

Ink Levels in Bank Note Printing

Precise Measurement
for Reliable Refilling

The Application

Bank note printing is subject to strict confidentiality. This confidentiality extends to the special composition of each ink mixture. The various ink colors are poured into compact containers mounted close together in the printing machine. During the printing process, the ink from these containers is applied to rollers that print it onto large paper sheets. There must always be sufficient ink in the containers, or the print roller will run dry. If the fluid drops to the minimum fill level, the containers must be refilled.



The Goal

The system must promptly identify which ink container requires refilling. This process is controlled by level sensors. The surface area available to the sensor to measure is only slightly larger than a postage stamp, and the fill level of the ink in the container is only around ten millimeters deep, thus, the sensor requires extreme precision. Its accuracy must also be unaffected by changing ink colors or shiny surfaces.

The Solution

Above each ink unit, a UB120-F12P-EP-V15 ultrasonic sensor is installed. The sensors determine the ink level with sub-millimeter precision, allowing the level to be controlled with a high degree of accuracy. The integrated potentiometer makes adjustment a quick and simple process. If the ink level drops to the specified minimum fill level, the sensor initiates the refilling process. This ensures that there is always sufficient ink available for the print roller. To prevent cross-talk between the sensors due to the highly compact assembly, the sensors can be used in multiplex mode – where the sensors automatically perform measurements in an alternating sequence. Only one sensor is active at a time, guaranteeing a reliable, cross-talk-free measurement.

The Benefits

The ultrasonic sensors are noncontact. They detect the ink level regardless of the color or other visual properties. The sensors feature a narrow sound beam, meaning they need only a very small measuring range. The compact sensors are easy to integrate above the ink containers of the printing machine. The synchronization function guarantees reliable measurements, even if the containers are positioned extremely close together. All the user needs to do is interconnect the sensors' self-synchronization inputs.



At a Glance:

- Precise, color-independent ink level measurement
- Potentiometer enables easy and accurate adjustment
- Compact housing design for easy integration into the printing machine
- Maintenance-free operation
- Automatic sensor synchronization prevents cross-talk