

Simulation for NX Safety Quick Start Guide

This guide describes how to program and run a simulation for an NX safety program.

Overview

Items needed: Sysmac Studios, version 1.08 or higher.

Description

For the purposes of this document, a single channel emergency stop pushbutton and single contact contact switch will be used.

Additional Information

www.omron247.com.

[Z931 manual](#) – NX-series Safety Control Unit
Function block details

Quick Steps

- 1.) Change S_EDM1 and S_EDM2 input variable names in the SF_EDM function block program.
- 2.) Make sure S_StartReset is set to TRUE in the SF_EDM function block program.
- 3.) Insert NOT Boolean operator in a new network line
- 4.) Inputs from EDM FB become output of NOT
- 5.) Output from DEM BF becomes input of NOT
- 6.) Run simulation (F5)
- 7.) Force Values (Ctrl + R)
- 8.) Stop simulation (Shift + F5)
- 9.) Comment out the line with the NOT Boolean operation.
- 10.) Change the inputs in the EDM FB back to the global assigned variable name.

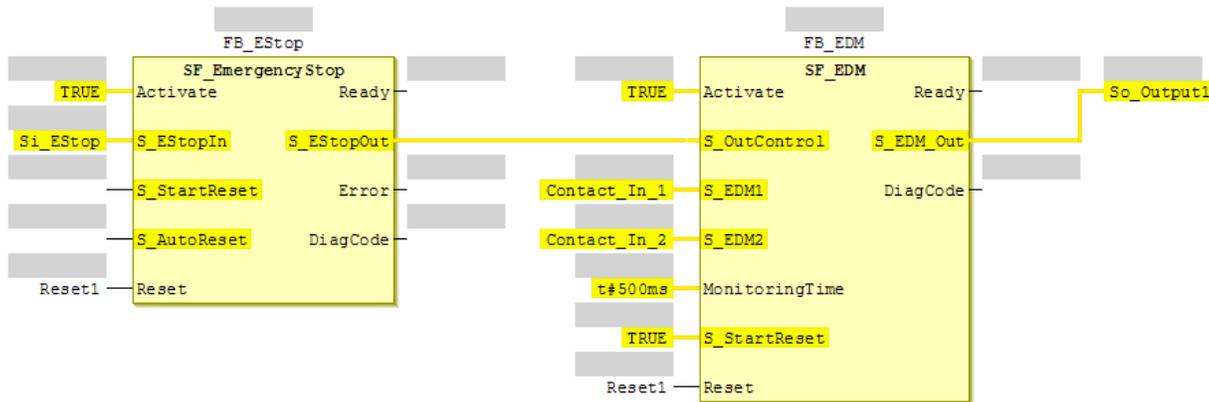
SF_EmergencyStop and EDM Function Block Sample Program

Sysmac Studio steps: **Multiview Explorer** -> select new_safetyCPU -> Programming -> POU -> Programs -> Program0

Toolbox -> Safety Function Blocks -> left click on a function block and drag onto the white part of the screen until you see a box that says "start here" and it turns green

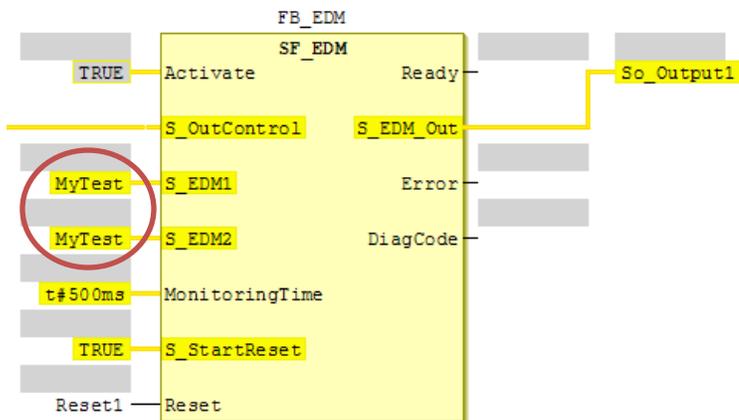
Click on white space next to the inputs (**always on left side of the FB**) -> click on the box with the three dots -> make sure "global variables" is selected under "categories", then select the input from the list **OR** start to type and select input from pulldown list. **Inputs highlighted in yellow and start with S_ require a SAFE variable type.**

Sample program using a single channel emergency stop button and 2 contact switches.



