

PHOENIX CONTACT BUSBAR CONTROLLER (IL ETH BK DI8 DO4) – FMS 5 SETUP AND CONFIGURATION V3

TECHNICAL BULLETIN TCC-103
(3/9/2022) Rev C

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Intent

The purpose of this document is to provide instructions for setting up Phoenix Contact Busbar Controller (IL ETH BK DI8 D04) to work with FMS 5 software version 5.1.0 and later. It contains information about how to setup networking on the controller and how to setup FMS 5 configuration to access sensors and digital outputs on the controller.

Screenshots used throughout this document are for guidance purposes only. Actual screenshots may differ slightly from those contained in this document.

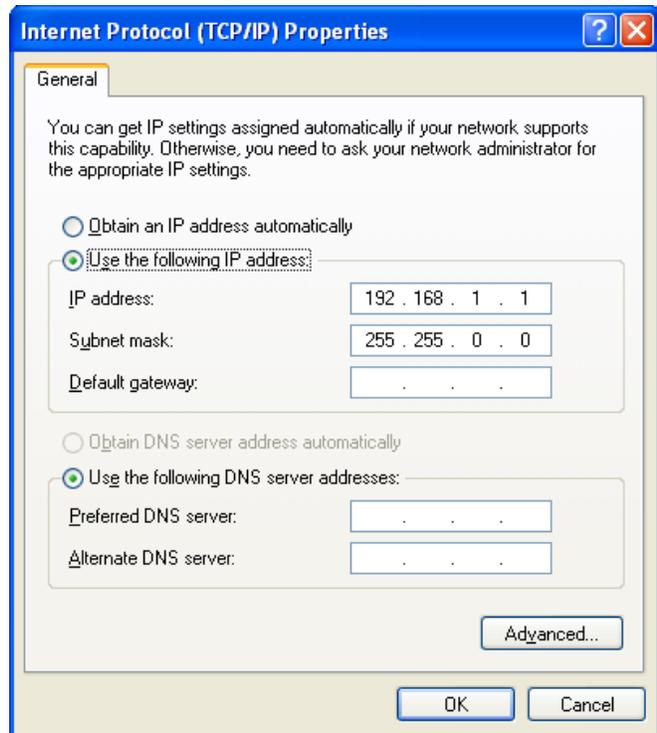
Controller (IL ETH BK DI8 D04) Installation and Configuration

For wiring diagrams and power requirements consult Phoenix Contact documentation that has been supplied with your controller.

FMS 5 system uses an Ethernet connection to talk to the controller. Generally, the controller and FMS 5 will be connected via an Ethernet switch/hub on a private subnet with address 192.168.x.x and net mask 255.255.0.0. Configure FMS 5 network controller with the following values as shown in the screen on the right.

NOTE: Do not use “Obtain an IP address automatically” even if DHCP server is present on the given network since there is no guarantee that IP addresses will stay the same once the lease expires.

It is important to setup a fixed network address for the FMS 5 computer before any further setup takes place on the controller side.

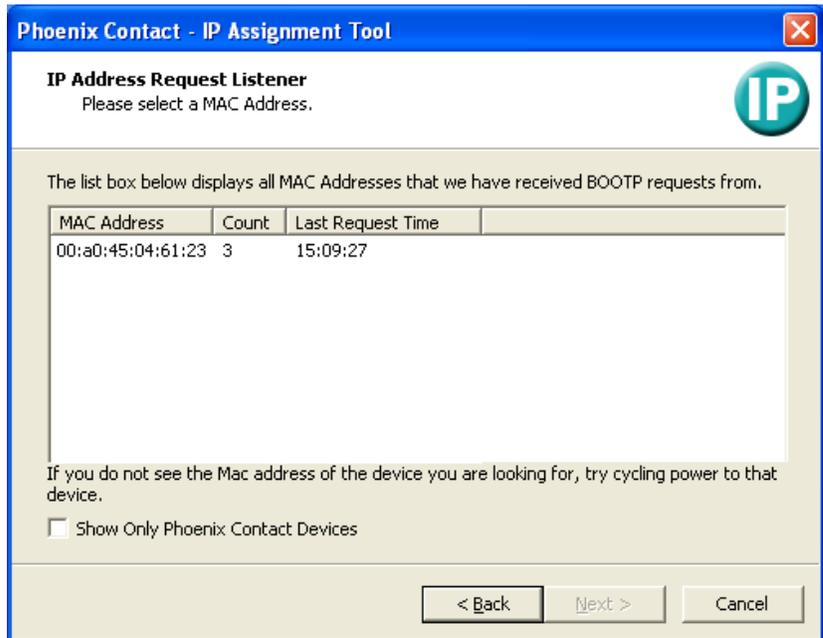
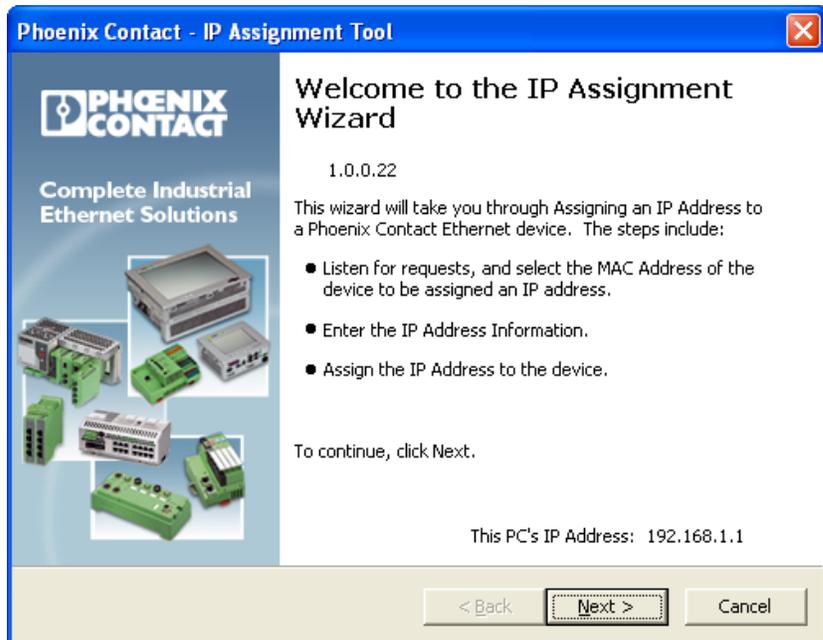


Connecting Phoenix Contact Controller

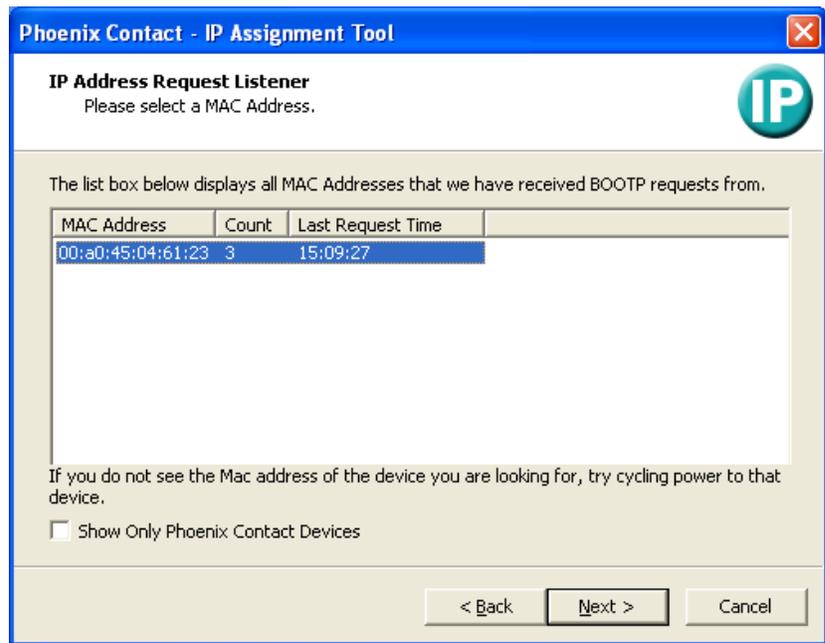
Initially, Phoenix Contact Controller is setup to use BOOTP protocol to request an IP address from the BOOTP server. You will need the IP Assign utility to configure an IP address on the controller. IP Assign can be obtained from the Phoenix Contact web site at www.phoenixcontact.com and search for IP Assign. This is a free utility application available for Phoenix Contact devices.

Once you have the IP Assign utility downloaded, start it up and it will come up with the screen shown to the right.

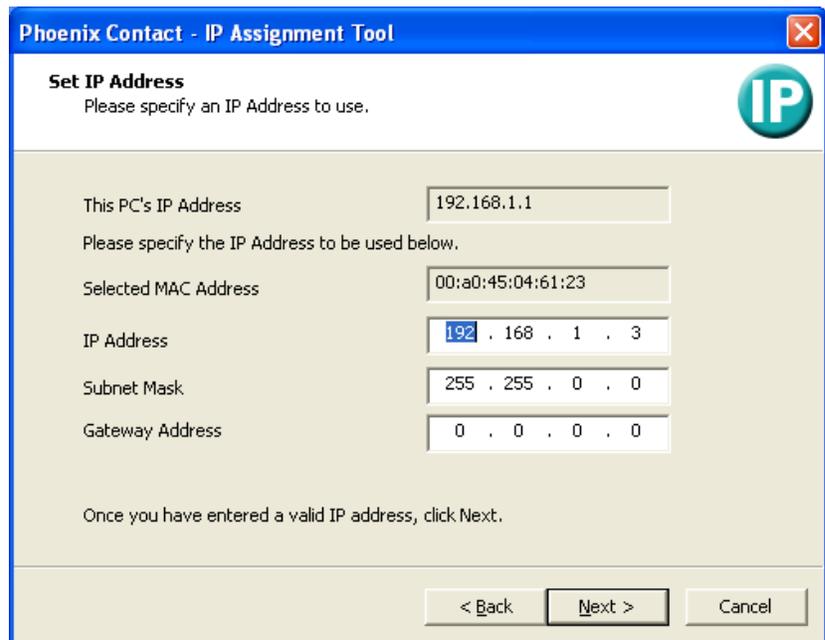
Click **Next** to proceed. IP Assign will try to detect available controllers, as shown in the screen on the right.



