SuperSystems
incorporated

DR (DIGITAL RECORDER)

OPERATIONS MANUAL

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Product Overview

Product Description

You'll find all the necessary information related to how to use the product in this manual. The product consists of software and hardware components, which are covered in separate sections of this document.

The Digital Recorder provides the hardware and software needed to meet industry standard digital chart recording.

It is easy to use and addresses the many industrial applications where data logging, trending, and reporting is required. The product is available with three different screen sizes and up to 80 inputs with user-defined inputs for each channel.

The easy-to-use VR Manager provides users with all the necessary tools to generate trend charts from a remote computer. Data is stored on a flash card on the touch screen display where data can be extracted through a network connection OR by removing the flash card and extracting the files to the computer using the VR Manager software. All data can be printed or stored electronically in an un-modifiable format.

Product Specifications

- User defined logging intervals as frequently as one second

- Optically Isolated inputs

- DC Power Supply: +24 VDC, 9 watts max, fused at ¾ A

- Password protected menu options

- Easy calibration

- Web-page enabled real-time view

- ETHERNET, RS485 and RS232 serial communications

- 16-Bit A/D converter

- Redundant data storage

Environmental Specifications

- Storage Temperature → -4° F to 158° F (-20° C to 70° C)

- Ambient operating temperature → 32° F to 131° F (0° C to 55° C)

- Ambient humidity → 5% to 95% relative humidity (non-condensing)

	Degrees F.	
TC Type	Min	Max
B	32	3308
C	32	4208
E	-328	1832
J	-346	2192
K	-328	2502
N	-328	2372
NNM	0	1409
R	-58	3214
S	-58	3214
T	-328	752

Thermocouple range listed by thermocouple

Software Installation

You will find the VR Manager software flash drive that ships with the unit includes all the reporting and data management utilities. Insert the flash drive into a USB slot on your computer and click the setup.exe file. You will be given step-by-step instructions for completing the installation process. See the section *Installing the VR Manager Software* for more details.

Calibration

The Digital Recorder is calibrated prior to shipment, although the calibration process is also available through the touch screen. Instructions for calibration are included in this manual. Super Systems calibrates the Digital Recorder using NIST traceable instruments that are listed on the calibration certificate included with the device. The default calibration is performed using a zero and span routine for the millivolt ranges of: 4-20mA, 0-20mV, 0-40mV, 0 – 80mV, 0-160mV, 0-1000mV. We calibrate all available ranges. Each range that is being used should be calibrated. For a list of suggested mV ranges by thermocouple types, please refer to the *Input Calibration* section of this manual.

Components

The Digital Recorder consists of the Touch Screen Interface, DR Matrix Module ("Module"), and VR Manager Software.

The Module is made up of four user-defined analog inputs per boards. Each input is configurable using the Touch Screen Interface and allows for different math functions to be performed on the input. Each input is fully isolated.

Analog Inputs

The Super Systems, Inc. Part Number 13701 Analog Module contains a group of four channels isolated from the main DC power source. Each input is fully isolated. The board can be connected to thermocouples, voltage sources from 20mV full scale to 1.28 Volts full scale, voltage sources from 0 V full scale to 10 V DC full scale, or 4 – 20 mA current loops.

Thermocouple connections

Thermocouple wires can be connected directly to the terminal blocks. The thermocouple junctions should not be grounded. If they do touch a ground reference, all thermocouples on a board must have a common ground reference. If multiple thermocouples are connected to different ground reference points, the accuracy of all thermocouples on the board cannot be guaranteed to be accurate.

Voltage connections

Voltages from 0 mV to 10 Volts DC can be directly connected to the terminal blocks. When measuring ground-referenced voltages, all references must share a common ground reference. If the voltage sources are connected to different ground reference points, the accuracy of all the voltage sources connected to the board need to be checked for accuracy. Since higher voltages can damage the input board, any voltage input signals, such as a vacuum gauge, must have the input type set to 10 VDC before applying the signal. This will insure that any signal going into the board will be scaled down so it will not damage the input board.

4 – 20 mA. Current Loop connections

There is a dedicated 4-20mA input connection. Use the inputs marked A+/A-.

Setting the DIP switches to Assign Board Numbers

Each input board, whether directly connected in the Digital Recorder or connected through a satellite box, must have a unique address assigned by the DIP switches on each input board. A unique address will ensure that the Digital Recorder will correctly read all of the boards set up. If two or more boards have the same address, multiple errors could occur such as: DR reading data from one board one second, then reading data from another board the next second, no data being read from the DR, etc. *It is important that each board has a unique address*. Each DIP switch has eight switches on it labeled 1-8. These numbers follow a binary numbering system. There is an ON and an OFF position for each switch. OFF = 0 and ON = 1. Each board number can be assigned by setting the appropriate switches to ON. For example, to set a board number to 1, set the "1" switch to ON and the "2", "3", and "4" switches to OFF ((1*1) + (2*0) + (4*0) + (8*0) = 1). To set the board number to 10, set the "1" and "3" switches to OFF and the "2" and "4" switches to ON ((1*0) + (2*1) + (4*0) + (8*1) = 10).
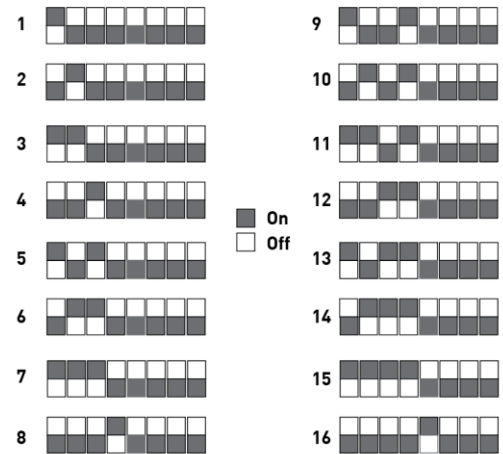
Getting Started

The data logging device and the touch screen have a unique IP address. The communications between the screen and the data logger is performed through the Ethernet ports. Both the screen and data logger require separate and unique fixed IP addresses.

Physical Installation

Mechanical Mounting
The din rail (Allen-Bradley P/N 1492-N22) is mounted to the enclosure panel. Snap the Digital recorder enclosure onto the DIN-rail.

Mounting the Touchscreen Interface

1. There is an adhesive waterproof gasket on the front bezel. Ensure that the waterproof gasket is in place before installing the TPC system in the panel opening.

2. Install the TPC in the panel opening.

3. Retrieve the clamps and long screws from the accessory pack. Hook the clamps the holes located on the four sides of the bezel. Insert screws into every clamp and tighten them to fasten the clamp in place. These screws will push against the mounting panel and secure the unit.

4. The suggested mounting panel thickness is less than 6 mm (0.236 in).

5. The suggested mounting screw torque is 2 KGF-cm (kilogram-force centimeter) or 0.14 ft*lb (foot pound) (*Finger tight + ¼ turn + removable Loctite)*
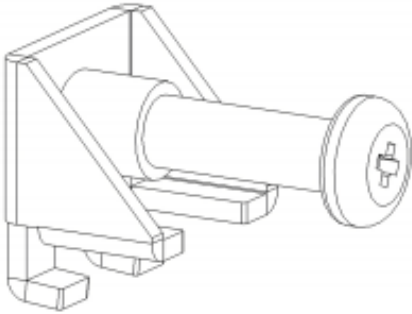
Insert the screws into each clamp and tighten them to fasten the clamp in place.
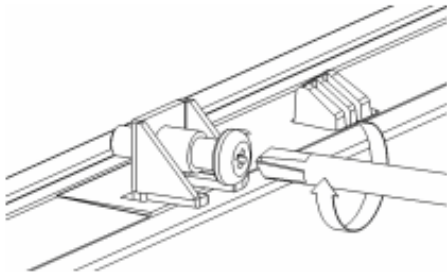
Hook the clamps into the holes and fasten the screws
Torque: 2 kgf-cm
These screws will push the mounting panel and secure the unit.

Wiring
Connect power with 18 or 20 AWG wire and inline fuse holder as shown in **Appendix A: Wiring Diagrams**.
Connect earth ground to the panel connector as shown in **Appendix A: Wiring Diagrams**.

Connecting the Module to the Touch Screen

Every Digital Recorder shipped includes a red Ethernet crossover cable that will connect the Module to the screen. The screen and the Module communicate either through the crossover cable OR using an existing network.

If you are connecting the Digital recorder to your network, you will need a straight-through Ethernet cable (the cable provided is a crossover cable for direct connections to a PC or Touchscreen) to be connected from the Module to an Ethernet hub and the Touch Screen to an Ethernet hub. The cable is plugged into the Module's Ethernet plug and then other end should be plugged into a network hub. The IP address of the Module will be provided with shipment.
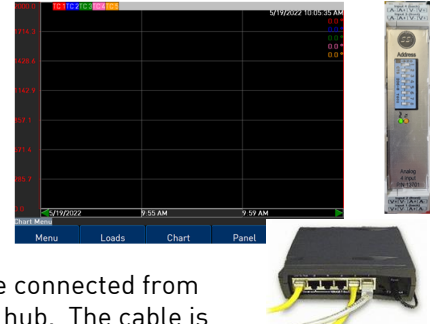
If you are not putting the data logger on the network, you should use the red Ethernet crossover cable that has been provided with the device. Ethernet crossover cables are most often used when connecting two Ethernet computers without a hub. An Ethernet crossover cable has its send and receive wires crossed. When using a hub or switch, this is automatically done for you.

With a crossover cable, you are forming a network between the computer that you are directly plugged into and the touch screen. See **Appendix A: Wiring Diagrams**.

Each screen and Digital Logging device is configured and setup with a fixed IP address. The screen is configured to communicate with a specific device. This is done through the *Configuration → Target DR IP Address* Menu Option.

Change the IP Address of the Module

IMPORTANT NOTICE: If changing the IP address of both the Touch Screen and the Module, the Module must be changed first.

Go to the main menu and log in as "2." Scroll down the options, select "Digital Recorder IP" and tap "View" to display the current IP address. From here, you can change the IP address to the desired settings.

Change the IP Address of the Touch Screen

IMPORTANT NOTICE: If changing the IP address of both the Touch Screen and the Module, the Module must be changed first. See section above for instructions on this procedure. After changing the IP address of the Module, use the touch screen to select "Target DR IP Address" under the "Configuration" menu and set it to the new address of the Module.

It is important to obtain an available IP address and correct Net Mask and Default Gateway from an administrator or IT associate before changing any of the IP settings. In order to change the IP address of the touch screen, the program must be shut down. To do this, scroll down the menu options and select "Exit Program." Then, click on Start Menu → Settings → Network and Dial-up Connections. This will display the Network settings screen. Double-Click on the existing connection to display the properties. To specify an IP address, select the "Specify an IP address" option and fill in the sections for the IP Address, Subnet Mask, and Default Gateway using the on-screen keyboard, which can be started by clicking on the Pen/Paper icon in the lower right corner and then clicking on "Keyboard" from the menu

option. Move the keyboard to a position where you will still be able to see the IP address section and the keyboard at the same time. Highlight the first section of the IP address and enter the IP address. *Note – The cursor will move to the next section once three digits have been entered*. To enter a two or one-digit section of the address, begin the section with zeroes, i.e., **001** instead of **1**. Repeat for the Subnet Mask and Default Gateway.

To have the IP address assigned by the network, select the "Obtain an IP address via DHCP" option. This option will disable the text boxes for entering the IP address, since the IP address will be given by the network. Click on the **OK** or **X** button on the top of the screen to close the screen. *Note – If the IP address of the touch screen is changed, then the corresponding profile in the VR Manager will have to be updated as well*.

If you are not comfortable with this procedure, contact SSi at 513-772-0060 for assistance.

Touch Screen Interface

The DR Series recorder is equipped with a touch screen operator interface, which is used to view the different variables that are being recorded. When the screen is powered up with the 24 VDC supply and connected to the DR series analog input base module, the Main screen appears.

The three options available are **Display, Configuration, and Template.** Clicking on the **Display** option will load the chart.

On the Display screen, there are several variables displayed.
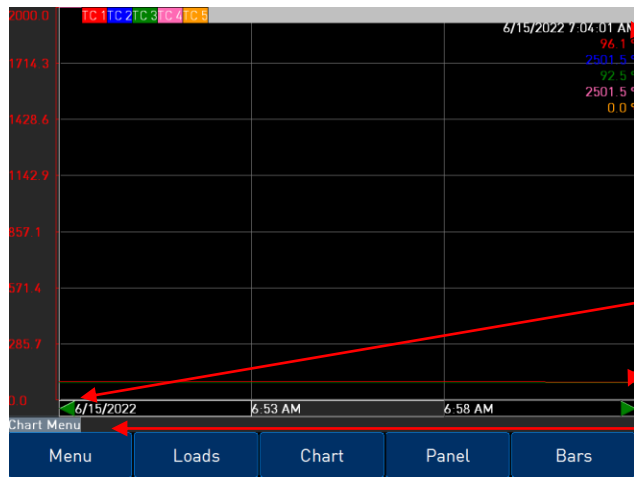
Date/Time – the current date and time in real time or historical mode.

Decimal Values – actual value of trend variable.

Green arrows – Move the displayed information either forward or backward in time.

Chart Menu – More choices for displayed features.

The inputs that appear on the chart can be toggled between being displayed or being left off simply by tapping on the name of the input along the top of the chart. The box with the input number will turn gray.

In this example, TC2 and TC4 have been deselected:
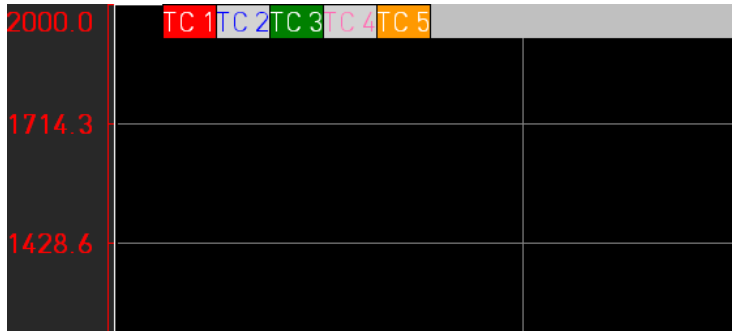
Selecting the Chart Menu provides more options for the display.

Realtime – Choosing this option sets the displayed values to the present date and time.

Zoom – This selection allows you to move your stylus or finger on the screen to a specific point creating a box. The zoom box will also display decimal values for the low and high variables inside the box. It will display the start and end time for the zoom box itself. The zoom feature can be used as often as desired allowing the user to drill down on the variable to show a specific value displayed on the screen.

Note – the Note feature available on DR series recorders allows the operator to add notes in the chart display. Notes can be added using either a stylus or the keyboard displayed on the screen. Choose the Add Note option from the Chart Menu then select keyboard or stylus to add a note. *Note on keyboard functionality – pressing the "caps" button or the "shift" button will display more keys for data entry. Also, the "del" key works more like the "Backspace" key on a regular keyboard – i.e. it will delete the character to the left of the cursor.*

If a note requires editing, select clear to retype or scribe the note or cancel to go back to the chart display.

The note is displayed on the chart menu with a small icon. If the icon is touched it will expand to show the information either scribed or typed onto the recorder.

Jump – This option allows the user to input the date and time to be displayed. The chart will jump to this time.

Statistics – The statistics option is also available on the chart menu. Choosing this option allows the operator to view statistics on any variable displayed on the operator interface. The statistics are based on the screen image displayed whether looking at seven days of data or zoomed in on a few minutes.

The statistics parameters include the trend name, the number of data points available for calculating statistics, the Minimum value, the Maximum value, the Average value, and the standard deviation.

Sample – Pre selected time frame formats change the displayed values on the screen to this duration.

Note: When the sample rate is "15 minutes @ 1 sec", the averagers will not be displayed on the trend chart.

Template Rotation – This option enables the display to cycle through the different templates that have been saved.

Selecting Rotation Settings brings up a list of available options for the display settings. Checking the **Use Main Template** box will keep the display on one template. **Select Main Template** allows the user to decide which template to display permanently if Use Main Template is chosen. Checking the **Use Rotation Settings** box will enable the templates to cycle. The templates to be displayed can be customized by checking or unchecking the box next to each name under **Select Rotation Templates**. The amount of time each template is displayed can be adjusted using the **Rotation Settings** button.

Along the bottom of the Display screen, there are other options for the way the template information is presented.

The **Loads** button helps keep track of Active and Historical load data.

Pressing **+** will bring up the screen for a New Load.
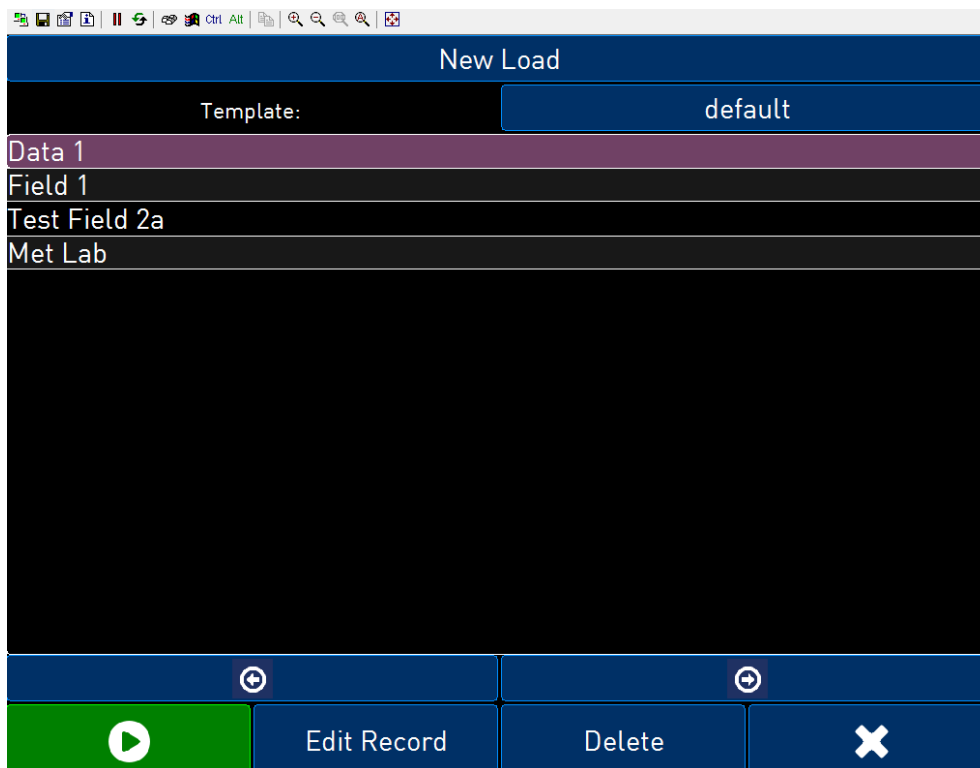
To change the displayed Template, tap the button with the current template name (in the above example, "default"). Then tap the desired template to highlight and tap [✓] to select or [✗] to cancel. The template options can be edited in the [Template Edit](#) section.

