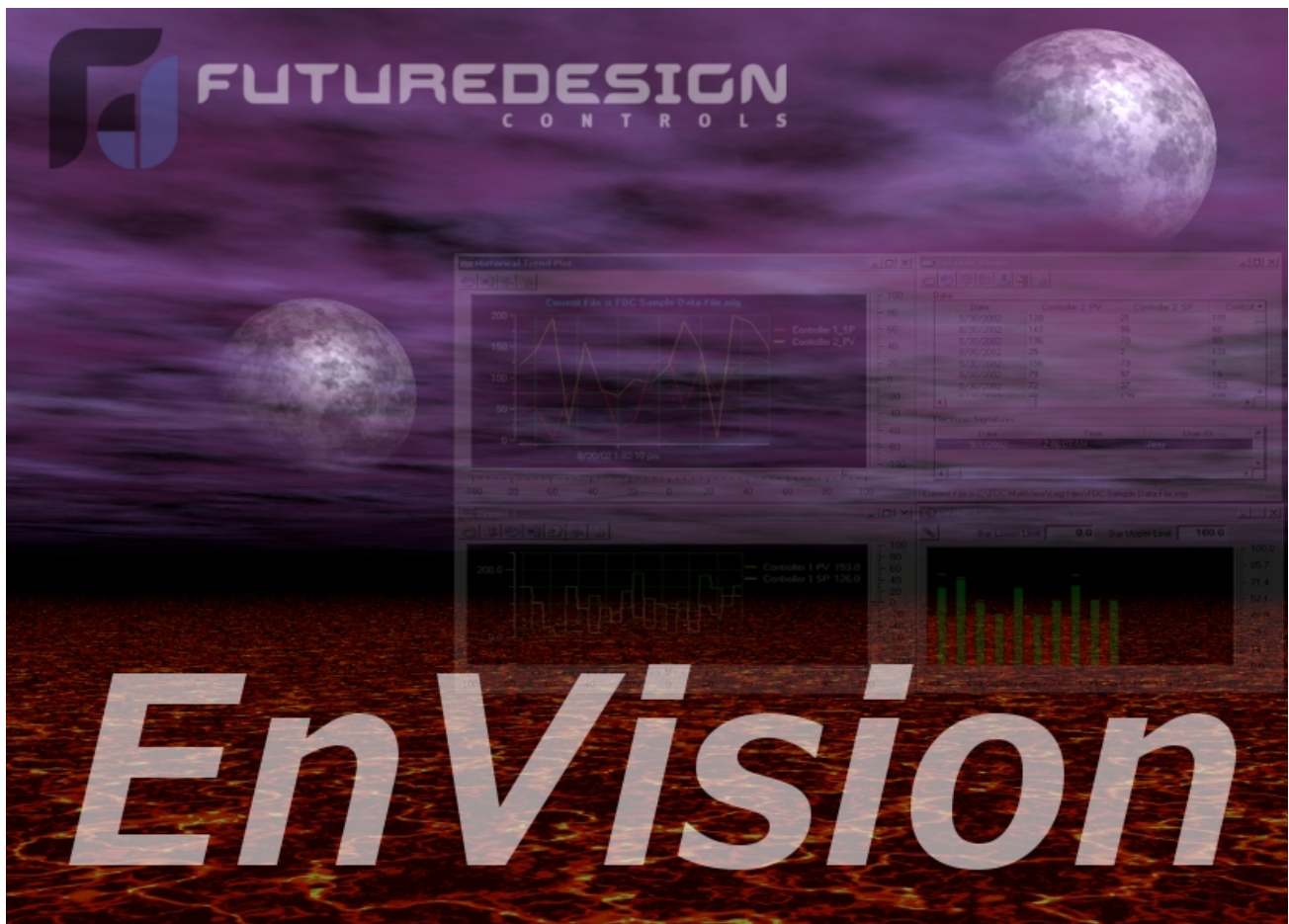




EnVision Configuration Manual



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1 Getting Started

EnVision is a SCADA (Supervisory Control and Data Acquisition) package for the Orion-Mi and nCompass CM multi-loop control systems, the nCompass LC dual loop controller, and also provides support for use with Future Design Controls' 100, 300 and C-Series single-loop PID controllers, L91/L41 limit controllers, P-Series profile controls and FDC-IO modules. Data from each device can be monitored from the Windows® based EnVision package. Connection to the individual devices is accomplished via an RS485 serial connection or Ethernet-to-serial connection.

EnVision provides a rich set of tools for control interaction and data analysis. Control data can be viewed in device detail, faceplate, digital and trend formats. You can change set points, alarm set points and even create, save, download and start schedules for any Orion or P-Series controller in the system.

The EnVision software package can monitor up to 128 individual devices. Each of the 128 devices, whether an Orion-M controller, or 300-Series controller for example, can have their data saved to the hard disk at user-defined rates. Data file analysis tools (digital and trend) make looking at schedule run data a simple task.

EnVision offers 21CFR Part 11 security features for use in Pharmaceutical or any industry that requires controlled security access to software functions, encrypted data, electronic signatures and audit trail listings.

1.1 Hardware Requirements

PC: minimum 2GHZ Pentium4 with 512MB of RAM.

OS: 98, NT 2000, XP Professional, Vista and Windows 7 operating systems supported.

EnVision will run on a lesser machine but performance may suffer if large trend buffers are used. It is recommended that a PC with an actual serial port be used. However, since many computers no longer provide a standard serial port, USB to serial port converters can be used. Note that port assignment for the converter can change depending upon which USB port it is connected to. Therefore, once the adapter has been connected to the computer and the proper port number is assigned in the EnVision Configurator, the adapter should always remain connected to the same USB port for use with EnVision.

Supported Controller Models: Orion-M iSeries and nCompass CM multi-loop, nCompass LC dual loop, 100, 300, and C-Series single-loop PID controllers, L91/L41 limit controllers and P-Series profile controls with RS485 communications as well as FDC IO-8TCS/6RTD/8AIIS/8AIVS modules.

When using Ethernet communications, serial to Ethernet protocol converters are required. Future Design Controls offers the model PC-E converter for this purpose. One PC-E is typically required for each device in the system. In addition, a Moxa MB3170, MGate Modbus master is required at the PC to address individual controllers from the PC's serial port over the Ethernet network. Each of these devices converts the serial communications signals between the PC and individual controllers to an Ethernet protocol format so that a network connection can be used.

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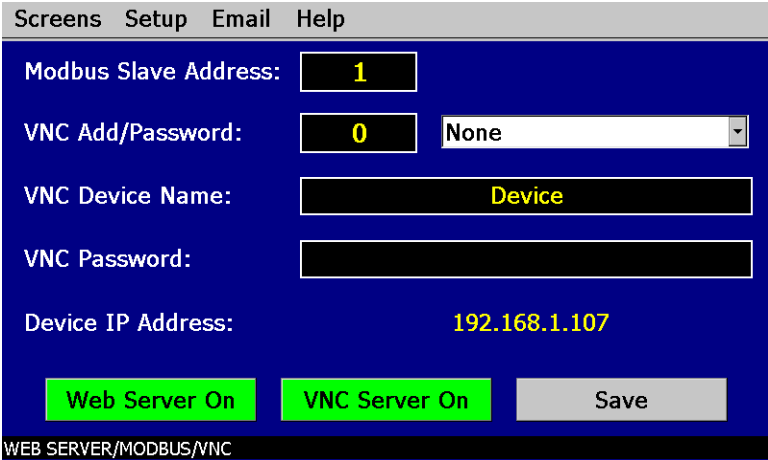
1.2 Connecting Devices to EnVision

Connecting the individual Orion-M, nCompass and single-loop PID controllers to EnVision, involves making the proper communication wiring connections and setting the Modbus slave address in each controller that is on the communications link. If the addresses are not set correctly, or multiple controls have the same communications address, the system will not work properly. Each controller must have its own unique address, from 1 to 128, corresponding to the address number (Add#) in the EnVision Configurator.

NOTE: *The location of the controller on the communications network does not matter when assigning the communications address. The controller is identified by its address only, not its position when wired into the communications link.*

1.2.1 Setting the Orion-M Controller Address

To assign the communications address from the Orion-M main view screen, select “System Setup” from the Setup menu. Next, select “Web Server/Modbus/VNC” from the Setup menu. This will display the Web Server/Modbus/VNC screen.



