PLCnext

How to Create a Multi-State Indicator in eHMI

All versions >= PLCnext 2021.6

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1. Overview a Multi-State Indicator

On an eHMI screen, sometimes there is a need to change the Text Displayed and the Background Color together based upon the Machine's State, Error, Mode, etc.

This allows a simple interaction and functionality between the Machine State (as noticed by the PLC) and the actual Text/Background Displayed for the Operator to understand the Machine's State or other function.

For Example..

There is a PLC Variable, Named 'Status'. It is an Integer used by the PLC to create and control the "States of the Machine". In the PLC, the associated values are: 0 = OFF, 1= Stopped, 2=Running, 3=Faulted, 4=Warning.

If the eHMI simply displayed the Integer Values (0-4), the Operator would require a 'Look-Up' table to understand the meaning of the Machine Status. If the PLC Programmer Used 'String' variables in the PLC to Monitor and Control machine status – this would take extra PLC Programming and make the code too complex.

To make this 'Interpretation' easier, the eHMI is able to use the raw 'Integer Value' from the PLC and then displayed the correct Text and Background Color for. Both the PLC Programmer and the Operator get what is easier for them to understand.

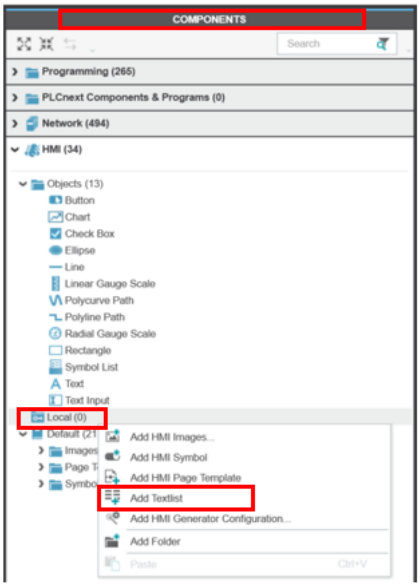
This Document describes the Methods of Creating and implementing the Connection between a PLC Variable 'Status', the Text String and the BackGround Color of that Text string as displayed on the eHMI. This is sometimes referred to a Multi-State Indicator by many in our Industry.

2. Create a New Text List

PLCnext Engineering has a Tool called a ‘Text List’. This List allows you to create different Text Strings based upon a Variables value.

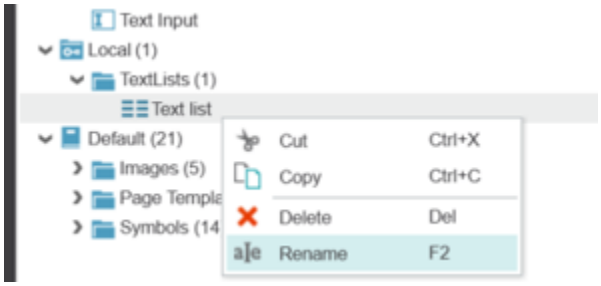
To access this Feature…

Under Components -> HMI -> Local… Right Mouse Click and Select ‘Text List’:



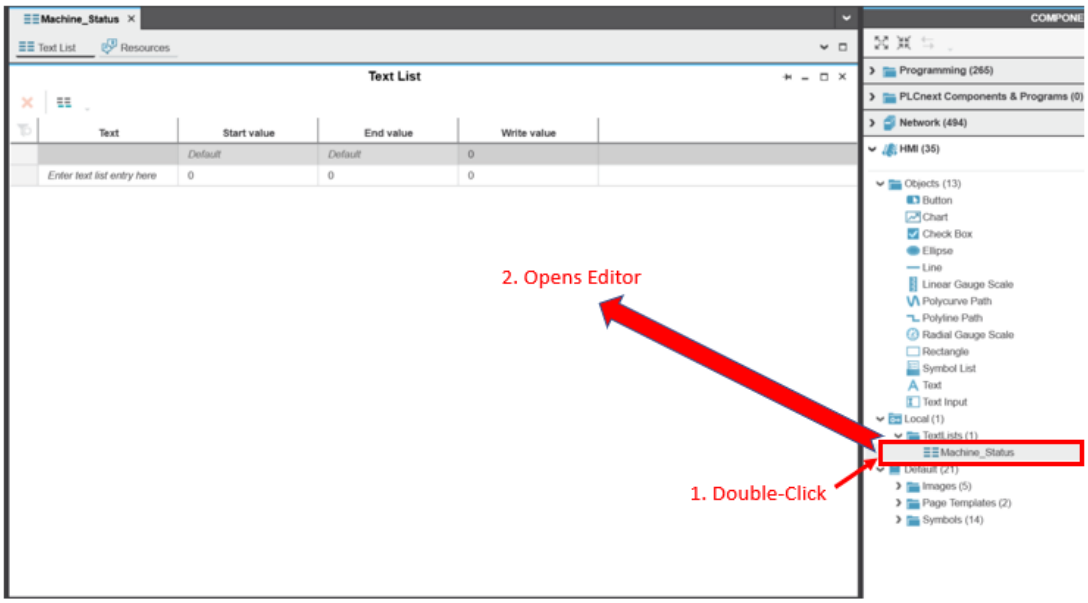
There will now be a TextList under the “Local” Section:

By a Right-Mouse Click, one can ‘Rename’ this to a useful designation.



In this example, the Text list was renamed ‘Machine_Status’ for easy access and to correlate the list and the corresponding Text.

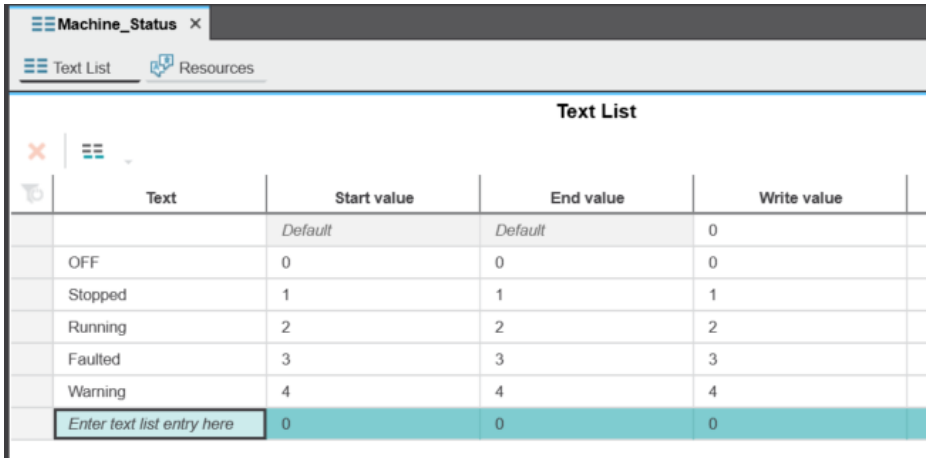
To Edit the ‘Machine_Status’ Text List.. Double-Click and the Listing will now appear:



Now, fill in the Text and Values to correspond to the PLC’s Variable (Integer) that will Determine what Text String is Displayed. In this case, focus on the Text that will be displayed depending on the value of the ‘Status’ variable.

NOTE: we will attached variable in Section 3.

In This example, the following was created:



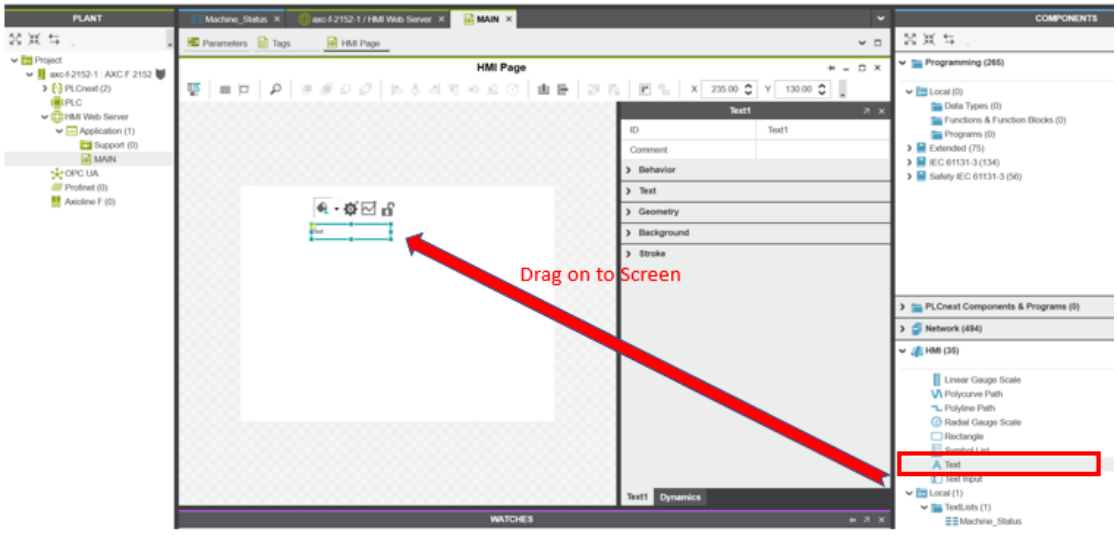
Text	Start value	End value	Write value
	Default	*Default*	0
OFF	0	0	0
Stopped	1	1	1
Running	2	2	2
Faulted	3	3	3
Warning	4	4	4
Enter text list entry here	0	0	0

