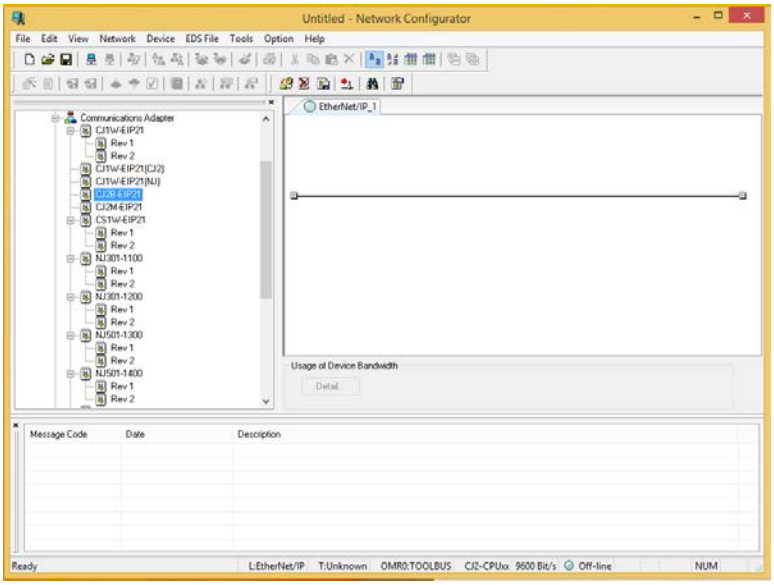
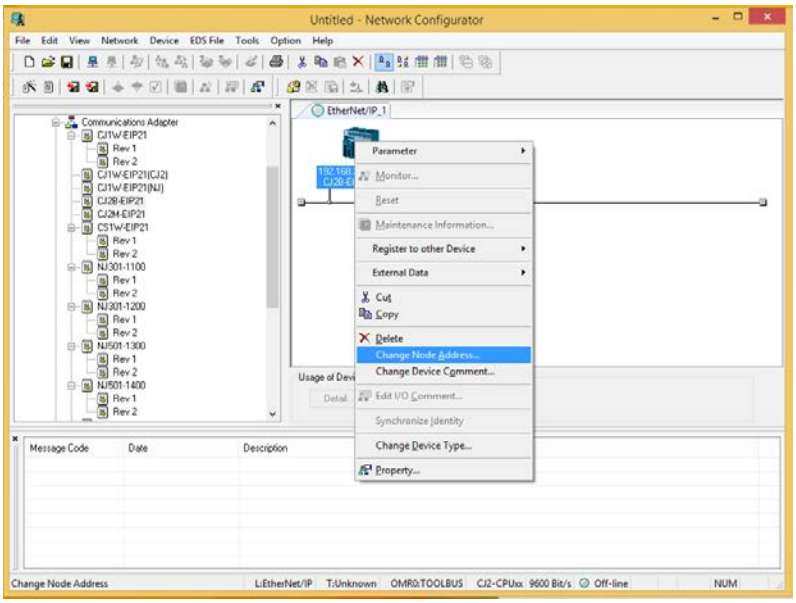
Establishing an EtherNet/IP Connection between a iVu Plus vision sensor and Omron CJ2H PLC

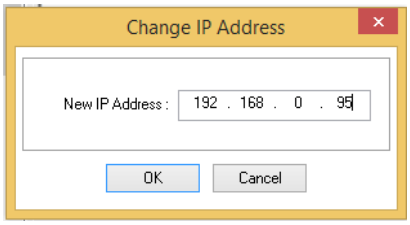
1. Open the Omron Network Configurator software.



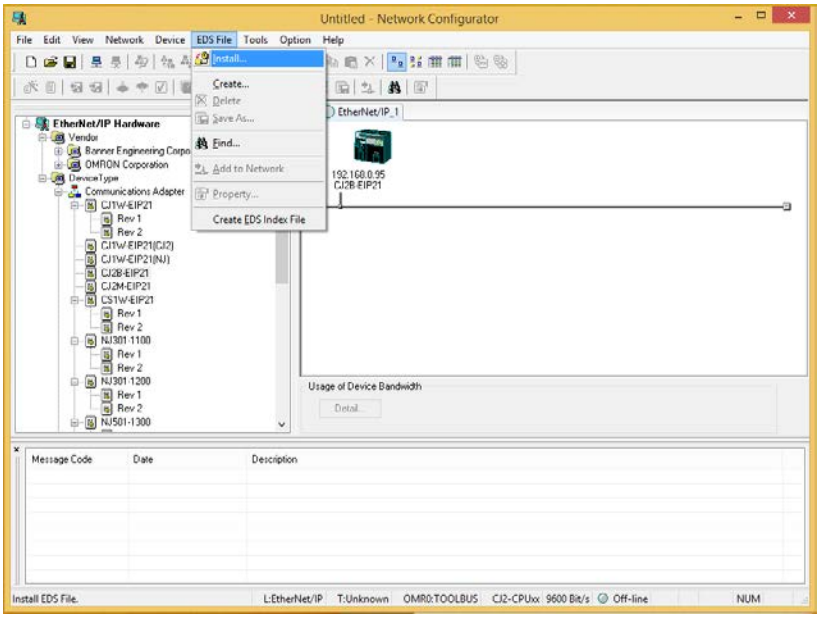
2. Add the correct PLC to the network. Then right click on the PLC to change it's IP address.



