Programming Languages

Ladder Diagram (LD)

Elmo
Motion Control

Programming Languages
Ladder Diagram (LD)

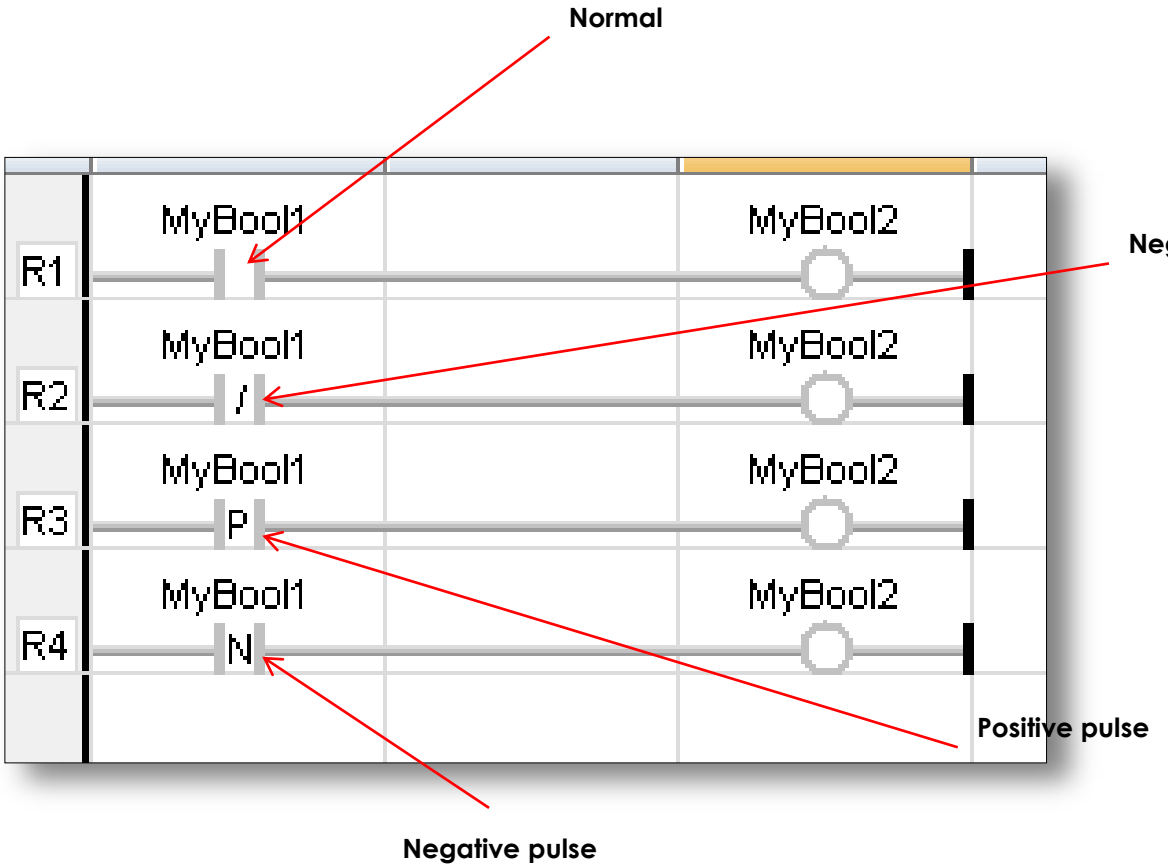
- Power rails
  - The power rail on the left represents the TRUE value and initiates the rung state.
  - The power rail on the right receives connections from the coils and has no influence on the execution of the program.

Programming Languages
Ladder Diagram (LD)

- Contacts
  - Contacts types:
    - Normal: The rung state on the right is the Boolean AND between the rung state on the left and the associated variable.
    - Negated: The rung state on the right is the Boolean AND between the rung state on the left and the negation of the associated variable.
    - Positive pulse: The rung state on the right is TRUE only when the rung state on the left is TRUE and the associated variable changes from FALSE to TRUE (rising edge).
    - Negative pulse: The rung state on the right is TRUE only when the rung state on the left is TRUE and the associated variable changes from TRUE to FALSE (falling edge).
  - Change the contact type using the space bar

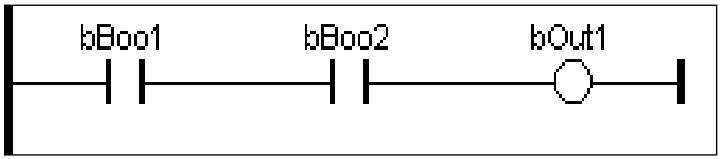
Programming Languages
Ladder Diagram (LD)

- Contacts (cont.)

