LASER PRESENTER STATION

The optional laser marker can print up to three lines of 15 characters each on programmed devices and operates as an integrated part of the BP-3000/4000 system.

Note: The Prolase 7 Server security dongle must be installed in order to laser mark.

Settings

The Laser Presenter Settings property page contains all the laser marking information, including laser settings, text settings and erase/ablate settings. The Laser Presenter Settings property page can be accessed via the *Autohandler->Laser Presenter->Settings...* menu option, right clicking on the laser presenter station in the APS view then selecting the *Settings...* context menu option, or right clicking on the laser presenter media in the Workflow Configuration dialog then selecting the *Settings...* context menu option.

Note: A laser presenter must be selected into the workflow in order to enable access the Laser Presenter Settings property page.

Text Lase Settings

- **Power** - Enter the percentage of full power of the laser. Generally, a value of 25 is used for plastic packages and 70 for ceramic packages.
- **Speed** - Enter a value to set the speed of the laser as it marks a device. Normally set at 4.
- **Text** - Enter the text. The laser can mark up to three lines of characters with a maximum of 15 characters per line. The three lines are completely independent of each other so you could have lines running at different angles with different sized characters. If applicable, click on the arrow button to add a date/time format specifier to the text line.

  Note: Users that do not have the Lase Serial Number and Date feature, but want to use a '%' sign in the text line will have to use "%%" in the line in order for a '%' to be lased.
- **X** - Enter the starting coordinates from the center of the device. The resolution is 0.001" (25.4 µm), and the upper left of the device is +X and -Y.
- **Y** - Enter the starting coordinates entered from the center of the device. The resolution is 0.001", and the upper left of the device is +X and -Y.
- **Angle** - Enter a value where 0 degrees will mark from left to right, 90 degrees will mark top to bottom, etc.
- **Size** - Enter the height of the characters with a resolution of 0.001". The smallest legible character is about 0.015" (381 µm).

Project File

A Prolase project file (i.e. .laz file) can be used for laser marking devices. The user can first create or modify a Prolase project using the Prolase software, save the project file, and then select the project file from BPWin's Laser Presenter Settings property page after which it will be used for laser marking. This allows for the easy use of all of Prolase's features in constructing laser marking templates consisting of graphics, text, or a combination of the two as well as make the positioning of the laser mark itself much easier and faster. Graphics can be created via Prolase's graphic tools or can be imported from a vector image file. Supported vector image types are the Enhanced metafile(.emf), the HP graphics language plot file (.plt), or the Windows metafile (.wmf). Raster images are not supported. You can convert a raster image to a vector image by using an image conversion software tool. Inkscape is a free third-party conversion software tool available for download.
The Project File settings (i.e. Checkbox setting and project file path) will be saved to the autohandler workflow (*.abp) file.

Note:

- It is possible to have Prolase and BPWin up and running at the same time. To do this you must first start Prolase and then start BPWin. If performed in the reverse order you will receive an error message. Changing the sentinel driver setting will allow both applications to run regardless of the launch order.
- The use of the Prolase software requires the presence of a USB key which may be obtained by purchasing a license for Prolase. The Prolase RTC2 software (PRONT.exe) can be found in the same directory as BPWin. Laser project files must be made with this version of Prolase.

Basic Walkthrough of the Feature

1. Start BPWin and setup a job using laser marking.
2. Open the Laser Presenter Settings property page via the *Autohandler->Laser Presenter->Settings...* menu option.
3. In the Laser Presenter Settings property page under Project File check the *Use project file* check box. Speed, Power, all of the Erase controls and all of the Text controls except for the 3 edit boxes, which permit the three lines of text to be edited, will be disabled. All of the necessary settings will be obtained directly from the selected project file.
4. Browse to and select the desired *.laz file. Note that *.laz files have an interdependency on several other Prolase file types one of the most notable being the Materials (*.mat) file which specifies the speed of the laser marking head and power of the laser for each pass. For more information on Prolase file types and the *.laz file in general, please refer to the Prolase manual which may be downloaded from American Laserware, Inc.
5. Enter any desired text for Line 1, Line 2, Line 3. See Laser Presenter Settings property page example. If specified, these three lines of text will be used in place of the following three corresponding context insensitive labels which may be present in a *.laz file:

LAZ File Label	Corresponding line of text from the Laser Presenter Settings property pag LAZ File label will be replaced with:
<Line1>	Line 1 edit box contents
<Line2>	Line 2 edit box contents
<Line3>	Line 3 edit box contents

   Note that the labels <Line1>, <Line2> and <Line3> may each be used multiple times or not at all in a LAZ file. When used multiple times each instance of the label will be replaced by the corresponding line of text from the Laser Presenter Settings property page. Example of 3TextGraphic.LAZ using label.
6. The laser mark placed on the actual device during a Test Laser operation or regular job run. See example result .