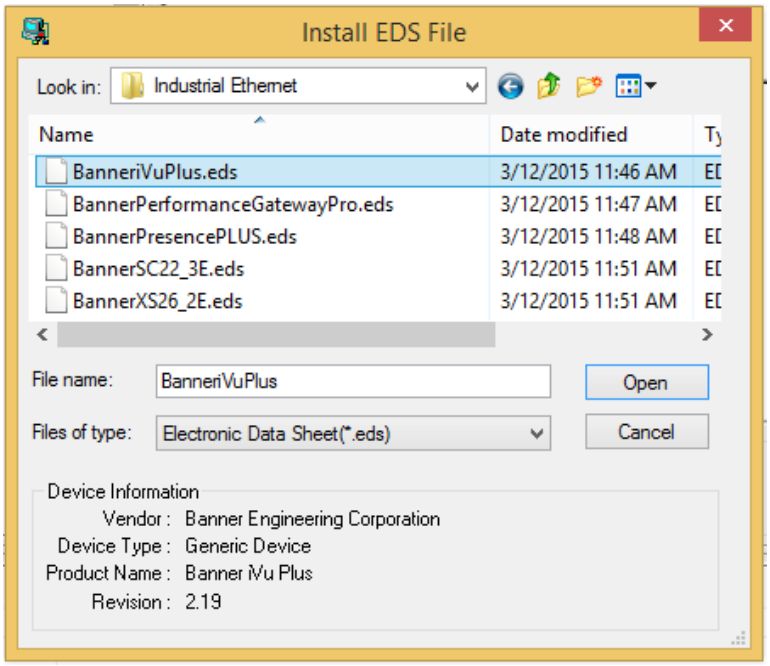
3. Here is the PLC's IP address



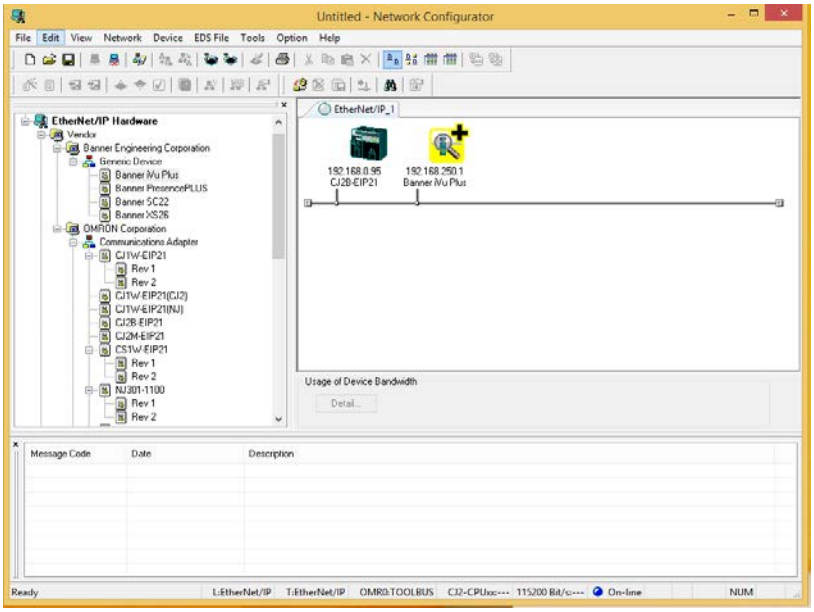
4. Install the iVu Plus EDS file. Choose EDS_File, then Install.



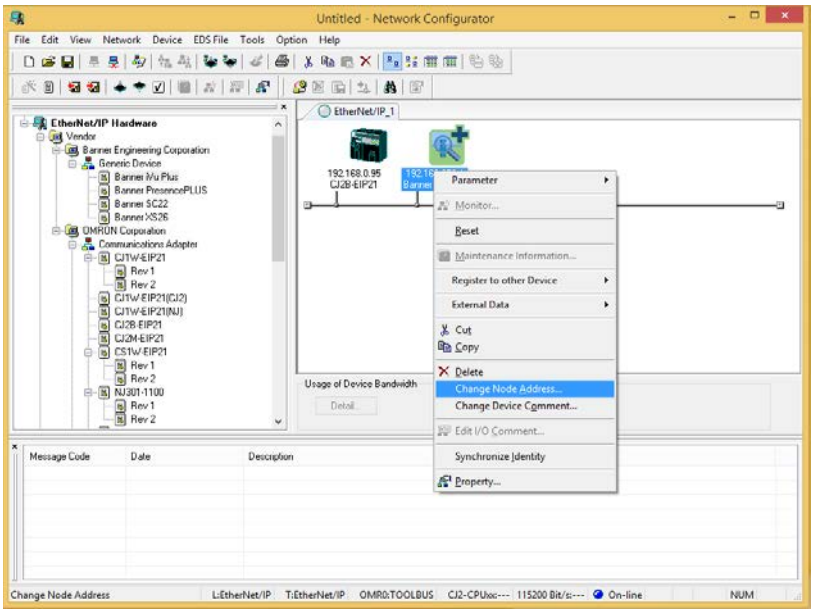
5. Choose the EDS file.



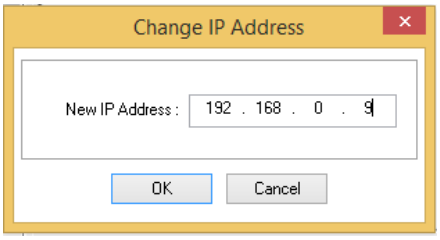
6. Double click the new item from the list at left to add it to the network.



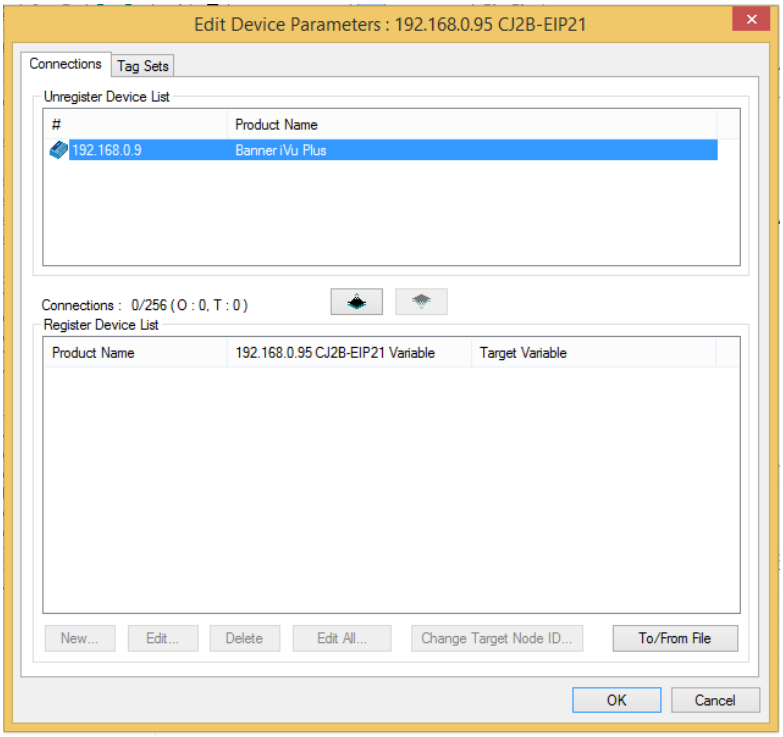
7. Right click on the vision sensor to change the IP address.

