



7

Beckhoff TwinCAT

Mapping TwinCAT I/O Server Variables to I/O

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1. Introduction

Beckhoff I/O can be used with a wide variety of control systems, but TwinCAT PLC will not necessarily be the main control system running on the PC. System control may be implemented in a customised program implemented using Visual Basic, C++ or another 3rd-party PC-based control system.

The TwinCAT IO Server provides the necessary services to transfer data to and from the Beckhoff I/O terminals via one of the supported communication networks, e.g. PROFIBUS-DP, Ethernet, etc.

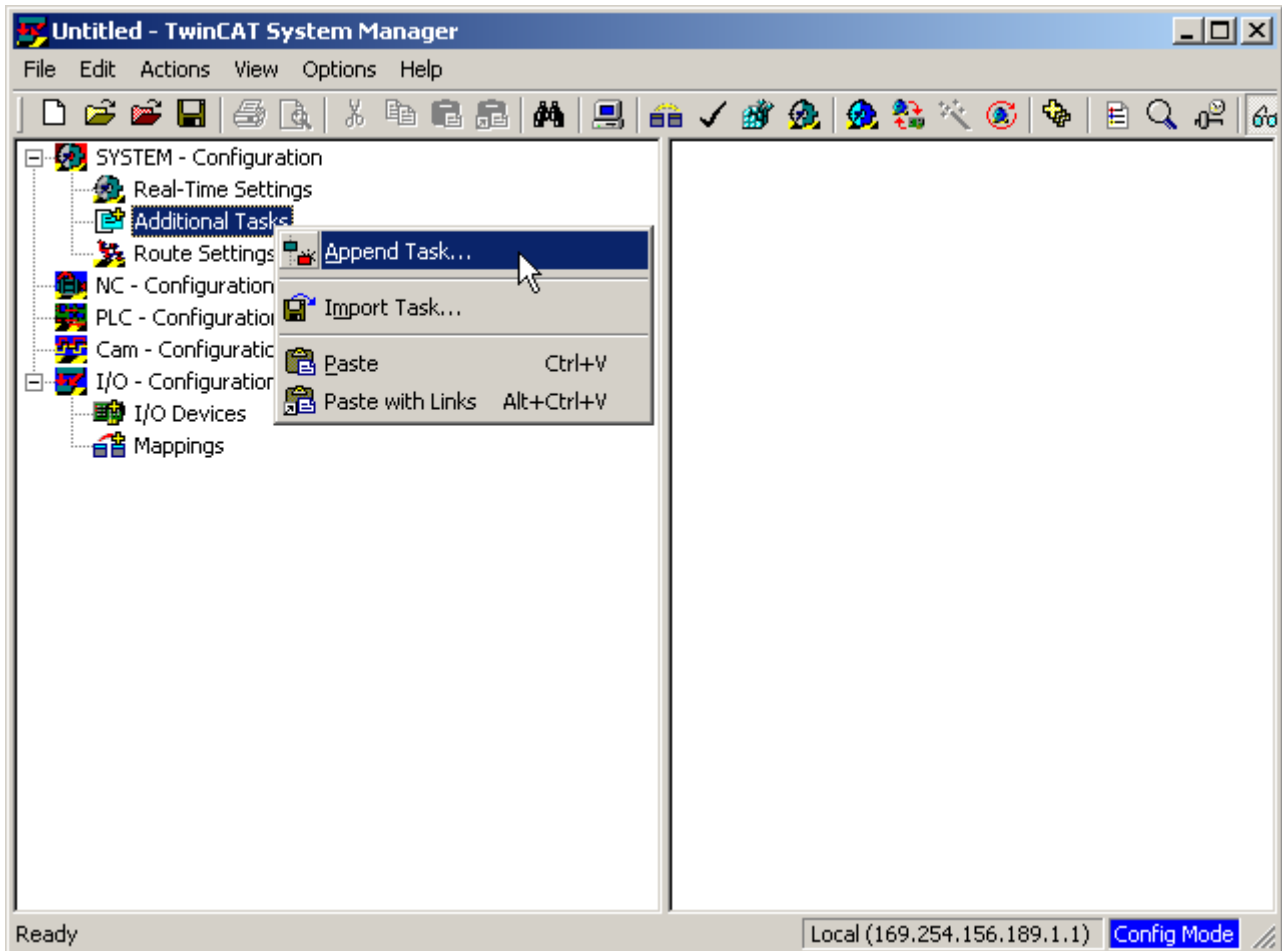
I/O terminals are linked to internal IO Server variables, and external programs can access these variables using various data transfer standards, e.g. ActiveX, DLL, OPC, etc. This allows the external program to read the status of the input terminals and control the status of the output terminals without having to use the TwinCAT PLC.

2. Creating I/O Server Variables

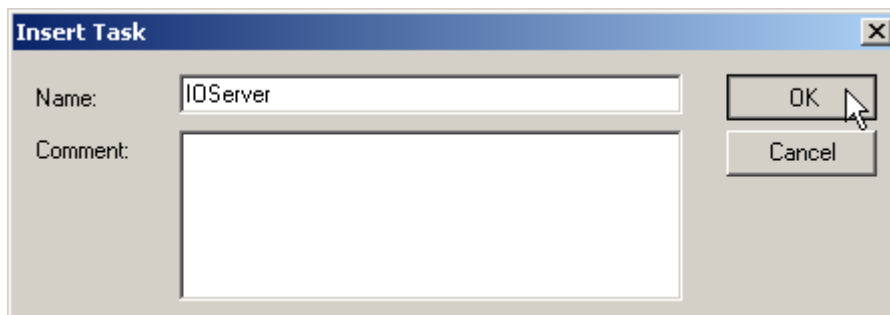
2.1. Add an “Additional Task”

To add an additional task to TwinCAT System Manager:

1. Double click on “System Configuration”
2. Right click on “Additional Tasks”
3. Select “Append Task...”



4. Assign a name to the new task. In the example below, the task has been called “IOServer”.
5. Click OK

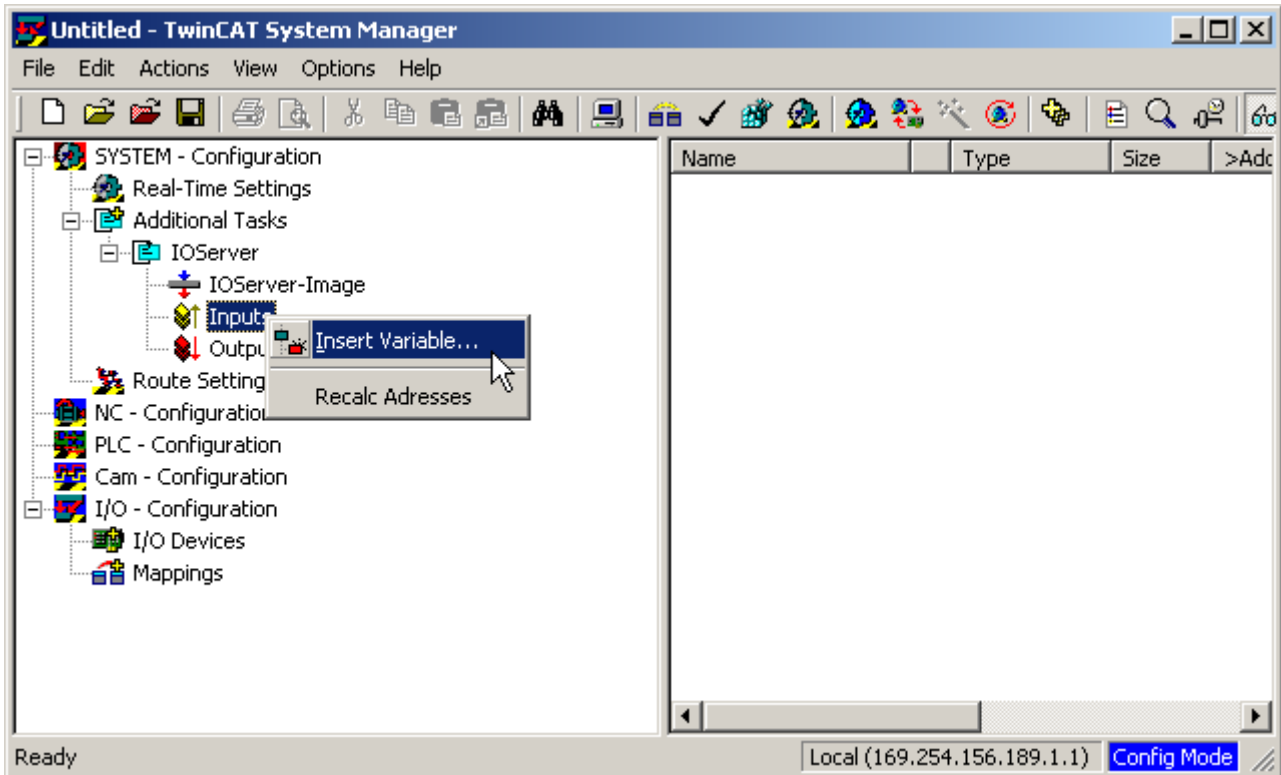


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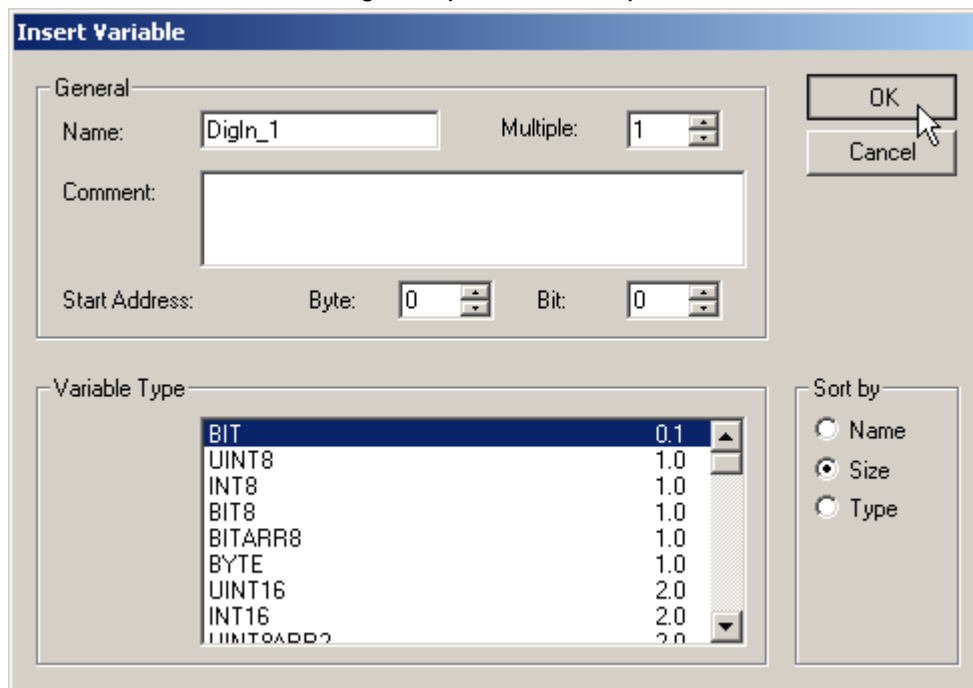
2.2. Adding IO Server Variables

Input variables will receive data from digital and analogue inputs, while output variables will be used to control digital and analogue outputs. To add an input variable:

6. Double click on "IOServer"
7. Right click on "Insert Variable..."
8. Select "Insert Variable..."

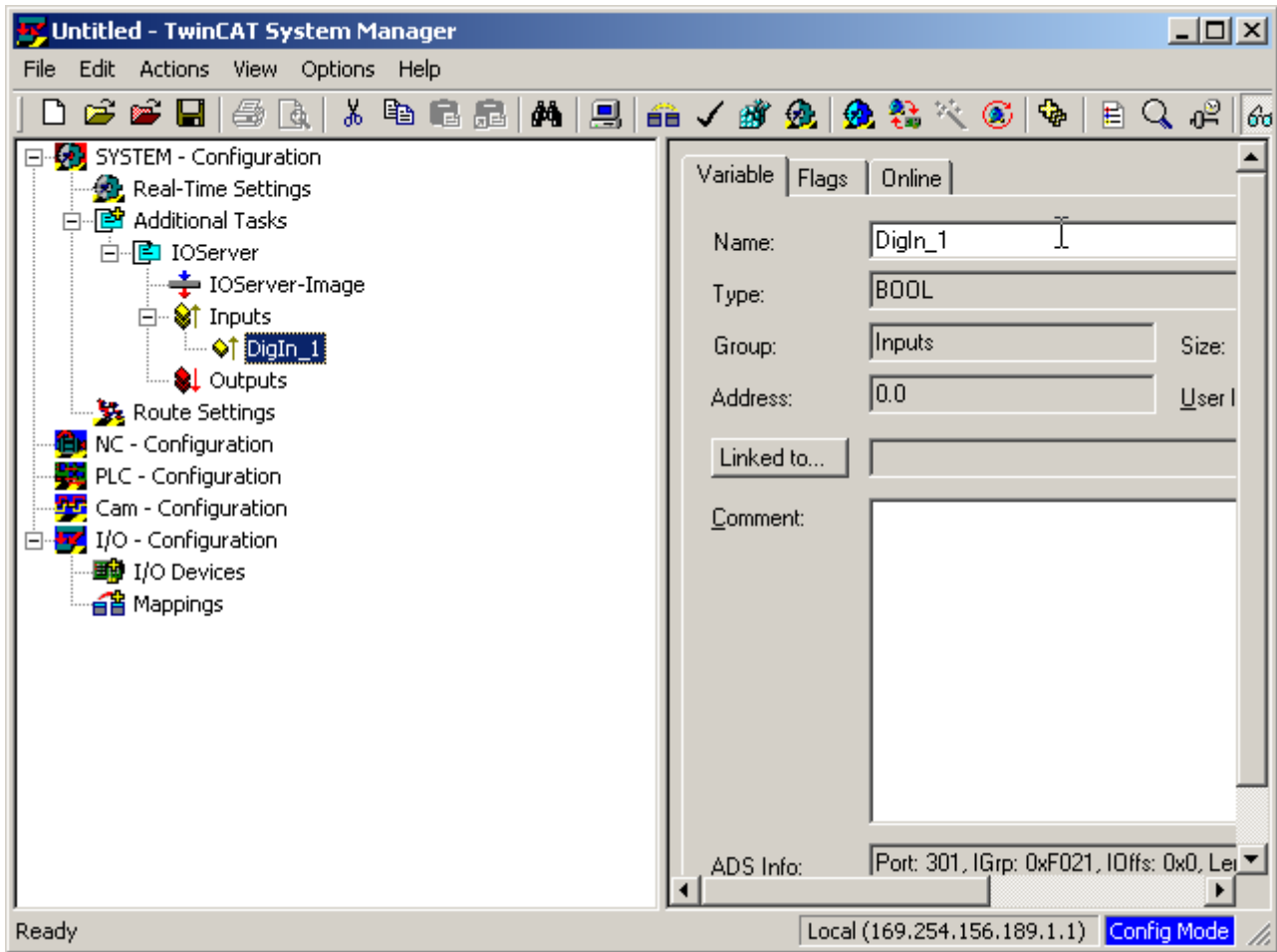


9. Assign a name to the variable
10. Select the variable type. BIT should be used for digital inputs and outputs, and INT should be used for analogue inputs and outputs.



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TwinCAT System Manager will add an input variable to IOserver.



To add more input and output variables as required, simply repeat steps 6 to 10.

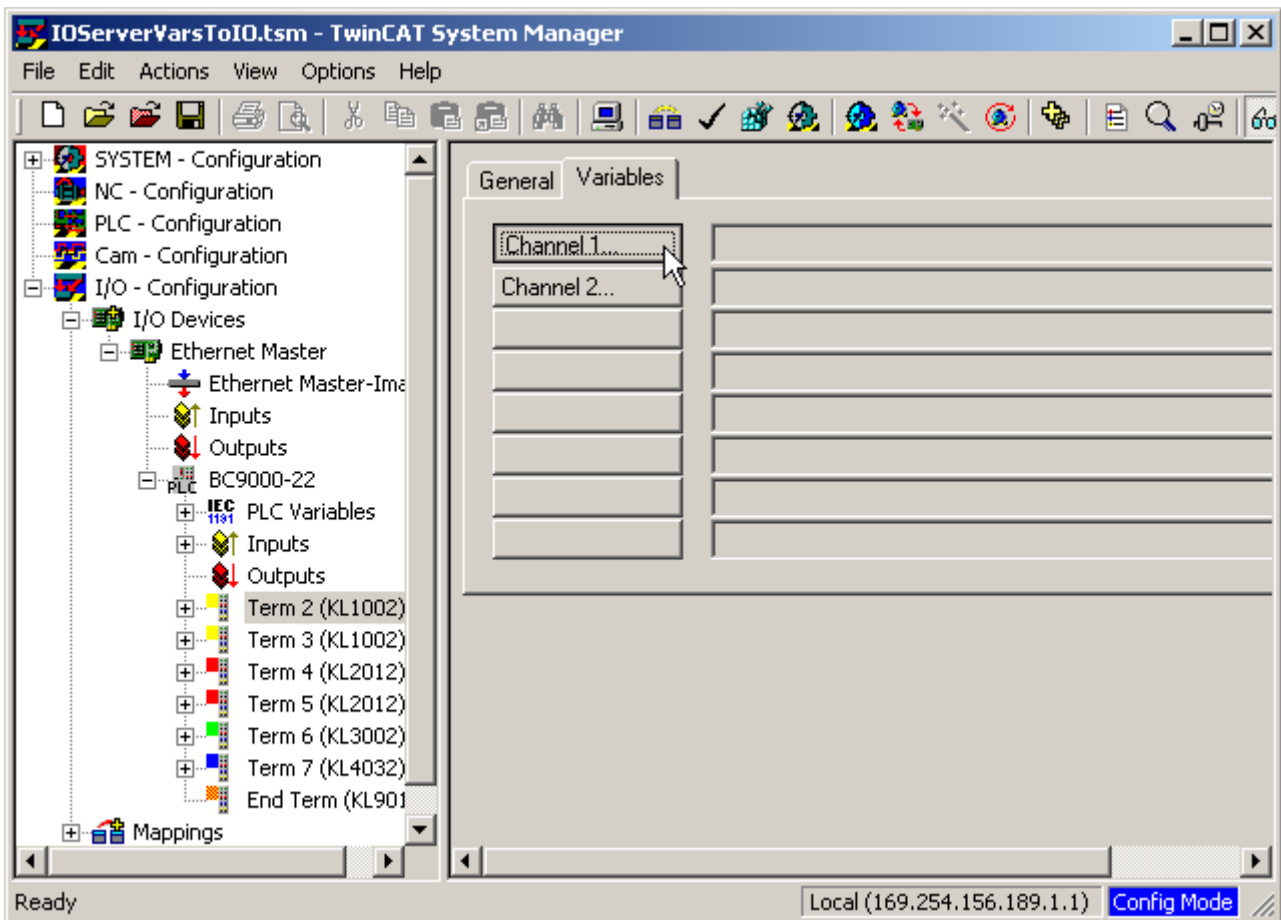
3. Linking TwinCAT IO Server variables to I/O

