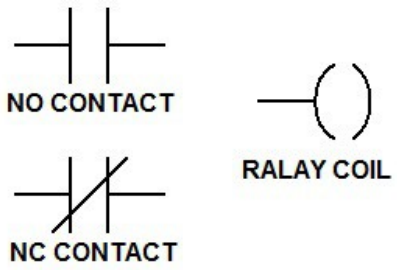
Basic ladder logic

Ladder diagram is one of the most used PLC programming languages. Its main elements work like relay logic components. In other words ladder logic instructions are ***virtual relays and switches.***

A ladder diagram is made of a vertical line, which represents the positive supply of a *virtual relay logic circuit*, and several rungs, which are supposed to be the *circuit* branches; the negative line is omitted.

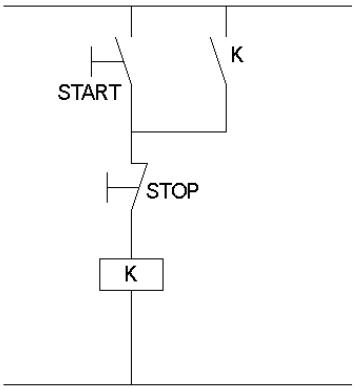


A PLC takes signals by input terminals, on which buttons, limit switches, proximity sensors etc. can be connected.
Through output terminals the PLC supplies contactors, actuators, lamps etc.

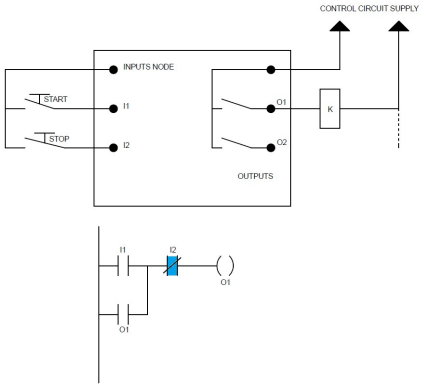
Ladder diagram *contacts* are controlled by input terminals or by *relay coils.* Output terminals are controlled by output *relays.* Please remember that we are talking about v*irtual contacts and relays.*

The images below show the ladder diagram condition while the PLC works in a basic start-stop configuration.

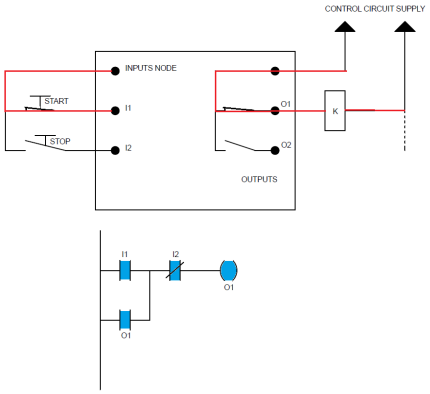
Once the PLC is supplied no button is pressed, then both inputs are OFF.
Therefore the ladder *contact* I1 is open, while I2 *(which is NC)* is closed.
By pressing the start button the input terminal I1 turns ON and closes the related ladder *contact.* So the *relay* O1 gets on and activates the corresponding output, which supplies the contactor.
When the stop button is pressed the NC ladder contact I2 opens and the program backs to the start condition.



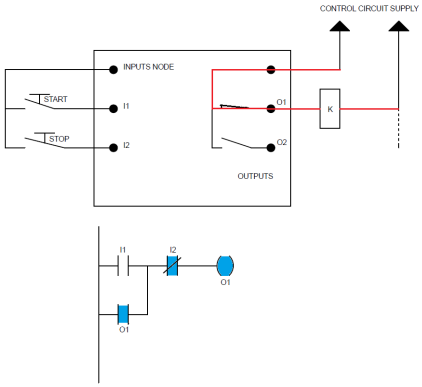
START/STOP
RELAY LOGIC VERSION



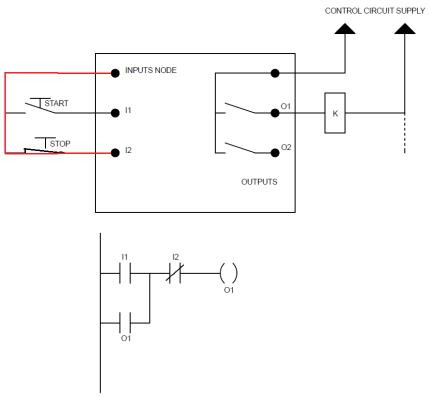
1



2



3



4