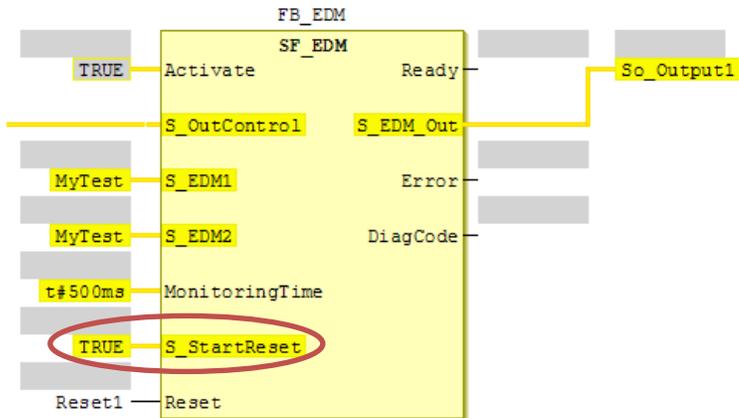
S_EDM1 and 2

Change these input variable names to something else. They need to be defined as "Internals" within the program.



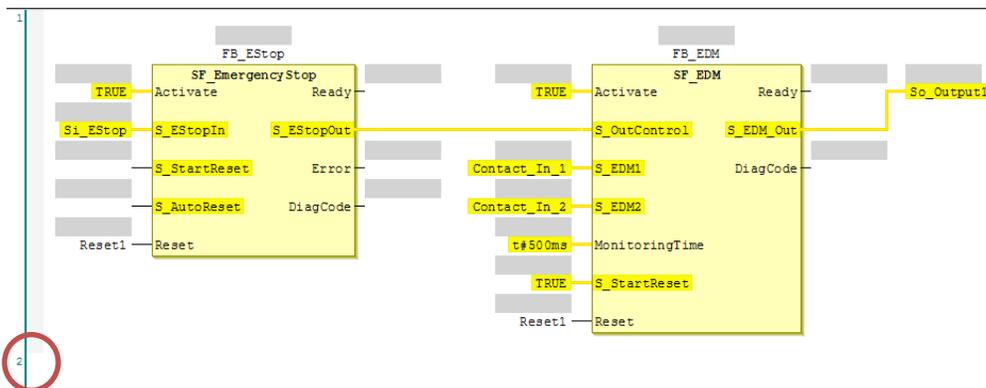
S_StartReset

Make sure this is set to true.



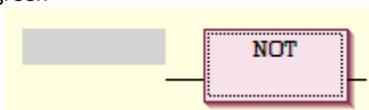
Insert a new network

In area left of the first green line, right click -> insert network below / above