Use the and buttons to select the numbered instance of Data. Each can then be assigned the information set in the template (see Template Edit). In the above example, this would be Field 1, Test Field 2a, and Met Lab. To name these fields, tap to highlight, then tap "Edit Record." Enter the information using the on-screen keyboard, and tap "enter" to save or "Esc" to leave without saving.

Tapping "Delete" will delete the displayed information.

Tap to start the load.

Tap to return to the Loads screen.

For information on a current load, tap it in the list to highlight, then tap

Use the and buttons to scroll forward and backward. Tap "End Load" to end the load, or to return to the Loads screen.

By pressing the button on the loads screen, the historical load data will be displayed. Use the date/time buttons at the top of the screen to set a start and end date to display.

The button will display the information that has been stored about each load. The **Search** key allows all historical load data to be searched according to the template fields, or within the Notes. Only notes that have been entered with the keypad can be searched. Notes written the stylus will not be included in searches.

To search historical loads, press the **Search** key.

Highlight the appropriate field and tap . A keypad will display. Press **enter** on the keypad to save information, **delete** to backspace a letter, and **esc** to leave the keypad without saving changes. Once the search key(s) have been entered, press the **Search** button, and a list of matching results will be displayed.

To view information on a load, tap it to highlight, then tap or "Chart."

When finished, tap to return to the Loads screen.

The data on the main screaen can also be displayed in a panel or bar format.

To select the panel view, view touch the **Panel** button on the bottom of the screen. In this mode, decimal values chosen for this template are displayed. Only realtime data can be displayed in the panel view. It is also possible to send a setpoint down to a Client instrument. The Client instrument's setpoint must be included as a trend line. From the panel view screen, touch the Client instrument's setpoint panel and a menu will pop up that will allow the user to send the setpoint down to the instrument. Select this option and enter the new setpoint.

A third choice for viewing variables on the DR operator interface is the Bars view. To select this view touch the **Bars** button on the bottom of the screen. In this mode, the decimal values chosen for this template are displayed as well as a vertical bar chart for each variable with the appropriate scaling for each. Only realtime data can be displayed in the Bars view.

Configuration Menu

The DR recorder is configured through the operator screen. The user must first select the configuration button from the main menu. Then choose the login button located on the lower left of the next screen.

    – Allows the operator to enter a password to enter the configuration of variables. The password for logging in is "2".

    – Allows the operator to view a configuration parameter that has been highlighted.

    – pressing this button returns the operator interface to the previous viewing screen.

Press   , type the password and press enter for configuration.

Status

Status – Includes the DR firmware revision, touch screen software revision, communication status, remaining disk space, estimated storage space remaining, memory usage, last response, and DR Date and Time.

The communication status shows the status of communications from the DR base unit to the operator touch screen. This will show either **OK** or **BAD** if communications have failed between the base and the operator screen. If your screen shows that coms are "Bad," see Connecting the Module to the Touchscreen. If coms are still "Bad," contact SSi at 513.772.0060 for assistance.

Template Edit

Template Edit allows the operator to edit an existing template, or create a new template. A template is the number of variables displayed on one screen. For example, this could be a control, overtemp, or load thermocouple on a batch furnace. Or it could be one thermocouple from eight temper furnaces. There is not a maximum for template selections, but the number of variables displayed on one screen must be a consideration in this process.

Note: on the main Template Edit screen, the buttons along the top of the screen will allow the user to work with different templates, while the buttons in the middle of the screen allow the user to work with specific trend lines in a template.

To create a new template, tap .

To edit based on an existing template, tap then tap to highlight the desired template and tap to select.

The following parameters can be edited:

- **Name** – the name of the input. This should be expressed in the fewest possible characters for clarity when displayed on the DR screen. For example "Control T/C" to "Ctl T/C"

- **Input** - the analog input that is being configured, for example on a DR5 this could be a channel from one through five. The list of options is: TC 1 – TC 40, Averager Group 1 – Averager Group 3, Totalizer 1 – Totalizer 10, and Function Based Timer 1 – Function Based Timer 5. Plus, with version 3.11+ of the screen software, Client 1 Process Variable, Client 1 Setpoint, Client 1 % Output – Client 10 Process Variable, Client 10 Setpoint, Client 10 % Output are available for versions 2.01+ on the DR Module.

- **Min** – the minimum displayed scale value on a chart

- **Max** – the maximum displayed scale value on a chart

- **Expression** – every input requires an expression to be calculated and displayed correctly. For example, an expression for thermocouple inputs would be x *.1. Use the onscreen keyboard to enter an expression.

- **Expression Wizard** – This feature will allow the operator to build an expression using either a custom curve or a regular expression. See the "Note About Expression Wizard" below for more information about this feature.

- **Line Format** – the value displayed on the chart display of the operator interface. A short custom description can be added here. For example, to display one (1) decimal point, enter a value of "#0.0". For carbon values, enter a value of "#0.00" for 2 decimals. This would display a value like "0.81". Entering "#.00" would display a value of ".81".

- **Units** – The type of units used for the trend.

- **Line Width** – a numeric value for the thickness of the trend line. A 1 is a thin line; A higher value = thicker line width.

- **Sample** – a number is entered here to test the expression.

- **Test** – Press the test button to calculate the expression with the value entered in the sample parameter. For example with and expression of x*.1 and a value of 250 entered in the sample parameter will display a 25.0

Note About Expression Wizard

This option will allow the user to select either a common expression, such as "x*.01", a custom curve created with the *Manage Curves* menu option, or to create an expression.

To use a common expression, select the "Common Expressions" menu option and select the desired expression from the drop-down list. Clicking on the ☑ button will set the expression to the trend, but clicking on the ☒ button will not set the expression to the trend.

To use a custom curve, select the "Apply Custom Curve" menu option and select the desired curve from the drop-down list. Clicking on the ☑ button will set the curve to the trend, but clicking on the ☒ button will not set the curve to the trend. If a custom curve is used, the "Expression" line will read "curve: <Custom Curve>" where <Custom Curve> is the name of the curve used.

To create an expression, select the "Create Expression" menu option. Select the input range for the trend from the drop-down list, and then select the scale minimum and maximum. Clicking the ☑ button will set the expression for the trend, but clicking on the ☒ button will not set the expression for the trend. The "Expression" line will contain the new expression, if an expression was created using the wizard. **Note – Expressions can still be entered in the text box manually, as described above**.

Note: on the main Template Edit screen, the buttons along the top of the screen will allow the user to work with different templates, while the buttons in the middle of the screen allow the user to work with specific trend lines in a template.

Communications

Communications allows the operator to change the baud rate, or mode of various communications parameters.

The IP Address, IP Netmask, and the IP Gateway are also displayed on this screen, but they cannot be configured from this screen. This screen also contains the communications status for any Client instruments that have been configured.

Calibration

This menu option allows the operator to calibrate each input on the DR recorder.

Calibrate Analog Inputs

NOTE: Use the Analog Input Type Setup **function to set Analog Input Types prior to calibration.**

Highlight "Calibrate Analog Inputs" from the first Calibration screen and tap ✏. Select the module you want to calibrate from the list and tap ☑.

The main calibration screen includes a diagram of the selected module, checkboxes representing each input, and a Zero/Span selector. The inputs will also display readings if applicable.
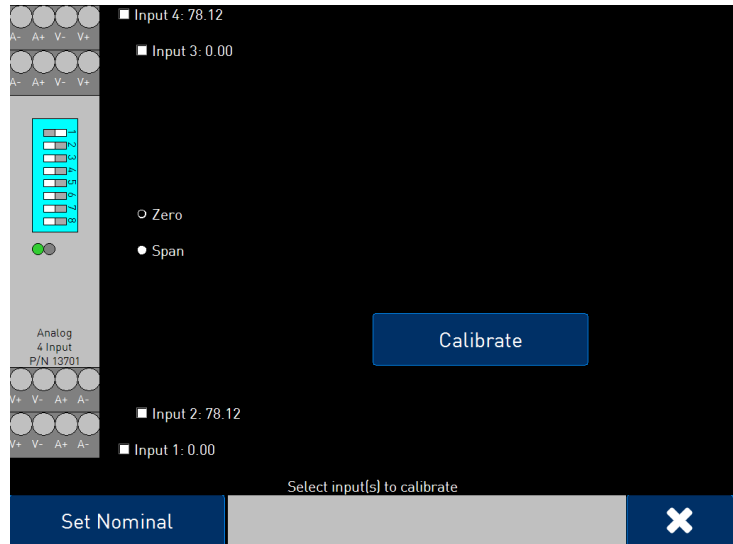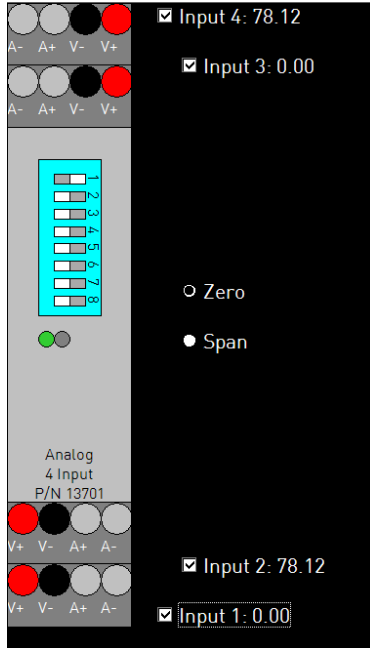
Tapping the input name will select the checkbox. It will also highlight the connections to be used for calibrating the inputs as shown.

NOTE: Only inputs with like ranges can be calibrated simultaneously.

Select the inputs to calibrate. The screen will now direct you to source the appropriate input:

Connect as directed. Make sure that "Zero" is selected (always run Zero Calibration before Span Calibration) and tap "Calibrate" to begin.

The progress bar and countdown will display the progress of the calibration.

When completed, select "Span." The screen will now direct you to source the appropriate span input:

Connect as directed and tap "Calibrate" to begin.

The progress bar and countdown will display the progress of the calibration.

When completed, check that your readings are accurate. If readings seem significantly off, it may be beneficial to use the "Set Nominal" feature. This will restore factory defaults and allow you to attempt a new calibration.

After completing the Analog Input Calibration, perform an analog input trim as follows:

Trim Analog Inputs

NOTE: Use the <u>Analog Input Type Setup</u> **function to set Analog Input Types prior to calibration.**

Highlight "Trim Analog Inputs" from the first Calibration screen and tap ✎. Select the module you want to calibrate from the list and tap ☑.

The main trim screen is similar to the main calibration screen, with the addition of a "Enter Signal" button.

Tapping the input name will select the checkbox. It will also highlight the connections to be used for trimming the inputs as shown (these should already be connected if you just performed a zero/span calibration).

NOTE: Only inputs with like ranges can be trimmed simultaneously.

Select the inputs to trim. Tap "Enter Signal" and select the source you will be inputting. When ready, tap "Calibrate" to begin.

The progress bar and countdown will display the progress of the calibration.

Repeat as needed for all desired inputs.

When completed, check that your readings are accurate If readings seem significantly off, it may be beneficial to use the "Set Nominal" feature.

Target DR IP Address

Target DR IP address is the address of the DR Module attached directly to the DR screen. This address has to match the IP Address setup on the data logging device to display and store data. Changing the IP address on this screen will point the screen to a different module.

Digital Recorder IP

This feature will display the IP address of the instrument that the DR is currently talking to and allow this IP address to be changed. Changing this IP address will change the IP address of the instrument that the DR is currently talking to. The DR will continue talking to the same instrument, however the IP address for that instrument will have changed.

Analog Input Type Setup

Analog Input Type Setup allows the operator to choose from the following parameters for each input of the DR recorder:

Thermocouple Input Types

B	C	E	J	K
N	NNM	R	S	T

D	G	P		

Voltage Input Types

2.5 V	1.25 V	160 mV	80 mV	40 mV
20 mV	625 mV	312.5 mV	25 V	12.5 V

Current Input Types

4-20mA   62 ohms

The user can apply the same settings to any Aux Inputs as well.

The user can also set the input temp units to F or C.

For each input, the user can set the User V/A Scaling to yes or no. V/A scaling is used to interpret a voltage or current input in terms of the sensor connector. For example: If connecting a 0-2 PSI sensor to a 4-20mA input, User V/A scaling would collect data in a 0-2 PSI format.

Analog Input Offsets

Allows the operator to offset the input by a value entered for this parameter. For example if thermocouple input is chosen as an input type, a value of 5 will increase the displayed value 5°. Scaling of the input should be considered when entering an offset value for any input.

Voltage/Current Custom Scaling

Allows the operator to assign Zero and Span settings for each input. Tap to highlight a row, then tap to edit. Enter the desired value using the numeric keypad. Tap "OK" to save and "Esc" to exit without saving.

Synchronize Clocks

Choose this parameter to synchronize the clock in the operator interface with the clock in the analog input base unit of the DR series recorder. This should only be performed when there has been a loss of power or other data logging issues.

Exit the program

Clicking on this menu item will exit the program and display the Windows screen. The user will have to confirm this action.

Full Disk Options

As the disk space on the flash card nears its capacity, the operator will have to decide how to handle the data logging capabilities if there is not enough free space to continue data logging. There are two options: "Overwrite Old Data", or "Stop Datalogging".

The first option, "Overwrite Old Data", will begin to overwrite the oldest files when the free space goes under 10 MB. The software will look for the oldest compressed files and it will begin to delete those files first. The software will delete around 5 MB and then resume normal data logging. Once the disk space gets below 10 MB again, these steps will be repeated.

The second option, "Stop Datalogging", will stop all data logging and inform the user that data logging has stopped. When this option is selected, the software will not log data until the disk space has been cleaned up.

Manage Curves

When the *Manage Curves* screen loads up, the drop-down list will load with all of the custom curves that have been set up, if any.

Clicking on the ⊕ button will allow the operator to add a custom curve.

The operator will have to name the curve before being able to edit a curve. The "Interpolation" drop-down list contains two options: Polynomial or Linear. The "Input Dec." option allows you to enter a value from 0-8. The "Value Units" text box will allow the operator to define the value units for the curve using the onscreen keyboard.

The **Add Plot** button will allow the user to add a plot point to the custom curve.

Clicking on the values will display the numeric keypad, which will allow the user to enter the value Click on the **OK** button to set the values, or click on the **Cancel** button to cancel the process.

The **Edit Plot** button will allow the operator to edit a selected plot point, while the **Delete Plot** button will allow the operator to delete a selected plot point. The operator will have to confirm the delete.

The **Delete** button will delete a selected curve. The operator will have to confirm the delete.

The 💾 button will allow the operator to save the curve as another curve, while the **Save** button will save the changes made to the current curve.

The **X** button at the top of the screen will close the *Manage Curves* screen.

Totalizers

This menu option will allow the user to add or modify up to 20 totalizers. If the totalizer selected is already set up, then the user will be able to see the type, the active inputs, and the date of the last reset, which is where the totalizer is set back to zero. If the totalizer is not already set up, the user will only see the type and active inputs, which will be blank. To select the type, click on the "Type" line and then click the **Edit** button. The type can be one of the following: **Off**, **Seconds**, **Minutes**, or **Hours**. Select the desired type and click on the **OK** button to set the type, or the **Cancel** button to cancel the action.

To select the active inputs, click on the "Active Inputs" line and then click on the **Edit** button. This will display the screen where the user can select the active inputs for the totalizer. To select an input, the user can click on the desired input, which will place a check mark next to the input. The available inputs are Input 1 – Input 48. After selecting the input(s), click on the **OK** button to set the active inputs, or click on the **Cancel** button to cancel the action. *Note: The screen may take a few seconds to update the active inputs and display them*. If the "Type" is set to something other than **Off**, then the date of the last reset will be displayed. If the "Type" is changed from a value to **Off**, then the date of the last reset will become invisible. *Note: The totalizer will be reset every time a value is given for the type*. The "RESET" line will allow the user to force a reset for the totalizer. The user will have to confirm the reset first. To reset a totalizer, click on the "RESET" line and then click on the **Edit** button. A message box will pop up confirming the reset. Click on the **Yes** button to confirm and reset the totalizer, or click on the **No** or **Cancel** button to cancel the action.

Averagers

Averagers allow the user to get an average value from one or more inputs and display that average on the graph.

Select the averager group to work with from the drop-down list at the top of the screen. The options are: **Averager Group 1** – **Averager Group 10**. The first line, "Enabled", lets the user know if the selected averager is enabled or not. Clicking on this line and then clicking on the **Edit** button will allow the user to enable/disable all averager groups at once, instead of doing it one at a time.

Click on the averager group to enable/disable that group. Click on the **OK** button to set the changes, or click on the **Cancel** button to cancel the action. Clicking on the "Active Inputs" line then clicking on the **Edit** button will allow the user to select the active inputs for the averager. The process is identical to selecting the active inputs for a totalizer. Once the active inputs have been set, the "Min|Avg|Max" line will populate with the appropriate data.

Function Based Timers

The function based timers will allow the user to monitor whether a specific input goes above a certain setpoint and for how long the input is over the setpoint. Select the timer to work with from the drop-down list. The options are: **Timer 1** – **Timer 5**.

The function will determine what input to base the timer off of. To select the function, click on the "Function" line and then click on the **Edit** button. This will bring up a list of functions to use. The choices are: **DISABLED** (No timer function), or **Input 1**– **Input 80**. Select the desired option and click on the **OK** button to set the function, or click on the **Cancel** button to cancel the action. *Note: Selecting a different function will reset the timer to zero*.