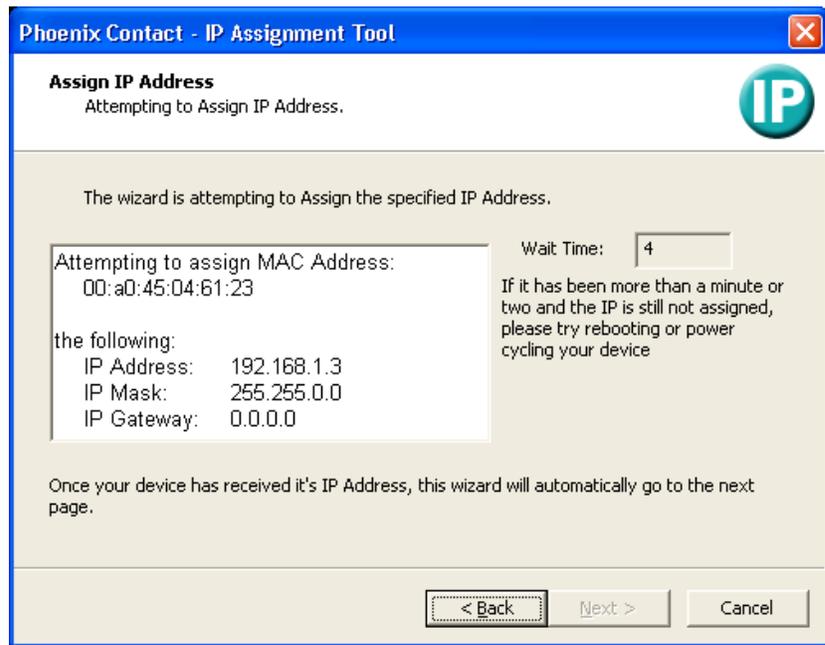
If the controller is not detected try power cycling it by either unplugging the power from it or removing the black power module on the controller for 30 seconds and plugging it back in again. Once the controller is detected, IP Assign will list its MAC Address and some additional information. Select the controller you want to assign the IP address to and click **Next**.



On the opposite screen enter the IP address and subnet mask that corresponds to your network. Typically the first three parts of the address would be the same as you setup on the FMS 5 side (computer) and the fourth part has to be different from the computer.



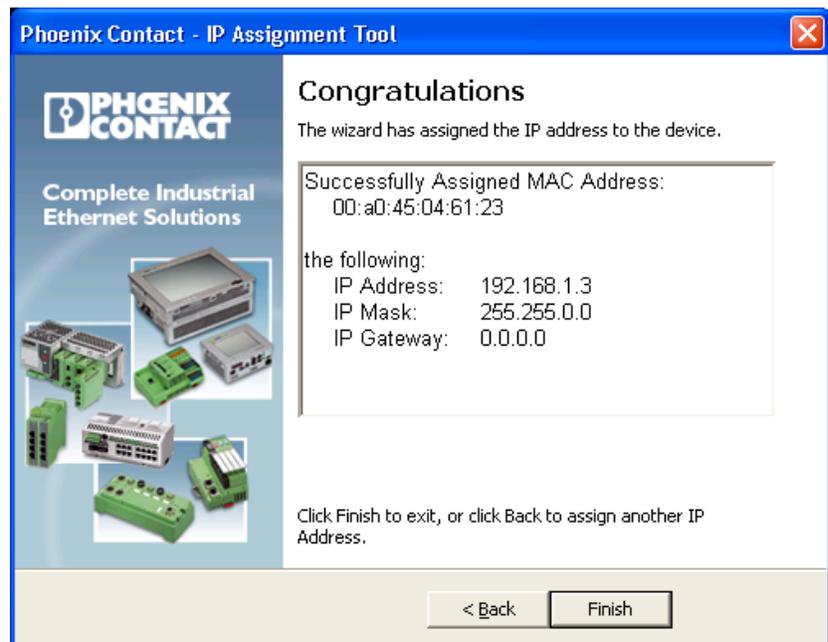
Set subnet mask to 255.255.0.0 and leave the Gateway address as 0.0.0.0. Click **Next** and the application will attempt to assign specified parameters to the controller.



Once parameters are assigned successfully, the screen on the right will appear, reporting success.

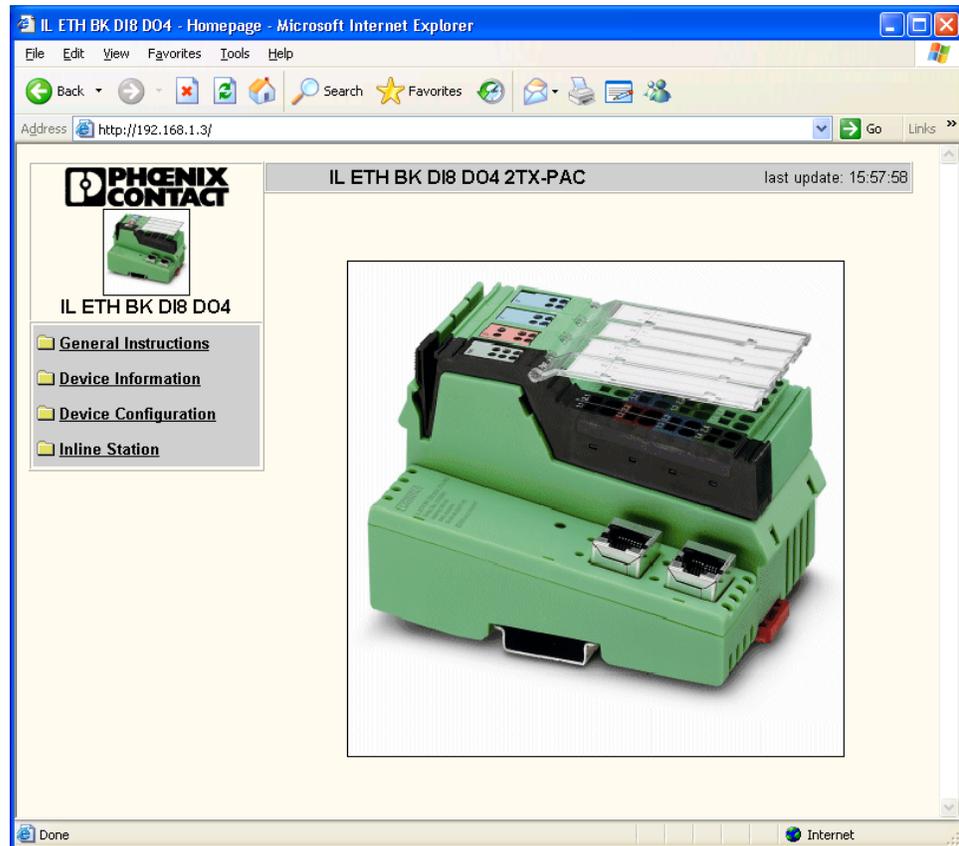
Click **Finish** to exit the application.

In case that assigning IP address takes too long, click **Cancel**, restart application, power-cycle the controller and repeat the previous steps.



Configuring Phoenix Contact Controller via Built-in Web Pages

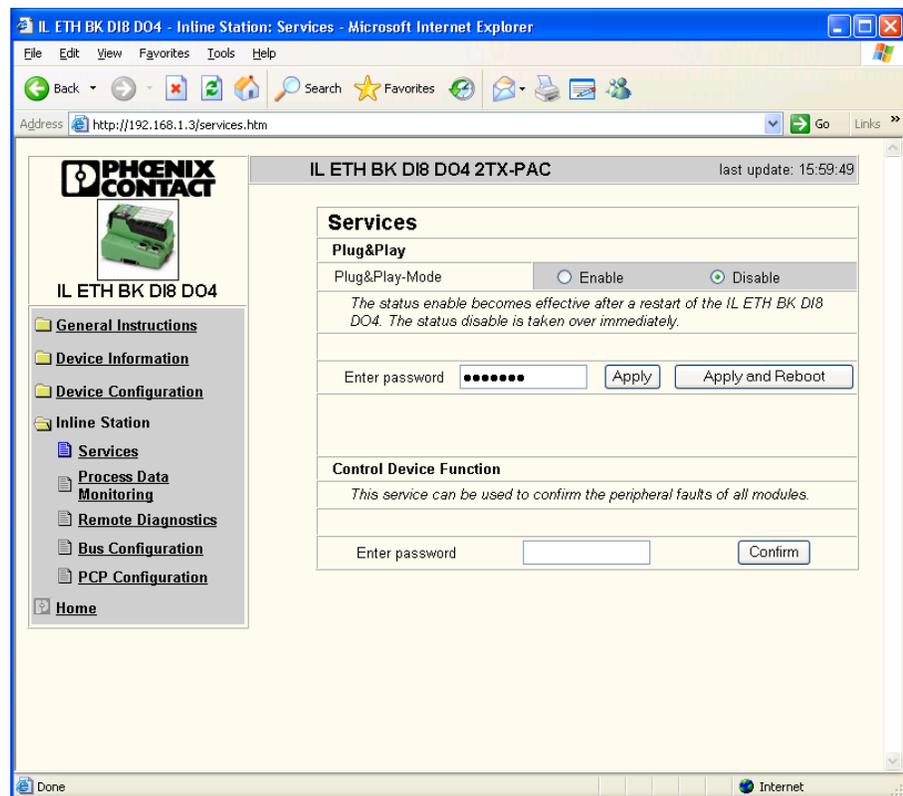
Once the IP address is assigned to the controller you can access configuration web pages directly. In the Internet browser (e.g. Internet Explorer, Mozilla Firefox) type in the previously assigned IP address of the controller.



Disabling Plug and Play Mode

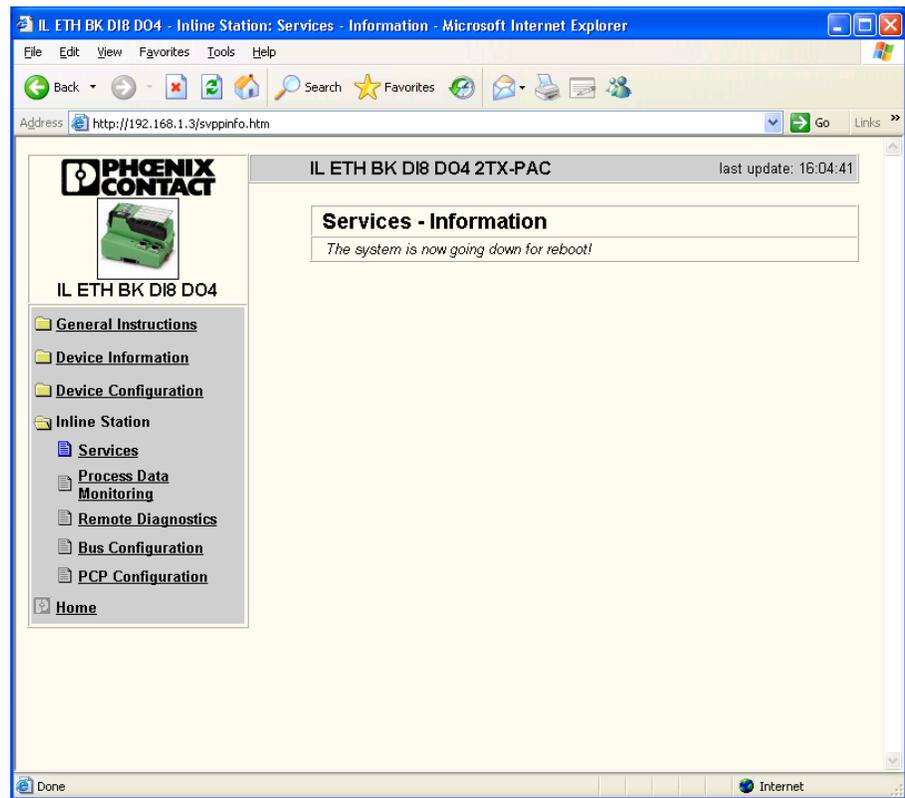
Plug and Play allows the Phoenix to determine what modules are included on the bus. All modules that are intended for use should have been installed and the Phoenix powered up prior to disabling plug and play.

