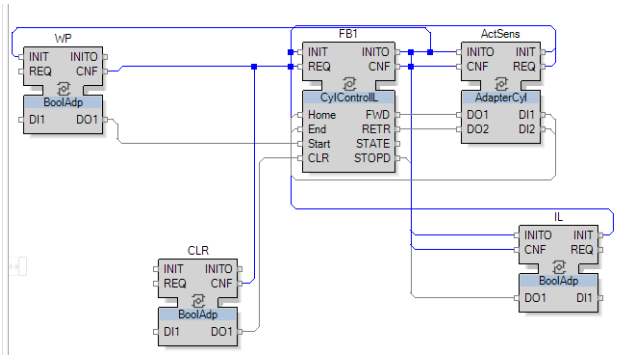
Lab 5 “Interlocks and Channels implemented with Adapters”

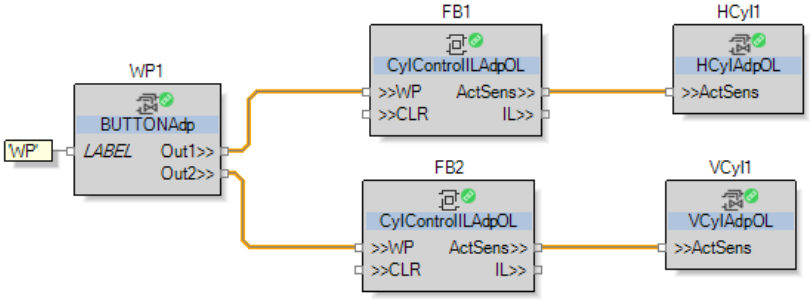
Task1:

1) Create the application as in Figure 1, first without the interlock connection (IL to CLR) between the two controllers and test it. **What behaviour do you observe? Why?**
2) Add the interlock connection from the horizontal cylinder controller to the vertical cylinder and test again. **What has changed in the behaviour? Why?**
3) Remove the previous connection and add the interlock connection from the vertical cylinder controller to the horizontal cylinder and test again. **What has changed in the behaviour? Why?**
4) Now add another the interlock connection from the horizontal cylinder controller to the vertical cylinder controller and test again. **What has changed in the behaviour? Why?**

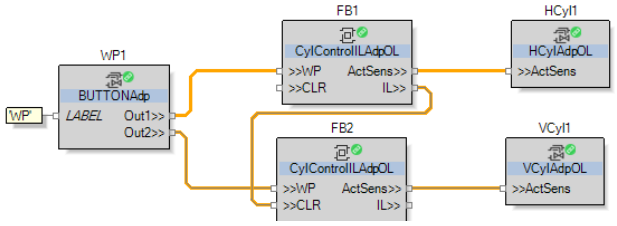


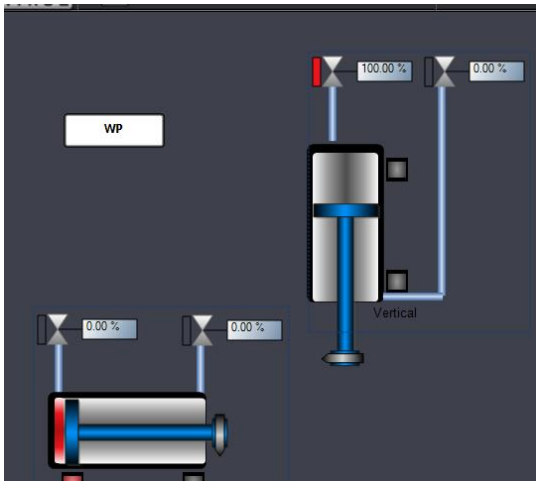
1)

When there is no connections between IL and CLR, neither of the cylinders move, because they don’t get CLR even to move to next state.

