InfoSight Corporation

"We BARCODE Difficult Stuff"™

LabeLase® 1000P Plate Printer
Service Manual
This manual is intended for qualified service technicians only.

Revision C2
April 2017

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Optical/Laser Safety

	INVISIBLE LASER RADIATION *AVOID EYE OR SKIN EXPOSURE TO* *DIRECT OR SCATTERED RADIATION* *CLASS 1 LASER PRODUCT, USING* *A CLASS 4 EMBEDDED LASER (10 W, 10.57 – 10.63 µm)* *The laser beam Exits the Final lens 5 inches from the tag*
	Never attempt to operate the Laser Tag Marker without the protective covers in place. *Never attempt to override any of the safety interlocks on the plate printer.* *Never attempt to dismantle or repair the tag printer. In case of malfunction contact an Infosight service representative.* *Any of the actions mentioned above may result in* **permanent eye or skin damage**. *Refer to Laser Safety ((page 30) for more information on laser safety.*

Labels / Warnings

	Caution, Laser Radiation – See Appendix A
	Warning label located on the front and top of the main cover: **CLASS 4 INVISIBLE LASER RADIATION WHEN OPEN AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION**
	Warning label located above the rating plate on the back of the Laser Marker: **CLASS 1 LASER PRODUCT**
Environmental Conditions	The LabeLase® Printer is intended for Indoor use only. Altitude up to 6500 feet, operating temperature 40 to 100 degrees F, 80% maximum relative humidity, rated 100-240Vac 50/60 HZ, 5 Amps, pollution degree 2
CAUTION	If this printer is not used in the manner specified by this manual, the safety features provided may be insufficient.
	Warning Label located on the front of the printer, near the tag feed, regarding California Proposition 65.
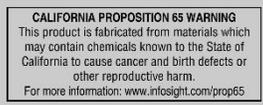
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PREFACE

The LABELASE 1000P series Plate Printer is fifth in the family of InfoSight laser tag markers. The LABELASE 1000P series contains many new features, including:

➢ **the ability to print on die-cut tags of irregular shape through the use of interchangeable carrier plates (LL1000P model suffix P);**

➢ **RoHS compliance (additional suffix R);**

➢ **a 2.5 mil nominal laser spot size for printing in finer detail (as compared to the standard 3 mil spot size) and to be compliant with US Govt UID specifications (additional suffix S);**

➢ **an integrated USB/Ethernet communications module in addition to the standard RS232 serial interface (additional suffix U).**

For simplicity, all versions of the Plate Printer are referred to in this manual as LL1000P. The additional suffixes R, S and U do not change the basic functioning of the marker or Producer™ software, unless otherwise stated explicitly.

This OPERATIONS manual is intended as a companion to the ONLINE REFERENCE MANUALS supplied with the Producer & Designer software package and also available on the Infosight webpage:
http://www.infosight.com/labelaseproducer2/producer
http://www.infosight.com/labelaseproducer2/designer

This OPERATIONS AND MAINTENANCE manual will be automatically installed on your computer hard drive when installing the Producer™ software. It may be found under the PROGRAMS menu with other INFOSIGHT software and HELP files.

MINIMUM SYSTEM REQUIREMENTS

❑ IBM PC 100% compatible computer.
❑ Windows 7 (32/64bit) / Windows 8/8.1 (32/64 bit) / Windows 10 (32/64 bit)
❑ 1 Serial Com port, USB port, or Ethernet port (for connection to the printer).
❑ Color monitor (1024X768 resolution or higher recommended).

      LL1000P® Plate printer

TABLE OF CONTENTS

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    LL1000P® Plate printer

PRINTER SETUP

The LABELASE® 1000P Plate printer requires 100-240 VAC, 50/60 Hz, 2.4 A.

> **NOTE:** both sides of the incoming line voltage are fused. See the Maintenance section for instructions on replacing fuses.

The LABELASE® 1000P Plate printer should be positioned so that the power supply cord exits from the back of the machine.

The LABELASE® 1000P Plate printer should be placed in a temperature controlled environment. This marker, though designed for industrial use, should be treated as any typical computer system and printer. Dirty environments will necessitate a more frequent cleaning schedule for internal optics.

NOTE: If the printer is housed in a secondary protective enclosure, the two exhaust fans located on the bottom of the printer directly underneath the tag feed drive area must not be obstructed. Ideally the fans should be exhausted to the environment outside the enclosure, with clean & dry makeup air entering the enclosure toward the back of the printer near the foam element air filter.

An RS-232 serial communications cable is provided for communicating with your Windows-based PC. A USB cable is also provided with the USB/Ethernet communications module. See the serial connector wiring diagram at the back of this manual for additional information if another serial cable is required.

