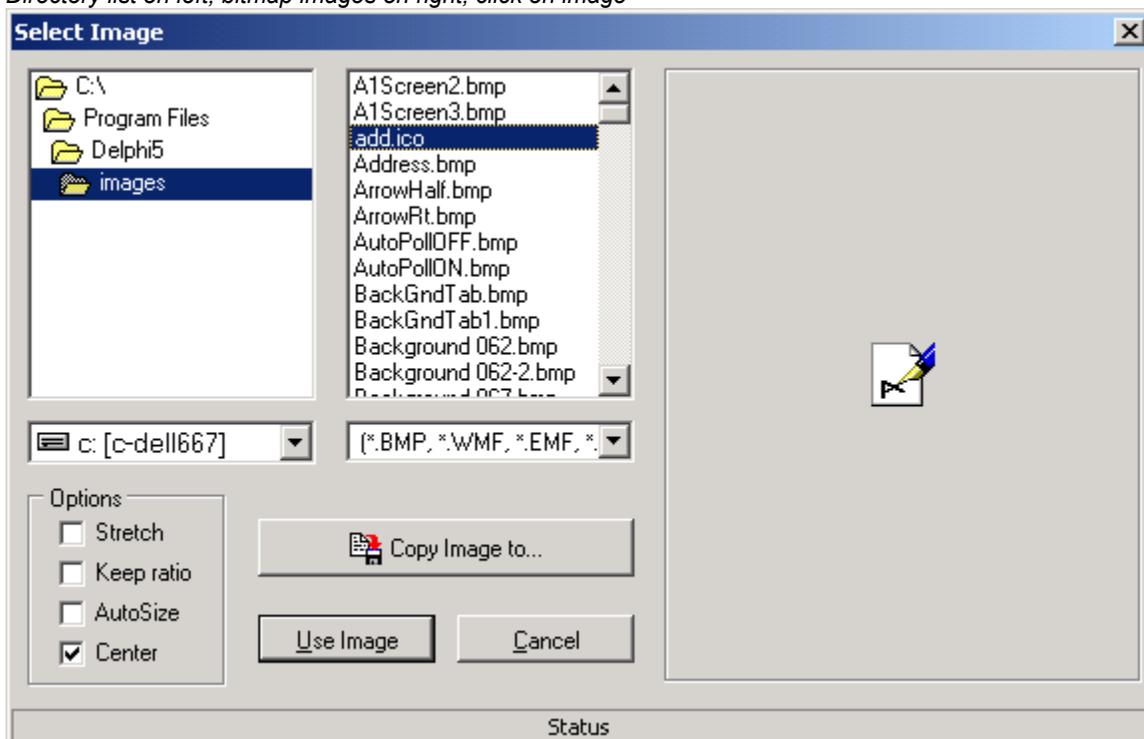
The masked option masks the bitmap image. The image cannot be stretched in this mode. Masked is effective for window backgrounds.

Image Transparent: The transparent option takes the color of the bottom left hand pixel, and makes that color transparent through the image.

Select Image Window

The Select Image Window is opened when the Add Image button is clicked. Use the directory list to select the directory of the graphic file to be added. Four types of files may be opened: bitmap (*.bmp), icon (*.ico), enhanced window metafiles (*.emf), and windows metafiles (*.wmf). Only files with these extensions will show up in the file box. Click on a file to preview the image in the window on the right.

Directory list on left, bitmap images on right, click on image



Copy an image into your form by selecting the image and then pressing Use Image button.

Options- the options box allows the user to preset some of the properties of the image.

Events Reference

Copy Image To- Click this button to copy the selected image file to another directory. This feature is helpful because all image files should be kept in the project directory. If you find an image to use elsewhere on the hard drive or on a floppy disk, use the Copy Image To button to copy it into the project directory. This button will open a standard Save As dialog where the file can be saved anywhere.

Use Image- Click this button when you have found and selected the image you want to use.

Cancel button- Click the cancel button to close the image window and to cancel the selection of an image.

Note: clicking on the Cancel button after copying files will not undo the files that have been copied.

3.11. Label

Label Displays

Labels are used to display analog values received by the master as well as regular text label displays. Labels can be used to show the results of the equation function also.

CURRENT RESERVOIR W.S. ELEVATION	8175.0
CURRENT SPILLWAY DISCHARGE (C.F.S)	0
W.S. RATE OF RISE/FALL (FEET/HOUR)	0.0

Labels can be used to show data or text

To add a label to the current form, click on the Add Label Button on the Displays tab of the toolbar. The label is a component capable of displaying sensor values or user set values. One label might display the level of a tank, another might say 'Main Valve' serving as a caption.

To modify the properties of any component, double click it and the Property Form will open.

The screenshot shows a 'Property Form' dialog box with a dropdown menu at the top showing '54 Label1 :evLabel'. Below the dropdown is a table with two columns: 'Property' and 'Values'. The table contains the following data:

Property	Values
▶ TagName	Label1
Caption	CURRENT RESERVOIR
Sensors(0)	None-Assigned
Font	Arial
Alignment	Left
BackColor	clWhite
Left	55
Top	309
Width	332
Height	19

At the bottom of the dialog box are three buttons: 'Close', 'Undo', and 'Update'.

Label properties

No Special TagName Properties

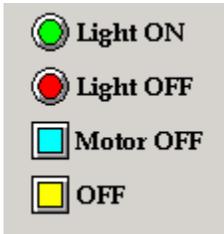
3.12. LED

The LED component is used to show status messages when a bit changes. The LED changes colors and the caption

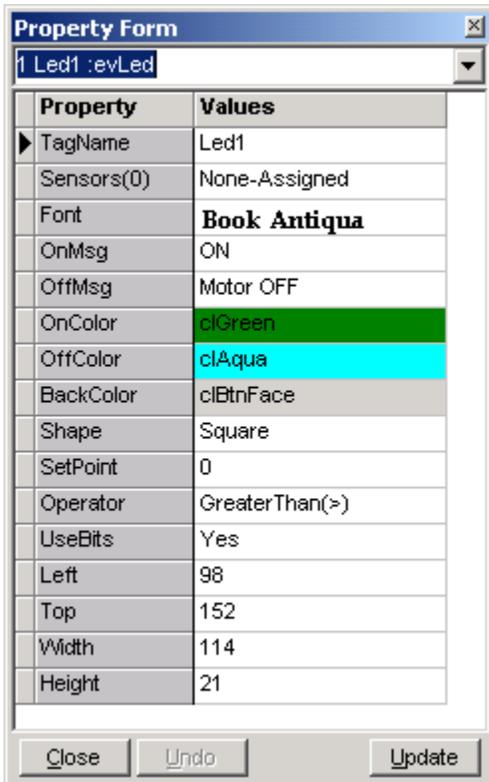
Events Reference

changes.

To add a status indicator to the current form, click on the Add Status Indicator Button on the Displays tab of the toolbar. The status indicator is a component capable of displaying data values. It shows the state of any bit in the system. Use it to display on, off, or fail conditions for tanks, pumps, valves, or anything else.



Status indicator changes color and caption.



Property	Values
▶ TagName	Led1
Sensors(0)	None-Assigned
Font	Book Antiqua
OnMsg	ON
OffMsg	Motor OFF
OnColor	clGreen
OffColor	clAqua
BackColor	clBtnFace
Shape	Square
SetPoint	0
Operator	GreaterThan(>=)
UseBits	Yes
Left	98
Top	152
Width	114
Height	21

Status Indicator-LED property box

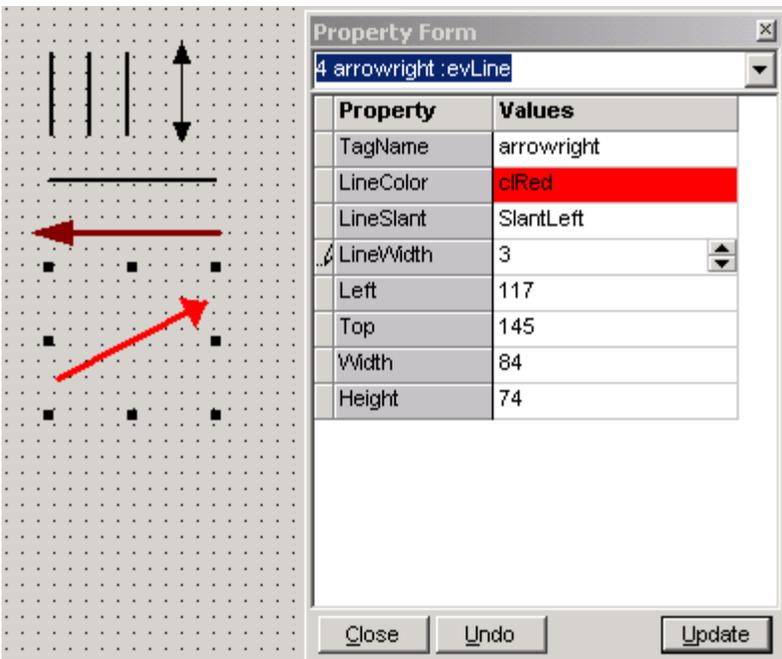
No Special TagName Properties

3.13. Line

Lines and lines with arrows are used for display purposes only.

To add a line to the current form, click on the Add Line button on the Displays tab of the toolbar. Lines are for graphical use only; they cannot be used to display sensor values.

Events Reference



Lines can be different colors and widths.

See special tagname properties to add arrows to one or both ends.

Line property box

To modify the properties of any component, double click it, and the Property Form will open.

Special TagName Properties (Arrows add names in lowercase)

arrowleft LineSlant=Horizontal, draws arrow on left.

LineSlant=Vertical, draws arrow on top.

LineSlant=SlantLeft, draws arrow on left.

LineSlant=SlantRight, draws arrow on right.

arrowright LineSlant=Horizontal, draws arrow on right side.

LineSlant=Vertical, draws arrow on bottom.

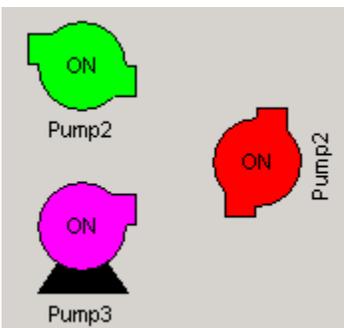
LineSlant=SlantLeft, draws arrow on right.

LineSlant=SlantRight, draws arrow on left.

arrowleftright draws an arrow on both ends of the line component.

3.14. Pump

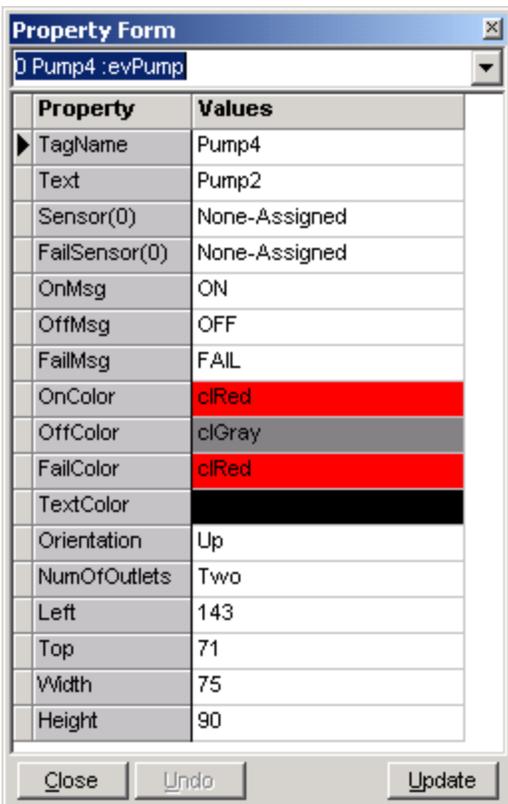
Use the pump component to show the status of a pump by changing colors and labels. This is a bit display. The pump will show if the pump is on, off or failed. You must assigned a failed sensor to show the failed status.



Pumps change color & text when on, off or failed.

To add a pump to the current form, click on the Add Pump Button on the Displays tab of the toolbar. The pump component will indicate whether the real pump's state is ON, OFF, or FAIL. Two sensors, both of which are set in the Sensors Tab of the Property Form, control the pump component. Pumps may have 1 or 2 outlets.

Events Reference



Property	Values
▶ TagName	Pump4
Text	Pump2
Sensor(0)	None-Assigned
FailSensor(0)	None-Assigned
OnMsg	ON
OffMsg	OFF
FailMsg	FAIL
OnColor	clRed
OffColor	clGray
FailColor	clRed
TextColor	
Orientation	Up
NumOfOutlets	Two
Left	143
Top	71
Width	75
Height	90

Pump properties

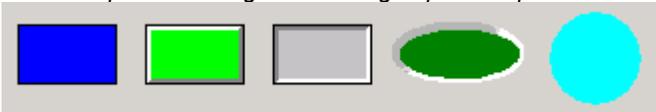
No Special TagName Properties

3.15. Shape

Shapes are used for display purposes only. You can right click a new shape and send it to the back, if it is on top of another component.

To add a shape to the current form, click on the Add Shape Button on the Displays tab of the toolbar. The shape will default to a rectangle, but it can be changed to a Circle, Ellipse, Round Rectangle, Round Square, or Square. A shape can serve only as a graphical component; it does not perform any functions or calculations. Shapes work well as pipes connecting tanks, pumps, and valves and for grouping labels in one area of the form.

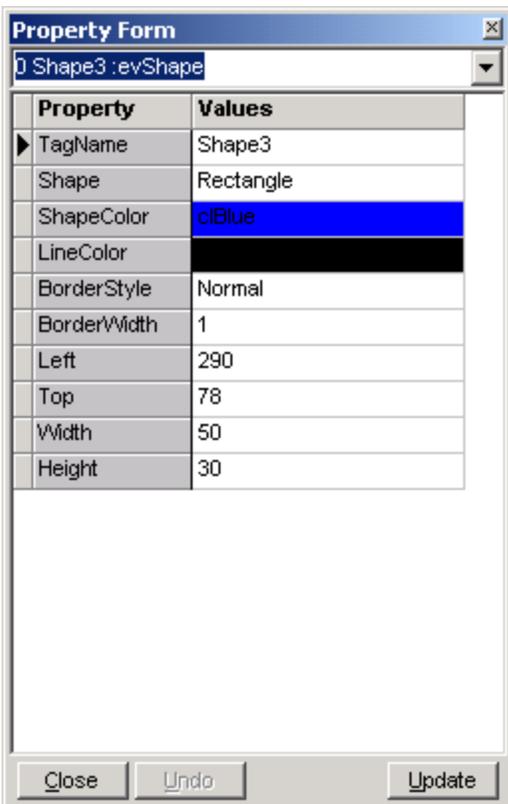
Use a shape as a background for a group of components.



Rectangles, circles, rounded rectangles, squares, raise rectangles, lowered rectangles.

To modify the properties of any component, double click it, and the Property Form will open.

Events Reference



Shape property box

No Special TagName Properties

3.16. Special Label

Special labels are used as form titles. Special labels are 3-dimension labels. This label can be rotated also.

note: Global alarm buttons can be shown as text that can also be rotated. The global alarm button doesn't have to be assigned a sensor address. The global alarm button also has different shapes you can use for display.

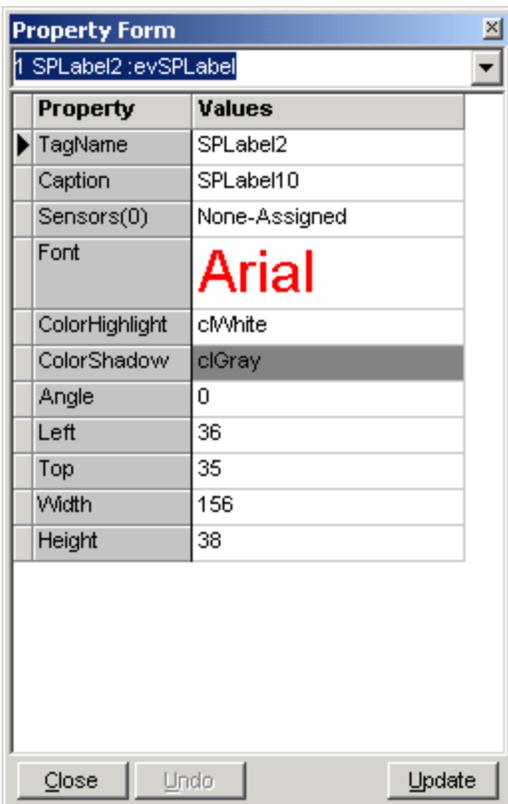
To add a special label to the current form, click on the Add Special Label button on the Displays tab of the toolbar. Special labels are mainly for labeling screens and components. They have a 3-D appearance, and can be rotated. This makes them useful for creating attractive screens. Align text to the right by adding "right" to the tagname properties

Special labels can be assigned a address to display data.



Special labels can be rotated and used as titles.

Events Reference



Special label property box

Special TagName Properties (put in the TagName property (use lowercase))

1. Align text properties: right, left, center can be entered in TagName property.

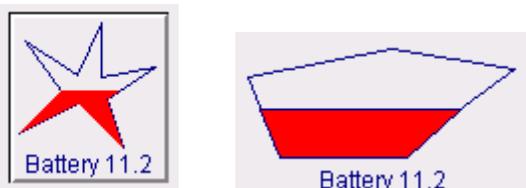
3.17. Polygon

Use the polygon component to display analog values in a non-standard shape. The polygon shows analog values filled from 0 to 100% if assigned a sensor address.

To add a polygon to the current form, click on the Add polygon button on the display tab of the toolbar. Polygon components are used to fill special shapes that have been created with the polygon editor. The polygon file (i.e. Reservoir.evd) is stored in the project folder. When Events is loaded it will look the polygon filename in the project folder. If it is not found, a default star polygon will be loaded.

Polygons are filled from the bottom up. The bottom is 0 percent and the highest point is 100 percent. The property box allows you to set the minimum and maximum engineering unit values assigned to 0 and 100 percent.

The Polygon can have a transparent look to it by making the bgcolor the same as the form color. The background will show through the polygon.



Polygons can be assigned a sensor address to display data.

A new polygon file is built by using the polygon editor. The editor is in the main EVENTS folder and is called PolyDraw.exe. The file is loaded each time EVENTS is started.

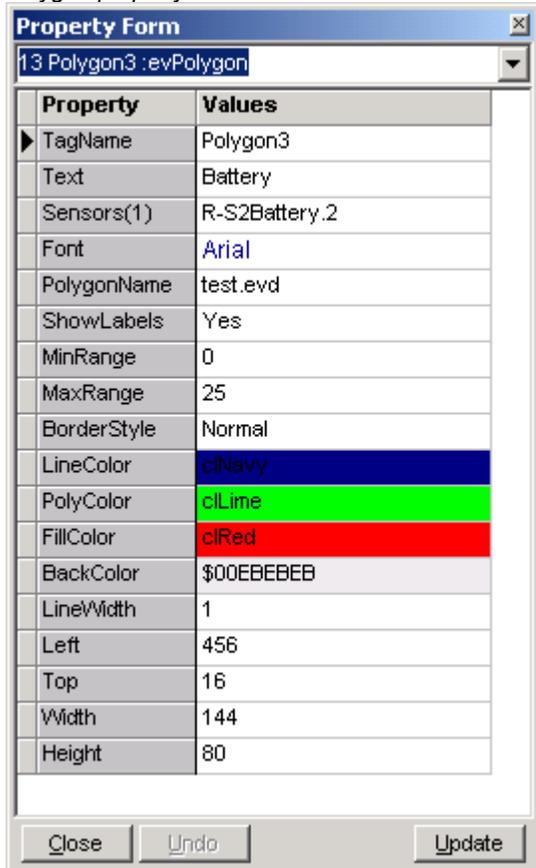
You can load a new polygon file by clicking on the polygon filename in the property box or by entering the name directly. When you click on the name a file dialog box will be presented showing the EVENTS directory and all polygon files with the *.evd extension.

When EVENTS is closed, the current polygon component will save itself to the project folder, overwriting the older polygon file. If you load the polygon file from EVENTS and then make changes to the file, it may be overwritten when

Events Reference

EVENTS is closed. The best approach is to rename the polygon file when editing it.

Polygon property screens



No Special TagName Properties

3.18. Rain

Use the rain component to show an analog value accumulation. The rain component shows a running total accumulation change over time. The time intervals are fixed at 1 hour, 6 hours, 24 hours and each day for 30 days. Alarms can be enabled for these time periods.

To add a rain button to the current form, click on the Add Rain Button on the display tab of the toolbar. The rain button shows the current rain accumulation for 1 hour, 6 hour, 24 hours, or 30 days. Clicking on the rain button displays rain-graph summaries. The list is the memo display of all the summaries. The rain graph is closed when editing and other forms are opened. The rain initialization file name is RateRain1.evt.



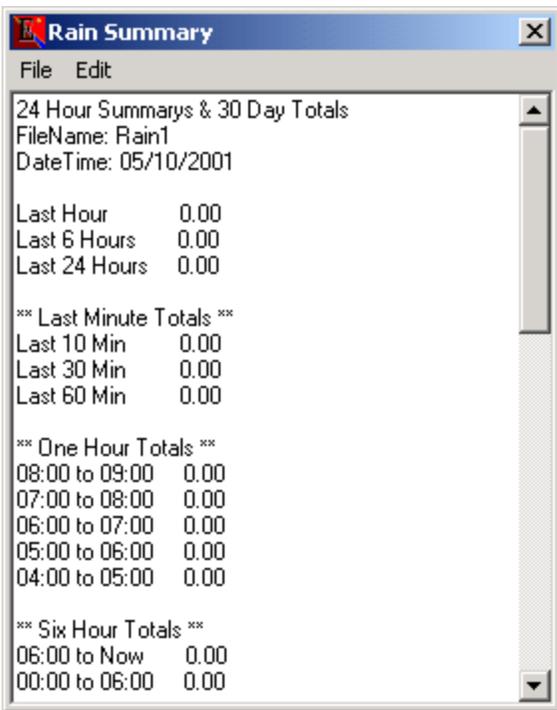
Rain Buttons



Rain Graphs

Open the rain graphs by clicking on a rain button
Close the rain graph by clicking on the graph or X button

Events Reference



*Rain list showing one hour, six hour, 24 hour and 30 rain totals
Print or save the memo, click File | Save or File | Print*

Rain Alarms

The rain button can also be configured to activate alarms based on accumulation. You can set low and high alarms for each time period (1 hour, 6 hours, & 24 hours). If the rain accumulation exceeds any of these values and the alarm is enabled, a system alarm will be triggered. The system alarm logs the alarm in the current and historical alarm log. You can configure the type of alarm action needed (log, blink, show, sound, message).

The rollover is used for systems where the accumulator value rolls over when counting up. If the value is -1, the roll over is ignored or disabled. ALERT systems use a roll over value of 2047.

To reset the rain values to zero, select the ResetRate to yes and press update. You can not undo a reset action. The next value received will be the starting accumulator value. Rain data received is stored in rate files, in the data folder. The accumulative file is named Rate-Name.evt in the project folder.

The multiplier (Mult.) property can be set to 0.03937, 0.01, or 1 to make engineering units.

Events Reference

Property Form

8 Rain1 :evRain

Property	Values
TagName	Rain1
Sensors(0)	None-Assigned
Font	Arial
RollOver	-1
Mult.	1
ResetRate	No
1HrLowAlarm	0.5
1HrHiAlarm	1
6HrLowAlarm	1.1
6HrHiAlarm	2
24HrLowAlarm	2.1
24HrHiAlarm	4
AlarmsEnable	No
AlarmActions	Log
AlarmMsg#	0
RainColor	clBlue
PanelColor	clAqua
BackColor	\$00EBE8EB
LowAlarmColor	clYellow
HiAlarmColor	clRed
Left	355
Top	333
Width	58
Height	28

Close Undo Update

Rain Button property screens

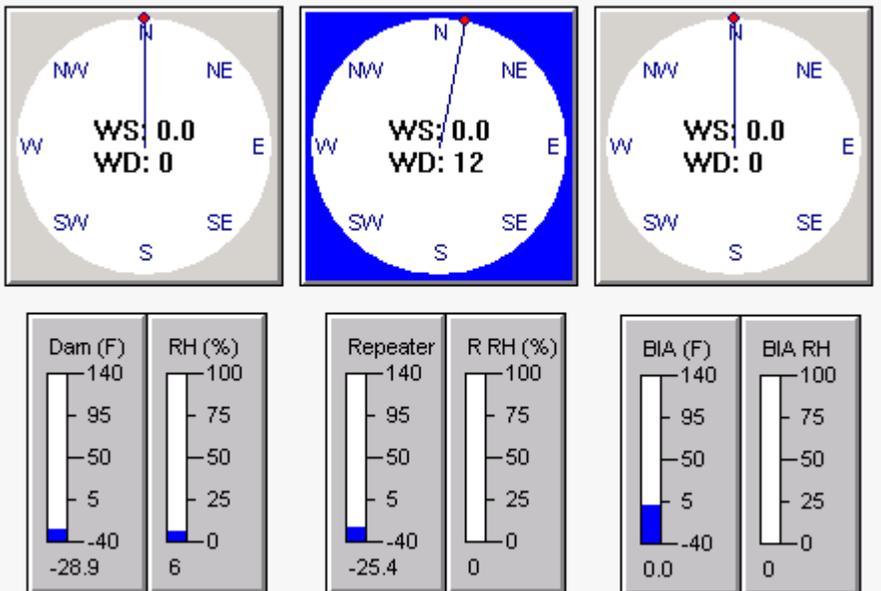
No Special TagName Properties

3.19. Tank

Tanks are visual displays of analog value changes. The tank shows the analog value as a graphical bar chart as well as numerically.

To add a tank to the current form, click on the Add Tank Button on the display tab of the toolbar. The tank component displays sensor data from a minimum to maximum value. The rising and lowering of the tank bar indicates the level.

Wind Rose with tank bar charts below.



Tanks or bar charts can be displayed in different colors and borders.

Events Reference

Property	Values
▶ TagName	Tank3
Text	Dam (F)
Sensors(1)	R-S1Temp.1
Font	Arial
MinRange	-40
MaxRange	140
ShowTitle	Yes
ShowLabels	Yes
ShowTickMarks	Yes
ShowBorder	Yes
BorderStyle	Raised
PanelColor	\$00F4F4F4
BarColor	cBlue
BarBackColor	cWhite
BackColor	cSilver
Left	265
Top	241
Width	61
Height	141

Close Undo Update

Tank property box

Tank Properties.

Title Color- the title color sets the color of the text on the tank, which displays the title.

Back Color- the back color determines the panel color on which the tank sits.

Tank Color- the tank color is the color of the stuff in the tank. In a water tank, the tank color is the water. This is what raises and lowers indicating the level.

Tank Back Color- the tank back color is the color behind the tank color within the tank.

Show Title- when this is checked, the title will be shown, and otherwise it will be hidden

Show Labels- when this is checked, the numbers on the side of the tank will be shown, and otherwise they will be hidden.

Show Tick Marks- show or hide the horizontal lines on the side of the tank with this checkbox.

Show Border- show or hide the border around the actual tank with this checkbox.

Border Style- the panel on which the tank sits can be nonexistent (None), Raised, or Lowered. Raised will make the panel sit forward a bit, and lowered will make it sink into the form.

Max Value- each tank must have a maximum value to create its own scale. Set the maximum level of the tank here.

Min Value- each tank must also have a minimum value. Set the minimum level of the tank here.

No special TagName properties.

3.20. Trends

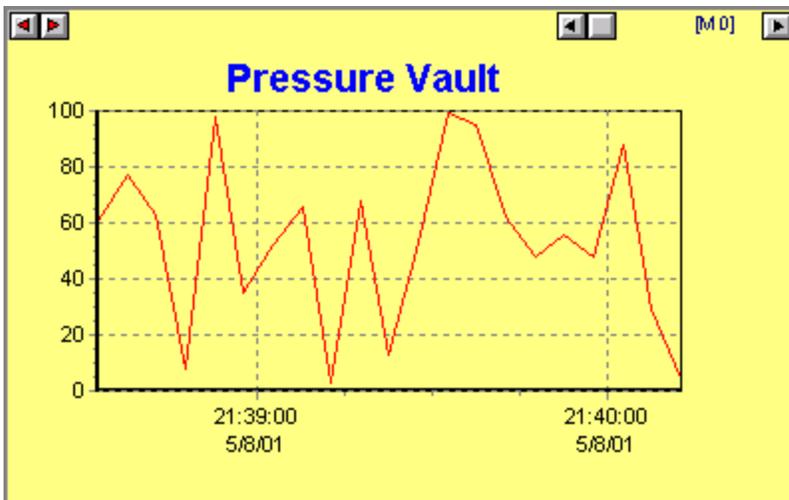
Trend charts are used to display one or more analog values in a historical trend. You must first configure the trend properties to add sensors, etc. Then in the run mode right click the trend to make additional changes. A separate edit button allows you to configure the settings for the trends.

To add a trend to the current form, click the Add Trend in the Displays tab of the toolbar. Double click the component and add "like" sensors to the trend's properties. The sensors' data values will be shown in the trend

Date/Time Changer Buttons on left

Scroller on right (A 0 shows the trend to be in automatic mode)

Events Reference



Real Time Trends

Right Clicking for additional properties

1. Right click the trend to set properties.
2. Right click the scrollbar to toggle between automatic scaling and manual scaling.
3. Click the changer button to change bottom scale time.

The real time trend has many of the same features at the Button Chart. Only this trend is showing the trend data all the time.

Right click on the trend and on the scrollbar.

Properties are toggled on and off and can be set by right clicking.

If you right click on the scrollbar, the trend changes from automatic datetime scaling to manual datetime scaling. Manual date time scaling allows you to stretch the data and to view only a portion of the data. Automatic datetime axis shows all the data in the trend.

DateTime Changer (Changing the bottom scale)

The datetime changer is a dual button that allows you to go short the datetime span or to lengthen the datetime span. There are 21 settings you can expand to (from 1 second to 1 year). Each click on the date time changer changes the trend to the manual mode. A hint shows up when the mouse is over the datetime changer that shows its current setting.

