

BECKHOFF



Addressing Variables

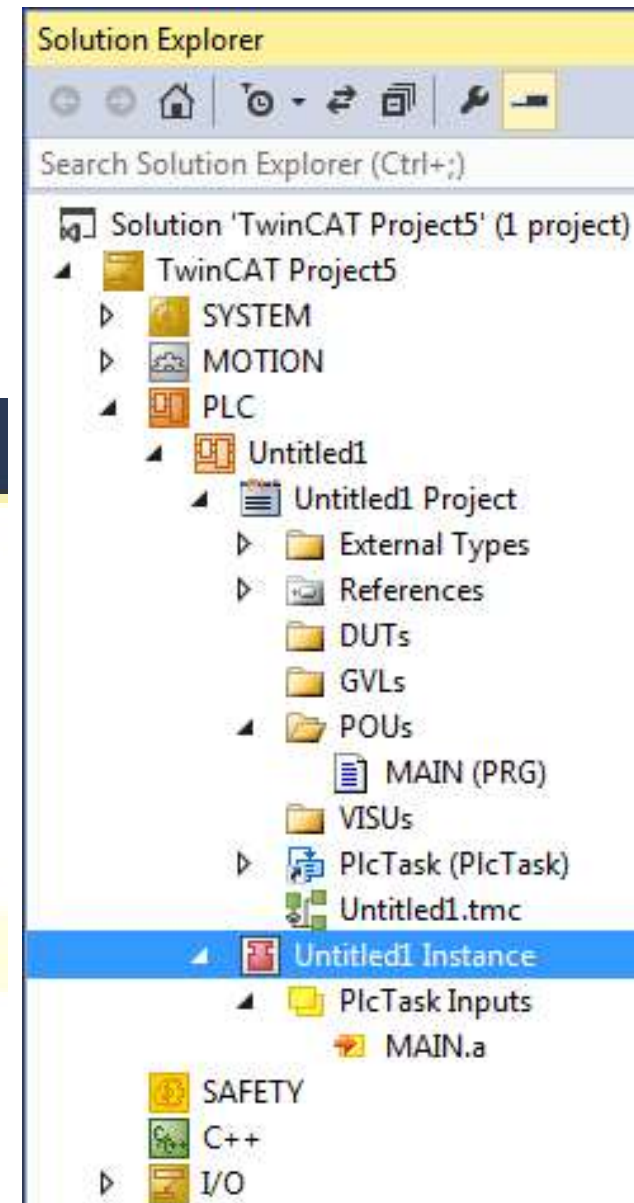
- Addressed Variables in TwinCAT are freely configurable
- It is allowed that addressed variables can be connected to any hardware point, axis, or other location in the Solution.
- Variables that are assigned an address within the PLC are 'Linked' to items outside of the PLC, such as hardware, axes, or other PLC tasks.
- These addressed variables can be defined in either a POU or in a Global Variable List (GVL)

POU Addressed Variables

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- Once an addressed variable has been declared in the PLC, it will be added to the 'Instance'

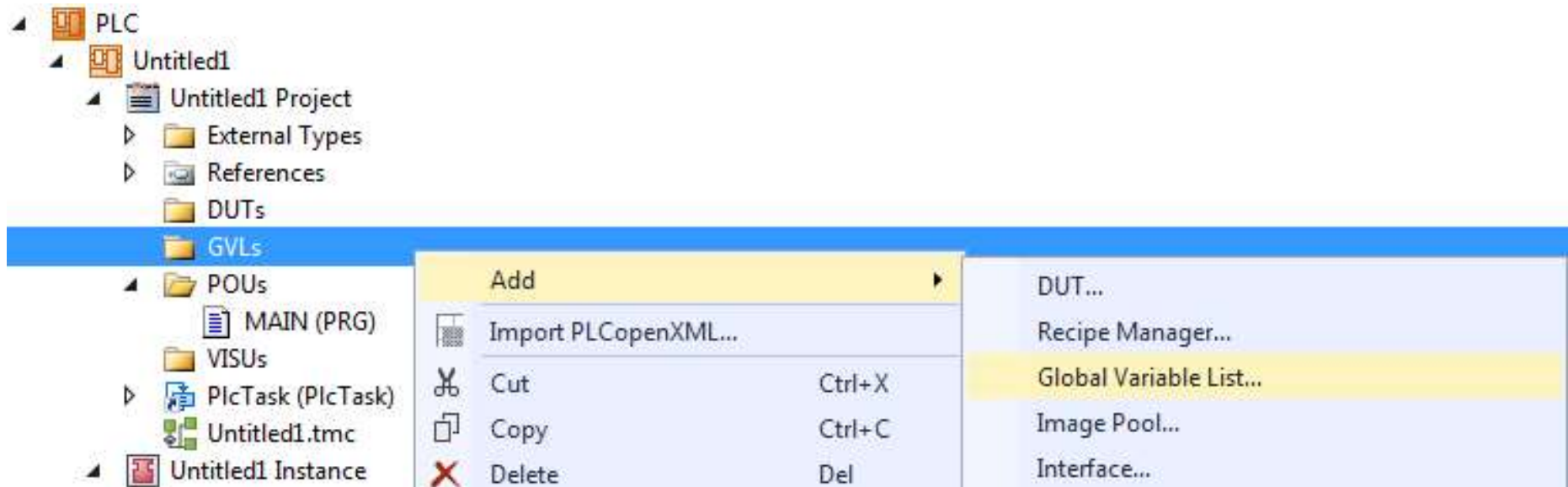
```
MAIN  [Icon] [X]
1  PROGRAM MAIN
2  VAR
3      a AT %I* : INT;
4      b : INT;
5      c : INT;
6  END_VAR
```