To complete the mapping process between I/O terminals and PLC variables, system image variables must be linked to the PLC input and output process image variables. Repeat steps 1 to 5 in each section until all required links between PLC process image variables and analogue and digital inputs and outputs have been created.

3.1. Digital Inputs

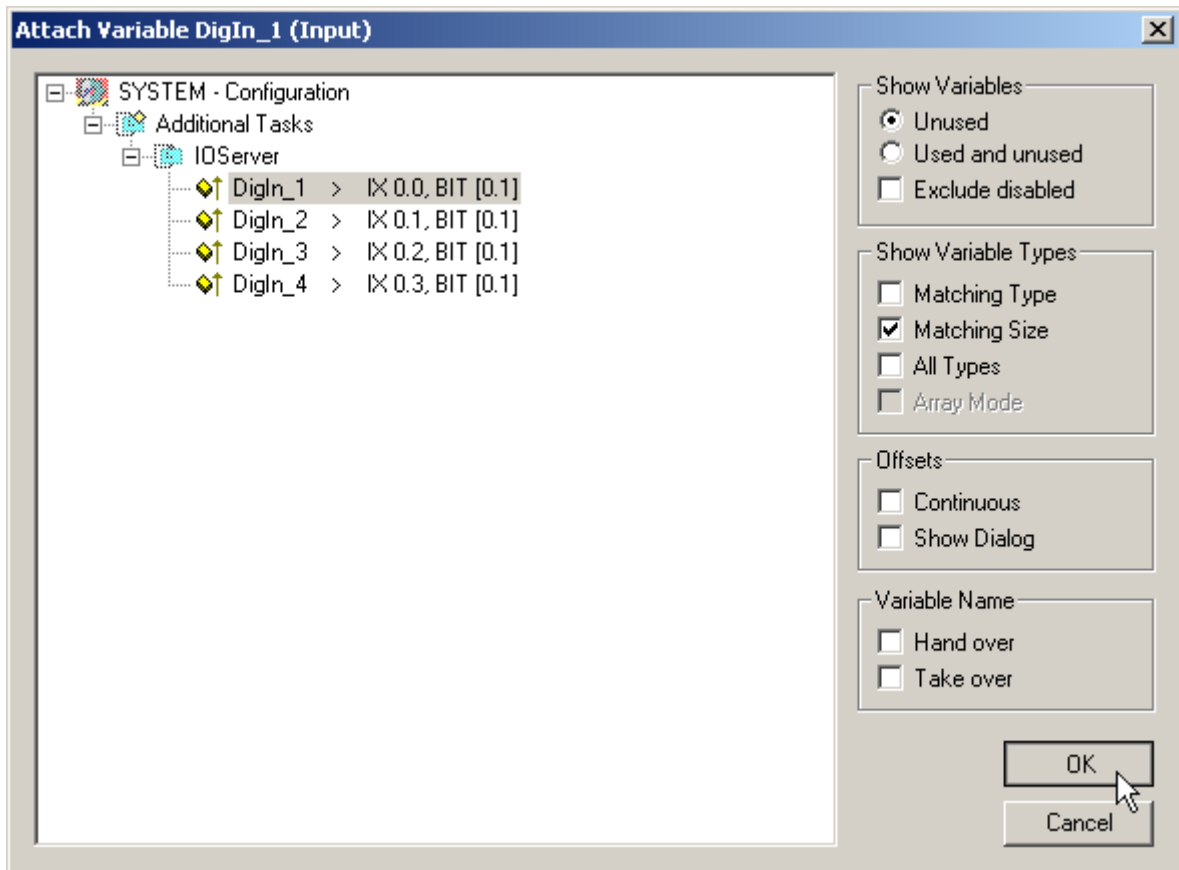
To map the first digital input to an I/O Server variable:

1. Click on "Term 2 (KL1002)"
2. Select the "Variables" tab
3. Click on "Channel 1..."

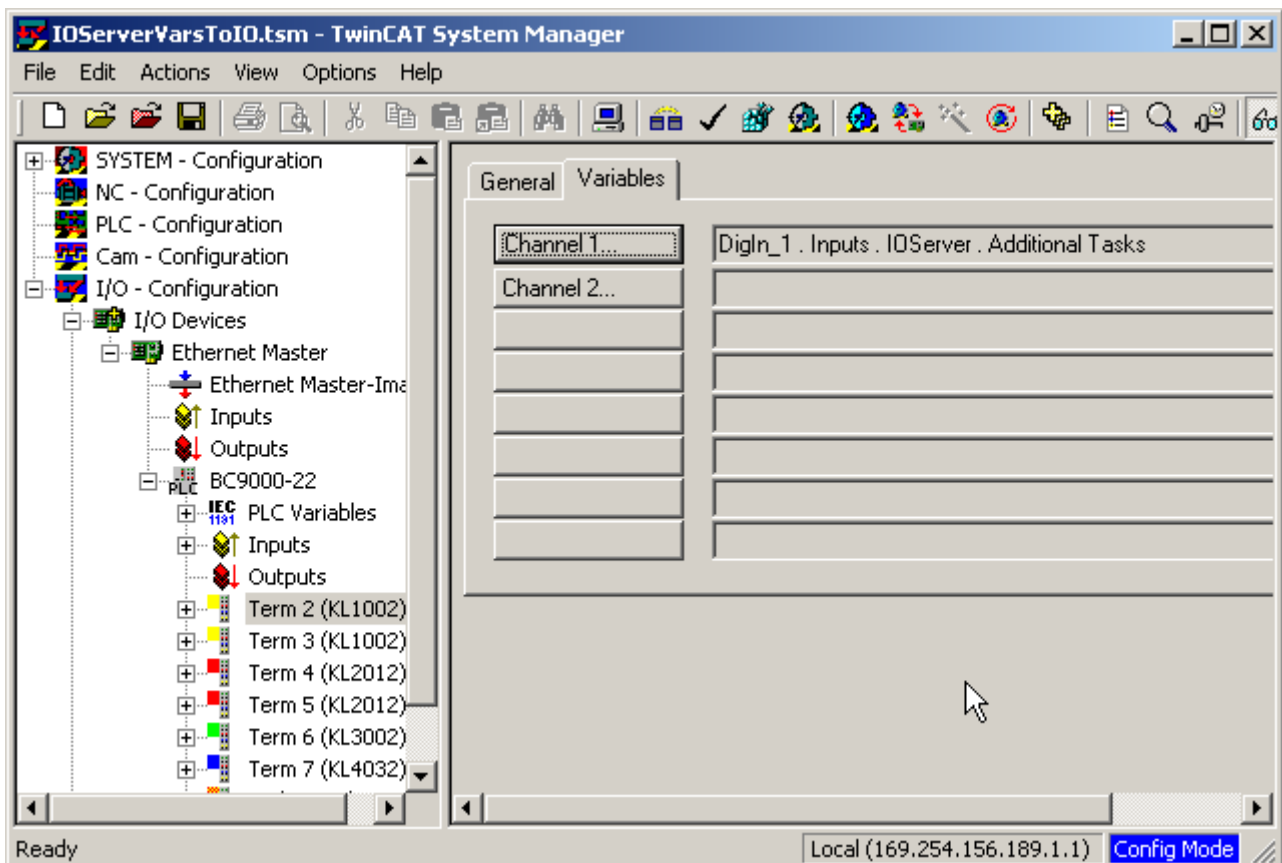


Mapping TwinCAT I/O Server Variables to I/O

4. Select the PLC input variable that the digital input should be linked to
5. Click OK



TwinCAT will link the IO Server variable "IO Server.Inputs.DigIn_1" to digital input Term 2 Channel 1.