Property	Values
Title	Pressure Vault
TrendName	CTrend1
Sensors(1)	Sensor1
MaxCount	4000
XScaleMax	100
XScaleMin	0
ClearData	No
Color	\$0080FFFF
GradientColor	clSilver
ShowGradient	No
Show3D	No
BevelInner	Lowered
BevelOuter	Lowered
ChangerPlacem	TopLeft
ScrollerPlacem	TopRight
MarginTop	10
MarginLeft	5
MarginBottom	15
MarginRight	15
Left	74
Top	52
Width	400
Height	250

Close Undo Update

Properties

Events Reference

No special properties are used in the trends.

Again Right Click On Trend

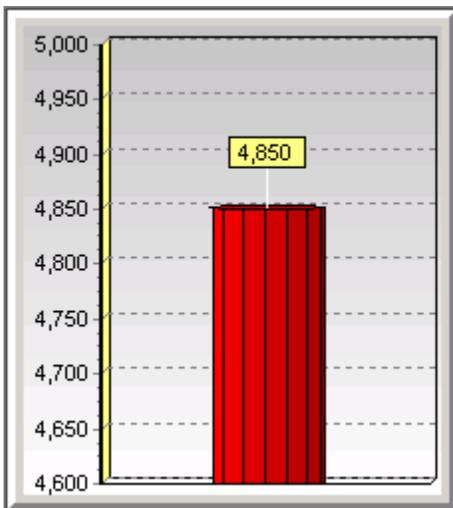
Right click on the trend to present the property forms for the trends. These properties are the same for the button chart. Goto Button Charts to see all the property options

3.21. Button Chart

Button trend charts are used to display one or more analog values in a historical trend. This component is really two charts. The first chart is the button. The second chart is the trend. You must first configure the button chart properties to add sensors, etc. Then in the run mode click the button to present the historical chart. A separate edit button allows you to configure the settings for the trends.

To add a button chart to the current form, click the Add Button Chart in the Displays tab of the toolbar. Double click the component and add "like" sensors to the button chart properties. The sensors' data values will be shown on the button and in the trend.

Note: The button chart has a time step property that adds a new data point to the trend at that time step. The trend also updates when the data value of any sensor changes. This way changes in sensor values are recorded in the trends. Maximum and minimum values will not be missed.



The button chart shows the last value received for each sensor. Click on button to view trend.

Button Chart Properties (On the button)

The button chart and trend chart have separate property setting. The button chart has a standard property dialog where you define the sensors to plot, the number of points to plot and the look of button. The trend chart properties are set by viewing the trend and then clicking on the red edit button.

1. Button Chart

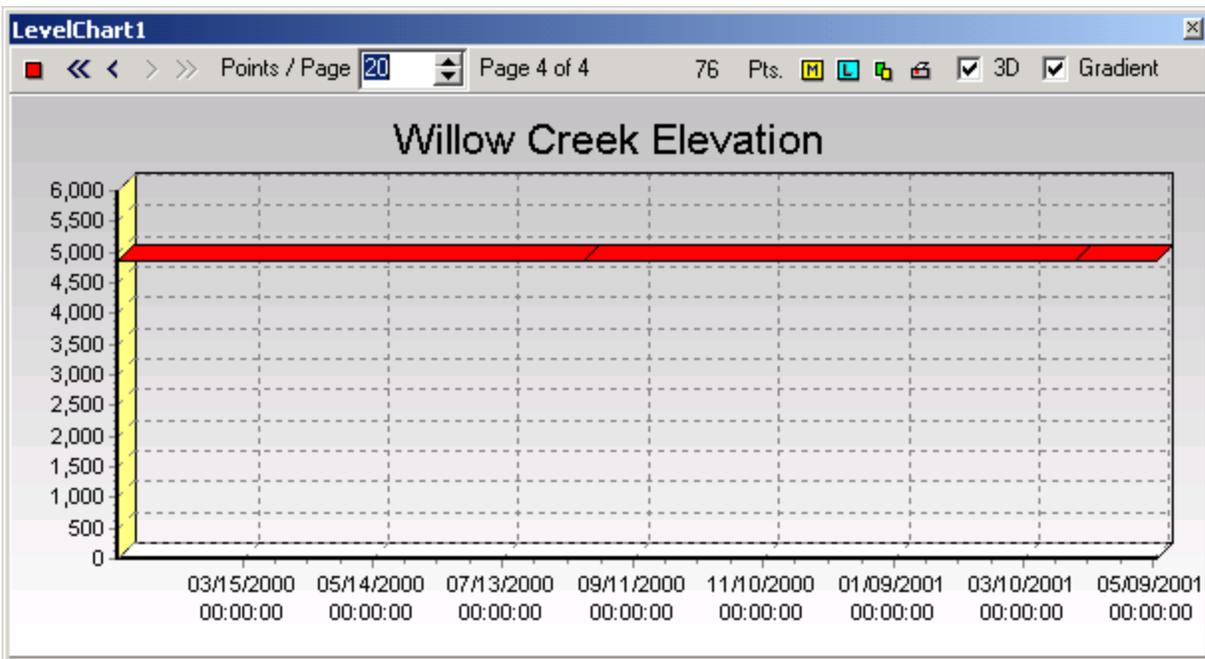
The button chart shows the last received value for each sensor. Click the button to show the historical trend. If you right click the button chart in the run mode, you will be presented a chart property dialog that allows you to configure the look of the button chart. This dialog is the same at the trend chart property dialog.

2. Trend Chart Properties

The trend chart also has separate properties that can be set. Click on the red edit button to change the look of the trend chart. See the trend chart dialog options below.

The red edit button allows you to configure the look of the trends.

Events Reference



The chart trends each sensor defined by the button chart. The toolbar at the top is for editing the chart trends.

Trend Chart Toolbar

Edit Button (Red Square)

Click this button to change the properties of the trend chart. Below are several screens showing all the properties you can set for each trend.

Navigator Buttons

Click on the navigation buttons to go back in time or move forward. The double arrows go to the first or last page of data.

Points / Page Selection

This is the number of points plotted on the trend. If you enter a zero (0), the chart plots all the points. As you change the number of points, the chart is updated.

Mark Button

The mark button shows a yellow box with the data value for each point on the chart. If more than one series is being plotted a dialog box will be presented for you to specify the data series you want to mark.

Legend Button

This is the show chart legend toggle. The chart legend will be displayed showing a color symbol and name of the sensor being plotted.

Copy Button

The copy button copies the current chart to the clipboard. You can paste the chart into the report editor or into a graphics program like paint.

Print Button

The print button presents a print preview dialog box so you can select how you want the chart to print. You can cancel the print or print it to your printer.

3D Checkbox

The chart can show data in three dimensions or in two dimensions. Unchecked is two-dimensional, checked is three-dimensional.

Gradient Checkbox

The chart's background is either a solid color or gradient color. The gradient checkbox allows you to toggle this option on and off. The gradient start and end colors can be selected from the chart property dialog.

Setting up the Button Chart

To modify the properties of any component, double click it, and the Property Form will open. The property form shows the properties of the button. These properties should be set first before you configure the trend properties.

The ChartName property should be a unique name. This name is used when storing the trend charts properties, data and position. If two charts have the same name, one chart will overwrite another chart's data. Use chart names that are meaningful.

Events Reference

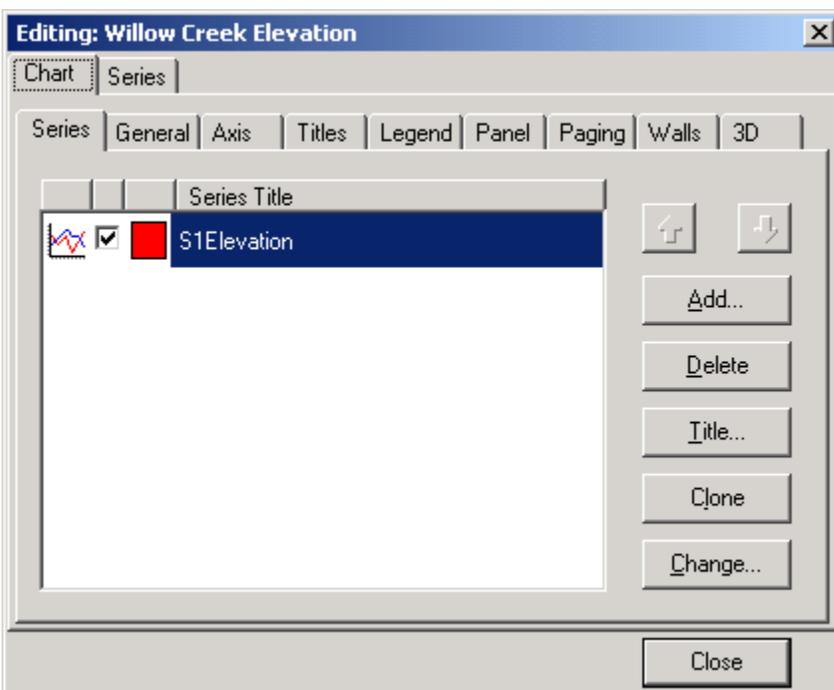


Button chart properties

These are the Button Chart Properties . These properties should be set first. Then change the trend properties. Change a property and click the update button to view your changes. You can always click the undo button to go back to the original components properties.

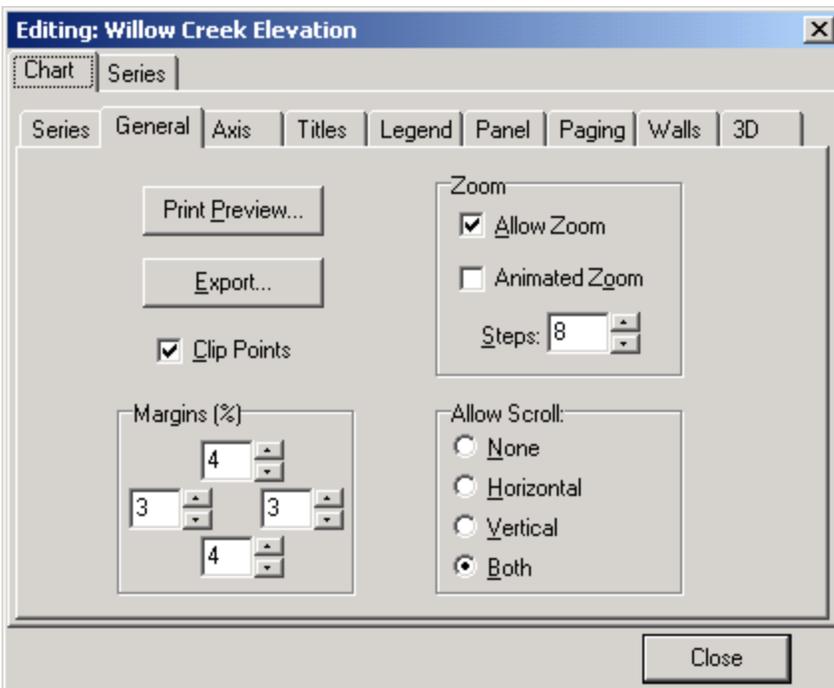
Trend Chart Property Dialogs

There are many properties that you will never set. The ones that are used the most are shown in the Axis tab, Titles tab, Paging tab and 3D tab. All the tabs are show below for reference.

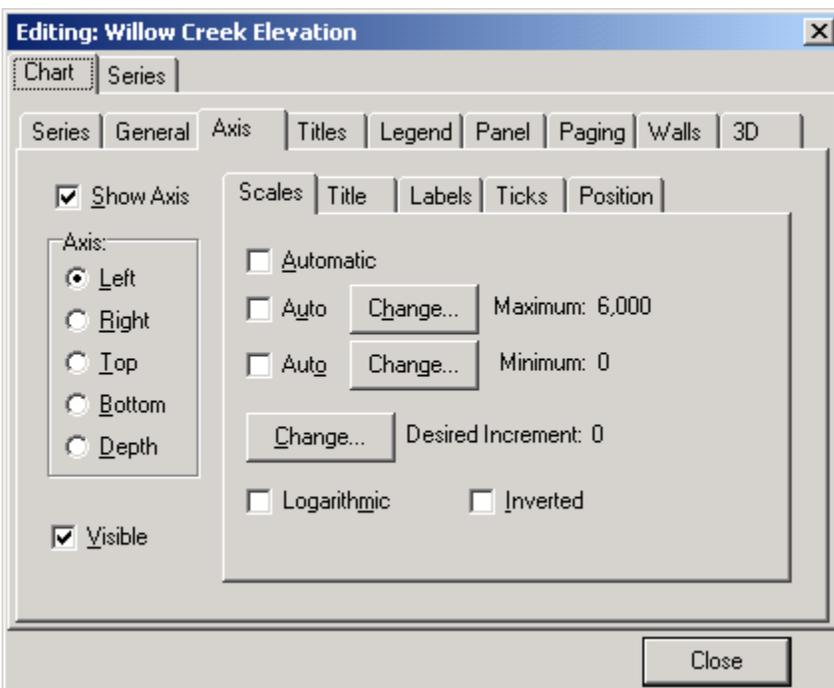


The chart series name is show here. The type of data series is shown by small graphic icon to the left. The check mark enables the trend. The square shows the color of the series.

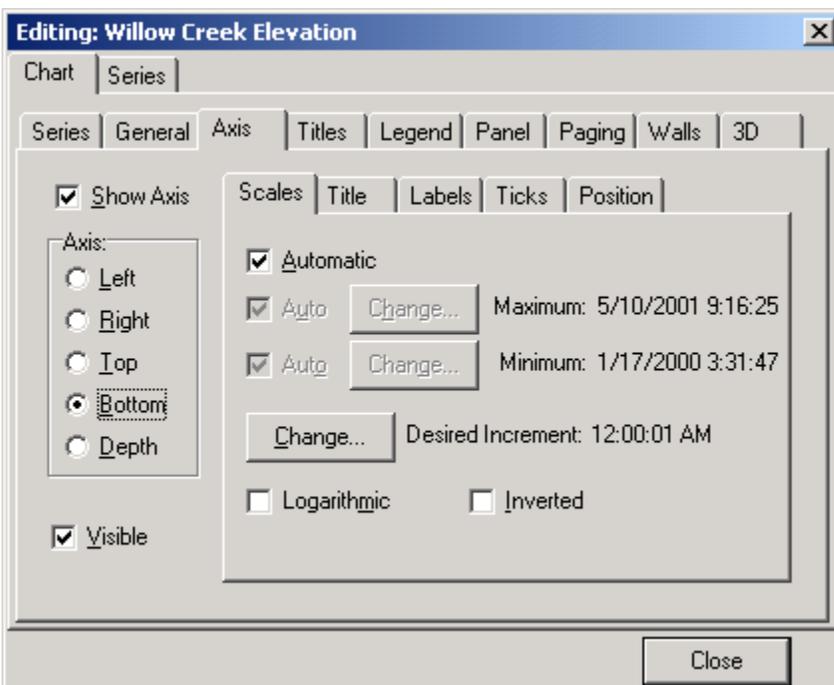
Events Reference



The General tab allows you to export the chart, print preview it, set the zoom properties and scroll properties.



The Axis tab allows you to set the left axis minimum and maximum values. Use these to see the range desired.

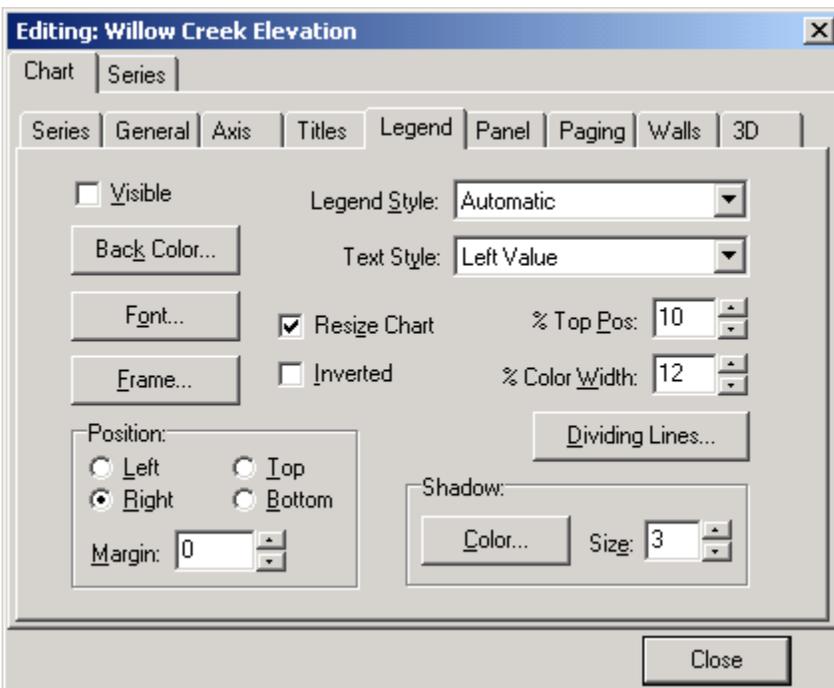


The bottom Axis should be set to automatic. You can specify a minimum and maximum range for custom charts. Data not in that range will not be shown. If your trend is not showing the correct time, be sure to set the chart to automatic.

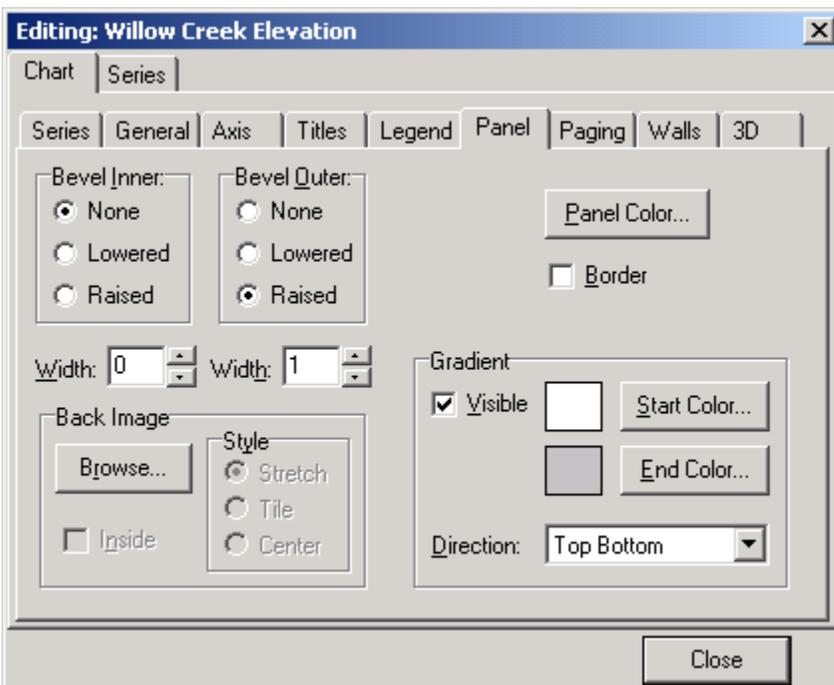
Events Reference



The Titles tab allows you to set the title for the trend. Change or add the text to help define the sensors being trended.

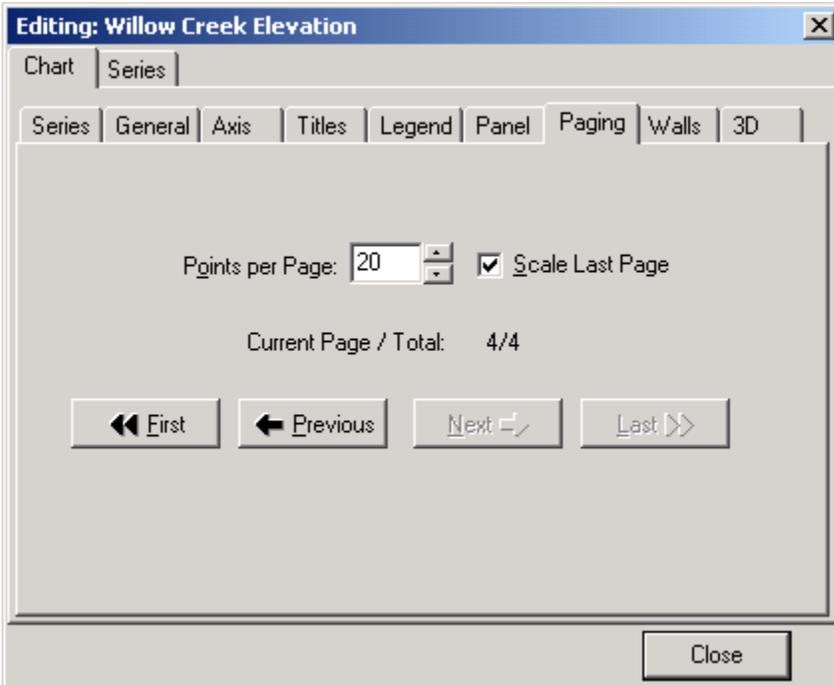


Show the legend, position the legend and define what shows in the legend.

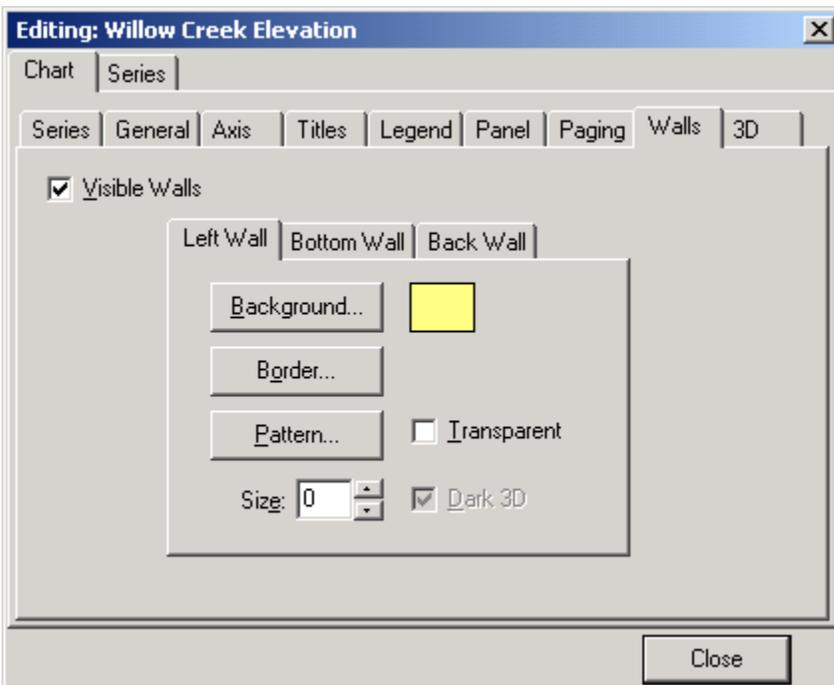


The Panel tab allows you to set the gradient color of the back panel.

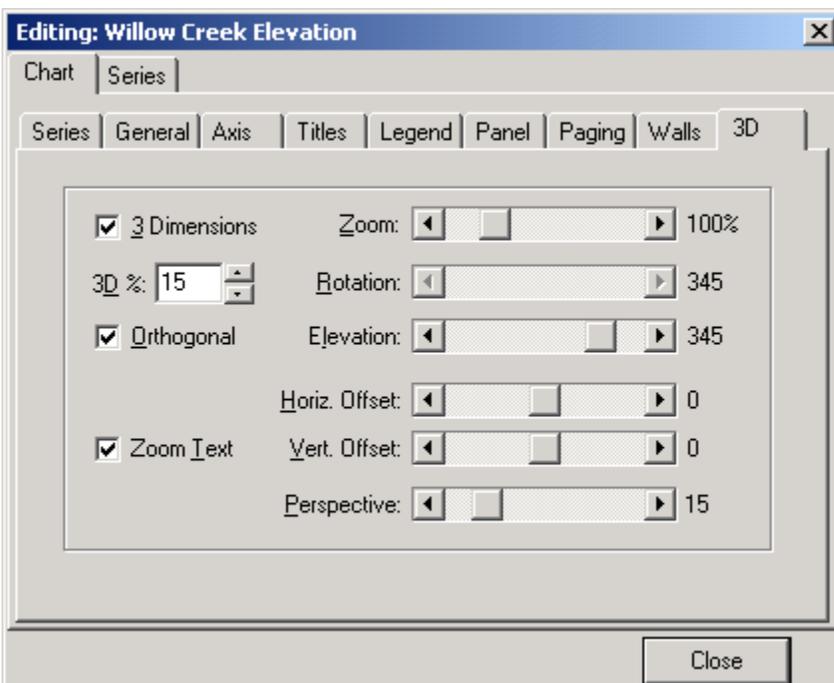
Events Reference



The Paging tab allows you to set the number of points per page and to scale the last page.



The Walls tab allows you set the left wall, bottom wall and back wall of the trend.



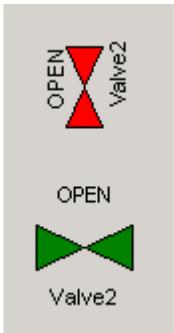
Events Reference

The 3D tab allows you to set the three-dimensional properties of the trend.

3.22. Valve

Use the valve component to display bit changes showing a valve opening, closing and failing. The valve shows color changes and text changes. The valve component is similar to the pump component.

To add a valve to the current form, click on the Add Valve Button in the Displays tab of the toolbar. The valve component will indicate whether the real valve's state is OPEN, CLOSED, or FAILED. Two sensor bits, both of which are set in the Bits tab of the Property Form, control the valve component.



Valves can be rotated.

To modify the properties of any component, double click it and the Property Form will open.

Property	Values
▶ TagName	Valve3
Text	Valve2
Sensor(0)	None-Assigned
FailSensor(0)	None-Assigned
OnMsg	OPEN
OffMsg	CLOSED
FailMsg	FAIL
OnColor	clRed
OffColor	clGray
FailColor	clRed
TextColor	
Angle	90
Left	231
Top	63
Width	67
Height	67

Close Undo Update

Valve Properties

Select one status sensor to show the on off state of the valve. Select another status sensor to show if the valve has failed. The failed state is shown before the on off state. If no fail sensor is selected, the fail state is ignored.

There are no special TagName properties for this component.

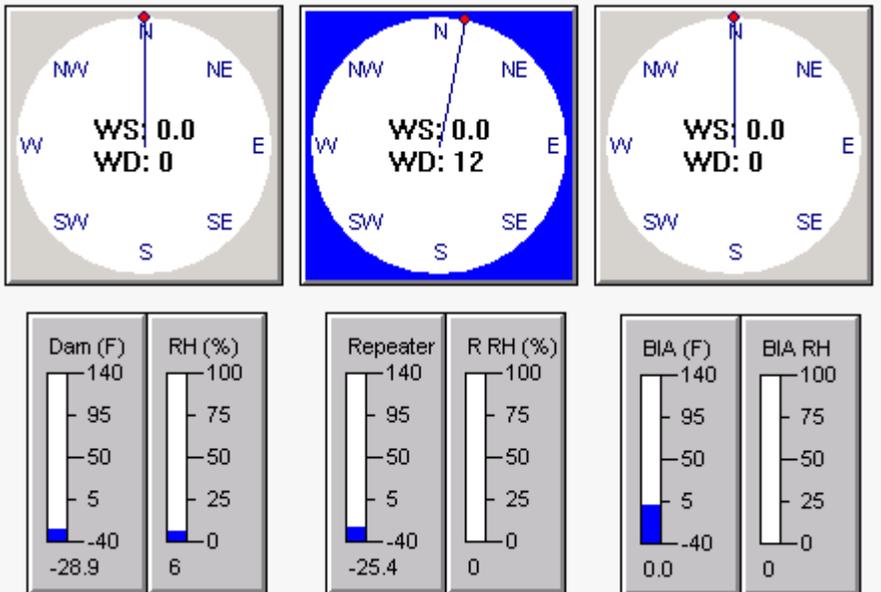
Events Reference

3.23. Windrose

Use a Wind component to display wind speed and direction graphically. The wind data and direction data are separate sensors. Size the component according to your needs.

To add a wind speed and direction component to the current form, click on the Add Windrose button in the display tab of the toolbar. Wind speed is normally 0 to 100 mph and wind direction is 0 to 360 degrees.

N = 0 or 360 degrees
 E = 90 degrees
 S = 180 degrees
 W = 270 degrees



Three Windrose components are shown and Six Tanks. Each component combines two analog measurements (Wind Speed and Direction.).

Property	Values
TagName	windrose2
WS_Sensors(0)	None-Assigned
WD_Sensors(0)	None-Assigned
Font	Arial
BorderStyle	Lowered
TextColor	cNavy
CircleColor	cWhite
BackColor	cTeal
Left	386
Top	212
Width	135
Height	135

Close Undo Update

Windrose Properties

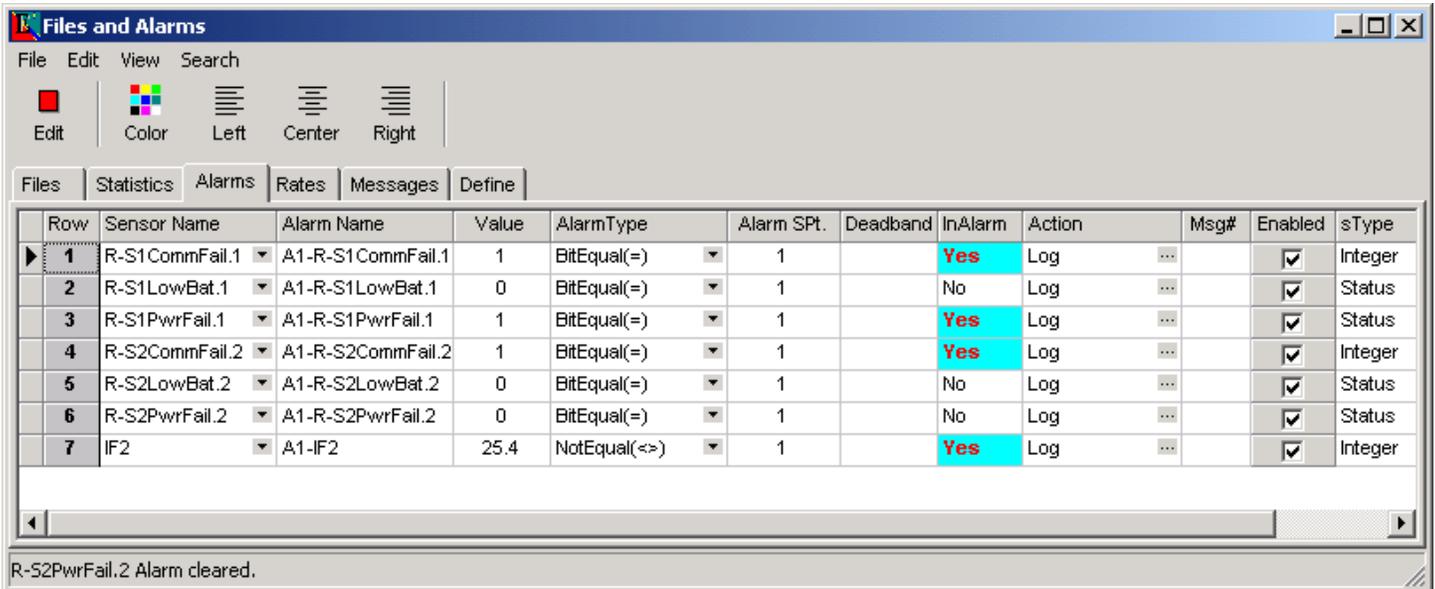
Special TagName Properties (put in the TagName property (use lowercase))
 rotate(45) (0 to 360 degrees: in lowercase) in the tagname property.