Erase

- Erase before Text Lase Settings - Select this option to ablate any pre-existing marks on the device before the laser marks any configuration entered above. The fields in the Erase section become active. Fill in the speed, power, X and Y fields.
- Power - Enter the percentage of full power of the laser. Generally, a value of 25 is used for plastic packages and 70 for ceramic packages.
- Speed - Enter a value to set the speed of the laser as it marks a device. Normally set at 4.
- Default - Select this option to fill in the width and height fields with the selected package parameters less 0.020" (508 µm).
- X - Enter the starting coordinates from the center of the device. The resolution is 0.001" (25.4 µm), and the upper left of the device is +X and -Y.
- Y - Enter the starting coordinates entered from the center of the device. The resolution is 0.001", and the upper left of the device is +X and -Y.
- Height - Enter the height of the area to ablate with a resolution of 0.001".
- Width - Enter the width of the area to ablate with a resolution of 0.001".
- Angle - Enter a value where 0 degrees will mark from left to right, 90 degrees will mark top to bottom, etc.

Advanced Setting

The lasing marking system can be configured without having to open the Prolase software.

- **Field** - Enter the maximum size of the marking field for the laser marking system. This field is used to correctly scale the mark on the target so that, for example, a 1 inch square defined in the application will mark a 1 inch square on the target.

  Note: The *Field Parameters* section will be disabled if the user does not have write access to the following registry key on a 3000 Series automated programming system:
  - HKEY_LOCAL_MACHINE\SOFTWARE\ BP Microsystems\BPWin\AutoHandler\Peripherals\LaserPresenter\ProlaseEngine\FieldParameters\3xAps

or the following registry key on a 4000 Series automated programming system:

- HKEY_LOCAL_MACHINE\SOFTWARE\ BP Microsystems\BPWin\AutoHandler\Peripherals\LaserPresenter\ProlaseEngine\FieldParameters\4xAps

- **Start segment TC** - Enter a time constant value in microseconds to minimize the effects at the beginning of line segments. Increase the value to reduce hot spots (dark point) at the beginning of lased marks. Note that if the value is too large, then the lased mark may decrease in size. For example, if the letter 'D' is lased the start of the letter 'D' will have a gap.
- **Poly TC** - Enter a time constant value in milliseconds to delay the start of the next line segment mark. If the value is too large, the points where 2 line segments connect will be very dark (hot spot). If the value is too small, the connecting point of 2 line segments will be rounded.
- **End segment TC** - Enter a time constant value in milliseconds to minimize the effects at the end of line segments. For example, an incorrect setting when lasing the letter 'A' will result in either an incomplete 'A' or a hot spot at the end of the letter. Adjust this value in increments of 0.5ms at a time until the letter lased is complete.
- **Pos TC** - Enter a time constant value in milliseconds to reduce marking tails on small line segments. Very high values will eliminate the marking tails but will unnecessarily slow down marking.
- **Distance TC** - Enter a time constant value in milliseconds to reduce marking tails on long line segments. Very high values will eliminate the marking tails but will unnecessarily slow down marking.
- **Pos res** - Enter a value in galvo steps that limits the velocity of the galvo. A value of 1 will cause the galvo to move at its slowest velocity. If a value is too high, then the galvo may 'ring' for long periods of time at the destination points.

  Note: The *Delays* settings will be disabled if the user does not have write access to the following registry key:

  - HKEY_LOCAL_MACHINE\SOFTWARE\ BP Microsystems\BPWin\AutoHandler\Peripherals\LaserPresenter\ProlaseEngine\Delays

Laser Power Limit

Laser Power Limit can be set at JobMaster - JobMaster Configure - Laser Power Limit. The Laser Power Limit can be any valid integer from 1 to 100, which represents the maximum percentage of Laser Power. User cannot set a Laser Power percentage higher than this limit in Laser Settings dialogs. If the user loads an ABP file that has a Power Limit higher that what is allowed, the user will be warned that the limit will be modified to the maximum allowed by the value the supervisor has chosen.

Laser Test

This allows for testing the laser mark on a device using the current settings. The autohandler takes the device from the input location to the Laser. The device will be marked and then placed at the location specified in the dialog. If necessary, the marking data can be adjusted and re-tested until the mark is correct.