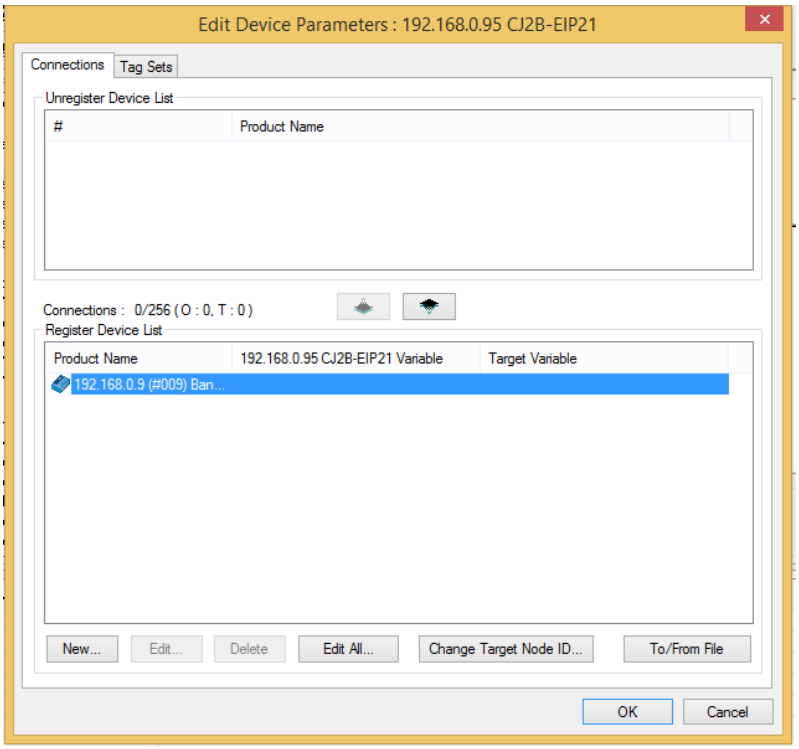


8. Enter the vision sensor's IP address.

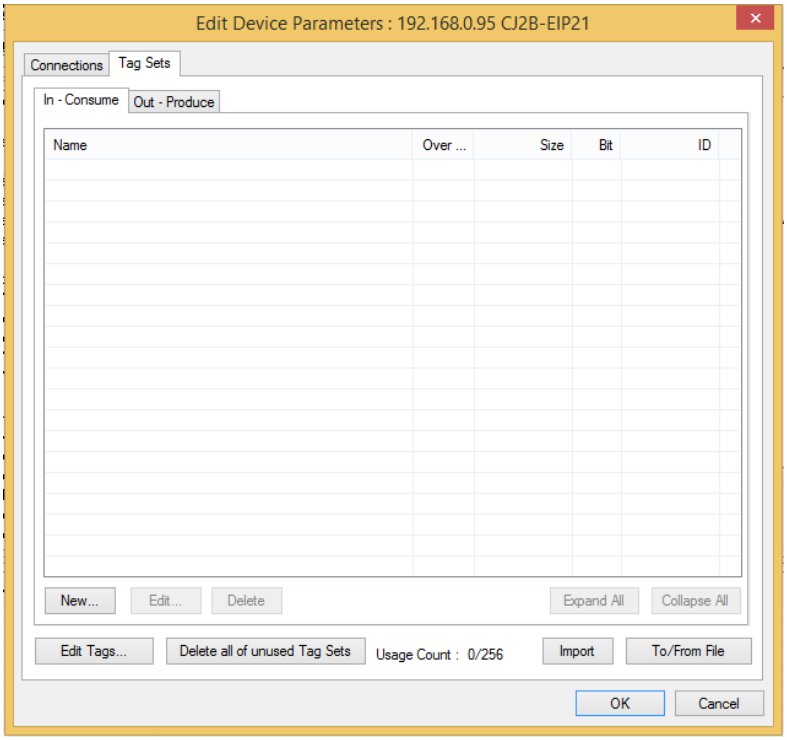


9. Double click on the PLC icon to edit the device parameters. Choose the vision sensor from the "Unregister Device List", then click the down arrow to send it to the "Register Device List".

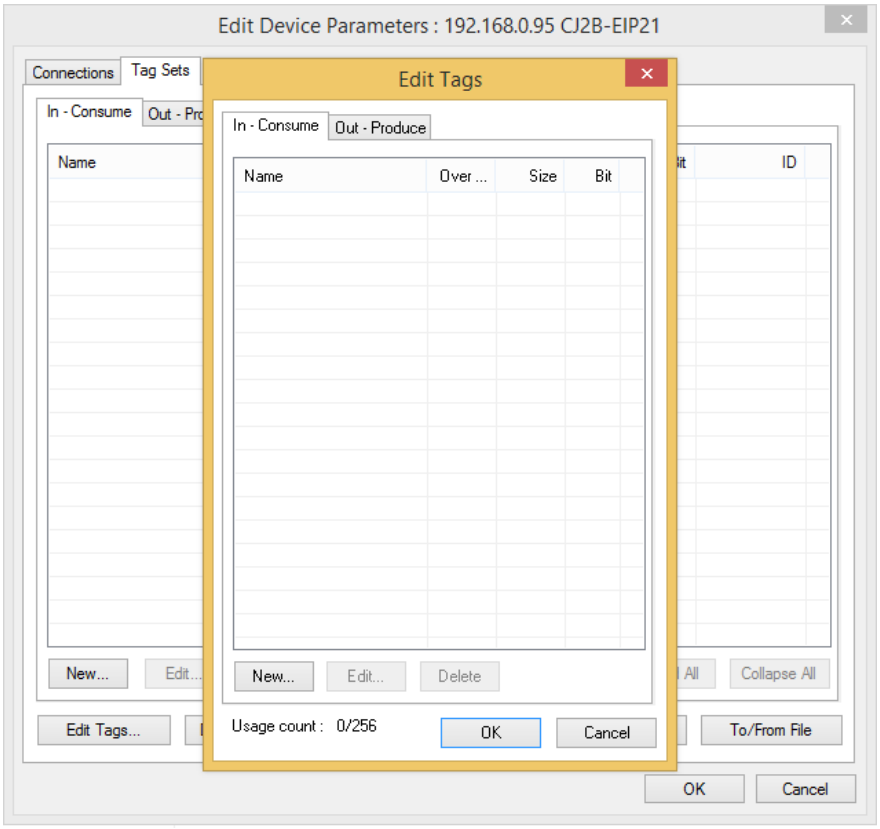




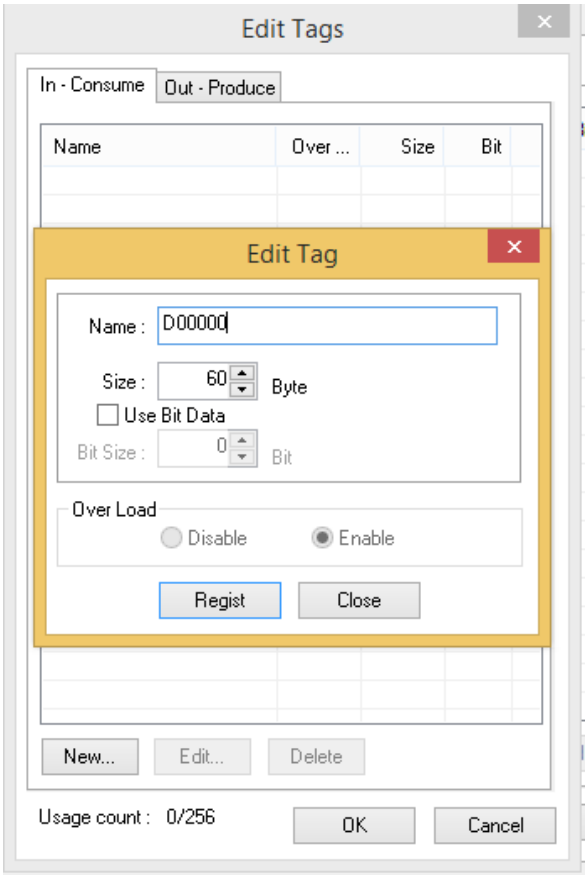
10. Click on the “Tag Sets” tab (to see the window below), then click the “Edit Tags…” button.



11. Choose the “In- Consume” tab, then click “New”.

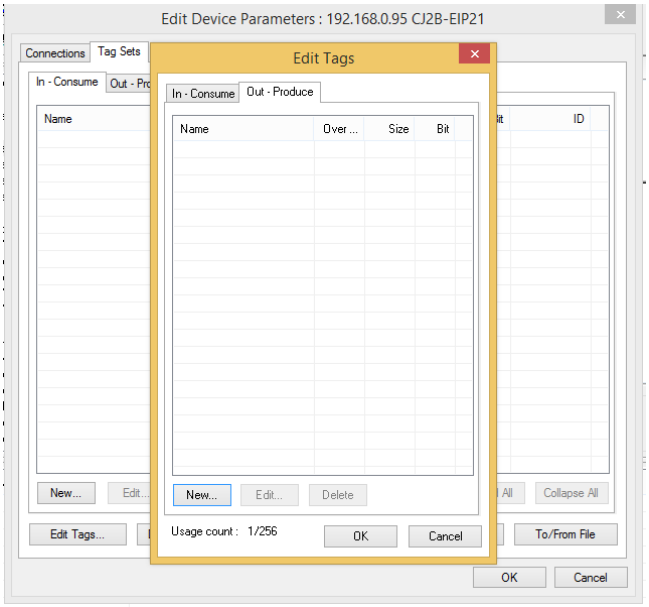


12. Choose an appropriate type and size CPU Data Area. In our case, the vision sensor will be sending out 16-bit words, so the DM area works. Choose a number of bytes equal to the desired vision sensor assembly. Here we are looking at "In- Consume" (from the PLC's point of view), which is the T→O assemblies. See the relevant model **iVu Plus Instruction Manual** for more information on the assembly objects. Your choices are:
    a. 100 (0x64), size 60 bytes
    b. 101 (0x65), size 480 bytes