GVL Addressed Variables

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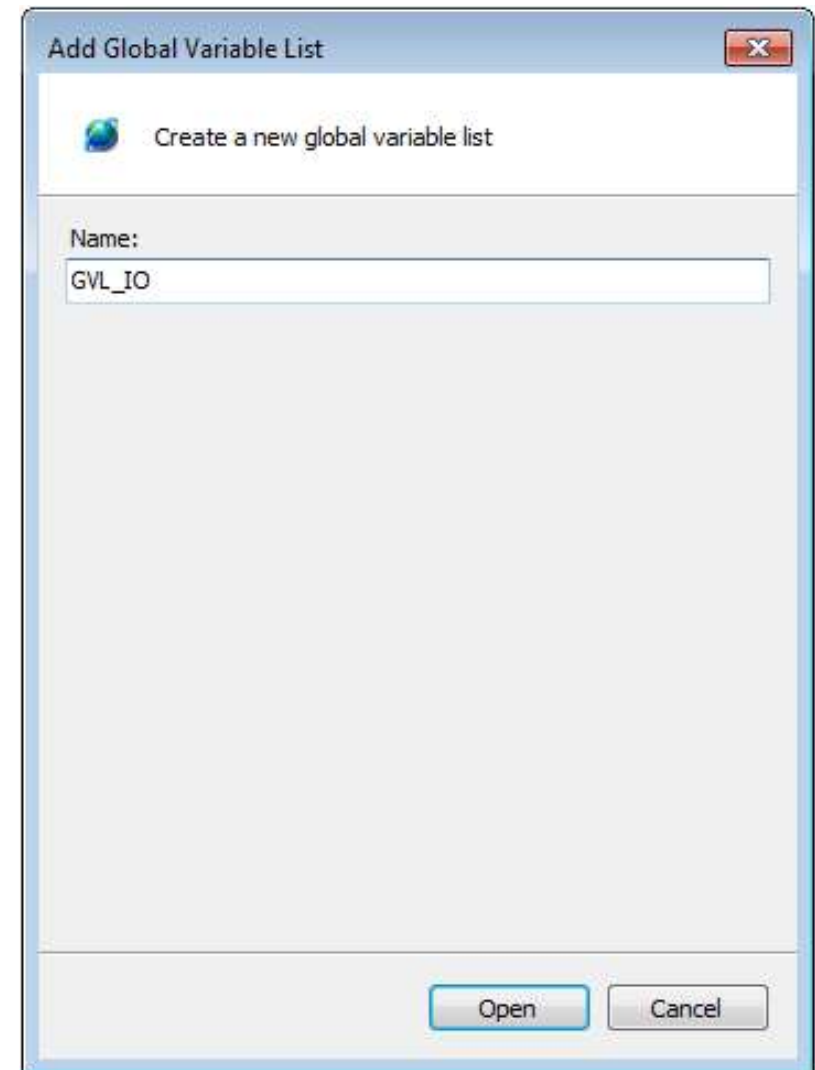
- To add 'Global' variables, 'Right-Click on the GVLs folder
- Select 'Add', then click on 'Global Variable List'



