**PANEL SUBSYSTEM SINGULATOR**

**1. Description  
Controls the singulation system to separate items on the conveyor.**

**2. Functions**

* **Detects and separates items for downstream processes.**
* **Provides signals to synchronize with other subsystems (e.g., camera, scale).**

**3. I/O and Signals**

| **Signal Name** | **Type** | **Description** | **Panel** |
| --- | --- | --- | --- |
| **SINGULATOR\_START** | **DO** | **Activate singulator** | **PANEL\_CONTROL\_RIO** |
| **SINGULATOR\_STATUS** | **DI** | **Singulator operational status** | **PANEL\_CONTROL\_RIO** |

**4. Interlocks & Safety**

* **Stops singulator if no items detected for separation.**
* **Stops if jam is detected (via PHOTO\_EYE\_JAM).**

**5. Dependencies**

* **Depends on PHOTO\_EYE\_JAM and PHOTO\_EYE\_INDUCT for item detection.**

**6. Alarms**

| **Alarm ID** | **Condition** | **Message** |
| --- | --- | --- |
| **A\_SING\_01** | **Singulator failure** | **"Singulator Fault"** |

**7. HMI / Operator Interaction**

* **Displays singulator status (active, idle, fault).**
* **Manual start/stop options.**