Events Reference

4. Alarms

4.1. Alarms

You can set three types of alarms in EVENTS (analog alarms , bit alarms, and rate alarms). The alarm set up form is used to configure the analog and bit alarms. See the Alarms tab in the Files/Alarms form. Click View Menu item and select the Files/Alarms option.



Row	Sensor Name	Alarm Name	Value	AlarmType	Alarm Spt.	Deadband	InAlarm	Action	Msg#	Enabled	sType
1	R-S1CommFail.1	A1-R-S1CommFail.1	1	BitEqual(=)	1		Yes	Log	...	<input checked="" type="checkbox"/>	Integer
2	R-S1LowBat.1	A1-R-S1LowBat.1	0	BitEqual(=)	1		No	Log	...	<input checked="" type="checkbox"/>	Status
3	R-S1PwrFail.1	A1-R-S1PwrFail.1	1	BitEqual(=)	1		Yes	Log	...	<input checked="" type="checkbox"/>	Status
4	R-S2CommFail.2	A1-R-S2CommFail.2	1	BitEqual(=)	1		Yes	Log	...	<input checked="" type="checkbox"/>	Integer
5	R-S2LowBat.2	A1-R-S2LowBat.2	0	BitEqual(=)	1		No	Log	...	<input checked="" type="checkbox"/>	Status
6	R-S2PwrFail.2	A1-R-S2PwrFail.2	0	BitEqual(=)	1		No	Log	...	<input checked="" type="checkbox"/>	Status
7	IF2	A1-IF2	25.4	NotEqual(<=>)	1		Yes	Log	...	<input checked="" type="checkbox"/>	Integer

Alarms are setup in the Alarms tab of the Files/Alarms Form.

SETTING ALARMS

Analog alarms are set points that are Greater Than(>), Less Than(<), or Not Equal(<=>) to the measured value. Multiple analog alarms can be set for each defined sensor. Just use a unique alarm name for each alarm assigned.

Bit alarms are used to identify 8 alarms in numbers (0-255), or up to 16 alarms in one number (-32768 to 32767). Each bit can be set to an individual alarm. You can save telemetry space, in your system by using one or two alarm numbers per site. This means you could have up to 32 alarms per site by sending only 2 numbers. Bit alarms are set by using the BitEqual(=) alarm type.

Note: There is a quick way to add alarms, file names, statistics and rate alarm. First select a sensor name or a defined sensor name cell (cell is highlighted) and then press Ctrl B or Add Names in the edit menu. Default names and alarms are entered for each of these grids. Delete or change the entries to fit your application.

Sensor Name: Select a sensor name from the drop down list. You can also type the sensor name in if known. You can also use the grid's fill down option by selecting several cells in this column and doing a fill down. The same sensor will be entered for each cell filled.

Alarm Name: Enter a unique alarm sensor name for each alarm. Alarms will not be updated properly in the historical alarm file if there are duplicate alarm names. Use as short a name as possible. Short names fit better in printed reports.

Value: This is the sensors data value entered by the program. It will be update each time a sensor data value is received.

Alarm Type: You can select Greater Than (>), Less Than (<) or Not Equal (<=>) for analog or status sensors. Most status sensors alarm on Bit Equal(=). Select the alarm type from the drop down list in the cell.

Alarm Set Point: Enter the alarm set point for the analog or status sensor. This should be in engineering units. Errors in this entry will disable the alarm.

Deadband: The deadband is used after an alarm condition exists. When a greater than (>) alarm condition is met. The alarm condition will continue until it drops below the set point plus the deadband. The purpose of the deadband is to eliminate alarms that might be at the threshold of alarming causing multiple alarms. A stream could be near the alarm set point, setting an alarm and then clearing right away. You can eliminate this condition by setting a deadband where the stream has to drop below the set point plus the deadband, before the alarm condition is cleared.

In Alarm: In-alarm is used to show that a sensor is in alarm. Each time the alarms are checked, the in-alarm condition is checked to see if a change in-alarm condition exists. If there is a change, then the appropriate action is taken.

Action: Each alarm can be assigned separate alarm actions. These actions include log, blink, show, sound and

Events Reference

message. Some alarms have more priority than other alarms. You can set this priority by selecting the appropriate action.

Log: Logs alarms to the current alarm log and historical alarm log. All alarms should be logged.

Blink: Blink causes the application title bar to blink and the alarm status bar to blink when shown. This is an effective way to show that alarm condition exists that hasn't been acknowledged. If the application is minimized the application will still blink on the task bar.

Sound: Sound uses the sound card to send four alarm sounds waves through your speakers. This will get any ones attention when an alarm condition exists. Acknowledging the alarms in the show alarm screen can stop sounds and blinking.

Show: Show alarms, pops up the alarm screen to show that a new alarm exists. The user doesn't have to select the show alarms option. This alarm screen will not pop up if the application is minimized.

Message: Message pops up a separate message screen with instructions or actions to take. You select the message number to present in the message number cell. This allows the managers to provide some instructions to operators when certain alarm conditions exist. The alarm message can be printed out if necessary.

Message #: This is the message number used by the action message. If multiple alarm use the message, the alarm message box will show a separate message for each alarm. You will have to scroll the messages to see more than one.

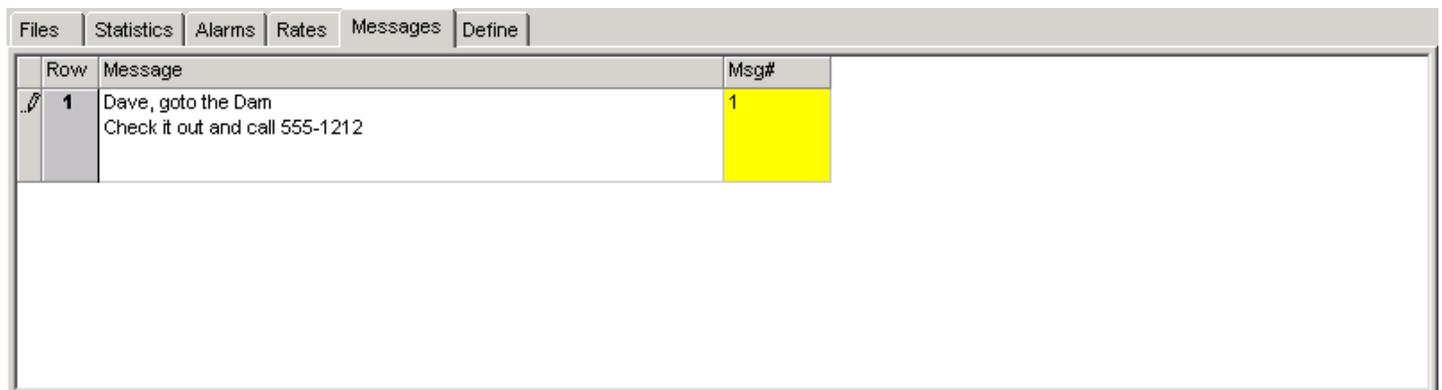
Enabled: You can enable or disable alarms as needed. You may want to disable an alarm if the site is being worked on or a sensor has failed. Uncheck the enable box to disable.

Type: This is the sensor type selected. This is for reference only and is not used in the alarm process. If you see that the sensor is a status type then the appropriate alarm type is the bit equals (=) alarm.

Index: The index is the data reference used by the program. If the sensor is defined in the system, the index will be shown as A1 through An or D1 through Dn. The number is the row of the sensor in the Alert or Modbus setup grid or the define grid. If the sensor is not found, an error will be shown in this column.

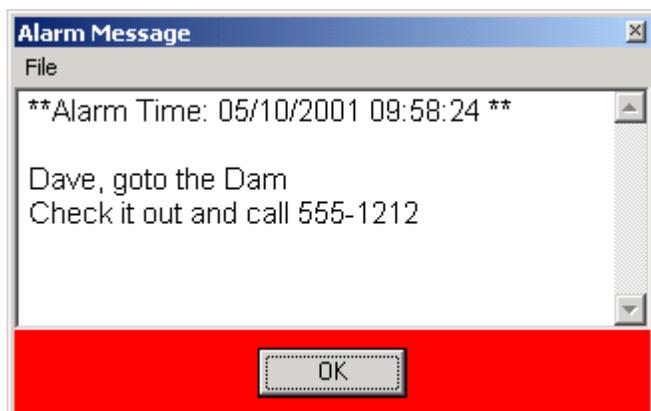
Alarm Messages

Type in alarm messages in the message grid. To enter a new line use Ctrl + Enter key. This will allow you to enter a multiple line alarm message. If the row height is not correct, position the mouse cursor in the first cell and then adjust the row height. All rows will be the same height.



Row	Message	Msg#
1	Dave, goto the Dam Check it out and call 555-1212	1

Messages are entered in the message grid. Enter a unique message number for each message.



This is alarm message screen which pops up if you select the action: message.

Events Reference

4.2. Show Alarms

Set Alarms Window

The Set Alarms Menu item opens the Files/Alarms form with the alarms tab selected.



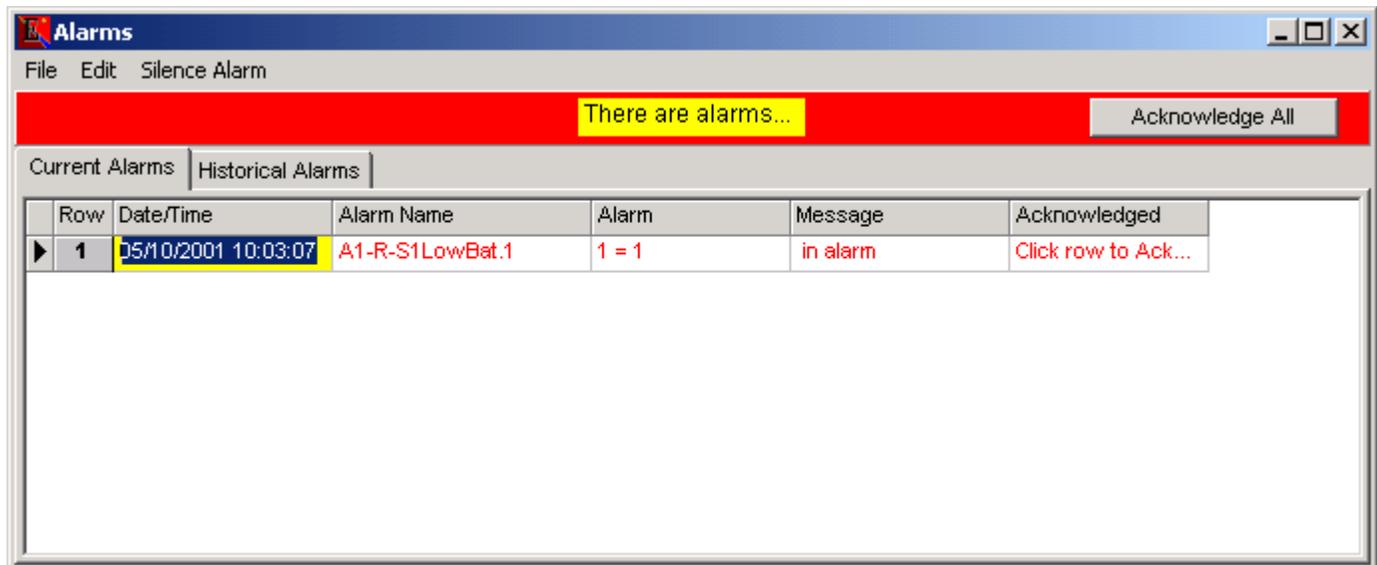
Note: The display of alarms or alarm log is a completely separate form. The alarms assigned here are displayed in the alarm log when active.

Show Alarms

The show alarms window shows the current alarms and the historical alarms. The current alarms are analog or bit alarms which were assigned by the alarm set up window. The current alarm tab shows only alarms that are current now and have not cleared. The historical alarm tab shows the last 600 alarms in a spreadsheet format.



Current Alarms



Current alarms are displayed here; click on red line to acknowledge alarm

The current alarm file shows the alarm time, tag name of the alarm, what caused the alarm, the alarm message, and if the alarm is acknowledged.

New alarms are shown in red. Acknowledged alarms are shown in blue. Alarms will remain in the alarm screen until they are cleared. Acknowledging an alarm does not clear it.

Clicking on the red panel below the menu items can stop the sounds and blinking.

The historical alarms can be printed at any time by using the File | Print History menu command. See print history.

Acknowledge Current Alarms

Each alarm is acknowledged separately. When a new alarm is received, it will be shown in red. When the new red alarm is acknowledged by clicking on the alarm line, the acknowledged alarm will change from red to blue in color.

Alarms that are acknowledged are logged into the historical alarm file. A dialog box will ask for your name when an alarm is acknowledged. The user who is logged on to the system is shown as the default person in the dialog box. Enter your name and it is recorded in the history file as the person who acknowledged the alarm.

Acknowledge before Clear

In the Edit menu, you can select acknowledge before clear. If checked, current alarms that have cleared and have not been acknowledged will remain in the current alarm grid. You will have to acknowledge all alarms if this is checked.

Events Reference

Historical Alarms

Row	WS	Alarm Time	Alarm Name	Alarm	Message	Ack..Time	Ack..By	Cleared
1	S	10/11/2000 17:16:16	Modbus	CommFail	Check Cables			
2	S	10/13/2000 08:25:41	Modbus	CommFail	Check Cables			
3	S	10/13/2000 11:00:35	Modbus	CommFail	Check Cables			
4	S	10/13/2000 11:14:54	Modbus	CommFail	Check Cables			
5	S	10/13/2000 13:42:41	A1-R-ResvTrigger.2	1 = 1	in alarm			
6	S	10/13/2000 13:42:41	A1-R-ResvTrigger.2	1 = 1	in alarm	10/13/2000 13:42:53	adfd	
7	S	10/13/2000 13:43:05	Modbus	CommFail	Check Cables			
8	W	05/10/2001 10:01:51	A1-R-S1LowBat.1	1 = 1	in alarm			05/10/2001 10:01:54
9	W	05/10/2001 10:03:07	A1-R-S1LowBat.1	1 = 1	in alarm			

Historical alarms are displayed by clicking the Historical Alarms tab.

The historical alarm spreadsheet shows the following information about each alarm:

1. The alarm number
2. Alarm time
3. Alarm name
4. What caused the alarm
5. The alarm message
6. The time the alarm was acknowledged and
7. Who acknowledged the alarm
8. When the alarm cleared.

This gives you a complete history of each alarm received in the system.

The alarms can be save to a comma-delimited file and can be printed at any time. The alarm file holds the last 999 alarms before it writes it to a file. When a file is written automatically, 600 alarms are stored in the file and the latest 499 alarms are still shown in the current file.

You can also clear the alarm log if needed.

4.3. Rate Alarms

Rate alarms can be enabled to generate an alarm if needed. The rate of change is calculated whether the alarm is enabled or not. Rate alarms are configured from existing sensors already defined. Different rates can be calculated for one sensor. The rate of change is calculated by taking the difference in two measurements and dividing the difference in time between the measurements. The rate alarm is based on the last value received.

Row	Sensor Name	Alarm Name	Rate	AlarmType	Rate Spt.	Interval(Min.)	Threshold	In Alarm	Action	Msg#	Enable
1	R-S1WaterTemp.	Water Rate	0.0	GreaterThan(>)	5.6	30	0		Log,Blink,Shc...		<input type="checkbox"/>

Rate alarms are configured in the Rates Tab of the Files/Alarms Form.

The sensor name is the sensor that is already defined and selected for the rate calculation. You can assign multiple rate-

Events Reference

of-change alarms for one sensor. The alarm name should be unique for each rate alarm.

Rate alarms are calculated each minute or when new data is received. This is a running rate window. If the rate is exceeded before the time interval specified, an alarm will still be enabled.

The rate calculation is shown in the rate column. The rest of the table shows the variables that are used in the rate calculation. If the rate alarm has been enabled, a rate alarm will be generated and action taken as specified. The rate alarm will clear itself when the rate is no longer in alarm.

Sensor Name: Select a sensor name from the drop down list. You can also type the sensor name in if known. You can also use the grid's fill down option by selecting several cells in this column and doing a fill down. The same sensor will be entered for each cell filled.

Alarm Name: Enter a unique alarm sensor name for each alarm. Alarms will not be updated properly in the historical alarm file if there are duplicate alarm names. Use as short a name as possible. Short names fit better in printed reports.

Rate: This is the sensors calculated rate value entered by the program. It will be update each time a sensor data value is received or every minute.

Alarm Type: You should select Greater Than (>), Less Than (<) for rate calculations.

Rate Set Point: Enter the alarm set point for the analog sensor. This should be in engineering units.

Interval (minutes): This is the rate interval in minutes.

Threshold: The threshold is used before an alarm condition exists. The sensor has to be above the threshold value before a rate of change alarm can happen. If the alarm type is less than (<) then the data value must be below the threshold before the rate alarm takes effect. To eliminate the threshold value, enter a high or low value that will always be exceeded. Zero (0) is usually entered in greater than (>) rates when the threshold is not needed.

In Alarm: In-alarm is used to show that a sensor is in alarm. Each time the alarms are checked, the in-alarm condition is checked to see if a change in-alarm condition exists. If there is a change, then the appropriate action is taken.

Action: Each alarm can be assigned separate alarm actions. These actions include log, blink, show, sound and message. Some alarms have more priority than other alarms. You can set this priority by selecting the appropriate action.

Log: Logs alarms to the current alarm log and historical alarm log. All alarms should be logged.

Blink: Blink causes the application title bar to blink and the alarm status bar to blink when shown. This is an effective way to show that alarm condition exists that hasn't been acknowledged. If the application is minimized the application will still blink on the task bar.

Sound: Sound uses the sound card to send four alarm sounds waves through your speakers. This will get any ones attention when an alarm condition exists. Acknowledging the alarms in the show alarm screen can stop sounds and blinking.

Show: Show alarms, pops up the alarm screen to show that a new alarm exists. The user doesn't have to select the show alarms option. This alarm screen will not pop up if the application is minimized.

Message: Message pops up a separate message screen with instructions or actions to take. You select the message number to present in the message number cell. This allows the managers to provide some instructions to operators when certain alarm conditions exist. The alarm message can be printed out if necessary.

Message #: This is the message number used by the action message. If multiple alarm use the message, the alarm message box will show a separate message for each alarm. You will have to scroll the messages to see more than one.

Enabled: You can enable or disable alarms as needed. You may want to disable an alarm if the site is being worked on or a sensor has failed. Uncheck the enable box to disable.

Count, Value, Old Value, and Rate Data: These values are used in the rate calculation. Don't enter or change any of these values.

Index: The index is the data reference used by the program. If the sensor is defined in the system, the index will be shown as A1 through An or D1 through Dn. The number is the row of the sensor in the Alert or Modbus setup grid or the define grid. If the sensor is not found, an error will be shown in this column.

ADDING NEW RATE ALARMS

To add a new rate calculation you need to select the following items:

Select a defined sensor from the drop down list.

Enter a unique alarm name.

Events Reference

Select Less Than (<) or Greater Than (>) from the drop down list.
Set the threshold value. Threshold is only used for rate alarms.

Greater Than (>) Calculations

If you are using greater than rate of change, the alarm is not looked at if the measured value is below the threshold value. The measurement must be greater than the threshold before the alarm takes effect. If you don't want a threshold, then set the threshold to a low value (i.e. 0).

Less Than (<) Calculations

If you are setting less than rate of changes, the measured value must be less than the threshold before the alarm rate takes effect. If you don't want the threshold, then set the threshold to a high value (i.e. maximum range of the sensor).

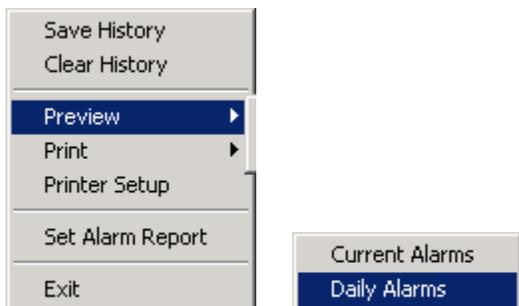
Set the alarm set point. The alarm set point value is a rate of change. Less than rates should have a negative rate of change. Positive rates of change are greater than zero changes.

Set the time interval. The time interval is in total minutes. If your rate time interval is three hours then the time interval should be set to (60x3) or 180 minutes.

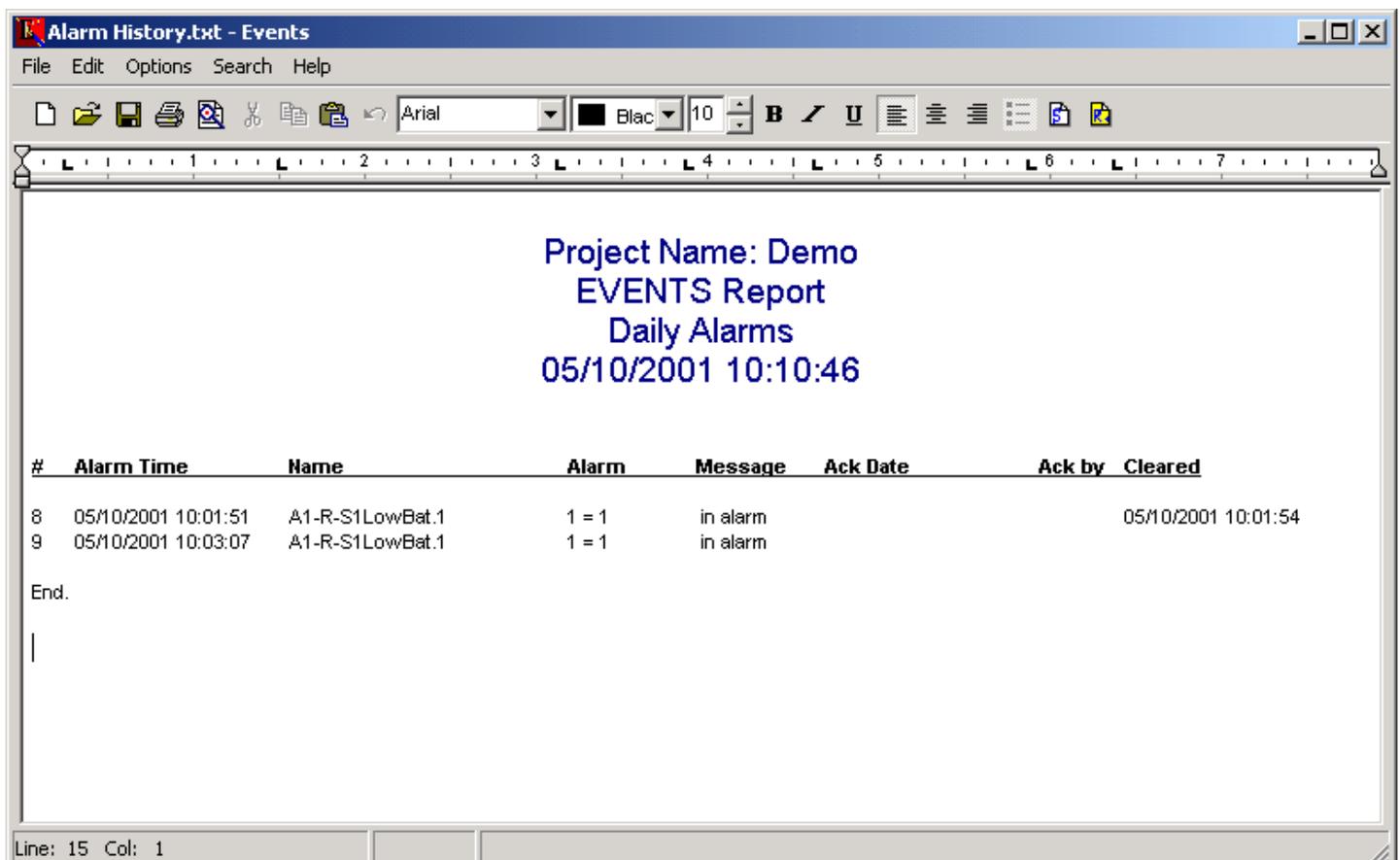
Set the action or actions required. Log, Show, Blink, Sound, or Message.
Enable the alarm by checking; disable by unchecking the enable column.

4.4. Print Alarms

From the Alarm Form Menus, select the preview or print menu items to open the report editor with a preview of historical alarms.



Select preview or print and then select current or daily alarms



Events Reference

Previewing a daily alarm report in the report editor.

AlarmReportForm

Select Report

Selected Report: AlarmsToday

Report Name: AlarmsToday

Select Date/Time (To & From)

To (current date)

Now Date/Time 05/10/2001 10:14:59

From (subtracted from To date)

Variable Date/Time 05/09/2001 10:14:59

Subtract Day(s) 1

Subtract Hour(s) 0

Add Delete Preview Close

Selected Report: AlarmsToday

Set alarm reports by clicking on a report name in the Select Report list box.

1. Enter a unique report name for each report developed.
2. Select the time interval desired for the report.
3. The To Date/Time is normally, the current time.
4. The From Date/Time is the oldest time.
5. The Fixed Date/Time uses the Day(s) and Hours(s) edit boxes to determine a set time for the "From" time.
6. The Date/Time selection uses a fixed date time for the report.

Be sure to enter any date times in the proper format. An easy way is to select the "Fixed" time first and then select the Date/Time. Edit the date and time which is already in the edit box.

From the Main Form Edit Menu goto Preference | Report Layout to set the Titles for your alarm and form reports.

Edit Form	F9
Cut	Ctrl+X
Copy	Ctrl+C
Paste	Ctrl+V
Reset	▶
Make Form Bitmap	▶
Show Image Visible Btn	
Set Tab Order	▶
Write Form Setpoints	Ctrl+W
Run Polygon Editor	
Preferences	▶

File Settings

Report Layout

Preferences | Report Layout to set titles for reports

Events Reference

Report Layout

Show Header

- Company Name: Company Name
- Report Title: Form
- SubTitle: SubTitle
- Date Prepared: 05/10/01 10:23:14

Top Margin: 1 Bottom Margin: 0.75
Left Margin: 0.5 Right Margin: 0.5
Width (Inches): 7.25

Show Footer

- Page Number: Pg
- Left Footer: Left Footer

Complete Page Layout

Company Title
Date Subtitle

Time Name Alarm Message A-Time Ack Cleared

1 04/01/97 CL2 bit on is high
1 04/01/97 CL1 bit on is high 12:12:00 Dan 04/5
1 04/01/97 CL3 bit on is high 12:12:00 Dan 04/5
1 04/01/97 CL5 bit on is high 04/5
1 04/01/97 CL8 bit on is high 12:12:00 Dan 04/5

Left Footer Page

Use Settings Set Defaults Close

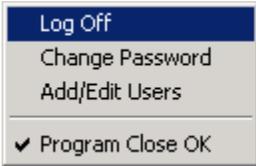
Report title and margin are set here.

Events Reference

5. Security

5.1. Security

Security provides a *superuser* with the capability to customize other passwords. Privileges include being able to modify form designs, change setup parameters, change file and set alarm levels, and modify communication parameters.



Security menu items.

Program Close Toggle

This is a toggle that allows the user to close the program or not close the program. If Program Close OK is checked then the program can be closed.

If Program Close Denied is shown then the program can't be closed.
If the user's security level: "forms" then this option can be changed.

Logging ON



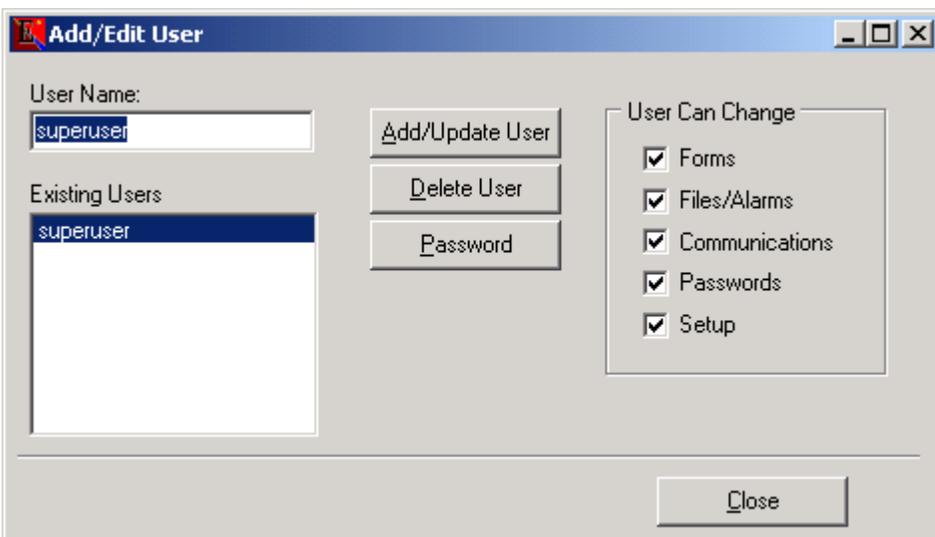
Log on to events to edit forms and make changes.