GVL Addressed Variables

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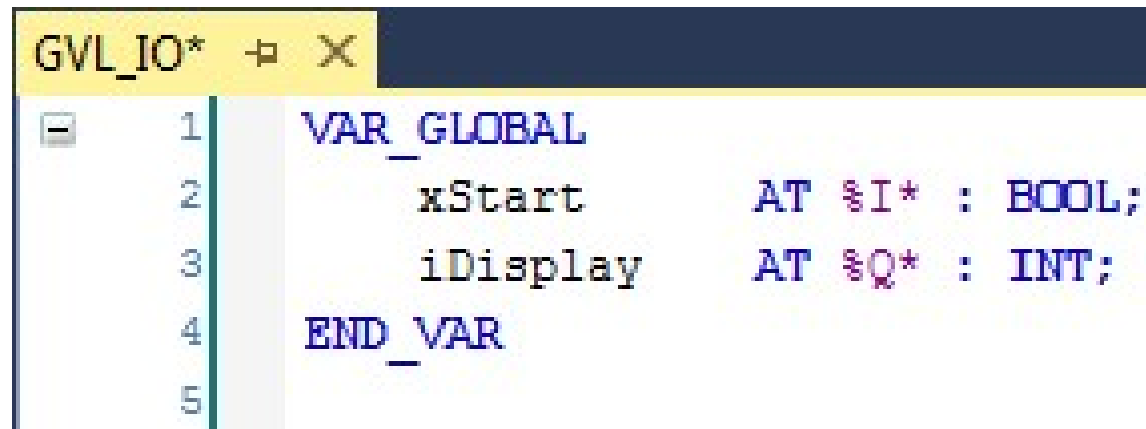
- Provide a unique and descriptive name
- Click 'Open'



GVL Addressed Variables

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- Create the variables with their addresses



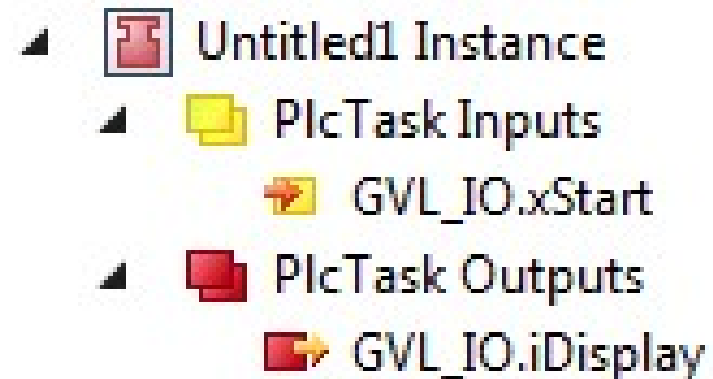
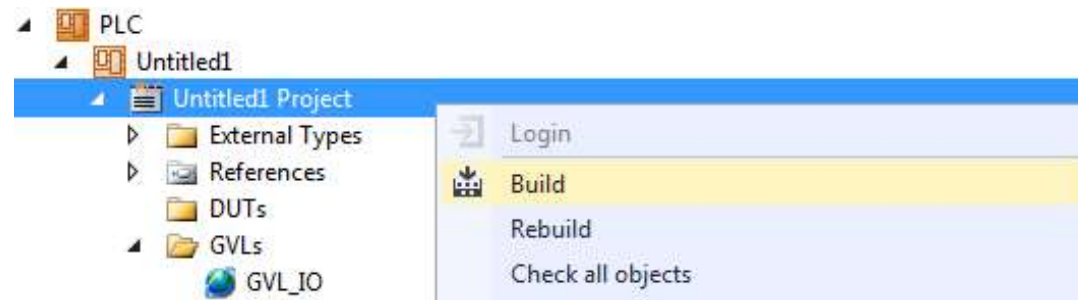
The screenshot shows a software window titled "GVL_IO*" with standard window controls (minimize, maximize, close). The window contains a text editor with the following code:

```
1  VAR_GLOBAL
2      xStart      AT %I* : BOOL;
3      iDisplay    AT %Q* : INT;
4  END_VAR
5
```

Addressed Variables ,Instance‘

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- To create the ‘Instance’
- In the ‘Solution Explorer’, Right-Click on the ‘Untitled1 Project’ and select ‘Build’
- If there are any Errors a new ‘Instance’ will not be created, or the existing ‘Instance’ will not be changed