SOFTWARE INSTALLATION

Before connecting the printer to your PC, LabeLase® Producer™ software should first be installed on your PC.

The easiest way to install the software is to use the Installer Thumb Drive that came with your new printer. In addition to installing the correct version of Producer™ and Designer for your specific printer model, it will also allow you to configure the appropriate communications interface.

If your original Installer Thumb Drive is not available OR for the latest release of Producer™ and Designer software, downloaded the installer package directly from http://www.infosight.com/support/software/37-labelase-producer-metal-tag-production-software. This is a self-contained, single self-installing file. However, it will not automatically guide you through the configuration process for communications, and you must therefore follow the steps outlined in the LabeLase® Producer™ Software Installation Manual.

The LabeLase® Producer™ Software Installation Manual is available and shipped with your equipment. The Installation Manual covers printer connection, communication connections, and installation of the software. Refer to this manual for any issues during software installation on your PC.

NOTE: LabeLase® Producer™ and Designer Software are separate executable programs, however they are bundled together and downloaded/installed together.

SYSTEM CONNECTIONS & POWER-UP:

USB & Ethernet connectors.
Refer to the LabeLase® Producer™
Software Installation Manual for
instructions on installing required
drivers.

1. Attach the included RS-232 cable from the LABELASE®
   1000P Plate printer to your Windows-based PC running
   LabeLase® Producer™ software.

2. Connect the AC power cord to the printer and plug the
   other end into a nearby power receptacle. **NOTE: both
   sides of the incoming line voltage are fused. See the
   Maintenance section for instructions on replacing
   fuses.**

3. Place the security key into rear of machine. The key
   functions as an ON-OFF switch.

4. Turn key to the vertical (ON) position. NOTE: The
   security key can only be removed when in the OFF
   position.

5. Press the power switch to the ON position (1).

NOTE: rear panel layouts may vary,
depending on the printer
configuration

PRINTER COMMUNICATIONS

LL1000P series of printers requires a communication link to a PC running Producer™ software. In addition to the standard serial RS232 link, an integrated USB/Ethernet module is provided. The LabeLase® Producer™ Software Installation Manual addresses Printer Communications in Sections "Connection Type", "RS232 Serial COM Port", "USB Port", and "Ethernet Network Connection".

     LL1000P® Plate printer

PRINTER INITIALIZATION

1. Start LabeLase® Producer™ software on your PC. This manual assumes you have version 2.0 or higher.

2. Load a pre-existing tag layout, or design a new tag layout. NOTE: designing or changing a tag layout requires SUPERVISOR login. Several sample templates for the LL1000P Plate Printer are provided on your installation CD, and may also be downloaded from www.infosight.com.

3. Choose a plate with a tag pocket that corresponds to the tag layout (i.e., matching tag size, orientation & placement on the plate, as well as plate length). Each plate is marked with a unique ITM number which can be included in the filename for the tag layout for future convenience in selecting the proper plate for printing.

Plates are individually labeled with a unique ITM part number

4. Carefully insert the plate into the front slot of the Plate Printer, in the direction of the arrows on the plate. NOTE: it is not necessary to place a tag in the plate pocket, unless the AUTO PRINT feature is enabled (see below).
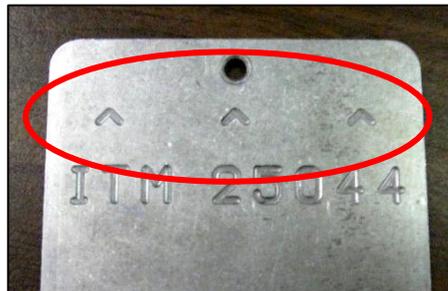

5. The plate will be drawn automatically into the printer and positioned at the "out and ready" position, ready for printing. NOTE: if the AUTO PRINT feature is enabled, the plate will fully enter the printer, printing will begin, and when finished printing the plate will be fully ejected (see below).