To set the setpoint, click on the "Setpoint" line and then click on the **Edit** button. This will bring up the numeric keypad so the user can enter the desired setpoint. *Note: Setting a different setpoint will reset the timer to zero*. Once a function and setpoint have been entered, the timer will begin to count if the function's condition exists. The value of the function is listed on the "Value" line, which shows the timer in terms of days, hours, and minutes. The "Last Reset" line will display the most recent date the timer was reset to zero. The "RESET" line will allow the user to force a reset for the timer. The user will have to confirm the reset first. To reset a timer, click on the "RESET" line and then click on the **Edit** button. A message box will pop up confirming the reset. Click on the **Yes** button to confirm and reset the timer, or click on the **No** or **Cancel** button to cancel the action. *Note: Function based timers can be added as an input on a template, but they will not be displayed on the graph*.

Alarm Text

This option will allow the alarm text displayed to be customized. Select the appropriate alarm number, and press the **Edit** button. A keypad will display. Press **enter** on the keypad to save information, **delete** to backspace a letter, and **esc** to leave the keypad without saving changes.

Alarm Setup

This menu option allows the user to set up the alarms for the screen. The user can set up to twelve alarms per screen. Select the alarm to edit from the drop down list at the top of the screen. Once selected, the alarm's settings will be displayed.

The "Type" field will define what type of alarm this alarm will be set up as.

The options are:

Off (No alarm)
Process (High)
Process (Low)
Band (In)
Band (Out)
Deviation (High)
Deviation (Low)

The "Setpoint" field will allow the user to set the setpoint for the alarm. This will bring up the numeric keypad where the user can enter the setpoint.

The "Hysteresis" field will allow the user to set the hysteresis for the alarm. This will bring up the numeric keypad where the user can enter the setpoint.

The "Input Source" field will allow the user to select the input or inputs to focus the alarm on. The process is identical to selecting the active inputs for a totalizer.

The "Delay (sec)" field will allow the user to set the delay time, in seconds, for the alarm. This will bring up the numeric keypad where the user can enter the setpoint.

The "Base" field will allow the user to set the base for the alarm. This will bring up the numeric keypad where the user can enter the setpoint.

The two "State" fields are non-editable, and will display the state of the alarm.

The "Alarm Text" field will allow the user to give a text description that will be displayed on the screen when the alarm is activated. The text of the alarm will also be referenced on the alarms report in the VR Manager.

Purge Data

This menu option will allow the user to delete data in one of four ways. This menu option will be useful if any of the following conditions apply:

- There is a "Low disk space" alarm on the screen
- Communication with the Digital recorder data logger has been down for a few hours and the user needs to get that data from the data logger
- The user believes that data is missing or is incorrect for the past week and would like to synchronize just those hours and/or days
- The user wants to delete all data and completely resynchronize with the Digital recorder data logger

Before, this would have been accomplished by shutting down the screen program and manually deleting the files from the storage card. With this menu option, the user can perform these operations without shutting the screen program down. There is a drop down list on the *Purge Data* screen that will allow the user to select what data is to be deleted.

Recent Data

The first option, **"Recent Data"**, will allow the user to delete the most recent data from the screen. Each option will have a brief description listed on the screen that the user can scroll through and read. These descriptions will also be listed in this manual.

This option is useful if you have had an interruption in communications between the DR screen and the DR module (data logger). After purging recent data and restarting the screen, the screen will download the data from the module during the synchronization procedure. Assuming continuous operation, data from the past 7 days is available for download from the DR module.

It may take up to 1 hour for the screen to download and compress the week of data.

The user will have the option to delete between **0** and **7** days, and **0** and **24** hours from the DR screen. Clicking on the **Purge** button will delete the files. Clicking on the **Cancel** button will cancel the purge and close out the screen. The user will have to confirm the purge.

Clicking on the **Yes** button will begin the file deletion. Clicking on the **No** button will cancel the delete process. Since this process involves deleting data logged data, the user will have a second chance to confirm the deletion.

Clicking on the **Yes** button will begin the file deletion. Clicking on the **No** button will cancel the delete.

Since the DR screen will need to be restarted in order to resynchronize with the data logger, the user will have the option to restart the screen from the *Purge Data* menu.

All Data

The second option, **"All Data"**, will allow users the ability to delete all of the logged data from the DR screen. This option can be used if the user wishes to completely resynchronize the DR screen with the DR data logger.

This option deletes all log data stored on the screen. After rebooting the screen is rebooted, recent data will be downloaded from the DR module (data logger) and compressed. This will take up to 1 hour to complete.

The user will have to confirm the deletion twice in order for the files to be deleted.

Since the DR screen will need to be restarted in order to resynchronize with the data logger, the user will have the option to restart the screen from the *Purge Data* menu.

Old Data

The third option, **"Old Data"**, will allow the users the ability to delete older data from the DR screen. The option can be used if the user wishes to free up space on the storage card.

This option is useful for freeing up space on the flash card. Be sure that the data you are deleting has been backed up, or is no longer needed.

The user can select the start date from the list box on the screen. The program will delete any datalog files that are older than the selected date.

To ensure that the datalog files are backed up before purging the data, it is recommended that the user run the download option from the VR Manager (**Download Data** button on the main screen, or *Tools* → *Communications* → *Advanced Download & Maintenance* menu option).

The user will have to confirm the deletion twice in order for the files to be deleted.

Since there is no need to resynchronize the data on the screen with the data on the DR data logger, the user will not have to restart the screen.

Advanced

The fourth option, **"Advanced"**, will allow the users the ability to delete datalog data from specific time frames. This option can be used to free up space on the flash card, or to cause a resynchronization between the DR screen and data logger.

Description – This option deletes data between two specific dates. If these dates fall within the past week, you may choose to restart the screen to synchronize that data.

The user can select the starting date and time from the "Between:" section and the ending time from the "and" section.

The user will have to confirm the deletion twice in order for the files to be deleted.

Since the DR screen may need to be restarted in order to resynchronize with the data logger, the user will have the option to restart the screen from the *Purge Data* menu.

Aux Instrument Setup

This menu option is only available with versions 2.01+ on the DR Module and with version 3.11+ of the screen software. The Aux Instrument Setup menu option will allow the user to set up to ten Aux instruments off of the Digital Recorder. To set the Aux type, select the appropriate Aux instrument type and press the **Edit** button. *Note: Any Aux instrument must be wired to the RS485 Aux terminals on the Digital Recorder module*.

The Aux address can be an integer ranging from **1** to **250**. A value of **0** will disable the Aux instrument, and the address will be displayed as **disabled**.

NOTE: The DR can have up to 21 Aux instruments. The first 10 do not affect any analog inputs. For each additional Aux instrument past 10, three analog inputs are used.

Notes Search

To search for a certain word or phrase in the notes, press the **click to input search phase** button. A keypad will be displayed. *Note on keyboard functionality – pressing the "caps" button or the "shift" button will display more keys for data entry. Also, the "del" key works more like the "Backspace" key on a regular keyboard – i.e. it will delete the character to the left of the cursor*. Press **esc** to go back without saving, or **enter** to save the search criteria. A list of notes with this phrase will then be displayed. Only notes written with the keypad can be searched. Notes written with the stylus will not be included in the search.

To view the chart of the relevant results, tap . Tap "Delete" to delete the note, or to return to the Configuration menu.

Loads

The **Loads** option keeps track of Active and Historical load data. This is identical to the Loads functionality available from the [Display screen](#).

Date Time Settings

The Date Time Settings option lets the user change the current date and time from this menu. Furthermore, the Date and Time settings can be changed to 24 hour instead of AM/PM. For changes to take effect, the screen must be shut down and rebooted (See the [Exit Program](#) configuration menu option).

User Fields

The User Fields feature allows for custom fields (for example Name, Company, and Notes) associated with a load to be either displayed or hidden. To toggle between, select the appropriate field name and press the **Show/Don't Show** button.

To enter a new field, tap the [+] button and enter the text using the keypad. Tap "enter" to save or "Esc" to exit without saving.

To edit an existing field, tap to highlight, then tap [✏] to edit**.** **E**nter the text using the keypad. Tap "enter" to save or "Esc" to exit without saving.

To delete an existing field, tap to highlight, then tap "Delete."

Passcodes

Passcodes allows the login numbers for the supervisor or administrator passcodes to be customized. The administrator is the only login with access to this menu. To change the passcode, press the corresponding box. A numerical keypad will be displayed. Select the new number and press **Enter.**

Menu Configuration

Menu configuration allows the Configuration Menu to be customized in terms of what is displayed depedending on the login level. The Administrator is the only login with access to this menu. To adjust whether or not the Menu Item is displayed, highlight the appropriate item and press either the **Toggle Operator** or **Toggle Supervisor** button. If the status reads True, the item will be accessable in the configuration menu. If the status reads False, it will not appear in the configuration menu list. Press **Save** to save changes.

Changing the Date/Time of the Touch Screen display

If the date or time needs to be changed on the Touch Screen display unit, use the following steps:

1. Exit the Digital Recorder display by selecting the "Exit Program" menu option from the "Configuration" menu.
   a. Click on the **View** button along the bottom of the screen to select the menu option.
   b. Click on the **Yes** button to confirm the program close.
2. Once the Digital Recorder display has closed, double-click on the time in the taskbar in the lower left corner. This will bring up the dialog to change the date or time.

OR

3. Go to Start Menu → Settings → Control Panel
   a. Click on "Date/Time" once and select <u>F</u>ile → <u>O</u>pen or
   b. Double-click the "Date/Time" icon to open the Date/Time dialog
4. If necessary, select the new date from the calendar by clicking on the date. Months can be changed by using the left or right arrow buttons next to the month/year on the calendar.
5. If portions of the dialog are not visible due to the screen size, click and hold the title bar and move the dialog by dragging the dialog.
6. If necessary, select the new time zone from the drop-down list.
7. Check the "Automatically adjust clock for daylight saving" checkbox if desired.
8. If necessary, adjust the time:
   a. Highlight the hours, minutes, or seconds by clicking on the desired section. When selected section will be highlighted in blue.

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b. Use the up or down arrows to change the selected section
9. Click on the **Apply** button or the **OK** button at the top of the dialog to save the changes
10. If no changes were made, click on the **X** button in the top right of the dialog to close the dialog
11. Cycle the power to the Digital Recorder Touch Screen to bring up the Digital Recorder display.

Remote Trend Web Page

Each touch screen will also contain a simple web page that will display the trend information for all of the templates. However, before anyone can view this web page, the web server may need to be configured. Open a web browser such as Internet Explorer or Mozilla Firefox, and enter the following into the address
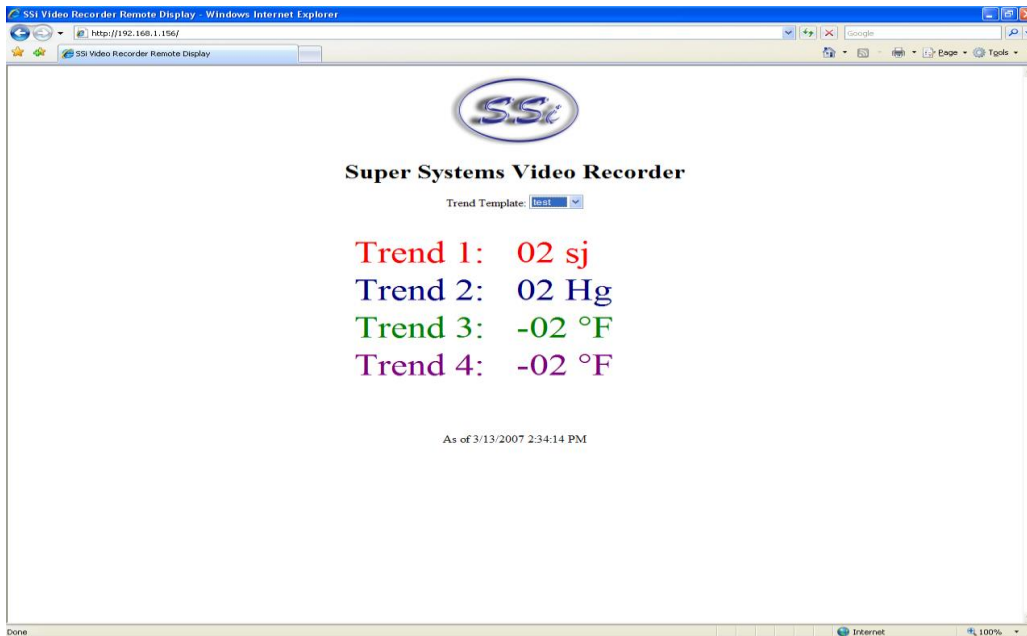
bar: http://< Touch Screen IP > where < Touch Screen IP > is the IP address of the *touch screen* (not the Digital recorder box). This will display the web page.

The templates are listed in the drop-down list next to "Trend Template:". Once a template has been selected, the trends will be displayed underneath. The

current date and time of the touch screen will be displayed beneath the trends.

If the above web page is not displayed, then the web server on the touch screen will need to be configured. First, enter the following address into a web browser's address bar:
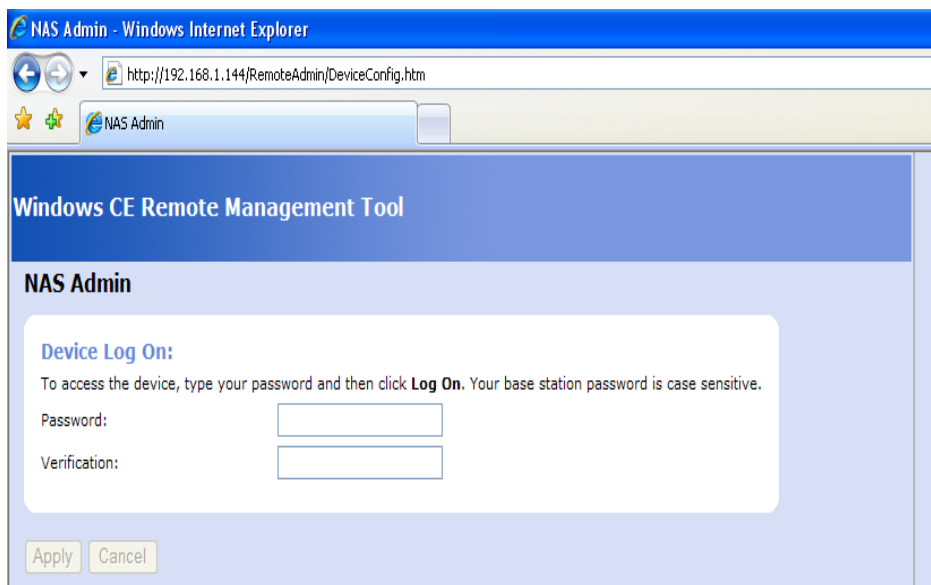
http://< Touch Screen IP >/remoteadmin where < Touch Screen IP > is the IP address of the touch screen.

This will display the remote administration page for the touch screen

Enter a password in the "Password:" and "Verification:" fields and then click on the **Apply** button. Clicking on the **Cancel** button will clear out the 2 fields. *Note –*