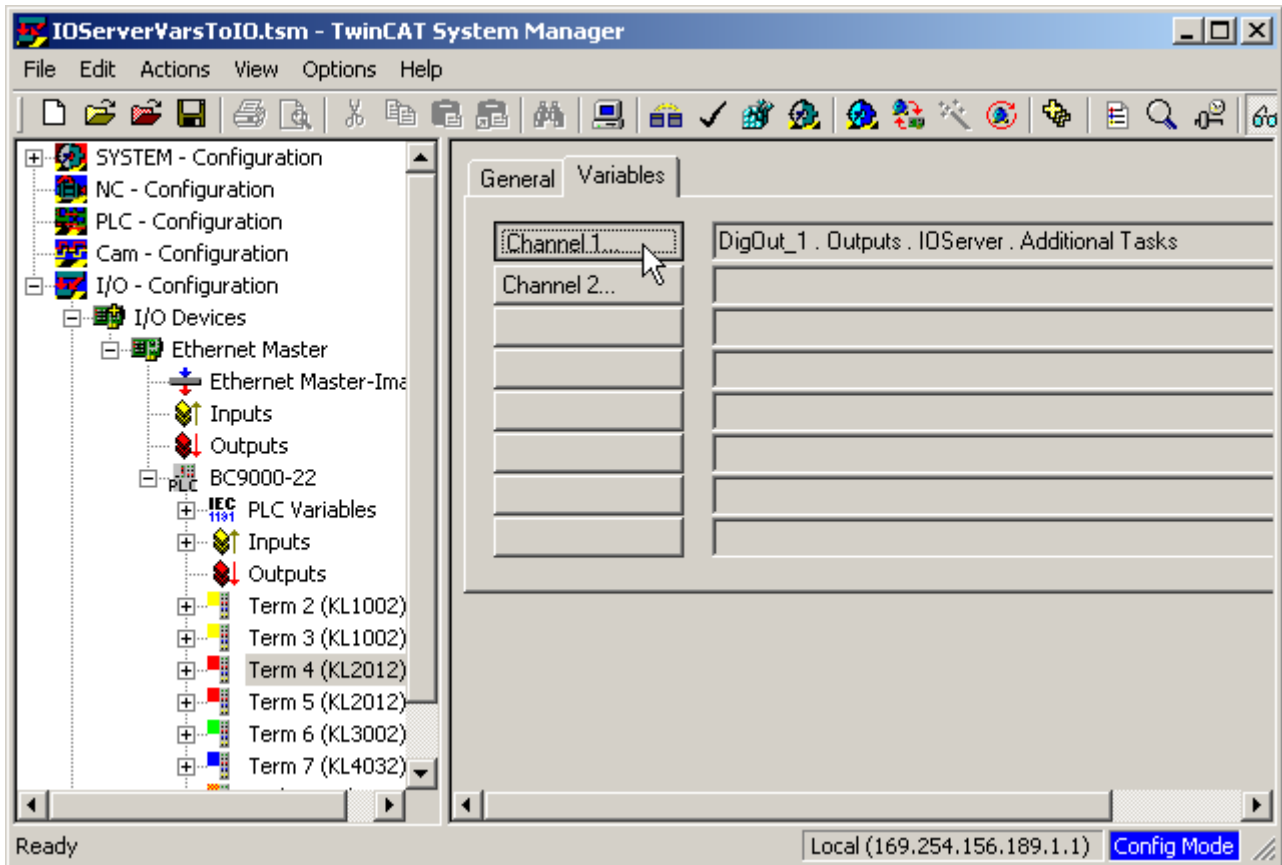


Mapping TwinCAT I/O Server Variables to I/O

3.2. Digital Outputs

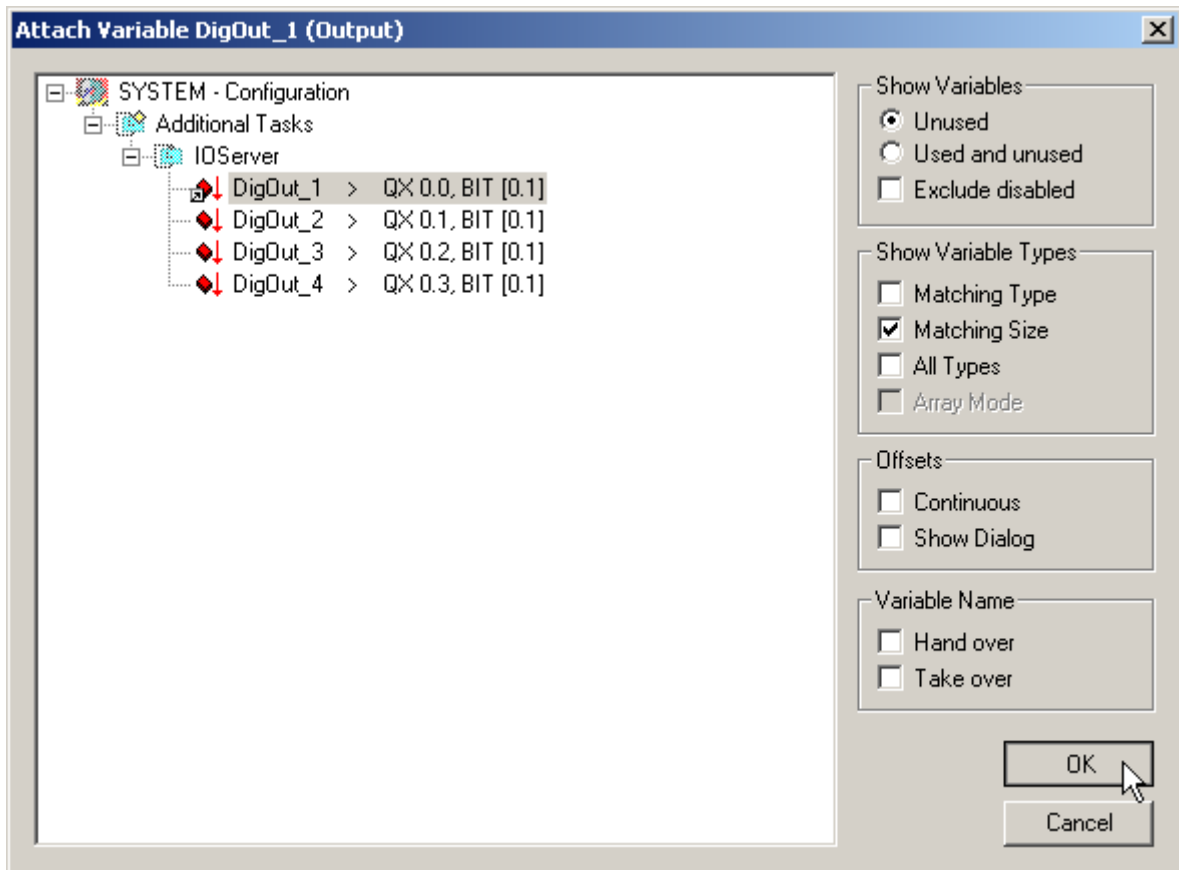
To map the first digital output to the PLC process output image:

1. Click on "Term 4 (KL2012)"
2. Select the "Variables" tab
3. Click on "Channel 1..."

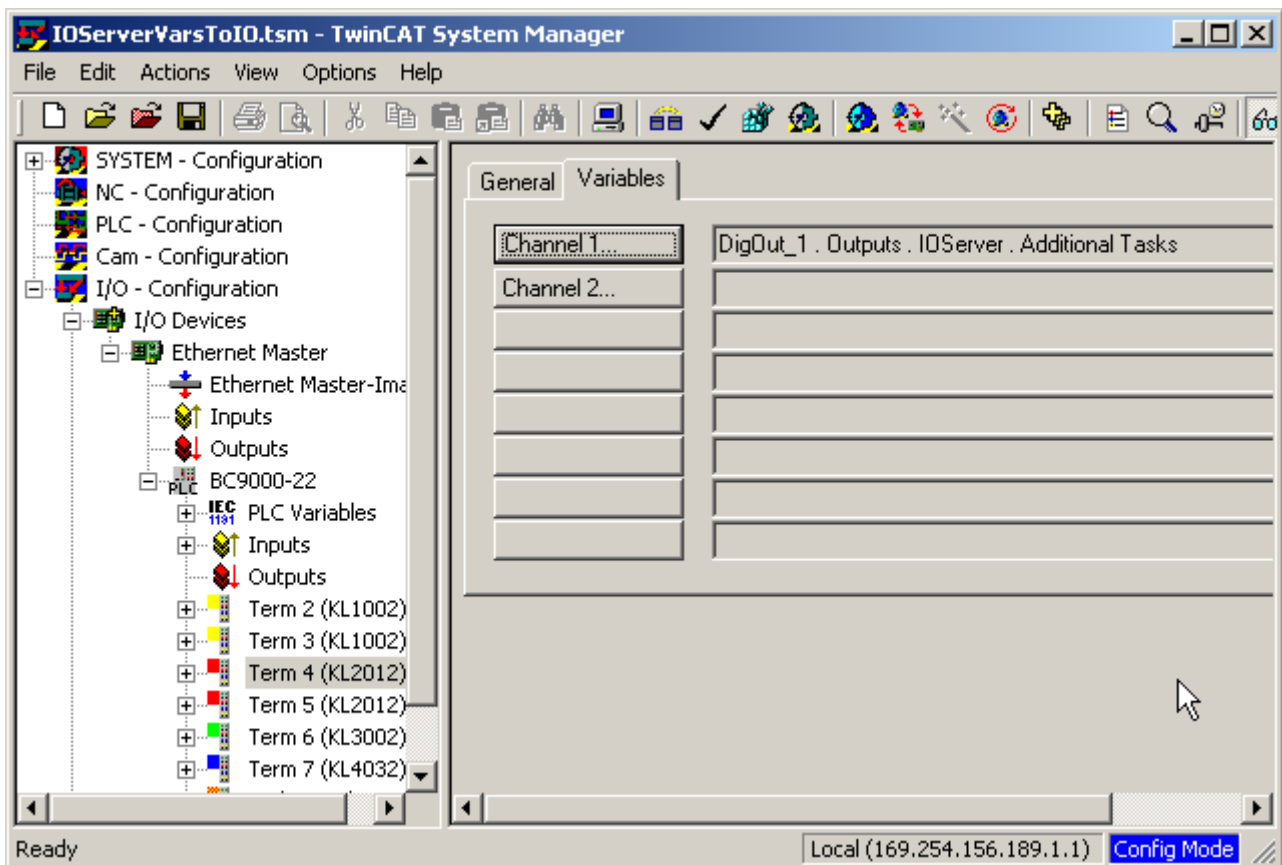


Mapping TwinCAT I/O Server Variables to I/O

4. Select the PLC output variable that the digital output should be linked to
5. Click OK



TwinCAT will link the IO Server variable "IOServer.Outputs.DigOut1" to digital output Term 4 Channel 1.

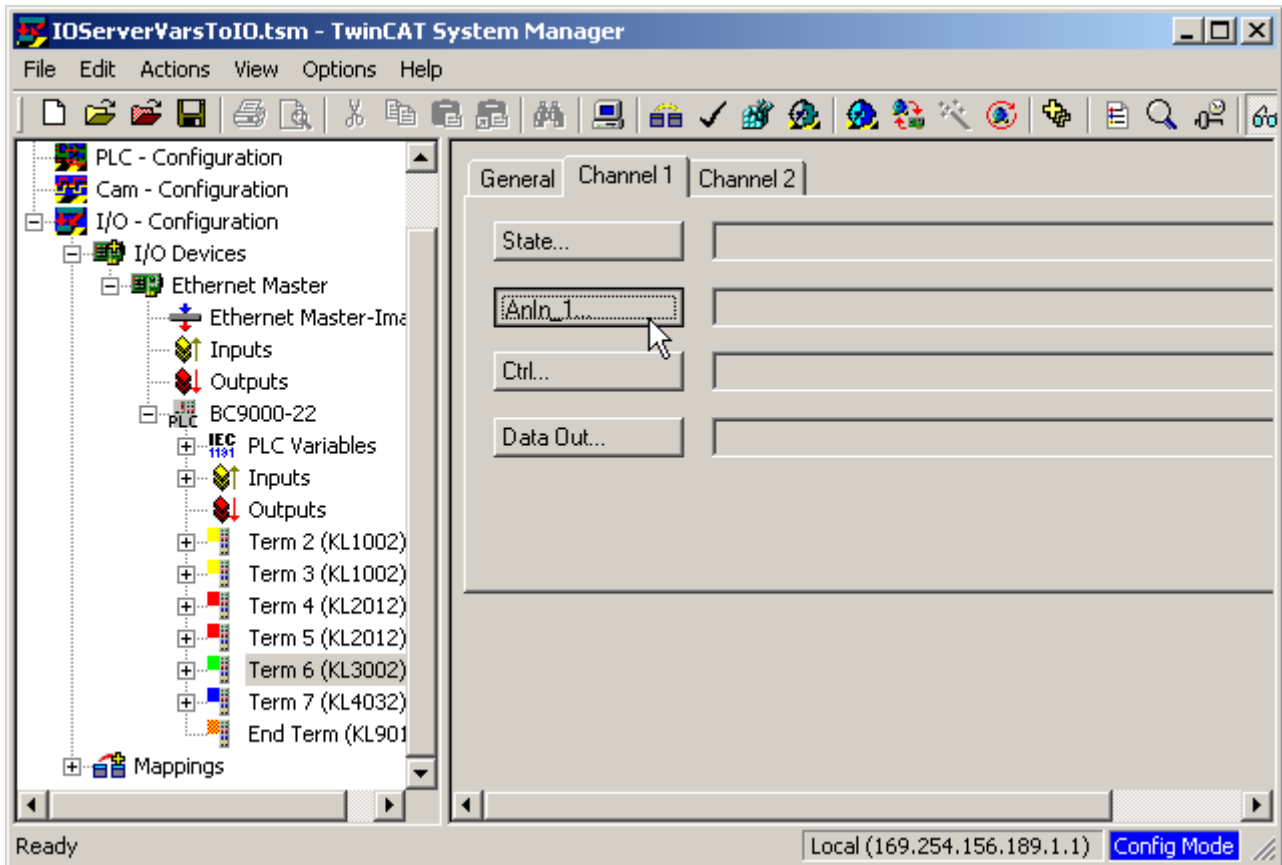


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3.3. Analogue Inputs

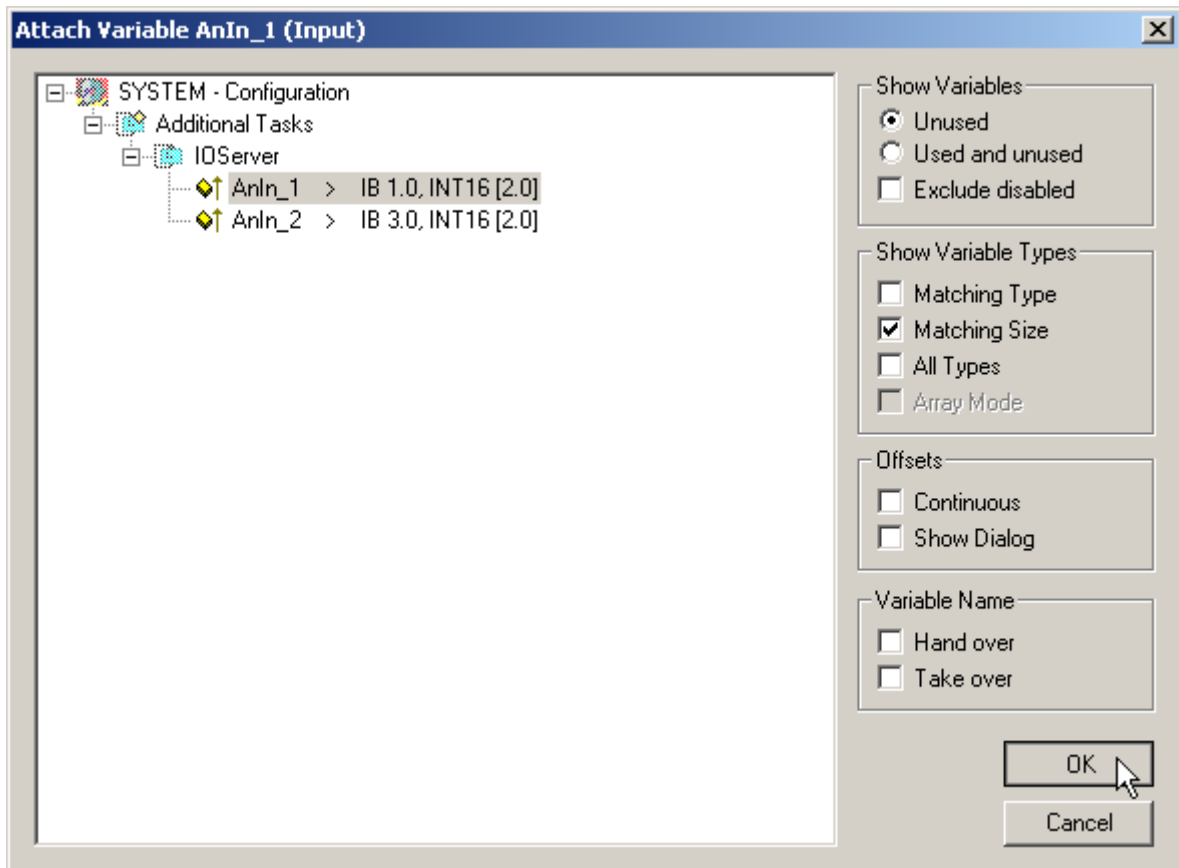
To map the first analogue input to the PLC process input image:

1. Click on "Term 6 (KL3002)"
2. Select the "Channel 1" tab
3. Click on "Data In..."

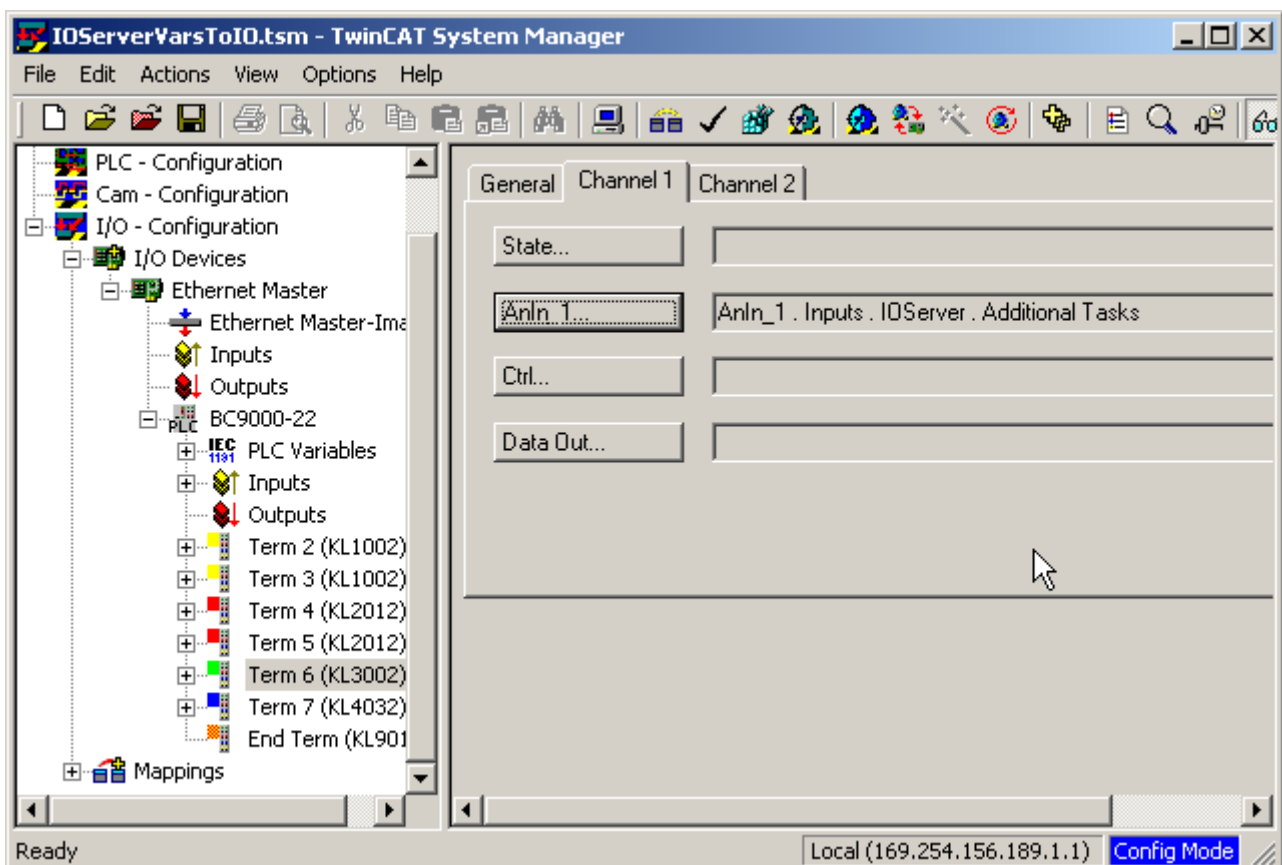


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4. Select the PLC input variable that the analogue input should be linked to
5. Click OK



TwinCAT will link the IO Server variable "IOServer.Inputs.AnIn1" to analogue input Term 6 Channel 1.

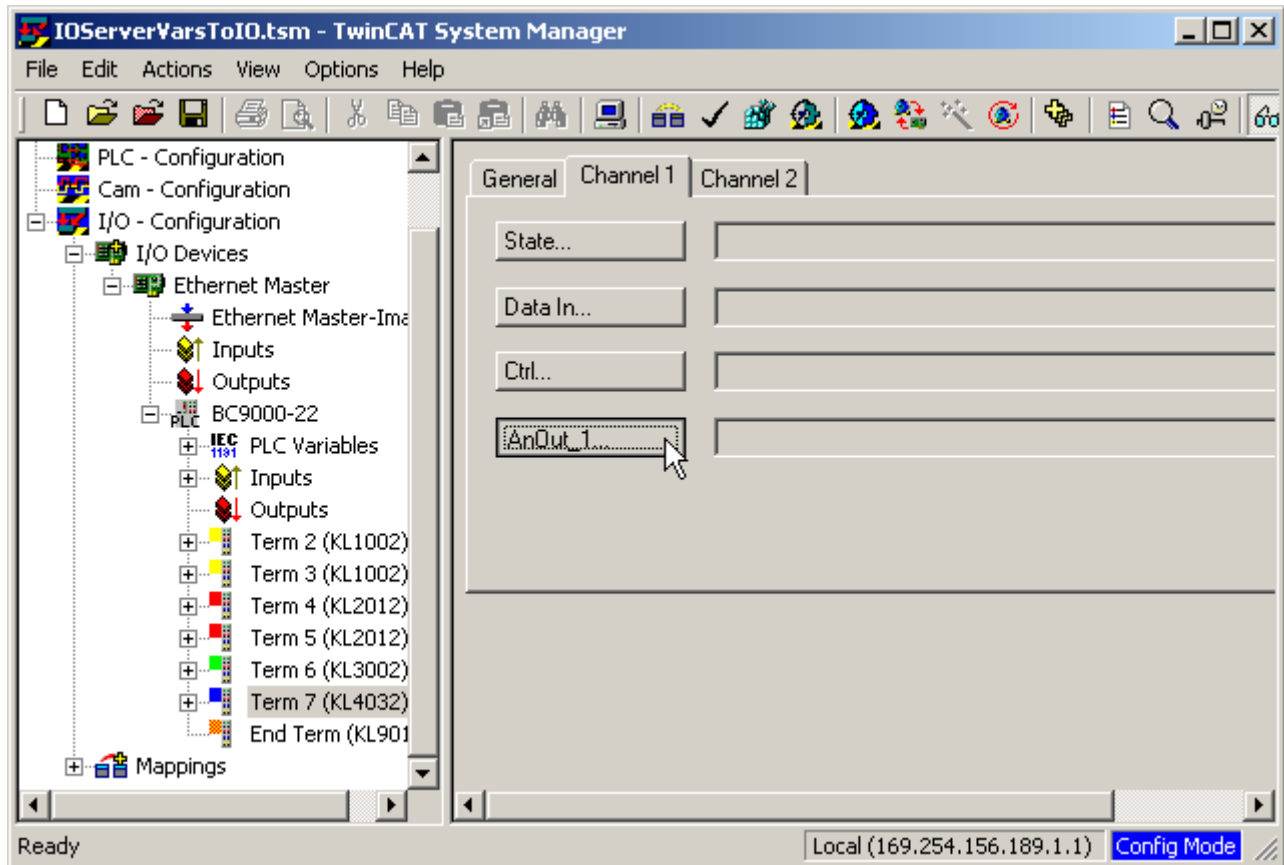


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3.4. Analogue Outputs

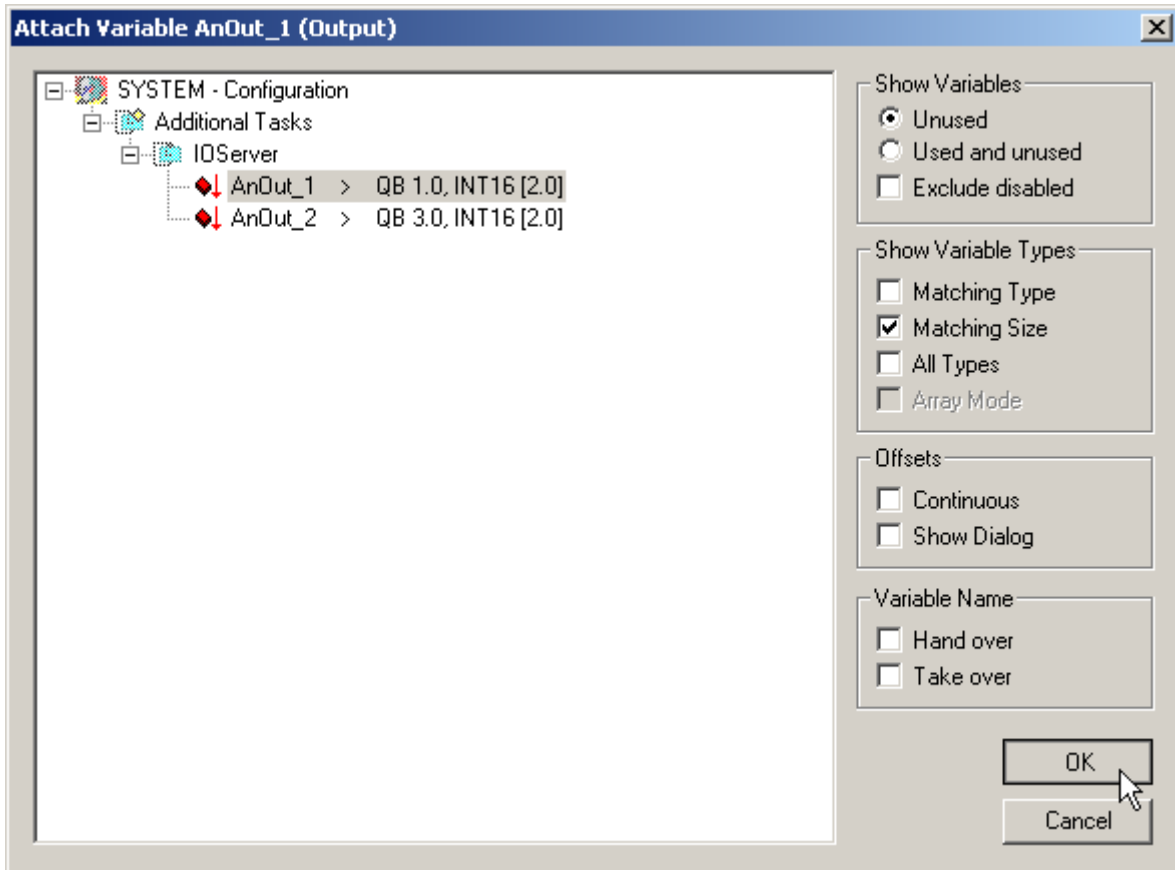
To map the first analogue output to the PLC process output image:

1. Click on "Term 7 (KL4032)"
2. Select the "Channel 1" tab
3. Click on "Data Out..."

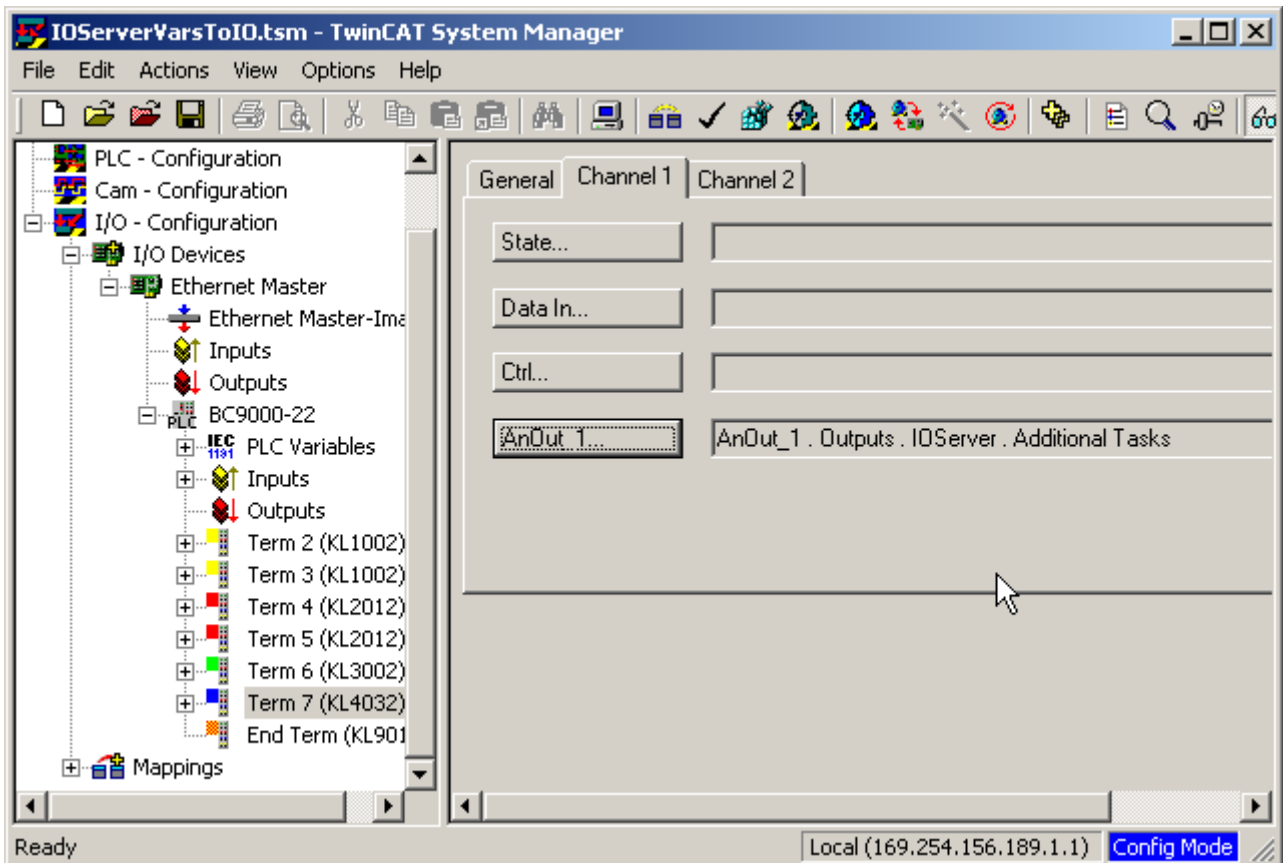


Mapping TwinCAT I/O Server Variables to I/O

4. Select the PLC output variable that the analogue output should be linked to
5. Click OK



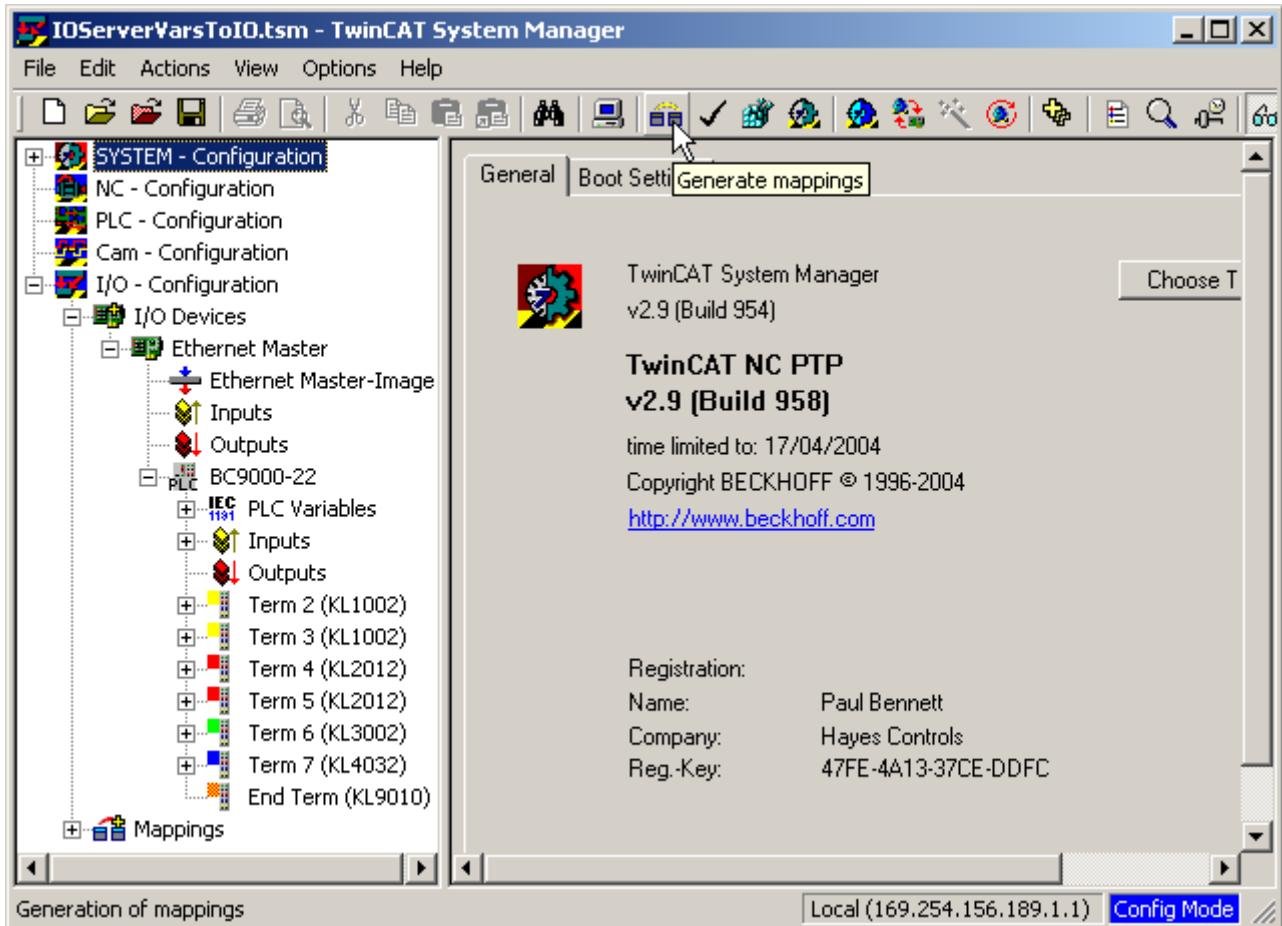
TwinCAT will link the IO Server variable "IO Server.Outputs.AnOut1" to analogue output Term 7 Channel 1.