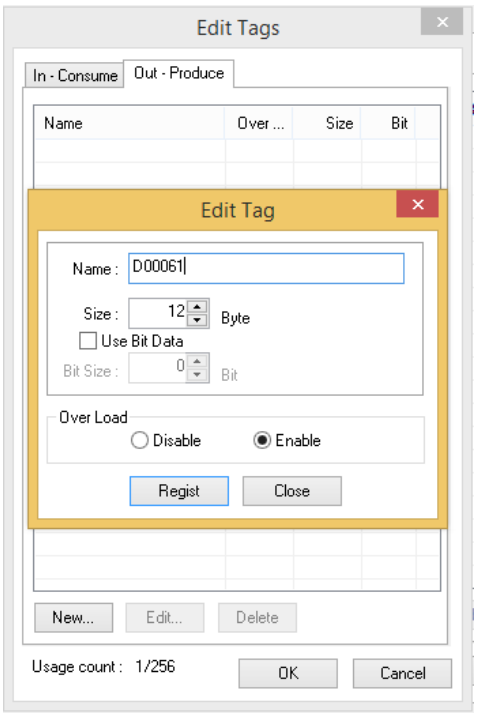


13. After filling in the Name (remember that this refers to a CPU Data Area on the PLC) and size in bytes, click the "Regist" button, then click "Close".

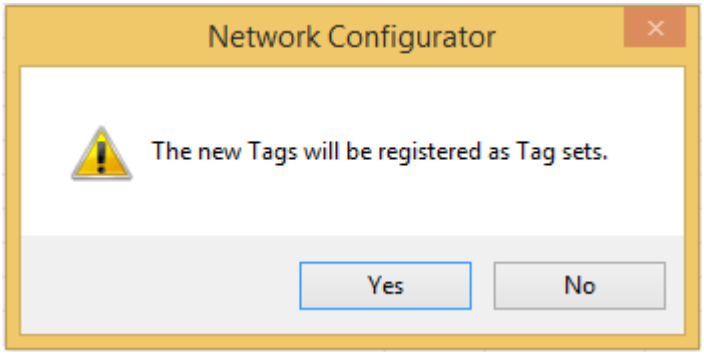
14. Click on the Out- Produce tab, then click “New”.



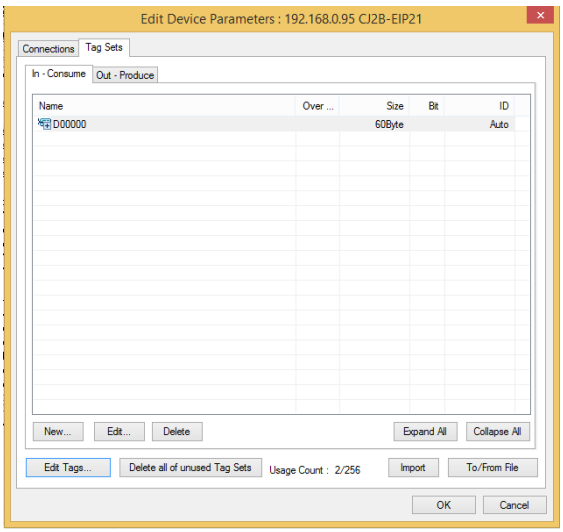
15. Choose an appropriate type and size CPU Data Area. In our case, the vision sensor expects 16-bit words as inputs, so the DM area works. Choose a number of bytes equal to the desired vision sensor assembly. Here we are looking at “Out- Produce” (from the PLC’s point of view), which is the O→T assemblies. See the relevant model **iVu Plus Instruction Manual** for more information on the assembly objects. Your choices are:
    a. 112 (0x70), size 12 bytes
    b. 113 (0x71), size 480 bytes

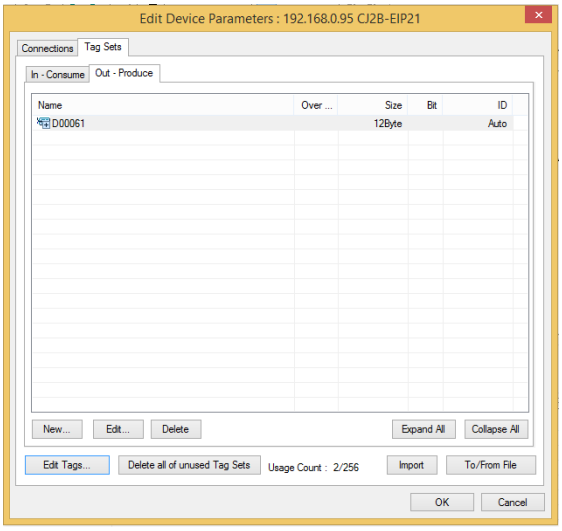


16. After filling in the Name (remember that this refers to a CPU Data Area on the PLC) and size in bytes, click the “Regist” button, then click “Close”.
17. Click OK on the Edit Tags window, then click Yes when the software tells you “The new Tags will be registered as Tag sets.”