It is necessary to modify this setting in order for the controller to communicate properly with the FMS 5 system. Select “**Device Configuration**” and under the submenu choose “**Services**”.



Set “Plug & Play Mode” to **Disable**, enter password (default password is “private” without the quotation marks) and press “**Apply and Reboot**”. If the Phoenix does not restart, cycle the power.

Once the controller reboots, go back to the “Services” page and verify that Plug & Play is disabled. Also on the controller itself the orange PP light (on the power module) should now be turned off.

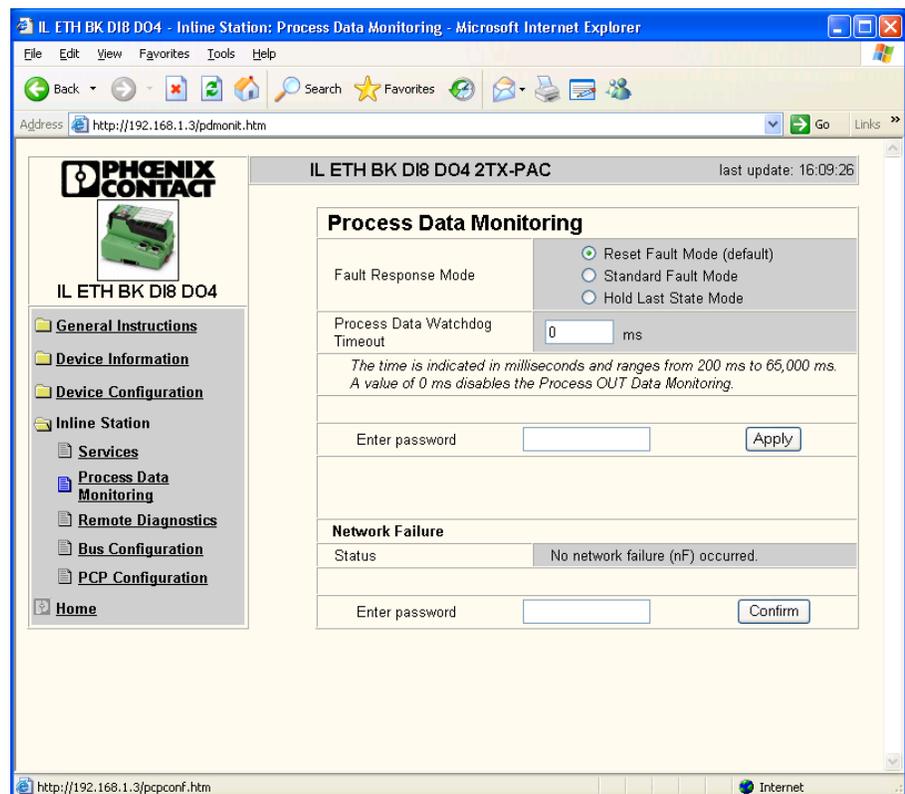


NOTE

After adding or removing any Phoenix modules it is essential that you enable “Plug and Play Mode”, reboot the Phoenix module, then disable “Plug and Play Mode” before FMS can operate correctly with the device.

Disabling Process Data Watchdog

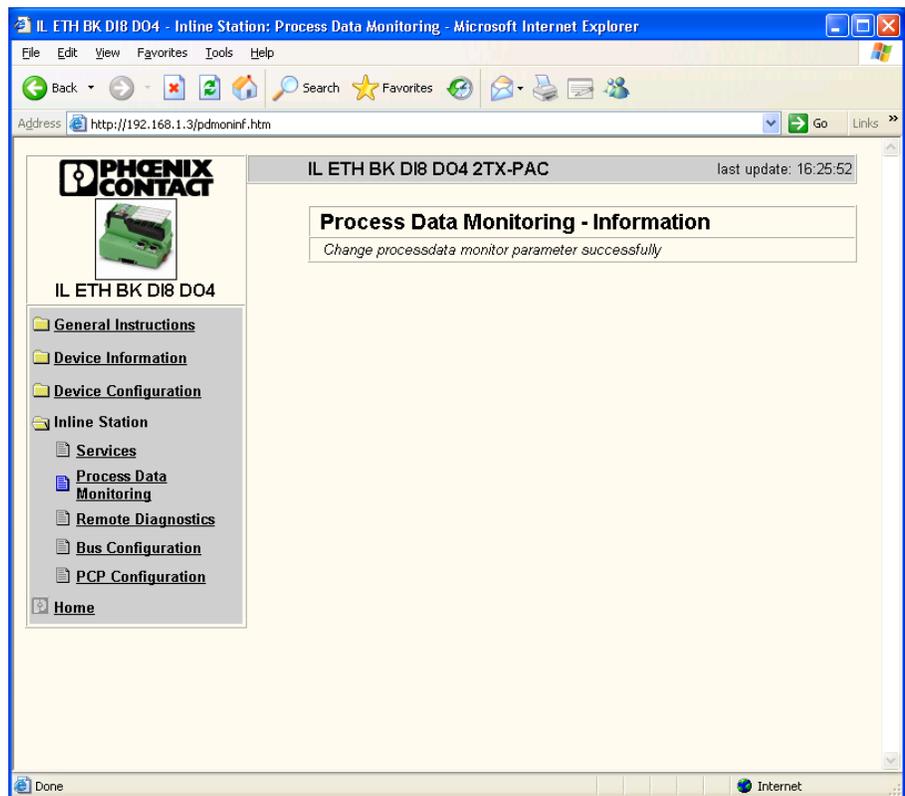
Next you need to disable Data Watchdog, the process that keeps monitoring device communication and halts the controller in the event of error. This process is used only for diagnostic purposes and with FMS 5 it is not necessary to be running during normal operation. Go to “Inline Station” then choose **Process Data Monitoring**.



Leave “Fault Response Mode” on “Reset Fault Mode (default)” and set the value for “Process Data Watchdog Timeout” to 0 (zero) milliseconds. Once everything is correct, type in the password (default password is “private” without quotation marks) and click **Apply**.

Go back to the Process Data Monitoring page and verify that all the parameters are set correctly.

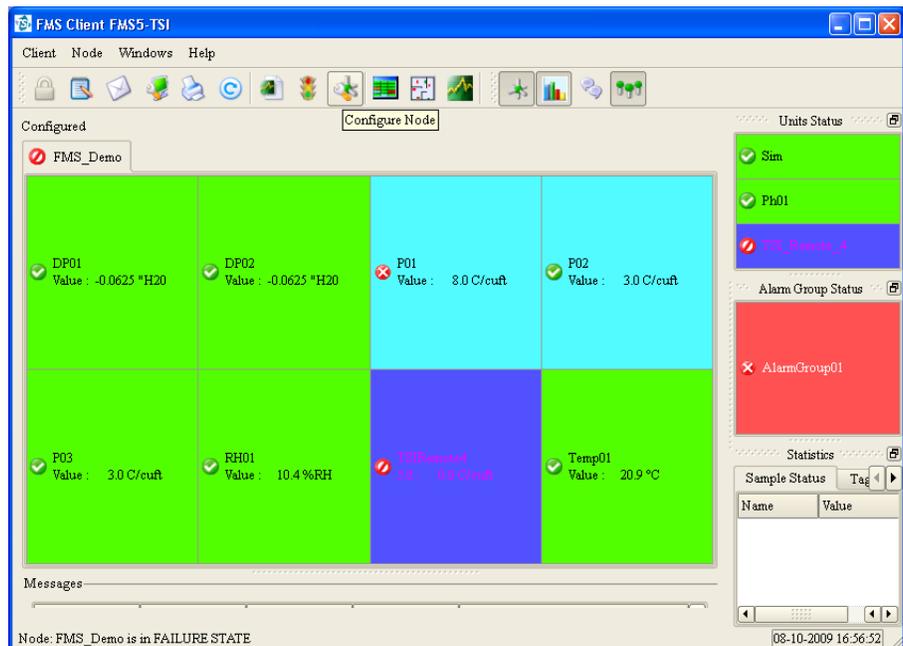
Click on **Inline Station** and then **Bus Configuration** to verify all modules are recognized by the Phoenix Module.



Configuring FMS 5 to Work with Phoenix Contact Busbar Controller

In order to configure FMS 5 to work with the controller, a user with privileges to modify node should login. Once logged in, select the node you want to configure to work with the controller. You must also include the Phoenix Contact module in the Client>Client Options>Module Selection if it is not selected.

Click on the **Configure Node** icon in the top button bar or select **Node->Configure->Node** in the top menu bar of the client window.

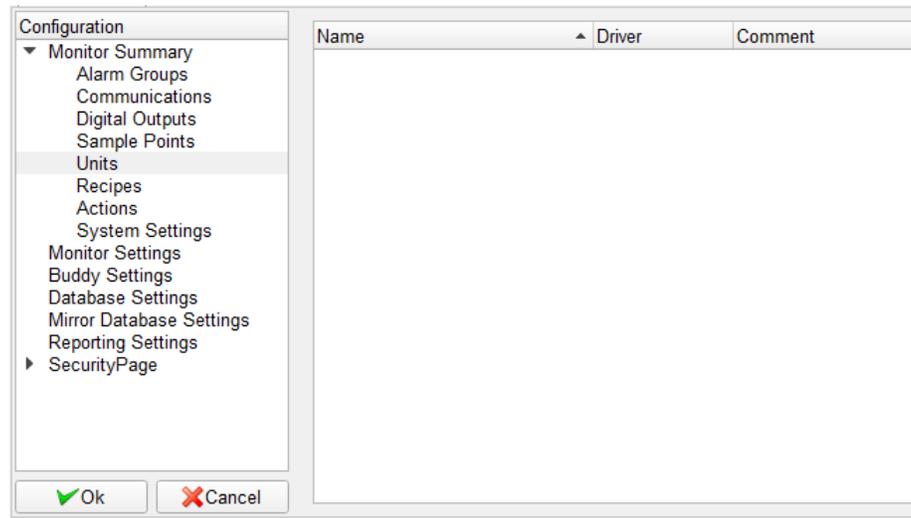


NOTE

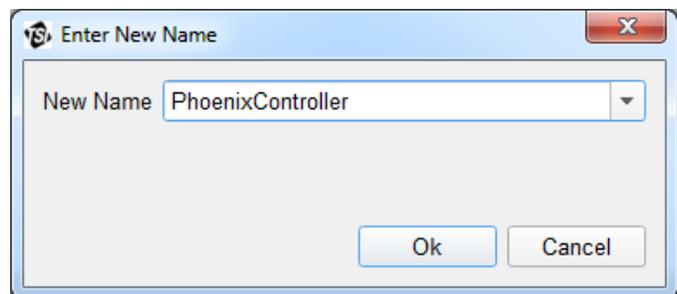
It is not necessary to configure a communication channel for the Phoenix unit.