4. Activating the TwinCAT I/O System

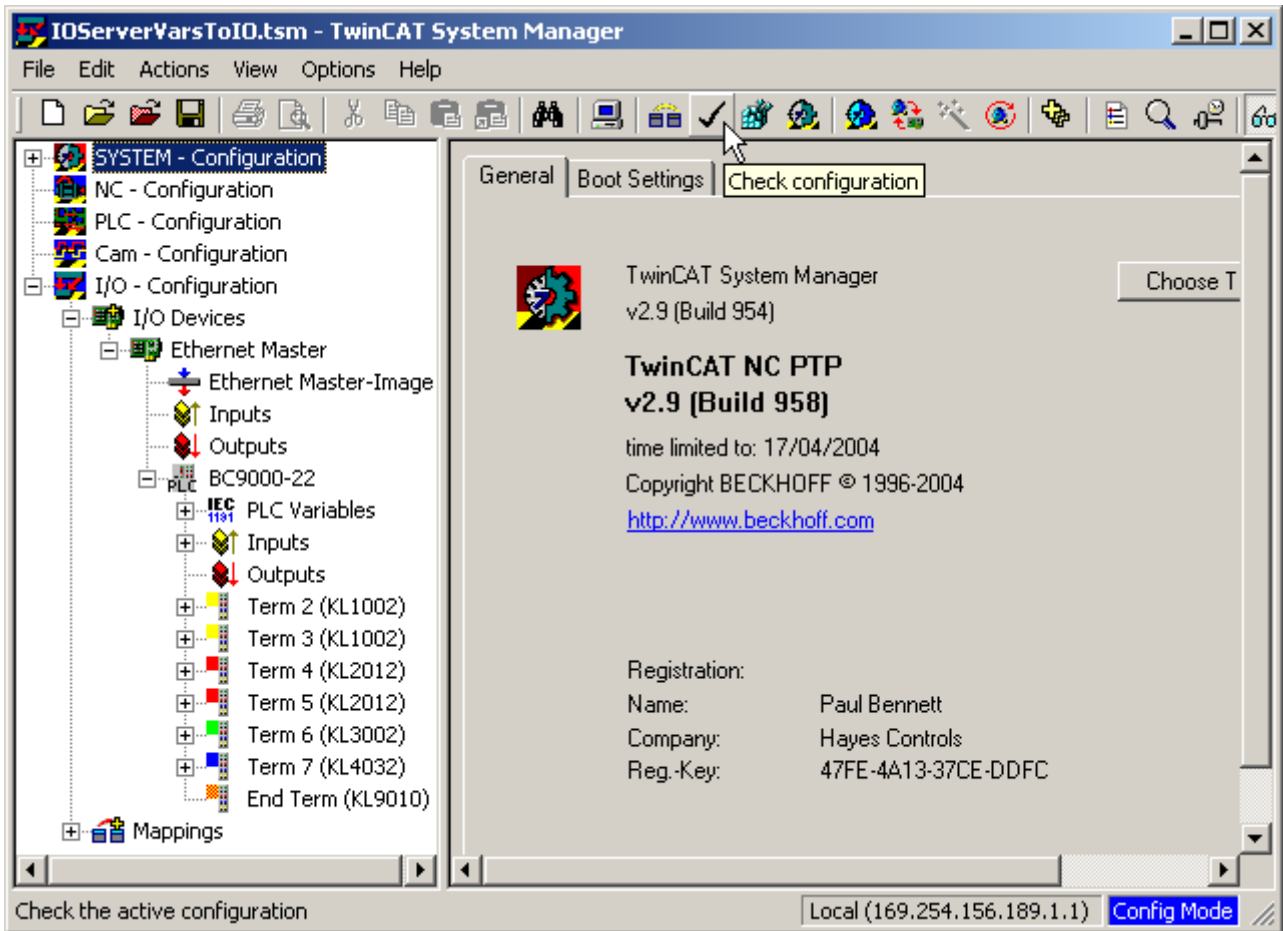
When the TwinCAT system configuration and I/O Server variables have been created, they must be downloaded to the TwinCAT system and activated. To download the updated TwinCAT System Manager configuration:

1. Click the "Generate Mappings" icon () on the TwinCAT System Manager toolbar.




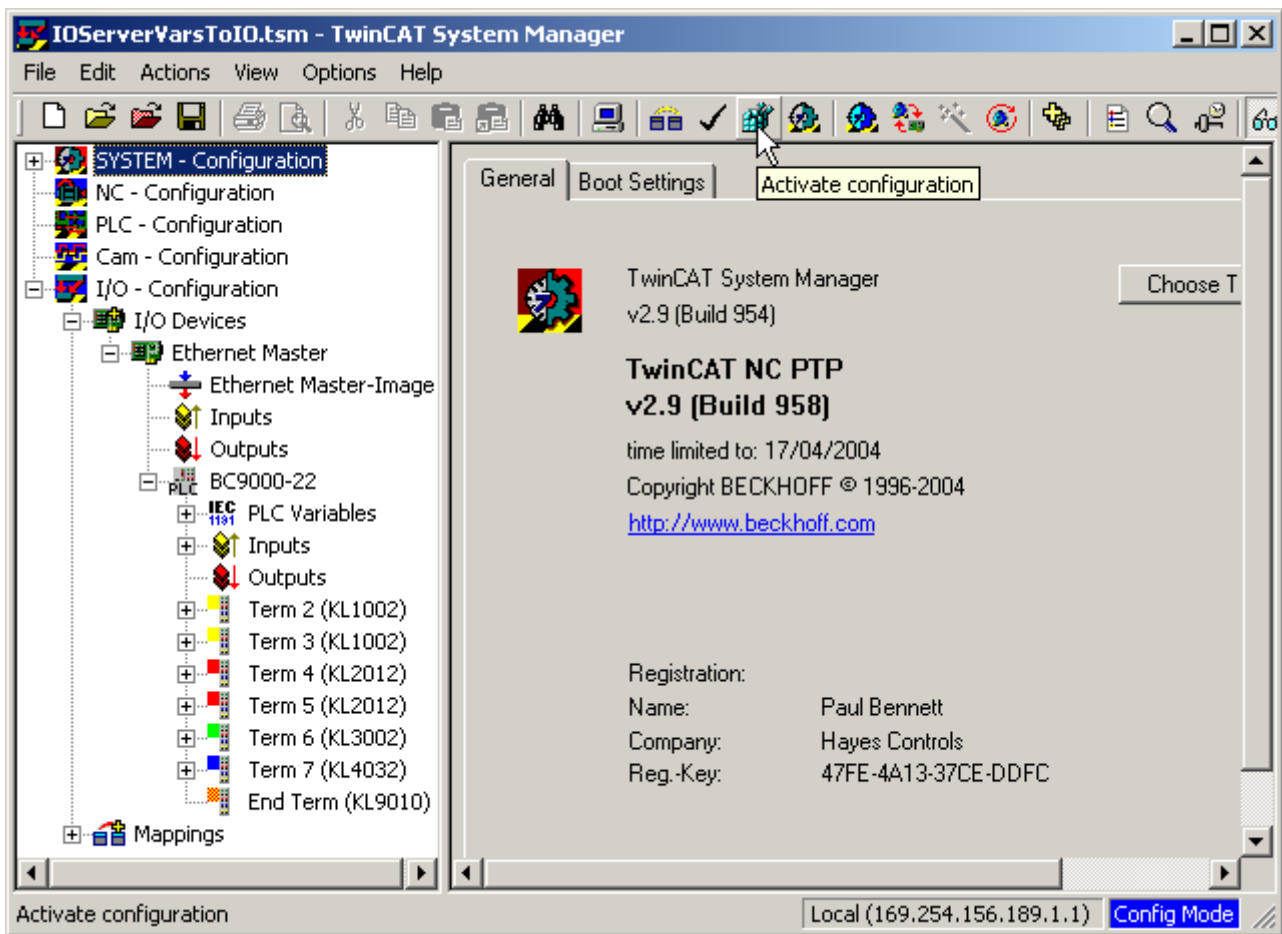
Mapping TwinCAT I/O Server Variables to I/O

2. Click the "Check Configuration" icon (✓) on the TwinCAT System Manager toolbar.

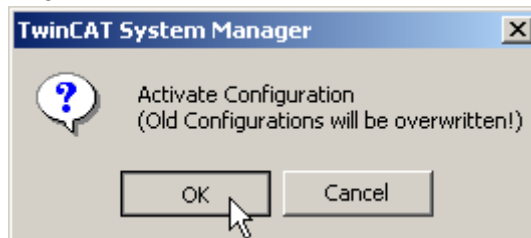


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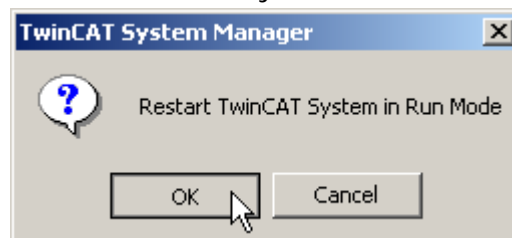
- Click the "Activate Configuration" icon () on the TwinCAT System Manager toolbar.



- Click OK to continue system activation.



- Click OK to restart the TwinCAT I/O system.



Mapping TwinCAT I/O Server Variables to I/O

TwinCAT will restart the system in the RUN mode. This can be seen in the bottom right of the screen, where "Running" will be displayed in white text on the green background.