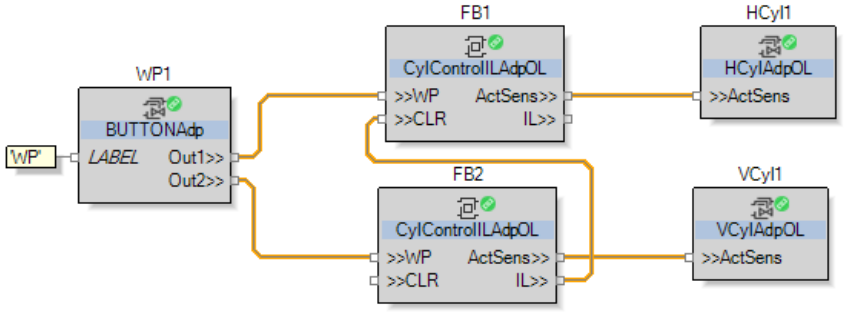


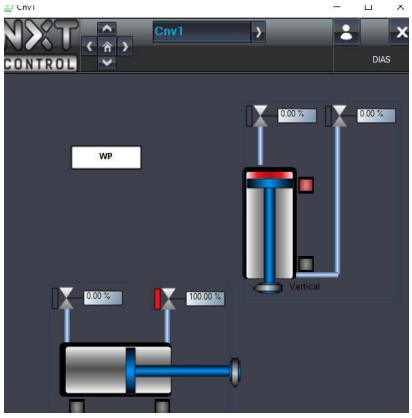
2) When we add interlock connection from the horizontal to vertical cylinder, we see that only the vertical cylinder moves. This is because only vertical gets clr event which allows it to move to next state in ECC.



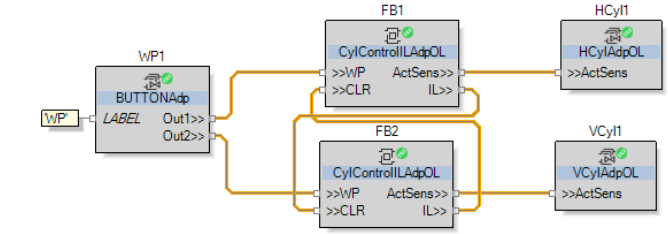


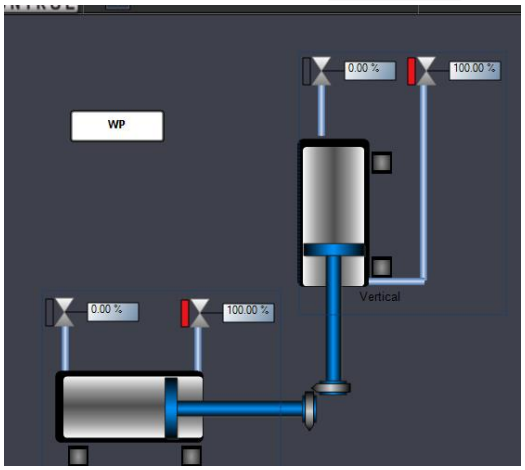
3) In this case we see that only the horizontal cylinder moves to extended position and back. This is same as in 2 but reversed. The reason is again, because horizontal cylcontrol gets the CLR event.





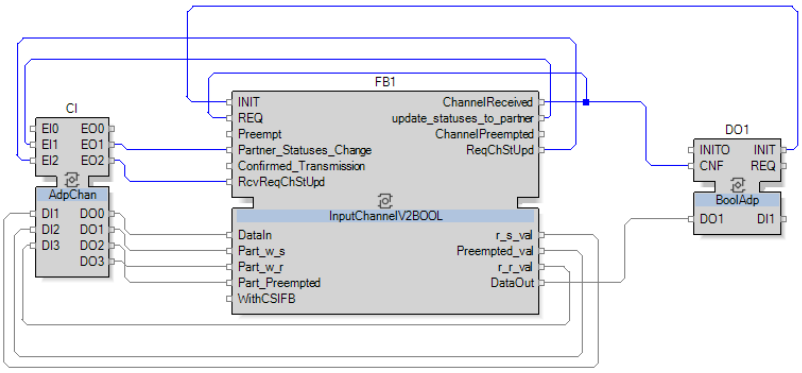
4) Here both start moving at the same time. This is because both get the CLR signal and both CylControls are identical.