Note: Place a piece of tape or stick-on label on the test device to enable multiple tests to be performed on the same device when testing laser marks.

- Source Media - Select a Source media from which the device will be retrieved.
- Destination Media - Select a Destination media to place the device after the test lase has completed.
- Nozzle 1 - Select this option to test the lase on Laser Presenter nozzle 1.
- Nozzle 2 - Select this option to test the lase on Laser Presenter nozzle 2.
- Test Lase - Select this option to start testing the selected lase settings.

Lase Serial Number, Date, and/or Socket Location Feature (optional)

This feature allows for real-time information to be lased on devices using format specifiers.

Note: Users that have upgraded to 4.62 or later and have a '**%**', "**%D**", "**%d**" or "**%S**" in a text line from an .abp file made with a previous version will need to make a one-time modification to the line in the new format and then save the updated file.

- A serial number format specifier can be specified with "**%s**". When lasing a serial number using "%s" using Simple serialization, the sequential serial number will be lased. In Complex serialization, the serial number handle (number for the "**T01**:" code) will be lased. To lase the actual serial number, the serial number handle will need to reflect the actual serial number.
- Date or time format specifiers can be arranged in any order and includes a wide selection. A pop-up menu of common specifiers is available in the Laser Configure dialog. Clicking on a specifier in the menu will add it to the text line. A list of all available specifiers can be found in the Date/Time Format Specifier Chart .

- A socket location specifier can be specified with "%l". When lasing using "%l", the Site/Socket location (example: "2A") that the device was operated on will be lased.

Example: If the week number is 12, the year is 2007.
Entered on the text line: BPM%U%y
Lased on the device: BPM1207

Text Orientation

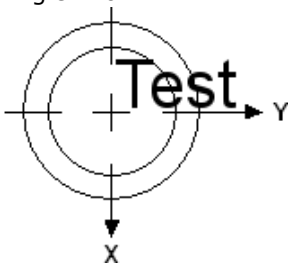
This section provides helpful information in setting up the text settings for proper orientation of the marked text on the device. The orientation of the text is relative to the calibrated center of the laser marker's nozzle. Therefore if the calibrated center of the laser marker's nozzle is incorrect or if the nozzle's X-axis and/or Y-axis learned teach location is incorrect then you will have a difficult time orienting the marked text on the device. Make sure that both the calibrated center of the laser marker's nozzle is accurate and that the nozzle's X-axis and Y-axis learned teach location is accurate before making adjustments to the text orientation.

The origin of the text to mark, X = 0 and Y = 0, is located at the bottom left of the text as illustrated here:

The examples that follow will illustrate how text will be oriented relative to the calibrated center of the laser marker's nozzle with different X, Y, and angle settings.

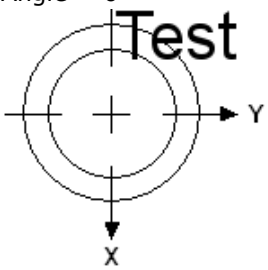
Example 1

X = 0
Y= 0
Angle = 0



Example 2

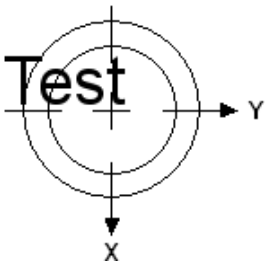
X = 0
Y= -0.1
Angle = 0



Note that the text moved up relative to the calibrated center of the laser presenter's nozzle because the value for Y is negative. Therefore for positive values of Y, the text will move down from the calibrated center of the laser presenter's nozzle.

Example 3

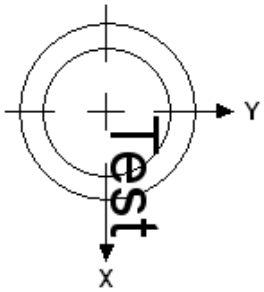
X = -0.1
Y= 0
Angle = 0



Note that the text moved left relative to the calibrated center of the laser presenter's nozzle because the value for X is positive. Therefore for negative values of X, the text will move right from the calibrated center of the laser presenter's nozzle.