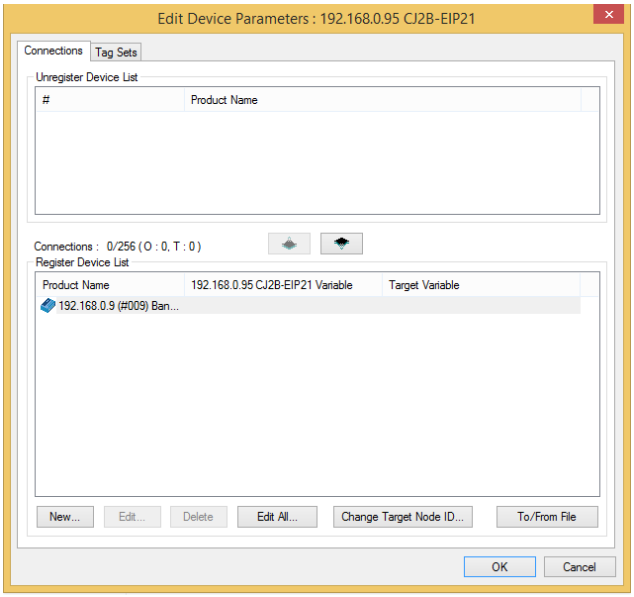


18. Double check the tags by clicking on both the In- Consume and Out- Produce tabs.

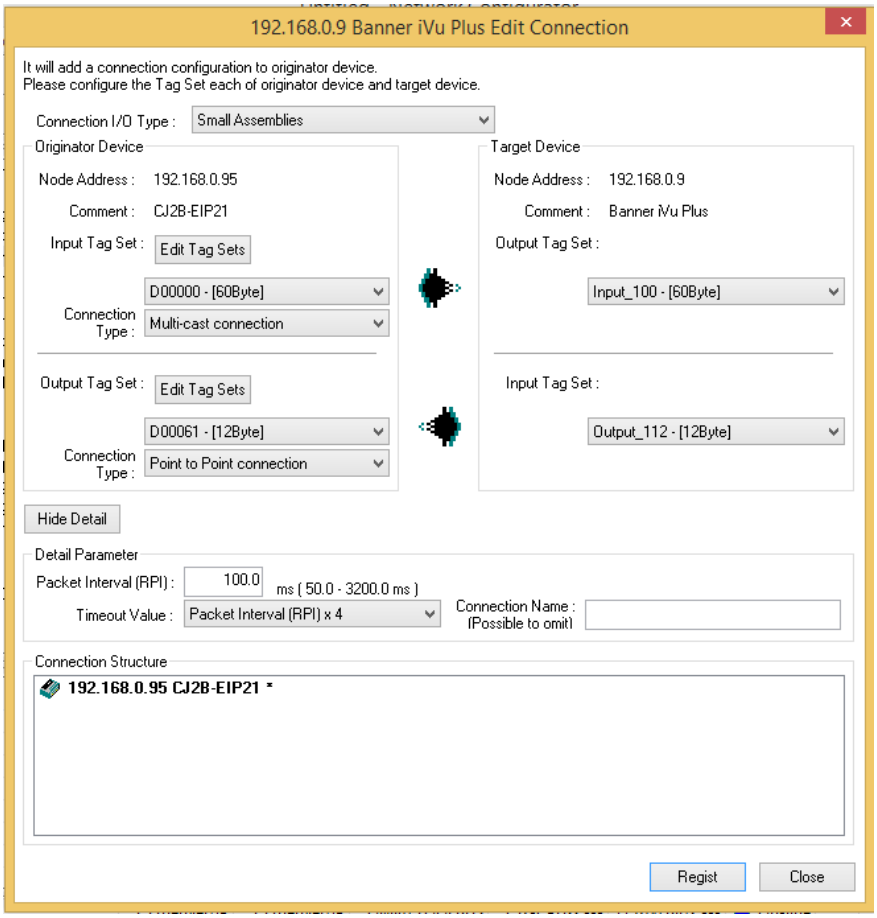




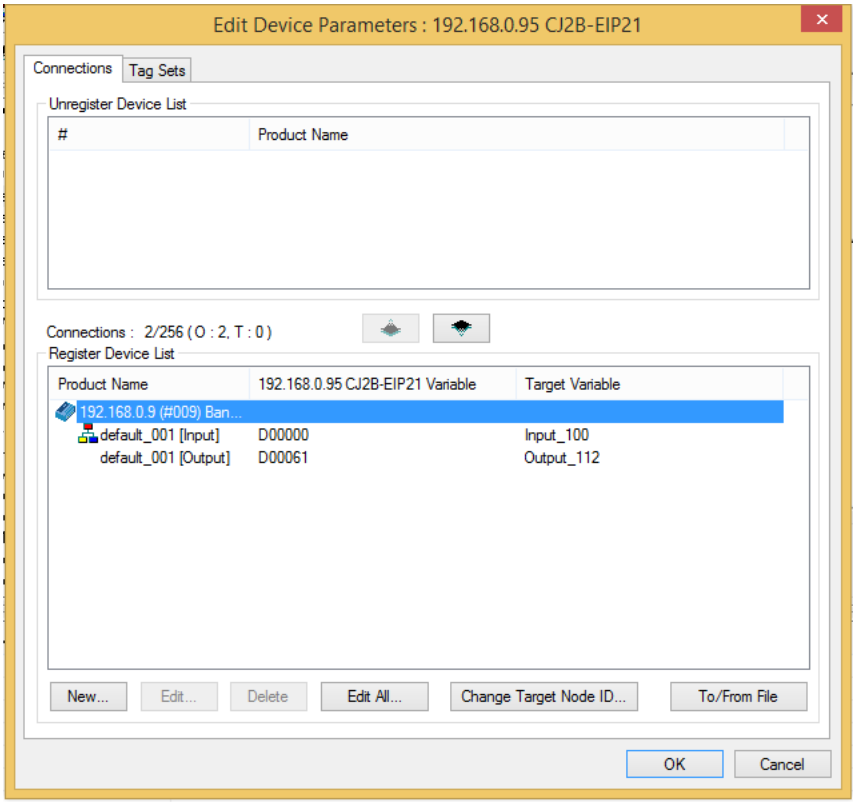
19. Go back to the “Connections” tab (to see the window below) then double click on the vision sensor seen in the “Register Device List” to bring up the Edit Connection window.



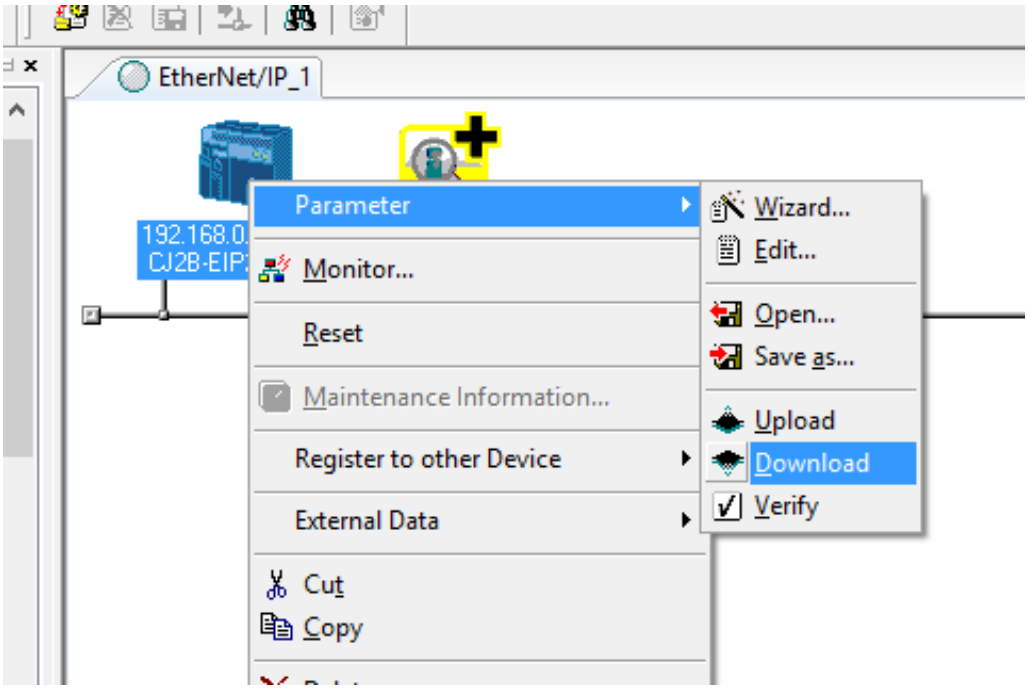
20. Fill in the connections and RPI, then click “Regist”, then “Close”.



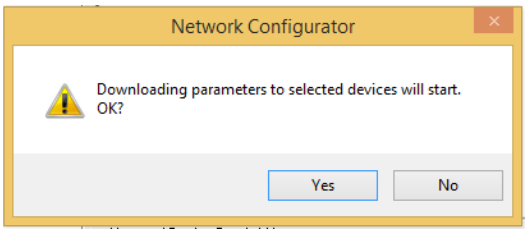
21. Now click “OK”.



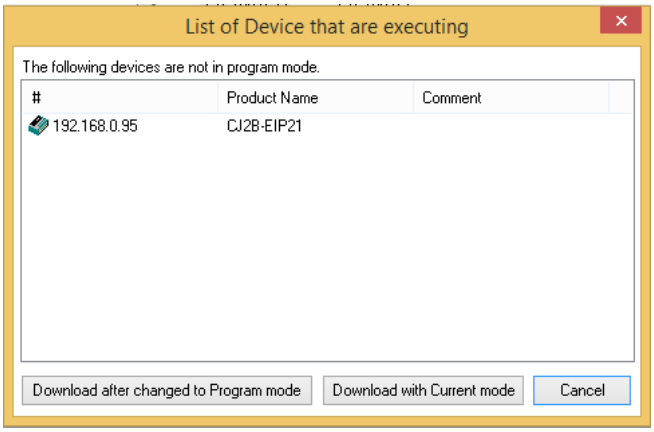
22. Go online and download the configuration to the PLC.