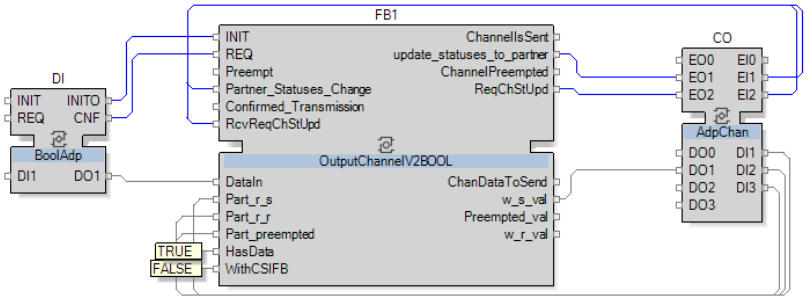


Task2:

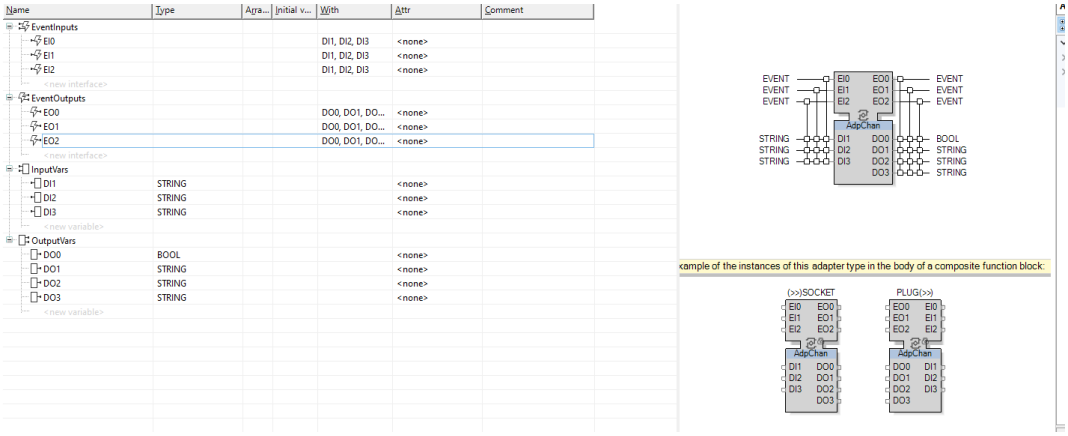
ChanRcvBool:



ChanSendBool:



AdpChan:



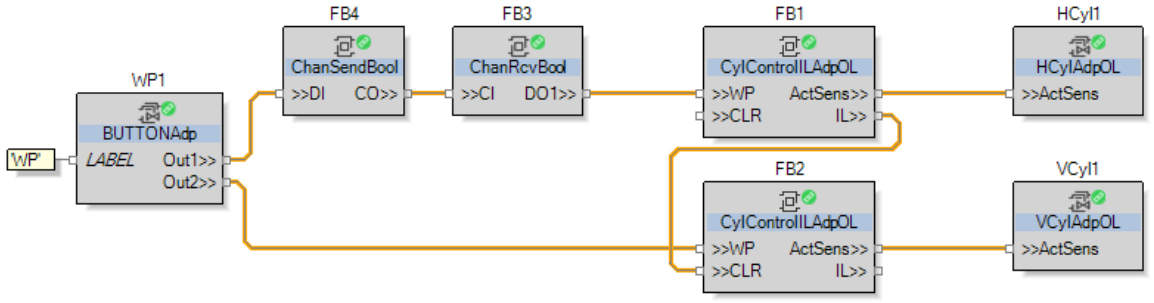
1)

It doesn't work in this case as the lines are not drawn to CLR.