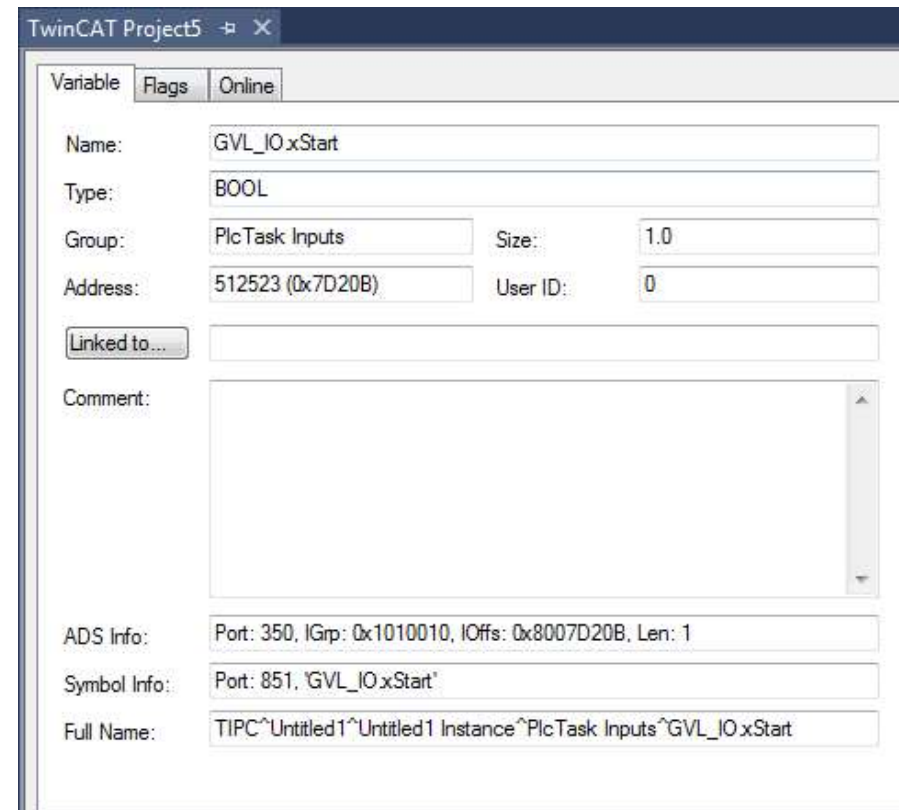
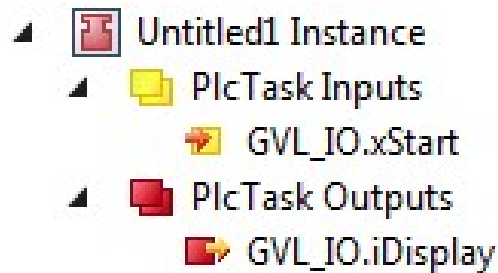
Linking Variables

- A link is created between two similar variables in two different tasks, so that they may share data.

Linking Variables

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- Double click on GVL_IO.xStart
 - On the 'Variable' tab click 'Linked to...'
- to open the Attach Variable window

