

APPENDIX C: Coordinate correction

For large samples or large automated batches, level plate alignment can be essential. Small inaccuracies (skew) in stage or plate installation can be magnified over large distances, and in the worst case, large samples may need manual adjustment during analysis because the laser dot will not hit the desired spot. In order to address this, MassTech wanted a simple way for customers to be able to correct for a skewed stage or plate before they began their sample run.

The newest version of Target software includes a coordinate correction feature, which allows the user to compensate for potential plate misalignment. This feature works with plates that use a rectilinear well (or spot) layout. In order to use this feature, the user must “calibrate” the plate first.

Coordinate correction calibration is multi step procedure. At the first stage user must define custom rectilinear plate and find corresponding target position offset using Sample Plate tab of the Settings dialog (see Figure 1). The target offset (top left corner target) needs to be entered, and the number of rows and columns as well as sample spacing needs to be entered (providing rectangular bounds for the target space). Assuming that the laser has been aligned properly, and that you have placed the red crosshairs at the location of the laser output, the laser dot should hit the top left corner target when you enter the data correctly.

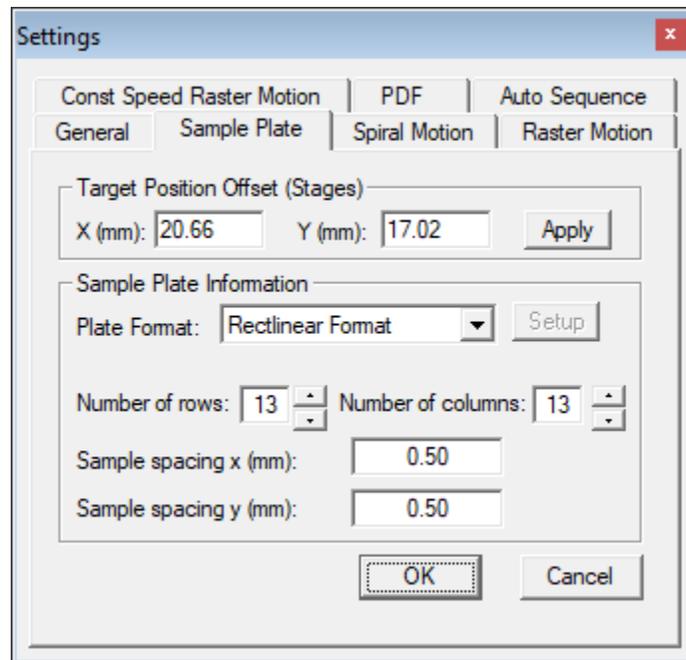


Figure 1. Sample Plate Settings

Custom sample plate alignment can be verified by navigation to the corner sample spots by clicking them in Sample Spot Selector widget. Red cross hair should be located at the center of the corresponding spots in case of perfect alignment. If the laser dot hits the sample well or spot effectively throughout the sample, then no coordinate correction is needed.

However, in the case of improper alignment, which may be caused by a plate or stage slightly skewed, you may see the red crosshair offset from the intended sample spot (as shown on Figure 2). In this case coordinate correction can be used for compensation of that misalignment.