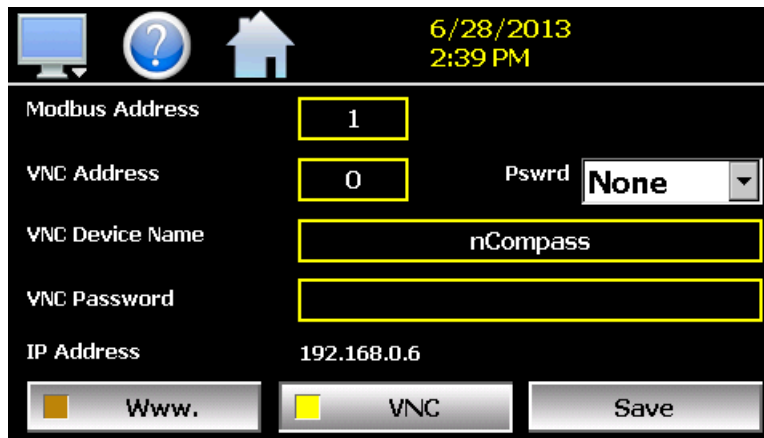
Touch the address entry field for the “Modbus Slave Address” and enter the desired address for the controller on the network. The address entered here, will correspond to the address (device) number in EnVision. In order to view the controller in EnVision, the corresponding device address in EnVision must be configured to match the Orion-M and be enabled under “Device Setup” in EnVision.

The Orion-M can only be assigned addresses in the range of 1-31. When assigning controllers to EnVision, be sure to leave the first 31 addresses open for Orion-M systems. The Orion-M can be assigned to other address slots in EnVision; however, an Ethernet to serial network is required.

1.2.2 Setting the nCompass CM Controller Address

To assign the communications address from the main view screen, select “Settings” from the Device menu. Next, select “Comms” from the Comms settings menu. This will display the Communications screen.

Touch the Modbus Address entry field and enter the desired address for the controller on the network. The address entered here, will correspond to the address (device) number in EnVision. In order to view the controller in EnVision, the corresponding device address in EnVision must be configured to match the nCompass and be enabled under “Device Setup” in EnVision.



The screenshot shows the 'Communications' setup screen in the EnVision software. At the top, there are icons for a monitor, a question mark, and a house, along with the date and time '6/28/2013 2:39 PM'. The main area contains several fields: 'Modbus Address' with a value of '1', 'VNC Address' with a value of '0', 'VNC Device Name' with 'nCompass', and 'VNC Password' which is empty. The 'IP Address' is set to '192.168.0.6'. There are three buttons at the bottom: 'Www.' (highlighted with a yellow square), 'VNC' (highlighted with a yellow square), and 'Save'.

The nCompass CM can only be assigned addresses in the range of 1-31. When assigning controllers to EnVision, be sure to leave the first 31 addresses open for nCompass CM systems. The nCompass CM can be assigned to other address slots in EnVision; however, an Ethernet to serial network is required.

1.2.3 Setting the nCompass LC Controller Address

To assign the communications address from the main view screen, select "Settings" from the Device menu. Next, select "Comms" from the Comms settings menu. This will display the Communications screen.



This screenshot shows the 'Communications' setup screen with additional settings. The date and time are '4/23/2013 5:04 PM'. The 'Modbus Address' is '1' and the 'Parity' is set to 'Even'. The 'VNC Address' is '0' and the 'Pswrd' is 'None'. The 'VNC Device Name' is 'nCompass' and the 'VNC Password' is masked with '*****'. The 'IP Address' remains '192.168.0.6'. The bottom buttons are 'Www.' (highlighted with a yellow square), 'VNC' (highlighted with a yellow square), and 'Save'.

Touch the Modbus Address entry field and enter the desired address for the controller on the network. The address entered here, will correspond to the address (device) number in EnVision. In order to view the controller in EnVision, the corresponding device address in EnVision must be configured to match the nCompass and be enabled under "Device Setup" in EnVision. The Parity settings must also be set for "Even" in order to be compatible with EnVision.

The nCompass LC can only be assigned addresses in the range of 1-31. When assigning controllers to EnVision, be sure to leave the first 31 addresses open for nCompass LC systems. The nCompass LC can be assigned to other address slots in EnVision; however, an Ethernet to serial network is required.

NOTE: If more than one device is to be connected to the PC running EnVision, a separate RS232/485 adapter is required for each nCompass LC in order to convert its RS232 serial connection to an RS485 serial connection in order to connect multiple devices on the communications link.

1.2.4 Setting Single-Loop Controller Communication Parameters

The 100, 300, L91/L41, C and P-Series controllers provide additional communications settings for baud rate, data bits, stop bits and parity, in addition to the communications address. For instructions on how to access these settings, see the respective controller manual for the model of controller you are using. In order for the controllers to communicate with EnVision, set the communication settings to the factory default of 9600 baud, 8 data bits, even parity and 1 stop bit as applicable.

The communications address entered in the controller will correspond to the address (device) number in EnVision. In order to view the controller in EnVision, the corresponding device address in EnVision must be configured to match, and be enabled under "Device Setup" in EnVision.

1.2.5 Setting IO Module Communication Parameters

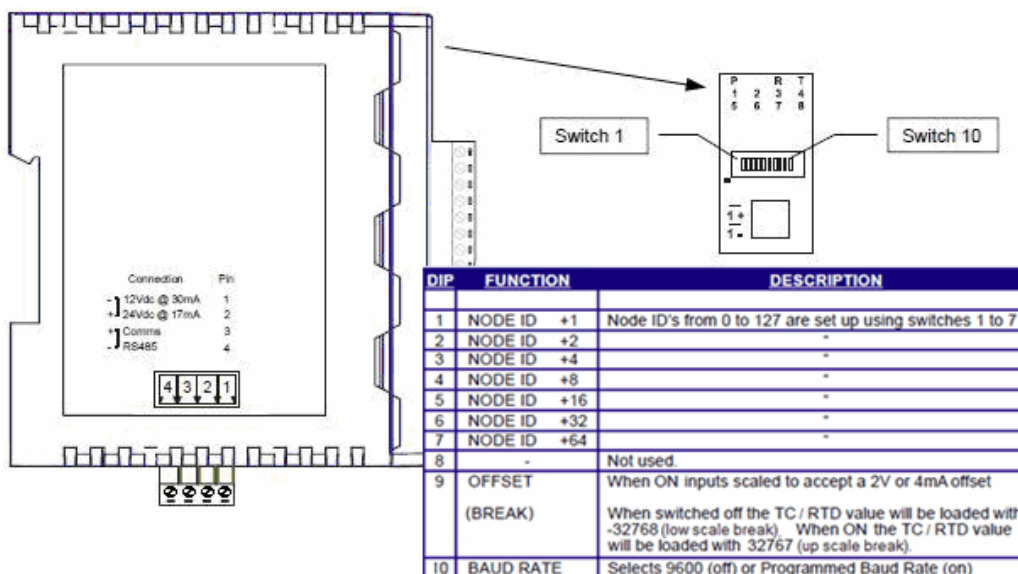
The FDC IO-8TCS/6RTD/8AIIS/8AIVS modules must be configured prior to connecting them to the EnVision communications link. This includes setting the thermocouple or RTD type for temperature models, and programming the proper communication settings for compatibility with EnVision.

NOTE: Analog input models must be programmed for the 0-4095 input range (input type =1). The EnVision Configurator provides linear scaling for each individual voltage and/or current input that allows the user to scale the 0(2)-10V or 0(4)-20mA signal to represent values in engineering units.