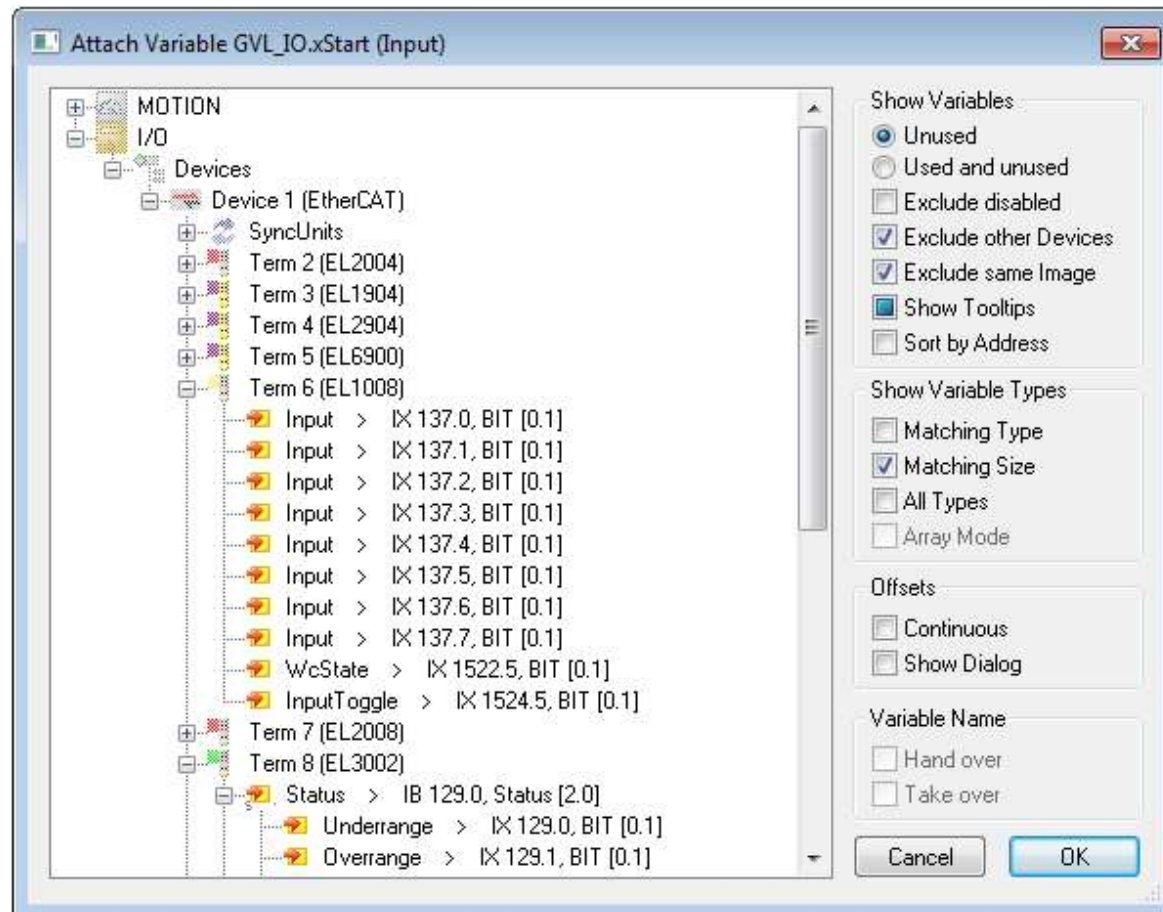


Note: If the Variable window was already open, the Attach Variable window will open instead.

Linking Variables

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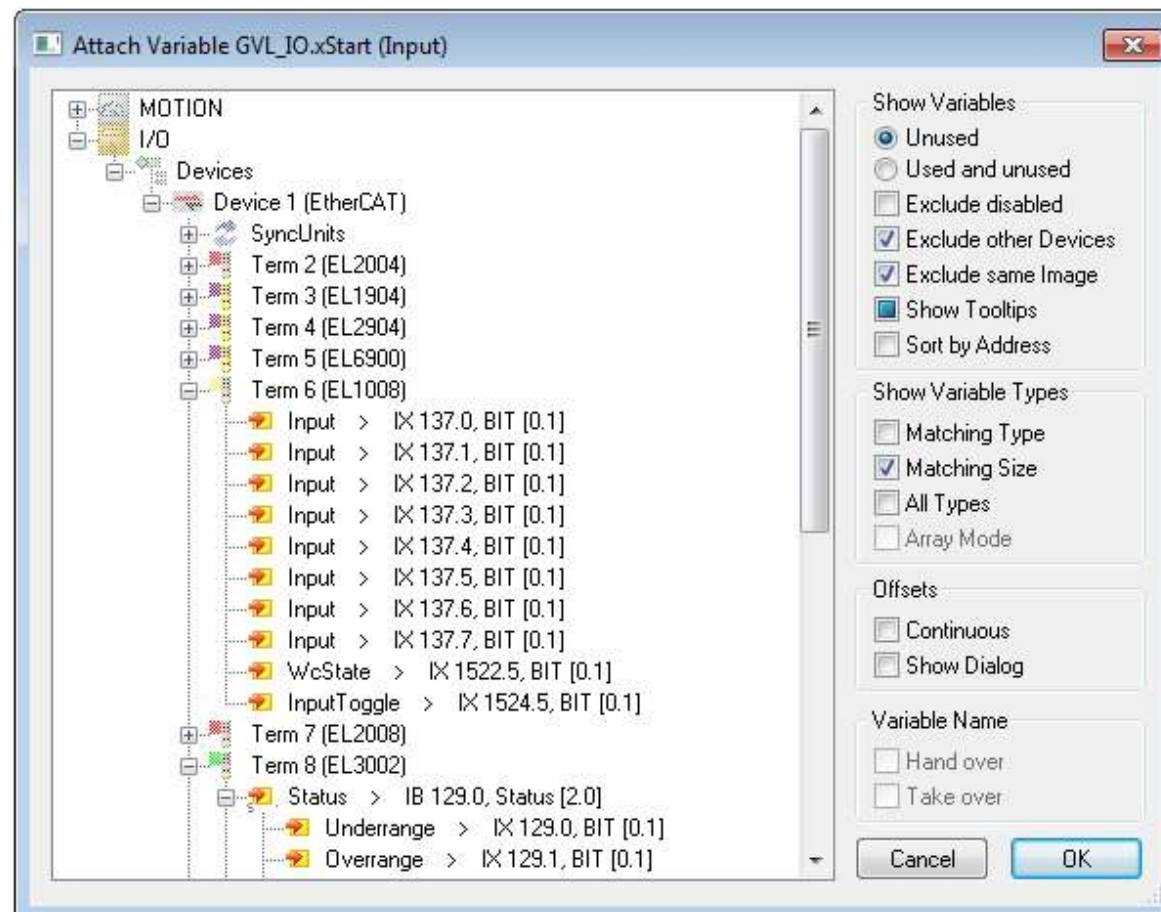
- The 'Attach Variable' window displays all possible locations that the variable could be linked to.