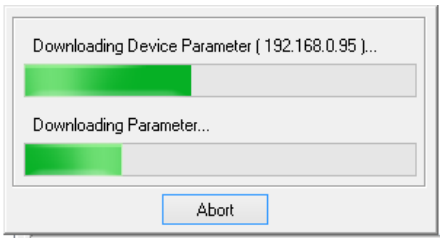
23. Click Yes.



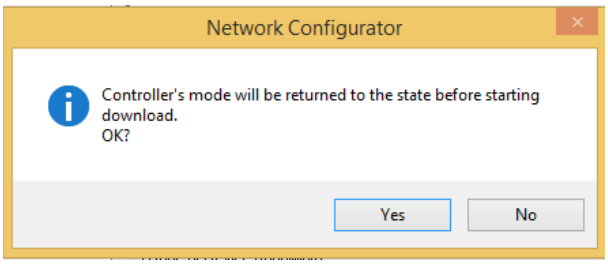
24. Choose a Download option.

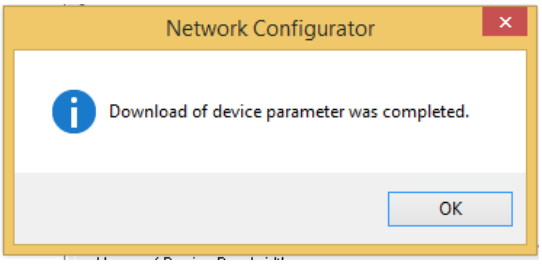


25. Downloading…

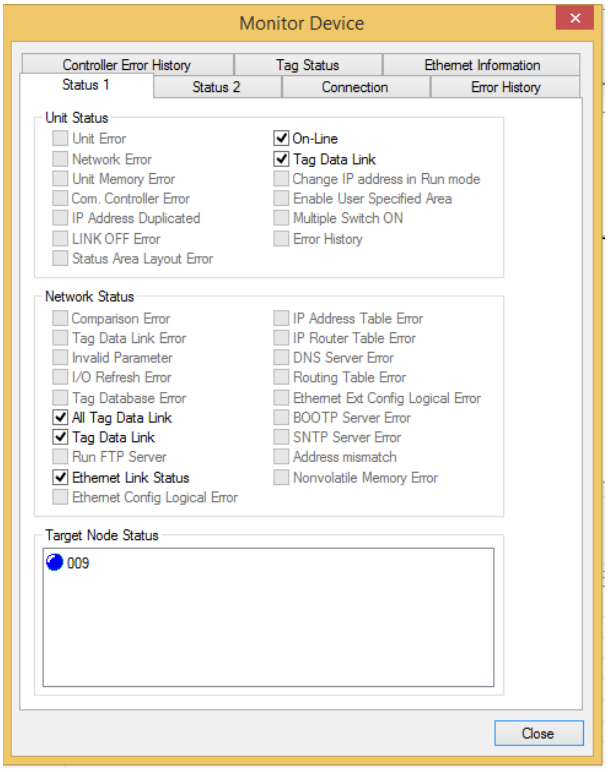


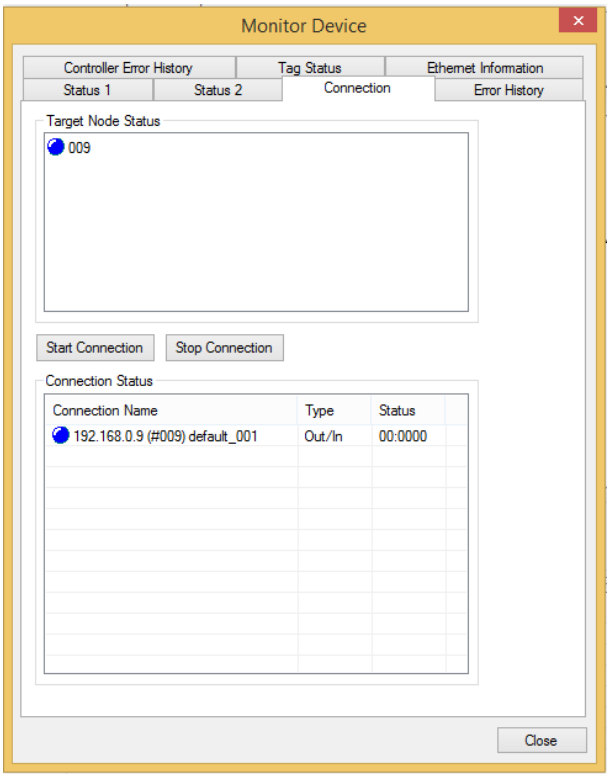
26. Click Yes, then click OK.



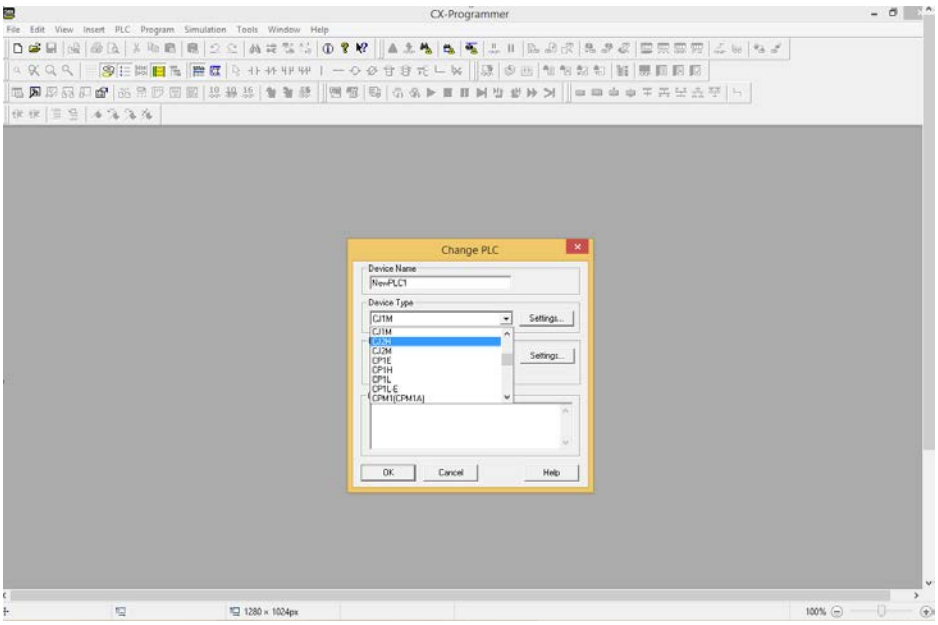


27. Now we can right click on the PLC icon and choose “Monitor”. This window can tell us if the connection looks good. Blue icons indicate a connection running fine, without errors.