For information regarding the steps involved in configuring the various IO modules, consult the FDC IO Manual on using IO Studio software, a free Windows based software package provided by Future Design that provides a simple, easy to use interface for configuring all FDC IO modules. The programmed communication settings must be set as follows:

Baud Rate: 9600
Parity: Even
Stop Bit: 1
Reply Delay: 0

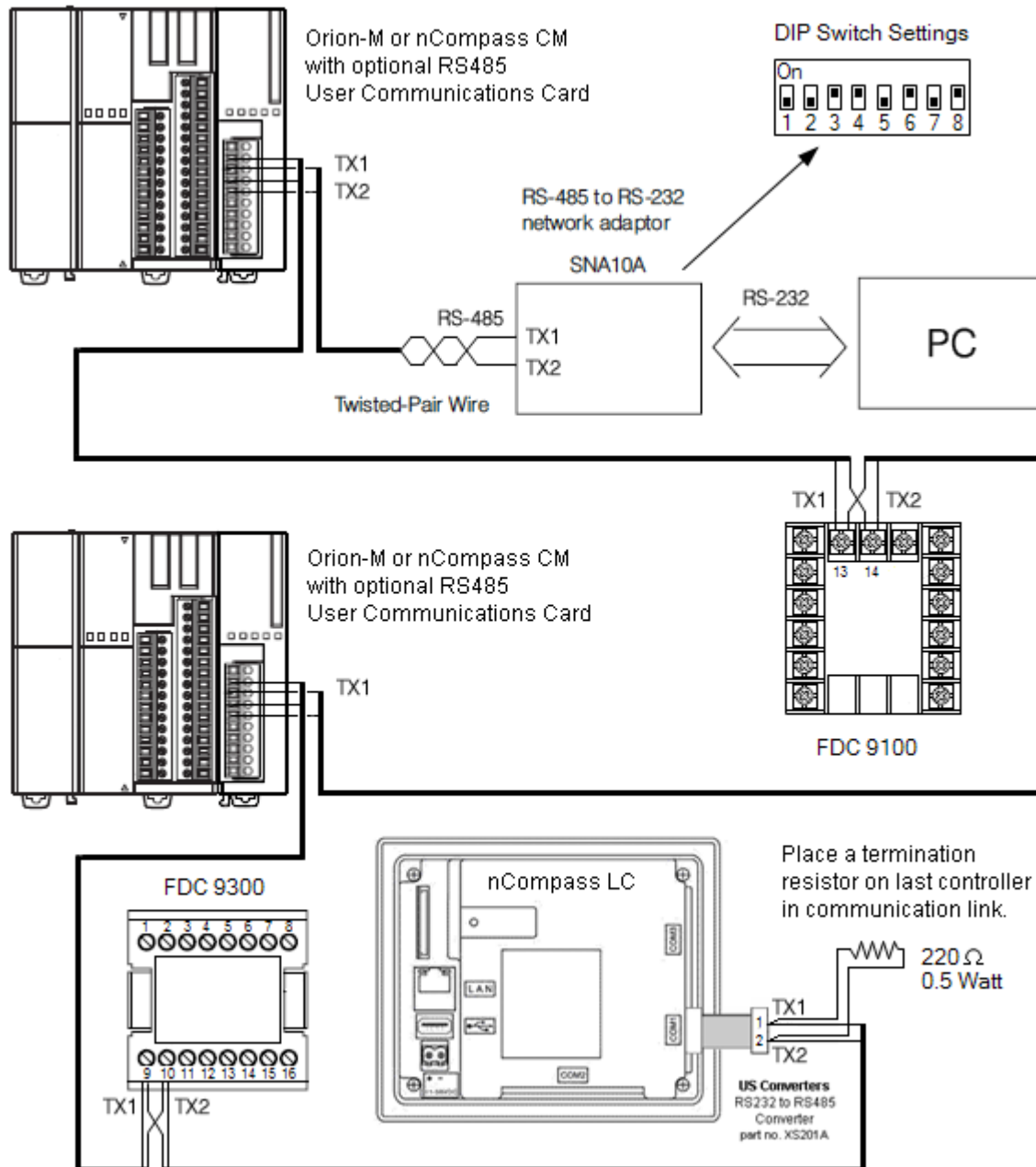
Once the module as been configured using IO Studio, DIP switch ten (0) must be turned on to activate the programmed communication settings so that the module can communicate properly with EnVision. DIP switches 1-7 must also be set to correspond with the desired address for the IO module.



1.2.6 RS485 Serial Communications Wiring

When installing the RS485 serial communications link, the wiring must be run using a minimum of 24 AWG twisted-pair, copper conductors. For short distances, non-shielded wiring can be used as long as proper separation from any power wiring, fluorescent light fixtures or other sources of electrical noise, is maintained. For longer distances, or in environments where a lot of electrical noise is present, shielded twisted-pair wire is recommended.

NOTE: When using shielded twisted-pair, be sure to ground only one end of the cable. Allowing any other portion of the cable shield to come in contact with ground, or grounding both ends, will cause ground loop currents to flow in that section of the cable shield which can disrupt communications.



Many factors affect the performance of an RS485 communications network. These include the total length of the wiring, the quality of wire used, the total number of controllers on the link and what sources of electrical noise are present in the environment. An RS485 network can be run as far as 4000 feet and perform reliably; however, the distances you may be able to achieve in your application may be much less.

Distances 1000 feet or less should present little issues, if any, with performance, regardless of the number of controls on the link. When exceeding 1000 feet, performance may begin to degrade, so it is important to follow good installation practices and use shielded wire. This is exceedingly important in areas where wireless networks or other forms of wireless communications are present. The more exposure the RS485 wiring has to the emissions from the transmitters of wireless devices, the more prone it will be to communications errors. Future Design Controls recommends an Ethernet to serial communications network for any installation where the total wiring distance can exceed 2000 feet.

1.2.7 Ethernet to Serial Communications Wiring

Ethernet communication provides a very robust and reliable backbone for controller communications even in noisy environments, and offers a virtually unlimited distance between the controllers and the PC running EnVision. However, special consideration must be taken when connecting controllers to EnVision over an Ethernet network via the PC-E protocol converters.

To set up this type of communications link, each PC-E (typically one per controller) is configured with a unique IP address. The IP address must then reference the specific Modbus address of the controller, so that the Moxa MB3170, MGate Modbus master can send the proper Modbus command to the correct PC-E in order to communicate with the controller. In addition, the controller communications network should be separated from all other networks within the building.

While the convenience of Ethernet makes it appear that you can simply connect any device to your network and make it available, doing so can cause performance issues when using EnVision. In order for EnVision to perform operations such as data logging for example, it must be able to acquire data when needed to log it. If there is heavy network traffic from other devices like printers, a co-worker downloading a large file from the internet, etc., this can consume most of the network bandwidth at the time EnVision needs to acquire data. Since the network is consumed with other activity, EnVision would not be able to acquire the data it needs and a communications error would result.

To insure proper operation, EnVision should be run on an independent Ethernet network to prevent other business machines from interrupting communications. Setting up the PC to controller network, and the steps required to properly configure the PC-E and Moxa Ethernet to serial converters, is beyond the scope of this manual. Please see Future Design Controls, EnVision Network Communications Guide, for information on how to properly set up an Ethernet to serial communications network.

1.3 Performance Considerations

For each device enabled in EnVision, the software must query data from the controller in order to display the information and data log the values. While communications to each individual device happens very quickly, as more devices are added to the communications link, the total amount of time that elapses between each read of a controller for data increases. This begins to slow the rate at which real-time data can be acquired and displayed in EnVision.

This is not a limitation of the software, but the limitation of the communications link. For a system with a single Orion-M controller, EnVision can capture and display data as often as every 300ms. However, if ten Orion-M systems were attached at the given 300ms per control, that results in a 3 second scan rate. Thus, EnVision is only able to acquire data for each controller once every 3 seconds. Depending on the desired real-time data update rate, it may be necessary to divide the total number of devices between multiple PC's running EnVision to keep the total scan time as short as possible.

EnVision's scan rate can be adjusted by the user under Device Setup in the EnVision runtime program. This adjusts the polling interval, i.e., the minimum period between commands that EnVision sends to read data from each device on the communications link. The scan rate can be adjusted from 100ms to 5000ms (5 seconds). The shorter the time period the faster EnVision scans all enabled devices; however, depending upon the network configuration and controls on the link, the faster scan rate may cause communication errors. It also consumes more of the PC's processor capacity for handling communications rather than data logging or displaying information. By adjusting the scan rate, the user can balance the system for the best overall performance.

1.3.1 Device Scan Rates

In order to acquire data from each device on the communications link, EnVision must send a "read" command to tell the device to send the requested information. There is a limit to the amount of data that can be sent in each response, therefore, certain devices may require more than one read command in order to get all available data from the device.

The total scan time for each device, i.e., the time it takes to acquire all of the data, is equal to the number of read commands multiplied by the scan rate set under Device Setup. For example, an FDC IO module requires one read command. At a 500ms scan rate, it would take 500ms to acquire the data. An Orion-M controller; however, requires 3 read commands. Using the 500ms scan rate, it would take 1.5 seconds to acquire the data for an Orion-M. The number of devices, the types of devices and the scan rate, all play a role in the total time it takes EnVision to acquire data from all devices enabled in the system.