Configuring Unit

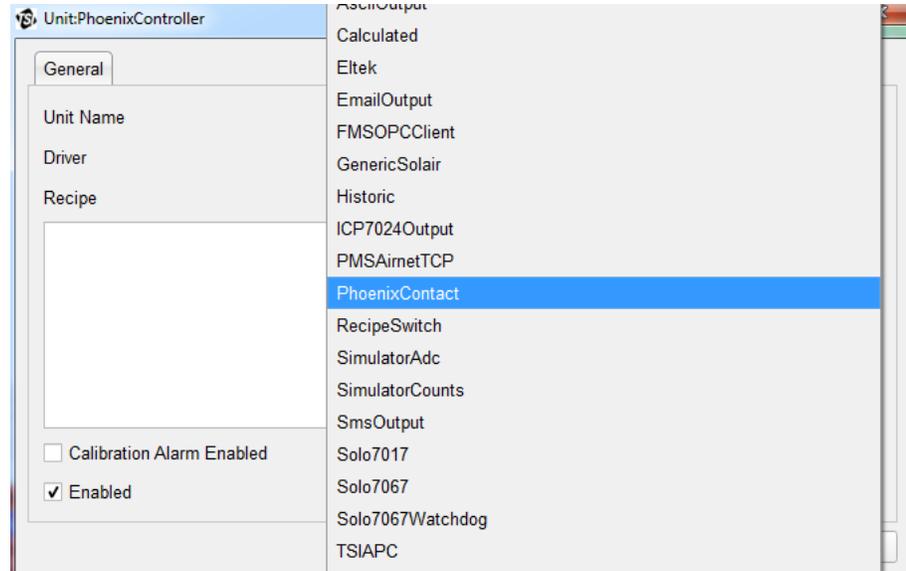
Expand “Monitor Summary” and select **Units**.



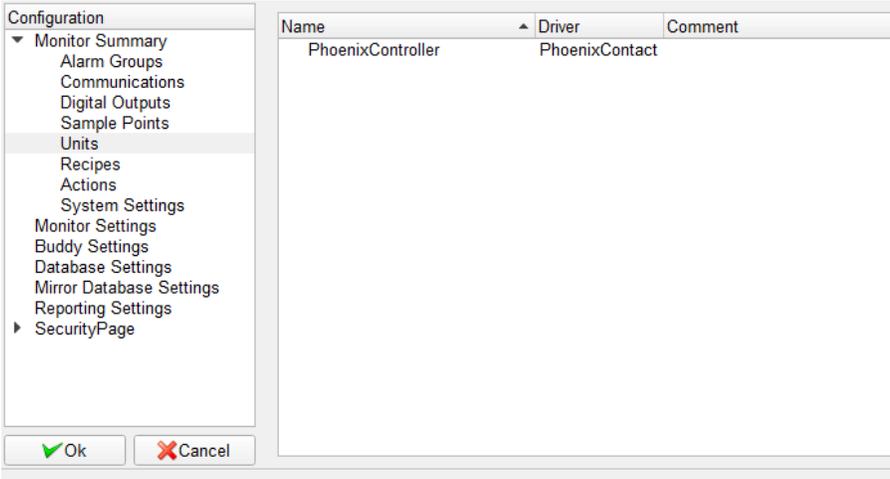
Right-click in the middle pane and select **New Unit** from the pop-up menu. Enter the name for the Phoenix Contact Controller.



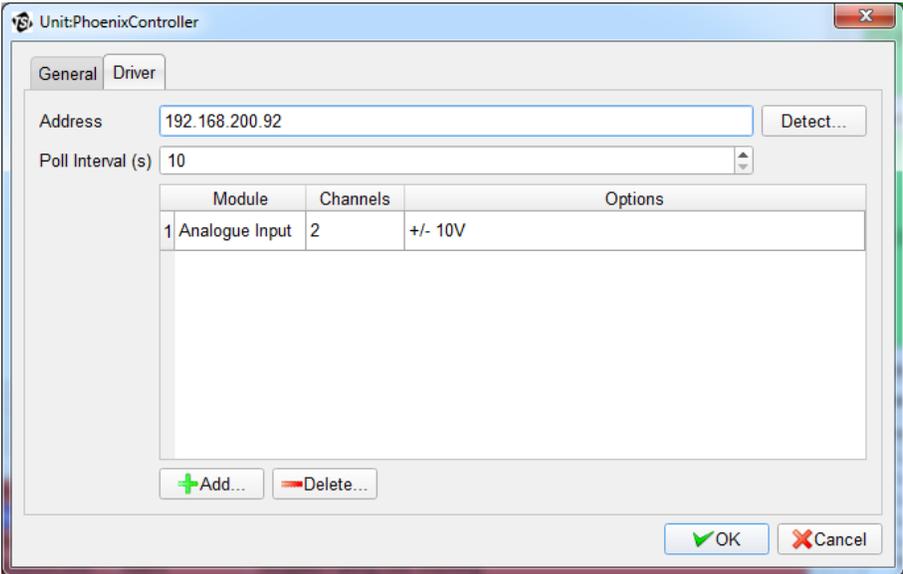
Click **Ok** and unit configuration windows will be displayed with this name already filled in. Expand the “Driver” drop-down list and select “PhoenixContact”. If PhoenixContact does not appear in the list check that the PhoenixContact module is selected in Client options.



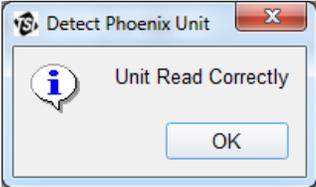
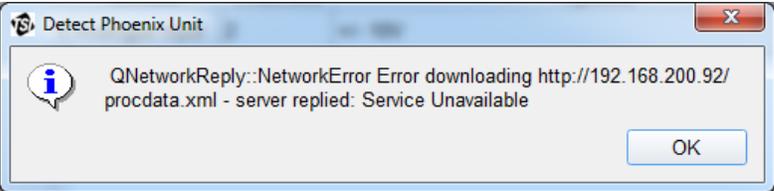
Once driver is selected click on the **Enabled** check box in lower left corner to indicate that this unit is in use. Select **Ok**. The new unit will be listed in the Unit configuration.



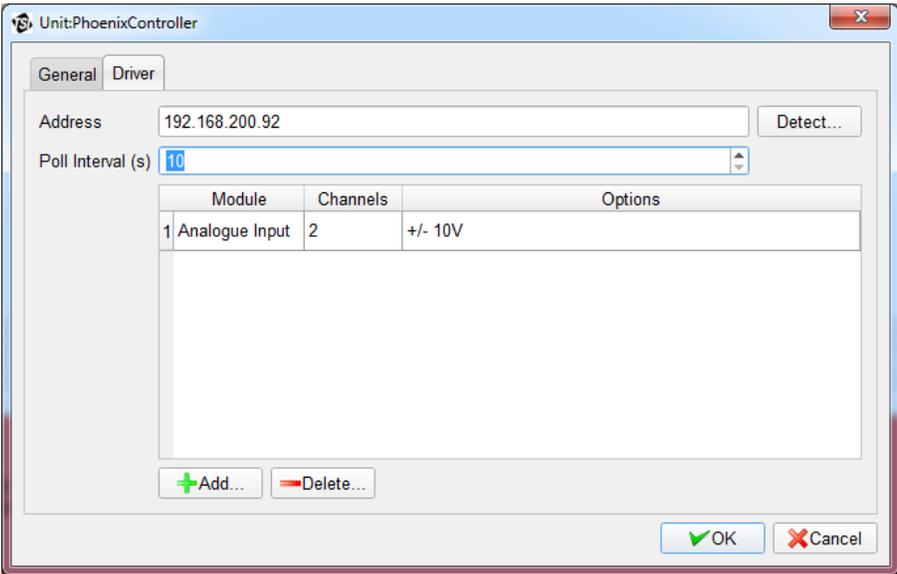
Open the unit PhoenixController configuration page again. This time there will be a “Driver” tab. Select this and enter the IP address of the controller configured in the “Connecting Phoenix Contact Controller” section of this manual.



Click **Detect** to test communication with the Phoenix Contact. A message will be displayed to indicate whether communication can be established.



Configure **Poll Interval** by either entering between minimum of 10 to maximum of 30 seconds. The arrow button will increment or decrement by 5 seconds.



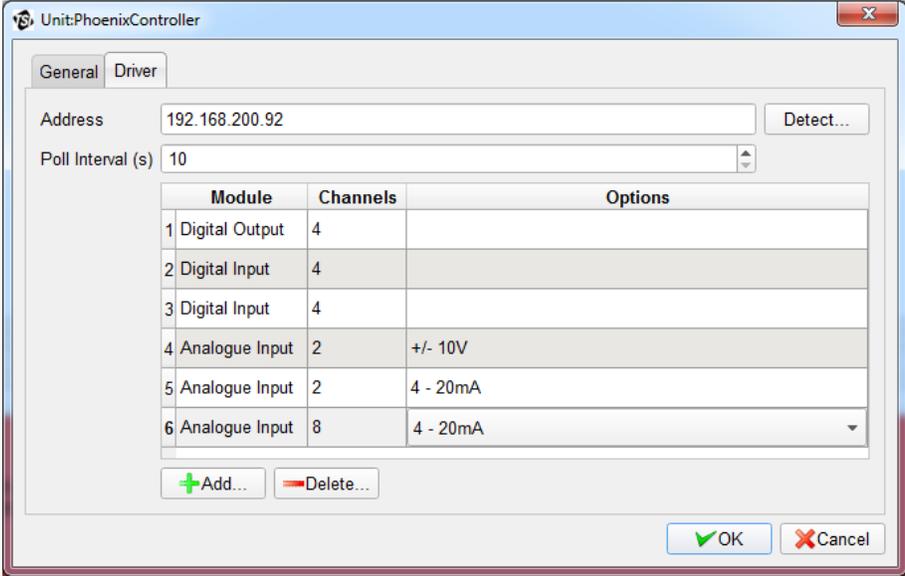
NOTE

The existing Phoenix Contact Unit will need to be re-configured for poll interval when applying Software Update, i.e SU 125. The recommended Poll Intervals using analog inputs are as followed:

- 3 bases and one to six modules is 10 seconds.
- 3 bases and seven to ten modules is 15 seconds.
- 3 bases and eleven to thirteen modules is 20 seconds.