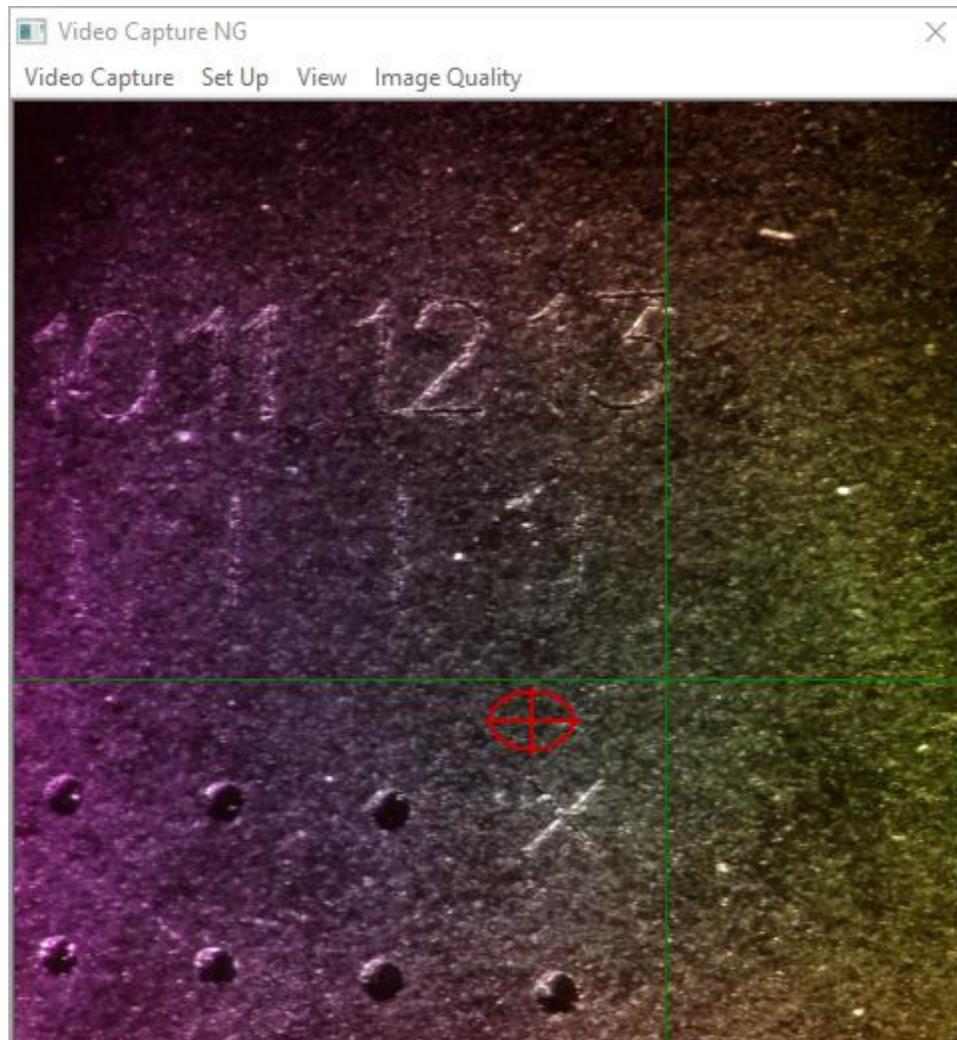


Figure 2. Top left sample spot in case of misalignment

The "Coordinate correction" wizard can be invoked by selecting Settings->Coordinate Correction... menu item in Target.

The wizard window will appear on the screen as shown on Figure 3. Read the instructions and press Next when ready.