1. Enter the user name (upper and lower case makes a difference).
2. Enter the password.
3. Press OK.

Add/Edit Users

By setting individual access privileges, you can insure that your operators have access to the items that match their responsibility. A night guard might be set up to have no access (none of the items checked). This guard can only view forms, acknowledge alarms and monitor the system. A day operator could be set up to send commands to controls, make changes to set points, but can't change the forms or change other users' access. A designer might have access to designing forms but have no other rights.

Select Security | Add/Edit Users to modify the user profiles in the system.



Events Reference

Add new users or edit existing users

User Name- enter a new user to create a new profile

Existing Users- select any of the existing users to see the current access privileges. Some standard users are: superuser, designer, operator, or guard.

Add/Update User Button- After modifying a user profile or creating a new profile, use this button to store the new settings.

Password Button- Change the password of the selected user.

Delete User Button- Delete the selected user from the system.

User Privileges- Give the selected user privileges by checking the boxes accordingly

1. Forms: user can edit the main display forms. This also means the user would be able to send data to the RTUs.
2. Files/Alarms: user can modify the grids in the files and alarms window, and database window.
3. Communications: user can modify the communication settings.
4. Passwords: user can modify passwords and make changes in this screen. If a user can change passwords, the user would be able to modify anyone password, and other settings. This is a high priority item.
5. Setup: user can change the sensor setup properties.

5.2. Password

The Change Password item allows the current user to change the existing password. To change the existing password, the user will enter the current password (if it exists), and then the new password twice.



Change password dialog

Note: A user is not required to have a password assigned. If no password is assigned the user can log on by entering the user name and then press return without entering a password.

You can Log On to or Log Off of the system at any time. Upon logging off, the system user has no privileges. This means the user will be in a view only mode and cannot design or change the system.

Note: when alarms are acknowledged, the program enters the current user's name as the person who acknowledges the alarm. If no user is logged in, then the acknowledged person is left blank.

Click on the Log On menu item to log back onto the system.

Password File

The Password File is a binary file containing all the system passwords. Each password in the system is encrypted and can not be read by the user.

Events Reference

6. Database

6.1. Files and Alarms

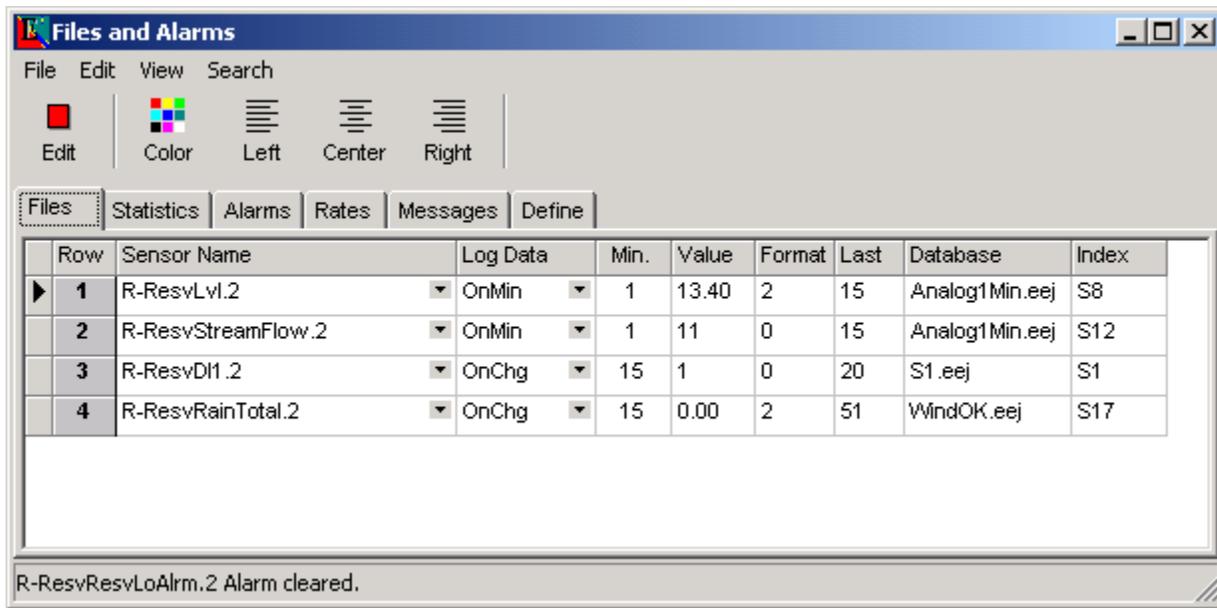
FILES FORM

See database recommendation before setting up your files. The *DATABASE RECOMMENDATIONS* above explains how the data is filed and how reports are made from the databases. It is important to combine like data into the same database. You can store the same value in more than one database if you need to.

The files and alarms form is where the sensors are assigned to database files, alarms, rate alarms, statistics, and defined sensors.

FILES TAB (DATABASE SETUP)

The files tab defines how your data will be stored. How the data will be logged and what database the data will be filed in.



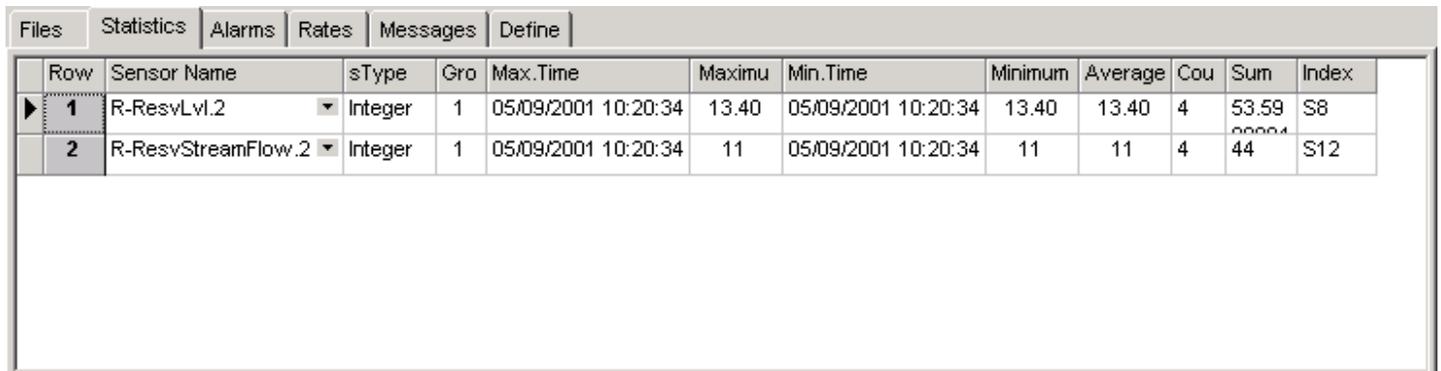
The Files Tab: Database setting

The files tab defines how the sensors will be stored in the database. The other tabs are used to setup your alarms, statistics and define special sensors and messages.

See ALERT Setup and MODBUS Setup for more information about adding data to these grids.

STATISTICS TAB

Making daily statistics.



The Statistics Tab: Daily statistics for each sensor listed.

The statistics are calculated on for the day and reset at midnight. You can schedule to print a statistics report at 23:55 to get the yesterdays statistics.

Statistics are stored on a daily basis in the data file in a Stat-1.csv file.

ALARMS TAB

Events Reference

Files	Statistics	Alarms	Rates	Messages	Define				
Row	Sensor Name	Alarm Name	Value	AlarmType	Alarm	Deadb	InAlar	Action	Msg#
1	R-ResvTrigger.2	A1-R-ResvTrigger.2	1	BitEqual(=)	1		Yes	Log,Blink,Sh ...	
2	R-ResvStreamHiAlrm.2	A1-R-ResvStreamHiAlrm.2	0	BitEqual(=)	1		No	Log,Blink,Sh ...	
3	R-ResvStreamLoAlrm.2	A1-R-ResvStreamLoAlrm.2	0	BitEqual(=)	1		No	Log,Blink,Sh ...	
4	R-ResvResvHiAlrm.2	A1-R-ResvResvHiAlrm.2	0	BitEqual(=)	1		No	Log,Blink,Sh ...	
5	R-ResvResvLoAlrm.2	A1-R-ResvResvLoAlrm.2	0	BitEqual(=)	1		No	Log,Blink,Sh ...	

Configure your alarm set points in the Alarms tab.

Sensor alarms are set in the Alarms tab. See setting alarms for more information on these settings. You can view all the sensors in the alarm grid and easily see if any of the sensors are in alarm. Sensors in alarm will have an aqua background and say Yes in the alarm column.

You can assign separate actions for each alarm. Alarm actions include logging, blinking the title bar, sounding alarms in your speakers, showing the alarm form, and showing a special alarm message box.

RATES TAB

The rates tab is where you can set up rate of change alarms. The rate of change alarms is a sliding window rate of change. If you set up a 30 minutes rate of change, after 30 minutes, the rate of change is calculated each minute and checked against the value stored 30 minutes ago to see if it is in alarm.

Files	Statistics	Alarms	Rates	Messages	Define					
Row	Sensor Name	Alarm Name	Rate	AlarmType	Rate Spt.	Interval(Min.	Threshold	In Alarm	Action	Ms
1										...

Rate of change alarms are defined here.

See Setting Alarms for more information about setting these alarms.

MESSAGES TAB

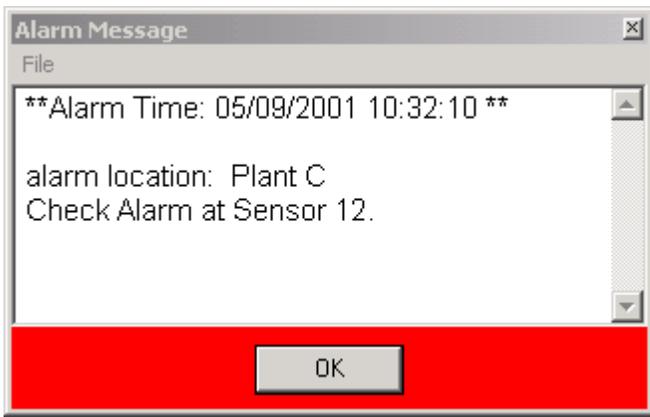
Files	Statistics	Alarms	Rates	Messages	Define
Row	Message	Msg#			
1	alarm location: Plant C Check Alarm at Sensor 12.	1			

Note: To enter multiple line in the message column, press Ctrl Enter. A soft return is entered and you can add additional lines.

Alarm messages are entered here. You can select the message action in the alarm setup. If you select the message option, you need to enter the number of alarm message. The alarm message number goes to this tab and displays the appropriate alarm message.

Double click the message column to see your message. This is a quick test to see what the message will look like.

Events Reference



Alarm Message

DEFINE TAB

The Define tab allows you to define special sensors for your database. You can define as many sensors as you need. The defined sensors are updated when any sensor change values. See Equations and Tables.

Files	Statistics	Alarms	Rates	Messages	Define
Row	Defined Name	Equation/Table	Data	Format	
1	Elevation1	=Equ([R-ResvLvl.2]+7050)	7063.4	0.0	
2	ResvLight	=Equ([T-MBResvHorn1Hand.-1])	3	0	
3	StreamLight	=Equ([T-MBResvHorn2Hand.-1])	3	0	

Defined sensors are used for reports and displays.

6.2. Database Recommendations

SETTING UP YOUR DATABASE

The files tab of the Files & Alarms Form configures database storage. You store data by selecting the log on options as defined below.

FILES TAB (Database: LOG ON Column)

- OnMin:** Stores data on minute intervals (0 – 1439). If you enter 15 in the minute column, you will store data every 15 minutes.
- Hourly:** Stores data on an hourly basis on the minute selected (0 – 59 minutes). This option only stores once per hour. If you want storage for every 3 hours, use OnMin with the minute column set to 180.
- Daily:** Store data daily. Use for summaries, daily totals, maximums, etc. Data is stored on the minute (0-1439). You can set up more than one daily database. One daily database may store at 15 minutes while another database stores at 360 minutes (6 AM). This could be used for different summary information.
- OnChg:** Used for sensors that need to store measurements on change. Rain gauges or other analog sensors that require storing data when it changes. The minute column has no effect.
- Status:** Stores status sensors, on off, true, false, 1, 0 when the status changes state. Status database only stores 1 or 0 for the data value. On change databases store real numbers. The minute column has no effect.

MIN (Column)

The minute column tells the program when to store data in the database. The minute columns must be the same value for databases with the same type and name. If the minute column is different for some of the sensors with the same

Events Reference

database name, data could be stored as zero instead of the current measurement.

DATABASE NAMES (name.eej)

Databases are stored with the *.eej extension. The SQL editor will only open .eej files for your reports. Sensors with the same log on type, minute, and database name will be stored properly. This storage only applies to timed database. (OnMin, Hourly and Daily).

Use Database names that are meaningful. DailyFlow.eej, HourlyLevels.eej, Hourly.eej, Rain.eej, Levels.eej, Pumps.eej, Status.eej, Alarms.eej, etc.

There are 3 types of database file structures.

1. Data file = timed files
2. Status file = on change files
3. On change file = on change files

STORAGE SPACE

The timed databases are most efficient on disk space. Each data file includes a header and data. The header allows the file to be standalone and be opened by another copy of EVENTS on another machine. You can transmit any database file to another computer, open it, read it, and create reports from it. The data file structure allows you to read it on any computer running Events.

(OnMin, Hourly, Daily Databases)

Timed files are stored with one date and then real values.

```
datetime      values...
10/30/1998 10:30:00 value value1 value2.. value=real number = Record 1
```

OnChg files

```
datetime      sensor number, value
10/30/1998 10:30:00 SN# value    value = real number=Record 1
```

Status files

```
datetime      sensor number, value
10/30/1998 10:30:00 SN# value    value = 0 or 1 =Record 1
```

The main difference between status and on change files is the data stored. Status only stores a 1 or 0. On change files store real numbers.

It is best to combine like sensors into one database. Then SQL searches and functions can be used on that database to produce a report. The SQL statements are used on one database at a time.

DATABASE RECOMMENDATIONS

DATABASE that store on time and have the same database name, must be stored on the same minute. Timed databases are more efficient and will produce reports faster.

Put like sensors in the same database. Remember that the SQL statements only work on one database at a time.

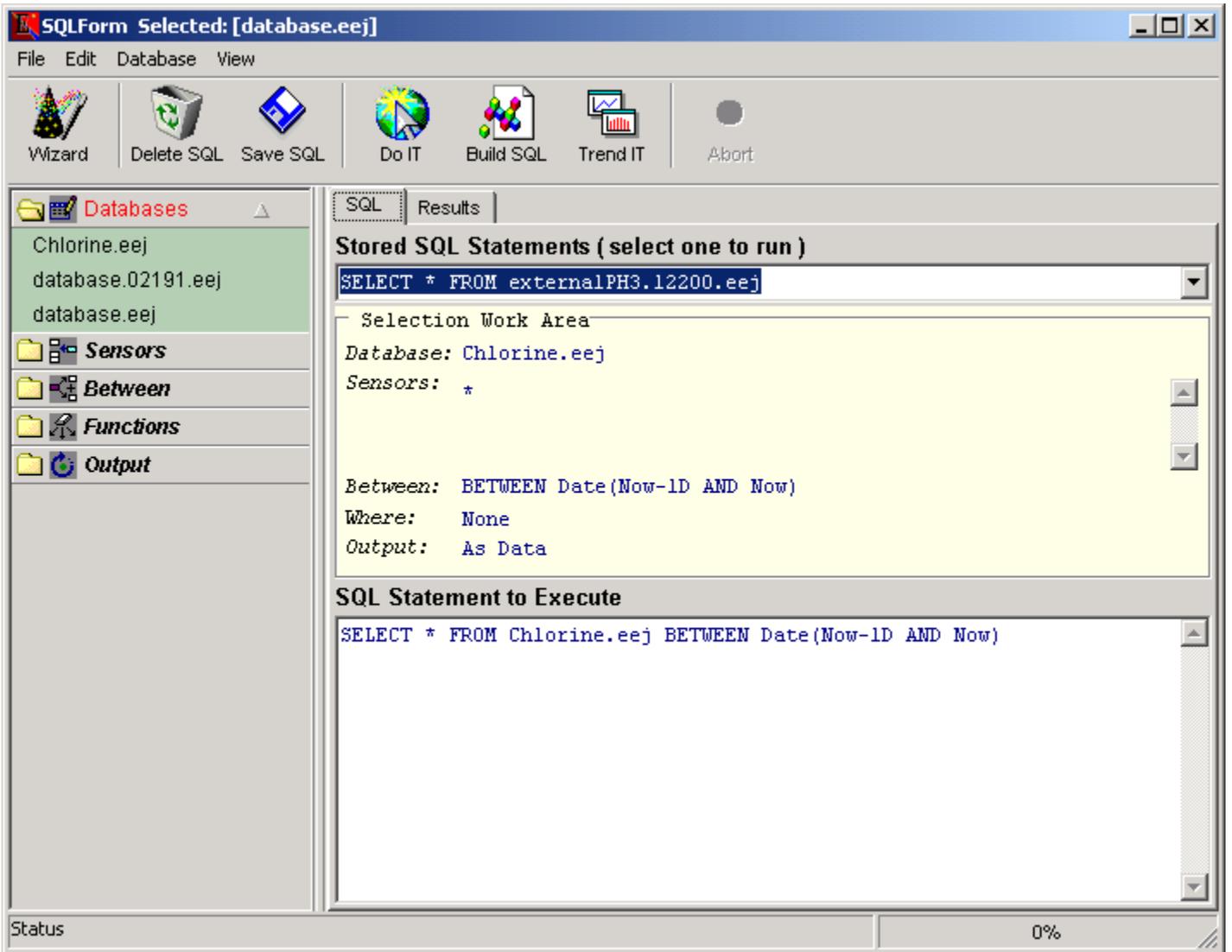
6.3. Database and SQL Editor

All Data Files are stored in the *data* directory within your project. If this folder is deleted it will be recreated when files are written to your disk.

VIEWING YOUR DATA

The database is setup in the files tab of the Files and Alarms Form. The data is stored in compact binary files. The data is viewed by selecting the SQL Editor. The SQL Editor allows you to build simple or complex statements to access the data.

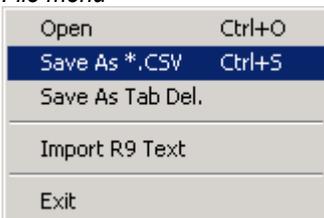
Events Reference



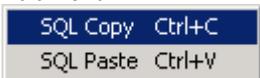
Select View | Data to open the SQL Editor for viewing data.

Do Now- Executes the SQL function listed in the New SQL: box. The data is shown in the lower grid.

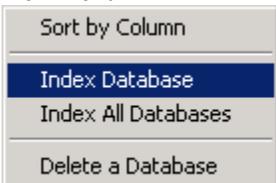
File menu



Edit menu



View menu



Open a database that is not open. Save AS: Saves the grid data as ASCII, comma delimited files or tab delimited. Index the current database or all databases. Import R9 ASCII data files into the result grid. Sort any column. Copy and Paste part of the New SQL function by selecting it and pasting it. Delete the current database.

SQL Editor

The SQL Editor allows you to pull data out of any the databases in your system.

Events Reference

SQLForm Selected: [Chlorine.eej]

File Edit Database View

Wizard Delete SQL Save SQL Do IT Build SQL Trend IT Abort

Databases

- Chlorine.eej
- database.02191.eej
- database.eej

Sensors

Between

Functions

Output

SQL Results

Results

From: 04/07/1999 00:53:17 To: 04/13/1999 07:05:46 Records: 1866

Row	DateTime	SensorName	SN#	Value
1848	04/13/1999 03:21:26	R-S2.3	8	0.0
1849	04/13/1999 04:16:43	R-S3.3	9	0.2
1850	04/13/1999 04:20:27	R-S3.3	9	0.0
1851	04/13/1999 04:33:35	R-S6.6	31	0.5
1852	04/13/1999 04:33:51	R-S6.6	31	0.0
1853	04/13/1999 05:30:42	R-S4.3	10	0.2
1854	04/13/1999 05:30:58	R-S4.3	10	0.0
1855	04/13/1999 05:53:33	R-S8.24	65	0.2
1856	04/13/1999 05:54:22	R-S8.24	65	0.3
1857	04/13/1999 05:56:14	R-S8.24	65	0.2
1858	04/13/1999 05:57:18	R-S8.24	65	0.0
1859	04/13/1999 06:07:11	R-S8.24	65	0.2
1860	04/13/1999 06:07:43	R-S8.24	65	0.3
1861	04/13/1999 06:11:27	R-S8.24	65	0.2
1862	04/13/1999 06:15:11	R-S8.24	65	0.0
1863	04/13/1999 06:52:51	R-S8.24	65	0.2
1864	04/13/1999 07:02:43	R-S8.24	65	0.0
1865	04/13/1999 07:04:26	R-S1.1	0	0.2
1866	04/13/1999 07:05:46	R-S1.1	0	0.0

Done: 5 Cols 1866 Rows 0%

Use then SQL Editor for building and viewing data in your database.

SELECT * FROM Chlorine.eej BETWEEN Date(04/13/1999 02:21:00 AND Now)

SELECT * FROM Chlorine.eej

SELECT * FROM Chlorine.eej BETWEEN Date(04/13/1999 02:21:00 AND Now)

SELECT * FROM externalPH3.12200.eej

Click on a stored SQL functions to select it.

Wizard Delete SQL Save SQL Do IT Build SQL Trend IT Abort

Stored SQL functions are added and deleted by pressing the add and del buttons at the right.

Select a database

Databases

- Chlorine.eej
- database.02191.eej
- database.eej

Sensors

Between

Functions

Output

Select a sensor

Databases

Sensors

- *
- Row
- DateTime
- SensorName
- SN#
- Value

Between

Functions

Output

Select between dates

Databases

Sensors

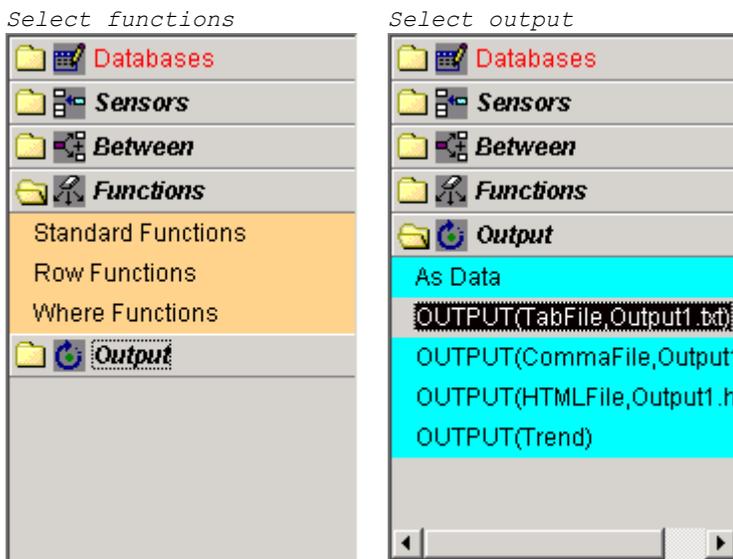
Between

- All Data
- BETWEEN Date(Now-1N A
- BETWEEN Date(Now-1H A
- BETWEEN Date(Now-12H
- BETWEEN Date(Now-1D A
- BETWEEN Date(Now-7D A
- BETWEEN Date(Now-1M A
- BETWEEN Date(Now-1Y A

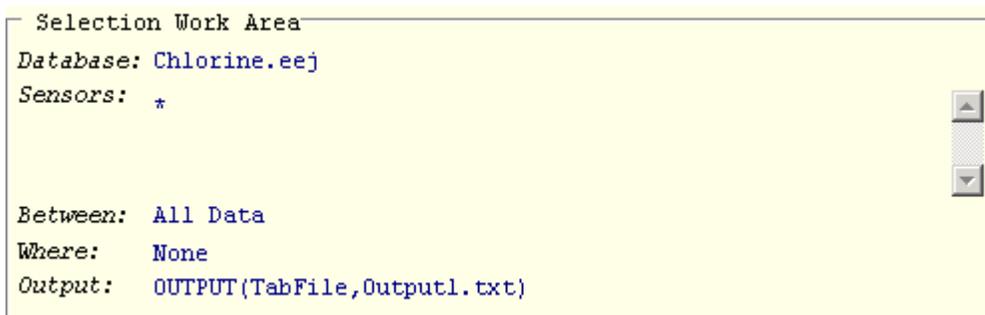
Functions

Output

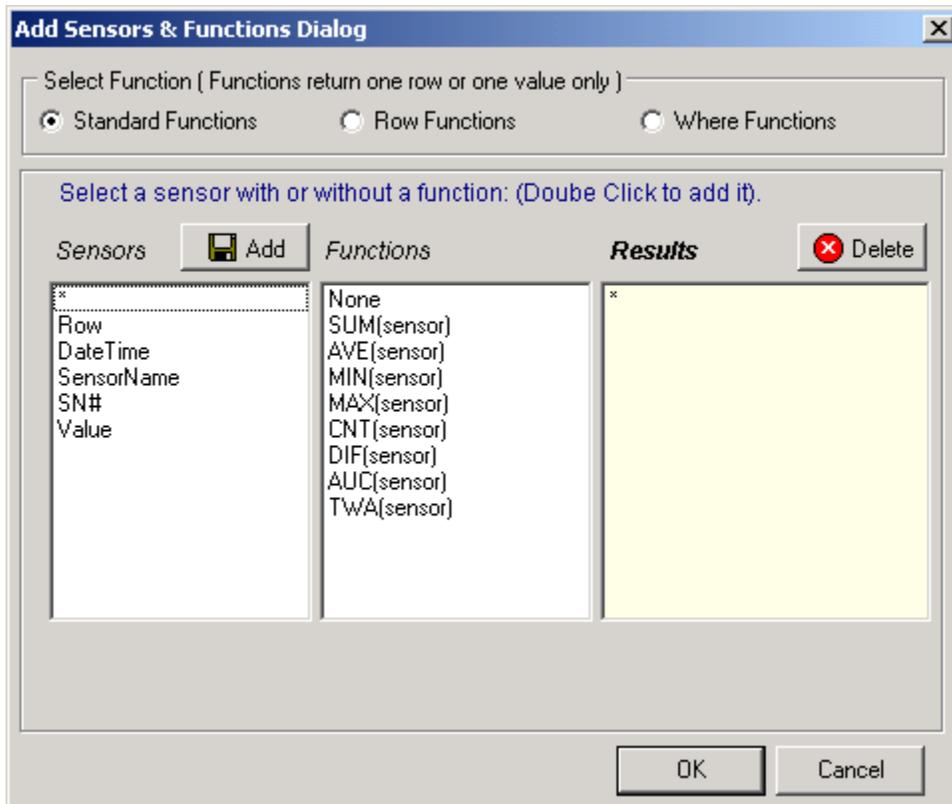
Events Reference



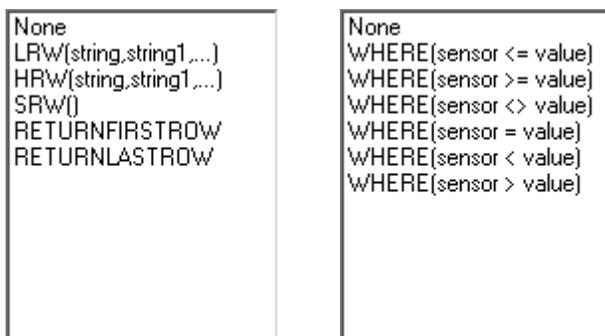
Selecting columns, functions, from, filters and output from these combo boxes. After selection, press the build SQL to show the new SQL function in the New SQL box.



Selecting Work Area shows the SQL statement your building. Click on the Build SQL and this selection will be added to the SQL function.



Column Functions include: AVE(),SUM(),MIN(),MAX(),CNT(),DIF(),AUC(),TWA()



Row Functions include: LRW(strings), HRW(), SRW(): Low in row, high in row, sum of row. Filters: Include BETWEEN, WHERE, WHERE AND, RETURNFIRSTROW, RETURNLASTROW

Events Reference

FROM: Only one database can be selected for an SQL function.

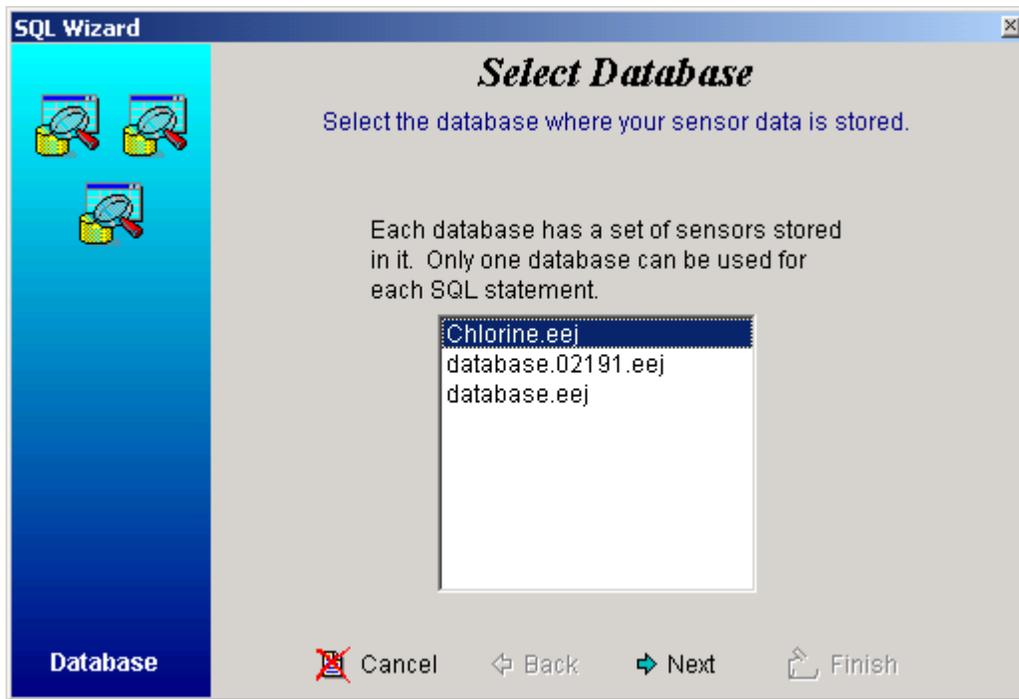
See Building SQL statements using the wizard.