This operation will only have to be performed once. This will set up the administration password for the web page. The user name will be "admin". The web server will reset and then it will load the same web page again.
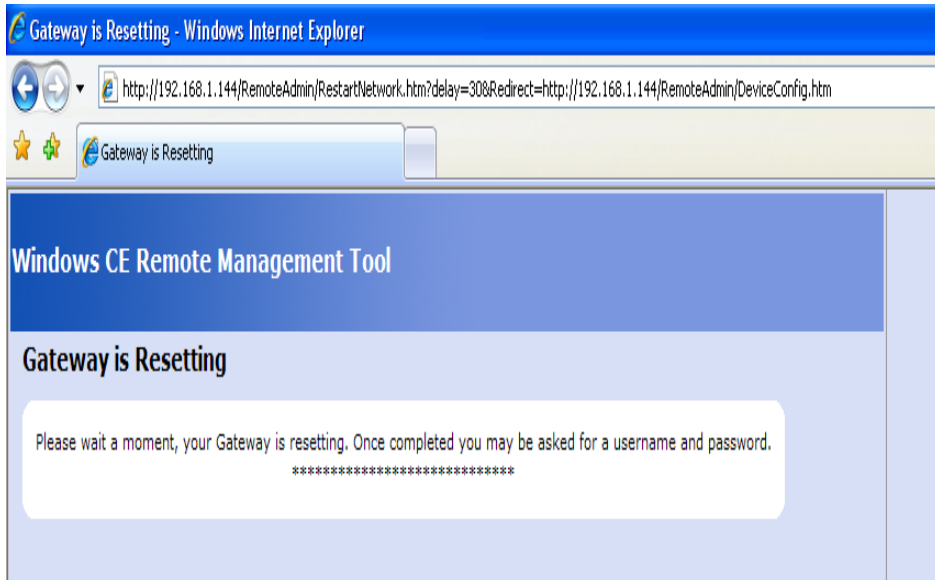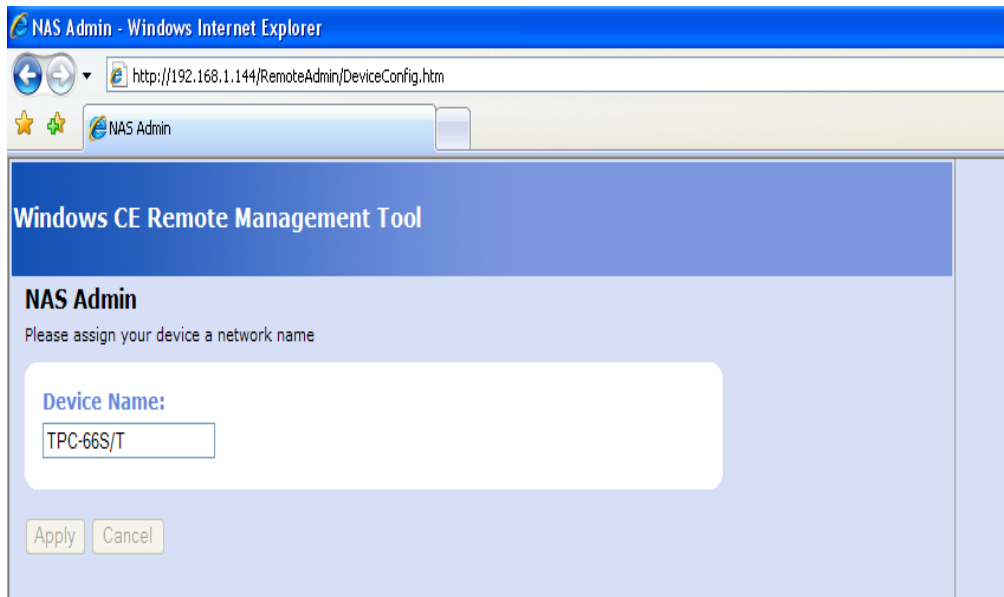
When the page reloads, you will be prompted for the username and password. If you are asked for a domain name, leave the domain name blank. Remember – the user name is "admin".
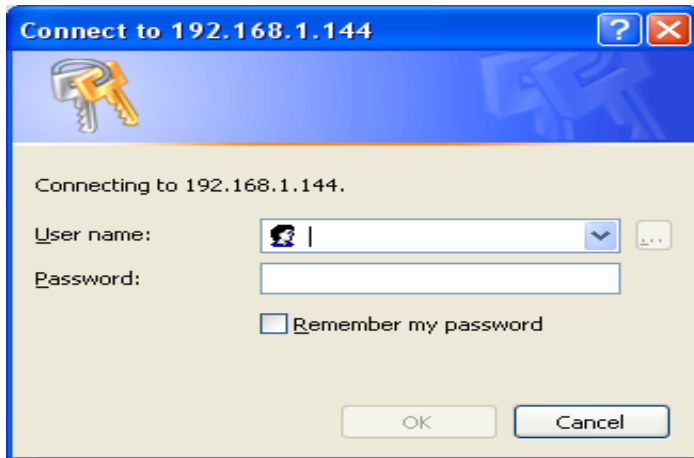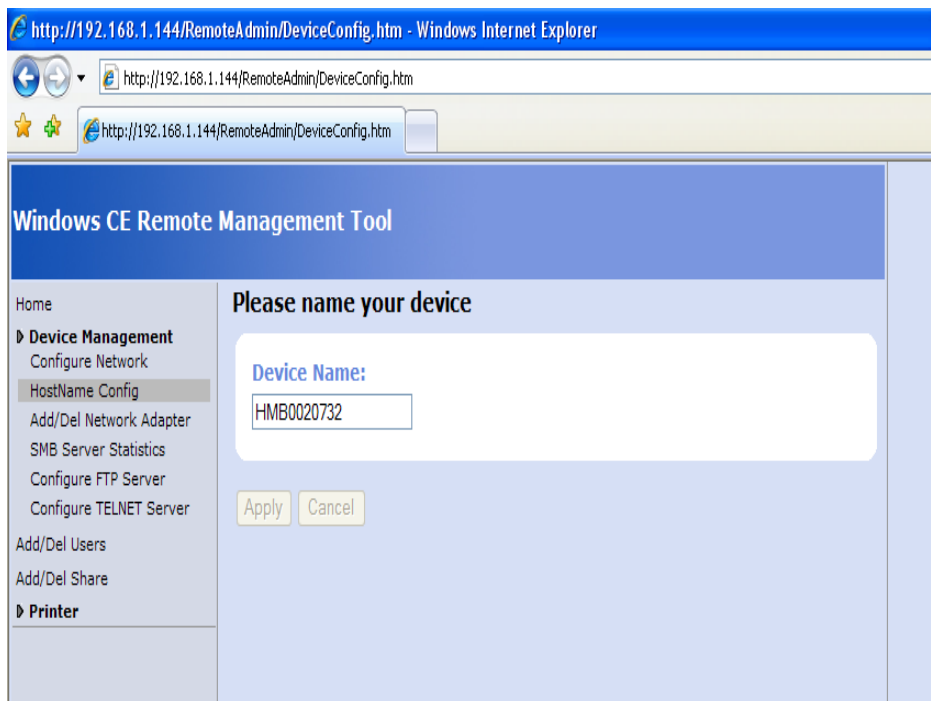

Once you are logged in, you will be asked to assign a device name. Use the serial number located on the back of the touch screen – i.e. HMB0000000.

Clicking on the **Cancel** button will reset the device name. Once the new device name has been entered, click on the **Apply** button.
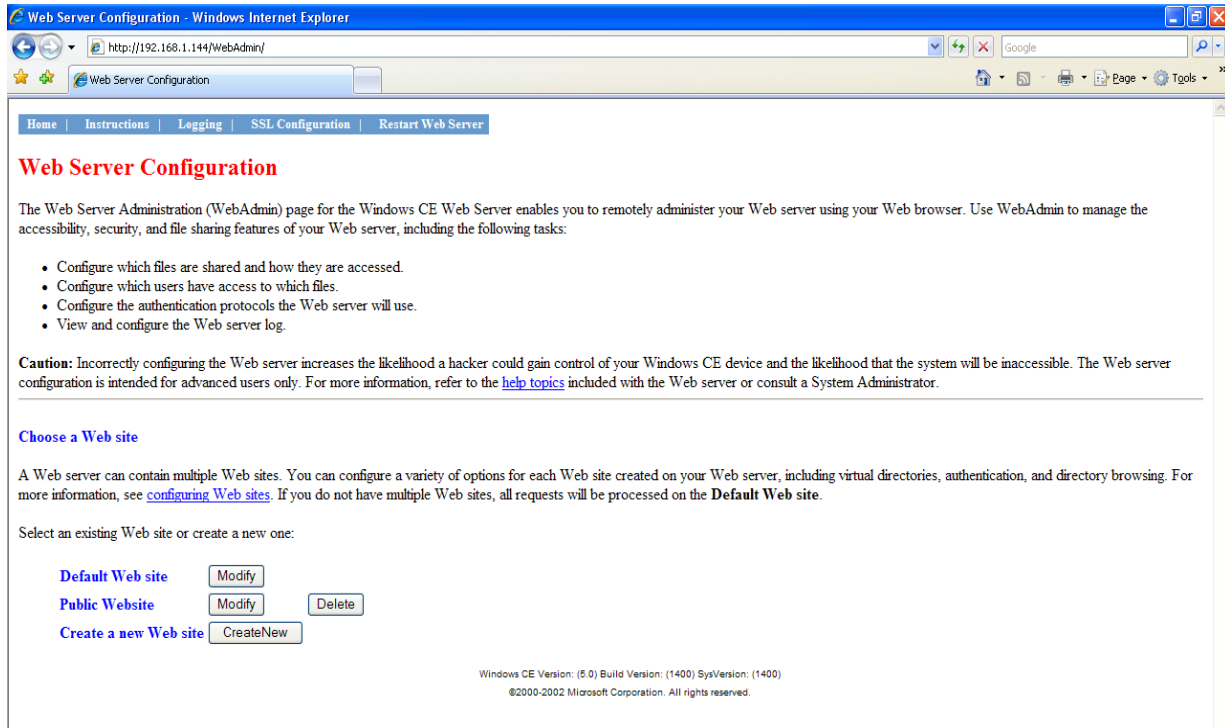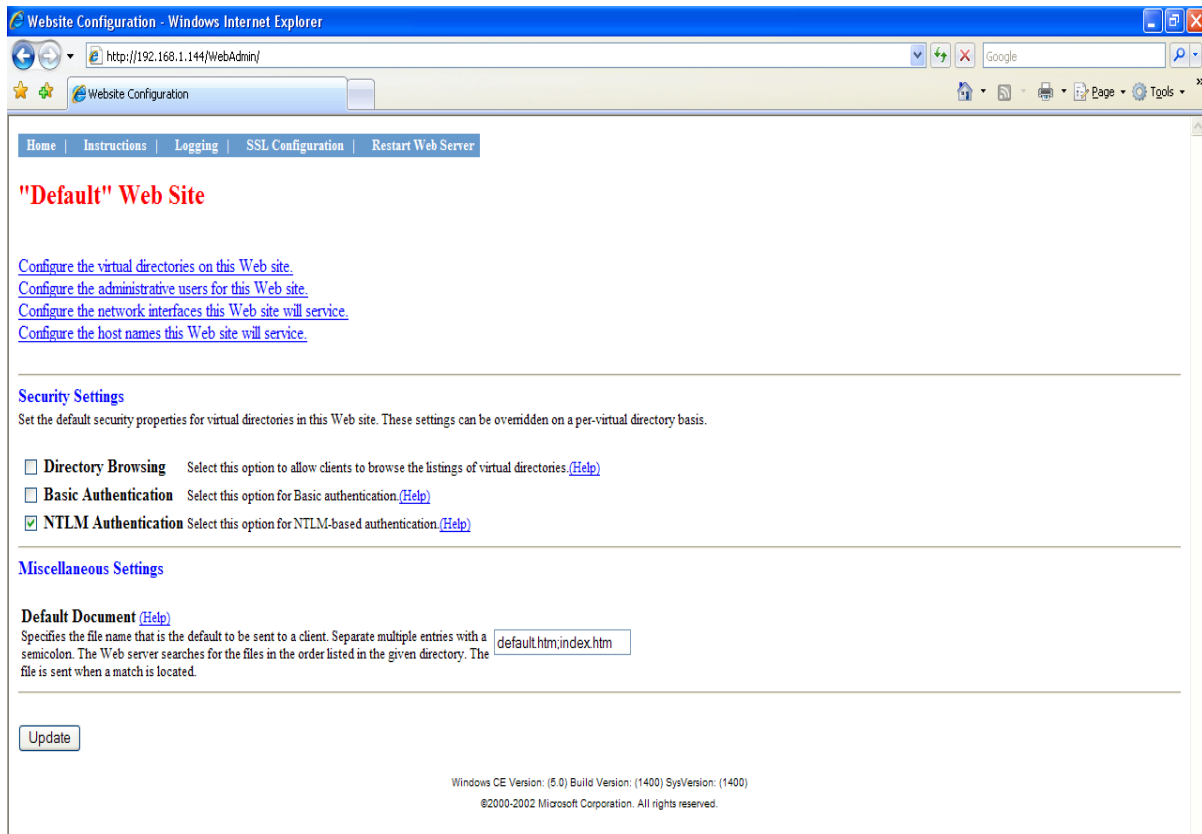
You will see the device name listed.
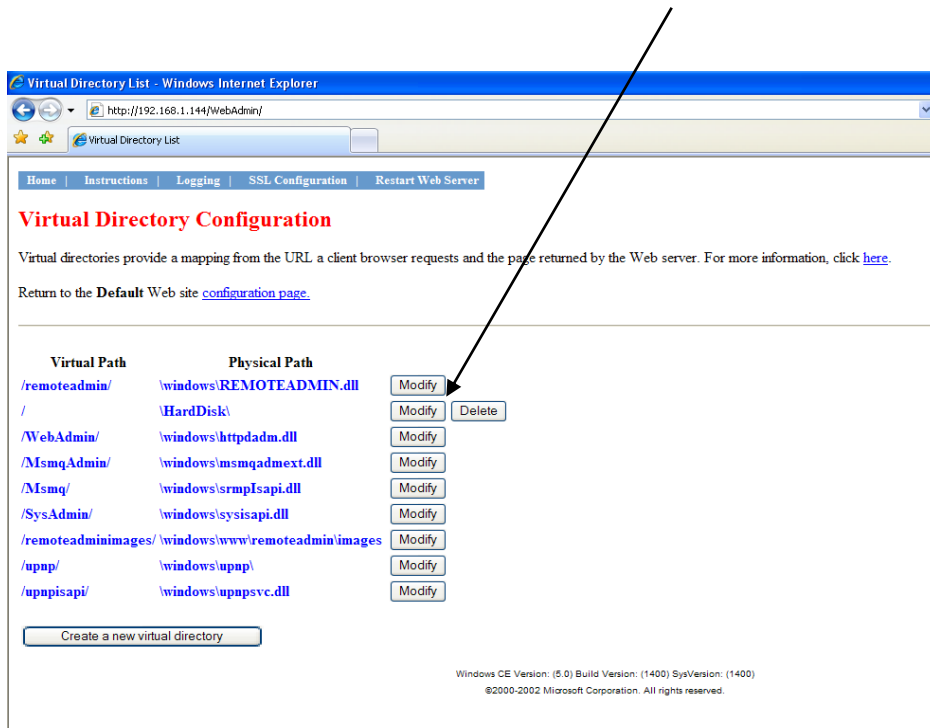

We now have to access the web administration page.

Type the following into the web browser's address bar:

http://< Touch Screen IP >/webadmin where < Touch Screen IP > is the IP address of the touch screen. This will display the Web Server Configuration page.

Click on the **Modify** button located next to the "Default Web site" text.

Immediately under the *"Default" Web Site* title, there will be a series of links. Click on the link titled "Configure the virtual directories on this web site".

The virtual path that you want to modify is the base path of the web server, which is just a slash (/). The default physical path for the base path is "\HardDisk\". Click on the **Modify** button for the base path of the web server.

In the text box which reads "\HardDisk\" under "Physical Directory or Redirection URL" in the "Virtual path mapping" section, replace "\HardDisk\" with "\Storage Card\web\". *Note – Storage Card must be typed as two words. Note: If the screen is a 12" screen, then the directory will be "\HardDisk\web".* Scroll down to the bottom of the page and click on the **Update** button.

You will see some text at the top of the screen letting you know that your changes have been saved. You will now need to restart the web server. Click on the **Restart Web Server** button from the list of menu buttons along the top left of the screen (it will be the last button). If all of the necessary files are already located on the screen, you

should now be able to view the trend page. Enter the following into the address bar of a web browser: http://< Touch Screen IP > where < Touch Screen IP > is the IP address of the touch screen. *Note – you may need to give the web server a few minutes to restart before viewing the trend page.*
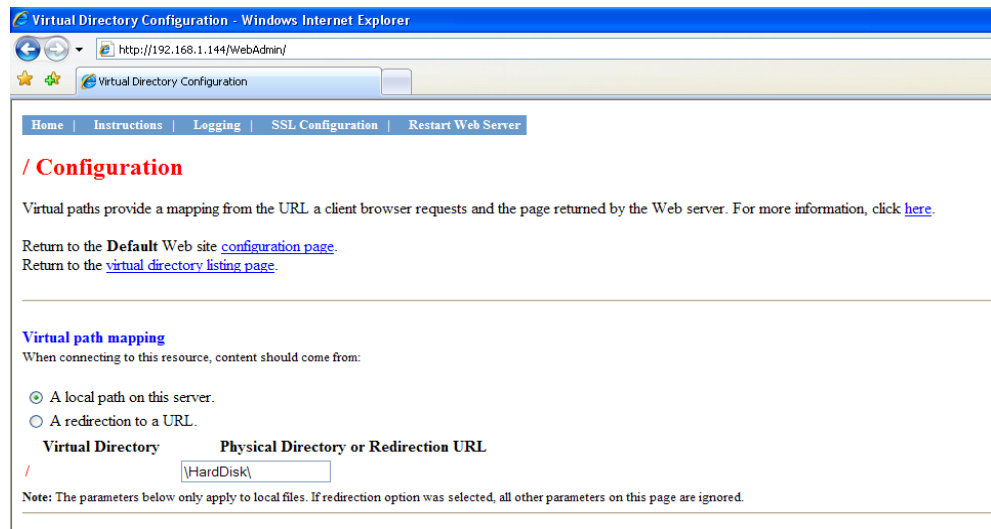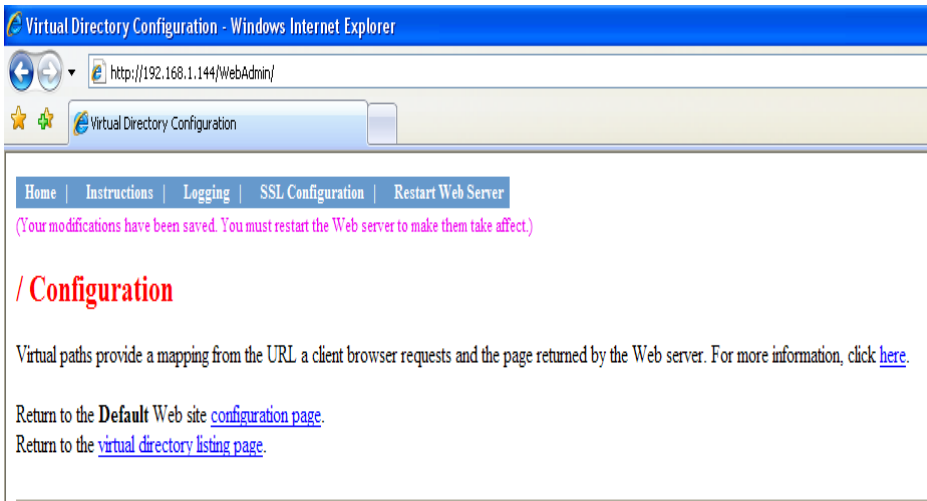
Digital Recorder Web Page

Each Digital Recorder unit will also contain a simple web page that the user will be able to view. The web page will display the current values of all of the inputs on the Digital recorder unit, plus any alarms. The web page will display information for sixteen boards, even if the Digital Recorder unit does not have sixteen input boards installed. Any line for an input board that is not installed will display asterisks (*). To access the web page, enter the IP address of the Digital Recorder unit itself into the address bar of any Internet browser, such as Internet Explorer or Mozilla Firefox, i.e. http://<DR Unit IP Address> where <DR Unit IP Address> is the IP address of the unit. For example, if the IP address was "192.168.1.216", then to access the Digital Recorder unit's web page, the user will have to enter "http://192.168.1.216" into the web browser's address bar. *Note: An Internet connection is not needed to access the Digital Recorder unit's web page.*

VR Manager Software

Installing the VR Manager Software

Note – The person installing the VR Manager Software must have administrative rights on the computer(s) where the installation is taking place for the installation to be successful.