Linking Variables

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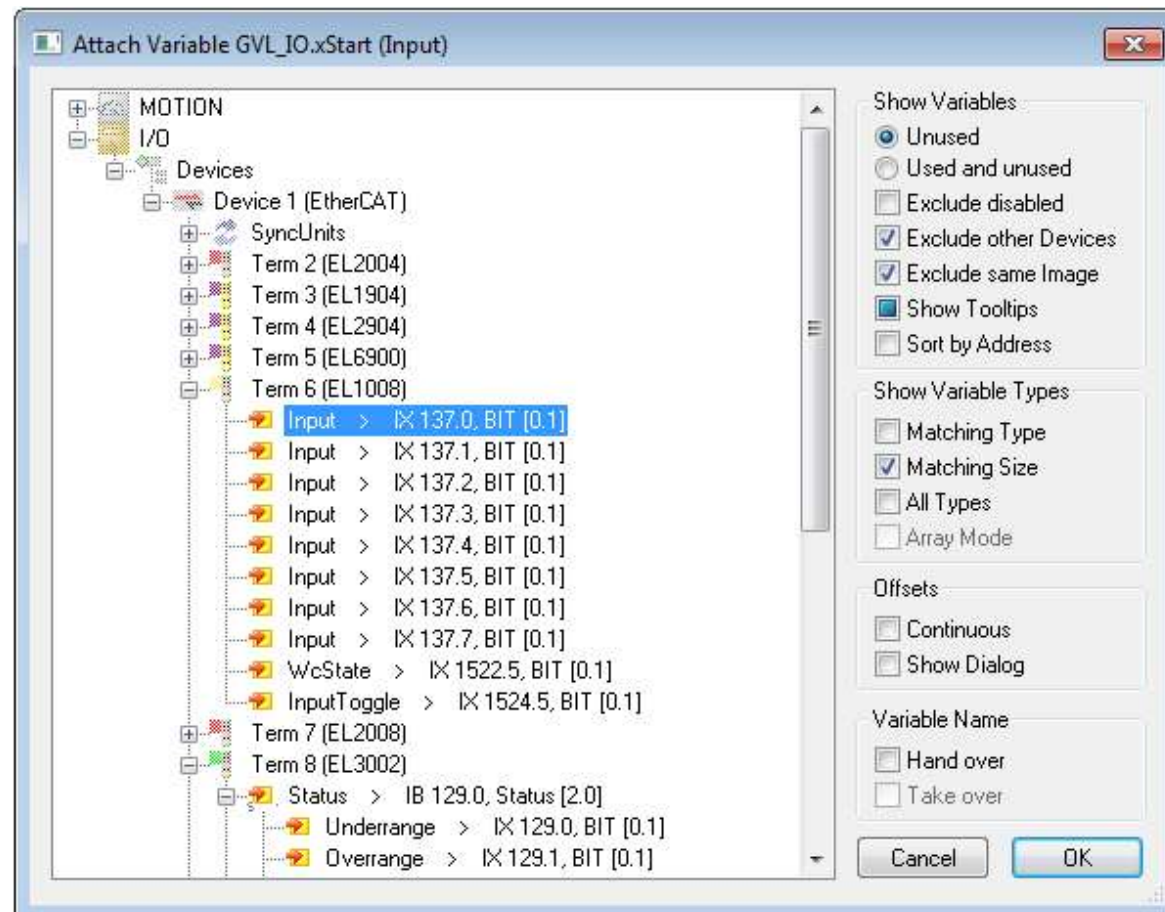
- The filter settings on the right side will narrow the results