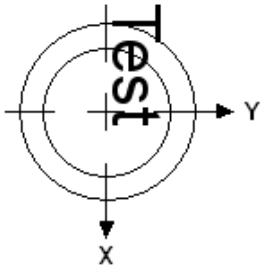
Example 4

X = 0
Y= 0
Angle = 90



Example 5

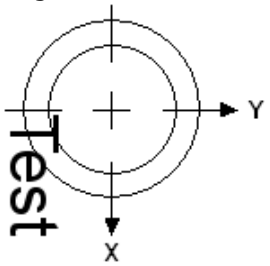
X = 0
Y= -0.1
Angle = 90



Note that the text moved up relative to the calibrated center of the laser presenter's nozzle because the value for Y is negative. Therefore for positive values of Y, the text will move down from the calibrated center of the laser presenter's nozzle.

Example 6

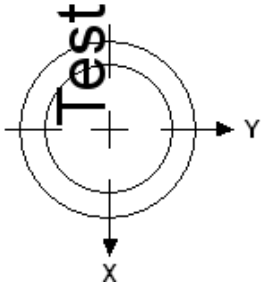
X = 0.1
Y = 0
Angle = 90



Note that the text moved left relative to the calibrated center of the laser presenter's nozzle because the value for X is positive. Therefore for negative values of X, the text will move right from the calibrated center of the laser presenter's nozzle.

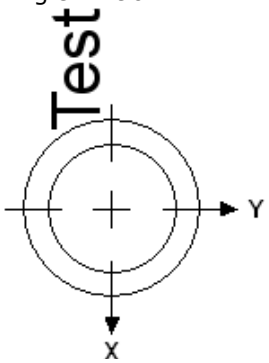
Example 7

X = 0
Y= 0
Angle = -90



Example 8

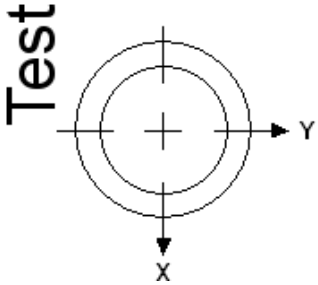
X = 0
Y= -0.1
Angle = -90



Note that the text moved up relative to the calibrated center of the laser presenter's nozzle because the value of Y is negative. Therefore for negative values of Y, the text will move down from the calibrated center of the laser presenter's nozzle.

Example 9

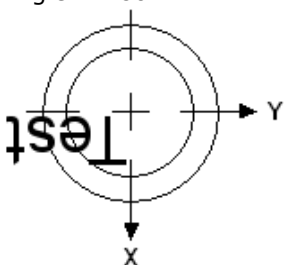
X = 0.1
Y= 0
Angle = -90



Note that the text moved left relative to the calibrated center of the laser presenter's nozzle because the value of X is positive. Therefore for negative values of X, the text will move right from the calibrated center of the laser presenter's nozzle.

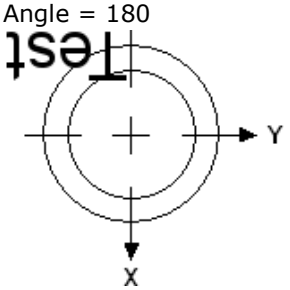
Example 10

X = 0
Y= 0
Angle = 180



Example 11

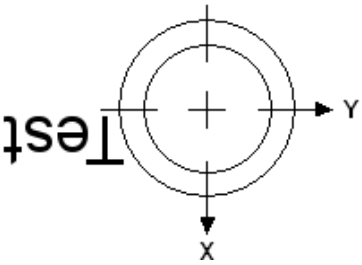
X = 0
Y= -0.1
Angle = 180



Note that the text moved up relative to the calibrated center of the laser presenter's nozzle because the value of Y is negative. Therefore for positive values of Y, the text will move down from the calibrated center of the laser presenter's nozzle.

Example 12

X = 0.1
Y = 0
Angle = 180



Note that the text moved left relative to the calibrated center of the laser presenter's nozzle because the value of X is positive. Therefore for negative values of X, the text will move right from the calibrated center of the laser presenter's nozzle.

Calibrating Laser Nozzles

BPWin retains offset values, from the origin of the laser marking head system, which represents the center of each laser marker nozzle. In the event that a modification of the autohandler causes these coordinates to no longer be correct, for example, replacing/adjusting the marking head system, the carriage assembly on the 4000 Series or the laser box rotary mechanism on the 3000 Series, the coordinates can be updated through the Calibrate Laser dialog. Each nozzle used for laser marking can be calibrated to the laser marker to insure the correct marking locations on each device. The Calibrate Laser dialog can be accessed by right clicking on the laser presenter station in the APS view then selecting the *Calibrate Nozzles...* context menu option, or right

clicking on the laser presenter media in the Workflow Configuration dialog then selecting the *Calibrate Nozzles...* context menu option.
Note: A laser presenter must be selected into the workflow in order to enable access the Calibrate Laser dialog.

