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

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.

![Node Set-up Diagram](image1.png)

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.

![I/O Map Diagram](image2.png)
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.)

```
<table>
<thead>
<tr>
<th>Name</th>
<th>Data Type</th>
<th>Initial Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estop1</td>
<td>SF.EmergencyStop</td>
<td></td>
</tr>
<tr>
<td>Contacts1</td>
<td>SF.EDM</td>
<td></td>
</tr>
<tr>
<td>Max.Feedback_Time</td>
<td>TIME</td>
<td>t#300ms</td>
</tr>
</tbody>
</table>
```

**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.