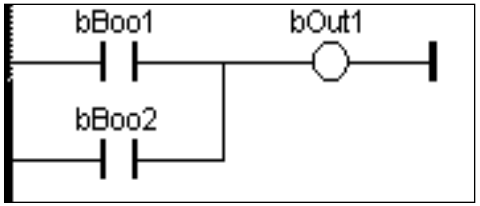


Programming Languages
Ladder Diagram (LD)

- Serialized and Parallel contacts
  - Serialized contacts perform a logical AND of all inputs.



  - Parallel contacts perform a logical OR of all inputs.



Programming Languages
Ladder Diagram (LD)

- Coils
  - Coils types:
    - Normal: The associated variable is forced to the value of the rung state on the left of the coil.
    - Negated: The associated variable is forced to negate the rung state on the left of the coil.
    - Set: The associated variable is forced to TRUE if the rung state on the left is TRUE. (No action if the rung state is FALSE.)
    - Reset : The associated variable is forced to FALSE if the rung state on the left is TRUE. (No action if the rung state is FALSE.)

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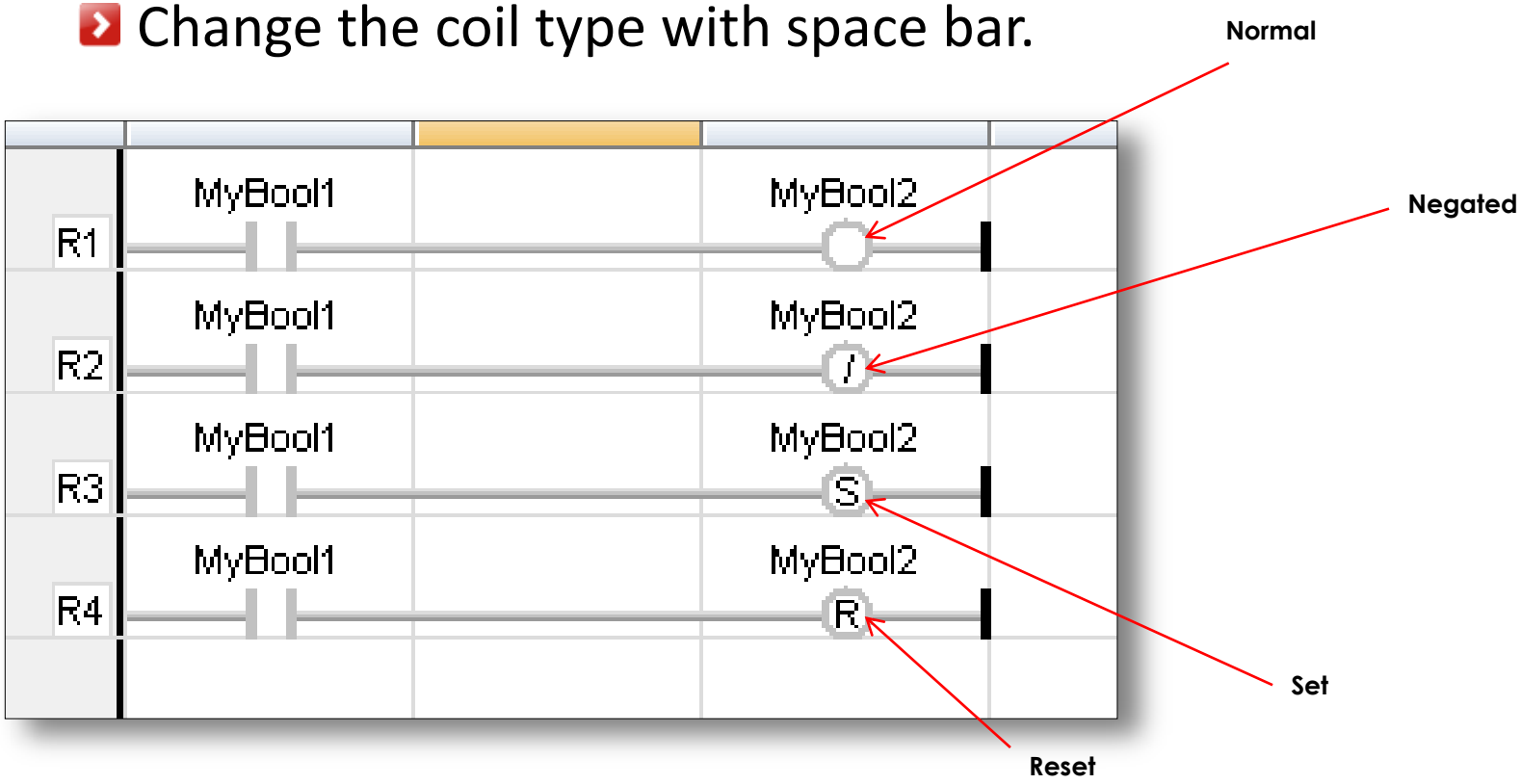
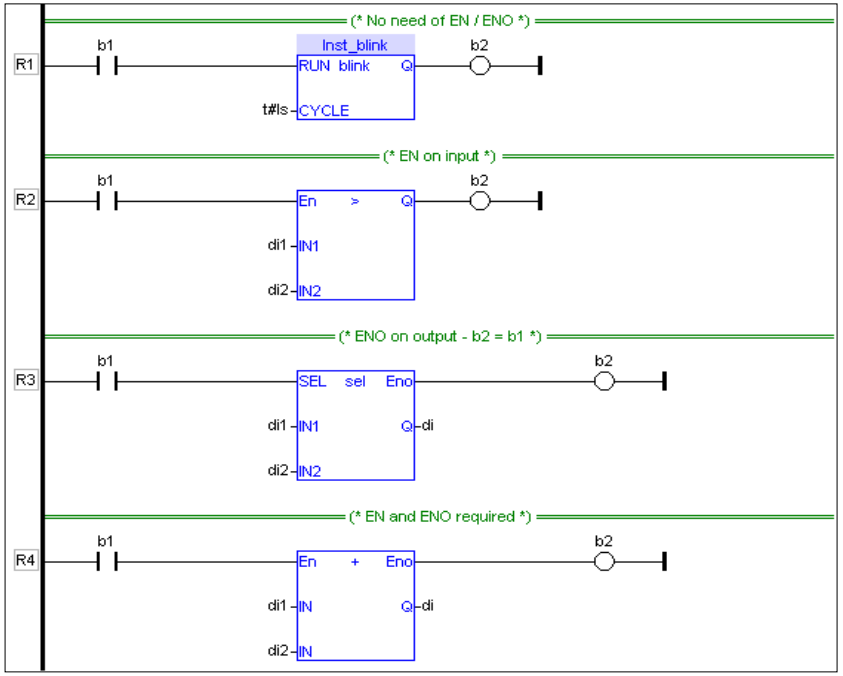
- Coils (cont.)
  - Change the coil type with space bar.