The number of read commands required per device is as follows:

Orion-M iSeries Multi-loop Controls =	3 reads
nCompass CM Controls =	3 reads
nCompass LC Controls =	1 read
100, 300 and C-Series Controls =	1 read
P-Series Profiling Controls =	1 read
L41/91 Limit Controls =	1 read
FDC IO Modules =	1 read

Using the information above, it is possible to calculate the minimum amount of time that is required to obtain real time data updates for any combination of devices. This flexibility allows EnVision to be tailored for virtually any application from a simple data acquisition system using basic IO modules, to a combination central control and acquisition package by combining Orion-M, limit and single loop controls and IO modules, to make a plant wide monitoring system.

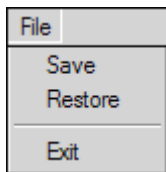
2 Configuring EnVision

The EnVision Configurator program must be run prior to starting EnVision, in order to enter the setup parameters for each controller on the communications network. The configurator is used to select the type of controller that is installed at a given address, and in the case of the Orion-M or nCompass controllers, define how many control loops, monitor points, inputs and outputs the controller has and what names should be assigned to events, process alarms, etc.

All of the configuration data entered for each controller in the system, is then used in the EnVision program to define how and what information is to be displayed. This allows EnVision to be tailored to each individual controller, and only display information for available options on the controller. It also allows you to omit certain options, if you do not want them shown or accessible throughout EnVision.

The EnVision Configurator program is accessed through the Windows start menu. To start the configuration program, select "Programs" from the Windows "Start" menu and select "EnVision Config" from the EnVision programs folder.

The configurator provides a tabbed interface that permits easy navigation and viewing of all controller setup data. The simple "File" menu provides the user with Save, Restore and Exit menu selections for saving and restoring configuration data.



The user can "Save" configuration settings at any time during the edit process. EnVision will also automatically prompt the user to save the configuration data upon exit to prevent accidental loss of any edits made to the configuration. The "Restore" menu item can be used to restore all of the Event Tags, DI Tags, DO Tags or Alarm Tags to the default configurator values, providing a quick and easy method to eliminate any previous configuration entries.

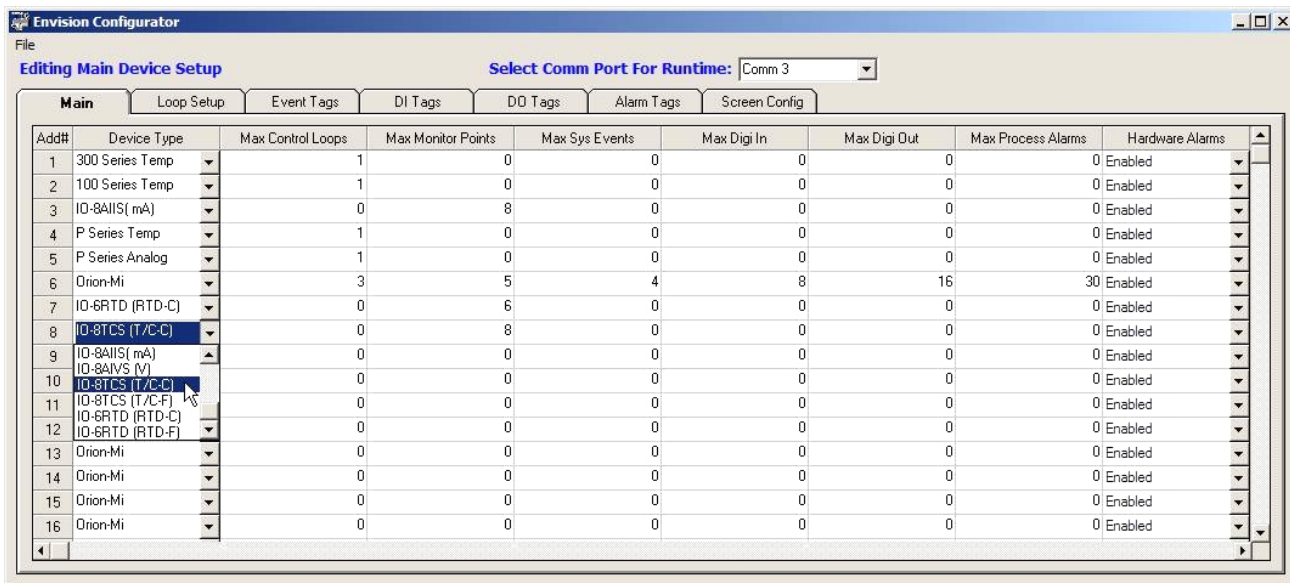
To use the "Restore" function, simply select it from the File menu when either the Event, DI, DO or Alarm Tags screen is selected. Select "Yes" at the prompt to set all entries on the tab to the configurator default tagnames. Note that this affects all entries on the screen for all devices. The restore function can be cancelled by selecting "No" at the system prompt, in case the user accidentally selected the item from the File menu or chooses not to proceed once selected.

NOTE: *Changes made using the EnVision Configurator program only take affect when the EnVision is started. If changes are made using the configurator while EnVision is running, you must quit EnVision and restart it in order for the changes to take affect.*

2.1 Main Device Setup

The “Main” tab of the configurator is used to select the type of controller that is present at each address on the communications link. For each controller, use the “Device Type” drop down menu next to each controller address to select the type of controller that is present at that communications address.

NOTE: The address number (Add#) corresponds to the communications address entered in the controller, so the order at which the controllers are entered in the list, is based on the address each controller has been given.



Add#	Device Type	Max Control Loops	Max Monitor Points	Max Sys Events	Max Digi In	Max Digi Out	Max Process Alarms	Hardware Alarms
1	300 Series Temp	1	0	0	0	0	0	Enabled
2	100 Series Temp	1	0	0	0	0	0	Enabled
3	IO-8AIIS(mA)	0	8	0	0	0	0	Enabled
4	P Series Temp	1	0	0	0	0	0	Enabled
5	P Series Analog	1	0	0	0	0	0	Enabled
6	Orion-Mi	3	5	4	8	16	30	Enabled
7	IO-6RTD (RTD-C)	0	6	0	0	0	0	Enabled
8	IO-8TCS (T/C-C)	0	8	0	0	0	0	Enabled
9	IO-8AIIS(mA)	0	0	0	0	0	0	Enabled
10	IO-8AIVS (V)	0	0	0	0	0	0	Enabled
11	IO-8TCS (T/C-F)	0	0	0	0	0	0	Enabled
12	IO-6RTD (RTD-C)	0	0	0	0	0	0	Enabled
13	Orion-Mi	0	0	0	0	0	0	Enabled
14	Orion-Mi	0	0	0	0	0	0	Enabled
15	Orion-Mi	0	0	0	0	0	0	Enabled
16	Orion-Mi	0	0	0	0	0	0	Enabled

The **Device Type** controller selections include the Orion-Mi, 300 Series Temp and 300 Series Analog, 100 Series Temp and 100 Series Analog, C Series Temp and C Series Analog, P Series Temp and P Series Analog and L91/L41 Temp and L91/L41 Analog. IO Module selections include the IO-8IIA(mA), the IO-8AIVS(V), the IO-8TCS (T/C-C) and (T/C-F), the IO-6RTD (RTD-C) and (RTD-F), the nCompass LC and the nCompass CM.

When selecting one of the single-loop controller types, it is important to select the proper type corresponding to the input type of the controller. The “Temp” device type is for temperature measurement inputs such as an RTD or thermocouple. The “Analog” type is for controllers with a voltage or milliamp input type, i.e., 0-10V, 0-20mA, etc. If the device type does not match the input type of the controller, EnVision will not display the process value correctly or properly set setpoints. The type selection tells EnVision how to scale the readings so that the information is displayed correctly.

When selecting the thermocouple (IO-8TCS) or RTD (IO-6RTD) module types, select the type (C/F) that corresponds to the temperature units, Centigrade or Fahrenheit, that the card is configured for.

The **Max Control Loops** is used to enter the number of control loops installed on an Orion-M, nCompass LC or nCompass CM controller. This enables the associated data fields in EnVision for displaying loop information and setting setpoints. For single-loop controller types, this field defaults to 1, as there is one control loop associated with the controller.

The **Max Monitor Points** field is used to enter the number of monitor points installed on an Orion-M or nCompass CM controller. This enables the associated data fields in EnVision for displaying the monitor point values. For the FDC IO modules, this field defaults to 8 for the analog, voltage and thermocouple types. For the RTD type IO module, the field defaults to a value of 6. For single-loop controller types, this field defaults to 0, as there are no monitor points associated with the controller.