USING CARRIER PLATES

6. Each pocket in the carrier plate has one or more small rubber buttons to help hold the tag securely during printing.
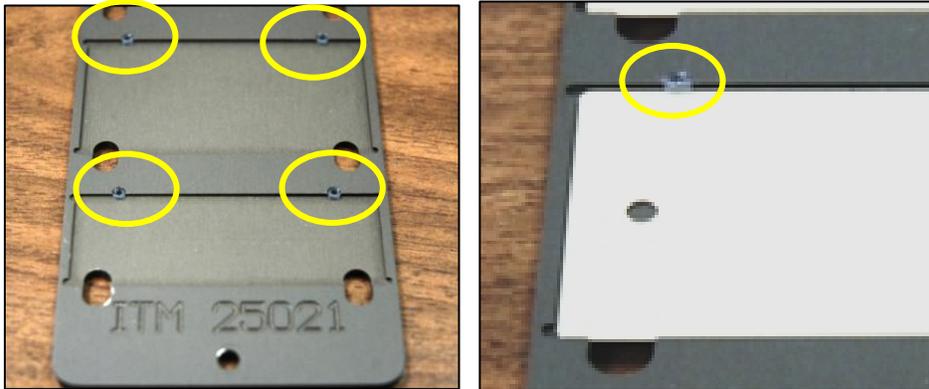
7. To load a tag, simply slide it into the pocket towards the buttons, pressing it lightly against the buttons, and snap the tag down firmly into the pocket so that it sits flat.
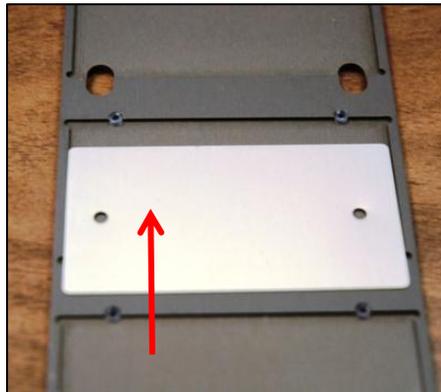
8. To remove the tag, use a pencil or other small pointed object to carefully lift the edge of the tag under the milled slot, and pop the tag out of the pocket. Be careful not to use excessive force, or you may bend the tag.

               LL1000P® Plate printer
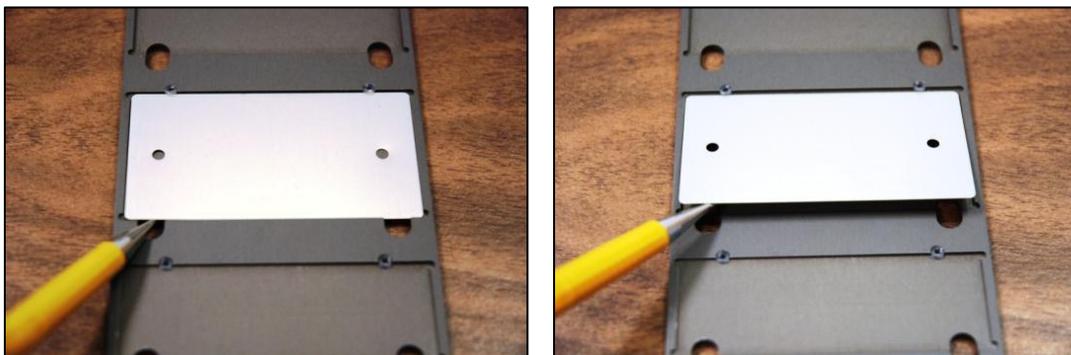
PRINTING TAGS

9. Once the plate is in the "out and ready" position, simply place a tag in the plate pocket and press the PRINT on the top of the printer. The plate will be drawn fully into the printer and printing will begin. When printing is complete, the plate will return to the out and ready position, so that the tag may be removed.

10. Repeat step (6) as many times as required.

|			
Plate Out & Ready Empty Pocket	Insert Blank Tag	Plate Retracted Printing	Plate Out & Ready Printed Tag

CHANGING TAG SIZES

11. A single plate may contain a single tag size or multiple tag sizes. If the plate already being used in the printer has a pocket for the new required tag size, simply load a new tag layout into Producer™, load a blank tag into the correct tag pocket, and press the PRINT button on top of the printer.

CHANGING PLATES

12. To change to a different plate, for example when you need to print a different tag size not found on the current plate, simply press the FEED button on the top of the printer. Pressing it once momentarily will cause the plate to eject from the front. Pressing and holding the FEED button will cause the plate to eject from the rear.