Populate the Module list using **Add** to add a row for each module of the Phoenix Contact. The example illustrated above is for an IL ETH BK DI8 DO4 module. Click **OK** to close the unit setup window and then **OK** once on the Configuration page.

Note: FMS 5 supports the following module types and sensor ranges. Refer to Application Note CC-112, *Authorized Components for TSI FMS Software*, for the Phoenix Contact modules TSI supports.



Phoenix Contact model types:

1. Digital Output, 4 and 32 channels
2. Digital Input, 4 and 32 channels
3. Analogue Input, 2 and 8 channels
 - a) ± 10 V
 - b) ± 20 mA
 - c) 0–10 V
 - d) 0–20 mA
 - e) 4–20 mA

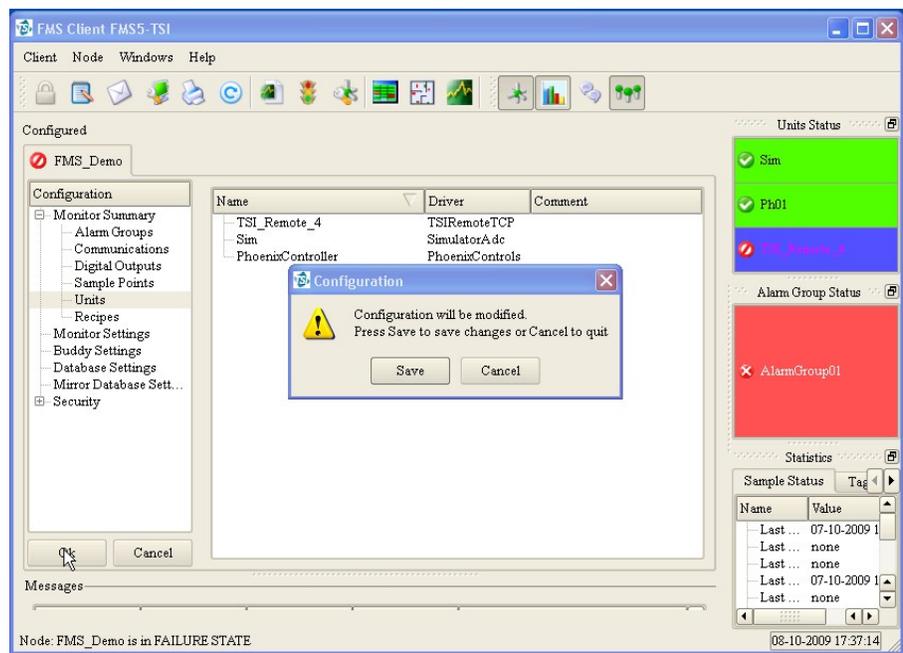
To configure Analogue Input, please refer to the sensor's manual to set sensor range as Options.

The Options drop-down menu enables the available input ranges to be selected.

NOTE

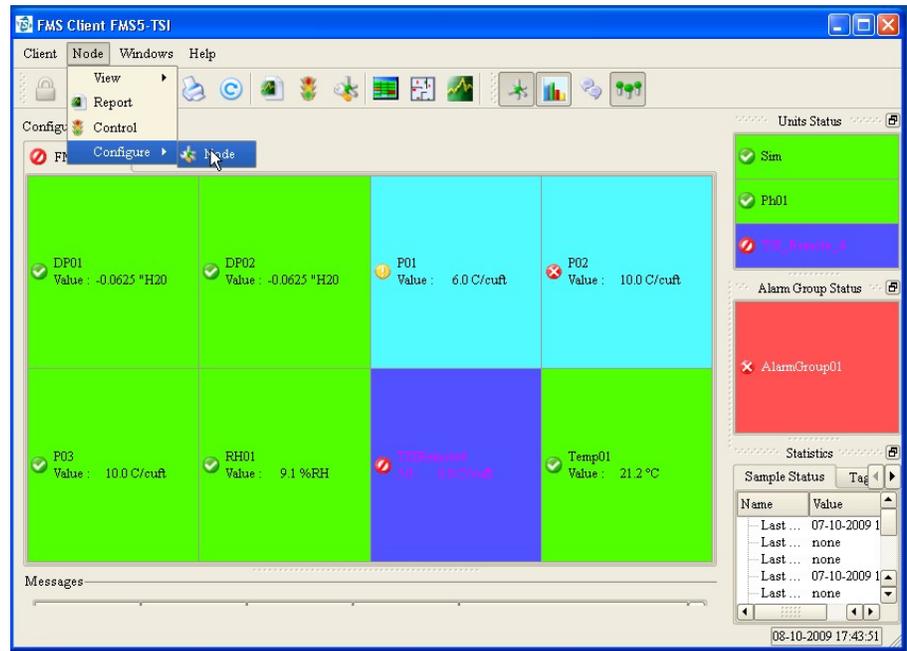
If more than one base are configured in FMS then a good configuration practice is to split all the different modules across the different base units.

Click **Save** on the warning window to save the unit configuration. After saving, FMS 5 will ask if you want to reboot the node in order for changes to take affect immediately. Select **No** since there are still several steps to configure before setup is complete.



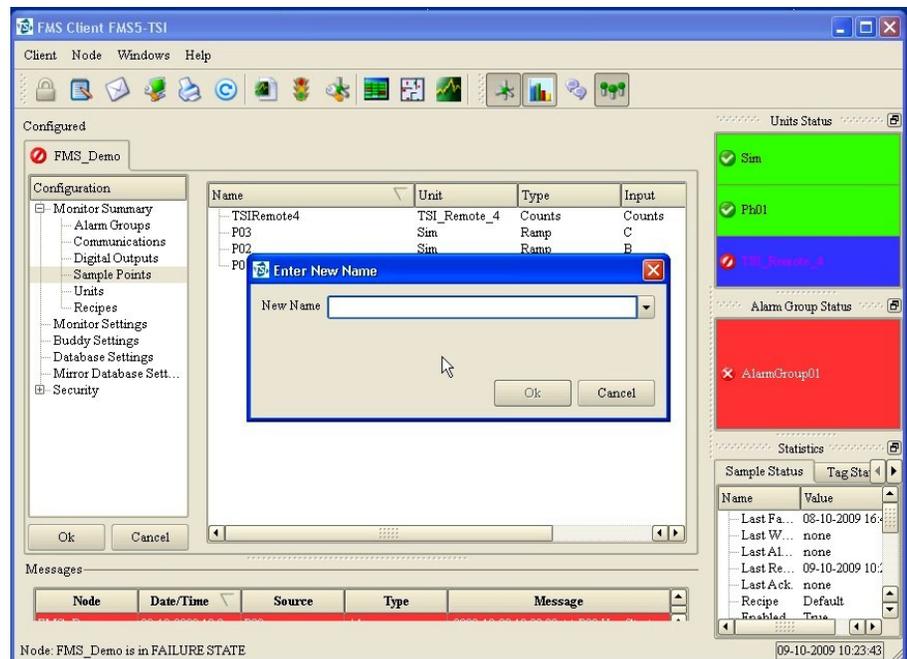
Configuring Sampling Points

Once the controller unit is configured you can proceed to set up sample points that correspond to the sensors attached to the controller. Go to Node configuration either by clicking on the **Configure Node** icon in the top button bar or select **Node->Configure->Node** in the top menu bar.

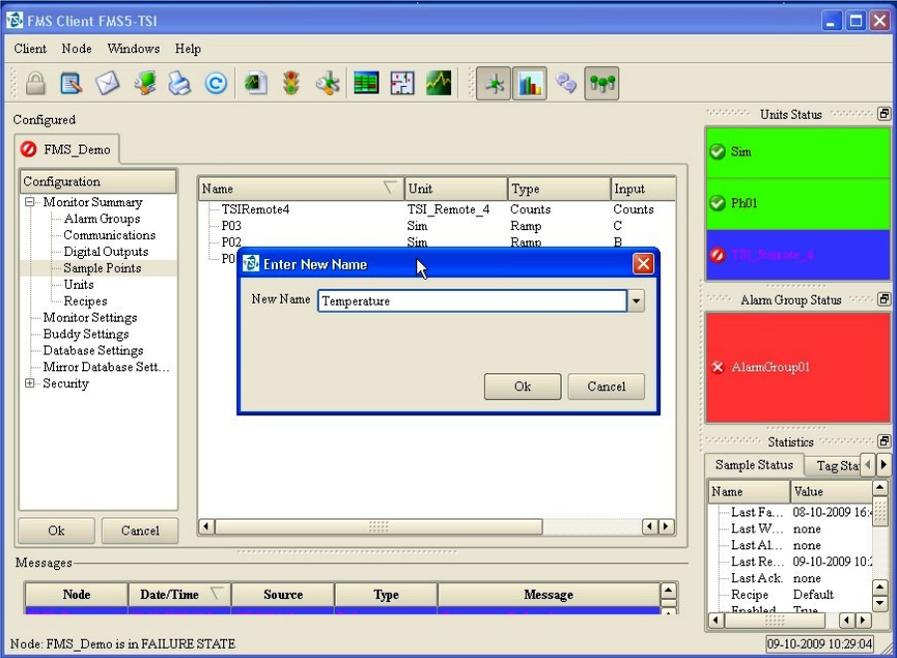


Configuring Temperature Sensor Sampling Point

Under “Monitor Summary” select **Sample Points** and right-click in the middle pane to open a pop-up menu. Select **New Sample Point** option. You will be prompted to enter the name for the sample point you are about to create.