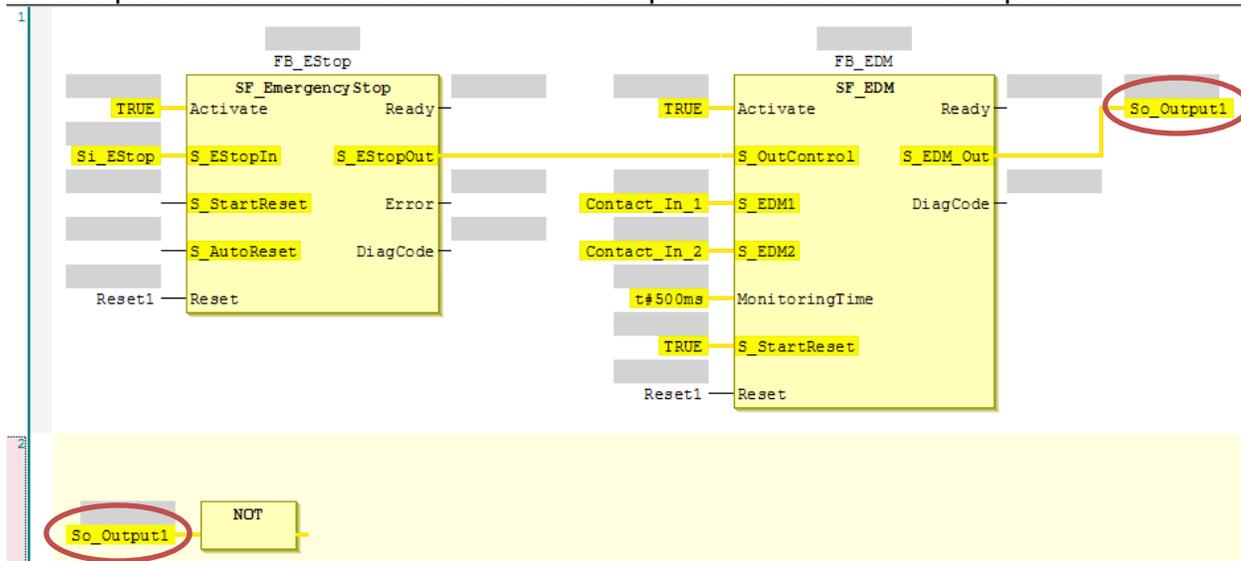
Insert NOT Boolean Operator

Toolbox -> Boolean operators -> left click on NOT and drag onto the white part of the screen until you see a box that says "start here" and it turns green



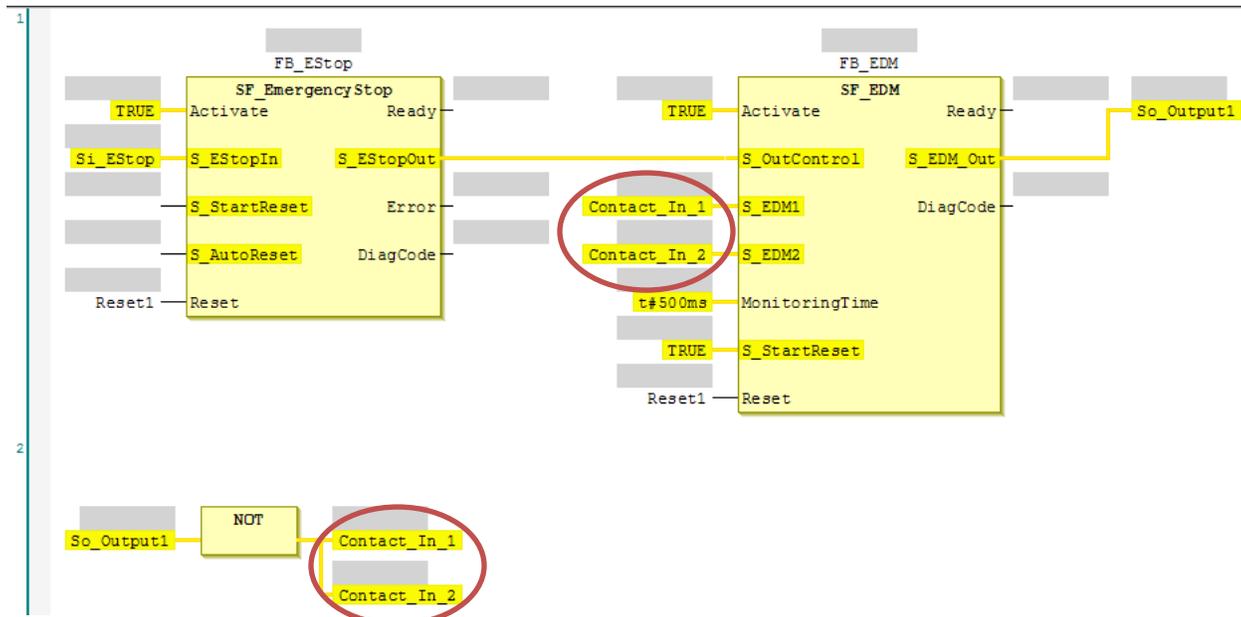
Input for NOT Boolean Operator

The output of the EDM function block is the input variable of the NOT operator.