13. Then return to step (2) above, loading a new template and its corresponding plate.

> **NOTE:** If you find you are frequently changing plates for just a few different tag sizes, it may be possible to design a single custom plate containing pockets for all your commonly used sizes. Contact your sales representative or our factory for more information.
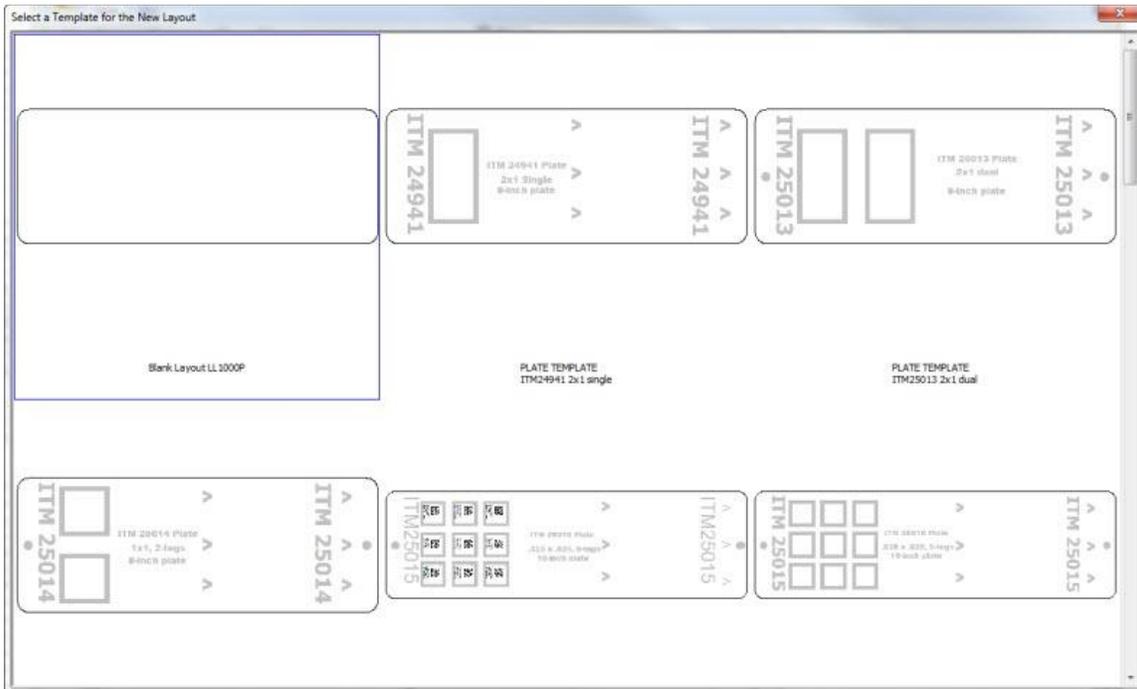


LL1000P Plate Printer Templates

AUTO PRINT FEATURE

➢ The LL1000P has been designed with a special AUTO PRINT feature which may be useful in certain circumstances, for example when printing larger quantities of tags in a batch mode.

14. AUTO PRINT is enabled from the SETUP-PRINTER CONFIGURATION menu, which is accessed from the main Producer screen.
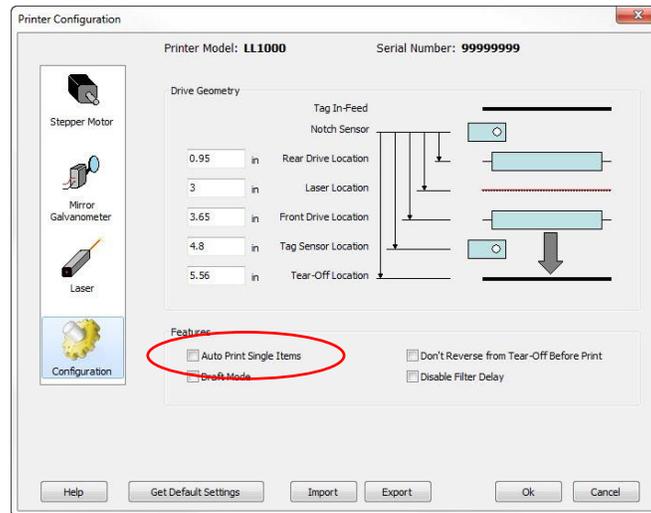
15. Before inserting a plate, first load a tag into each appropriate pocket. Then carefully insert the plate into the marker, as in step (4) above, being sure all tags remain in their pockets.

16. The plate will be drawn automatically into the printer, printing will be begin automatically (there is no need to press the print button), and when finished printing the plate will be fully ejected automatically.

➢ With two or more identical plates, this feature makes it possible to pre-load plate #2 with tags while plate #1 is printing. Then as soon as plate #1 is finished it can be quickly removed and plate #2 inserted. Printing will again begin automatically as in step (13). While plate #2 is printing, plate #1 can be unloaded and reloaded.

➢ This feature can greatly increase productivity and output when larger quantities of die-cut tags need to be printed in batches.