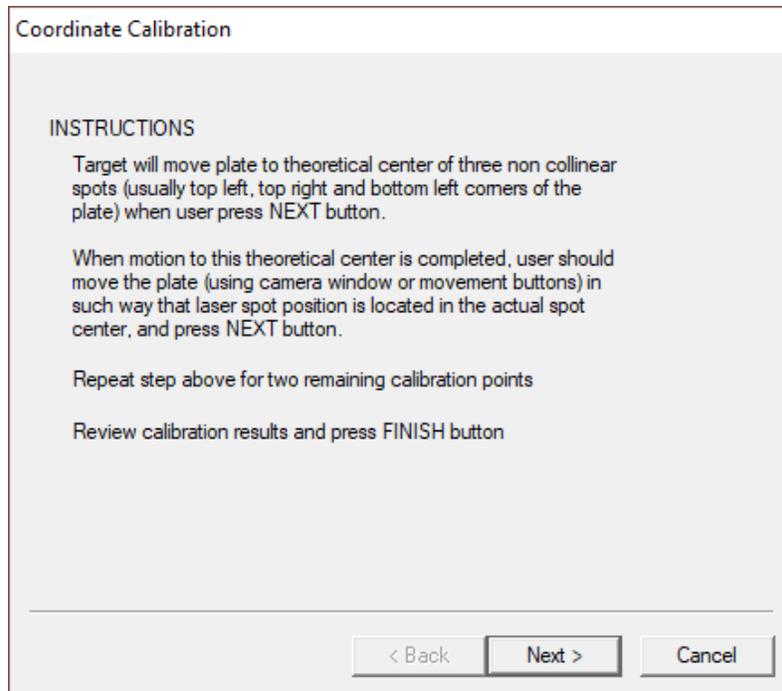
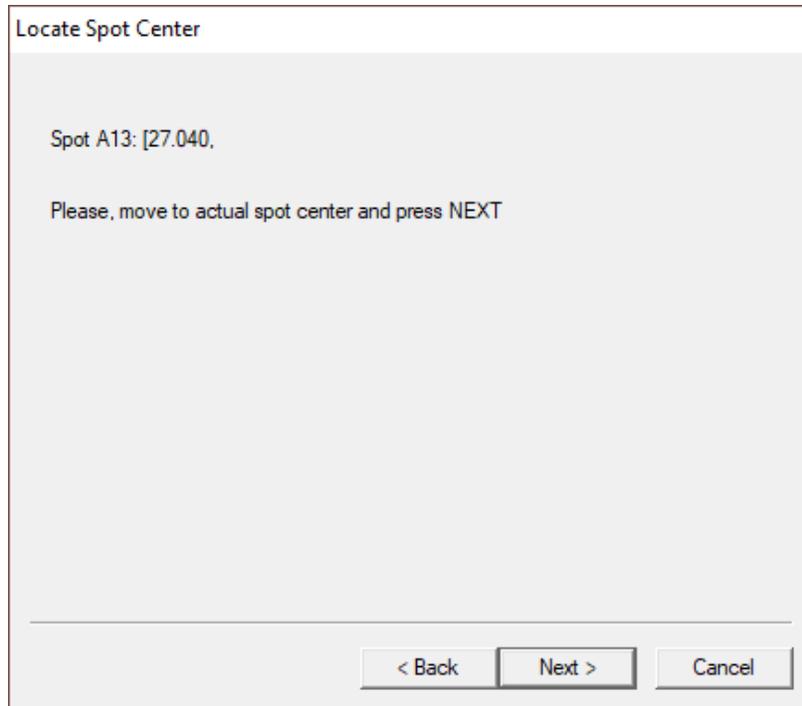


Figure 3. Coordinate Correction Calibration Wizard Start Page

Target will move to the upper left sample spot when the user presses “Next”. The user should then position the sample plate in such way that laser spot (or red crosshair) position is located in the correct spot center by double clicking in the video capture window to move the spot center to the laser spot (or red crosshair).



Then press Next and repeat this step for the bottom left spot and top right spot (see Figure 4). After that, the “Done” page will appear showing the resulting coordinate transformation (Figure 5). Accept calibration results by pressing Finish button. Coordinate correction can be enabled/disabled in Target by accessing the Settings->Enable CC menu item. In case of proper coordinate correction red cross hair (or laser spot) should be located at exact spot centers, when Sample Spot Selector widget is used for navigation.

Figure 4. Coordinate Correction Calibration Wizard Locate Spot Center Page

Done

Input

A1: [21.040, 16.960] - [21.082, 16.952]
M1: [21.040, 22.960] - [20.872, 23.042]
A13: [27.040, 16.960] - [27.132, 17.212]

Verification

A1: [21.040, 16.960] - [21.082, 16.952]
M1: [21.040, 22.960] - [20.872, 23.042]
A13: [27.040, 16.960] - [27.132, 17.212]

Activate Coordinate Correction

< Back Finish Cancel

Figure 5. Coordinate Correction Calibration Wizard Done Page

You should now be able to click on any spot or well in Target and the laser spot should fall on the appropriate spot.