6.4. Build SQL Statements

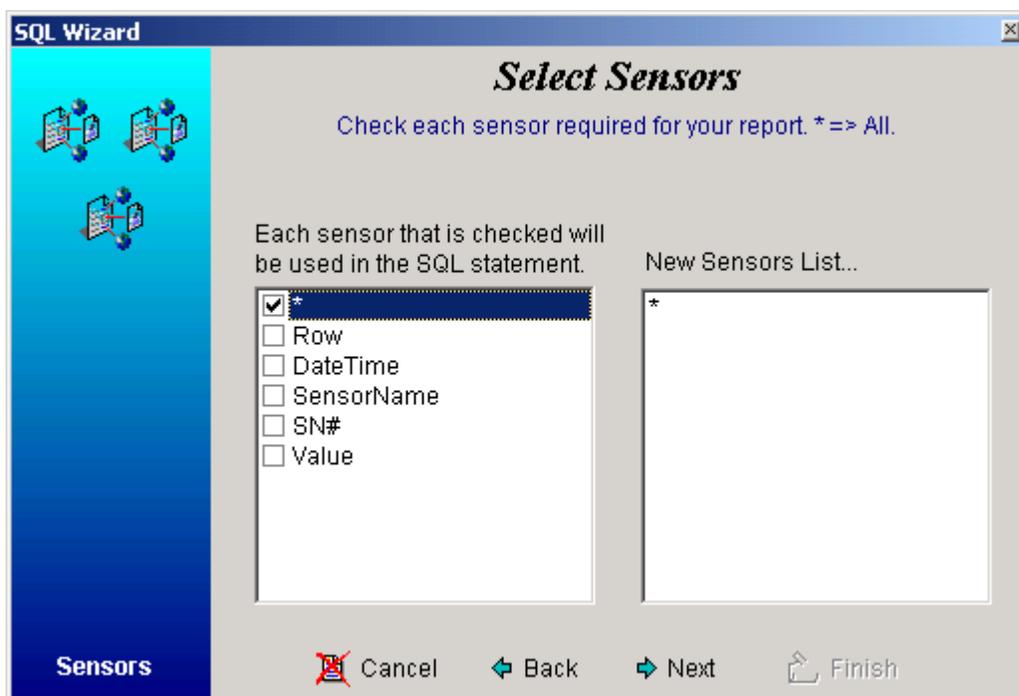
Building SQL statements for reports

Building SQL statements are important for database reporting and for analysis of your data. The SQL Editor tries to build a properly spaced SQL statement for you. Just select the options you want and start building. Spacing is very important in these statements. Use only one space between column and other commands. If more than one space is used the statement may not execute properly.

Use SQL Wizard to start.

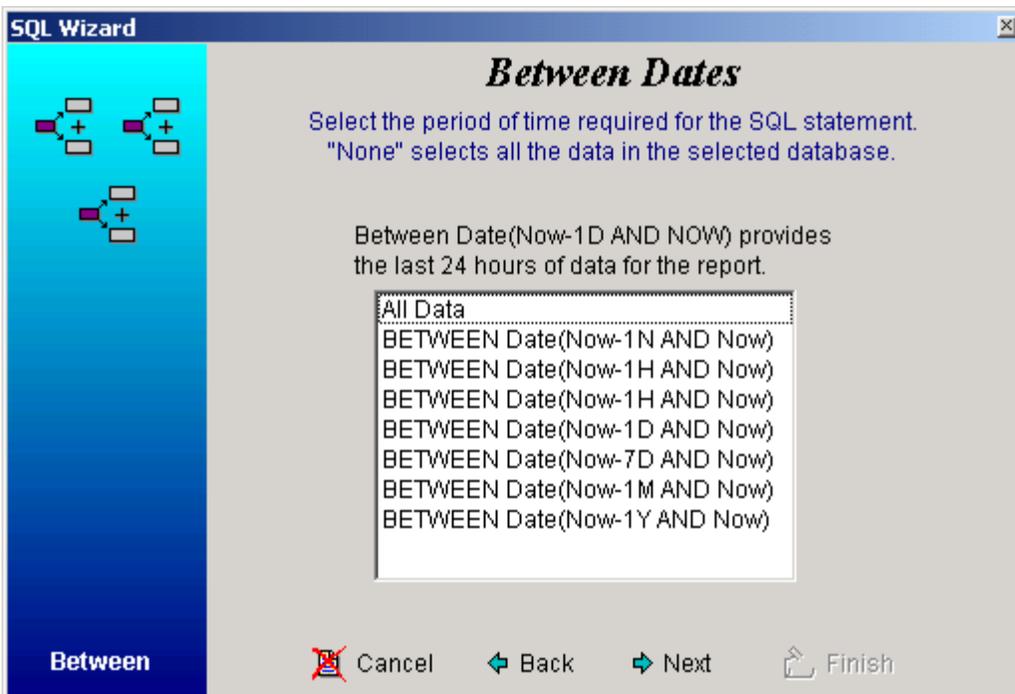


Select a database.

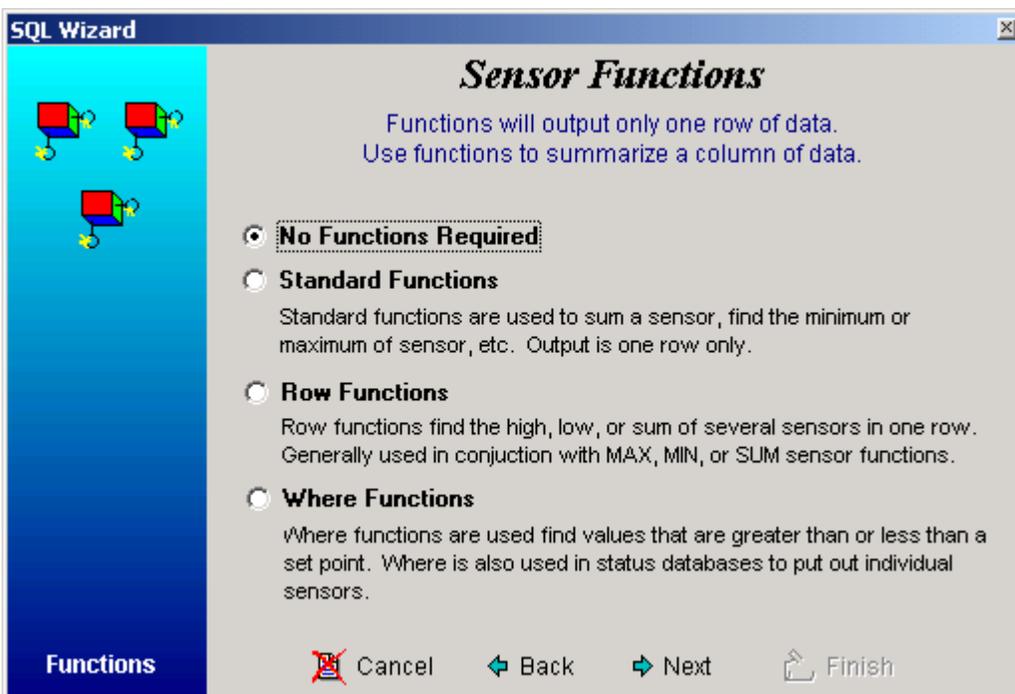


Check the sensors needed, * = All.

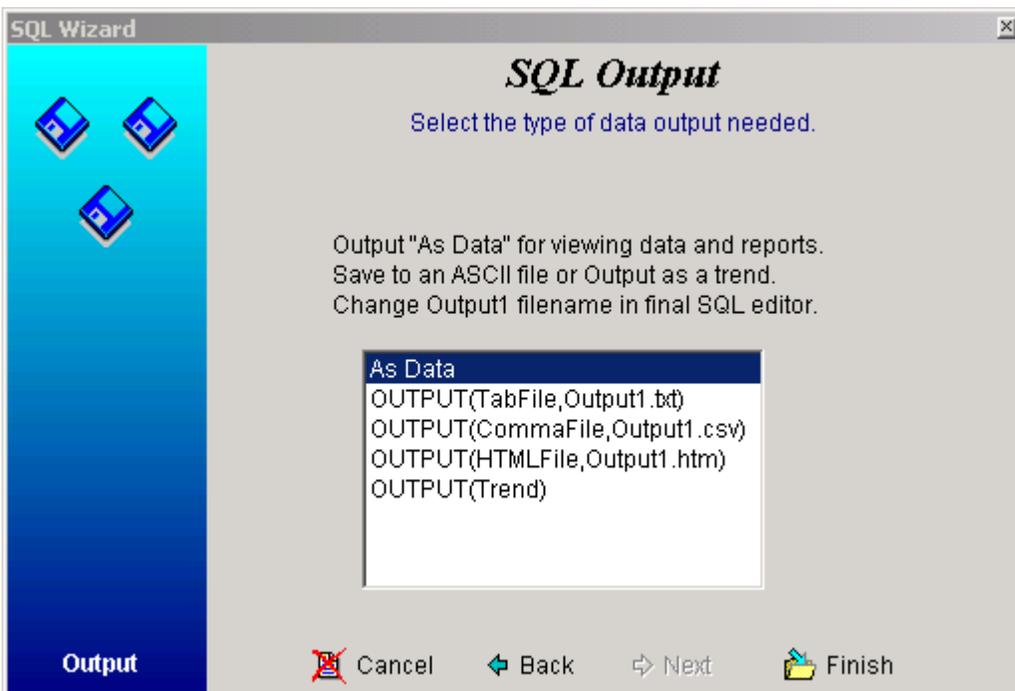
Events Reference



Select between time interval.



Select a function.



Select your output. As data is the most common and is used in all reports. Now click finish and the output is ready to run.

Events Reference

```
SELECT * FROM Chlorine.eej
```

Output from the SQL Wizard.

SQL Rules

Note: Watch your character spacing in the SQL statement.

1. Use only one (1) space between statements and functions!
2. Capitalize keywords as shown in the lists.
3. Spell names correctly when typing your own columns.

SQL KEYWORDS

SELECT <column1 column2 column3...columnN>

Select columns to be displayed, one space between columns

SELECT *

Select all columns

FROM <database>

Select database name from existing databases in combobox.

BETWEEN <lower date AND higher date>

Between lower and higher dates, Use (Now-7D AND Now) for the last 7 days

WHERE <column = value>

Where column = value, value must be of same type in column, if date then use a date or Now, if real number then type only numbers.

WHERE <column = value AND column1 = value>

Where column = value AND column1 = value; mainly used for status databases and onchg databases. You can search for a sensor name and a value = 1 to show on status.

OUTPUT(AsciiFile, Filename.txt)

Writes the result output as a text file, tab delimited. This file can be read directly by Excel or other text file editor.

OUTPUT(Trend)

Produces a trend of the output. Can be used in reports. This is the same as pushing the trend button after the data has been generated.

OPERATORS

<>, >, <, =, >=, <=

Acceptable operators are above. These operators are used between a column and value. Use one (1) space between operator and column or value.

COLUMN FUNCTIONS

* (function)

Returns all columns. * can be used with OnMin, Hourly and Daily databases. Sum(*) ignores the first two columns and returns the sum of each column in the database.

SUM(column)

Sums the column specified, you can use multiple sums in one statement. SUM(column) SUM(column1) SUM(column2) SUM(columnN)

Returns one column with the sum(column)

AVE(column)

Events Reference

Averages the column specified, you mix and match sum(), ave(), min(), in one statement.

MIN(column)

Minimum of the column is returned. Only one column is returned.

MAX(column)

Maximum of the column is returned. Only one column is returned.

CNT(column)

Count returns the number of rows that are not zero. Count is used to count the times a value is a certain value. Count can tell you how many times a pump went on when combined with a where and clause & between clause.

AUC(column)

Returns the area under the curve. This function calculates the area between 2 points and sums the area for the number of points.

TWA(column)

Returns the time-weighted average for a selected sensor. This function calculates the area under the curve and divides the result by the number of samples.

ROW FUNCTIONS

LRW(string,string2,string3,string4)

Returns the lowest value in the row. The string can be used to output a string instead of the column name. The result is one column.

Column1, column2, column3 LRW(Low Level1, Low Level2, Low Level 3) FROM database will return Low Level1 = 1.23. without the string the result LRW(Column1) = 1.23

Note: the strings are separated by commas ",". Everything else is divided by one space.

HRW()

Returns the highest value in the row. You can take the MAX of each column first and then use the HRW() to get the highest of all the columns. Use the strings for custom output.

SRW()

Returns the sum of the row. Can be used to totalize data from different sensors. You can use the SUM() function combined with the SRW() function to get total totals.

DATE FUNCTIONS

Date()

Date functions are used to filter your between certain dates. Most of the time you will want the data from Now and back so many years, months, days, hours, or minutes. Be sure to go from the earliest date to the latest date. Actual dates can also be input. Use the proper format when typing in dates.

Now

Now is the current date and time.

Now-1N

Now-1N subtracts one minute from the current time. Now-15N subtracts 15 minutes from the current time.

Now-1H

Now-1H subtracts one hour from the current time. Now-12H is half a day from now.

Now-1D

Now-1D subtracts one day from the current time. Now-3D subtracts 3 days from the current time.

Now-7D

Now-7D subtracts seven days from the current time. Use for weekly calculations.

Now-1M

Now-1M subtracts one month from the current time. Use for monthly summaries.

Now-1Y

Now-Y subtracts one year from the current time. Use for yearly summaries.

10/29/1998 10:00:00

Events Reference

This is the correct format for date time. Use this format when entering date directly.

SPECIAL FUNCTIONS

RETURNFIRSTROW

Sometimes the SQL statement may create more than one row of output. You may only want one row. You can use this function to return the first row of the result. The first row will be the oldest data.

RETURNLASTROW

Returns only the last row of the SQL statement. The last row is the latest or most current data.

REPORT FUNCTIONS

There are functions that are used only in the report editor. These functions are normally associated with dates. Enter these functions with the names in lower case between the brackets.

=[date]

Returns the current date in the system format. 10/30/1998

=[time]

Returns the current time in the system format. 10:30 AM

=[datetime]

Returns the current date time in the system format. 10/30/1998 10:30 PM

=[day]

Returns the number of days in the year (1 to 365).

=[week]

Returns the number of weeks in the year (1 to 52).

=[month]

Returns the number of months in the year (1 to 12)

=[year]

Returns the year in four digits. 1998

6.5. SQL Examples

```
SELECT * FROM Daily1.eej
```

```
SELECT DateTime FROM Flow2Hr.eej RETURNFIRSTROW
```

```
SELECT SUM(R-S2DailyFlow.2) FROM Daily1.eej BETWEEN Date(Now-7D AND Now)
```

```
SELECT SUM(R-S2DailyFlow.2) SUM(R-S3DailyFlow.3) SUM(R-S4DailyFlow.4) SUM(R-S5DailyFlow.5) SRW() FROM Daily1.eej BETWEEN Date(Now-7D AND Now)
```

```
SELECT SUM(R-S2RuntimePump.2) FROM Daily1.eej BETWEEN Date(Now-7D AND Now)
```

```
SELECT SUM(R-S2DailyFlow.2) FROM Daily1.eej BETWEEN Date(Now-1M AND Now)
```

```
SELECT MAX(R-S2DailyFlow.2) FROM Daily1.eej BETWEEN Date(Now-1M AND Now)
```

```
SELECT MIN(R-S3Pressure.3) FROM Hourly1.eej BETWEEN Date(Now-1M AND Now)
```

Events Reference

```
SELECT SUM(R-S5DailyFailPumpCt.5) FROM Daily1.eej BETWEEN Date(Now-1Y AND Now)
```

```
SELECT * FROM Hourly1.eej
```

```
SELECT DateTime R-S2Pressure.2 R-S2Level.2 R-S2Kwatt.2 FROM Hourly1.eej RETURNLASTROW
```

```
SELECT * FROM Alarm1.eej BETWEEN Date(Now-1N AND Now)
```

```
SELECT * FROM Alarm1.eej BETWEEN Date(Now-1H AND Now) WHERE(column >= value)
```

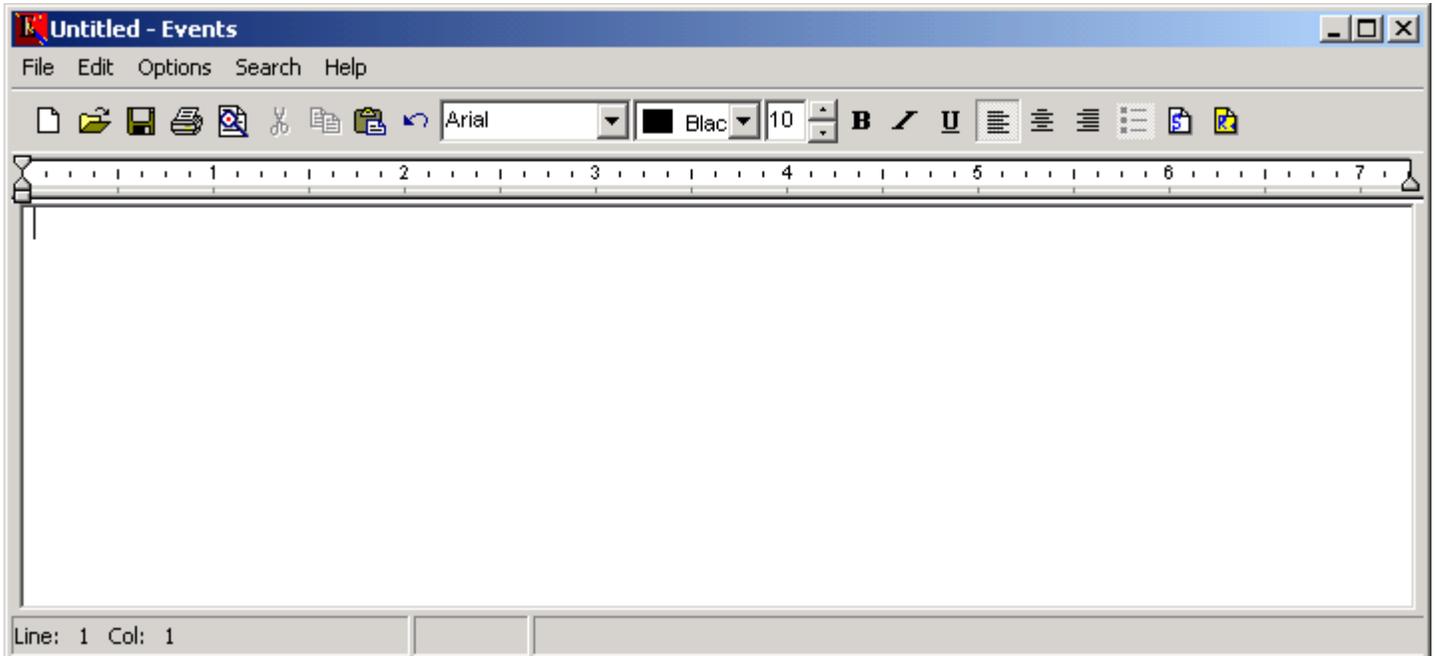
```
SELECT Row DateTime SensorName FROM Alarm1.eej BETWEEN Date(Now-1H AND Now) WHERE(SN# <= 3)
```

Events Reference

7. Reports

7.1. Report Editor

ReportsReport Editor are generated by use of the report editor.



Report editor with no files loaded.

GENERAL REPORT INSTRUCTIONS

To make reports you type into the editor the details of the report. Enter the titles, subtitles, and text as needed. Format the titles and text by using color and changing fonts, font styles. Use built in commands for dates (= [date], = [time] or = [datetime]) and then enter placeholders for data (= [1], = [2], = [3]). Set your tabs for each row in the report. Tabs will help to line up rows of data at the same point in the report.

You can mix and match text with data placeholders. This way you can identify the data with the text.

Set tabs by clicking in the ruler area. Remove tabs by selecting the tab and dragging off the ruler. Move the tabs by selecting the tab and drag.

After you have entered some placeholders for data, select the add sensors button on the right and select the sensors or SQL statements you want to use for the data. After you have made your sensor selection, press the run report button and the report will be produced.

You can not edit the finished report directly. You need to go back to the editor and edit it, and then run your report again. To go back to the editor, click the run button again.

Be sure to save the report with an *.rtf extension. When data has been entered into the sensor list a second file is saved with the sensor information, margins, headers and form size. When the scheduler prints the report, this information is required to make the report look right.

You can print and preview both the setup report and the report itself. Just click on the print or preview buttons. You can also save the data report separately if you need to keep a copy of it. You can always regenerate the report as long as the data is in the database. Real time data will change if you are pulling the current data from the grids.

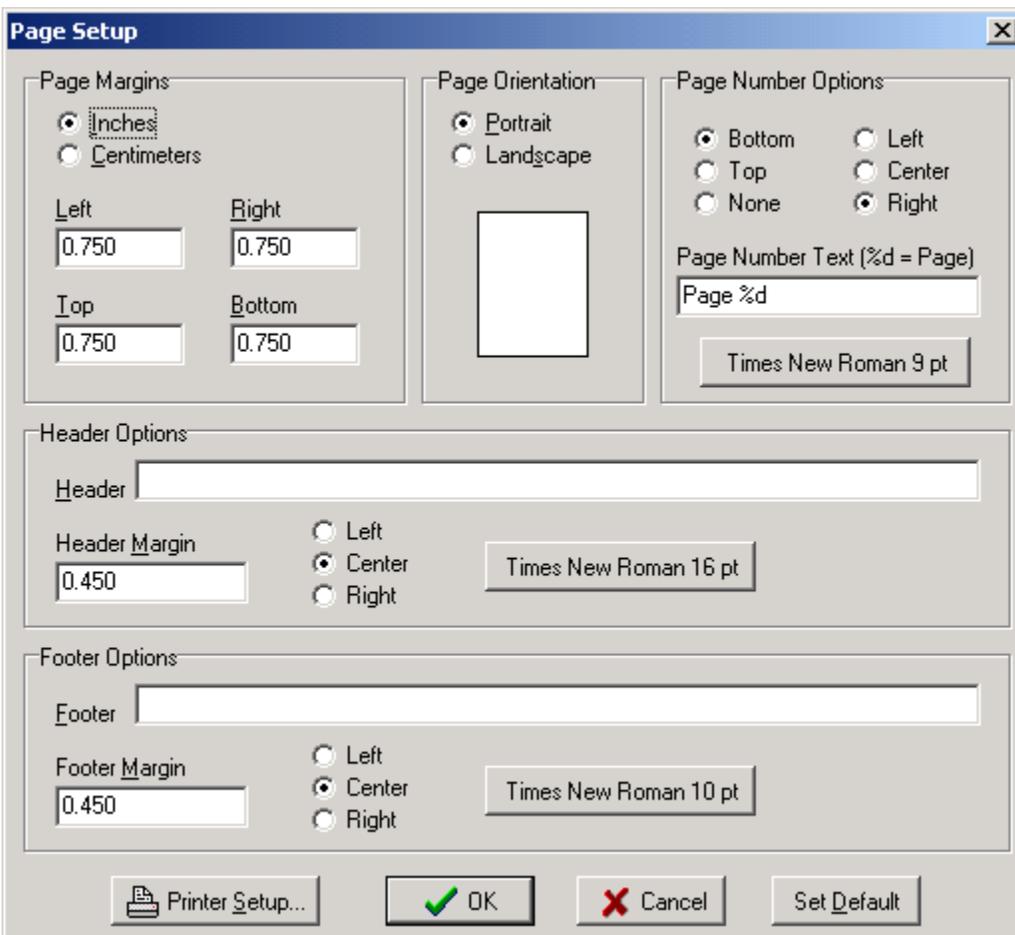
Events Reference



File Menu: Open and save files, preview, print or print report if sensors are assigned

These are standard word processing commands. Use the print report command if you have data placeholders and have selected sensors for your data. You may want to run the report first to see what it looks like. Press the run report button on the right of the editor to run the report.

Press the Page Setup menu item to set the page formatting options.



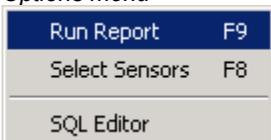
Page Setup allow you to set margins, headers, footers and positions. These settings are saved with the report.

Edit menu



Edit Menu: Standard editing function plus run editor.

Options menu



The edit menu allows you to cut, copy, paste, select all and change font. You must select some text first before you can use these commands. The Run Editor command executes the report by getting the data and showing the finished report. Go back the editor by clicking the same option again.

Events Reference



Report Toolbar and ruler. The two buttons on the right allow you to select sensors for your report and to run the report.

You can view what each button does by placing the cursor over the button. A hint will be shown with the action of the button. The toolbar buttons and windows are as follows:

New file, open file, save file, print file, preview file, cut, copy, paste, undo, select fonts, font colors, font size, font styles [bold, italicize, underline], align left, align center, align right, add bullets, add sensors, run report.

ADDING DATA PLACEHOLDERS

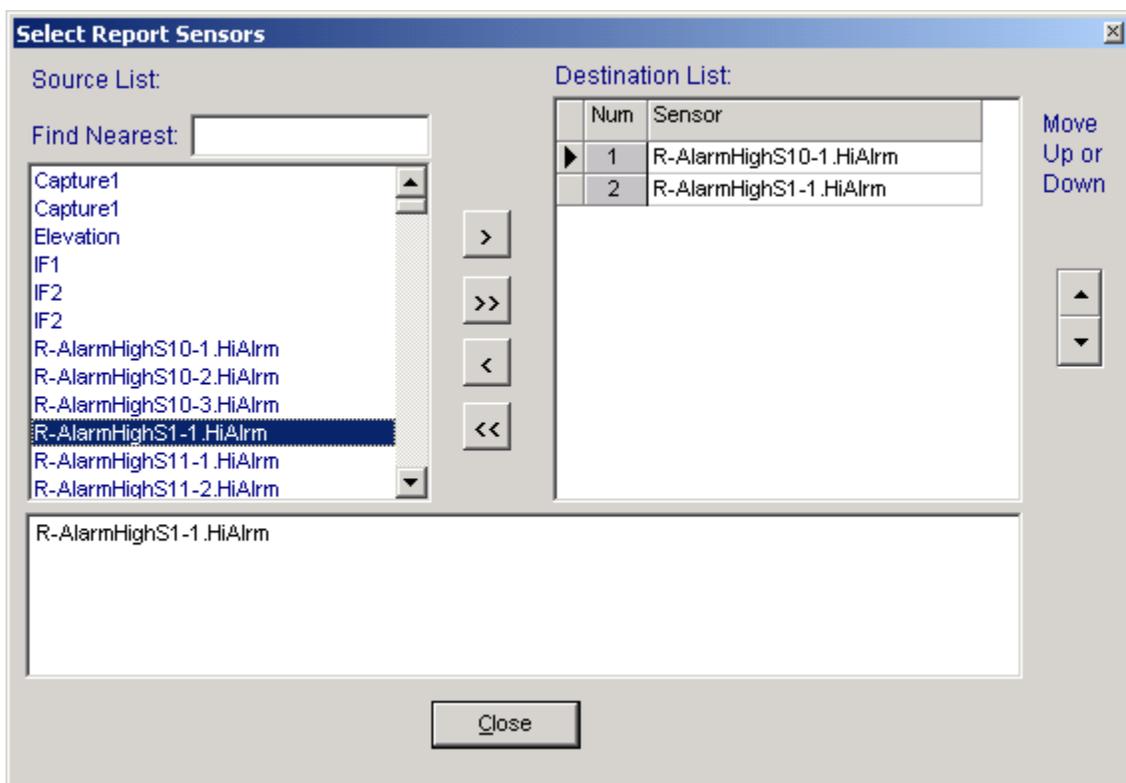
Datetime **Sensor1** **Sensor2**
=[datetime] =[2] =[3]

Enter =[1] is the first sensor in the report. Sensors are defined from the SQL list or from any of the defined sensors in the setup grids and file grids.