If there is no install file, make sure the following six files are located in the same folder:

- DRManager.exe
- AutoUpgrade.exe
- AutoUpgrade.Lib.dll
- SSiControls.dll
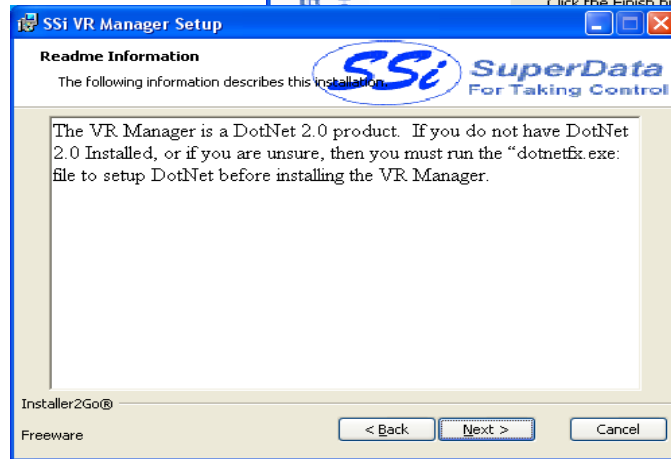- SSiLibrary.dll
- ZedGraph.dll

If there is a setup file, follow these instructions. Double-click on the setup file, DRManagerSetup.msi to start the auto-installation. If there is no version of the VR Manager running on the computer, the installation will display a splash screen. Click on the Next > button to begin the installation.

Click on the **Cancel** button to cancel the installation. The user will have to confirm the cancellation.

Click on the Finish button to close out the installer.

Since the VR Manager software uses the Microsoft .NET 2.0 framework, the framework must be installed on the computer in order for the software to run. If you are unsure if the .NET framework is installed on the computer, contact Super Systems Inc at 513-772-0060. If the .NET 2.0 framework is not installed, click on the **Cancel** button to close out the installer and install the framework. The user will have to confirm the cancellation. *Note: The .NET framework installation file is named* "dotnetfx.exe".

Clicking on the **< Back**   button will
display the previous screen,   and clicking on
the **Next >** button will   display the next
screen. The next screen   will prompt the
user for the download   location.

The default location is "C:\SSI\". *Note: The installer will automatically create a "Bin" folder to install the files to. For example, if the default location, "C:\SSi\" is used, then the files will be installed to "C:\SSi\Bin".* Click on the **Browse** button to select an alternate location. Clicking on the **Disk Usage** button will display the available computer drives onto which the SDS Reporter can be downloaded, as well as the total space, available space, required space, and the difference between the available and required space for each drive.
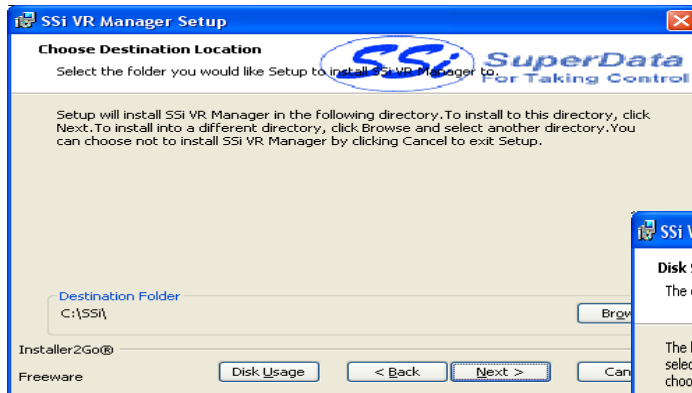
Clicking on the **OK** button will close out the disk usage screen. Clicking on the **< Back** button will display the previous screen. Clicking the **Next >** button will continue with the installation process. Clicking on the **Cancel** button will cancel the installation

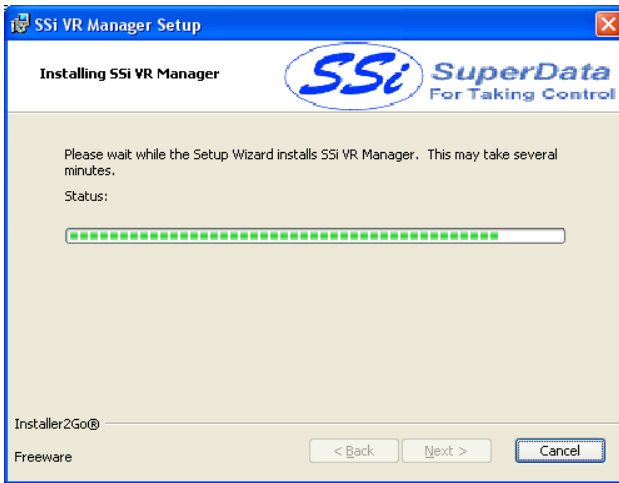process. The user will have to confirm the cancellation.

Clicking on the **Cancel** button will cancel the installation process. The user will have to confirm the cancellation. Clicking on the **< Back** button will display the previous page. Clicking on the **Install** button will install the software to the specified location.
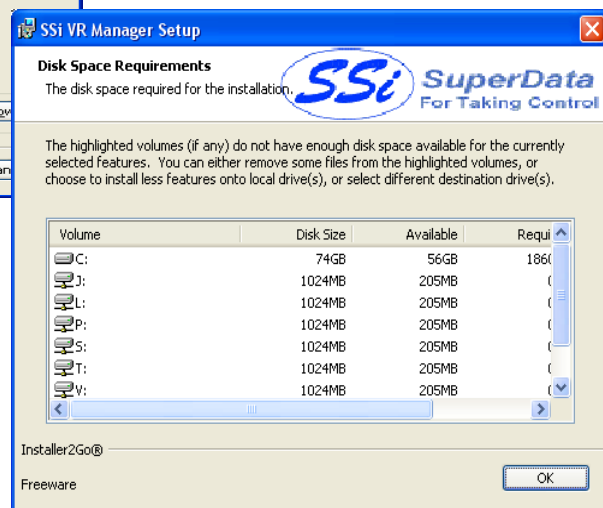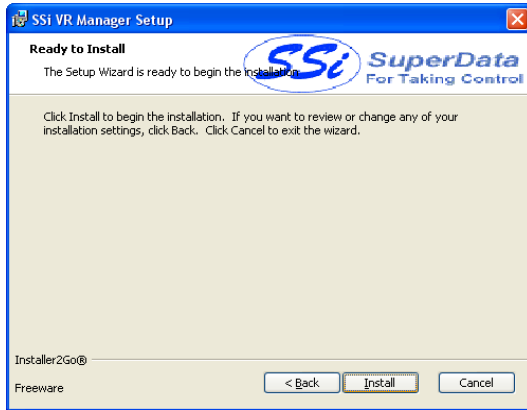
Once the software has been installed, the VR Manager will be ready to use.

Click on the **Next >** button to continue.

The last screen is a description of the software used to install the VR Manager software. Clicking on the **dev4pc.com** button will display the dev4pc.com homepage, the authors of the installer software. Clicking on the **Finish** button will close out the installer.

If there is a version of the VR Manager already installed on the computer, the installer will either re-install the software (**Repair** button) or remove the software from the computer (**Remove** button). Clicking on the **Cancel** button will cancel the actions. The user will have to confirm the cancellation. *Note: the installer does not remove any subfolders in the main VR Manager folder. These files will have to be manually removed*.
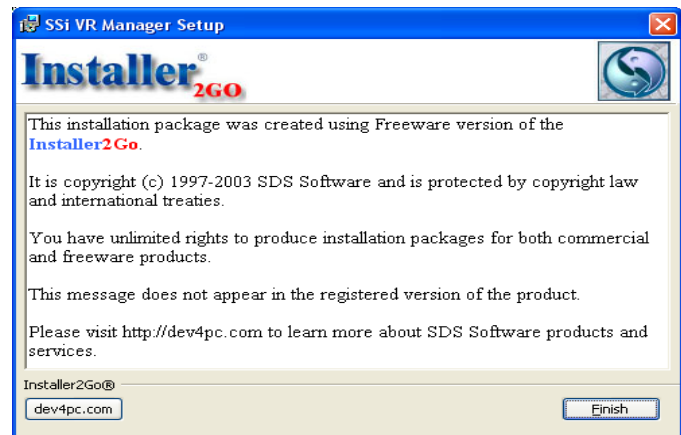
The *Repair* option will allow the user to repair the installed files. This option is useful if the installation was interrupted in some way and did not finish on its own. The *Remove* option will remove the main executable file from the computer.
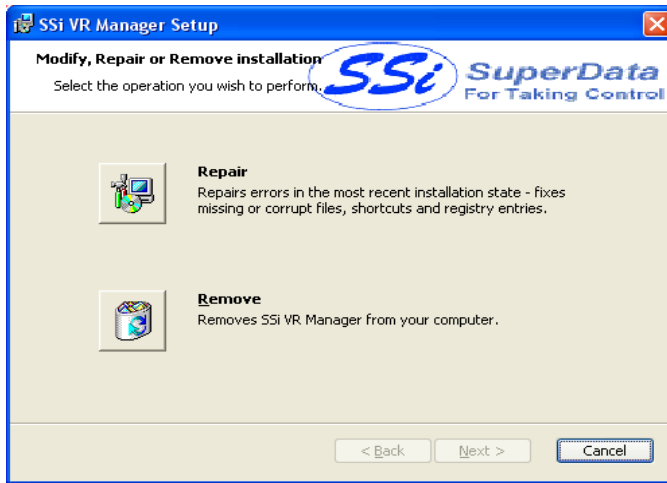
VR Manager Minimum System Requirements

- Computer with a minimum of 600 MHz processor clock speed (Intel, AMD, etc).

- Operating System – Microsoft© Windows© 98/2000/XP/Vista

- Memory – 256 MB RAM or higher

- Disk Space - Minimum of 1 GB storage space

- CD-ROM drive or DVD-ROM drive

- Keyboard and mouse

- Monitor with 1024 x 768 resolution or higher and 256 colors

The VR Manager also requires the .NET Framework version 2.0 to be installed on the computer. The install file for the .NET framework is located on the setup disk included with the Digital Recorder shipment

VR Manager Overview

The VR Manager software provides all the necessary utilities to collect, review and print data that is being logged on SSi Digital Recorders. The software can be used to retrieve data over the network when the DR Recorders are hooked up to the same network as the computer or data can be retrieved from the flash card using the flash card reader, which is included with the shipment.

VR Manager Screen

There are drop down lists and buttons that activate the functions on the screen. The screen is used to

- Select Digital Recorders to Manage
- Review Historical Trend Data In Graphical and Data Grid Format
- Review Notes Written on Screen
- Print Trend and Data Grid
- Export Data to File
- Select Chart Data Interval
- Look at Specific Data Points
- Download Data from Digital Recorder
- Review Statistics of Displayed Data
- Pan Through Historical Data
- Zoom In Display
- Save Displayed Image
- Turn On/Off Trend Points
- Backup Data to a Network
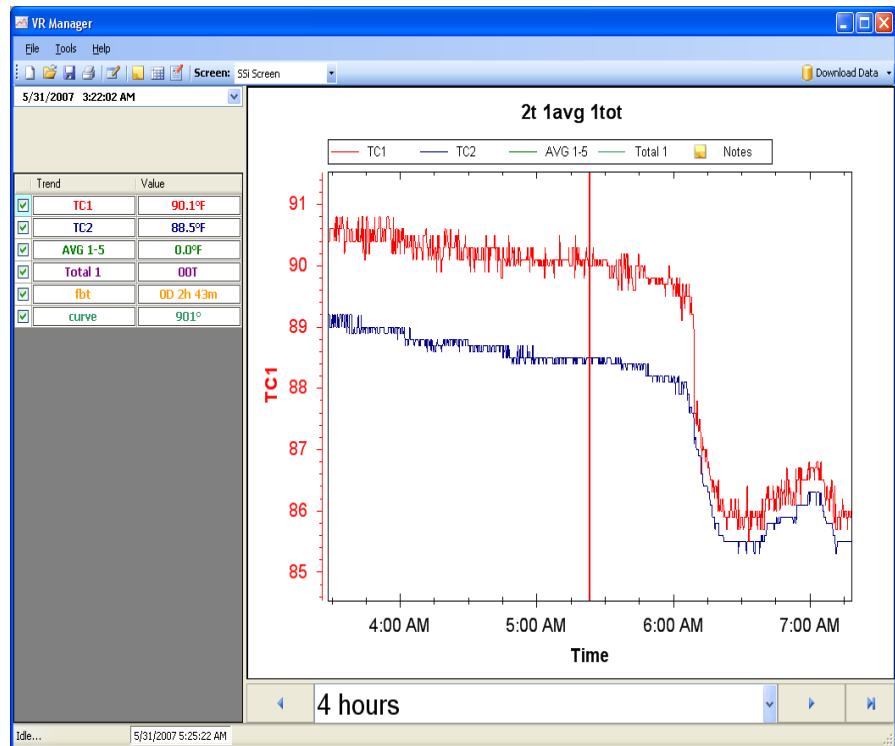
When the VR Manager software is started up, the user sees the above screen. The three menu options to choose from are: *File*, *Tools* and *Help*. There are eight buttons to choose from: New , Open , Save , Print , Edit Custom Curves , Show Notes , Show Data Grid , and Edit Chart .

When multiple Digital Recorders are being managed using VR Manager, the operator can select which DR and set of data for the Digital Screen to use. This is done using the drop down list.

A DR device can be added through the *Tools* → *Communications* → *Setup* menu option.

Operating the VR Manager Screen
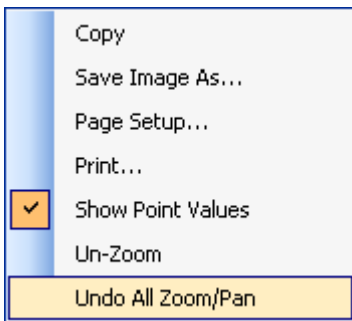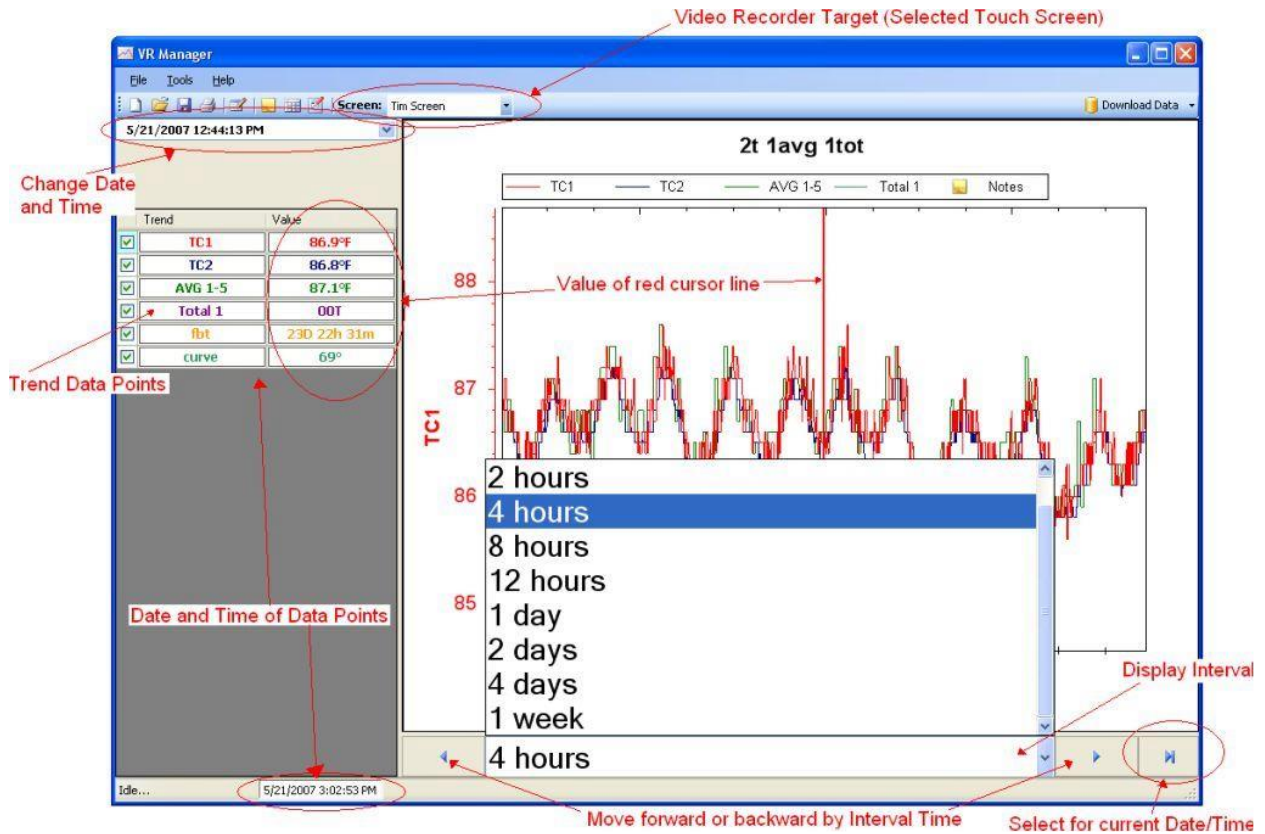
"Copy" will copy the graph image onto the system clipboard, where it can be copied to another location.

"Save Image As" will allow the user to save the image as a separate file.

"Page Setup" will allow the user to set up the page settings, such as page margins" for printing purposes.

" Print" will print the graph to a printer.

"Show Point Values" will show all of the point values on the graph when the mouse is hovered over them on the graph.

"Un-Zoom" will undo the last zoom.

"Undo All Zoom/Pan" will undo all zooms/pans performed.