NOTE: *The nCompass LC does not offer monitor points, but can be configured for monitor only operation on one or both loops. If one or both loops are configured as a monitor only point, the “loop” will still be entered under max control loops. To hide the set point and percent output fields for the loop in EnVision, leave the “SP Name” and %Out Name” fields blank under the loop setup for that loop.*

The **Max Sys Events** field is used to enter the number of system events configured on an Orion-M, nCompass LC or nCompass CM controller. This enables the associated data fields in EnVision for displaying event status, and also provides the ability to turn system events on and off. For single-loop controller types, this field defaults to 0, as there are no events associated with the controller.

The **Max Digi In** field is used to enter the number of digital inputs installed on an Orion-M or nCompass CM controller. This enables the associated data fields in EnVision for displaying the status of the digital inputs. For single-loop controller types, this field defaults to 0, as there are no digital inputs associated with the controller.

The **Max Digi Out** field is used to enter the number of digital outputs installed on an Orion-M or nCompass CM controller. This enables the associated data fields in EnVision for displaying the status of the digital outputs. For single-loop controller types, this field defaults to 0, as there are no digital outputs associated with the controller.

The **Max Process Alarms** field is used to enter the number of alarms configured on an Orion-M, nCompass LC or nCompass CM controller. This enables the associated data fields in EnVision for displaying the alarm configuration, and also provides the ability to configure alarm types and adjust associated alarm setpoints on the Orion-M or nCompass CM controller. The alarm set points are not available for the nCompass LC control. This option simply allows the user to configure the alarm tag for the alarm.

For single-loop controller types, this field defaults to 0. In order to configure an alarm on a single-loop controller, it must be done at the control itself. EnVision does not provide access to the alarm settings on single-loop type controls, as the outputs of the controllers can be configured for an alarm or a control output.

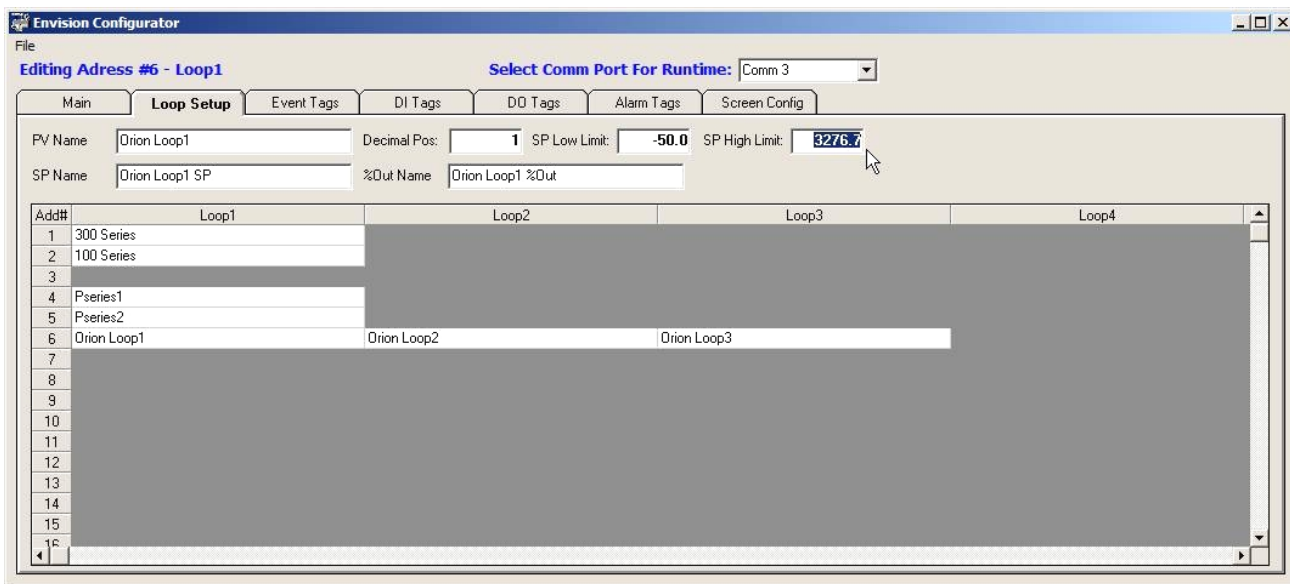
The **Hardware Alarms** field is used to enable and disable alarm reporting for the device. This is typically used to disable alarm reporting for the second and third outputs of the single loop controllers (100, 300, C and P-Series). This allows the additional outputs to be used as a control outputs for heat/cool operation for example. If the second and or third output of a controller is used as a control output, the hardware alarms should be set to disabled. Otherwise, each time the output turns on based on the demand for cooling for example, EnVision will report that the controller is in alarm.

If the outputs are configured as alarm outputs on the controller, enabling the hardware alarms will allow EnVision to report the alarm condition when it occurs. If there is no desire to have EnVision report the alarm condition, leaving the field set to disabled will prevent EnVision from reporting the alarm even though the output is configured as an alarm output on the controller.

For Orion-M, nCompass LC and nCompass CM controllers, disabling the hardware alarms for the controller will prevent any of the alarms configured on the controller from being reported in EnVision. They will still perform there function as configured in the controller, but the alarm state will not be provided in EnVision. Thus, the alarm may be active at the controller, but there will be no indication from EnVision.

2.2 Loop Setup

The “Loop Setup” tab is used to enter the display names for the process variables, setpoints and percentage of outputs of each controller configured in EnVision. It is also used to define the display resolution (decimal point) to be used when displaying data from each control loop and to define the setpoint limits to be used in EnVision.



NOTE: If you do not enter a description for a field, i.e., the loop control PV Name or SP Name for example, the field will not be shown in EnVision and you will be unable to view the data, data log it or change its value, even though you enabled the loop on the Main tab.

The EnVision runtime software will only display fields that have been given a name. This allows you to choose which values you want available in EnVision, for each controller configured. If you want to only view the process variable of a given loop, then by entering a description only for the “PV Name”, the setpoint and percent output fields will be hidden and not shown when EnVision is run. This allows you to remove any information deemed irrelevant for your application, and only provide accessibility, and display data from each controller that is important for operations.

Only loops enabled under the Main tab will be available for edit. Loops not enabled will have their fields “grayed out” and will not be able to be changed. By default, all name fields are blank, the decimal point is set to 0, and the low and high setpoints limits are set to -32767 and 32767 respectively. To enter information for a control loop, click on the loop field for the address of the control you wish to modify in the table.

The header at the top of the screen will indicate which loop is being modified, i.e., “Editing Address #6 – Loop 1” for example. To enter a name for PV, SP or %Out, click on the field and type in the desired description. Names can be up to 20 characters in length. Special characters including a period “.”, a comma “,” and a slash “/” or “\” are not permitted.

Set the decimal position to match that of the controller’s configuration. If the decimal point does not match, EnVision will not display the values correctly, and any setpoint entered, will not be set to the controller properly. For example, if the controller is configured for 1 decimal point, and EnVision is set to a decimal position of 0, a value of 24.0 at the controller will be displayed as 240 in EnVision. Setting a setpoint of 24 in EnVision could result in a setpoint at the controller of 2.4.

The setpoint low and high limits can be used to limit the setpoint range the user is allowed to enter for a control loop in EnVision. These settings do not affect the controller itself. These are separate software limits in EnVision and only limit setpoint entry through the software.

NOTE: *The set point limits for the controller should be set to match or be inside of the actual controller set point limits. If the set point limits are outside of the controller range, a communications error can occur when the user tries to enter a set point outside of the range of the controller.*

2.2.1 Monitor Points

The monitor points are also configured from the Loop Setup tab. When configuring monitor points, whether it is an Orion-M monitor point or an input from one of the FDC IO modules, only the PV name and decimal point selections will be shown, as there is no setpoint or %Out associated with the monitor points.

Just as with the loops, any monitor points that are not assigned a “PV Name”, will not be shown in the EnVision runtime software. For Orion-M or nCompass CM monitor points, the decimal point must be set to match the resolution of the monitor point on the controller in order for the value to be displayed properly.

For the FDC IO modules, the display resolution of the thermocouple and RTD modules can be set between 0 and 1. For the analog type modules (voltage and current), the resolution can be set between 0 and 3. In addition, when configuring a monitor input of an analog module, minimum and maximum scale fields are provided in order to scale the monitor point to match the input source.