Linking Variables

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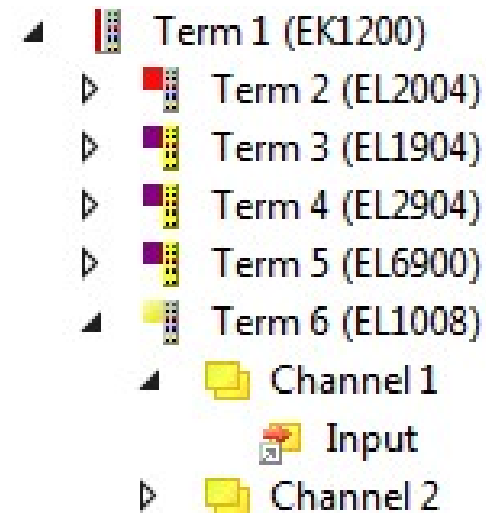
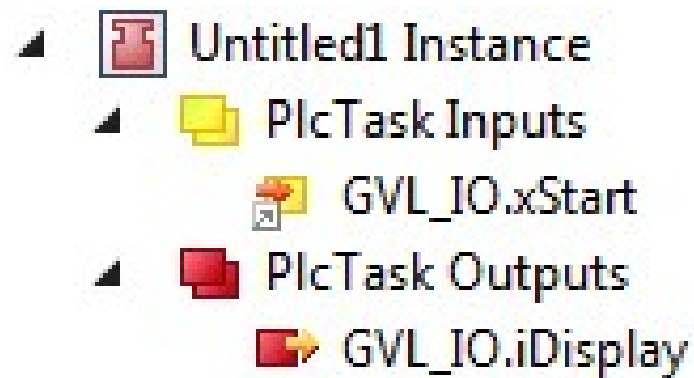
- Select the first Input under the EL1008 and click 'OK'



Linking Variables

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- The icons of both variables now show the 'Link' symbol



Linking Variables

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- The 'Variable' Tab now shows the linking information in the 'Linked to...' box

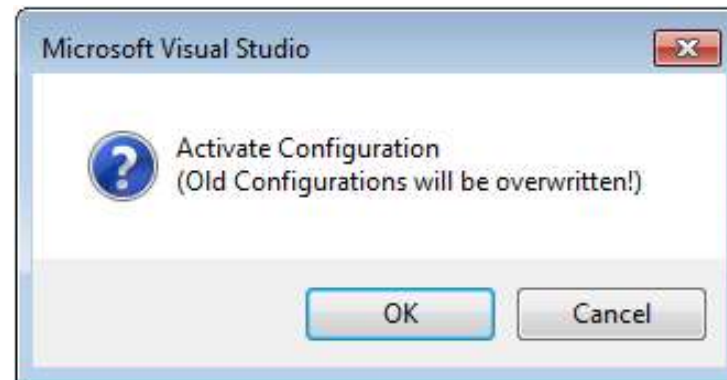
The screenshot shows the 'Variable' tab in the TwinCAT Project5 interface. The variable 'GVL_IO.xStart' is of type 'BOOL' and is linked to 'Input . Channel 1 . Term 6 (EL1008) . Device 1 (EtherCAT) . Devices'. The 'Linked to...' button is visible next to the link text. The 'Comment' field is empty. The 'ADS Info' field shows 'Port: 350, IGrp: 0x1010010, IOFs: 0x8007D20B, Len: 1'. The 'Symbol Info' field shows 'Port: 851, 'GVL_IO.xStart''. The 'Full Name' field shows 'TIPC^Untitled1^Untitled1 Instance^PlcTask Inputs^GVL_IO.xStart'.

Variable		Flags	Online
Name:	GVL_IO.xStart		
Type:	BOOL		
Group:	PlcTask Inputs	Size:	1.0
Address:	512523 (0x7D20B)	User ID:	0
Linked to...	Input . Channel 1 . Term 6 (EL1008) . Device 1 (EtherCAT) . Devices		
Comment:			
ADS Info:	Port: 350, IGrp: 0x1010010, IOFs: 0x8007D20B, Len: 1		
Symbol Info:	Port: 851, 'GVL_IO.xStart'		
Full Name:	TIPC^Untitled1^Untitled1 Instance^PlcTask Inputs^GVL_IO.xStart		

- The variable links are not implemented until an 'Activate Configuration' command is executed.
- From the 'TwinCAT' menu select 'Activate Configuration'