VR Manager Menu Options

File → New / New Button

The New option will allow the user to create a new trend chart. The default name is "New Chart".
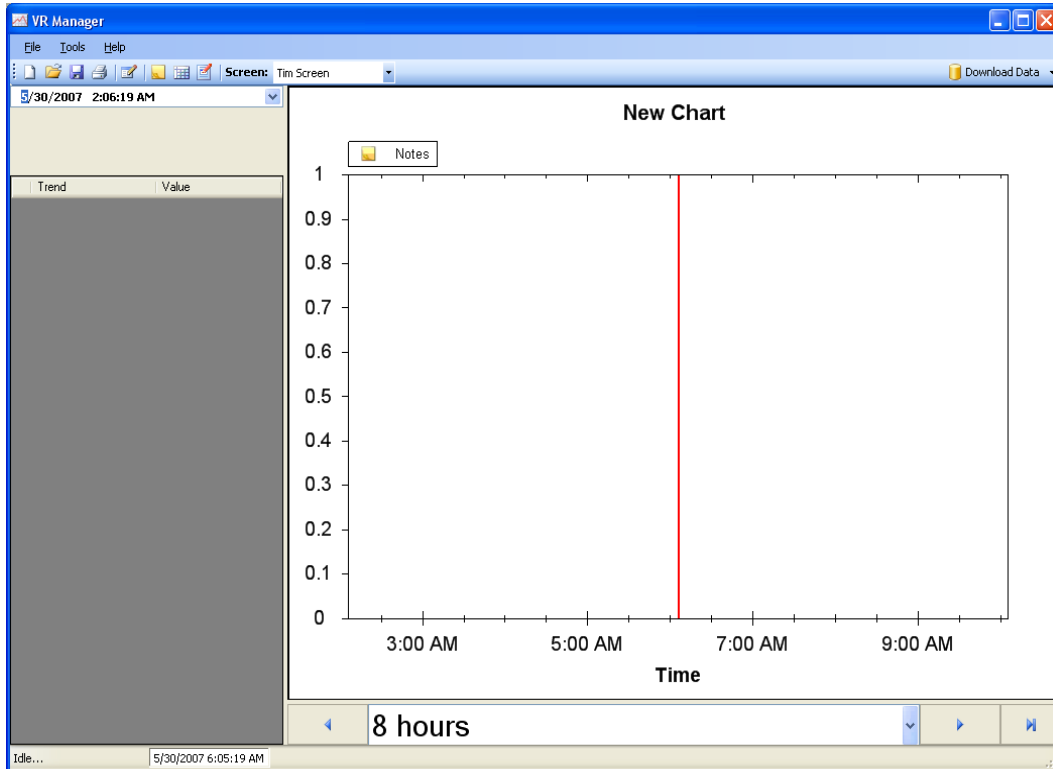
When a chart is first created, there will be no trend variables assigned. Trend variables can be created using the **Edit Chart** menu button, . For more information on how to edit a chart, see the section *Editing a Chart in VR Manager* on page 68.

File → Open / Open Button
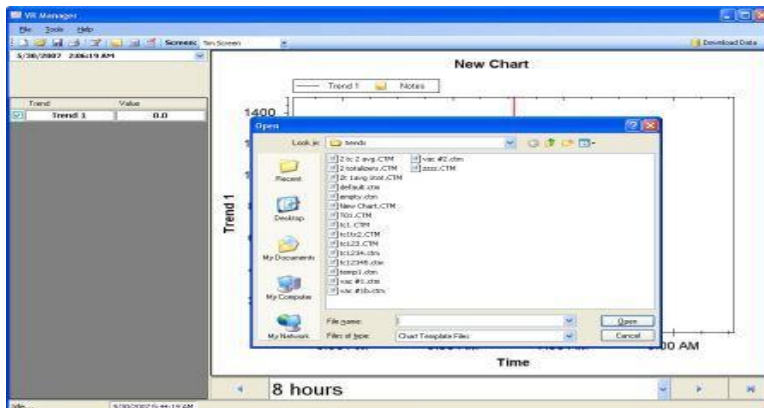
The Open menu option will allow the user to choose an existing Trend for the selected Digital Recorder Screen. The Digital Screen that is highlighted will be one of the previously created profiles for a device. The Trends that are available here have to be Synchronized with the Digital Screen in order to be up to date with the data logger and screen. This is performed using the Synchronize option under the *Tools → Communications → Advanced*

Download & Maintenance selection, or by clicking on the **Download Data** button on the top right of the screen. See the section *Tools → Communications → Advanced Download & Maintenance* on page 59 for more information on the **Download Data** button and its features.

The **Open** button will look at the Trends that have been downloaded and allow the operator to select one of the previously setup trends. This will display all the data associated to the Digital Recorder for the Trends selected.

Trends consist of inputs for the specified device, alarms, function based timers, totalizers, and averagers. Trends can be modified in the VR Manager, but the changes cannot be saved back to the data logger.

File → Save / File → Save As / Save Button

The Save option is used when editing a trend chart. For more information on this topic please refer to section *Editing a Chart in VR Manager* on page 68.

File → Print → Chart
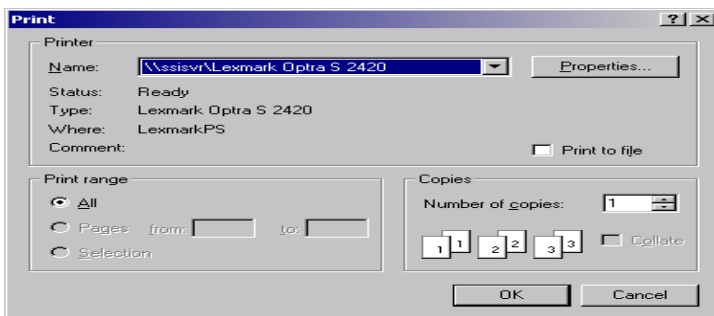
When the user clicks on the Print Chart menu option, the software will prompt the user to confirm the print job by displaying a print dialog box. Clicking on the **OK** button will print the report.

The print dialog box will allow the user to select the number of copies to print. Clicking on the **Properties** button will allow the user to change some of the properties of the printed material, such as margins, page layout, etc.

File → Print → Notes

When the user clicks on the Print Notes menu option, the software will prompt the user to confirm the print job by displaying a print dialog box. Clicking on the **OK** button will print the report. The print dialog box will allow the user to select the number of copies to print. Clicking on the **Properties** button will allow the user to change some of the properties of the printed material, such as margins, page layout, etc. The report will consist of all Screen Notes during the currently viewed data. *Note: The notes do not need to be shown in order to print them out. All notes during the viewing time frame will be printed*.
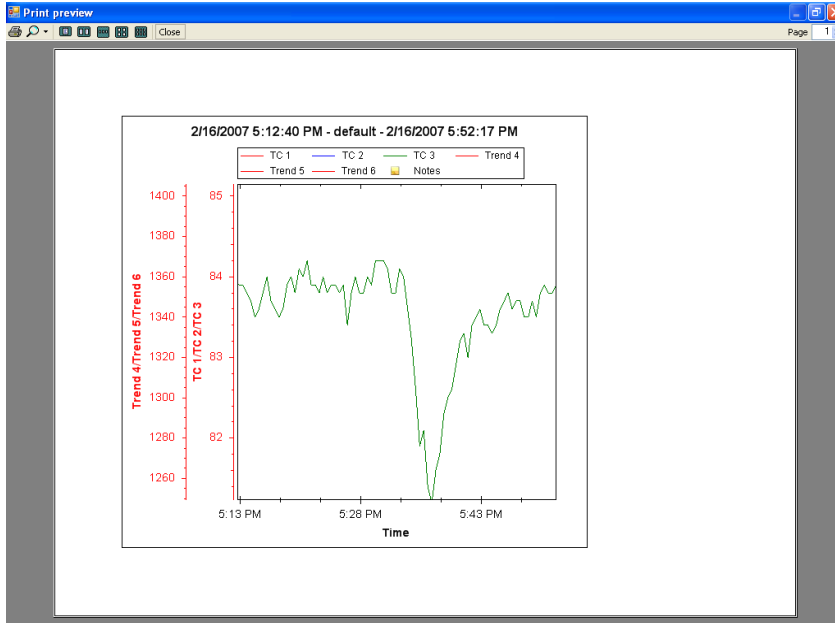
Print Button

When the user clicks on the **Print** button, the software will display the print dialog box, which is similar in design and function to *File → Print → Chart* menu option.

File → Print Preview → Chart

The Print preview will pull up a dialog box to display what will be sent to the printer for printing as displayed below.

The chart can be printed directly from the print preview by clicking on the printer icon in the top left of the screen, or from the *File → Print → Chart* menu option. Clicking on the **Close** button will close out the print preview. *Note: If the chart is printed from the print preview screen, it will be sent to the last printer used on the computer. If there are no printers set up on the computer, the print preview will not be displayed and a warning message will be displayed.*

File → Print Preview → Notes

The Print preview menu option will display a preview of what will be sent to the printer. The notes can be printed directly from the print preview by clicking on the printer icon in the top left of the screen, or from the *File → Print → Notes* menu option. Clicking on the **Close** button will close out the print preview. *Note: The notes do not need to be shown in order to print them out. All notes during the viewing time frame will be printed. If the chart is printed from the print preview screen, the software will display a dialog box allowing the user to select a printer. If there are no printers set up on the computer, the print preview will not be displayed and a warning message will be displayed.*

File → Exit

This menu option will exit the application.

Tools → Customize → Chart Interval

The operator can customize the number of data points that are displayed on the screen. The operator can change the data to be displayed for 1 Second, 5 Seconds, 10 Seconds, 30 Seconds and 1 Minute. The Digital Recorder is always logging data in 1-second intervals, but the Customize Option allows the number of data points to be increased or decreased. *Note: The shorter the chart interval, the longer the screen will take to refresh.*

Tools → Communications → Setup

The Communications Setup screen is used to Add, Edit and Delete managed Digital recorders. As displayed below the operator will click on the *Tools* menu option and tab through to the *Communications* option and select *Setup*.

The Setup option will display the Configuration screen (frmConfiguration) as displayed below.
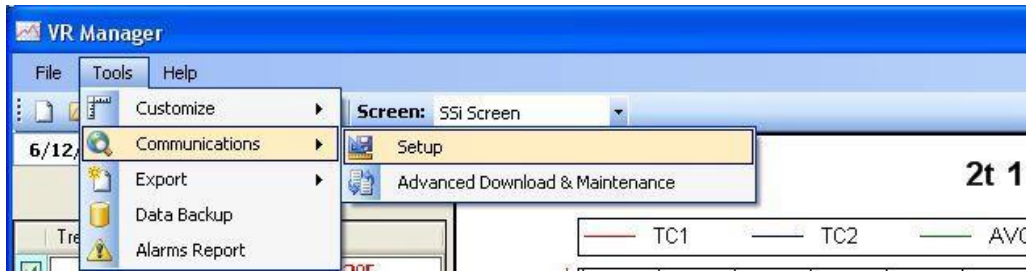
Setup → Add

Used to Add new Digital Recorders to the VR Manager Menu. All added Digital Recorders will be available in the drop down list on the main VR Manager Screen once they have been added. All changes are instantaneous.

The **Add** Button displays the text box with a Name and IP Address fields set to a default value. The system will default the name to DR Screen. The system will default the IP Address to 192.168.1.120. The name is user defined and can be configured by the operator. The IP address is the IP address of the touch screen device. If the computer is connected to the touch screen either directly or through a network, the 3 period button [...] can be selected to search the network for existing devices. The DR Screen Scanner is displayed below.
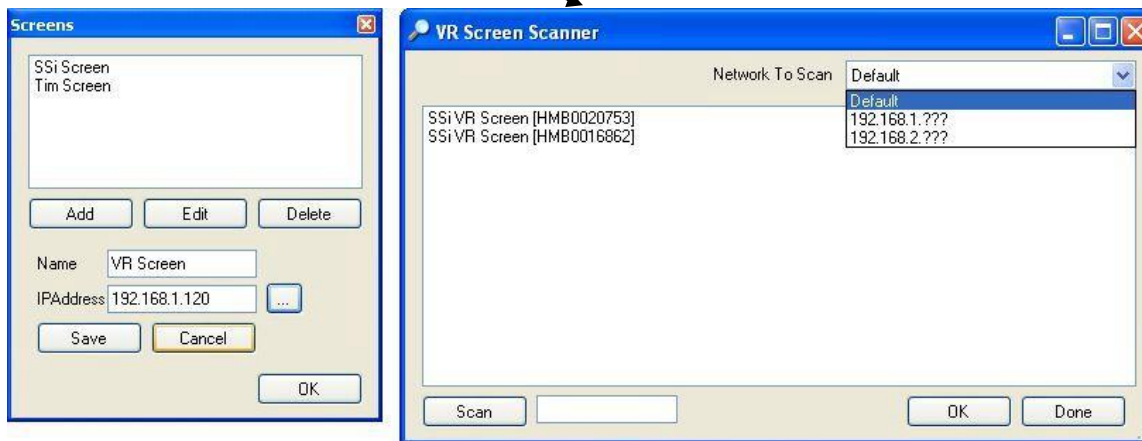
Clicking on the **Scan** button will scan the network for any touch screens. The "Network To Scan" drop down list will allow the user to select the specific network to scan for the screens. This option is useful if the user is using the VR Manager software on a laptop that also has a wireless network setup, or is connected to more than one network. The screens will be displayed with the following format: SSi DR Screen [Device Name], where [Device Name] is the device name given to the touch screen, which is typically the serial number located on the back of the screen. Select the desired touch screen from the list and click on the **OK** button to select that screen and close the DR Screen Scanner form. When a touch screen is selected, the IP address will be displayed in the textbox. Clicking the **Done** button will close out the scanning screen without selecting a screen. *Note: The touch screen must be powered up and the screen program (DCR.exe) must be running in order for the screen to be seen in the scan*.

In order to download the data directly from the flash card on the touch screen, the IP Address needs to be correct. Click on the **Save** button to save any changes or add the touch screen.

Setup → Modify

This menu option allows the operator to change the Name or the IP address of an existing Digital Recorder definition.

Setup → Delete

This menu option allows the operator to delete an existing Digital Recorder definition. The deleted device will no longer be available as an option in the drop down list for Recorders to manage. *Note – There must be at least one device set up in the system.* When there is only one device set up in the system, the user will be unable to delete it. *Note: When a screen is deleted, all of the corresponding data is deleted as well from the local computer*, *unless it has been backed up using the* Tools → Data Backup *menu option*.

Tools → Communications → Advanced Download & Maintenance

The Transfer Data tab is used download data from the selected Digital Recorder. The specified recorder is identified on the drop down list from the initial VR Manager Screen.

There are 2 ways to synchronize data. This can be done using the Screen as the source of the data (network connection) or Disk source (flash card from the screen). *Note: Users can also download data from the main VR Manager screen using the "Download Data" button on the top right corner*.
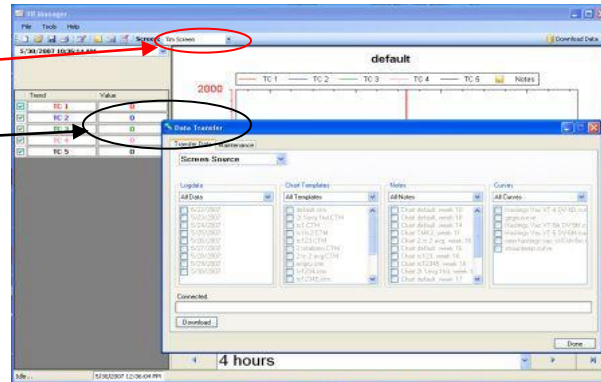
Synchronization will pull all Log Data, Chart Templates, Notes, and Curves that were entered on the screen onto the computer that is running VR Manager. The data will be stored in the DRManager directory under the screen name.
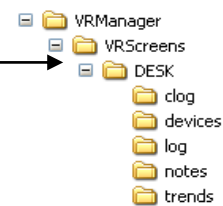
Log Data – Users can use the drop down list to select: All Data, Selected Data, or Skip. The check boxes are used to select which data gets included for the download when the Selected Data is selected.

Chart Templates – User can use the drop down list to select: All Templates, Selected Templates, or Skip. The check boxes are used to select which templates get included for the download when the Selected Templates is selected

Notes - User can use the drop down list to select: All Notes, Selected Notes, or Skip. The check boxes are used to select which notes get included for the download when the Selected Notes is selected

Curves – Users can use the drop down list to select: All Curves, Selected Curves, or Skip. The check boxes are used to select which notes get included for the download when the Selected Curves is selected.

The **Download** button ![Download] is used to start the synchronization process.
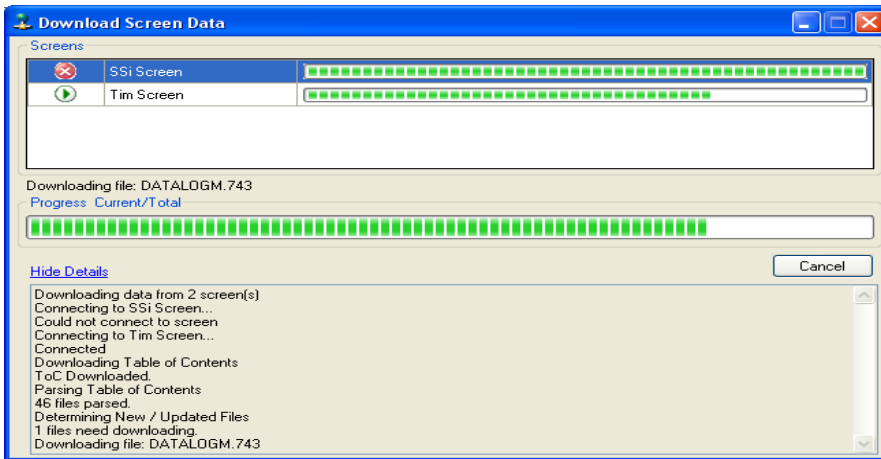
Note: A file that is downloaded will overwrite any existing file.

Download Data button on VR Manager main screen.
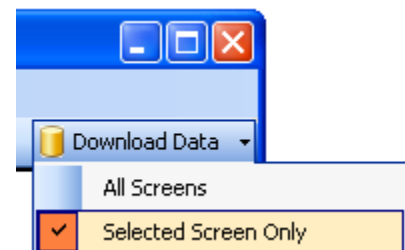
Clicking on the down arrow will give the user the ability to download data from all of the Digital Recorder screen definitions, or only the selected screen. Clicking on the button will begin the download progress.


If there are multiple screens, then each screen will be displayed along with the progress of each download. Clicking on the "Show Details" link will expand the screen and show any download details. The link will then say "Hide Details", which will shrink the screen and not provide any details. If there are any errors with downloading, then there will be an "X" next to the screen with the issue. The error will be listed in the details section. If the download is successful, then the download screen will close when the download is finished.