NOTE: Contact your sales representative or the factory for information on obtaining additional copies of your plate, as well as custom-designed plates with multiple pockets.
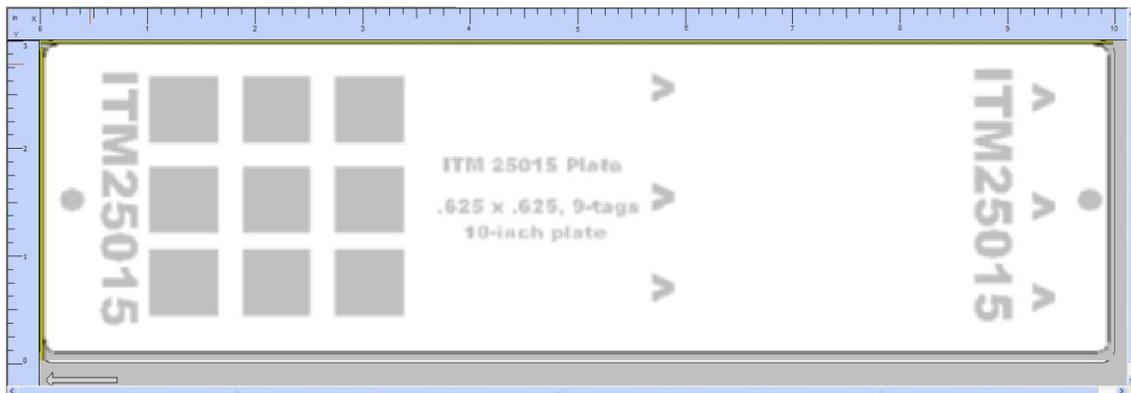

LABELASE® PRODUCER™ SOFTWARE

LabeLase® Producer™ is an integrated, Windows-based application for complete control of tag design and printing. For complete details, please refer to the ONLINE REFERENCE MANUAL supplied with the software, or on the web at http://www.infosight.com/labelaseproducer2/producer.

Features:

The software has many features designed to provide maximum flexibility to serve the customer's specific marking needs. Some of these features include:

- ❑ Built-in and online (web access) HELP.
- ❑ Total freedom to change tag layout whenever needed.
- ❑ WYSIWYG ("What You See Is What You Get") user interface for simple and intuitive tag design.
- ❑ New features emulating popular presentation software packages to speed layout and organization of complex designs containing multiple text and graphics fields.
- ❑ An unlimited number of data, text, barcode and graphics fields.
- ❑ Move fields easily with drag-and-drop.
- ❑ Rotate fields in 90-degree increments.
- ❑ Unlimited UNDO-REDO to easily correct mistakes.
- ❑ Optional placement grid with snap-to placement aid.
- ❑ Optional field anchor display shows field alignment.
- ❑ Zoom in/out for detailed display.
- ❑ Tag geometry features such as holes, slots, bare edges and bend lines can be shown.
- ❑ Prints all PC-installed fonts, including Unicode characters for all languages.
- ❑ User-selectable download of message data from a host computer via RS-232, network TCP/IP, or network file transfer. A wide selection of communications protocols includes InfoSight Extended, emulation of Zebra and Intermec standard printers, and simple comma or tab-separated, flat-file formats.
- ❑ Operator entry of message data, for example if the host computer is unavailable.
- ❑ Easy control over printer setup parameters such as laser speed and high/low pixel density (i.e., "draft" and "normal" printing modes)
- ❑ Auto-print feature for single tag printing (i.e., whenever a roll of tags is not loaded, a single tag can be auto-printed simply by inserting the tag in the front tag slot).
- ❑ Auto-incrementing of all text and number fields, for unattended batch printing.
- ❑ Option to make text and graphic fields "non-printable"
- ❑ Option to make non-printable fields visible in the File Open dialog, and on the Producer™ main screen.

 LL1000P® Plate printer
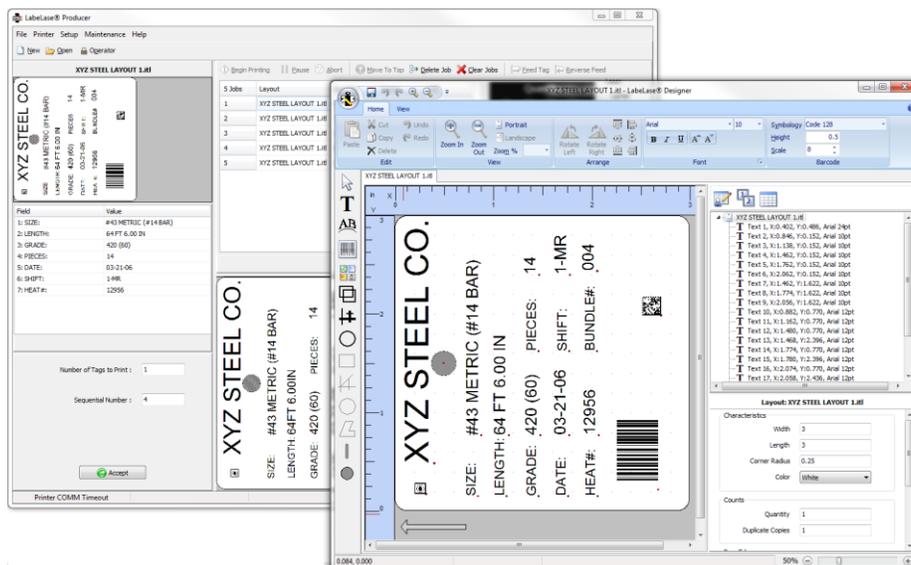
LABELASE PRODUCER DIFFERENCES

➤ There are several new features and a few differences in the appearance of the Producer™ main screen when running the LL1000P Plate Printer, compared to the standard roll-feed versions of the Tag Printer.