Input for NOT Boolean Operator

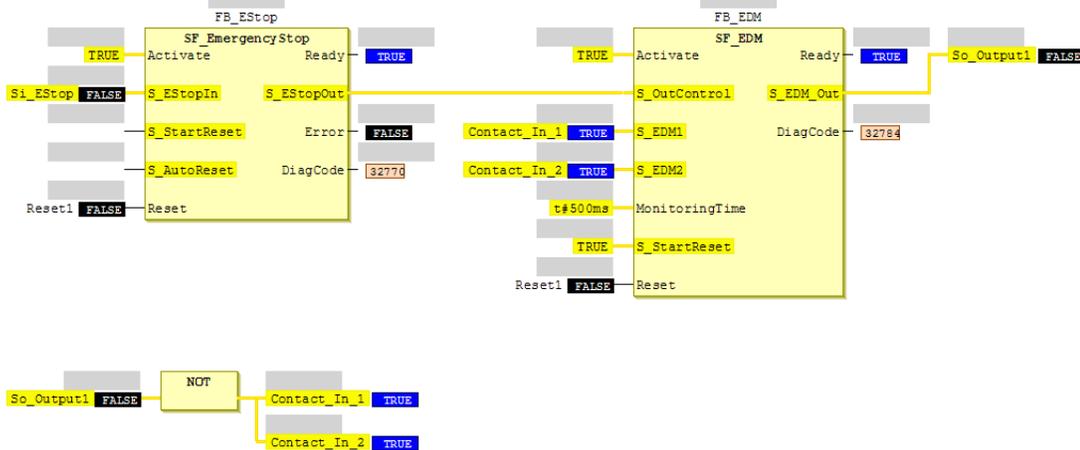
The inputs of the EDM function block are the output variables of the NOT operator.



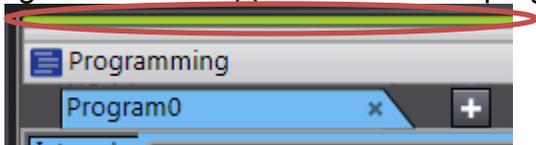
Start the simulation

Toolbox -> Simulation -> run (F5)

The variables will now have false (black) or true (blue) boxes.

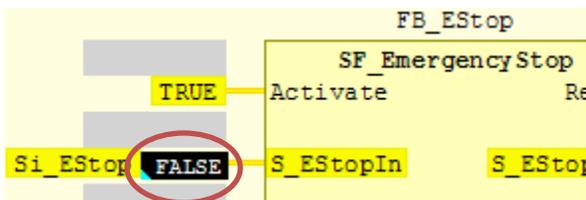


A green bar will appear above the programming tab.



Change state of emergency stop variable

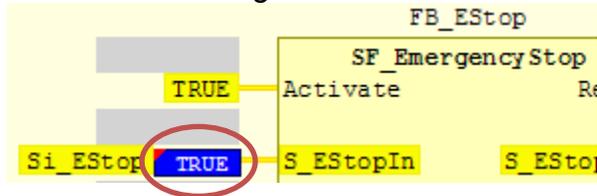
Click on the black "False" box for the input. A small green triangle will appear in the lower left corner.



Force

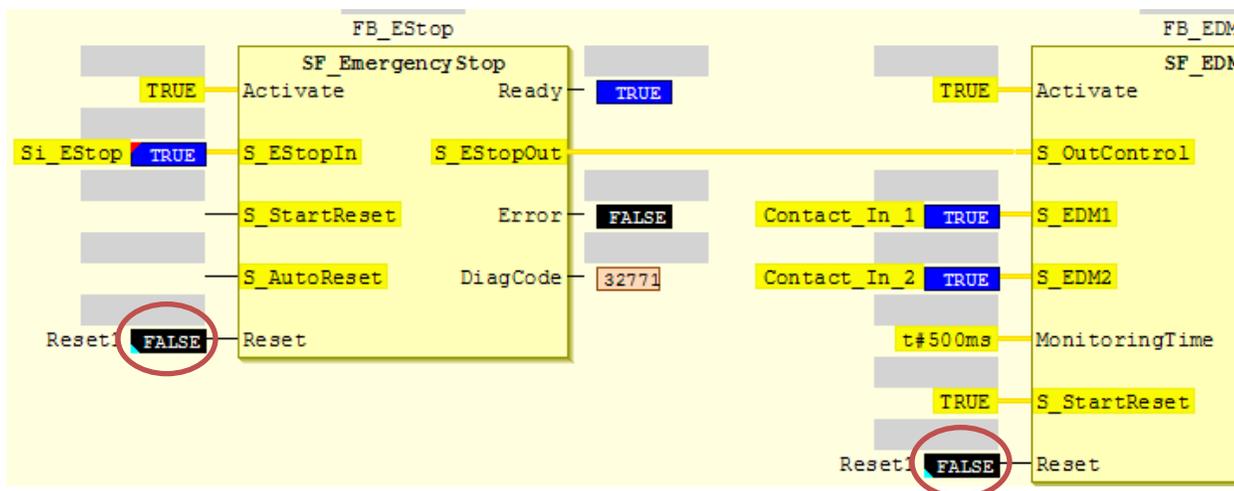
Toolbox -> Controller -> Force Values (CTRL + R)