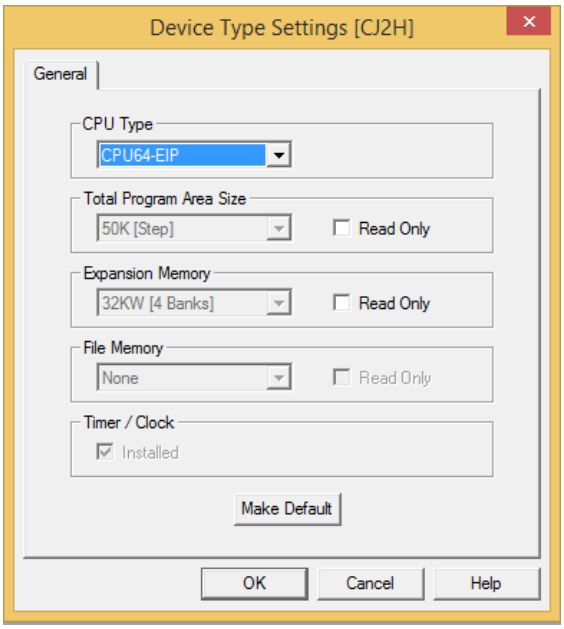


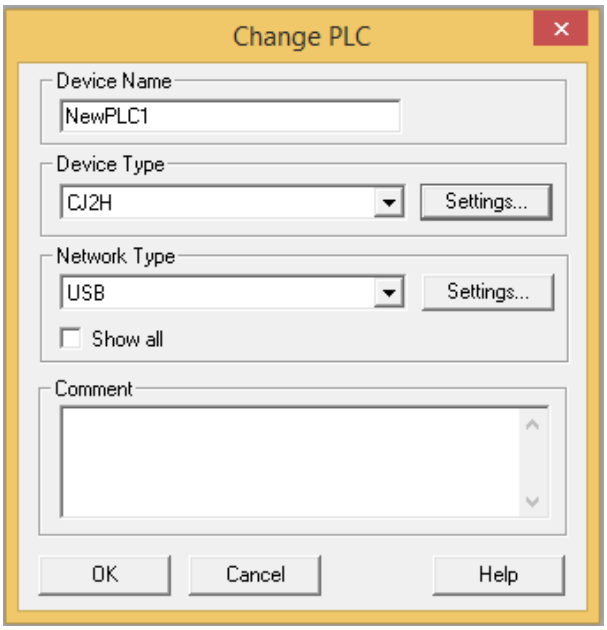


28. Now we can open the CX Programmer software. Click on File → New, then choose a PLC model and click “Settings”.

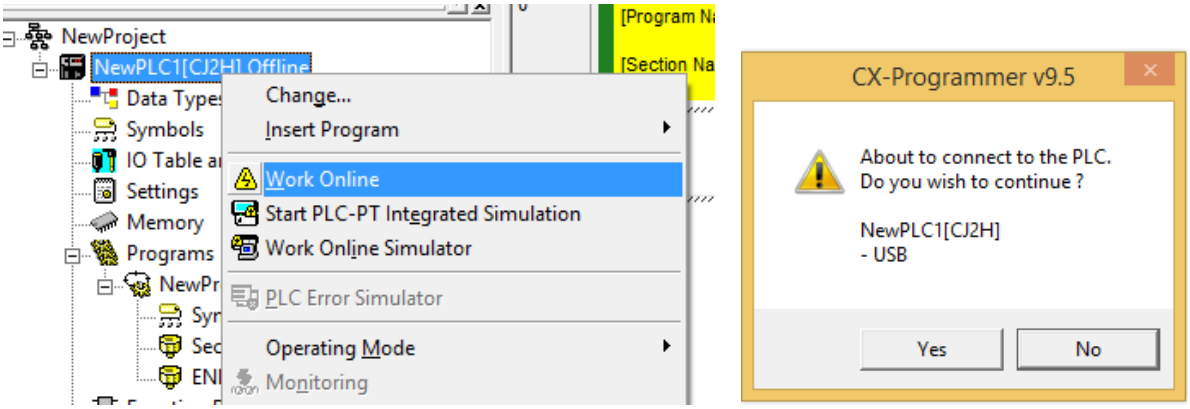


29. Choose a Type and click OK, then choose a Network Type and click OK.

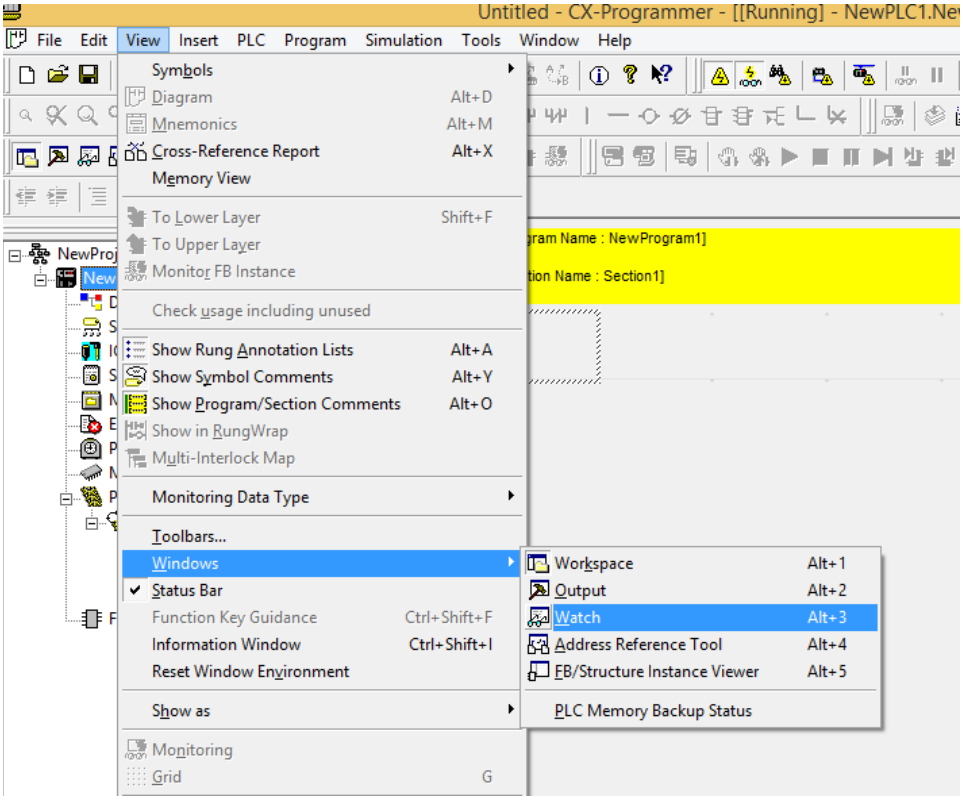




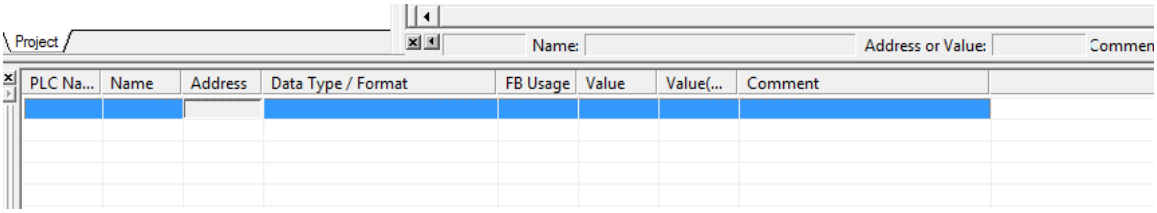
30. Go Online with the PLC. Click Yes.



