

# Reset and Restart for NX Safety and G9SP Programming Quick Start Guide

This guide will show you how to set up reset and restart for NX safety and G9SP according to the standards.

## Summary

Resetting an e-stop is NOT allowed to restart the machine.

Use manual reset when people can be inside hazardous areas and for e-stops.

Every machine must have at least 1 category 0 e-stop (or rope pull).

## How to Describe Reset and Restart with E-stop

1. Human detects something is wrong.
2. Press e-stop, which will latch.
3. Unlatch e-stop. (reset) (Machine cannot move.)
4. Press start button. (restart) (Machine moves.)

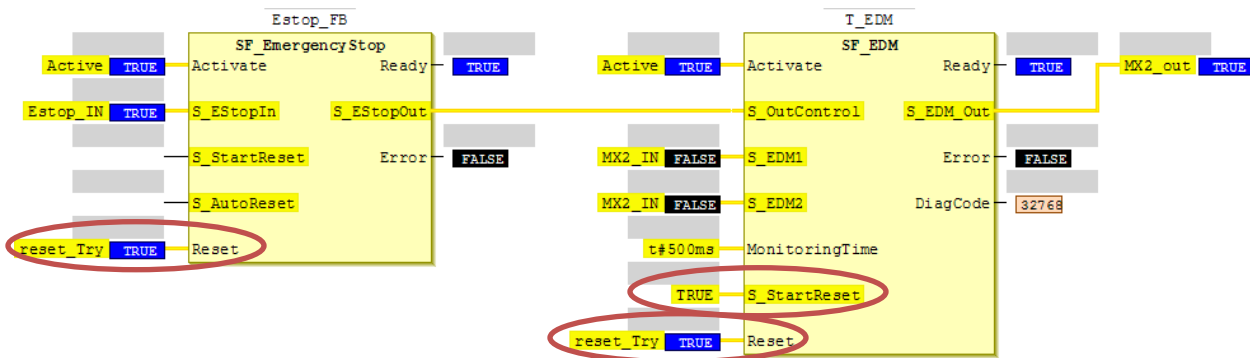
## Standards

ANSI B11.19-2010  
NFPA 79 – 2012  
CSA Z432  
ISO 14118

## Robotics Standards Restart Summary

- Restart interlock to prevent restart of hazardous operation
- Not possible to activate from inside the cell
- Provided through a safety-related control system
- Achieved if all safety functions are operable
- Not initiate motion or hazardous situation by itself

## NX Programming E-stop Example with Restart



Use reset pushbutton (variable used in example: reset\_Try) input for all safety devices and EDM function blocks.

On EDM function block, set “S\_StartReset” to TRUE.

## Troubleshooting Chart

Estop FB			EDM FB		Result	Okay
S_StartReset	S_AutoReset	Reset	S_StartReset	Reset		
True	True		True		No EDM output	No
Reset	True		True		No EDM output	No
True	Reset		True		No EDM output	No
Reset	Reset		True	Reset	No EDM output	No
		Reset			No EDM output	No
				Reset	No EDM output	No
		Reset		Reset	No EDM output	No
Reset	True		Reset		No EDM output	No
Reset			Reset		No EDM output	No
Reset	Reset		Reset		No EDM output	No
Reset			True		No EDM output	No
			True	Reset	No EDM output	No
Reset	True		True		No EDM output	No
True	Reset		True	Reset	Reset PB to start, auto reset	No
True	True	Reset	True	Reset	Reset PB to start, auto reset	No
True	True			Reset	Reset PB to start, auto reset	No
True	True	Reset			All auto	No
		Reset	True	Reset		Yes
Reset	Reset	Reset	True	Reset		Yes

Note: Blank fields are automatically “False”.

## Troubleshooting

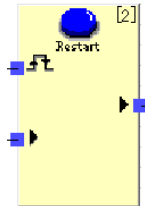
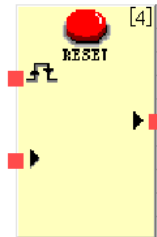
If reset or e-stop has LED, verify the light was not wired as the input.

If reset is wired into NJ (standard PLC), make sure it is exposed in NX program. It also needs to be programmed on the NJ side.

## G9SP Programming


Logical way to remember.


Red is same color as e-stop .... And reset is actually the unlatching of the estop button. Do not use this one.



**Always use this one.** Blue is the industry standard color for reset.

To set property by right clicking on the function block, make sure the reset signal is set to "Low-High-Low."

(Hint, it is the default and you can tell by the symbol  on the 1<sup>st</sup> input.)

(If you see , change it. It is the symbol for rising edge.)

Parameter	In/Out Setting	Out point	Comment
Reset/Reset			Restart
Reset Signal			Low-High-Low

Purpose: To make sure operators are not bypassing the reset by wedging screw drivers, coins, tapes, screws, etc. into the button so it remains latched. Standards require the reset button to latch and be released before allowing the machine to start .... Well, provided all of the safety devices are okay.

## Frequently Asked Questions

Do restart buttons have to be a safety input?

*No. (If the button fails it simply will not allow the system to start. You can use input from standard PLC such as the NJ.)*

So why do the “StartReset” inputs have to be safety?

*They also do a functional check of the safety devices.*

Can I restart from my HMI?

*No. (What if a fly lands on the HMI's restart button? It will become an unintended start of the machine, which is a hazard.)*

Does the reset button have to latch?

*No. The reset button needs to have a momentary contact and then be released.*

*Note: There are some pushbuttons that stay latched, even when they are released. You have to press them again to unlatch. If you have a button that latches, and needs to be pressed again to release, you may be prone to locking up the safety circuit if you forget to press it the second time. (You may need to repower.)*

Why do we even need a reset?

*Did you ever close the door to a big machine and it instantly started? It creates a startling effect, meaning it makes you jump. The purpose is that you verify no one is still in the safeguarded space. (Although other means like safety laser scanners or safety mats should detect that, and anyone in the safeguarded space needs to have an emergency stop.)*

My customer wants me to program auto start and auto reset. Am I allowed to do that?

*No - For emergency stops and hazardous areas where people can be inside the safeguarded space. Refer them to NFPA 79 for emergency stops and ANSI B11. Reset button is needed for all machines since all machines require an e-stop, so you might as well use it in the programming.*

*There are cases for small systems and some types of safety devices where a person cannot be within the safeguarded space (packaging machine with Lexan doors than can maybe hurt a hand if exposed to hazard), answer will depend on outcome of the risk assessment.*