REPORT FUNCTIONS ENTERED DIRECTLY

Report functions

=[date] =[time] =[datetime] =[day]
=[week] =[month] =[year]

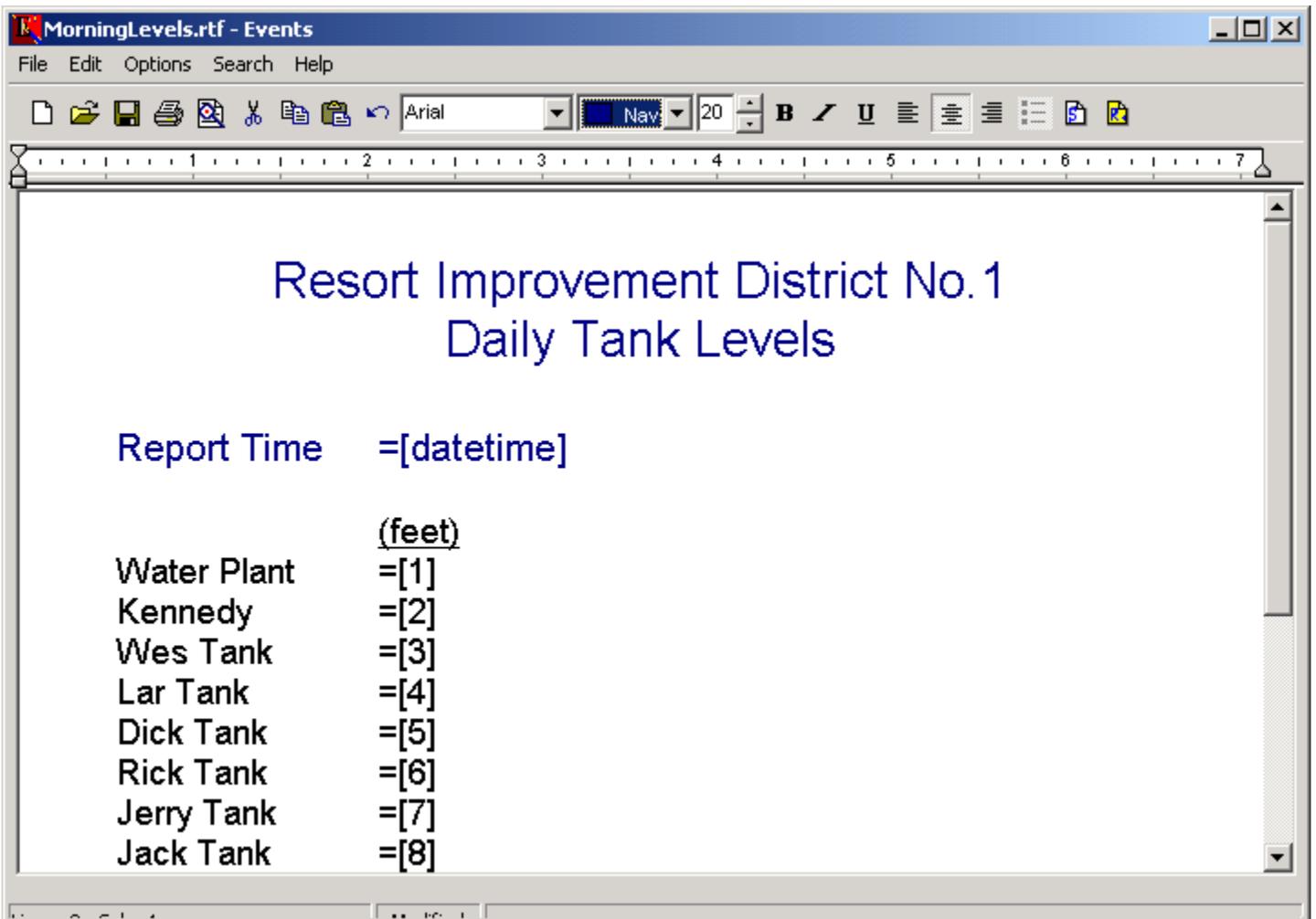


Selecting sensors from the source list. The destination list is used for the report.

Add and remove sensors or SQL statements from the source list. The destination list becomes your report list. You can move sensors up and down in the list once it is entered into the destination list. The number of the destination list relates directly to data placeholder number in the report.

EXAMPLE OF A DAILY REPORT FORMAT

Events Reference



Set your report with the look you want by using standard editing commands.

Assign a sensor to each of the =[number], and the values will be inserted into the report when it is run.

Options menu

Run Report	F9
Select Sensors	F8
SQL Editor	

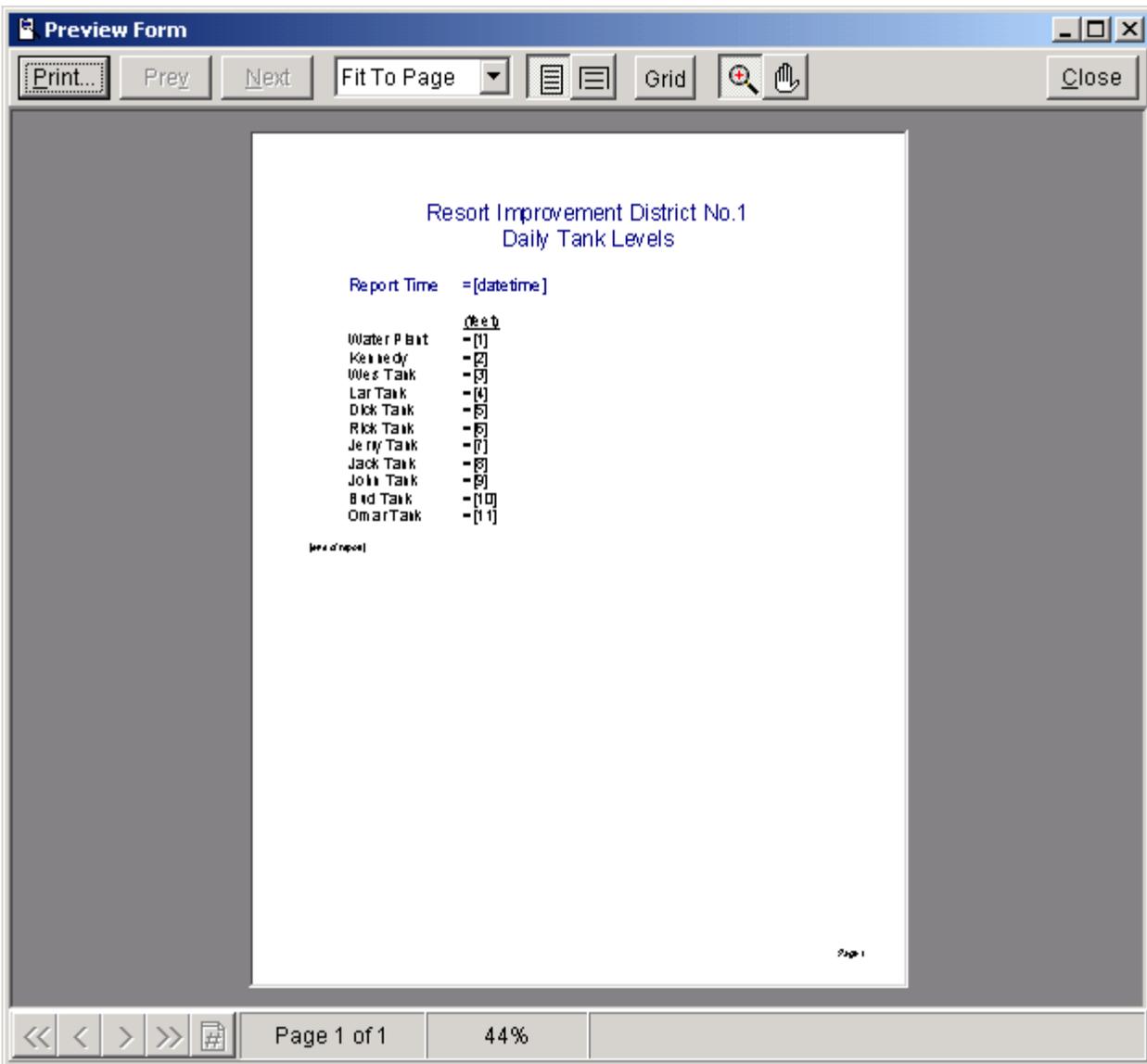
Report options: Run report, select sensors and run the SQL Editor.

Each report saves the sensor names, margins, header, and footer information. You can change this information by selecting these options.

You can also run the SQL Editor to enter a new statement for your report. Once you have added the SQL statement to the SQL combo box, it will become available for your report in the data source list.

PRINT PREVIEW

Events Reference

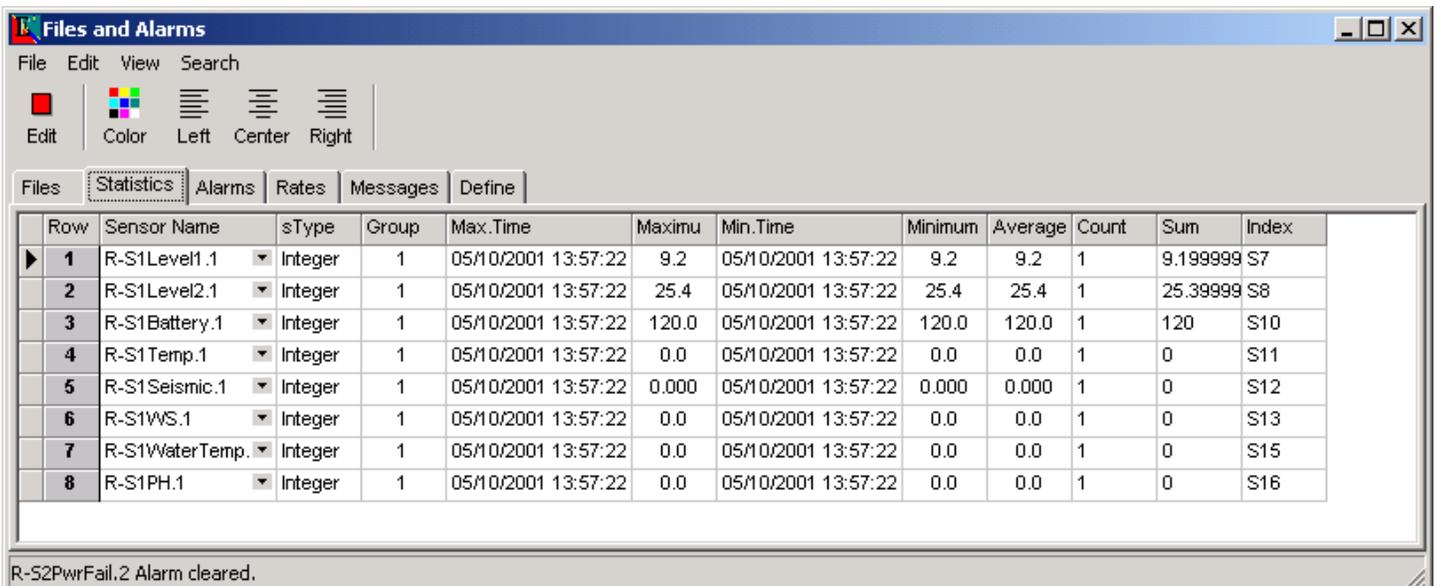


Report preview: Select preview to see how your report will look printed.

Print the report from here by selecting the print button. You can print all pages or select the pages you want from the print dialog that pops up.

7.2. Statistics

Statistics are stored for selected analog and status sensors selected on a daily basis. The maximum, minimum and average are calculated when a component is updated. The running averages are stored in the statistical value table in the Files/Alarms form.



Events Reference

Statistical data for analog sensors

Analog and status sensors can have daily statistical information stored in the Files/Alarms form. You can add or delete sensors that you want to show maximum, minimums, and averages.

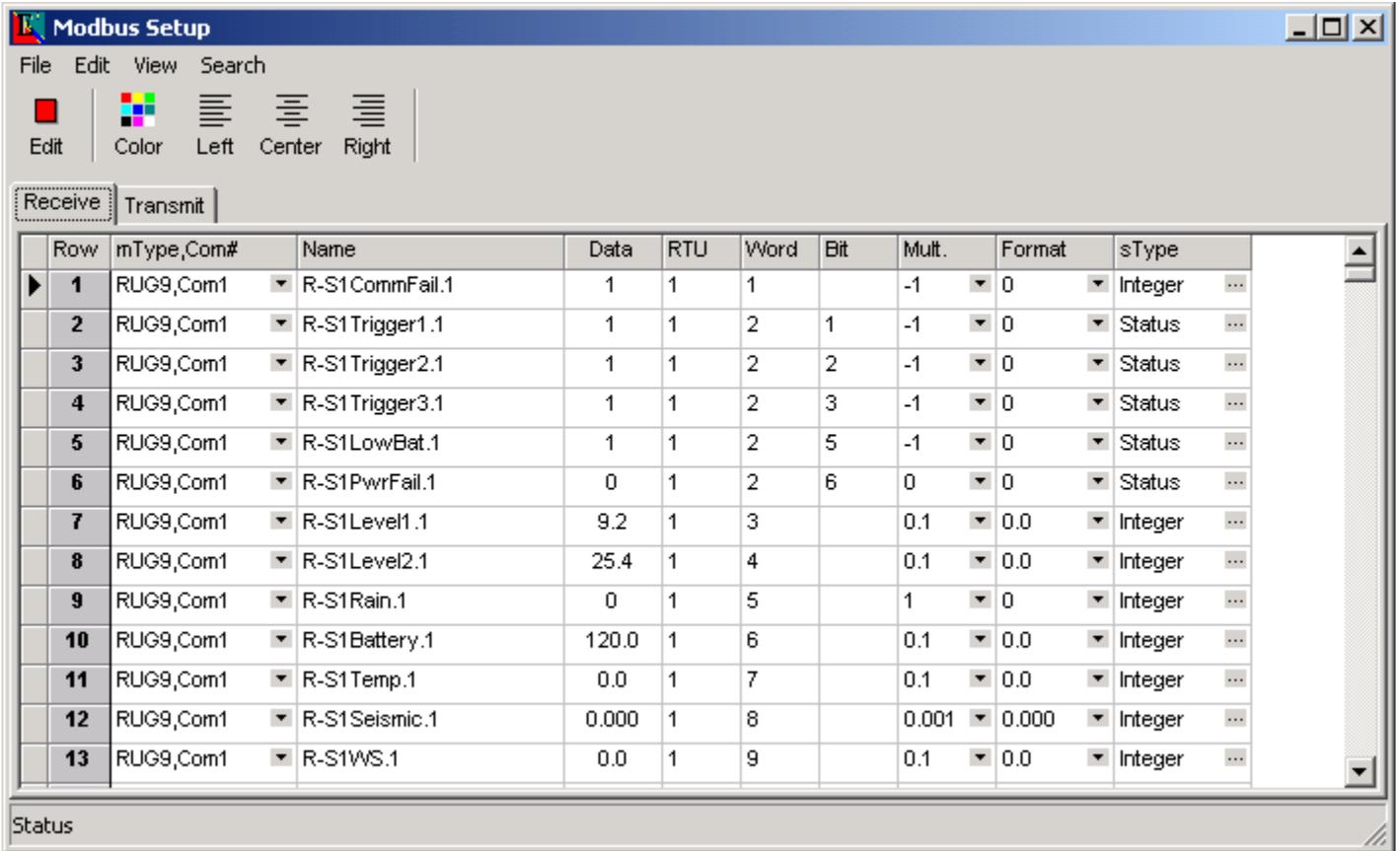
Status information shows stores the number of counts during the day (Maximum = on counts (1)), Minimum = off counts (0)). The statistical information is saved at 11:59 each day. A new statistical file is started at that time.

Events Reference

8. Setup

8.1. Modbus Setup

Modbus Setup is a very important part of the program. All other forms and data collection processes use the names assigned in this form. The data being transmitted and received are put into this form before other forms are updated. You can always view the data in this form to see the latest value received.



The screenshot shows the 'Modbus Setup' window with a menu bar (File, Edit, View, Search) and a toolbar (Edit, Color, Left, Center, Right). Below the toolbar are 'Receive' and 'Transmit' tabs. The main area contains a table with 13 rows of sensor data. The table has columns for Row, mType,Com#, Name, Data, RTU, Word, Bit, Mult., Format, and sType. The 'Data' column shows values like 1, 0, 9.2, 25.4, 0, 120.0, 0.0, 0.000, and 0.0. The 'sType' column shows values like Integer and Status.

Row	mType,Com#	Name	Data	RTU	Word	Bit	Mult.	Format	sType
1	RUG9,Com1	R-S1CommFail.1	1	1	1		-1	0	Integer
2	RUG9,Com1	R-S1Trigger1.1	1	1	2	1	-1	0	Status
3	RUG9,Com1	R-S1Trigger2.1	1	1	2	2	-1	0	Status
4	RUG9,Com1	R-S1Trigger3.1	1	1	2	3	-1	0	Status
5	RUG9,Com1	R-S1LowBat.1	1	1	2	5	-1	0	Status
6	RUG9,Com1	R-S1PwrFail.1	0	1	2	6	0	0	Status
7	RUG9,Com1	R-S1Level1.1	9.2	1	3		0.1	0.0	Integer
8	RUG9,Com1	R-S1Level2.1	25.4	1	4		0.1	0.0	Integer
9	RUG9,Com1	R-S1Rain.1	0	1	5		1	0	Integer
10	RUG9,Com1	R-S1Battery.1	120.0	1	6		0.1	0.0	Integer
11	RUG9,Com1	R-S1Temp.1	0.0	1	7		0.1	0.0	Integer
12	RUG9,Com1	R-S1Seismic.1	0.000	1	8		0.001	0.000	Integer
13	RUG9,Com1	R-S1WS.1	0.0	1	9		0.1	0.0	Integer

Define your Modbus receive sensors in this grid.

The RTU, Word and Bit must be in the correct order (lowest to highest). If you are polling RTU 1, then the word column must be in order from lowest to highest. If a sensor is assigned as a status sensor, the bits must be in order also (lowest to highest).

The lowest to highest ordering starts with the RTU, then Word, then Bits.

RECEIVE COLUMNS

Column 1: This is the row column that tells you how many sensors are entered into the system. The rows are entered automatically when you add a row.

Column 2: Enter the type of Modbus communications you want. The two types are RUG6 and RUG9. The main difference between these protocols is an offset of 1 in the Modbus address. The RUG9 follows the standard Modbus protocol. This program uses types 3, 6 and 16 Modbus messages for reading and writing data. Events supports up to 10 serial ports. It has been tested with the blue heat add on board which supplied ports 6, 7, 8, & 9. The software worked well with any of these ports as well as ports 1 and 2. Be sure to use the same configuration for each row. (RUG9,Com1).

Column 3: This is a name for your sensors, which is used by the parts of Events. Each name in the receive and transmit arrays must be unique or different. Try to use names representing your sensors. The data shown above was imported from a RUG9 file. The R- was added to the existing sensor's name.

Column 4: Data polled from the master RTU is entered in this column. This data is converted into engineering units using the multiplier and format. If the raw data is not in final form, you can take this value as an input in the defined grid. The defined grid allows you to create an equation or lookup table using any data in the receive grid.

Column 5, 6, 7: RTU, Word, Bit make up the modbus address. The RTUs, Words and Bits need to be in the correct order (lowest to highest). The program will try to catch any errors in these rows. The multiplier and format are used to format the data with the selected number of decimal places. The data displayed on your forms will be in the format selected.

Column 8: Format defines the number of decimal places shown in the data column. This usually corresponds to the

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multiplier used. If the multiplier is 0.1 then the format would be 0.0.

Column 9: sType is either an integer or status. The modbus format sends data as integers. Status sensors use one word that is divided into 16 status bits. Each bit can be assigned as a sensor. Events take care of the bit manipulations. If the bit is on the data value will be one (1). If the bit is off the data value will be zero (0).

EDITING MODBUS SETUP VALUES

If you have the setup user privileges, you can editEditing Modbus Setup the Modbus setup parameters. To go into the edit mode, click on the Red button

Click on the Edit button (red square) or select the Edit | Edit Values menu item or press F9. The forms tool bar will be shown.

Edit Values	F9
Copy Cells	Ctrl+C
Paste Cells	Ctrl+V
Fill Down	Ctrl+D
Fill Right	Ctrl+R
Send TX	
Send All TX	Ctrl+T
Add to ALL Lists	Ctrl+B
Add to Files List	
Add To Stat List	
Add To Alarm List	
Clear All Grids	
Rebuild Poll Grids	
Undo	Ctrl+Z

Modbus Setup edit menu

Using the Add to Commands

The add to commands are an easy way to set up your files (data logging), statistics and alarms. Select the sensor(s) in the Modbus Grid and then select the menu item. The sensors will be entered into your grids.

Using this method automates the entry of data into these files

First select the rows or cells you want to be included in the files tab of the files and alarm form. Then select Add to Files List. The select sensors will input into the files grid with default file names and data logging.

The best way to use the add to commands is to group status sensors together and add them to the grids you want. Then group the integer values by selecting sensors that should be stored with each other. Add Hourly sensors together, add Daily sensors, add OnMin sensors, add Alarm sensors, add Status sensors together. That way they will be in the grids together for easier viewing.

Row	mType,Com#	Name	Data	RTU	Word	Bit	Mult.	Format	sType
1	RUG9,Com1	R-S1CommFail.1	1	1	1		-1	0	Integer
2	RUG9,Com1	R-S1Trigger1.1	1	1	2	1	-1	0	Status
3	RUG9,Com1	R-S1Trigger2.1	1	1	2	2	-1	0	Status
4	RUG9,Com1	R-S1Trigger3.1	1	1	2	3	-1	0	Status
5	RUG9,Com1	R-S1LowBat.1	1	1	2	5	-1	0	Status
6	RUG9,Com1	R-S1PwrrFail.1	0	1	2	6	0	0	Status
7	RUG9,Com1	R-S1Level1.1	9.2	1	3		0.1	0.0	Integer
8	RUG9,Com1	R-S1Level2.1	25.4	1	4		0.1	0.0	Integer
9	RUG9,Com1	R-S1Rain.1	0	1	5		1	0	Integer
10	RUG9,Com1	R-S1Battery.1	120.0	1	6		0.1	0.0	Integer
11	RUG9,Com1	R-S1Temp.1	0.0	1	7		0.1	0.0	Integer
12	RUG9,Com1	R-S1Seismic.1	0.000	1	8		0.001	0.000	Integer
13	RUG9,Com1	R-S1WS.1	0.0	1	9		0.1	0.0	Integer

Modbus form in edit mode, toolbar is shown. Selected sensors in black.

Events Reference



Modbus toolbar

Each column can be edited in this mode. The columns with buttons showing provide default values for that column. You can type these in or use the combo boxes. If you type the value in, be sure to type it exactly like the combo box entry. Case makes a difference.

EDITING BUTTONS



Editing toolbar with check, add, insert and delete buttons.

Check Button: This button checks for errors in your setup. It checks for name duplicates, communication port differences, RTU, Word, and Bit ordering and other error. Press this button to see if you have errors in your setup.

Add Button: The add button adds a row to the end of the grid. Add as many rows as needed.

Insert Button: The insert button inserts a row just above the current row. This is to add sensors that belong in the middle of the grid.

Delete Button: The delete button deletes the current row in the grid. The current row is where the cursor is located or column is selected.

TRANSMIT MODBUS SETUP

The transmit grid Modbus Transmit Setup is where you enter the names and values for data that is sent to the RTUs. The order the RTU, Word and Bits are the same as the receive grid, from lowest to highest. The type assigned is also very important.

Row	mType,Com#	Name	Data	RTU	Word	Bit	Mult.	sType
1	RUG9,Com1	T-M1StopSpeech.1	0	1	1		1	Integer
2	RUG9,Com1	T-M1LevelBase.1	8000	1	3		1	Integer
3	RUG9,Com1	T-M1RRate1h.1	200	1	4		100	Integer
4	RUG9,Com1	T-M1RRate3h.1	300	1	5		100	Integer
5	RUG9,Com1	T-M1RRate6h.1	400	1	6		100	Integer
6	RUG9,Com1	T-M1RRate12h.1	432.0	1	7		100	Integer
7	RUG9,Com1	T-M1RRate24h.1	600	1	8		100	Integer
8	RUG9,Com1	T-M1LRate1.1	555.6	1	9		10	Integer
9	RUG9,Com1	T-M1LRate2.1		1	10		10	Integer
10	RUG9,Com1	T-M1LRate3.1		1	11		10	Integer
11	RUG9,Com1	T-M1Threshold1.1		1	12		10	Integer
12	RUG9,Com1	T-M1Threshold2.1		1	13		10	Integer
13	RUG9,Com1	T-M1Threshold3.1		1	14		10	Integer
14	RUG9,Com1	T-M1High1.1	345	1	15		10	Integer
15	RUG9,Com1	T-M1High2.1		1	16		10	Integer

The transmit grid showing set points and status numbers being sent to the master RTU.

The transmit column information is nearly the same as the receive grid. The transmit grid does not have a format column since the data sent is always an integer.

Type: The type is either status or integer. Status rows require a bit assignment. Integer values are from -32768 to 32767. The type does effect the data value transmitted to the remote RTU.

STATUS SENSORS: Status sensors use the 16 bits in one word. Each of the bits can be assigned to a different sensor. The program changes the integer value based on the bit status. If the bit is on, then the data value will turn that bit on in the word. If all the bits are off, the data value will be 0.

INTEGER SENSORS: Integer assignments normally have a multiplier. The data value transmitted is an integer value. The multiplier times the set point equals the data value. If your set point control has a value of 45.7 and the multiplier is 10, the value sent to the RTU is 457. If the multiplier is one, the value sent would be 45.

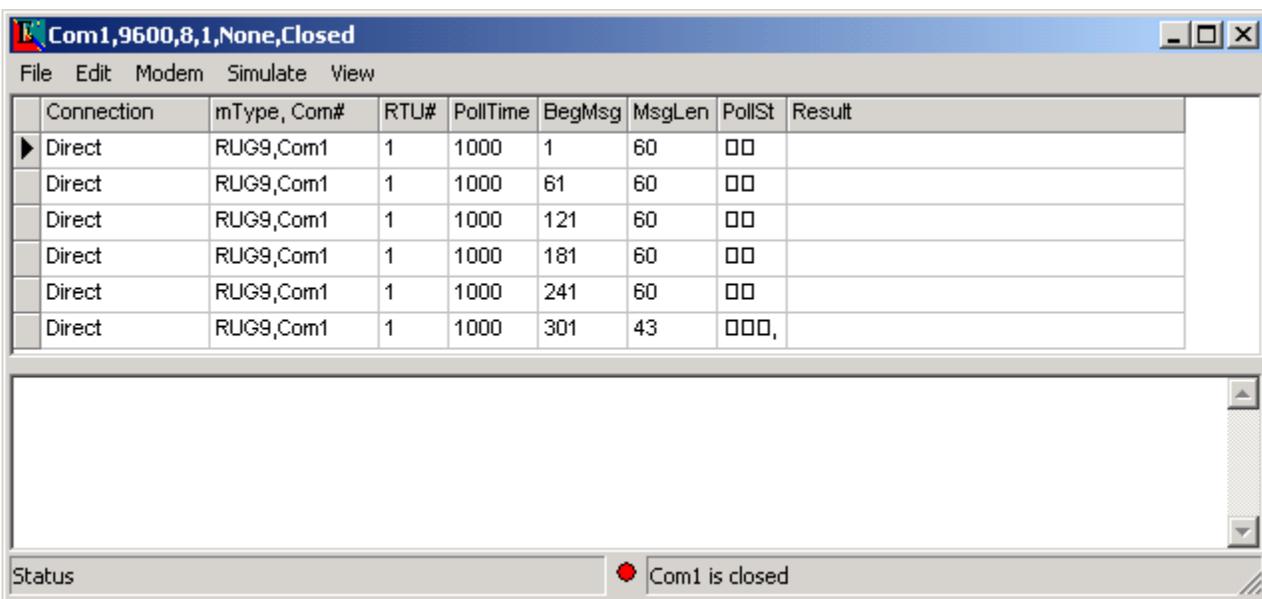
Events Reference

BOOT UP: When you close EVENTS and reopen it, the data values in the transmit grid are written to the master RTU. If your set points are incorrect, you can make a change in this grid and then write all the transmit values by selecting the Edit | Send TX menu item to write the transmit values.

Note: The transmit values are not resent to the master RTU unless you select the menu item to send them. Individual transmit values are sent when you enter and exit a set point controls or press a bit button control.

8.2. Modbus Communications

You can check the communicationsModbus Communications window to see if data is being received and if the communications port is open. The most current data should be viewed in the Modbus Setup Form. This form is only used for modbus error checking and to see if the communications port is open.



The MODBUS communications shows the receive polling and if the port is still working. The green dot should be flashing green and white. The is red when the port is closed.

EDIT MENU



The Edit menu allows you to close and start the communications port, change the poll interval, send the transmit data (if any) start or stop the memo (for troubleshooting).

EDIT | CLEAR MEMO

This command clears the memo so new data can be added to the memo pad.

EDIT | INTERVAL

Clicking in a row off the PollTime column sets the interrogation interval. The poll interval is normally set around 1000 milliseconds or (1 second). This is the speed the serial port will be updated. The interval menu item just tells you to click in that column to set the interval.

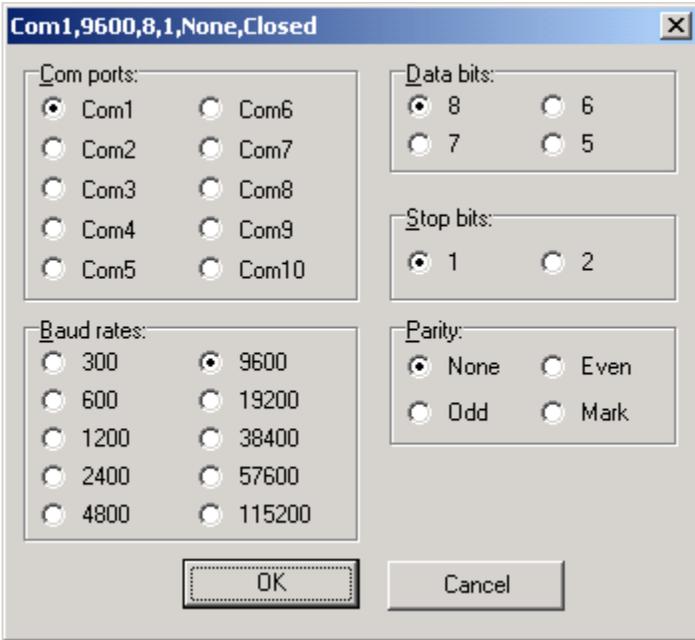
EDIT | CLOSE COMPORT

EDIT | OPEN COMPORT

You can close or open the communications port at any time with these commands. The lower communications dot will become red when the communications port is closed.

Events Reference

EDIT | SELECT COMPORT



Communication Port Setting defaults

When you select the Edit | Select ComportSelect Comport menu, a dialog box will be shown, listing the communication parameters. Make your selections and press OK. Pressing OK tries to open the selected port. The decoder is normally configured for 300 or 9600 baud, 8 data bits, 1 stop bit, and no parity.

There are four steps that need to be done to start the communications.

1. Connect your serial cable from the computer to the receiver / decoder.
2. Configure your port for 300 to 9600 baud, 8 bits, 1 stop bit, and no parity.
3. Open the serial port from the Set Comm menu.