The box will change to blue with a red triangle in the upper left corner.



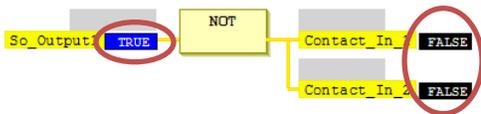
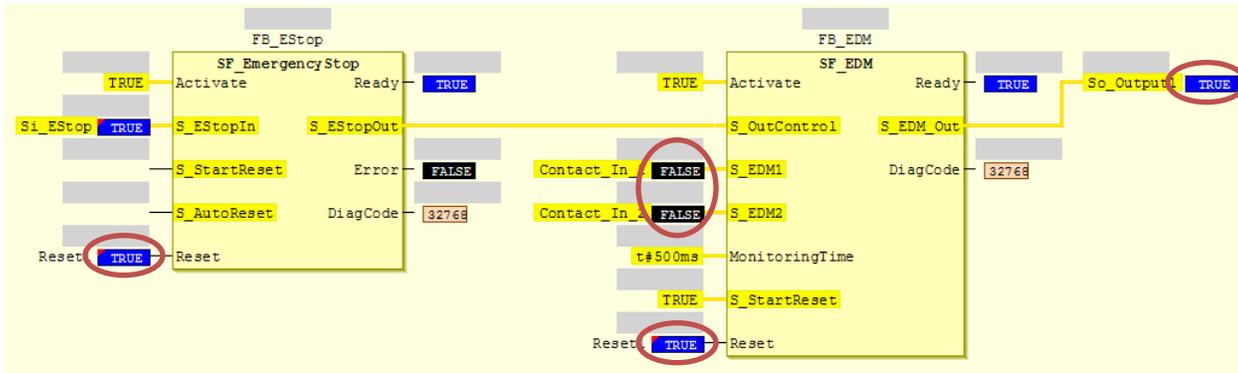
Reset variable

But notice that the EDM output did not change. Remember, you need to press the reset button to start the system. Note: You only do this with 1 reset button. The other ones will automatically change when one is changed.



Force

Toolbox -> Controller -> Force Values (CTRL + R)



Unforce

Toolbox -> Controller -> Unforce Values (CTRL + Shift + R)

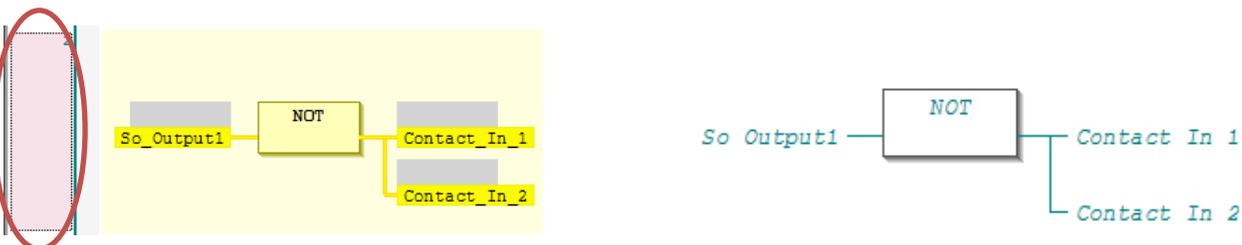
It will change back only the recently changed variables.

Stop the simulation

Toolbox -> Simulation -> Stop (Shift + F5)

Disable EDM change before building and downloading program

Right click in the area to the left of the green line in the program, and select "Toggle network comment state".



Change S_EDM1 and 2

Change these input variable names back to their global variable name.