This means that when a Variable that uses the ‘Machine_Status’ Text List has a Value of 0, ‘OFF’ will be displayed. When the Variable has a value of 3, ‘Faulted’ will be displayed.

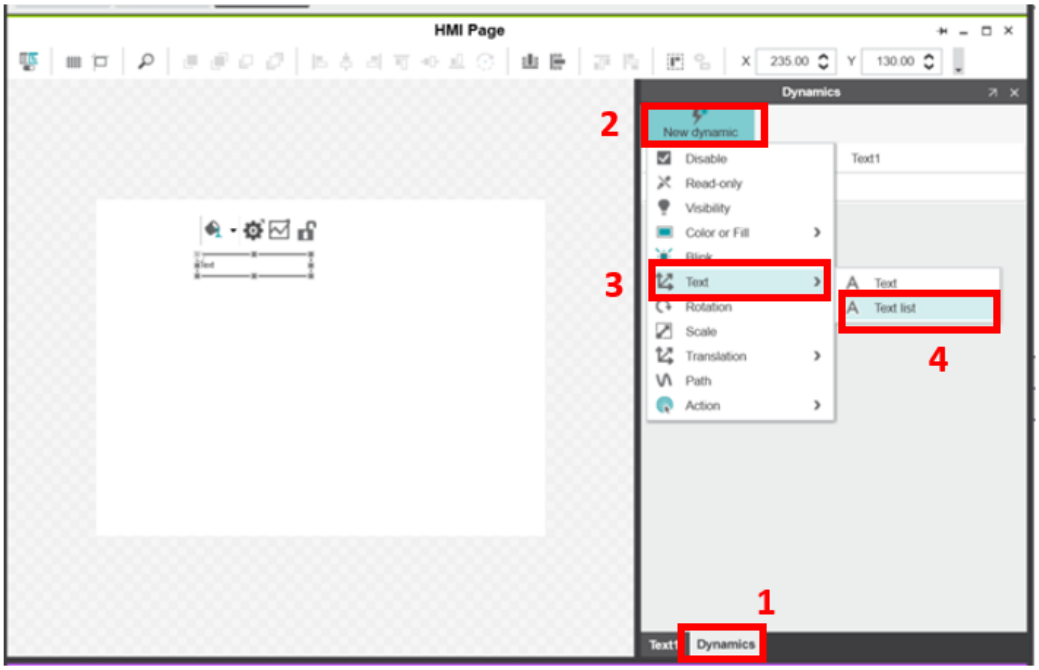
Note: Text Lists are Flexible and can be used with Ranges of numbers. Please refer the HELP inside of PLCnext Engineer to better understand how the columns can interact.

3. Implementing a Text List in the eHMI

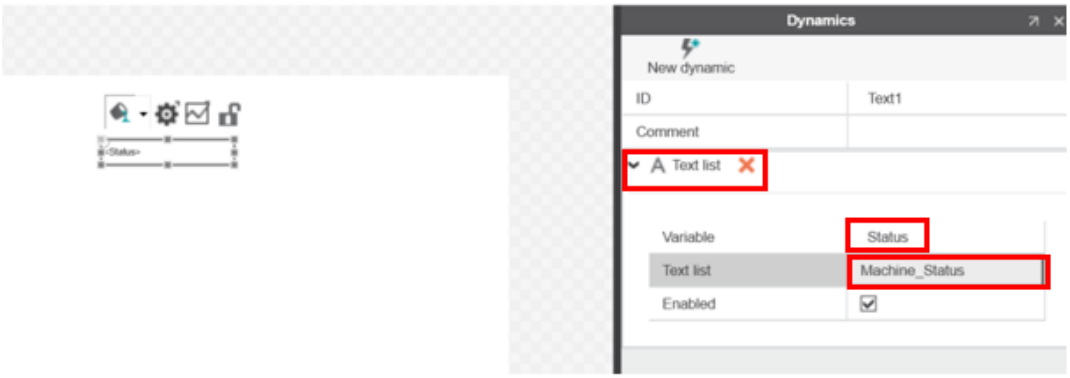
Create a ‘Main’ eHMI Page (any name will work)
On that Page, Drag a ‘Text’ Object from the Components -> HMI Section



Select the Object, Select Dynamics -> (2) New Dynamic -> Select (3)Text -> (4)TextList



The ‘Dynamics’ can now be assigned to the PLC Variable which will control what is displayed when the PLC Variable’s value – and the TextList.