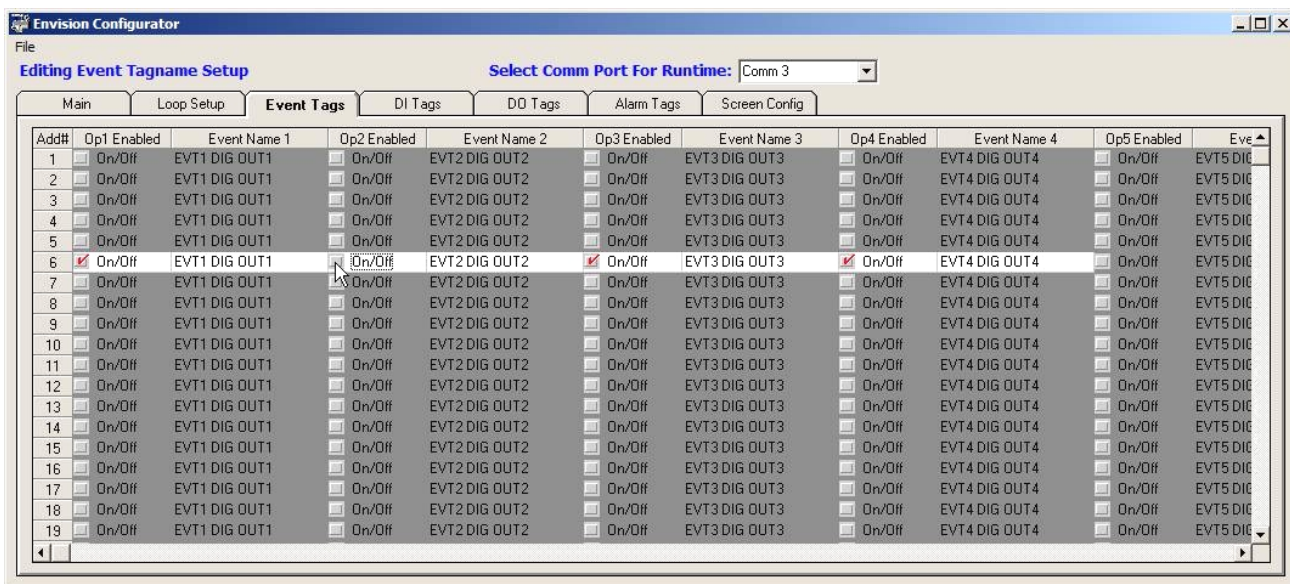
For example, if a pressure sensor was connected with a range of 0-100psi, setting the minimum and maximum scale values to 0 and 100, will instruct EnVision to scale the display value from 0 to 100 based on an input signal of 0-10V or 0-20mA to the module input. Since the scaling is performed by EnVision, the 0-100psi signal from the pressure sensor could also be displayed as 0 to 689.5kPa or any other equivalent measurement.

EnVision’s internal scaling allows the IO module’s inputs to be linearly scaled to match virtually any type of sensor input or signal. Note that the minimum and maximum scale values are limited between -32768 and 32767. Thus, if the decimal point is set to a value of 1, the range becomes -3276.8 to 3276.7; a decimal point value of 2 limits the fields to -327.68 to 327.67, and so on. When choosing engineering units for the display range, it may be necessary to limit the decimal point resolution depending upon the total input range of the sensor or signal to the module.

2.3 Event Tags

The “Event Tags” tab of the configurator allows the user to assign names to the various system events of each Orion-M, nCompass LC and nCompass CM controller in the system. Event names can be assigned with up to 17 characters in length. Special characters including a period “.”, a comma “,” and a slash “/” or “\” are not permitted. Only the number of system events specified on the Main setup tab will be available for edit.

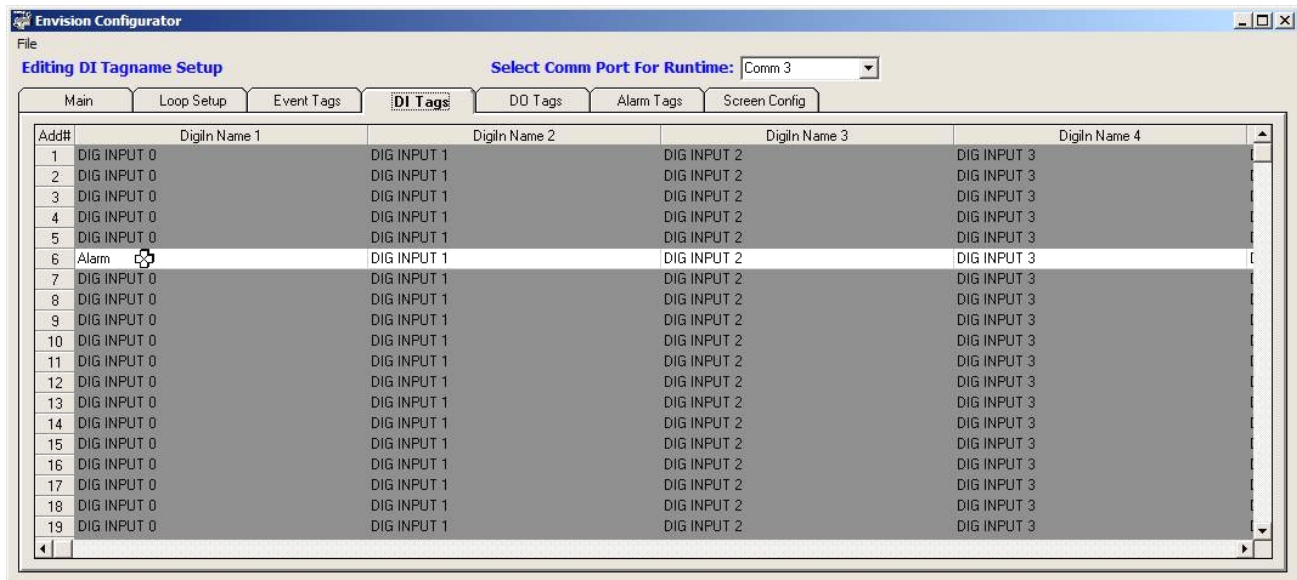
Events can also be enabled or disabled individually, so that only those events that are enabled can be controlled through EnVision. If the event has not been enabled, the user can view the event state through EnVision, but will be unable to turn it on or off. All events are disabled by default. To enable an event, place a red check in the “enabled” checkbox. Note that this selection includes both manual event and profile event selections.



Add#	Op1 Enabled	Event Name 1	Op2 Enabled	Event Name 2	Op3 Enabled	Event Name 3	Op4 Enabled	Event Name 4	Op5 Enabled	Event Name 5
1	☐	EVT1 DIG OUT1	☐	EVT2 DIG OUT2	☐	EVT3 DIG OUT3	☐	EVT4 DIG OUT4	☐	EVT5 DIG OUT5
2	☐	EVT1 DIG OUT1	☐	EVT2 DIG OUT2	☐	EVT3 DIG OUT3	☐	EVT4 DIG OUT4	☐	EVT5 DIG OUT5
3	☐	EVT1 DIG OUT1	☐	EVT2 DIG OUT2	☐	EVT3 DIG OUT3	☐	EVT4 DIG OUT4	☐	EVT5 DIG OUT5
4	☐	EVT1 DIG OUT1	☐	EVT2 DIG OUT2	☐	EVT3 DIG OUT3	☐	EVT4 DIG OUT4	☐	EVT5 DIG OUT5
5	☐	EVT1 DIG OUT1	☐	EVT2 DIG OUT2	☐	EVT3 DIG OUT3	☐	EVT4 DIG OUT4	☐	EVT5 DIG OUT5
6	☒	EVT1 DIG OUT1	☐	EVT2 DIG OUT2	☒	EVT3 DIG OUT3	☒	EVT4 DIG OUT4	☐	EVT5 DIG OUT5
7	☐	EVT1 DIG OUT1	☐	EVT2 DIG OUT2	☐	EVT3 DIG OUT3	☐	EVT4 DIG OUT4	☐	EVT5 DIG OUT5
8	☐	EVT1 DIG OUT1	☐	EVT2 DIG OUT2	☐	EVT3 DIG OUT3	☐	EVT4 DIG OUT4	☐	EVT5 DIG OUT5
9	☐	EVT1 DIG OUT1	☐	EVT2 DIG OUT2	☐	EVT3 DIG OUT3	☐	EVT4 DIG OUT4	☐	EVT5 DIG OUT5
10	☐	EVT1 DIG OUT1	☐	EVT2 DIG OUT2	☐	EVT3 DIG OUT3	☐	EVT4 DIG OUT4	☐	EVT5 DIG OUT5
11	☐	EVT1 DIG OUT1	☐	EVT2 DIG OUT2	☐	EVT3 DIG OUT3	☐	EVT4 DIG OUT4	☐	EVT5 DIG OUT5
12	☐	EVT1 DIG OUT1	☐	EVT2 DIG OUT2	☐	EVT3 DIG OUT3	☐	EVT4 DIG OUT4	☐	EVT5 DIG OUT5
13	☐	EVT1 DIG OUT1	☐	EVT2 DIG OUT2	☐	EVT3 DIG OUT3	☐	EVT4 DIG OUT4	☐	EVT5 DIG OUT5
14	☐	EVT1 DIG OUT1	☐	EVT2 DIG OUT2	☐	EVT3 DIG OUT3	☐	EVT4 DIG OUT4	☐	EVT5 DIG OUT5
15	☐	EVT1 DIG OUT1	☐	EVT2 DIG OUT2	☐	EVT3 DIG OUT3	☐	EVT4 DIG OUT4	☐	EVT5 DIG OUT5
16	☐	EVT1 DIG OUT1	☐	EVT2 DIG OUT2	☐	EVT3 DIG OUT3	☐	EVT4 DIG OUT4	☐	EVT5 DIG OUT5
17	☐	EVT1 DIG OUT1	☐	EVT2 DIG OUT2	☐	EVT3 DIG OUT3	☐	EVT4 DIG OUT4	☐	EVT5 DIG OUT5
18	☐	EVT1 DIG OUT1	☐	EVT2 DIG OUT2	☐	EVT3 DIG OUT3	☐	EVT4 DIG OUT4	☐	EVT5 DIG OUT5
19	☐	EVT1 DIG OUT1	☐	EVT2 DIG OUT2	☐	EVT3 DIG OUT3	☐	EVT4 DIG OUT4	☐	EVT5 DIG OUT5

