

# EDM FB for NX Safety Quick Start Guide

This guide describes how to use an EDM (External Device Monitoring) function block using Sysmac Studio. EDM is almost always the function block used to allow final actuation of the equipment.

## Overview

Items needed: Sysmac Studio, version 1.07 or higher.

## Quick Summary

- 1.) Node setting – See chart under “Node Set-up”.
- 2.) Set up each mode’s variable name in the I/O map.
- 3.) Function block - SF\_EDM, entering variable names as inputs

## Description

For the purposes of this document, two single channel contactors will be used.

## Additional Information

[www.omron247.com](http://www.omron247.com).

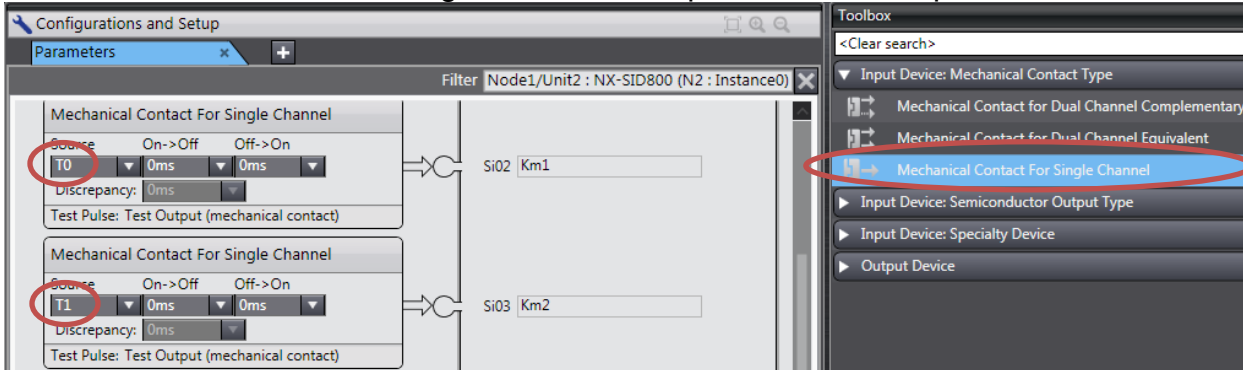
[Z931 manual](#) – NX-series Safety Control Unit  
Function block details

[Z930 manual](#) - Safety Control Unit  
Application examples in appendix

## Node Set-up

**Sysmac Studio steps:** **Multiview explorer** -> Select Safety CPU -> Configuration and setup -> Communications -> Safety -> Safety I/O -> Select a node -> double click on parameters -> click on the white X next to the filter to see all of the nodes -> use **toolbox** to select a safety device (might need to drag right side window to see the toolbox) -> drag and drop parameter to knob -> complete for all nodes. **Note: The fields in the nodes are not used in the program. Could be used to enter part name/type/number.**

Use Mechanical contact for single channel. Keep the default test pulses.



## I/O Map

**Sysmac Studio steps:** **Multiview Explorer** -> select Safety CPU -> Configurations and Setup -> double click on I/O Map -> make sure arrow buttons are all pointing down -> use variable template to paste (**Note: It will not paste if there is an empty field. Can only do groups when no empty fields.**) **OR** manually enter with right click **OR** scroll down to highlight all variables -> right click -> select variable. (**Note: Do not enter a variable name for the second input or output of dual channel devices.**)

Enter the input variable name into the I/O map.

Pos	Port	R/W	Data Typ	Variable
EtherCAT Network				
Master				
NX-SID800				
Safety Inputs				
	Si00 Logical Value	R	SAFEBO	estop_001
	Si01 Logical Value	R	SAFEBO	
	Si02 Logical Value	R	SAFEBO	KM1
	Si03 Logical Value	R	SAFEBO	KM2
	Si04 Logical Value	R	SAFEBO	Reset_PB
	Si05 Logical Value	R	SAFEBO	
	Si06 Logical Value	R	SAFEBO	
	Si07 Logical Value	R	SAFEBO	
Status				
	Safety Connection Status	R	SAFEBO	N2_Safety_Connect
	Safety Input Terminal Status	R	SAFEBO	
NX-SOD400				
Status				
	Safety Connection Status	R	SAFEBO	N3_Safety_Connect
	Safety Output Terminal Status	R	SAFEBO	
Safety Outputs				
	So00 Output Value	W	SAFEBO	ContactOutput