Flash Card Synchronization

When synchronizing from a flash card, the flash card needs to be retrieved from the touch screen on the Digital recorder. **The screen should be turned off before pulling the flashcard.** When the screen is turned off, data is still being stored. Data will be stored on the data logging device and when the flash
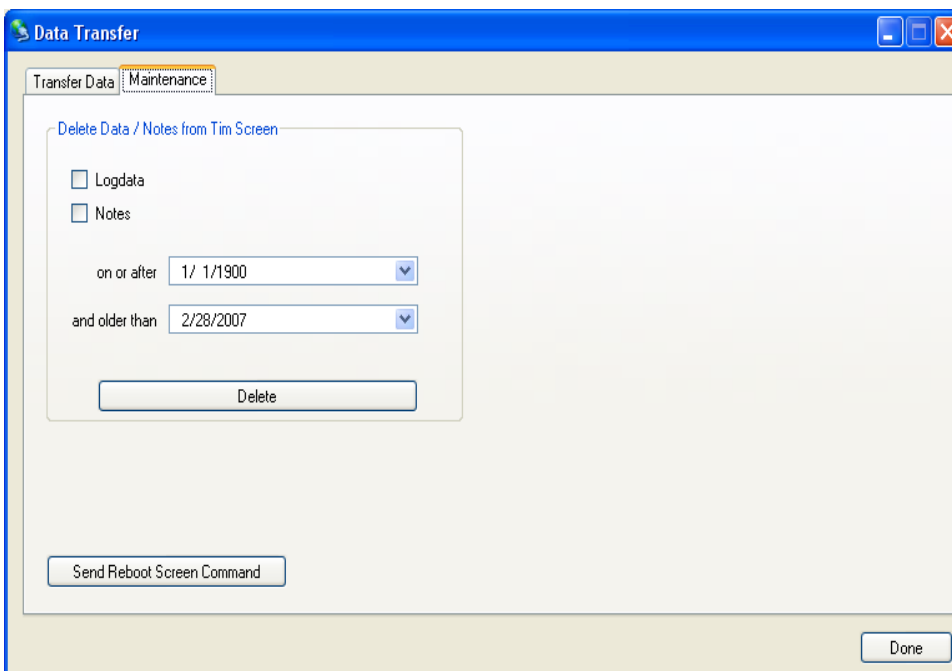
card is returned to the screen and the screen is turned on, the data will be transferred to the flashcard for the period of time when the screen was turned off automatically. The data logging device storage depends on the number of points being logged but is capable of storing over 3 days of data on a 10 channel Digital recorder.

The storage location of the flash card should be selected using the period button [--] on the Data Transfer screen's Transfer Data tab.

The Maintenance tab is used to delete logged data either from the Digital screen directly or on the flash card. Logged data and notes can be removed to create additional free space on the storage card. All data

that is synchronized with VR Manager maintains a backup of the data in the ..DRManager\DRScreens\"Digital recorder name"\Log, Clog and notes directories.

To delete the log data, select the "Logdata" option, and to delete the notes, select the "Notes" option. One or both options may be selected at the same time. The data will be deleted by a date range, which means the user will have to select a beginning date for the date range and an ending date for the date range. The "on or after" control is the beginning date for the date range, and the "and older than" control is the ending date for the date range. Clicking on the **Delete** button will delete the selected files from the screen. The user will have to confirm the delete. The **Send Reboot Screen Command** button will force a reboot for the screen. One of the purposes of the maintenance tab is to force synchronization between the screen and the data logger, and deleting log data will force that synchronization, but the screen will need to be rebooted first.
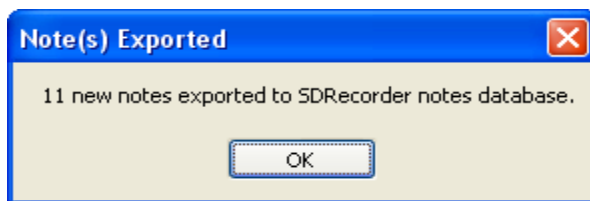
The **Done** button will close out the screen.

Tools → Export

This menu option is used to export the data in the current view to 3 different file formats. CSV (comma separated variable) TSV (tab separated variable) and TXT (text) files. The files are stored in the "trends" folder for the selected screen.
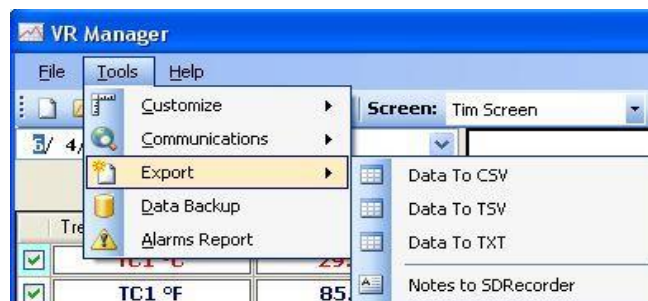
Tools → Export → Notes to SDRecorder

This menu option will allow the users the ability to export the notes to the SDRecorder software, if the software is installed on the computer. If the export was successful, then the user will see a message detailing the export.

If SDRecorder is not installed, or there was a problem with the install, no notes will be exported and the user will get an error message.
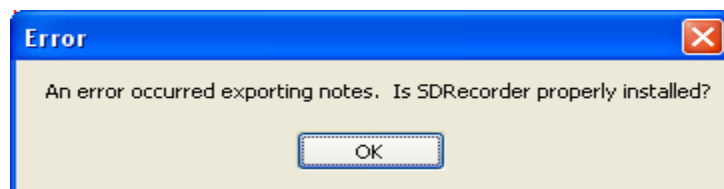
Currently, the VR Manager cannot export notes that were entered on the screen with a stylus.

Tools → Data Backup
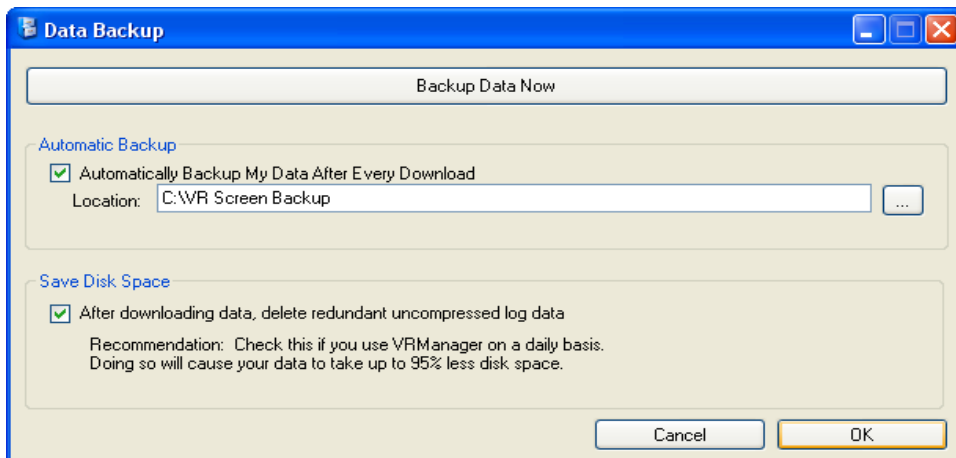
The Data Backup menu option will allow the user to backup all of the data from the local computer to another location on the local computer, or to a location on a server. The **Backup Data Now** button will allow the user to backup all of the data. Clicking on this button will bring up a folder browsing dialog box that will let the user browse to the specific location for the backup. Checking the "Automatically Backup My Data After Every Download" box will let the user backup all of the data every time data is downloaded from the screen. The search button, [..] , will display a folder browsing dialog box that will let the user browse to the specific location for the backup. The "After downloading data, delete redundant uncompressed log data" box will delete any log data that has been compressed on the local computer. Each day, the hourly log files on the DR screen and the data logger are compressed into a compressed log file, which is stored in a separate location from the log files. However, the uncompressed hourly log files on the computer are not deleted, since the new compressed log file will be downloaded. Each hourly log file is around 600 KB, which will take up unnecessary space if they are not deleted. Clicking on the **OK** button will close out the form and save any settings that were made on the screen. Clicking on the **Cancel** button will just close out the form. When the backup is running, the user will see a DOS-style dialog box displayed on the screen until the backup is finished.
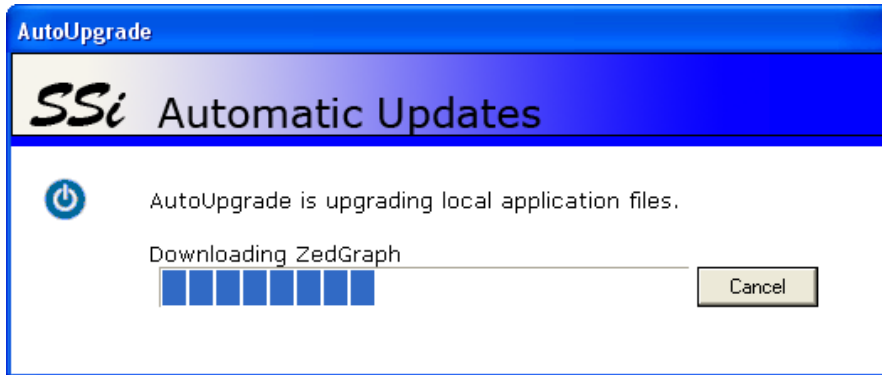
Tools → Alarms Report

This menu option will display a log of all of the alarms on the data logger.
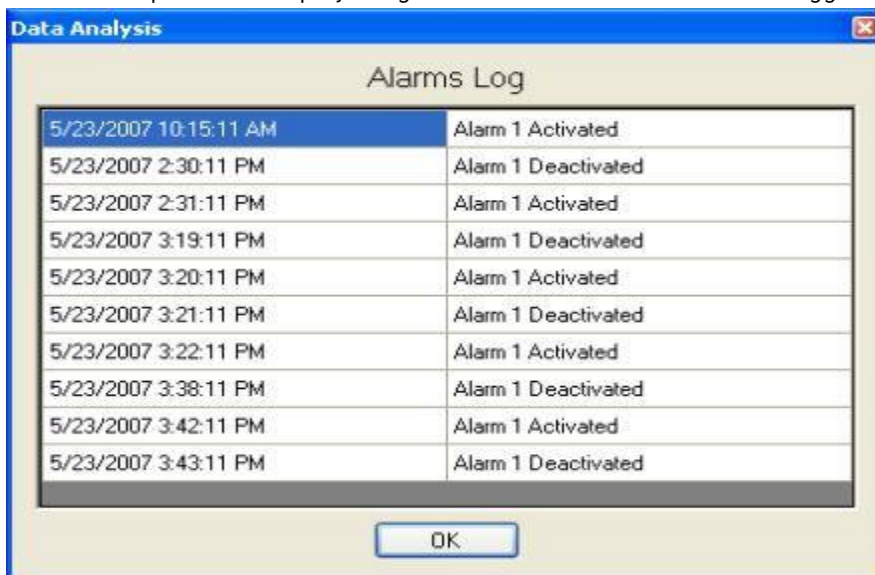
The alarms log will show when all alarms were activated and when they were deactivated. Clicking on the **OK** button will close out the log form.

Help → Check for Updates

This menu option requires an Internet connection to work. *Be sure to save any changes in the VR Manager before updating the VR Manager.* Clicking on this menu option will allow the user to easily update the VR Manager software, as well as receive any updates for the DR Screen. If there are no updates available, the software will display a message box saying that there are no updates available. If there is an update available, then the software will display a message box asking the user whether to begin the update process or not. If the user begins the process, the VR Manager screen will shut down and the auto-update will begin. *Note: Since a new executable file is being downloaded, some settings, such as the backup information (*Tools → Data Backup*) will be lost. These settings will need to be reapplied once the download is finished.*

Once the update has completed, the VR Manager software will start up.

Help → About

This menu option will display the current version number. This will be helpful when troubleshooting any issue with the VR Manager, or when in contact with someone from Super Systems Inc.

VR Manager – Data Point Statistics

Data points for a given display and trend are displayed in detail on the VR Manager screen. Click on a TC's "Value" cell to display the statistics. The data set that is displayed is based on the location of the red cursor. For additional information about a data point, click on the trend value to see the statistics of the data currently on the screen. The system will display the number of data points, minimum value, maximum value, average and standard deviation.
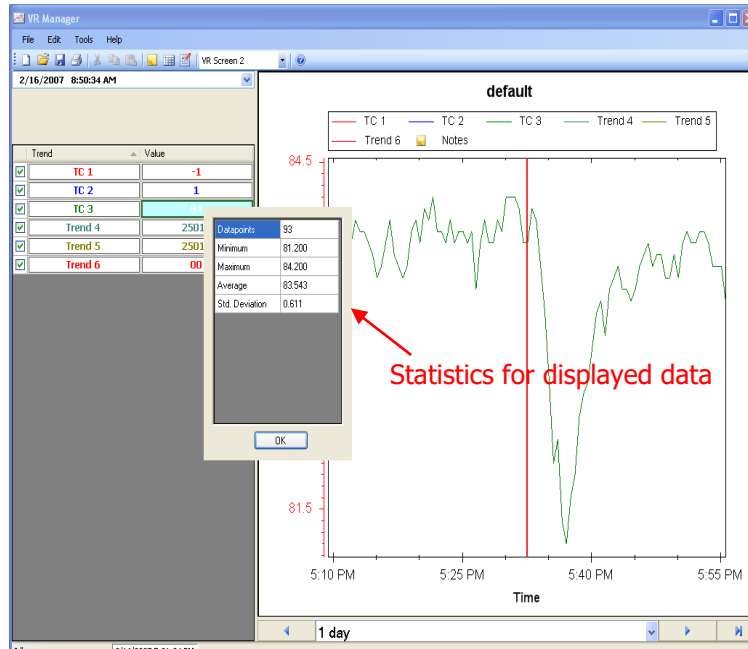
Totalizers and Function Based Timers Logs
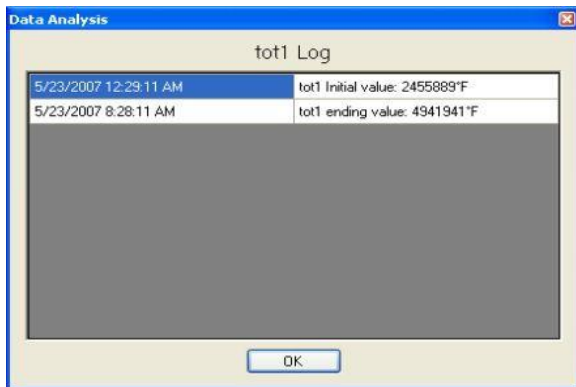
Clicking on the "Value" cell for a totalizer or a function based timer will display a log for that item. For a totalizer, the log will display the initial and ending value for the given time range.

Clicking on the **OK** button will close out the log form. For a function based timer, the log will display when the timer was activated and when it was deactivated during the given time range.

Clicking on the **OK** button will close out the log form.
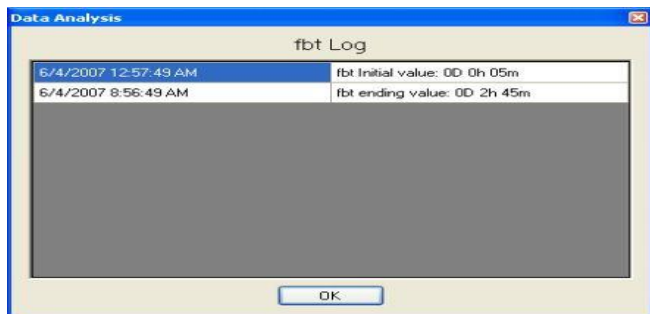
Edit Custom Curves

The **Edit Custom Curves** button on the toolbar, , will allow the user the option to edit a curve that is located on the computer.
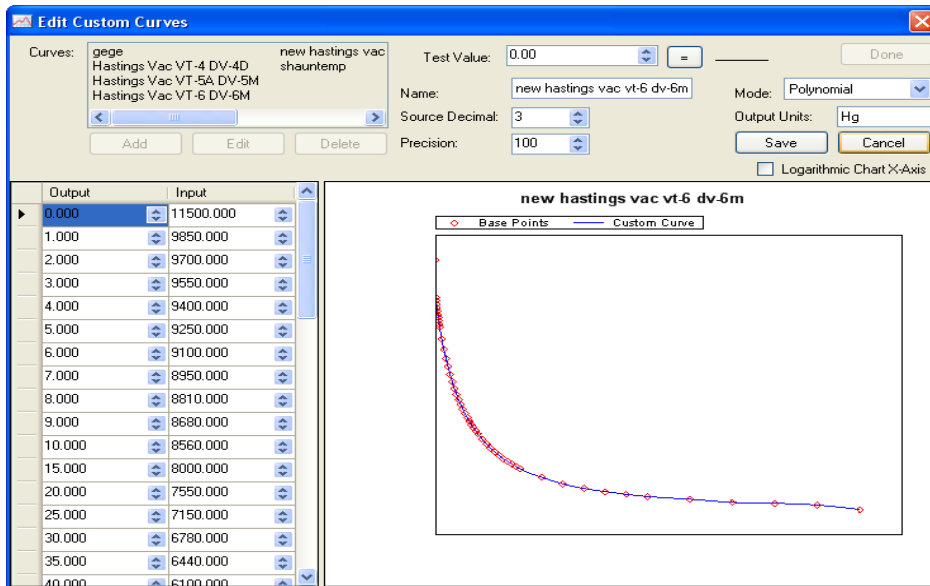
The curves in the "Curves:" section are the curves that have been downloaded from the screen or created on the computer. To edit a curve, select the curve from the list and then click on the **Edit** button. To add a curve, click on the **Add** button. When the **Edit** or **Add** button has been clicked, the rest of the screen will become visible. The user can now begin entering information about the curve. The "Output" column represents the X-Axis on the graph, and the "Input" column represents the Y-Axis on the graph. The output is the value that will be output if a certain input is received. For example, using the graph above, if an input value of **8000.000** is received, the corresponding output would be **15.000**. Values between the points will be curved to accommodate. For example, again using the graph above, if an input value of **8400.000** is received, then the corresponding output would be **11.35**. As points are entered in the "Output/Input" area, the graph on the right will add those points to it and the graph with the curve will begin to take shape. The "Test Value" field at the right will allow the user to test out the curve with sample input values. Clicking on the button with the equals sign, [=], will display the output value to the right of the button. The "Name" field will set the name of the curve. The "Source Decimal" field will set the number of decimals for the source, with a range of **0** to **4**. The "Precision" field will set the precision, with a range of **1** to **1000**. The "Mode" field will set the mode of the curve, and it can be either **Linear** or **Polynomial**. The output units will describe what kind of units the output will be in. The "Logarithmic Chart X-Axis" box will convert the graph into a logarithmic function, as seen below.
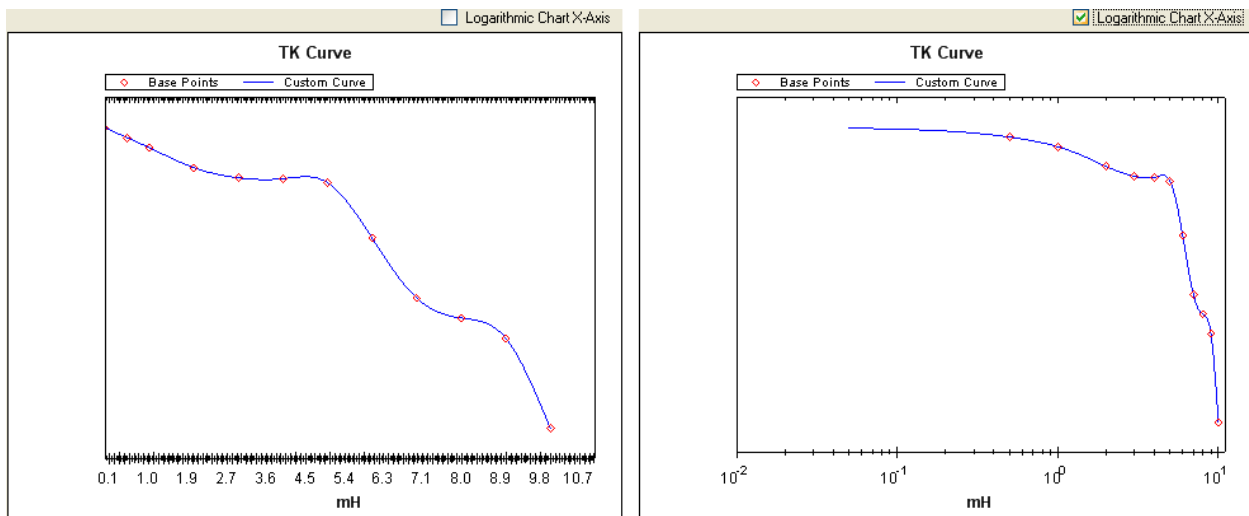
Click the **Save** button to save the changes or add the curve. Click the **Cancel** button to cancel any changes.