Programming Languages
Ladder Diagram (LD)

- Block call
  - Blocks are connected to the rung with their first input and output.
  - This implies the special "EN" and "ENO" input and output added to the block if its first input or output is not Boolean.



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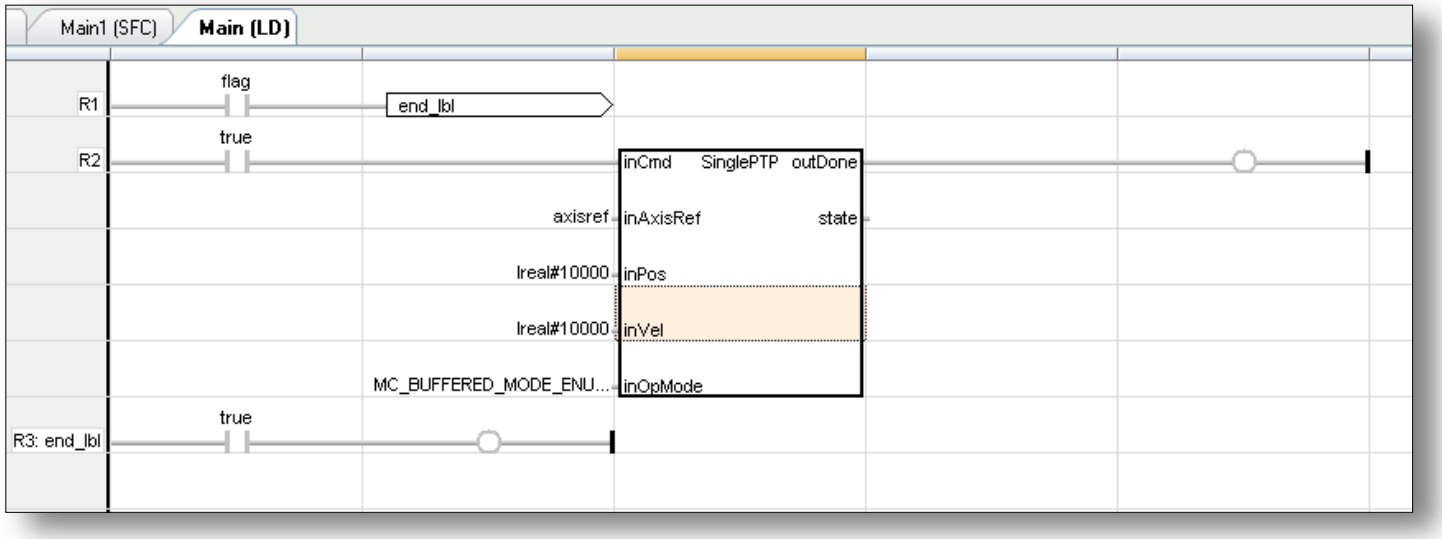
Programming Languages
Ladder Diagram (LD)

- Jump / Label
  - Each rung may begin with a label.
  - Labels are used as destination for jump instructions.



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