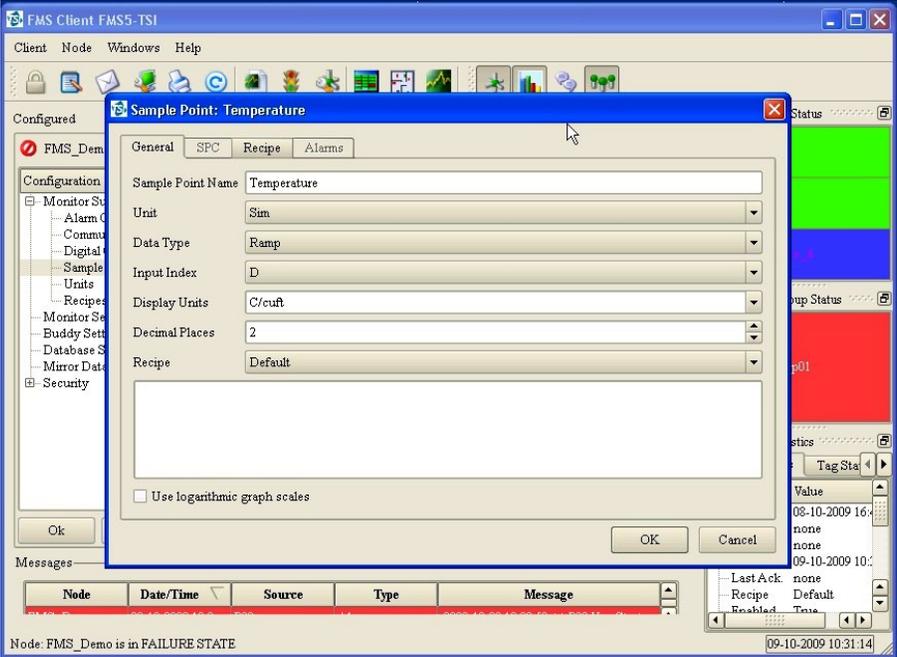


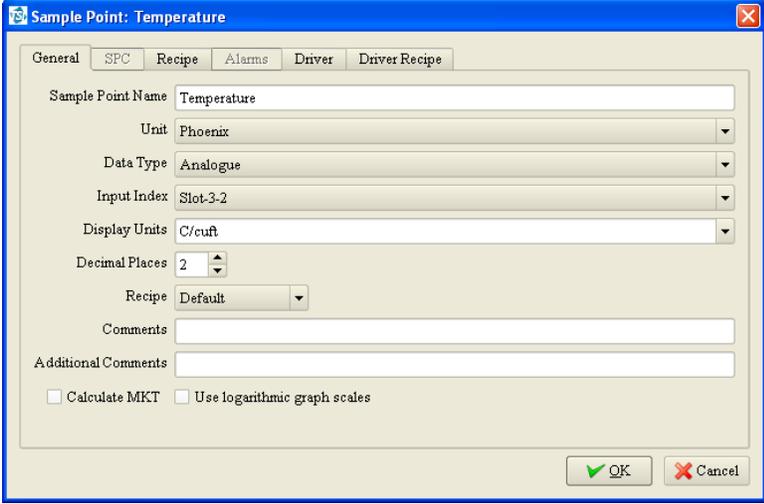
Enter a meaningful name for the sample point. In this example, a sample point for a temperature sensor is being created and named "Temperature".



Click **Ok** and the Sample Point configuration window is displayed.

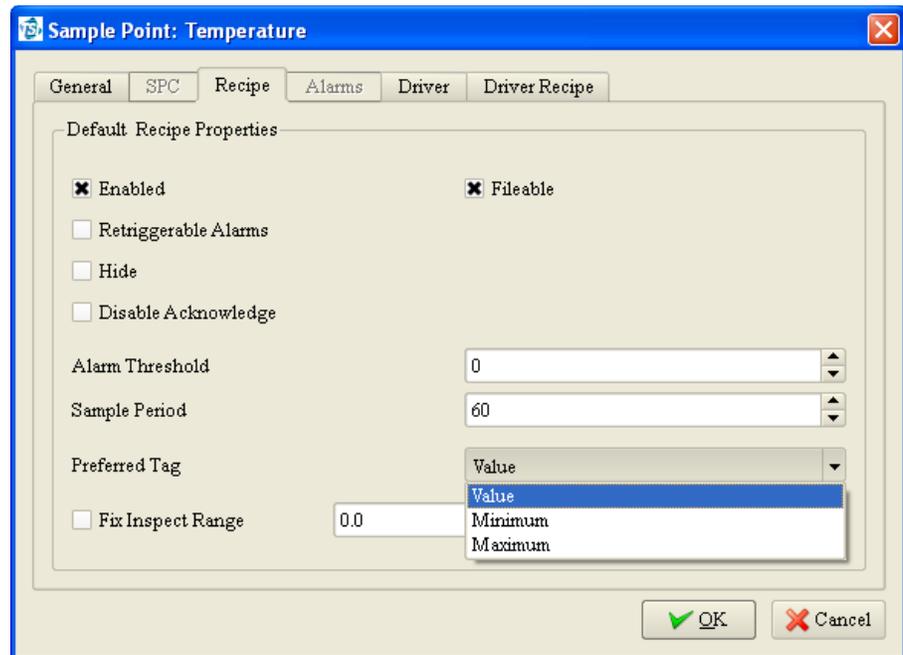
On this screen it is necessary to setup which unit this sample point belongs to, the sampling point's data type, as well as measurement units and other parameters that enable FMS 5 to interpret the data correctly.



Unit	Select the Phoenix Contact Controller configured in previous steps (see “Configuring Unit”).
Data Type	Select Analogue if it has not been set by default.
Input Index	This corresponds to the input ports on the controller itself; consult the wiring that has been done on the controller when it was installed.
Display Units	This is the unit of measurement. In this example, °C would be used. 
Decimal Places	Specifies number of significant digits for the displayed value.
Recipe	Leave as “Default”.

Click on the **Recipe** tab and verify that “Enabled” and “Fileable” are checked. Set “Sample Period” to the desired polling frequency of the sensor in seconds. “Preferred Tag” defaults to “Value” but the options “Minimum” or “Maximum” can be chosen where:

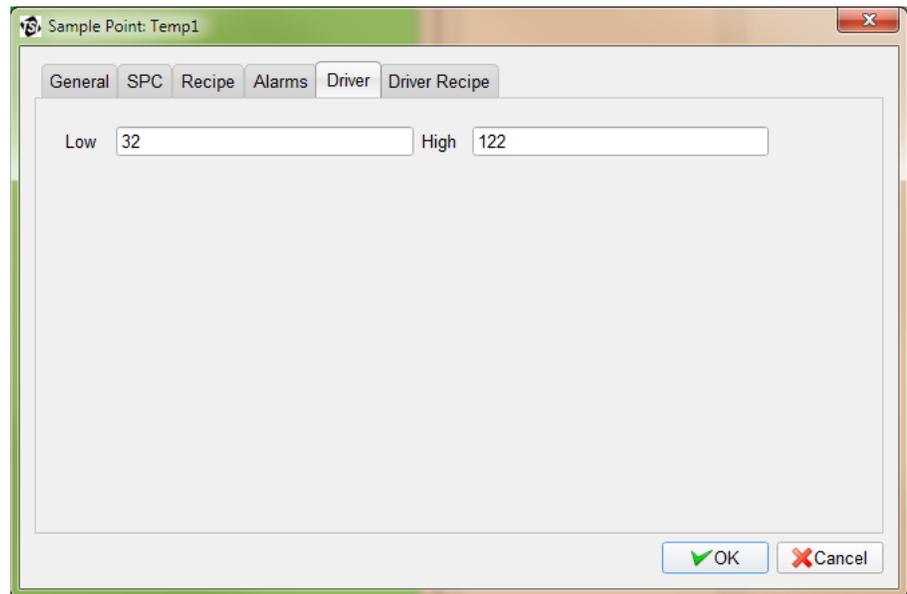
- Value is the average of the sub samples taken during the Sample Period.
- Maximum is the highest value of the sub samples taken during the Sample Period.
- Minimum is the lowest value of the sub samples taken during the Sample Period.



Next click on the **Driver** tab.

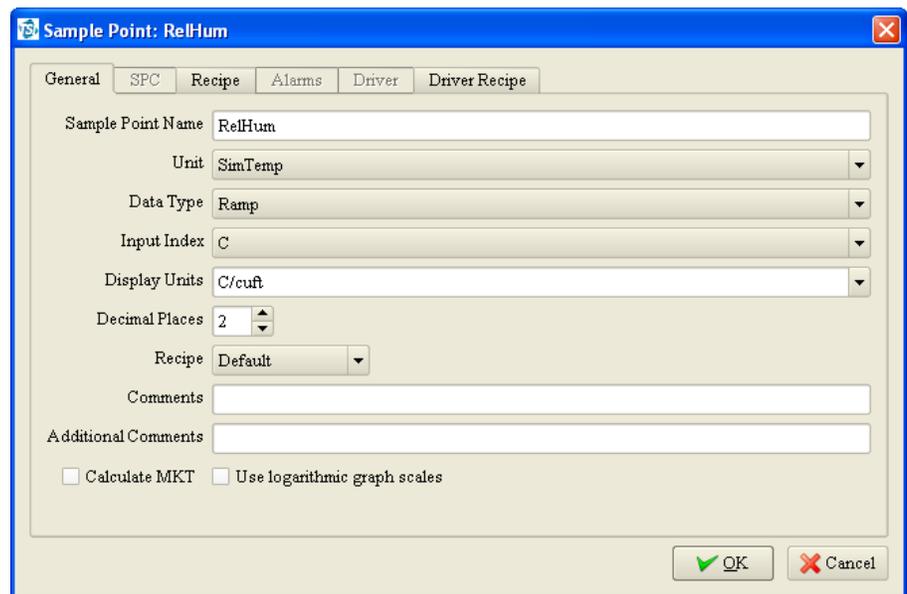
Set Low and High according to the sensor's manual. The temperature sensor used in this example has measurable range from 32 °F to 122 °F. So, set Low to 32 and High to 122.

Click **OK** and then click **OK** on the left pane to save changes. When asked if you want to reboot click **No** since you will reboot once all the sample points are set. If this is the last sample point that you need to setup select **Yes** when asked to reboot.

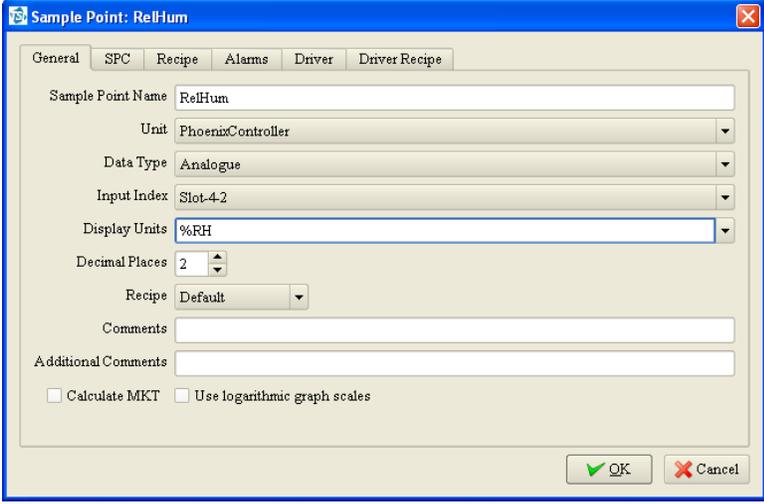


Configuring Relative Humidity Sensor Sampling Point

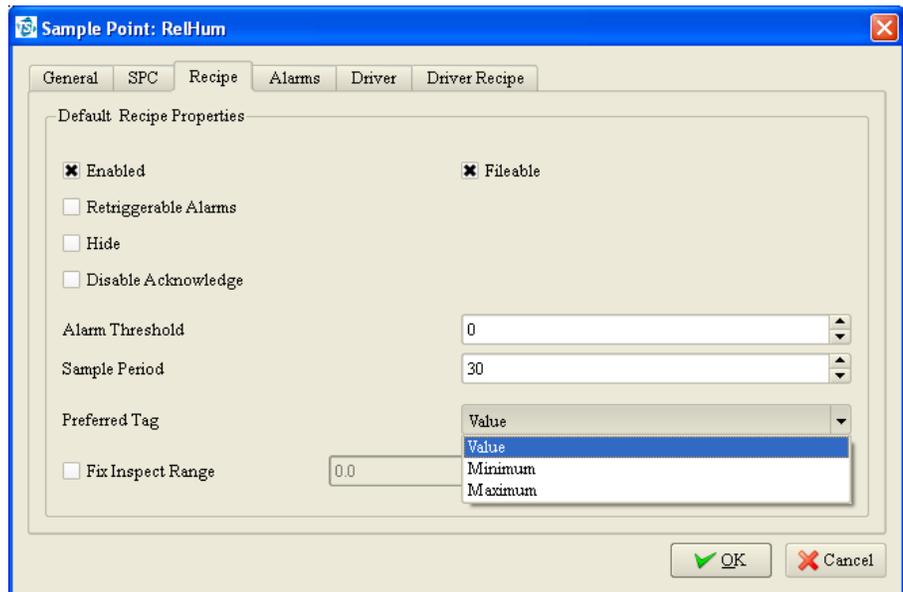
Repeat the steps from the previous section to create a new sampling point and name it "RelHum". Once you assign it a name and click **OK** you will be presented with the configuration window.