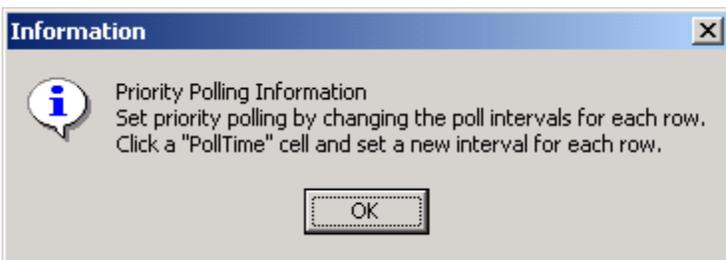
STATUS DISPLAY (1 DOT at the bottom of the communications program)

The program will display the status of the communications port and if you are receiving any data from the master. If everything is running properly, the communication dot will be flashing between white and green. If no MODBUS addresses have been assigned, then the top grid will not show any updates. At least one sensor needs to be assigned for the communications to work properly. A red dot indicates the port is closed or not operating properly.

Setting the Poll Interval

The Poll IntervalPoll Interval can be adjusted for priority polling. Click on a row in the PollTime Column to change the poll interval (in milliseconds, i.e. 1000 Msecs = 1 second). Try to make the poll intervals multiples of the lowest time interval.

If row one is set to 1000 Msecs and row two is set to 10000 Msecs, row one will be polled ten times before row two is polled. The system could have alarm words in the first poll and slow moving analog information in the second poll. It may be important to poll for the alarm information more times than the analog data.

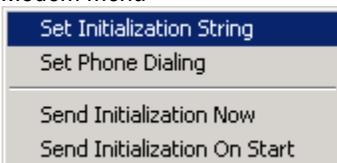


Click on a row in the PollTime column to change the poll interval. Don't enter commas in the number.

Setting Modem Initialization

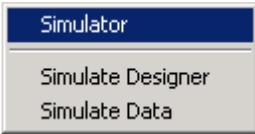
EVENTS can be set up to initialize a Modem connected to the serial port. The initialization string can be sent when EVENTS starts up or at any time by selecting Modem | Send Initialization Now from the Communications Form.

Modem menu



Configure a modem initialization string and send it to your modem on start up.

Events Reference



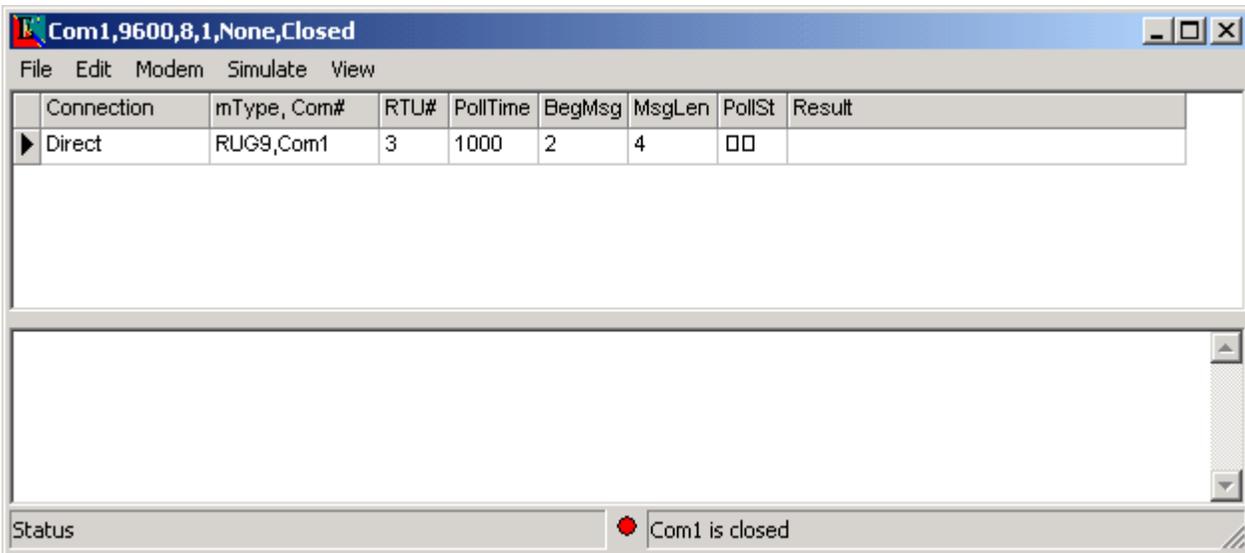
Simulate menu
(See *Simulating Data*)

8.3. Simulating Data

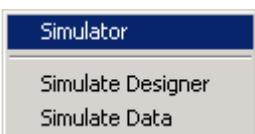
Events can be configured to simulate data instead of receiving data from a master RTU. The simulator consists of three forms. The simulator form, designer form and the data form. The simulator form starts and stops the simulation and gives you a progress indicator showing how much of the simulation is complete. The designer form is used to create data for the data form. The designer form has formulas that are used to create data for each row of data. The data form is the data that is transmitted into EVENTS receive array.

When the simulator is started, the communications serial port is closed to stop data conflicts between the Modbus communications and the simulator data. The communication port must be restarted after the simulation is closed. It will not restart automatically. Use Communications Form Edit menu: Edit | Open ComPort to restart the Modbus communications.

To start or design a simulator file, select View | Communications from the Main Form menu. The Modbus communications form has a simulate menu item shown below.



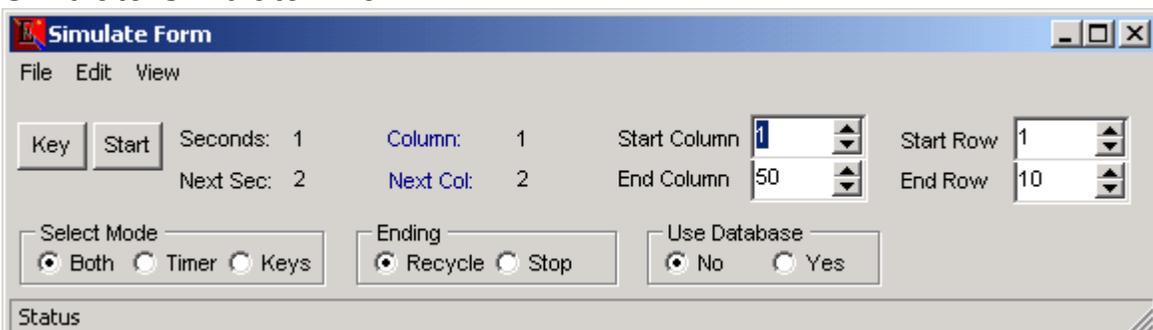
From MainForm menu View | Communications to start simulator.



Communications Form simulate data menu items

Select Simulator\Simulator to open the main simulator form. If no data has been created for your application, you should open the designer form by selecting View | Designer Form from the Simulator Form.

Simulator\Simulator Form



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After data has been created for your project, press the start button to begin the simulation.

Data is sent to the Modbus receive grid column by column. You can specify the start and end columns to send. You can also specify the start and end rows. Each row is for one sensor. The Key Button allows you to transmit data by pressing a key on the keyboard. If the select mode is both, a timer will send data based on time as well as a key press.

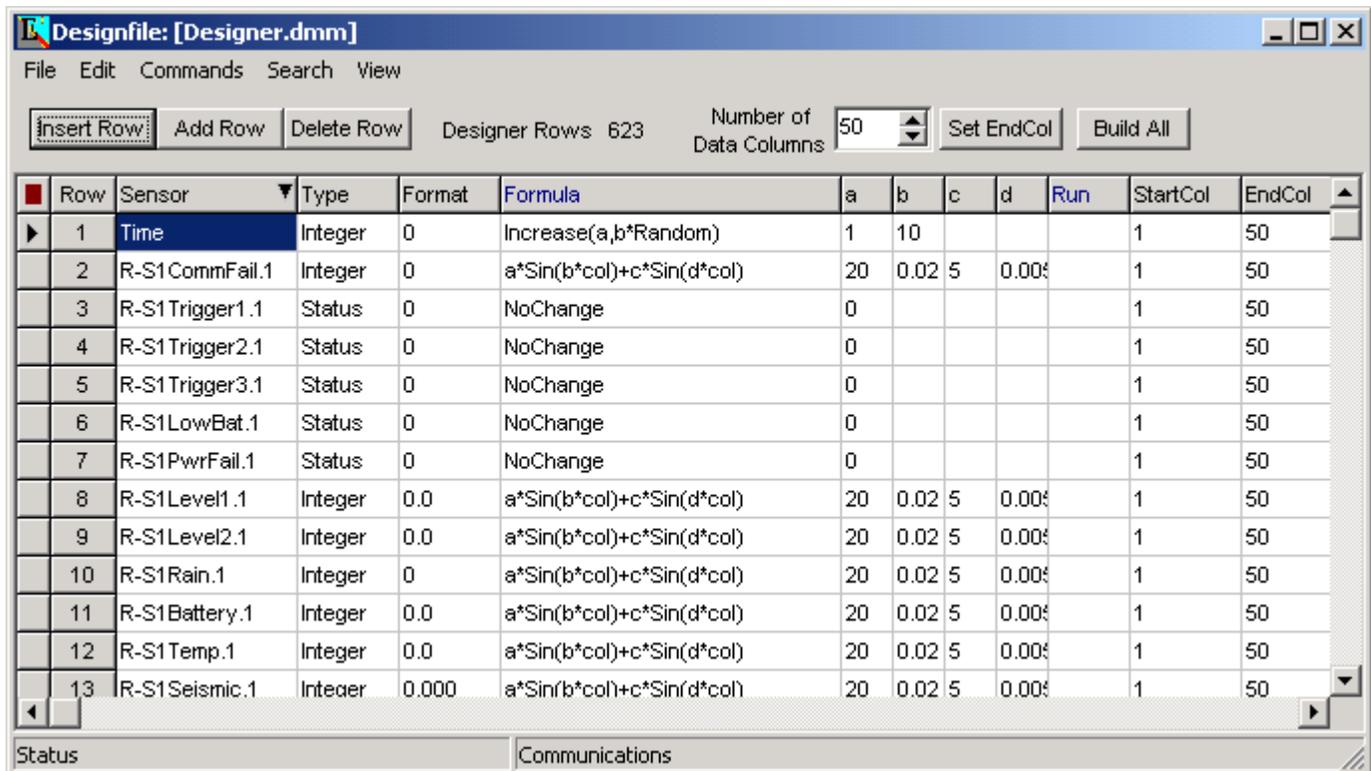
You can select the simulator to recycle or stop at the end of process. You can also specify if you want to write or not write to the database during the simulation.

Designer Form Designer Form

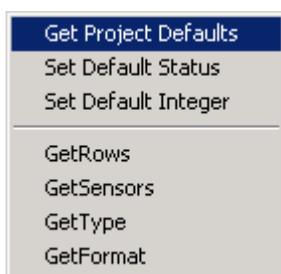
If you look at the Modbus receive grid, a sensor's definition is shown in each row of the grid. We want to create the same format in the designer form. Each row of the designer form is a sensor's definition. The columns in the designer form define the sensor's characteristics: name, type, data format. The rest of columns are used to define how the data will be created. This includes the formula, the variables, a run button, the start column, and the end column.

Note: the first row in the designer form is Time. The Time sensor is used when the time or both modes are selected. Time is measured in seconds. Each column in the data form has a time interval assigned in row one. The time interval should increase as the column number increases.

A counter starts to increase after the Start Button is pressed. When the counter reaches the column's count in row one, the data is sent for that column.



Designer Form sensor definitions, formulas, variables, run button, start and end columns.



Start by selecting Get Project Defaults from the Commands menu.

The get project defaults builds the design form with sensor information, default formulas and variables. You can do the same by executing the individual commands in the Commands menu. Be sure to execute GetRows first, if you use the individual commands.

Building the Data Form

You can build all the data rows at one time by clicking the Build All button or you can press the Run Button in each row to build data for that row. The Build All button does the same thing as the run button except that it loops through all the rows in the designer grid.



After you have selected a formula and enter the variables a,b,c and d, press the run button to add data for a single row.

Editing the Designer Form Grid and Data Form Grid

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Copy	Ctrl+C
Paste	Ctrl+V
Cut	Ctrl+X
Clear Grid	
FillDown	Ctrl+D
FillDown+	Shift+Ctrl+D
FillRight	Ctrl+R
FillRight+	Shift+Ctrl+R
Color Selection	Ctrl+Alt+C
Undo Last	Ctrl+Z

Edit Menu grid commands, copy, paste, cut, clear, filldown, fillright, color and undo.

The spreadsheet grids have many editing commands that can help when editing. To copy, cut, fillright, filleft, you must first select some cells to be copied.

Then you can use the menu or use the keyboard combinations to do the copy or fillright. The fillright+ command increments the text or number by counting the fill. If you filldown+ and the top column selected text is "Sensor1". The filldown+ will fill in Sensor2, Sensor3, Sensor4, etc. The fillright+ does the same.

If the top column is "1", then filldown+ will fill in 2,3,4,5, etc. This is handy when you need to increment the fill results.

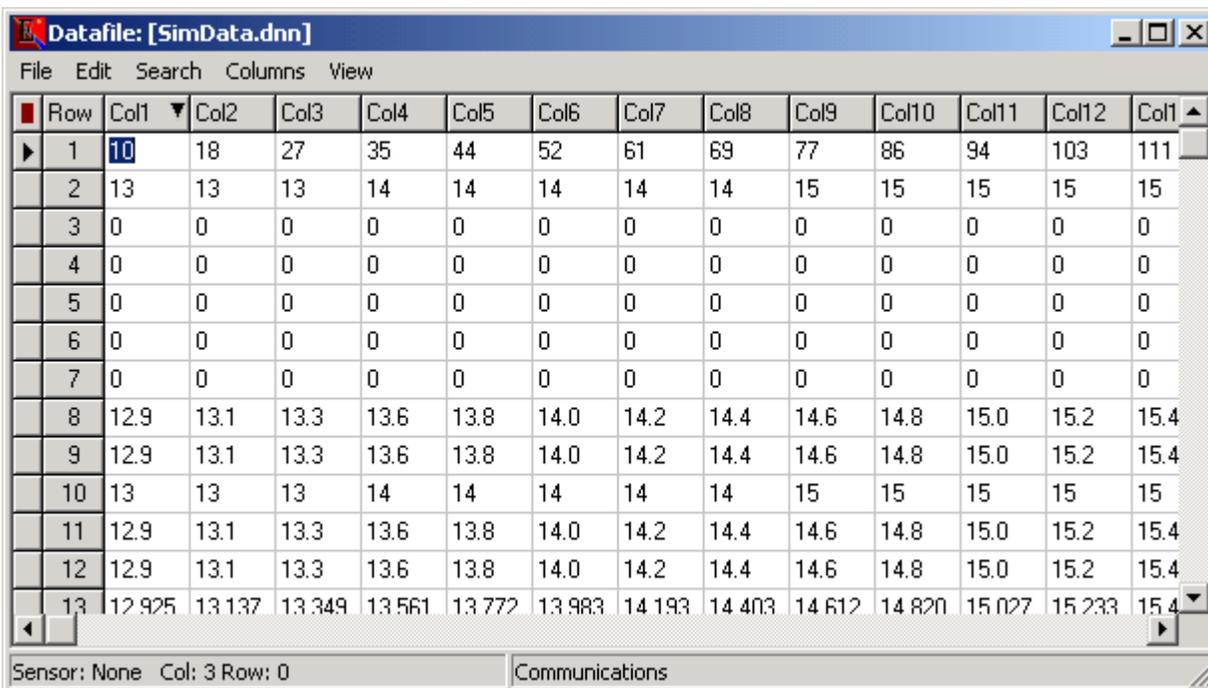
There one level of undo. If you filldown and overwrite some data you didn't want to overwrite, you can do an undo to go back to the original data. The undo will be remembered until you do another paste or fill command.

The copy command is very useful. If you configure a formula and its variables for a certain type of sensor, select and copy those cells. Then scroll down to the other sensors, put the cursor in the first cell and paste the copy into the grid.

You can also do a **find and replace** from the search menu. Select a column and then do a find or replace command. You can replace all if necessary. This operation doesn't have an undo. The find and replace is case sensitive.

Grid Editing and Select Modes

There are 2 editing modes in the grid. One mode is editing the data, the other mode is selecting the data. To select multiple cells, move the cursor to the left edge of any cell until the cursor changes. Click the cell to go into the select cell mode. Then click and drag to select multiple cells.



Selecting multiple cells in the simulate grids. Arrow changes to a black tail and black outline at the left of the cell.

Select a cell and start typing or just click when the arrow is normal. The grid will go back to the edit mode. Only one cell can be edited in the edit mode.

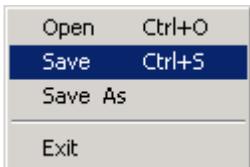
Events Reference

Row	Col1	Col2	Col3	Col4	Col5	Col6	Col7	Col8	Col9	Col10	Col11	Col12	Col13
1	10	18	27	35	44	52	61	69	77	86	94	103	111
2	13	13	13	14	14	14	14	14	15	15	15	15	15
3	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0
8	12.9	13.1	13.3	13.6	13.8	14.0	14.2	14.4	14.6	14.8	15.0	15.2	15.4
9	12.9	13.1	13.3	13.6	13.8	14.0	14.2	14.4	14.6	14.8	15.0	15.2	15.4
10	13	13	13	14	14	14	14	14	15	15	15	15	15
11	12.9	13.1	13.3	13.6	13.8	14.0	14.2	14.4	14.6	14.8	15.0	15.2	15.4
12	12.9	13.1	13.3	13.6	13.8	14.0	14.2	14.4	14.6	14.8	15.0	15.2	15.4
13	12.925	13.137	13.349	13.561	13.772	13.983	14.193	14.403	14.612	14.820	15.027	15.233	15.440

Grid is now in editing mode. Arrow is standard. Type in your changes or copy the selected cell.

Saving Your Grid Work

The Designer Form and the Data Form have separate save commands. You could build several different data sets for one project and want to save the data sets separately. Be sure to save or Save As when you are finished with your work. Do it for both forms.



Use Save As when you first save, or when you want to make a copy of your work.

Data Form

The data form is the end result of the designer form. The designer form sets the number of columns and rows. You can edit the data and use the standard cut, copy, fillright, filldown, and paste commands in this grid. You can also select an column or row, copy and paste it multiple time. Be sure to edit the time row at the top to increase the time. Or just run the time run button in the Designer Form to rebuild the Time Row.

Each column in the Data Form is one set of data to be transmitted into the receive grid.

Row	Col1	Col2	Col3	Col4	Col5	Col6	Col7	Col8	Col9	Col10	Col11	Col12
1	10	18	27	35	44	52	61	69	77	86	94	103
2	13	13	13	14	14	14	14	14	15	15	15	15
3	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0
8	12.9	13.1	13.3	13.6	13.8	14.0	14.2	14.4	14.6	14.8	15.0	15.2
9	12.9	13.1	13.3	13.6	13.8	14.0	14.2	14.4	14.6	14.8	15.0	15.2
10	13	13	13	14	14	14	14	14	15	15	15	15
11	12.9	13.1	13.3	13.6	13.8	14.0	14.2	14.4	14.6	14.8	15.0	15.2
12	12.9	13.1	13.3	13.6	13.8	14.0	14.2	14.4	14.6	14.8	15.0	15.2
13	12.925	13.137	13.349	13.561	13.772	13.983	14.193	14.403	14.612	14.820	15.027	15.233

The Data Form data. Data is sent column by column into EVENTS receive grid.

Be sure to save the data when you are finished editing it. Saving the data, saves the grid column and row information as well as the data.

Events Reference

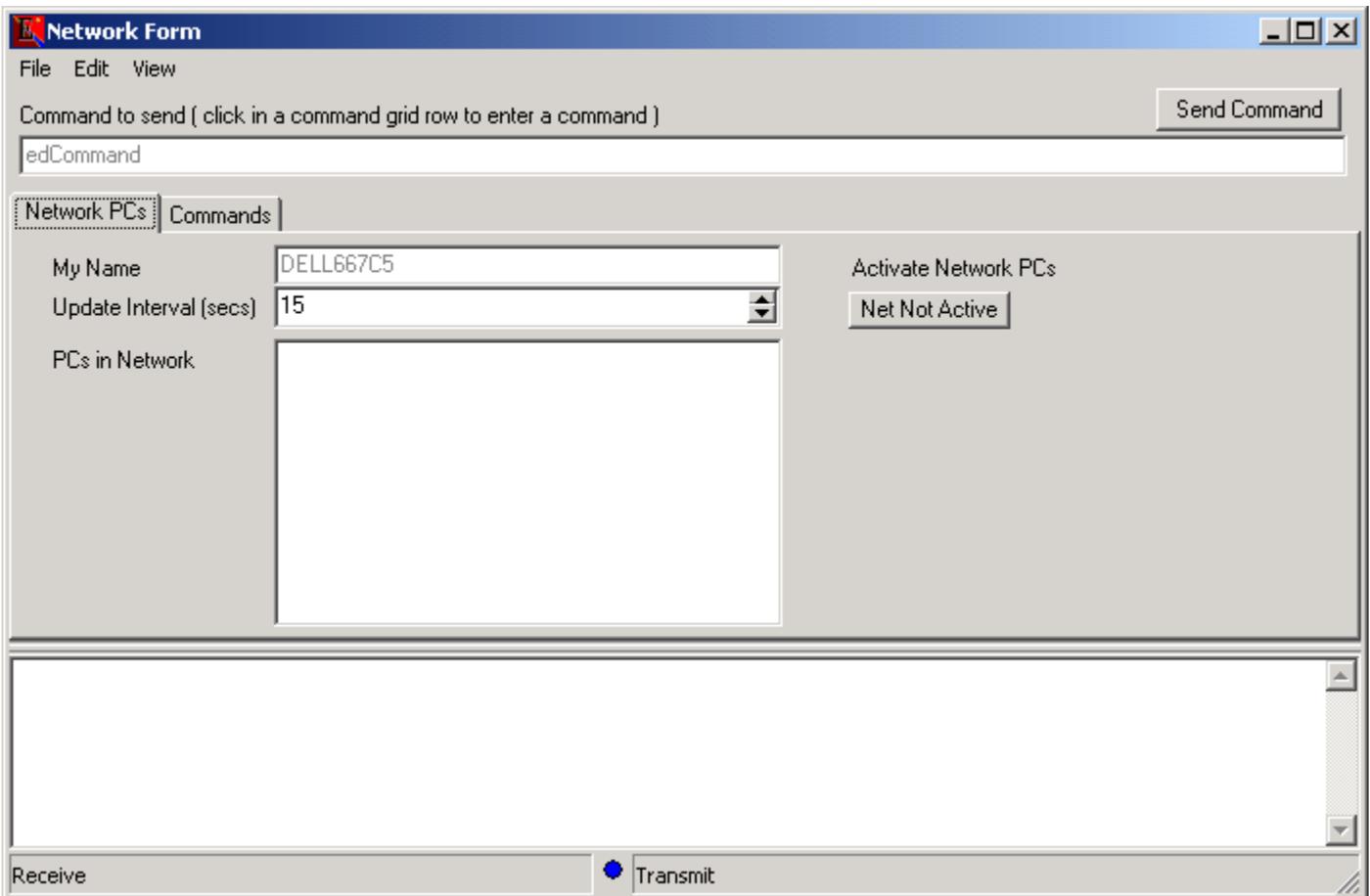
8.4. Networking

Networking is available in every EVENTS product. EVENTS has to be registered for the networking to be active. You can go to View | Network from the main form to display the Network Form.

EVENTS networking can be used on Microsoft Networks using TCP/IP, NetBEUI or IPX/SPX protocols. EVENTS uses a secure messaging method that works along with any of the Microsoft supported protocols. We have a program call Lantest that can be used to see if EVENTS will communicate over your network. Lantest is available on our web site: www.rope.com.

The networking is very easy to set up and use. The first step is to press the Net Not Active Button. This will activate the network and allow EVENTS to listen for messages from other computers running EVENTS on the network.

If Networking is active on another computer, this computer should display the names of the other computers in the PC's in Network list box.

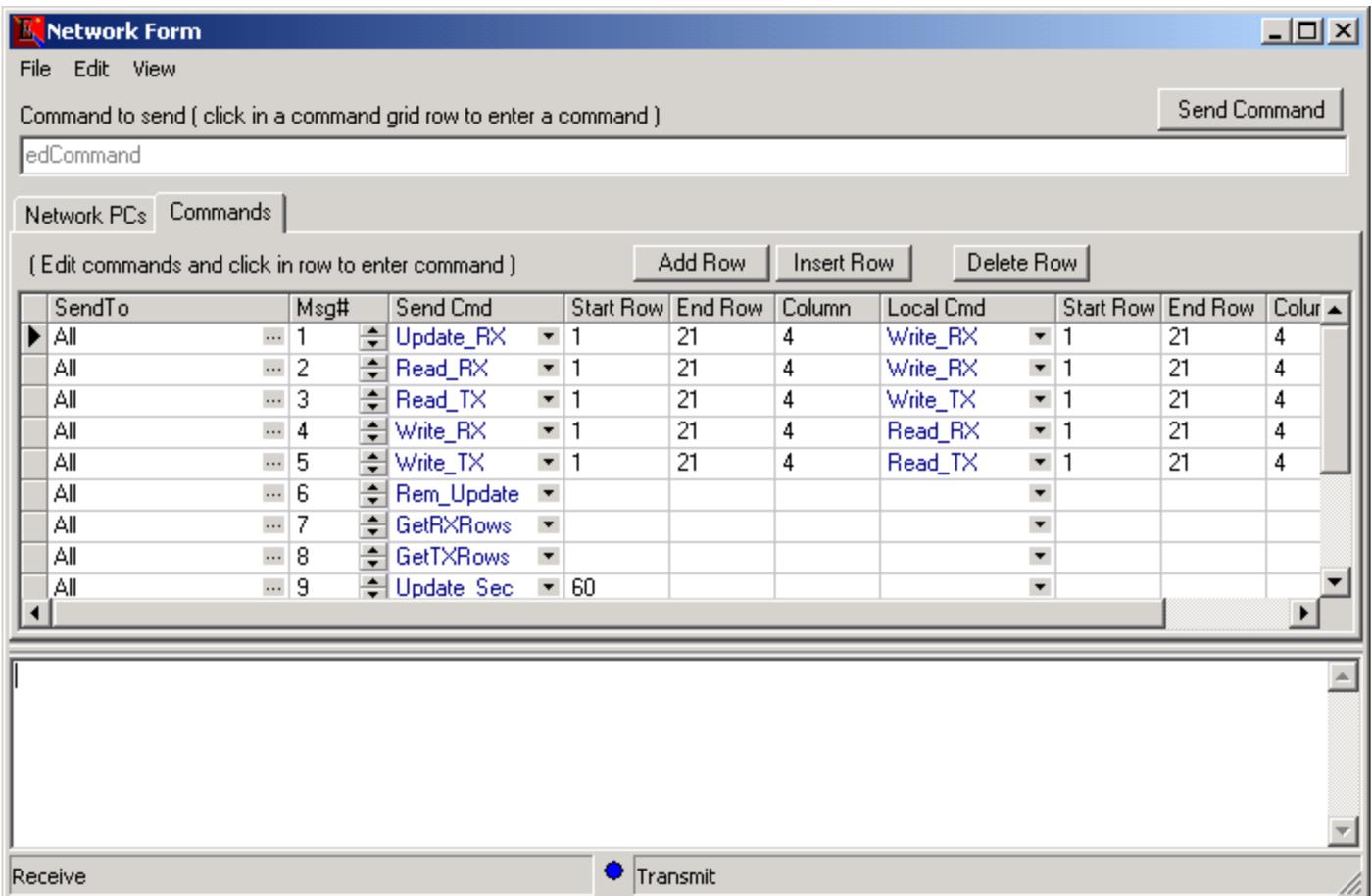


Network PCs tab shows My Name, Update Interval, PCs in Network and a button to activate the network.

When the Net Not Active button is pushed, a network link is created and a message is sent out to all computers on the network. The message tells other computers the name of the new computer in the network.

If another computer running EVENTS has its networking enabled and its name does not show up in the list box, try sending a command to all computers. Each command has a response. The response will log the computer's name in the list box when a reply is received.

Events Reference



Command tab shows the available commands that can be sent to another computer.

Network Commands

The send command structure is as follows:

Send To Name | From Name | Message Number | Command | Start Row | End Row | Column

When a response is received, the reply includes the message number. If the row with the message number has a local command, that command will be executed.

You could send a command "Read_RX" starting at row 1, ending at row 21, column 4. This will read the other computer's Modbus receive column 4, row 1 to 21. The data is sent back as a pipe delimited string (i.e. 0|1.2|3.4|0.0|). If a local command is assigned, "Write_RX", row1, row21, column4, the data will be written into your Modbus receive data grid at the specified rows and column.

The network generally works by sending a command and receiving a response. The available commands are shown in the command grid, Send Cmd column. When a command is sent and a response is received, EVENTS looks for message number Local Command. The local command tells EVENTS what to do with the received data.

This method of reading and writing data allows one computer to be updated by more than one computer. One read-write could be for the first 21 rows and another read-write could be for 21 to 100 rows.

The data received will be treated the same as data received by a master RTU. You can build alarms, a database, update screens and print reports based on the network data.

Update Command

The "Update_RX" command eliminates the need for one computer to send a command and wait for a response. The update command is sent once to a computer and the receiving computer stores the update command. The update command is used to read the Modbus receive array on a time basis and send back the data to the requesting computer. The time interval is shown in the Network PCs tab. You can set the update computer's time interval by sending the command Update_Sec | 30. The Start Row is used as the update time interval.

Updating Computer Set Points

Another important benefit of the update command is the updating of transmit set points and commands on other computers. Normally transmit set points are sent only to the master RTU. Those set point changes are not sent out to other computers unless an update command has been received.

Set point changes are done by editing a set point and pressing the enter key or by tabbing out of the set point edit box. Other commands include HOA changes, On-Off button changes, checkbox changes, and poll button changes. These commands are written locally to the Modbus transmit array and then sent to a master RTU (if connected to a master RTU). Now those commands are written to the transmit array and also transmitted over the network to update other computer's transmit array and screens with the new set point or new command. The receive computer will also update the master RTU with the new set point or command.

Sending Commands Over the Network

To send a command, you first configure a command in the command grid. Standard commands are already set up. Click on a row in the command grid and that command will be entered into the command edit box. Now click the send

Events Reference

command button. If the command requests data, the reply will be received with the data shown in the lower memo box.

