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RE : Commissioning checklist for the Auto-Reset Safety Module (CE-SA-019-0001)

1. Introduction

The Auto-Reset Safety Module is a safety device realizing safety logic.

Therefore, it is essential to verify that it is correctly integrated and that the safety functions that it supports are performed as expected.

2. Supported safety functions

System emergency stop output at the Safety OUT connector from the Safety IN port:

When the redundant dry contacts of the input unit (other Vention safety device) connected to the safety IN port open, the redundant dry contacts controlling the safety signals at the Safety OUT port open.

This function is latched. It means that the dry contacts of the output cannot be closed until a reset is requested.

Automatic reset :

When the OSSD signals of the safety device ports 1 to 3 or triggered and cleared as per the following table, the Safety OUT port is automatically reset after 5 seconds.

Table 1 Automatic reset sequence

Sequence order	Zone 1	Zone 2	Zone 3	Safety out
Operating machine				
Crossing into zone 1				
Crossing from zone 1 to zone 2				
Someone is in zone 2. The state of zone 1 has no impact				
Crossing from zone 2 to zone 3				
Someone is in zone 3. The states of zone 1 and 2 have no impact				
Crossing from zone 3 to zone 2				
Someone is in zone 2. The state of zone 1 has no impact				
Crossing from zone 2 to zone 1				
Someone is in zone 1				
Leaving the monitored area				Delay of 5s

If any device is triggered for more than 30 seconds the module will not auto-reset.
The Auto-reset module does not send a reset pulse after an automatic reset of the OSSD signals of the Safety Out port.

System emergency stop output at the Safety OUT port :

When any of the OSSD signals of the safety device ports 1 to 3 go low, the redundant dry contact controlling the safety signals at the Safety OUT port open.

Unless the safety function Automatic reset is activated this function is latched. It means that the dry contacts of the output cannot be closed until a reset is requested.

System reset propagation from the Safety IN port to the Safety OUT port:

When a reset signal is received from the Safety IN port, a reset signal is sent to the Safety OUT port.

3. Checklist

Compliance to the requirements of table 1 shall be verified

Table 1 Commissioning checklist for safety

Requirement	Description	YES	NO	N/A	Comments / Reference
System ES from Safety IN	4.1				
Auto reset function	4.2				
System ES from detection devices	4.3				
System reset propagation	4.4				

Signature

Name	
Function / Title	
Signature	

4. Procedures

4.1. System ES from Safety IN

The state of the redundant safety signal of the Safety IN port is propagated to the Safety OUT port. This safety function shall be verified as per the following procedure.

Procedure :

Install a estop-reset-module upstream to the module (Safety IN port):

- Press the emergency stop button;
- Release the emergency stop button;
- Press the reset button of the estop-reset-module.

Behavior :

Following the above procedure, the system emergency stop shall be activated and reseted :

- When pressing the emergency button or activating the system emergency stop at the Safety IN port, the LED shall turn solid red and the connected end effectors (Machine Motion and robot) shall goes in emergency stop;
- When releasing the emergency button or restoring the system emergency stop signal at the Safety IN port, the LED should turn flashing red;
- When pressing the reset button, the LED should go back to solid green

4.2. Auto-reset function

For the auto reset function the following shall be verified.

Procedure :

1. Break the device or enter the zone corresponding to the port Zone 1;
2. Unbreak the device or leave the zone corresponding to the port Zone 1;
3. Wait 5 seconds;
4. Break the device or enter the zone corresponding to the port Zone 1;
5. Break the device or enter the zone corresponding to the port Zone 2;
6. Unbreak or leave the zone corresponding to the port Zone 2 while breaking the device or reentering zone corresponding to the port Zone 1;
7. Unbreak the device or leave the zone corresponding to the port Zone 1;
8. Wait 5 seconds;
9. Break the device or enter the zone corresponding to the port Zone 1;
10. Break the device or enter the zone corresponding to the port Zone 2;
11. Break the device or enter the zone corresponding to the port Zone 3;
12. Unbreak or leave the zone corresponding to the port Zone 3 while breaking the device or reentering zone corresponding to the port Zone 2;

13. Unbreak or leave the zone corresponding to the port Zone 2 while breaking the device or reentering zone corresponding to the port Zone 1;
14. Unbreak the device or leave the zone corresponding to the port Zone 1;
15. Wait 5 seconds;

Behavior:

Following the above procedure, the muting feature shall not be activated :

- At items 1, 4 and 9 the LED shall flash BLUE and the safety signal on the Safety OUT port shall go low. When connected to the Reduced port of an RSM, the robot shall go in collaborative mode or protective stop;
- After items 3, 8 and 15, the LED shall turn solid GREEN and the safety signal on the Safety OUT port shall go high. When connected to the Reduced port of an RSM, the robot shall resume normal operation.

4.3. System ES from detection devices

If the sequence for enabling the auto-reset is not respected, a manual request shall be necessary. The following shall be verified.

Procedure :

1. Break the device or enter the zone corresponding to the port Zone 1;
2. Break the device or enter the zone corresponding to the port Zone 2;
3. Unbreak or leave the zone corresponding to the port Zone 2 without breaking the device or reentering zone corresponding to the port Zone 1;
4. Wait 5 seconds;
5. Press the reset button of a estop-reset-module;
6. Break the device or enter the zone corresponding to the port Zone 1;
7. Break the device or enter the zone corresponding to the port Zone 2;
8. Break the device or enter the zone corresponding to the port Zone 3;
9. Unbreak or leave the zone corresponding to the port Zone 3 without breaking the device or reentering zone corresponding to the port Zone 2;
10. Wait 5 seconds;
11. Press the reset button of a estop-reset-module;
12. Break the device or enter the zone corresponding to the port Zone 2;
13. Unbreak or leave the zone corresponding to the port Zone 2 without breaking the device or reentering zone corresponding to the port Zone 1;
14. Wait 5 seconds;
15. Press the reset button of a estop-reset-module;
16. Break the device or enter the zone corresponding to the port Zone 3;
17. Unbreak or leave the zone corresponding to the port Zone 3 without breaking the device or reentering zone corresponding to the port Zone 2;

18. Wait 5 seconds;
19. Press the reset button of an estop-reset-module.

Behavior:

Following the above procedure, the muting feature shall not be activated :

- At items 1, 6, 12 and 16, the LED shall flash BLUE and the safety signal on the Safety OUT port shall go low. When connected to the Reduced port of an RSM, the robot shall go in collaborative mode or protective stop;
- After items 4, 10, 14 and 18, the LED shall flash RED and the safety signal on the Safety OUT port shall remain low. When connected to the Reduced port of an RSM, the robot shall remain in collaborative mode or protective stop;
- After items 5, 11, 15 and 19, the LED shall turn solid GREEN and the safety signal on the Safety OUT port shall go low. When connected to the Reduced port of an RSM, the robot shall go in collaborative mode or protective stop.

4.4. System reset propagation

The reset propagation is verified with the reset of other modules or the MachineMotion.
When performing 4.1 and 4.3, verify if other modules and the MachineMotion (if applicable) reset.