Set the parameters on “General” tab as:

Unit	Select the Phoenix Contact Controller configured in previous steps (see “Configuring Unit”).
Data Type	Select Analogue if it has not been set by default.
Input Index	This corresponds to the input ports on the controller itself; consult the wiring that has been done on the controller when it was installed.
Display Units	This is the unit of measurement. In this example, %RH is selected. If the unit you require is not available in the drop-down box it can be typed in directly. 
Decimal Places	Specifies number of significant digits for the displayed value.
Recipe	Leave as “Default”.

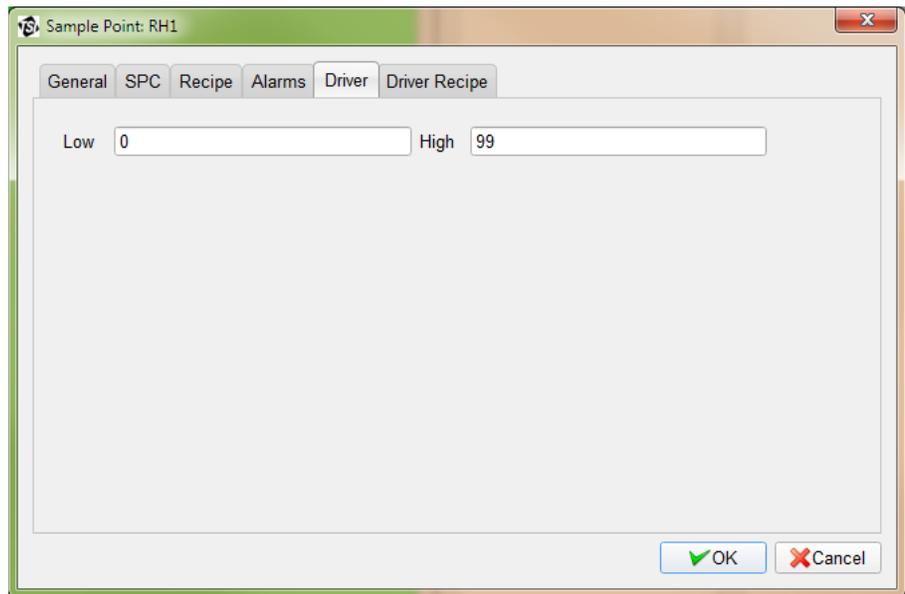
Click on the **Recipe** tab and verify that “Enabled” and “Fileable” are checked. Set “Sample Period” to the desired polling frequency of the sensor in seconds. “Preferred Tag” defaults to “Value”; the options “Minimum” or “Maximum” can be chosen if the highest or lowest value recorded during the sample period is to be viewed.



Once this is done click on the **Driver** tab.

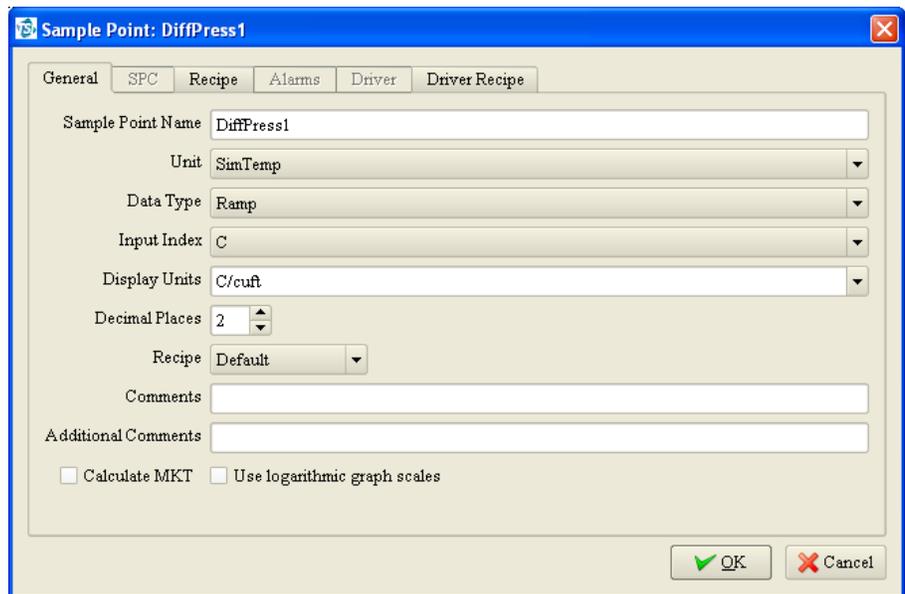
Set Low and High according to sensor's manual. The relative humidity sensor used in this example has a measurable range from 0% RH to 99% RH. So, set Low to 0 and High to 99.

Click **OK** and then click **OK** on the left pane to save changes. When asked if you want to reboot click **No** since you will reboot once all the sample points are set. If this is the last sample point that you need to setup select "Yes" when asked to reboot.



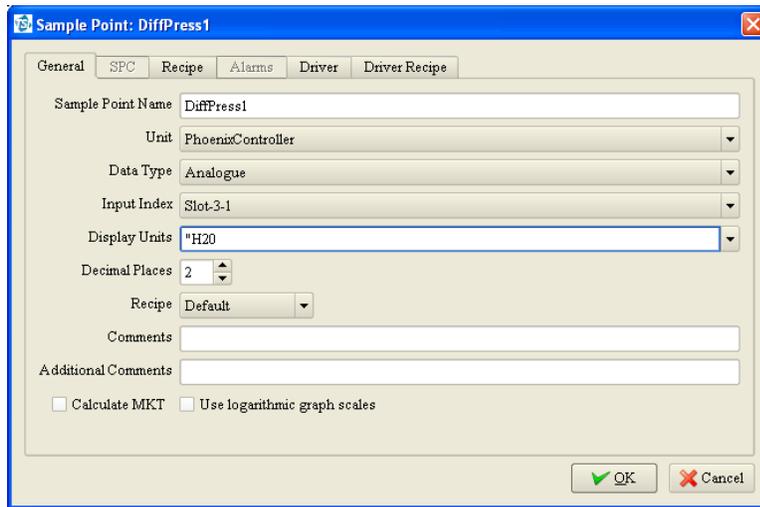
Configuring Differential Pressure Sensor Sampling Point

Repeat the steps to create a new sampling point and name it "DiffPress". Once you assign it a name and click **OK** you will be presented with the configuration window.

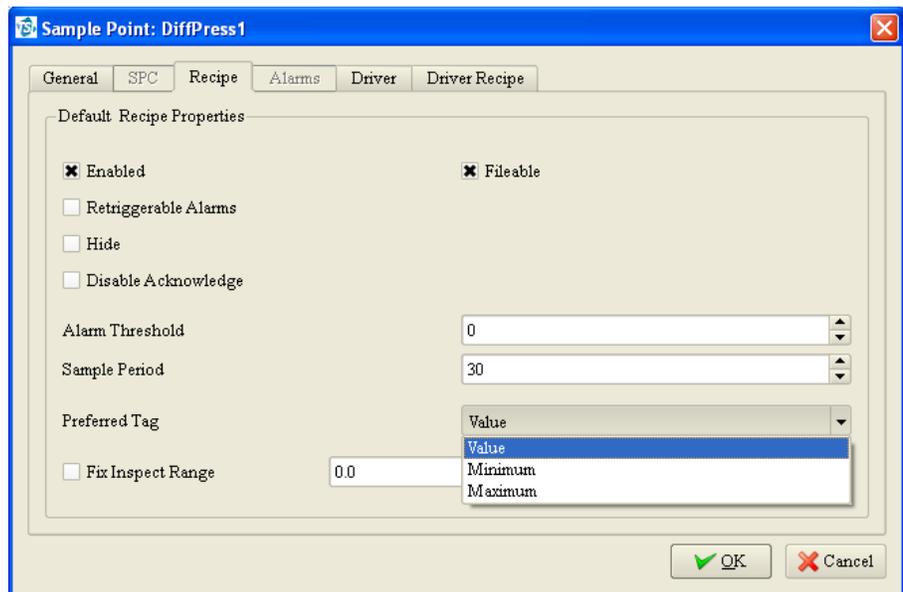


Set the parameters on “General” tab as:

Unit	Select the Phoenix Contact Controller configured in previous steps (see “Configuring Unit”).
Data Type	Select Analogue if it has not been set by default.
Input Index	This corresponds to the input ports on the controller itself; consult the wiring that has been done on the controller when it was installed.
Display Units	This is the unit of measurement. In this example, “H2O would be used. If the unit you require is not available in the drop-down box it can be typed in directly.
Decimal Places	Specifies number of significant digits for the displayed value.
Recipe	Leave as “Default”.