Note: Replies may overwrite your command before you send it. The command edit box is used to show received commands and commands that you are sending.

Starting Your Network For the First Time

If the network communications has not been set up previously, you should do the following. We are assuming you are running the same project on both computers. The receive and transmit grids are the same on both computers.

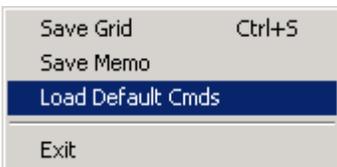
1. Click the Net Not Active Button to activate your network.
2. Click on the first column's ellipse button. Select the computer you want to receive updates from. Select the send to computer for the update command row and GetRXRows command.
3. Click on the GetRXRows command and press the Send Command Button. You will receive the number of rows on the other computer.
4. Click on the first column's ellipse button. Select the computer you want to receive updates from. Select the send to computer for the update command row.
5. Modify your update command End Row to show the number of receive rows.
6. Modify your local command End Row to show the number of receive rows. This will write the received data into your Modbus receive grid.
7. Click in the Update_RX command row and press the Send Command Button.
8. The receiving computer will store your update command and begin sending the requested data.

Network Menu Items

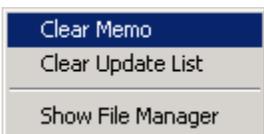
Network commands are saved in your project folder called LanGrid.csv. If these setting are missing or gets corrupted, you can load default commands by selecting the File | Load Default Cmds. After you have modified your command grid, you can save it by selecting File | Save Grid. You can also save the bottom memo to a file by selecting File | Save Memo.

The bottom memo shows the replies of commands sent. This memo is cleared when it reaches 30K. It starts over at that time. You can also clear it by selecting Edit | Clear Memo.

If your computer is updating another computer it will have one or more update command stored. You can view the update commands by selecting the View Menu: View | Show Update Cmds. If you want to clear these commands you can select Edit | Clear Update List. Computers on the network will have to resend the update commands if this list is cleared.



File menu items



Edit menu items

The show file manager runs the Window's Explorer Program. This is basically a shortcut for running this program.

8.5. Alert Communications

Edit menu

Events Reference

Edit Sensors	F9
Copy Cells	Ctrl+C
Paste Cells	Ctrl+V
Fill Down	Ctrl+D
Fill Right	Ctrl+R
Build All	Ctrl+B
Build Files	
Build Alarms	
Build Status	
Build Communications	
Undo	Ctrl+Z

View menu

Communications	
Files/Alarms	
Network	
Alarms	Ctrl+A

Communications Form

ALERT COMMUNICATIONS:

Com#	ID#	Name	RawDat	OldValue	DateTime	Index
Com1	231	Level1				1
Com1	232	Level2				2
Com1	233	Level3				3
Com1	234	Level4				4

Status ● Com1 is closed

ALERT communications window: memo shows any received ALERT data

When EVENTS starts, the communications program also starts. If the communications was previously opened, the ALERT driver tries to open the communications port, and start the data receive. If the communications port is not opened, you can start it from the *Set Comm | Select Com Port or Open Com Port* menu items.

Set ComPort
Open Comport
Interval
Show All
Clear Memo

Edit menu items

EDIT | CLEAR MEMO

This command clears the memo so new data can be added to the memo pad.

EDIT | INTERVAL

The port interval is normally set from 1000 milliseconds or (1 second). This is the speed the serial port will be updated.

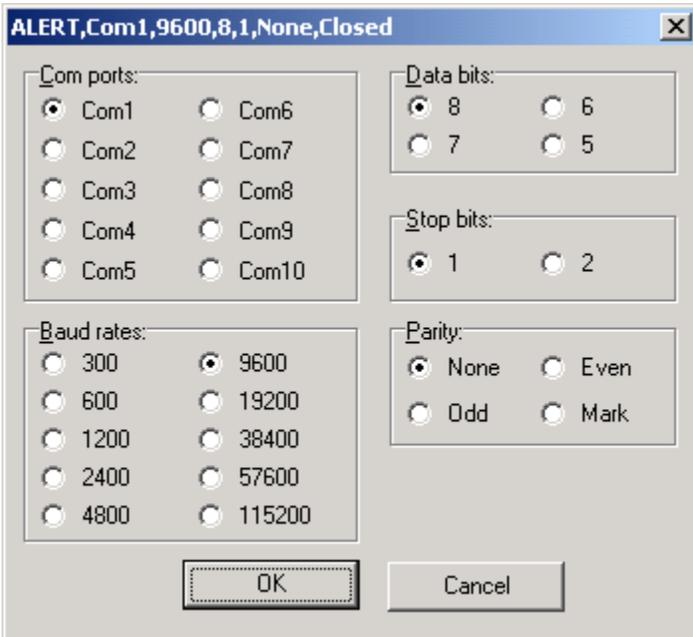
EDIT | CLOSE COMPORT

EDIT | OPEN COMPORT

You can close or open the communications port at any time with these commands. The lower communications dot will become red when the comport is closed.

Events Reference

EDIT | SET COMPORT



Communication Port Setting defaults

When you select the Edit | Select Comport menu, a dialog box will be shown, listing the communication parameters. Make your selections and press OK. Pressing OK tries to open the selected port. The decoder is normally configured for 9600 baud, 8 data bits, 1 stop bit, and no parity.

There are four steps that need to be done to start the communications.

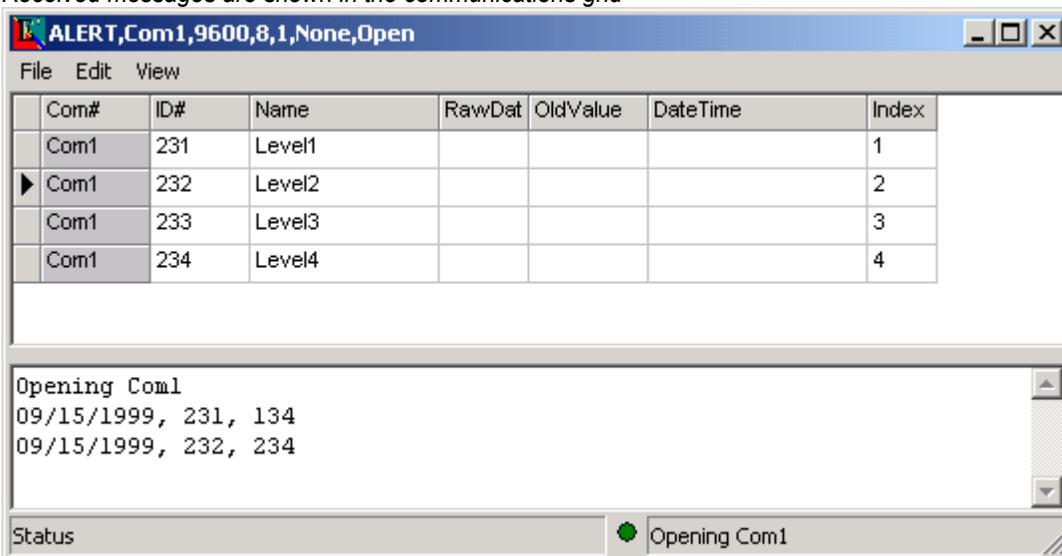
- Connect your serial cable from the computer to the receiver / decoder.
- Configure your port for 300 to 9600 baud, 8 bits, 1 stop bit, and no parity.
- Open the serial port from the Set Comm menu.

STATUS DISPLAY (1 DOT at the bottom of the communications program)

The program will display the status of the communications port and if you are receiving any data from ALERT sensors. If everything is running properly, the communication dot will be flashing between white and green. If no ALERT addresses have been assigned, then the top grid will not show any updates. At least one sensor needs to be assigned for the communications to work properly. A red dot indicates the port is closed or not operating properly.

ALERT MESSAGES

Received messages are shown in the communications grid



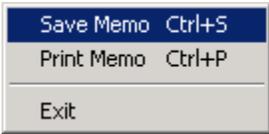
Note: You can define the same sensor ID# to multiple sensors if required. This is done when one sensor is used as a status sensor. Each bit would indicate a different sensor. The names will need to be unique for each ALERT sensor assigned.

MEMO

The memo at the bottom of the communications form shows all data being received by the decoder. If you double click on one of the grid cells, the data from that cell will be entered in the memo. You can look at the older data from a sensor by double clicking on the old value cell. You can see roughly analysis the raw data this way.

Events Reference

If the memo fills up (30K), it will write a file called "memo.txt" to the hard disk. This is for reference only.



File Menu Options

FILE | SAVE MEMO CTRL+S

Save the memo to disk. A dialog box will be shown asking for a file name and directory.

FILE | PRINT MEMO

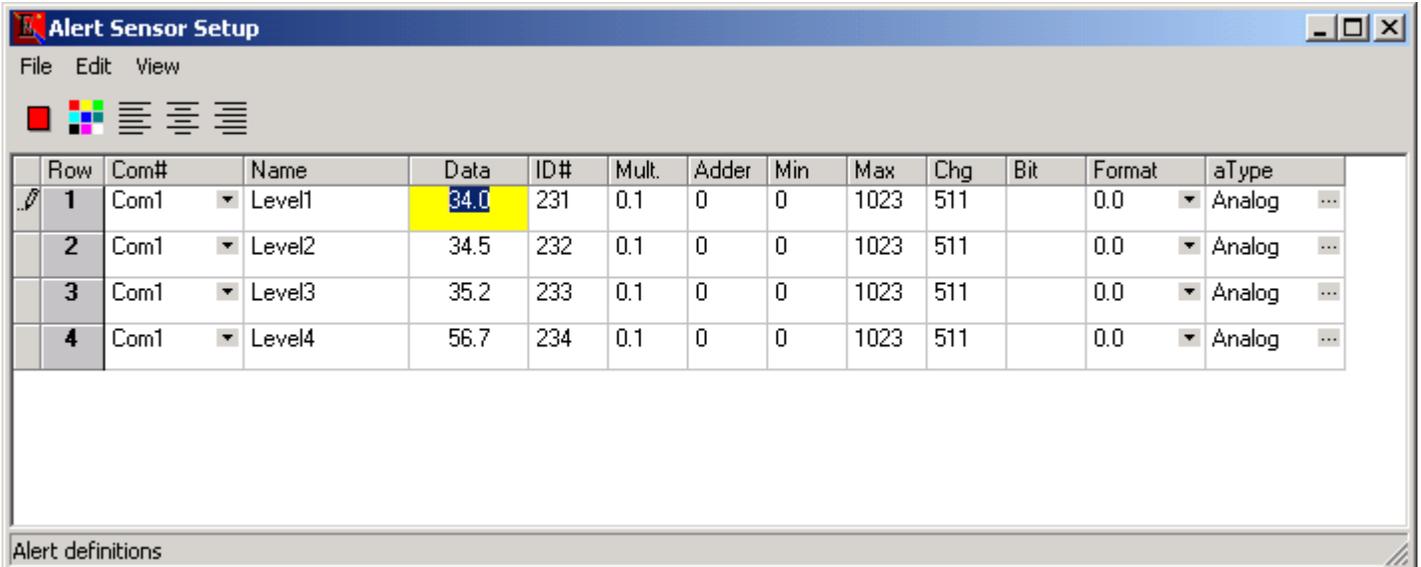
The print memo command sends the memo file directly to the printer.

FILE | EXIT

The exit command hides the communications window. The communication window only closes when EVENTS is closed.

8.6. Alert Setup

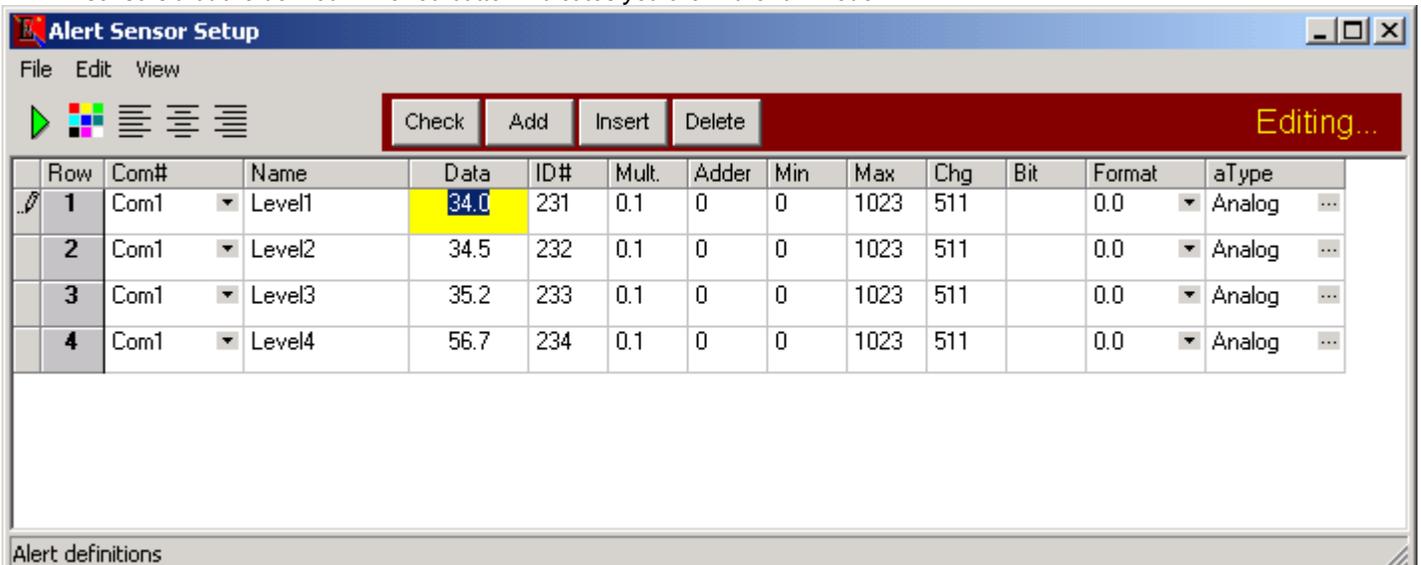
Adding sensor to your ALERT setup.



Go into the edit mode by clicking on the red button.

The red button changes to a green arrow and with new buttons and maroon panel.

ALERT sensors that are defined. The red button indicates you are in the run mode.



Edit Mode: The multiplier, adder, etc. can be entered directly or you can use predefined sensor types by clicking on the Type button (last cell).

Events Reference

Com#: This comport is selected for the ALERT communications. If this incorrect, open the communications screen and change the port directly. You can also edit the comport values here and then rebuild the communications by selecting the Edit | Build Communications.

Name: The name is one of the most important entries. The display components and other processes in the files and alarms form use the sensor name. Be sure to have unique names for each sensor.

Data: The program receives raw data, makes a calculation, does error checking based on the minimum, maximum and change value, and then enters data in this form. If the data is not valid or fails one of the checks, the communications program will show which error stopped the value from being updated.

The data shown is in engineering units. The display components use this data when displaying data on your forms.

ID#: The ID# is the ALERT sensor number (1 to 8191). Sensors with numbers 1 through 99 are decoded in ASCII and numbers 100 through 8191 are decoded in a binary format.

Multiplier: Engineering unit calculation: Data = Multiplier x Raw + Adder.

Adder: Engineering unit calculation: Data = Multiplier x Raw + Adder.

Minimum: Error checking: minimum acceptable value.

Maximum: Error checking: maximum acceptable value.

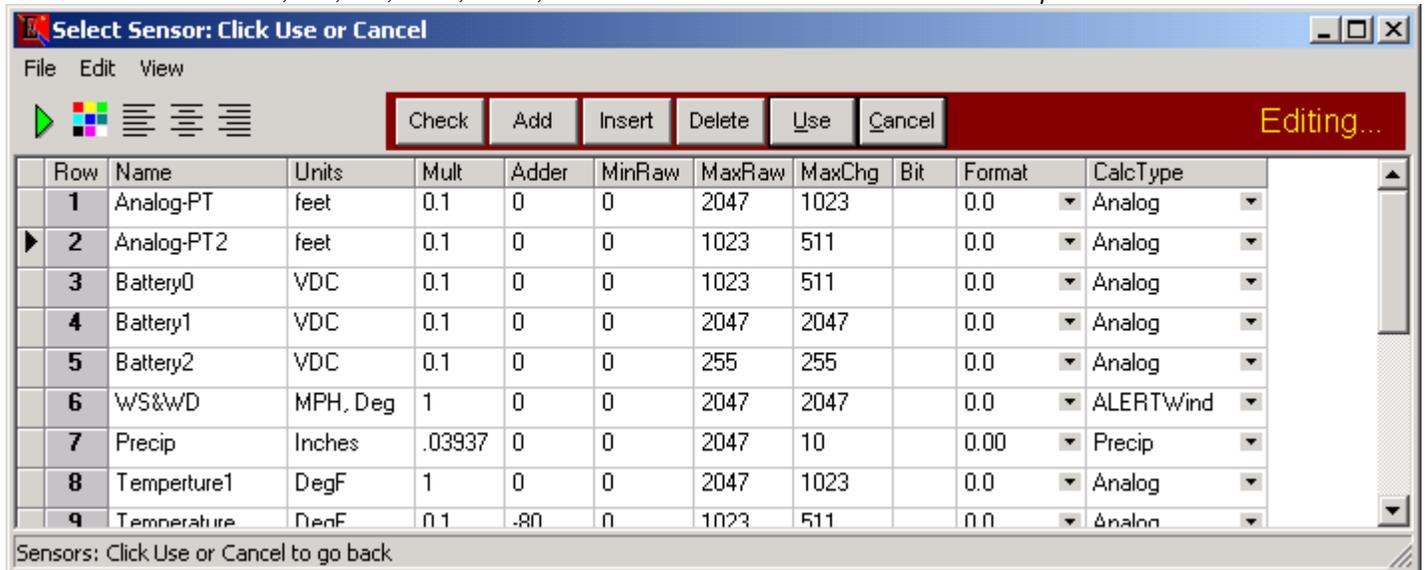
Change: Error checking: maximum amount of raw value change.

Bit: Status bit used for data value received. Data shows either a 1 or 0 for status sensors.

Format: Text format for decimal places. 0.00 would show data in hundreds, 0.0 shows tenths.

Type: ALERT formats: analog, status, precip, ALERTWind, UpDown. The format determines what type of error checking is done on the sensor. Precipitation sensors check for rollover, updown sensors check for rollover and rollback, alertwind sensor values are divided into wind run, wind speed, and direction. Status sensors check to see if the assigned bit is on or off. Analog sensors have standard max, min and change error checking.

ALERT Sensor Definitions, add, edit, insert, delete, and select a sensor for use in the ALERT Setup Form.



Predefined ALERT sensors, select the sensor row and click the Use Button to select.

The values in the multiplier, adder, minraw, maxraw, maxchg, bit, format and calctype are defined above. The selected row values are used in the Alert setup form if the use button is clicked.

8.7. Menu Items

The following items are listed in order as they are seen within the program (from the top of the main window to the bottom).

Title Bar

Program Icon (Icon at top left of EVENTS program)

Caption: EVENTS Unregistered or EVENTS

If a child window is maximized then caption reads: EVENTS - [Form Name]

Minimize Button, Maximize Button, Close Button

If you click on the program icon a standard Windows menu is displayed. This menu item includes standard window command:

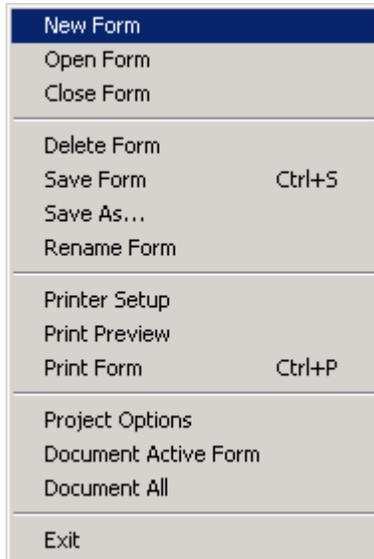
Restore, Move, Size, Minimize, Maximize and Close.

Menu Items

Events Reference

The menu items allow you to view different forms and make changes to your program. Buttons on the toolbar duplicates some of the menu items. If you like using the keyboard, you can press the **Alt** key and the underlined letter to access a menu item.

File Menu



New Form

The New Form menu item creates a new form. This item is enabled only if the current security level allows it. Once a form is created it becomes part of the application until it is deleted.

Note1: When a form is created the application names it: Form1.ffr. You should rename the form by clicking on the File | Rename Form. Enter your new form name and click OK. When the application is closed, the form will be saved with this name. Save the current form with the selecting the Save Form menu item or using the key command Ctrl S.

Note2: You can also save the form by doing a File | SaveAs. This saves the form with the new name and doesn't change the original form. To duplicate forms, use the SaveAs command.

Open Form

The Open Form menu item opens a form file (*.ffr). If the file is already opened then it open a copy of the form. You can open forms from other projects into your application. Be sure to rename the form if your form is a copy of another form or if the form name is the same as another form in your project.

The opened form becomes part of the project when saved or when the application is closed.

Close Form

The Close Form menu item closes the active child form and removes it from your project. It does not delete it from the project folder. You will be prompted that this form will be closed from the project. Select yes if you really want to close it from the project.

Delete Form

The Delete Form menu item deletes the form from the project and also deletes the form file from the project directory. Use the delete command if you want to delete this file from your project and from the hard disk.

Save Form

The Save Form menu item saves the current form to disk, creating a .ffr file. The form name is the form's caption or title. You can use the rename form command at any time to rename the current form to a more meaningful name. Use keyboard command "Ctrl S" to save at any time.

Save As

The Save As menu item saves the current form as a new form.ffr file. Use the Save As form command when you want to make a duplicate of a form. This is useful if many of your sites are the same. You can then open the new form into your project for editing. You can open any existing form again by using the open form command. It makes a copy for you and opens it in your project.

Rename Form

The Rename Form menu item renames the current form and its corresponding ".ffr" file.

When a new form is created it is named Form1.ffr. You can rename the form to a more meaningful name by using the rename command. None of the components are changed or checked, since it is using an existing form.

Printer Setup

The Printer Setup menu item allows you to the select and configure the printer for this application.

Print Preview

The Print Preview menu item pops up a print preview screen to show the form to be printed. You can cancel the print job or select Print Form.

Events Reference

Print Form

The Print Form command is used to print the entire active form. If you only want a portion of the form you can resize the form first to show only the items you want to print and then select print form. Print form will print the form as soon as you select it.

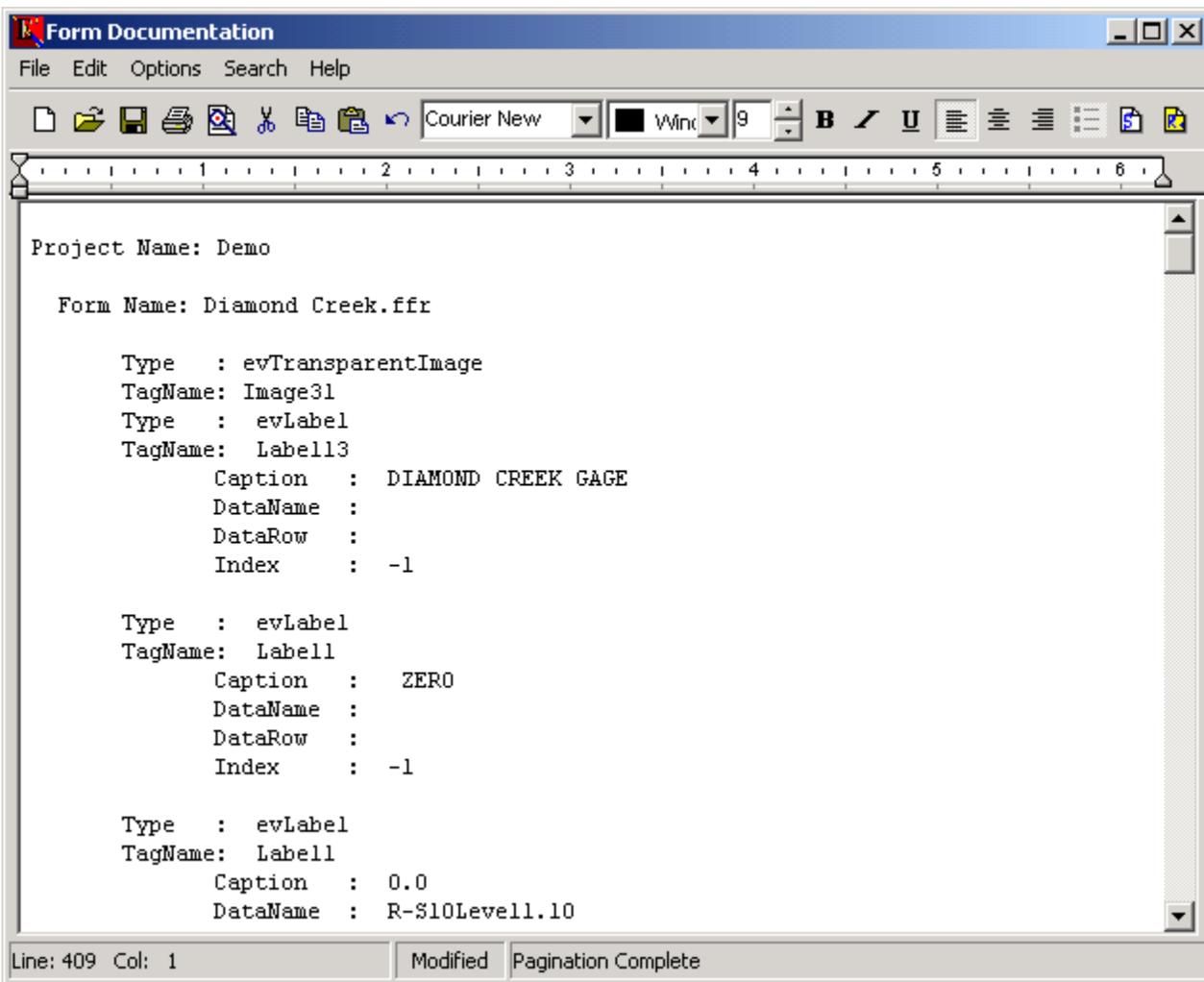
Note: Be sure to check your default printer if you are using more than one printer. Use the printer setup command to do this.

Project Options

EVENTS loads the last project opened when started. A project is a group of screens, and setup files stored in a project folder. You can open other projects from this menu item as well as back up your existing project (recommended). See the projects section for a complete description.

Document Active Form

Document Active Form loads the report form with a list of the project name, and the active form with all components. Important component's properties are shown. Use this menu command to check your forms and to keep a record of your forms. The report can be saved or printed.



Form documentation

Document All

The Document All menu command loops through all the forms and documents each screen or form. The output is presented as a report. You can save it or print it.

Exit Command

The Exit menu item closes the application and automatically saves the child forms and components. You do not have to save the forms individually. The program saves it for you. The exit command also writes to the EVENTS.ini file and the Project.ini file. These files are used to reopen the project as you left it.

Edit menu

Events Reference



Set Tab Order

You can set the tab order of any window component that accepts tabs. If your application has Edit boxes or Checkboxes, you can set the tab order for these components.

The Tabs are set from the Left 1st, and then Top next. If the components have the same Left value then the Top Value is evaluated. Columns of Edit components will be ordered from top down.

Write Form Set Points

This option goes through each form and finds all control edit box set points, check boxes, HOA switches, on-off buttons and writes their current state or set point to the Modbus transmit array. You will be asked if you want to transmit these set points to the master RTU.

You may want to check the values entered into the transmit array before sending the data to the master RTU. After checking the transmit values, use the Edit | Send All command to send your set points the master RTU.

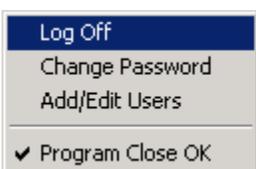
ALARMS MENU



Alarms menu items

See the ALARMS section tab for setting and viewing alarms.

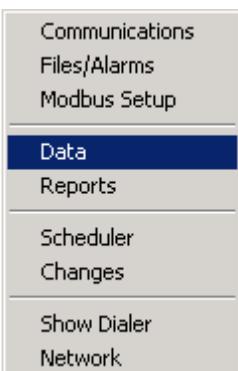
SECURITY MENU



Security menu items

See the SECURITY tab for information on changing and viewing passwords. You can also select if the program can be closed or not closed. If program closed is not checked then you will not be able to close Events until this item is checked.

VIEW MENU



View menu items

The view menu provides access to many important windows. This menu will probably be used more than any other menu item. The communication windows, Alert setup, Modbus setup, Files/Alarms, Data, Changes, Reports, Scheduler, and Network forms can be selected from here.

Events Reference

Many of these topics are discuss in other sections. Select the manual tab for the selection needed.

Standard Window Commands

Window menu items



Window Cascade

Window | Cascade performs the standards Windows cascading function. The forms will be cascaded downward and to the right.

Window Tile

Window | Tile performs the standard windows Tile function. This arranges the windows side by side in the main window.

Cycle

Window | Cycle allows you to select windows to cycle to the front at a selected time interval. You may want to cycle 2 or 3 forms every 10 seconds. Just select the forms you want in the cycle list and the cycle time. Select the menu item again to disable this feature.

Window Arrange

Window | Arrange Icons stacks all of the minimized windows in the bottom left corner of the main window.

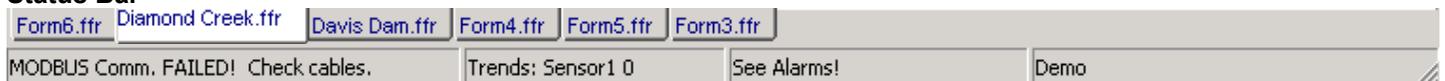
Window Maximize

Window | Maximize All maximizes all of the forms in the project.

Child Forms

The forms shown below the menu and tool bar are MDI Child Windows. These are your real time screens with display components. Forms, screens, windows, displays are all MDI child windows.

Status Bar



Status bar and form tabs.

Panel 1: Display system status messages.

Panel 2: Displays the current user who is logged on.

Panel 3: Show alarm status messages.

Panel 4: Current project name.

Events Reference

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