Select the Variable (PLC variable that will determine which Text Line will be Displayed). NOTE: Must Be type=INT and designated as HMI Variable).
Select Text List. In this Case, Choose Machine_Status (which we created in Section 2).

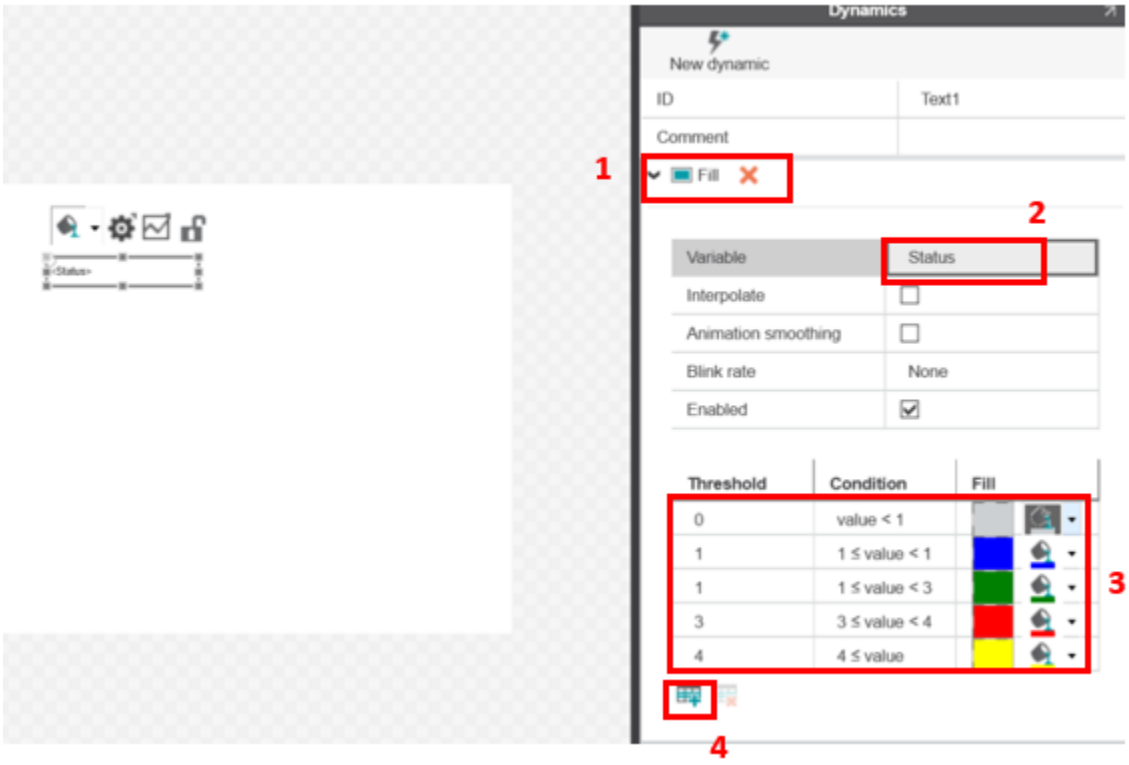
This Feature is Now complete… When Executing this Code, the Text on the Screen will interpret the PLC’s variable and fill the Text Box with the String associated with that Value.

If there is a need to add additional Integer Values in the PLC, Refer to Section 2 and add additional Text Strings to accommodate the new Variable Values.

4. Background Color Change to Text Box

If there is also a Desire to Change the ‘Back ground’ (Fill) Color, Outside Line or Text Color, this also can be done by adding another Dynamic to the Displayed Item.

To Change Background Color: Select ‘New Dynamic’ -> Color or Fill -> Fill



1. The Fill Option of the Object’s Dynamic.
2. The PLC Variable (in this Example, it is ‘Status’ is Used to Change the Fill Color
3. The Background Color Associated with the value of the PLC Variable ‘Status’
4. Allows the addition of further values/Colors to be associated with the Fill Color.