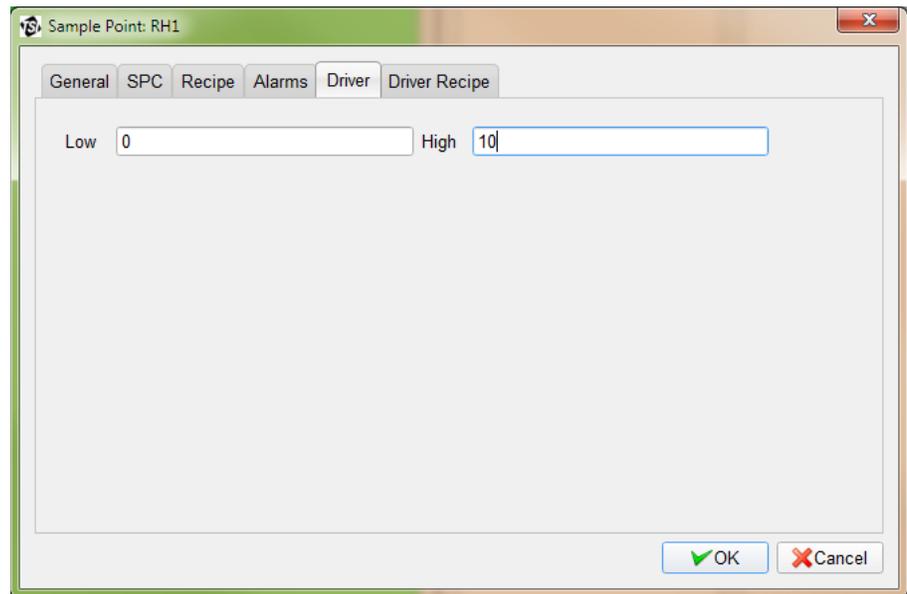
Click on the **Recipe** tab and verify that “Enabled” and “Fileable” are checked. Set “Sample Period” to the desired polling frequency of the sensor in seconds. “Preferred Tag” defaults to “Value”; the options “Minimum” or “Maximum” can be chosen if the highest or lowest value recorded during the sample period is to be viewed.



Once this is done click on the **Driver** tab.

Set Low and High according to the sensor's manual. The differential pressure sensor used in this example has measurable range from 0" H₂O to 10" H₂O. So, set Low to 0 and High to 10.

Click **OK** and then click **OK** on the left pane to save changes. When asked if you want to reboot click **No** since you will reboot once all the sample points are set. If this is the last sample point that you need to setup select **Yes** when asked to reboot.



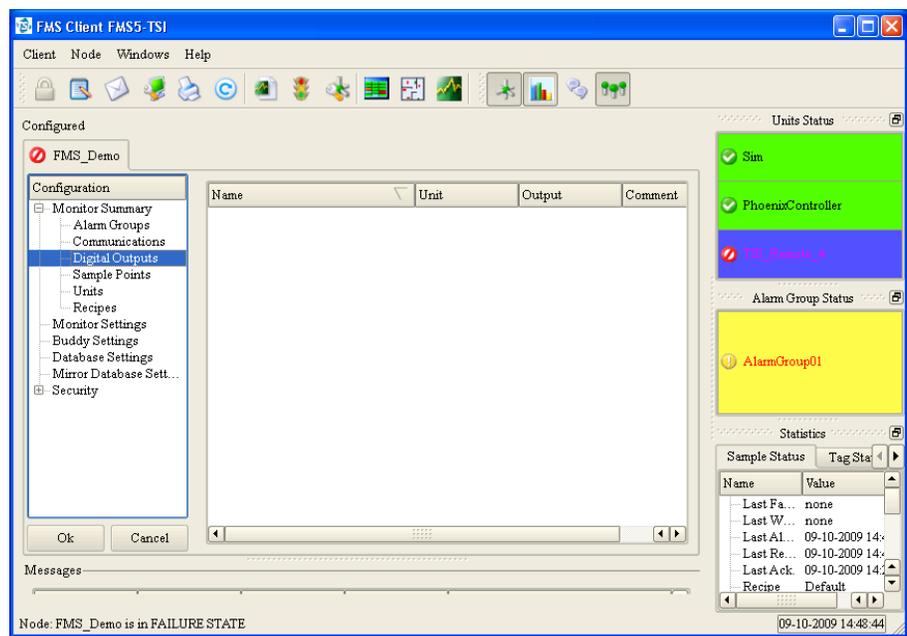
Configuring Digital Outputs

In order for FMS 5 be able to access the status beacon it is necessary to configure digital outputs. Consult the wiring on the controller in order to determine how the beacon lights and sounder are connected. This information will be necessary for the following setup.

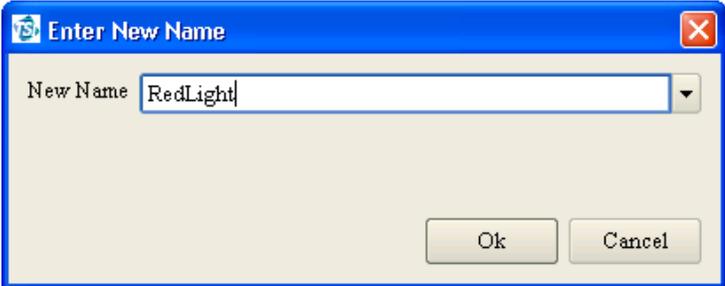
Digital outputs are usually used for alerting users when alarms or warnings that have been created for particular sampling points are triggered. For instructions on how to set alarms and warnings on sampling points consult FMS 5 documentation.

Click on the **Configure Node** icon in the top button bar or select **Node->Configure->Node** in the top menu bar.

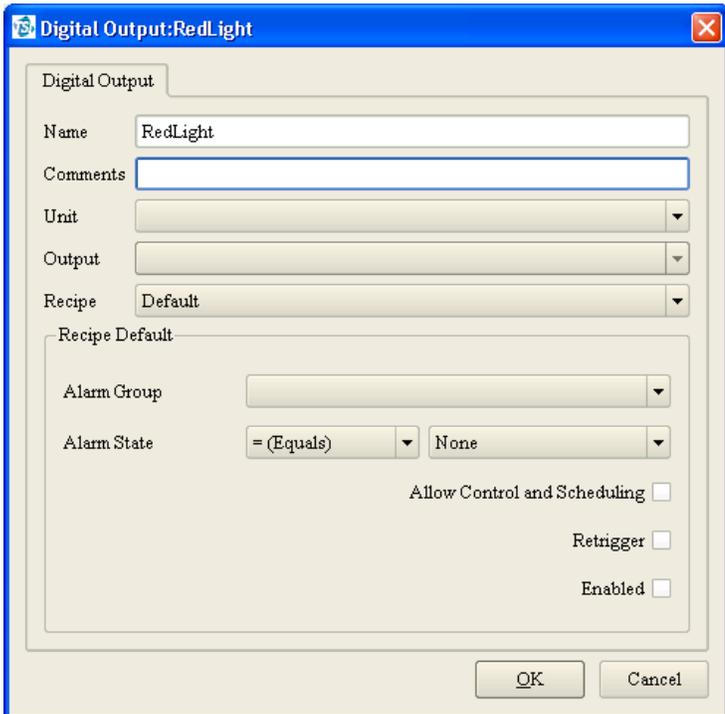
In the configuration pane (left pane) expand "Monitor Summary" and select **Digital Outputs**.



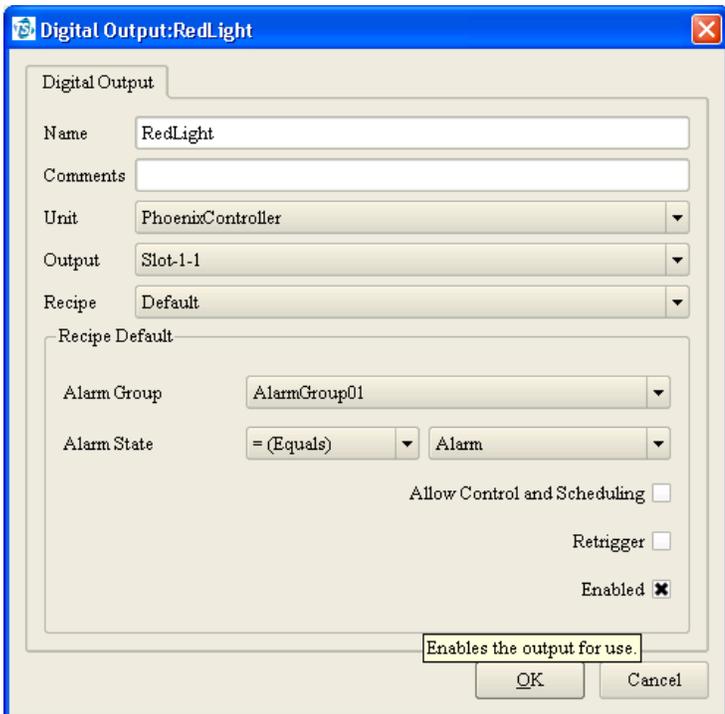
Once “Monitor Summary” is expanded, right-click on the middle pane and select **New Digital Output**. Enter the name for the output you want to create. In this example, an output for beacon’s red light was created. Click **Ok**.



Click **Ok** and configuration page is brought up.



For “Unit” select the unit created for Phoenix Contact Controller. The value of “Output” depends on the wiring done on the controller. Physically verify which digital output on the controller is wired to the red light, and assign the output slot accordingly. Leave “Recipe” as default.



Alarm group specifies which set of alarms is used to control this digital output, select the alarm group you want to use.

Alarm state defines the behavior of the output. Here you can select under what condition output will be triggered.

Make sure that “Enabled” is checked in order to use this output. Click **Ok**.

Create additional digital outputs repeating the steps in this section as necessary. Once all the outputs are created click **Ok** on the Configuration pane and select to save configuration. When prompted to reboot the node select reboot for changes to take effect.

NOTE

If only digital outputs are configured for a Phoenix Contact unit, failures will only be detected when the FMS software attempts to communicate with the unit. To ensure immediate detection of failures it is advisable to configure a “dummy” digital input. Set the digital input attributes to: not fileable; hidden; alarm ack not needed and alarm threshold of zero.

Changing the Module Configuration of the Phoenix Contact Busbar Controller

Adding Modules

If an additional module is added to the Controller it is necessary to inform the Controller that the configuration has changed. To do this enable plug and play, reboot the controller, then disable plug and play.

If the module has been added to the end of the bus there is no need to change the configuration in FMS of existing sample points and digital outputs. The Phoenix Contact unit configuration must be changed in FMS by adding the new module into the Unit configuration. The slots in the new module will then become available to configure. If the module has been added to any other location on the bus it will be necessary to check and modify the slots that existing sample points and digital outputs reference.

Removing Modules

If a module is removed from the Controller it is necessary to inform the Controller that the configuration has changed. To do this enable plug and play, reboot the controller, then disable plug and play.

The Phoenix Contact configuration must be changed in FMS by removing the module from the Unit configuration and removing any sample points and digital outputs that reference slots in the removed module. If the module has been removed from the end of the bus there is no need to change the configuration of sample points and digital outputs that do not reference the removed module. If the module has been removed from any other location on the bus it will be necessary to check and modify the slots that sample points and digital outputs reference.



UNDERSTANDING, ACCELERATED

TSI Incorporated – Visit our website www.tsi.com for more information.

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France	Tel: +33 1 41 19 21 99	Singapore	Tel: +65 6595 6388
Germany	Tel: +49 241 523030		