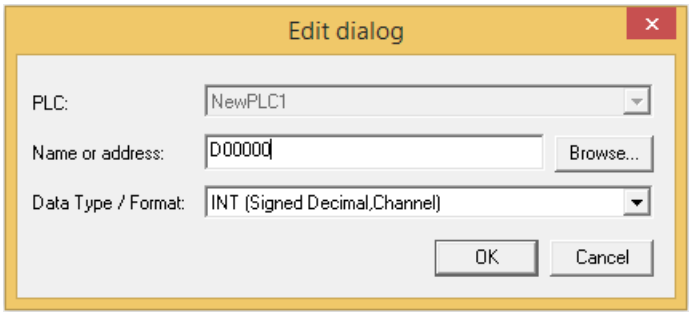
31. Go to View→Windows→Watch

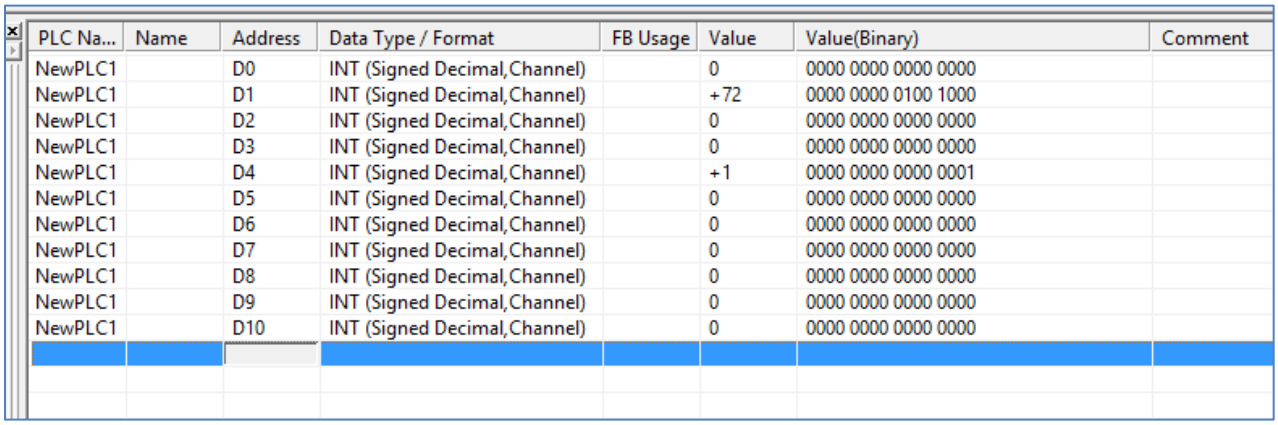


32. Click on the top line in the Watch window.



33. Add some registers to the watch window.

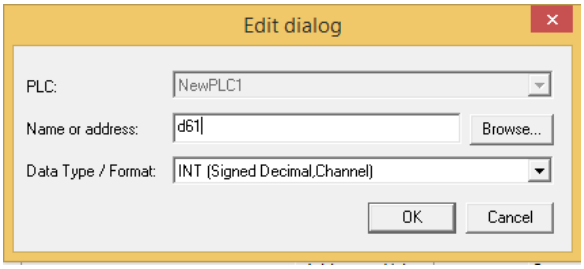


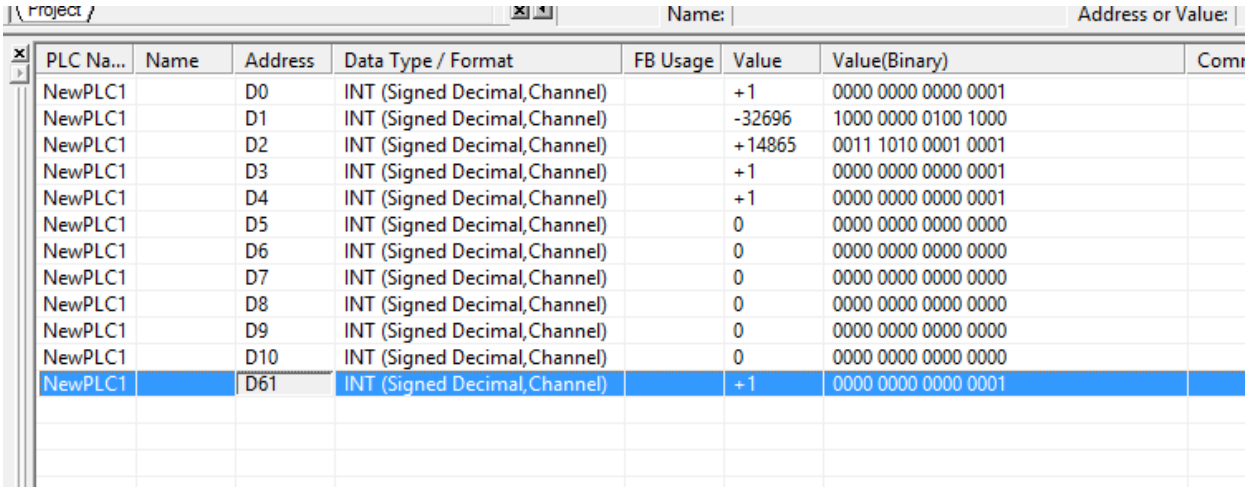


PLC Na...	Name	Address	Data Type / Format	FB Usage	Value	Value(Binary)	Comment
NewPLC1		D0	INT (Signed Decimal,Channel)		0	0000 0000 0000 0000	
NewPLC1		D1	INT (Signed Decimal,Channel)		+72	0000 0000 0100 1000	
NewPLC1		D2	INT (Signed Decimal,Channel)		0	0000 0000 0000 0000	
NewPLC1		D3	INT (Signed Decimal,Channel)		0	0000 0000 0000 0000	
NewPLC1		D4	INT (Signed Decimal,Channel)		+1	0000 0000 0000 0001	
NewPLC1		D5	INT (Signed Decimal,Channel)		0	0000 0000 0000 0000	
NewPLC1		D6	INT (Signed Decimal,Channel)		0	0000 0000 0000 0000	
NewPLC1		D7	INT (Signed Decimal,Channel)		0	0000 0000 0000 0000	
NewPLC1		D8	INT (Signed Decimal,Channel)		0	0000 0000 0000 0000	
NewPLC1		D9	INT (Signed Decimal,Channel)		0	0000 0000 0000 0000	
NewPLC1		D10	INT (Signed Decimal,Channel)		0	0000 0000 0000 0000	

In the watch window above, we see the first 10 registers of iVu Plus Output (PLC Input) data. Notice how the current inspection number (registers D4 and D5) is listed as “1”.

34. You can add some more registers (PLC Outputs/iVu Plus Inputs) to control the sensor.





Project Name: Address or Value:

PLC Na...	Name	Address	Data Type / Format	FB Usage	Value	Value(Binary)	Comr
NewPLC1		D0	INT (Signed Decimal,Channel)		+1	0000 0000 0000 0001	
NewPLC1		D1	INT (Signed Decimal,Channel)		-32696	1000 0000 0100 1000	
NewPLC1		D2	INT (Signed Decimal,Channel)		+14865	0011 1010 0001 0001	
NewPLC1		D3	INT (Signed Decimal,Channel)		+1	0000 0000 0000 0001	
NewPLC1		D4	INT (Signed Decimal,Channel)		+1	0000 0000 0000 0001	
NewPLC1		D5	INT (Signed Decimal,Channel)		0	0000 0000 0000 0000	
NewPLC1		D6	INT (Signed Decimal,Channel)		0	0000 0000 0000 0000	
NewPLC1		D7	INT (Signed Decimal,Channel)		0	0000 0000 0000 0000	
NewPLC1		D8	INT (Signed Decimal,Channel)		0	0000 0000 0000 0000	
NewPLC1		D9	INT (Signed Decimal,Channel)		0	0000 0000 0000 0000	
NewPLC1		D10	INT (Signed Decimal,Channel)		0	0000 0000 0000 0000	
NewPLC1		D61	INT (Signed Decimal,Channel)		+1	0000 0000 0000 0001	

Note how when register D61 is equal to “1” (meaning the Product Change is being asserted) that we also see register D0 reported back as a “1” (meaning the Product Change ACK flag, bit 0, is also asserted).