F12 / Begin Print is disabled. Always use PRINT button on printer.

Non-printing text and graphic features will display in light-grey if the SHOW checkbox is selected in the LAYOUT DESIGNER menu SETUP…PREFERENCES…DISPLAY

OUT OF TAGS Message will always display.
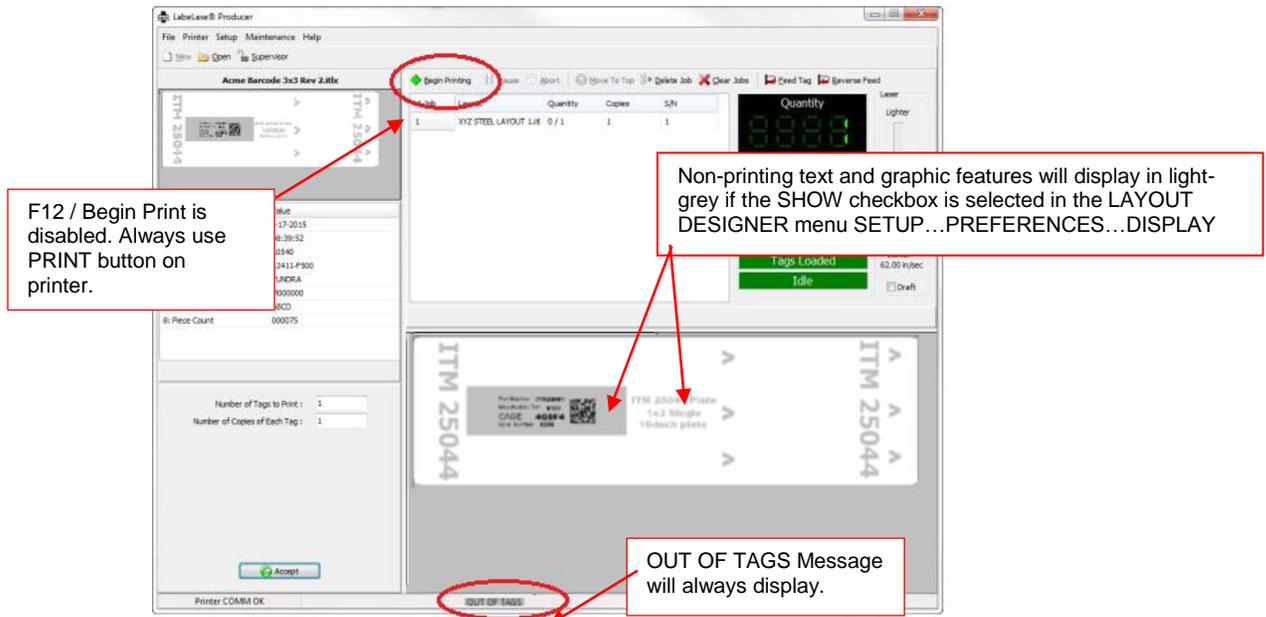
➤ There are also a few differences in the Producer™ Layout Designer main screen. The example below is based on a standard 1x3 pocket centered on a 3"x10" plate (ITM 25044) as shown below, but the main points will apply to all plates of all sizes.

Plate and layout can be labeled with non-printing ITM number, descriptive information and feed-direction arrows.