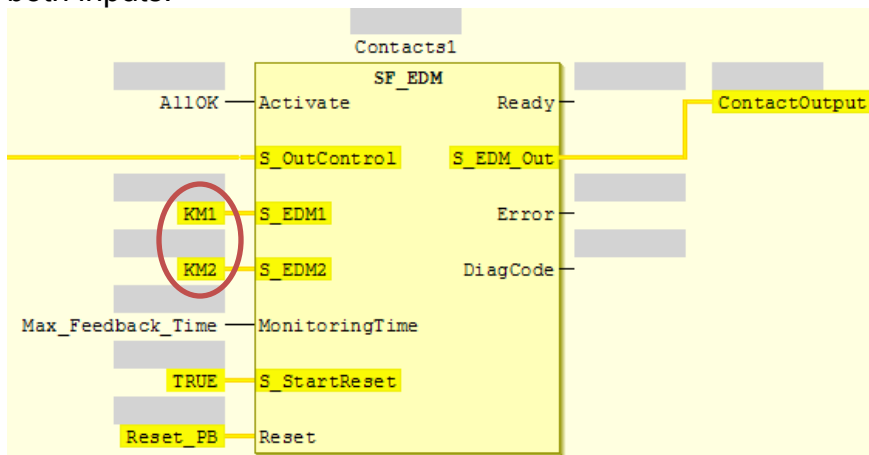
## SF\_EDM Function Block Inputs

**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.**

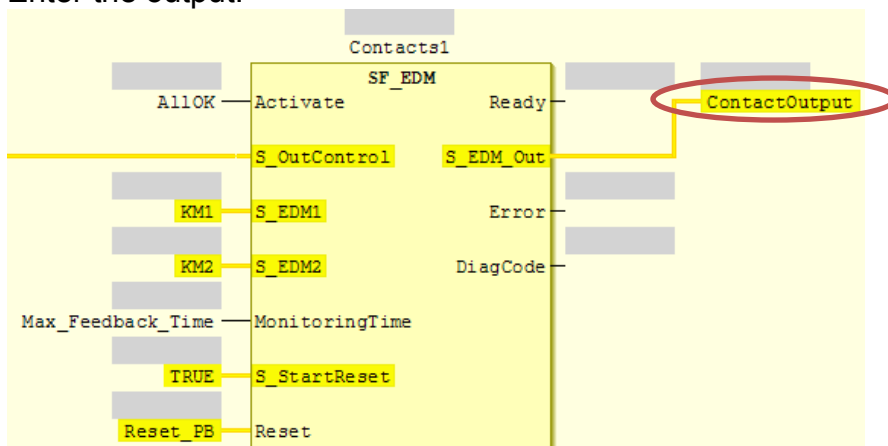
Enter the inputs for S\_EDM1 and S\_EDM2. If it is single channel, use the same variable name for both inputs.



## SF\_EmergencyStop Function Block Outputs

**Sysmac Studio steps:** Click on white space next to the outputs (**always on right 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. **Outputs highlighted in yellow and start with S\_ require a SAFE variable type.**

Enter the output.



## Other Input and Output options

### S\_StartReset Input

Does a reset button need to be pressed at start-up?

Default value is left blank is false.

If no, enter "True". (Setting in all examples and needed for simulation.)

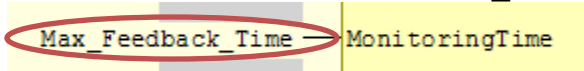
### Reset

Enter the variable name for the reset button. (Note: Reset is a reserved variable so either pick a new another name or add an extension.)

Enter TRUE is no reset button is being used.

### MonitoringTime

Enter variable name such as "Max\_Feedback\_Time."



Then define the length in the internal variable list. (This method will give you the correct time format.)

A screenshot of a software interface showing a table of internal variables. The variable 'Max\_Feedback\_Time' is highlighted with a red oval, and its initial value 't#300ms' is also circled in red.

	Name	Data Type	Initial Value
Internals	Estop1	SF_EmergencyStop	
Externals	Contacts1	SF_EDM	
	Max_Feedback_Time	TIME	t#300ms

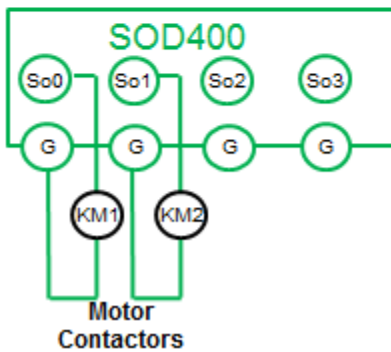
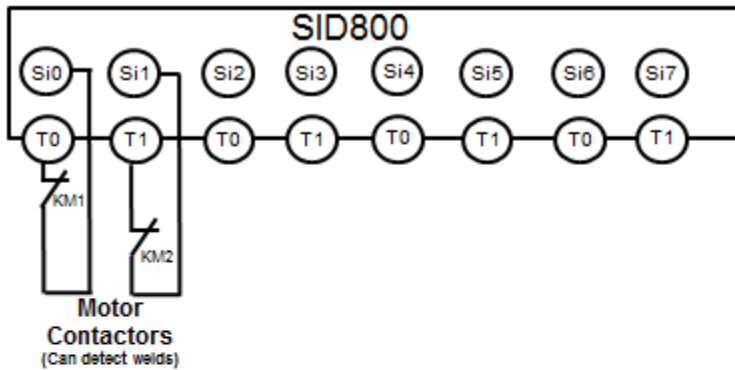
### Name

Give the function block a unique name.

### Reduce function block size

Right click the mouse inside the function block → Remove unused FB call parameters

## Wiring



Notes on dual channel devices:

- 1.) first input starts with T0
- 2.) consecutive order (i.e. Si4 and Si5)
- 3.) wired into the same module \*\*

\*\* If wired into different input modules, the timing of the test pulse signals may be out of sync and cause false shut-downs.