2)

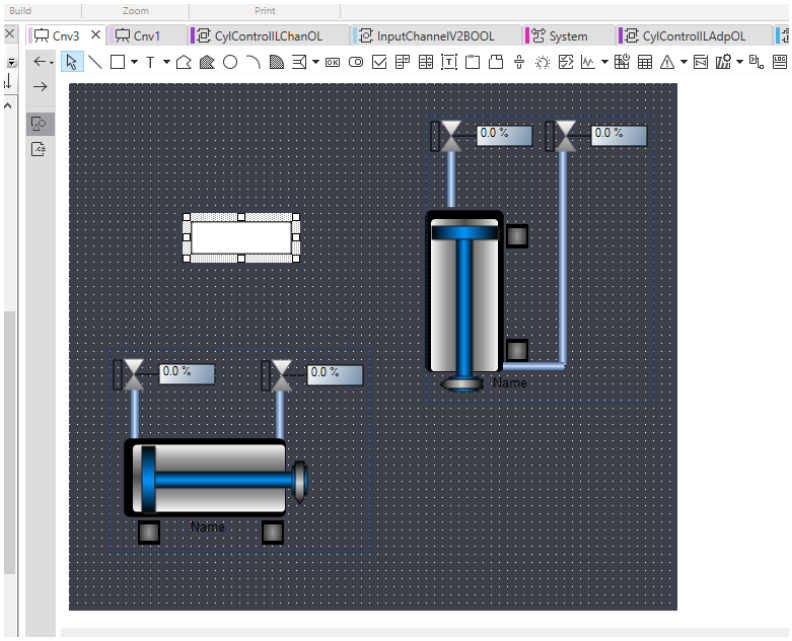
Test one is the same. Neither moves because they don't get CLR.

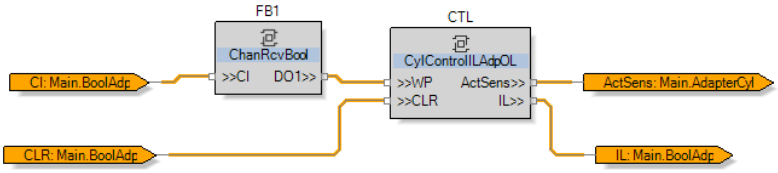
With this only vertical works, because it gets CLR from the other cylcontrol.

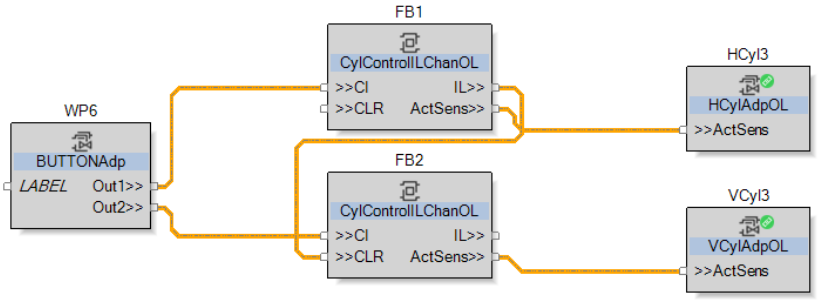


Third one, neither moves, because neither get CLR in time. There needs to be small delay for this one to work. And last one where both CLR go to both IL, only vertical moves for the same reason as 2 and 3.

Task 3 is completed to Cnv3. Pictures of the solutions are below. We can see that CylControlILChanOL encapsulates CylControlILAdpOL and the channel sender and receiver blocks.


Build
Zoom
Print
Cnv3
Cnv1
CylControlILChanOL
InputChannelV2BOOL
System
CylControlILAdpOL
0.0 %
0.0 %
0.0 %
0.0 %
Name
Name


FB1
ChanRcvBool
>>CI
DO1>>
CTL
CylControlILAdpOL
>>WP
>>CLR
ActSens>>
IL>>
CI: Main.BoolAdp
CLR: Main.BoolAdp
ActSens: Main.AdapterCyl
IL: Main.BoolAdp


FB1
CylControlILChanOL
>>CI
>>CLR
IL>>
ActSens>>
HCyl3
HCylAdpOL
>>ActSens
WP6
BUTTONAdp
LABEL
Out1>>
Out2>>
FB2
CylControlILChanOL
>>CI
>>CLR
IL>>
ActSens>>
VCyl3
VCylAdpOL
>>ActSens