(example illustration)

- **Offset X and Offset Y -** The value in inches from the origin of the laser marking head system.
- **Angle -** The offset angle in degrees from the origin of the laser marking head system.
- **Mark** - Prompts user to place target onto marker nozzle and then a calibration mark will be lased onto the target.
- **Power** - The percentage of full power of the laser for lasing on the paper. This value will be lower than the value for lasing on devices.
- **Reload** - Load the saved calibration offset values from the file.
- **Save** - Saves the current calibration offset values to the file.
- **Cancel** - Closes the dialog without saving the current calibration offset values.

Note:

- **On the 3000 Series -** The two laser marker nozzles are mounted on a rotary mechanism in the laser box assembly near the origin of the laser marking head system, so the X and Y coordinate values should be near 0 inches. The angle is measured from the origin of the laser marking head system.
- **On the 4000 Series** - The two laser marker nozzles are stationary and the origin of the laser marking head system is set up to be between the 2 nozzles. The offset values are determined from this origin. The nozzles are about 1 inch (2.54cm) away from the origin. When viewing the nozzles from the front of the autohandler, the left nozzle will be about -1" from the origin (X offset) and the right nozzle will be +1" from the origin. The X coordinates for the nozzles are measured from the origin of the laser marking head system. The angle is rotated about the laser marking head system origin, when the angle is changed, the X and Y coordinates may need to be changed too.

Steps to calibrate a laser marker nozzle:

1. Insure the laser marker nozzle tip to be used is installed.
2. Add a laser presenter to the workflow.
3. In the APS view, right click on the laser presenter and select the *Calibrate Nozzles...* context menu to open the Calibrate Laser dialog.
4. Enter a Power of **10**.
5. Click the corresponding **Mark** button to initiate the calibration lasing for the marker nozzle.
6. When prompted to place a target on the nozzle. The target will be a piece of paper approximately 1" x 1" (2.54cm x 2.54cm). Open the autohandler interlock and place the paper over the marking nozzle. The vacuum will keep the paper on the nozzle. Press the paper onto the nozzle with enough pressure so that there is an imprint of the nozzle on the paper.
7. Close the autohandler interlock.
8. Select "**Continue**".
9. The paper will get marked with a '**+**' sign and the nozzle number by the laser.
10. Remove the paper. The '**+**' sign should be in the center of the nozzle imprint.
11. If necessary, adjust the X, Y, and angle offsets until the '+' is in the center of the nozzle imprint.
12. Save the offset values by clicking on the **Save** button on the Calibrate Laser dialog.

Diagnostics

Laser Presenter Control...

Opens the Laser Presenter Diagnostics dialog to run diagnostics tests on the laser by testing the sequence operations and discrete operations.

Z Teach Range Calibration (4000 Series Gen 1 only)

Laser presenter nozzle tips are required to be installed onto the laser presenter's nozzle chuck sleeves located in the carriage assembly. The nozzle chuck sleeve is much shorter than the height of the nozzle tip. Failing to install the nozzle tip onto the chuck sleeve during a teach will learn the Z-axis of the device incorrectly which will cause damage to the device when running a job session. The calibration process will learn the maximum travel for the Z-axis during a teach. This will help prevent teaching the nozzle chuck sleeve instead of the

nozzle tip. The calibration process will need to be performed when the laser presenter hardware is installed initially, replaced, or adjusted.

Calibration Steps

1. Ensure you have the CPICNOZTESTJIG tool available
2. Ensure that the laser presenter station is present in the workflow
3. Teach the laser presenter station
4. When presented with the Teach Options Wizard,

   select the Calibrate Z Teach Range checkbox.
   Note: If the calibration has not been previously performed, the checkbox will be automatically selected and greyed out.
5. Click on the Next button to present the Laser Z Teach Range Calibration Selection Wizard
6. Click on the Yes button to continue
7. Move the Pick-and-Place away from the laser presenter then click on the Next button to present the Laser Z Teach Range Calibration Wizard
8. Open the interlock then install the CPICNOZTESTJIG tool onto any of the laser presenter chuck sleeves
9. Click the Next button to present the Pick-and-Place Position Tool dialog
10. Move the crosshairs over the CPICNOZTESTJIG tool then click the OK button to learn the Z-axis of the tool
11. After the Z-axis is learned successfully, open the interlock and remove the CPICNOZTESTJIG tool and then install the nozzle tip