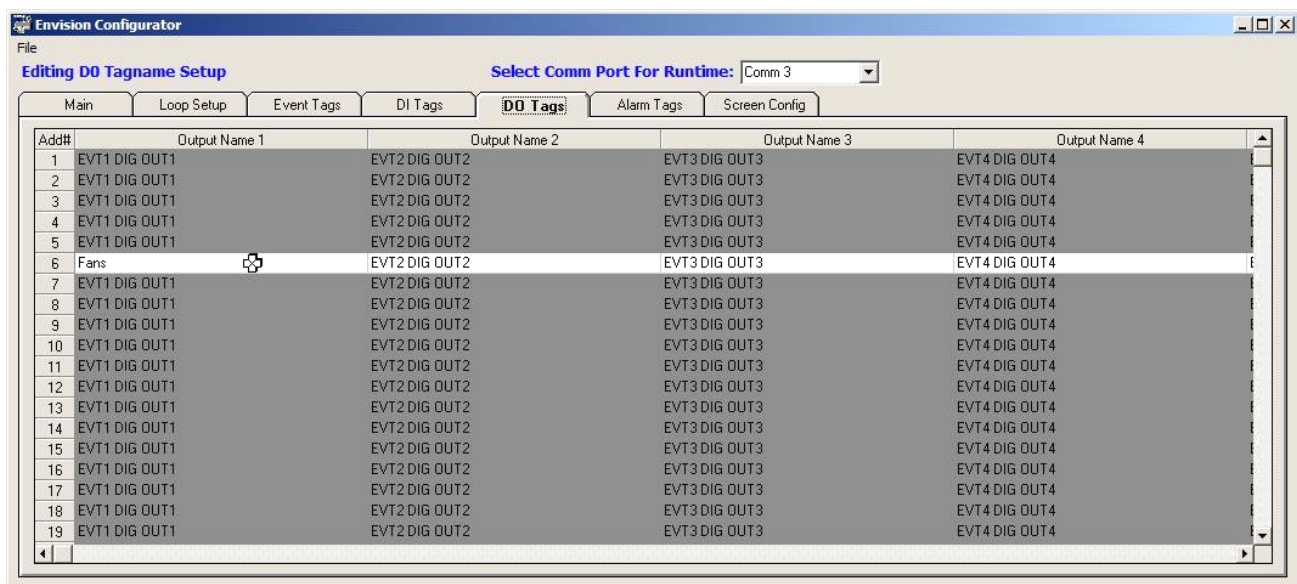
2.4 Digital Input (DI) Tags

The “DI Tags” tab of the configurator allows the user to assign names to the various digital inputs of each Orion-M and nCompass CM controller in the system. Names can be assigned with up to 30 characters in length. Special characters including a period “.”, a comma “,” and a slash “/” or “\” are not permitted. Only the number of digital inputs specified on the Main setup tab will be available for edit.



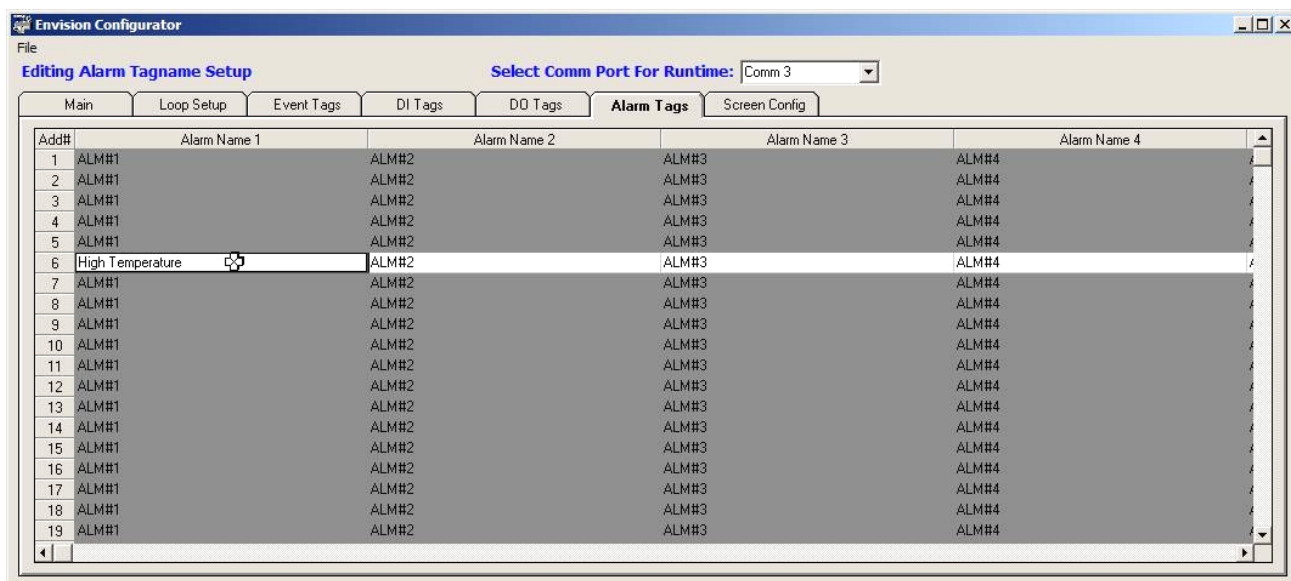
2.5 Digital Output (DO) Tags

The “DO Tags” tab of the configurator allows the user to assign names to the various digital outputs of each Orion-M and nCompass CM controller in the system. Names can be assigned with up to 30 characters in length. Special characters including a period “.”, a comma “,” and a slash “/” or “\” are not permitted. Only the number of digital outputs specified on the Main setup tab will be available for edit.