- Click 'OK' to proceed



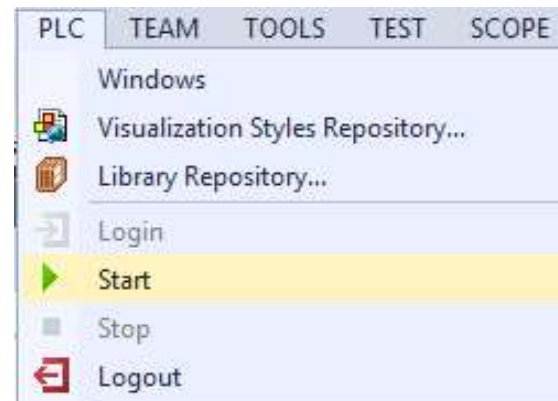
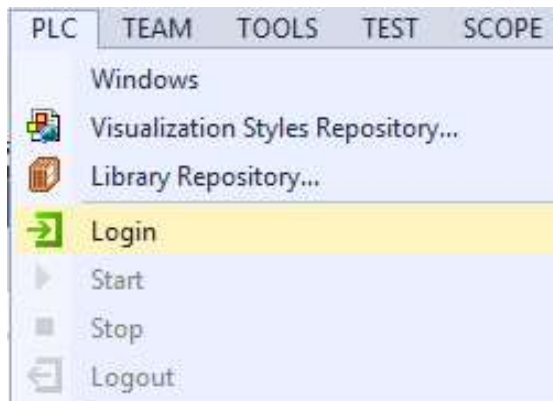
- Click 'OK' to Restart TwinCAT in 'Run Mode'



Linking Variables

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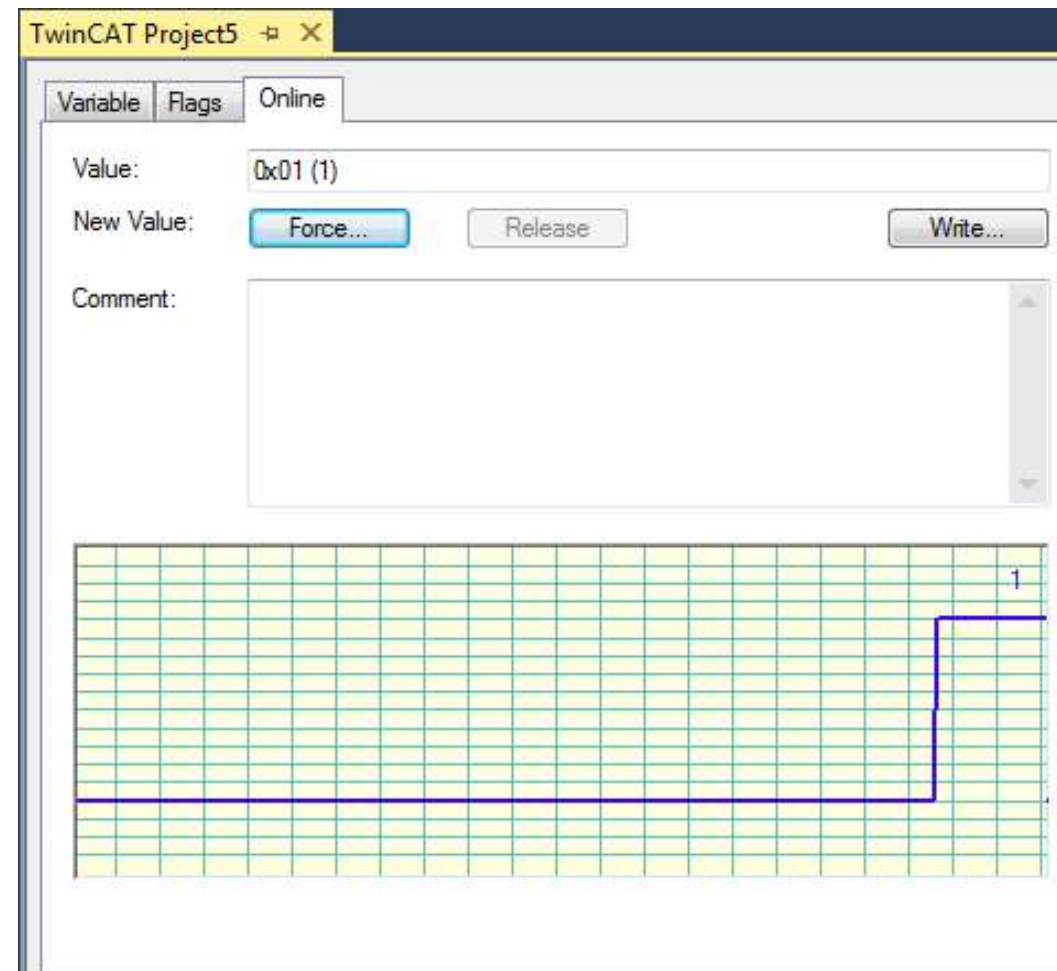
- Now that the hardware variable is linked to the PLC variable, the PLC must be running for the hardware to update
- Login and Run the PLC



Linking Variables

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- Select the PLC or the hardware variable and go to the 'Online' tab
- You can now watch the value change



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