Clicking on the **Delete** button will delete the curve. The user will have to confirm the delete.

Clicking on the **Done** button will close the screen.

The **Show Notes** toolbar button, , will show any notes on the screen. A note is signified by the note icon, , on the graph. Clicking on the note icon on the graph will expand the note and display the note's contents.

The top date/time is the date/time the note was made for, and the bottom date/time is when the note was created.

Tabular Data

Tabular data can be reviewed by using the **Show Data Grid** button on the toolbar. The data that is displayed on the screen will be defined by the start and stop time displayed on the screen and the data points will be selected in intervals defined by the *Customize Chart Interval* menu option under the *Tools* menu option.

To print tabular data, simply choose the print option through the *File* menu or the **Print** button on the screen.

To return to the trend view, select the **Show Chart** button on the tool bar.

Editing a Chart in VR Manager

To edit a chart in VR Manager, use the **Edit Chart** toolbar button . This will display the current trend chart definition screen. Trend data can be modified so that when using this chart through VR Manager the trend data will be using these definitions. Click on the **Edit Chart** button again to return to the Trend Chart view.

- Name – User defined field for trend / input.

- Data – The input number used from the data logging device.

- Min – Minimum number to display on the trend chart scale for that data.

- Max – Maximum number to display on the trend chart scale for that data.

- Format – Number of decimal points to display.

- Units – Unit definition for the value (scfh, °C, etc).

- Expression – This is the function that is performed on the actual input data. For temperature, the data should be multiplied by .1 to apply the decimal point value.

- Test – To test an expression that is being used, enter in a value into the TEST field to see what the calculation on the data will produce.

- "=" – By clicking on this, the value entered into the Test field will be used in the Expression field. The results will be displayed in the Total field.

- Total – Results of the tested value in the expression.

To Save the changes made to the trend chart, use the *File → Save* or *Save As* options. If using the *Save* option, remember that when data is synchronized with the data from the Digital Recorder, this trend chart definition may be overridden.

VR Manager Batch Mode

Starting with VR Manager version 1.0.1.11 and up, there is an optional batch mode that will automatically download new data and export any new notes to SD Recorder without the need to start up the VR Manager software.

Adding The VR Manager Location to the System Path
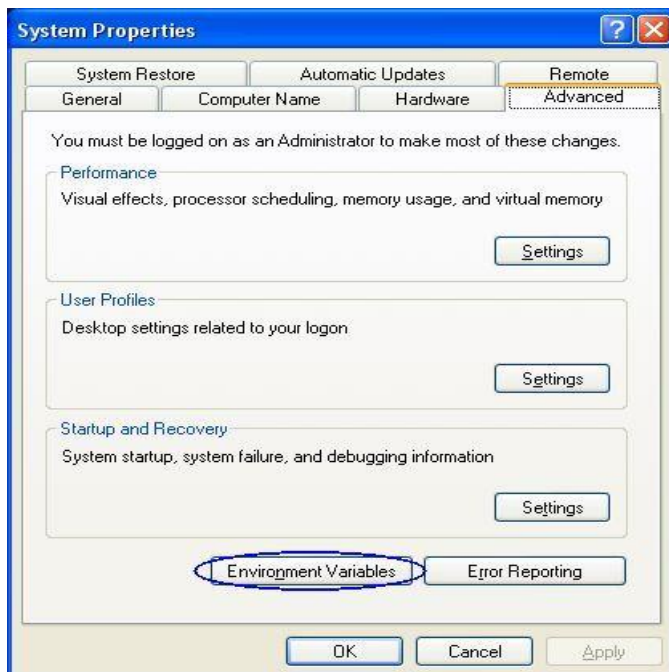
The first step in setting up the batch mode for the VR Manager is to add the VR Manager's installation path to the system's Path variable. This will simplify the execution of the application. From the Start Menu, click on the "Control Panel" option. Once the Control Panel is opened, double-click on the "System" icon to open the System Properties screen. There will be a few tabs across the top of the screen. Click on the "Advanced" tab to select it. From the "Advanced" tab, click on the **Environment Variables** button.

On the "Environment Variables" screen, there will be a list of environment variables in the section labeled "System variables". Scroll down this list until the "Path" variable is visible. Select the "Path" variable and click on the **Edit** button within the "System variables" section. This will allow a user to modify the system's path variable. Click in the "Variable

value:" field and use the right arrow button to scroll to the end of the variable. Add the following text to the end of the variable:

;<DR Install Location\>

Where <DR Install Location> is the location of the VR Manager software on the computer. For example, if the software was located at

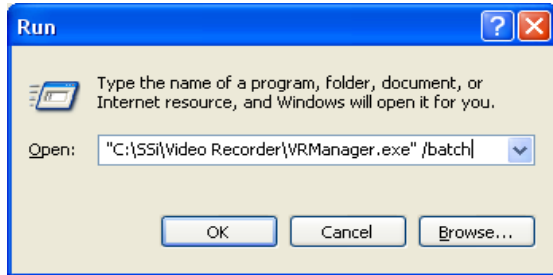the following path: C:\SSi\Digital Recorder\, then the text entered at the end of the variable would be: ;C:\SSi\Digital Recorder\. It is important to include the semicolon (;) at the beginning, since the semicolon indicates separate variables to the computer. It is also important to keep the backslash at the end of the text (\), since the backslash will allow the computer to add the proper location to the path variable. *Note: To avoid any future errors with other programs, make sure that none of the text in the "Variable value" field is highlighted when editing this value. Any highlighted text will be erased when the user begins to type in the new path text.* Click on the **OK** button to close out the "Edit System Variable" screen. Click on the **OK** button to close out the "Environment Variables" screen. Click on the OK button to close out the "System Properties" screen.
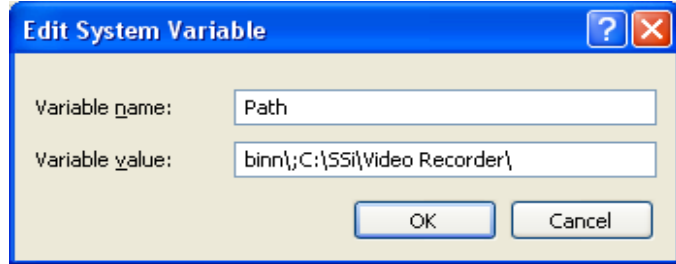
Adding the VR Manager's installation location to the system path is not necessary to run the VR Manager software in batch mode and should only be completed if the administrator wishes to simplify the execution of the application for the users.

Running the VR Manager Software in batch mode

The batch mode operation can be started by using the "Run" screen for Windows. From the Start Menu,

click on the "Run" menu option to open the "Run" screen, or press the Windows key ( ) + R. If the VR Manager's installation path was not added to the system's path variable, the user will have to enter the whole path to execute the batch mode. For example, to run the batch mode type in:

"C:\SSi\Digital Recorder\DRManager.exe" /batch

in the field on the "Run" screen and press the **OK** button or press the **Enter** button. *Note: The quotes are necessary if there is a space in the path for the VR Manager software.* So:

"C:\SSi\Digital Recorder\DRManager.exe" /batch will require quotes around the VR Manager path and filename (DRManager.exe) because of the space in the "Digital Recorder" folder name. However
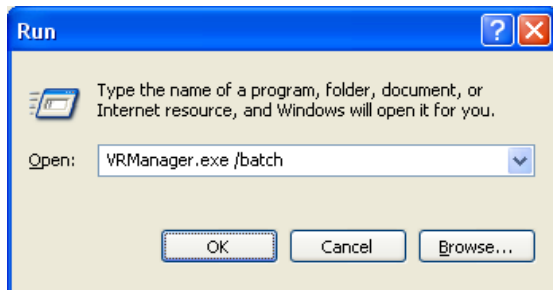
C:\SSi\DR\DRManager.exe /batch will not require quotes, since there are no spaces in the path and filename.

If the VR Manager's path was included in the system's path variable (see *Adding the VR Manager Location to the System Path section above*), then all that would need to be entered would be the file name and parameters:

DRManager.exe /batch

Running the VR Manager in batch mode will not actually open the VR Manager software; rather, it will download any new datalog files from all of the screens set up and export any new notes to the SD Recorder database if desired. While the VR Manager is running in batch mode, the cursor will change to an hourglass. When the VR Manager has finished, the cursor will change back to an arrow.

Error logging

The VR Manager will maintain an error log of the batch mode process in the installation location called "batch.log". This file will contain a step-by-step list of the batch mode, and it can be helpful when contacting Super Systems Inc with any issues. The log will only contain the most recent batch run.

List of Batch Mode Parameters

Currently there are only two parameters that can be used with the batch mode.

- /batch – This will initiate the datalog file download. This parameter must be located directly after the "DRManager.exe".

- /exportnotes – This will export any new notes into the SD Recorder notes database. If this parameter is included, it must be placed after the /batch parameter:

  DRManager.exe /batch /exportnotes

  The /exportnotes parameter cannot be used by itself, i.e., DRManager.exe /exportnotes.

Remote Modules

Remote modules represent expandable input slots for the Digital Recorders which can be mounted remotely and connected back to the main Digital Recorder unit using the RS485 ports. These remote modules will give customers the ability to add inputs to the Digital Recorder.

To connect the remote module back to the main Digital Recorder unit, the "Remote RS485" on the satellite box must be wired into the "RS485 Remote" on the main unit. 24VDC is supplied from the "RS485 Remote" connector on the main module or can be supplied from a different source.

Running Applications Over A Network

Super Systems Inc has developed an application called "SSi Network Setup" that will allow users to run SSi programs that require the Microsoft .Net Framework version 2.0 directly from a local intranet network.

In order to run the SSiNetworkSetup.exe file, the Microsoft .Net framework 2.0 will need to be installed on the local computer. Contact Super Systems Inc at 513-772-0060 if you are not sure if the .Net framework 2.0 is installed on your computer. The .Net framework 2.0 installation file should be included with the installation CD for the VR Manager application. If the installation file was not included, it can be downloaded directly from Microsoft's website free of charge. Go to: http://www.microsoft.com/downloads/Browse.aspx?displaylang=en&categoryid=10, and look for the download link for ".NET Framework Version 2.0 Redistributable Package (x86)". *Note: The VR Manager application also requires the .Net framework 2.0 to run. If the VR Manager application can be run on the computer, then the .Net framework 2.0 has already been installed.* Also, the user logged on to the local computer should have administrative rights when running the SSi Network Setup application or certain access errors may result.

To enable Microsoft .NET programs, such as the VR Manager, to be run on a local computer directly from a network location, make sure the first checkbox "Enable .Net programs to be run from the network on my computer" is checked and click on the **Finish** button. Clicking on the **Cancel** button will not allow .Net programs to be run locally from a network resource. When the setup has been completed, a message box will be displayed.

Once this setup has been completed, the operator can navigate to the network location and be able to run the desired SSi .Net 2.0 application directly from the network.

The second checkbox "I have a specific program in mind, and would like to locate it. A shortcut to this program will be added to my desktop and start menu.", will allow the operator to add a shortcut to an application in a network location directly onto the local computer's desktop and start menu.

Clicking on the **Browse** button will open up a Windows-style file browsing dialog, which will allow the user to locate the specific application file. Once an application has been selected, the SSi Network Setup application will create a shortcut to the network location on the local computer's desktop, as well as create a shortcut to the program in the SSi folder in the Start Menu's programs list.

Purpose

The purpose of the SSi Network Setup application is to allow .Net framework version 2.0 applications, such as Configurator or VR Manager to run across a network as opposed to locally on a PC. The advantage to this setup would be the centralization of the application. For example, suppose that the VR Manager is installed on a network server, and all data logging will be stored on the server. With the SSi Network Setup application, any number of workstations will be able to run the VR Manager application and view the data without having to download the data to each specific workstation. Also, any update for the application will automatically apply to any workstation.

Without the SSi Network Setup application, each workstation would need to install and download logged data separately to use the VR Manager software.

Cutout Dimensions for Touch Screens

Screen Size	Cutout Dimensions
5.7"	5.552" x 7.402"
12"	8.976" x 11.889"
15"	11.75" x 14.74"
17"	13.18" x 15.8"

Appendix A: Wiring Diagrams

INTENTIONALLY BLANK

INTENTIONALLY BLANK

MATRIX
4 POSITION
ANALOG INPUT MODULE
MAI303

300 279

301 RED 1001

302

303 J4 J4 J4 J4
PIN-04 PIN-03 PIN-02 PIN-01
A- A+ V- V+

304

305 3051 | 3051 | PRESSURE GAUGE
RED 4-20mA INPUT

306 3060 | 3060 | (TO TERMINALS)
BLK

307

308

309

310

311 J3 J3 J3 J3
PIN-04 PIN-03 PIN-02 PIN-01
A- A+ V- V+

312

313 3131 | 3131 | VACUUM GAUGE
BLU 0-10VDC INPUT

314 3141 | 3141 | (TO TERMINALS)
WHT/BLU

315

316

317

318

319 J2 J2 J2 J2
PIN-01 PIN-02 PIN-03 PIN-04
V+ V- A+ A-

320

TC321

321 + BLK LOAD T/C #2
TYPE 'S' T/C INPUT

322 - RED WIRE DIRECT

323

324

325

326

327 J1 J1 J1 J1
PIN-01 PIN-02 PIN-03 PIN-04
V+ V- A+ A-

328

329

330

TC331

331 + YEL LOAD T/C #1
TYPE 'K' T/C INPUT

332 - RED WIRE DIRECT

333

334

335

336 (SOLD SEPARATELY)

337

338 RED 1001

339 340

300 279

301 WHT 1002

338 WHT 1002

339 340

Parts List

Part No.	Description
1371X.R	Digital Recorder, No HMI
13711.R	Digital Recorder, 5.7" HMI
13712.R	Digital Recorder, 12.1" HMI
13713.R	Digital Recorder, 15" HMI
13714.R	Digital Recorder, 17" HMI
13701	4-Input analog Module
13707	DR remote IO adapter
13705	DR main module
31297	5.7" HMI
31299	12.1" HMI
31270	15" HMI
31271	17" HMI

Warranty

Limited Warranty for Super Systems Products:

The Limited Warranty applies to new Super Systems Inc. (SSI) products purchased direct from SSI or from an authorized SSI dealer by the original purchaser for normal use. SSI warrants that a covered product is free from defects in materials and workmanship, with the exceptions stated below.

The limited warranty does not cover damage resulting from commercial use, misuse, accident, modification or alteration to hardware or software, tampering, unsuitable physical or operating environment beyond product specifications, improper maintenance, or failure caused by a product for which SSI is not responsible. There is no warranty of uninterrupted or error-free operation. There is no warranty for loss of data—you must regularly back up the data stored on your product to a separate storage product. There is no warranty for product with removed or altered identification labels. SSI DOES NOT PROVIDE ANY OTHER WARRANTIES OF ANY KIND, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. SOME JURISDICTIONS DO NOT ALLOW THE LIMITATION OF IMPLIED WARRANTIES, SO THIS LIMITATION MAY NOT APPLY TO YOU. SSI is not responsible for returning to you product which is not covered by this limited warranty.

If you are having trouble with a product, before seeking limited warranty service, first follow the troubleshooting procedures that SSI or your authorized SSI dealer provides.

SSI will replace the PRODUCT with a functionally equivalent replacement product, transportation prepaid after PRODUCT has been returned to SSI for testing and evaluation. SSI may replace your product with a product that was previously used, repaired and tested to meet SSI specifications. You receive title to the replaced product at delivery to carrier at SSI shipping point. You are responsible for importation of the replaced product, if applicable. SSI will not return the original product to you; therefore, you are responsible for moving data to another media before returning to SSI, if applicable. Data Recovery is not covered under this warranty and is not part of the warranty returns process. SSI warrants that the replaced products are covered for the remainder of the original product warranty or 90 days, whichever is greater.

Revision History

Rev.	Description	Date	MCO #
-	Initial Release	7/6/2022	2325