

Exception Handling

Exceptions

Exception handling is an important part of any application. If a problem condition can be identified and correctly handled it can prevent damage to equipment or loss of production.

Typical exception handling may be written for the following:

- Equipment being turned on but not running, such as a conveyor jam
- Motors not running at the correct speed
- Insufficient product
- No bottles or caps for a bottling machine
- Storage container overfill (if a high level probe fails)
- Product backup on conveyor

The last of these for example, may cause product to spill on the floor if there is not enough room on the conveyor and it is not stopped.

The following exercises will add code to handle the first two of these.



Note:

If any of these physical exceptions occur they are often referred to by engineers as faults. The fault is not part of the control system but with the process itself and if programmed correctly, the control system can handle the fault in a controlled way.

Exception Indication

As well as handling the exception, the program should also provide some kind of indication to the operator so they can take the appropriate action to resolve it. This can be in the form of indicator lights, horns and/or alarm displays. An output will be provided for lights/horns and the program must be written to operate these outputs under the appropriate circumstances.

Alarm displays are usually implemented using a graphic or text display and data connection to the controller. In most cases there must be some programming in the controller to accommodate this.

Exception Handling (cont.)

Conveyor Application

For this section of program, inputs %I0.2, %I0.3 and %I0.4 will simulate conveyor faults. A settling time will be provided for each conveyor and if the input is activated after this time then an exception will be generated.

The appropriate conveyor will be stopped along with all preceding conveyors to prevent product from being fed to the conveyor that has stopped.

The speed of a conveyor will also be monitored. This speed will be represented by an analog value on input %IW0.0. A low and high setpoint will be configured and if the speed of the conveyor is outside the range of the setpoints then an indication will be made to the operator. No other automation control is required.

A fault Indicator output will be provided on %Q0.7: It will be flashing for a conveyor speed error and permanently on for a conveyor fault.