Non-printing option available for all graphics and logo fields, to aid in visualizing plate pockets for fine-tuning of print placement
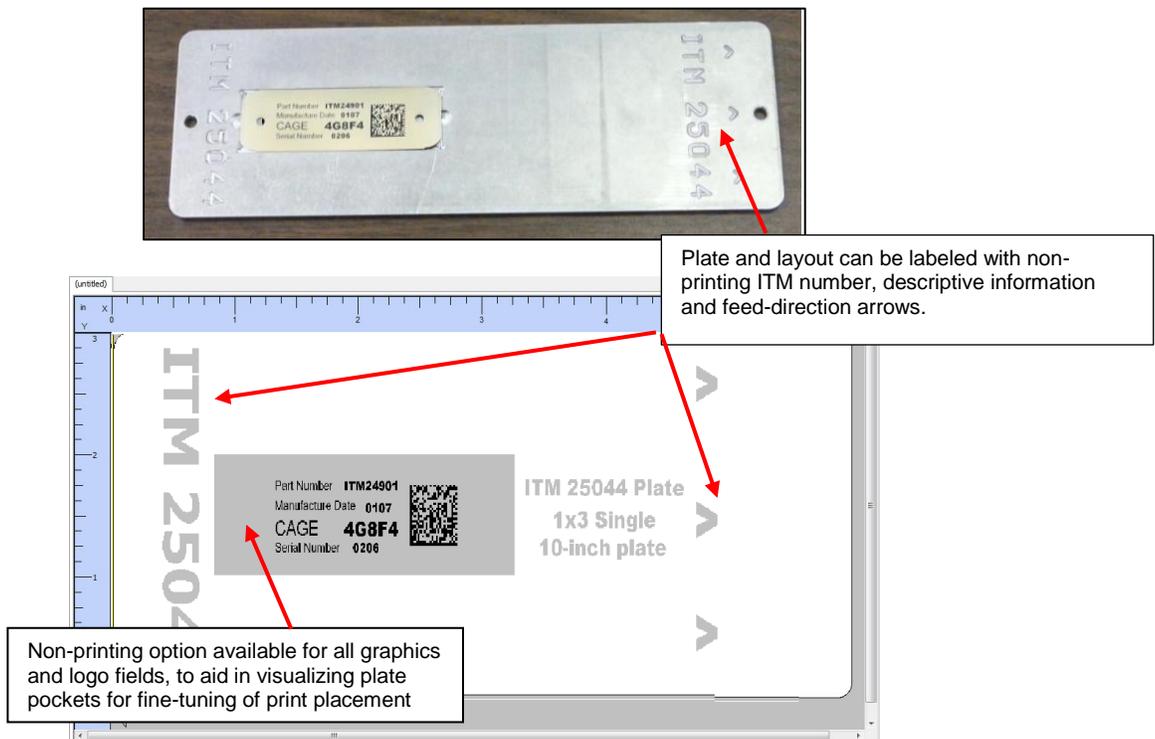
TAG LAYOUT TIPS

A. VISUALIZING POCKET PLACEMENT. The location of the plate pocket(s) can be visualized by sizing and positioning an appropriately shaped graphic object, and setting the HIDE parameter checkbox.

Normally the graphic object image will be "filled in" with light-grey shading. If desired, the FILLED checkbox can be unchecked, leaving behind the outline of the box. Line thickness can be adjusted as necessary to aid in visibility.

B. SPECIAL POCKET SHAPES. To help visualize pockets for custom-designed die-cut tags, special "logo" images can be designed in a graphic program such as MS Paint, saved as a monochrome bitmap, and imported directly into Producer.

NOTE: Contact your sales representative or the factory for information on obtaining custom-designed plates and die-cut tags for your special applications.

C. FINE TUNING PRINT LOCATION. Once the basic layout with data and barcodes has been created for a particular tag, actual print location relative to geometric tag features such as holes, slots and corners, may require fine tuning. This may be caused by errors in the assumed versus actual location of the pocket; by normal manufacturing variations in the tags, plates and printer; or by calibration modifications in the printer.

To adjust print location, simply "click and drag" the printed fields, save the layout, and print another test. NOTE: moving non-printed fields, such as pocket outlines, will not move the printed fields. The pocket outlines are intended as visualization aids only.

D. PRINTABLE PLATE AREA. Normally the tag layout template will already be created with the pocket outline in the correct nominal location. Producer™ provides the flexibility to modify existing layout designs and create all-new designs, with very few software restrictions. However, for proper functioning of the LL1000P plate marker, the "printable" area of the plate is restricted.

The first 2.5 inches on the right of every plate (end of the plate with the entry arrows) and the last inch on the left end of every plate are reserved by the printer for proper feeding of the plate in and out. Attempts to print in these areas of the plate will be ignored by the laser. Thus, in the example of a plate for a 1x3 tag, although the physical plate length is 10 inches, the "printable" area is limited to approximately 6.5 inches of length.
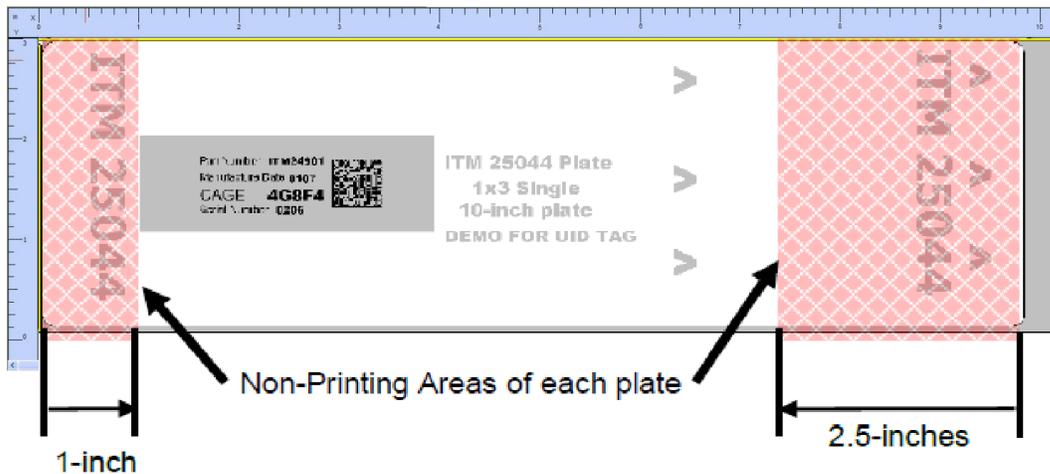
E. OPTIMIZING CYCLE TIME ON NARROW TAGS. The LL1000P printer has been designed to print across the full 3-inch width of every plate. However, in some cases the actual tag width may be significantly less than 3-inches, and a cycle time improvement can be achieved by optimizing layout parameters.