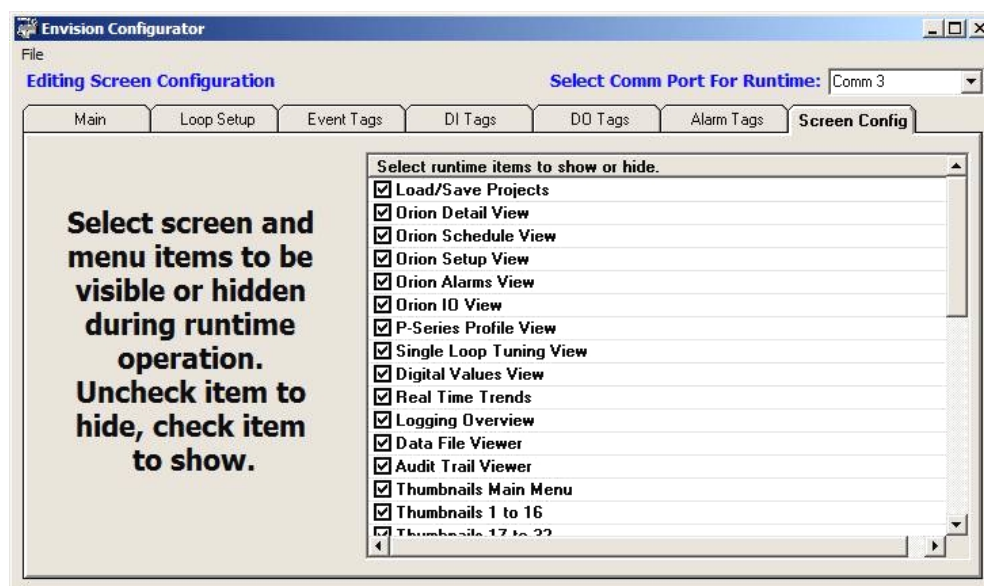
2.6 Alarm Tags

The “Alarm Tags” tab of the configurator allows the user to assign names to the various process alarms of each Orion-M, nCompass LC and nCompass CM controller in the system. Names can be assigned with up to 30 characters in length. Special characters including a period “.”, a comma “,” and a slash “/” or “\” are not permitted. Only the number of alarms specified on the Main setup tab will be available for edit.



2.7 Screen Configuration

The “Screen Config” tab of the configurator allows the user to customize the appearance of the EnVision runtime menus and screens. By default, all items are selected (checked), so that they are shown when EnVision is run. To remove menu items or screens from the EnVision runtime, de-select the desired items by removing the check mark next to the chosen item(s).



2.7.1 EnVision Screen Configuration Items

The following table provides a list of the available screen configuration items in EnVision, where to find the menu/item(s) applicable to the screen item and a description of what it applies to.

Screen Item	Menu/Item Location	Description
Load/Save Projects	File/Load Project-Save Project	provides menu items allowing user to load and save projects
Orion Detail View	View/Orion Detail View	provides menu item allowing access to the Orion detail view screen
Orion Schedule View	View/ Orion Detail View – Schedules Tab	provides schedules tab selection to access Orion-M schedules which includes the ability to create, modify and download profiles (affects all Orion-M controllers) Note: in order to provide access to this item, the “Orion Detail View” screen configuration item must also be enabled.
Orion Setup View	View/Orion Detail View – Setup Tab	provides setup tab selection to access Orion-M alarms settings, IO monitor and schedule options (affects all Orion-M controllers) Note: in order to provide access to this item, the “Orion Detail View” screen configuration item must also be enabled.
Orion Alarms View	View/Orion Detail View – Setup Tab/Alarm Settings Tab	provides tabbed selection to view/configure Orion-M alarms (affects all Orion-M controllers) Note: in order to provide access to this item, the “Orion Setup View” screen configuration item must also be enabled.
Orion IO View	View/Orion Detail View – Setup Tab/IO Monitor Tab	provides tabbed selection to view IO status of the Orion-M (affects all Orion-M controllers) Note: in order to provide access to this item, the “Orion Setup View” screen configuration item must also be enabled.
P-Series Profile View	View/P-Series Profiler	provides menu item allowing access to the P-Series profiler screens including access to profile run
Single Loop Tuning View	View/Single Loop Tuning	provides menu item allowing access to the single loop tuning screen
Digital Values View	View/Digital Values	provides menu item allowing access to the digital values screen
Real Time Trends	View/Real Time Trends	provides menu item allowing access to all real time trends
Logging Overview	View/Logging Overview	provides menu item allowing access to the logging overview screen
Data File Viewer	View/Data File Viewer	provides menu item allowing access to the data file viewer
Audit Trail Viewer	View/Audit Trail Viewer	provides menu item allowing access to the audit trail viewer
Thumbnails Main View	Thumbnails (main menu)	provides menu item allowing access to individual device thumbnail view menu items
Thumbnails 1 to 16	Thumbnails/Devices 1 - 16	provides menu item to access thumbnails for devices 1 - 16 Note: in order to provide access to this menu item, the “Thumbnails Main View” screen configuration item must also be enabled.

Screen Item	Menu/Item Location	Description
Thumbnails 17 to 32	Thumbnails/Devices 17 - 32	provides menu item to access thumbnails for devices 17 - 32 Note: in order to provide access to this menu item, the "Thumbnails Main View" screen configuration item must also be enabled.
Thumbnails 33 to 48	Thumbnails/Devices 33 - 48	provides menu item to access thumbnails for devices 33 - 48 Note: in order to provide access to this menu item, the "Thumbnails Main View" screen configuration item must also be enabled.
Thumbnails 49 to 64	Thumbnails/Devices 49 - 64	provides menu item to access thumbnails for devices 49 - 64 Note: in order to provide access to this menu item, the "Thumbnails Main View" screen configuration item must also be enabled.
Thumbnails 65 to 80	Thumbnails/Devices 65 - 80	provides menu item to access thumbnails for devices 65 - 80 Note: in order to provide access to this menu item, the "Thumbnails Main View" screen configuration item must also be enabled.
Thumbnails 81 to 96	Thumbnails/Devices 81 - 96	provides menu item to access thumbnails for devices 81 - 96 Note: in order to provide access to this menu item, the "Thumbnails Main View" screen configuration item must also be enabled.
Thumbnails 97 to 112	Thumbnails/Devices 97 - 112	provides menu item to access thumbnails for devices 97 - 112 Note: in order to provide access to this menu item, the "Thumbnails Main View" screen configuration item must also be enabled.
Thumbnails 113 to 128	Thumbnails/Devices 113 - 128	provides menu item to access thumbnails for devices 113 - 128 Note: in order to provide access to this menu item, the "Thumbnails Main View" screen configuration item must also be enabled.
Setup Menu	Setup (main menu)	provides menu item that gives access to device setup, system security, system data logging, software device alarms, relay card settings and email/web server settings
Device Setup	Setup/Device Setup	provides menu item that allows user to turn controllers on and off in EnVision Note: in order to provide access to this menu item, the "Setup Menu" screen configuration item must also be enabled.
System Security	Setup/System Security	provides menu item that allows user to access security settings for EnVision including users and user rights Note: in order to provide access to this menu item, the "Setup Menu" screen configuration item must also be enabled.

Screen Item	Menu/Item Location	Description
System Data Logging	Setup/System Data Logging	provides menu item that allows user to access system data log settings Note: in order to provide access to this menu item, the "Setup Menu" screen configuration item must also be enabled.
Software Device Alarms	Setup/Software Device Alarms	provides menu item that allows user to access software device alarms Note: in order to provide access to this menu item, the "Setup Menu" screen configuration item must also be enabled.
Relay Card Settings	Setup/Relay Card Settings	provides menu item that allows user to access relay card settings Note: in order to provide access to this menu item, the "Setup Menu" screen configuration item must also be enabled.
Email Client Settings	Setup/Email Client Settings	provides menu item that allows user to access email settings Note: in order to provide access to this menu item, the "Setup Menu" screen configuration item must also be enabled.
Web Server Settings	Setup/Web Server Settings	provides menu item that allows user to access web server settings Note: in order to provide access to this menu item, the "Setup Menu" screen configuration item must also be enabled.
Main Users Menu	Users (main menu)	provides menu item that gives access to user log on/log off, current user, change password and system operator message menu items
Current User	Users/Current User	provides menu item to view current user logged into EnVision Note: in order to provide access to this menu item, the "Main Users Menu" screen configuration item must also be enabled.
Change Password	Users/Change Password	provides menu item which allows user to change their password Note: in order to provide access to this menu item, the "Main Users Menu" screen configuration item must also be enabled.
System Operator Message	Users/System Operator Message	provides menu item which allows user to add operator events to the system log file Note: in order to provide access to this menu item, the "Main Users Menu" screen configuration item must also be enabled.
System Mode Menu	Mode (main menu)	provides menu item which allows selection of simulation mode where all data values are simulated by EnVision software or real time mode in which all data is gathered from attached controllers Note: in order to provide access to this menu item, the "Main Users Menu" screen configuration item must also be enabled.

2.8 Select Comm Port for Runtime

The “Select Comm Port for Runtime” field allows the user to select which serial port on the computer is to be used for communicating with the enabled devices. Note that when using USB to serial port converters, the port assignment for the converter can change depending upon which USB port it is connected to. Therefore, once the adapter has been connected to the computer and the proper port number is assigned in this field, the adapter should always remain connected to the same USB port for use with EnVision.