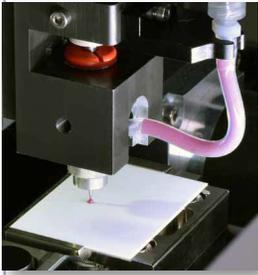


# Needle/Nozzle Calibration Station

## Automatic XYZ Calibration

GPD Global® dispensers are regarded as some of the highest precision dispensers available today, and the inclusion of the calibration station enhances that precision.



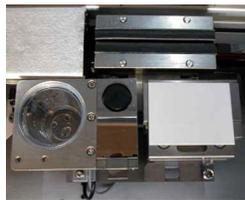
The **Needle Calibration Station** is a standard feature offered on all MAX Series and DS Series™ dispensers.

The calibration process is completely automatic, can be done without operator intervention, and takes place in less than 20 seconds. Calibration can be programmed to occur at the startup of a process or any time the valve is removed and reinstalled.

The calibration process incorporates a “Z” pad that is located by the surface sensor. The tool tip contacts this same “Z” pad and the system records the offset between it and the surface sensor.

To locate the center of the nozzle, a dot calibration area is incorporated that uses either paper, backlit ceramic, or a needle impression. The system dispenses a dot on the area, except for foil impression where the nozzle indents the foil to replicate a dot, and then the vision system moves over the dispensed dot to locate the center. This action determines the offset between the camera and the nozzle center allowing for greater accuracy. The procedure also includes calibration of the vision system. A purging step and automatic needle cleaning step are included in the procedure and can be programmed to occur at any time.

Backlit Ceramic Model



Foil Impression Model

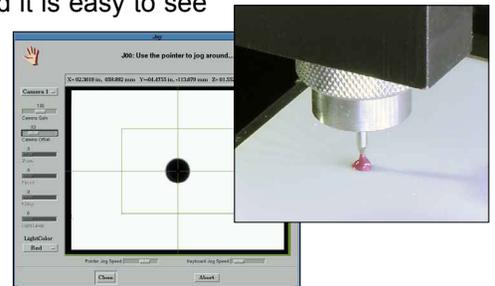


Paper Model



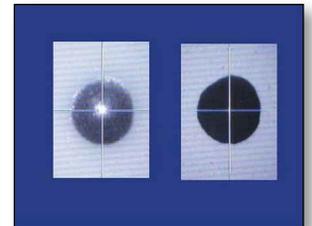
Couple this calibration procedure with our gantry mapping process - Contour Mapping™ - which is performed on all GPD Global® dispensers, and our high resolution encoded drive motors, and it is easy to see

why GPD Global® is a leader in high precision, high accuracy dispensing systems.



### Backlit Calibration Station

This model of calibration station provides the highest level of camera-to-needle alignment. The Backlit model of calibration station provides a pristine dot pattern on which the vision system aligns. The high quality image comes from illuminating the dot from below and turning off the top side illumination. By illuminating from below, we eliminate the ghosting and reflecting effects commonly seen when looking at wet, shiny materials. All the vision system sees is a black outline in a bright area, giving the best environment for determining the center of the dispense nozzle. The system will dispense dots on the ceramic chip in a matrix pattern. Once the matrix has filled the ceramic chip, the system will notify the operator that it is time to clean or replace the chip.



Compare quality of dispense outline - the Backlit Calibration Station is used at RIGHT but not at LEFT.

For special materials or environments, the backlit calibration routine can be used in conjunction with our standard on-axis illumination or other variant of Dark-Field lighting.



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