In the case of a 1x3 tag printed picket-fence style (long tag dimension parallel to plate length), the physical plate width is 3-inches but the pocket only uses 1-inch of actual plate width. Reducing the programmed tag width (Layout Designer…Setup-Geometry-Dimensions) to more closely match the tag & pocket width dimension will significantly reduce printing cycle time.

NOTE: it will be necessary to first move the tag layout fields "down", to align them to the Y=0 coordinate, before reducing the tag width.

NOTE: for fastest cycle times, a tag size and orientation which permits printing the long dimension ACROSS the plate instead of along the plate is preferred. For example, a 2.80 x 1.00 tag will generally print faster than a 1.00 x 3.00 tag.

Note: For further instructions on designing tags, read the Producer Designer Manual that accompanies the LabeLase® Producer Manual and Printer.

DIAGNOSING PRINT-QUALITY ISSUES

If the tag is not securely seated in the plate pocket during the complete printing cycle (e.g., if the tag is not flat or if the tag is smaller or larger than the pocket size), imperfect printing may result. Check that the tag and plate are properly matched. Check the condition of the small rubber buttons in the pocket. A magnifying glass may be helpful. If the buttons are missing or damaged, contact your sales representative or the factory for a replacement. It is also possible to reduce the maximum and minimum stepper frequencies for the internal plate feed rollers. This is accomplished from the Producer™ main menu, go to SETUP…PRINTER CONFIGURATION…STEPPER MOTOR. See the built-in help screens for more information.

POSSIBLE PRINTING ISSUES

NORMAL PRINTING
solid black text & barcode
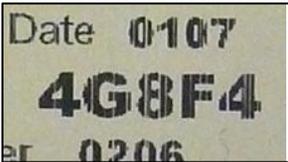
TAG MOVING IN POCKET
random missing lines
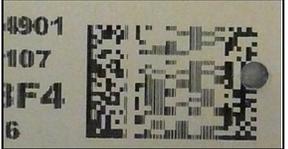
TAG SLIPPING OUT
printing is visibly stretched

TAG SLIPPING OUT
printing is visibly compressed

PRINTER CONFIGURATION & LASER SETTINGS

The LabeLase® 1000P printer and LabeLase® Producer™ software are designed with a high degree of flexibility and user-control, to enable the system to be used in a wide range of applications and on an ever-increasing array of laser-markable materials.

Calibration and configuration settings are accessed in LabeLase® Producer™ under SETUP-PRINTER CONFIGURATION. On-line help instructions will guide you through each of the available settings. The most common parameters for fine-tuning the performance of the printer beyond the easy-to-use LIGHTER/DARKER SLIDER BAR are LASER SPEED, LASER OFF TICKLE, and LASER ON DUTY CYCLE, all of which are found under the LASER tab. Each of these parameters separately and together can be adjusted to create the right balance of black/white contrast, fineness of detail and cycle time.

As laser speed is increased printing cycle time will be faster. In general, as laser speed increases, duty cycle must also be increased to achieve the same relative blackness. Some materials with especially sensitive surfaces, such as PermaLabel®, will print more consistently at lower duty cycles, and therefore correspondingly lower laser speeds. Tickle controls the readiness of the laser to fire and helps maintain consistency of marking across the tag surface. Some tag materials are more sensitive to power variation than others, but in most cases this parameter can be left at its factory setting.

Typical Range of Settings (DRAFT mode OFF):
- Laser Speed: 50-75 ips
- Laser Off Tickle: 7-15 µs
- Laser On Duty Cycle: 60-95%

Each printer is calibrated in our factory before shipping, and the results are recorded on two tags as shown at the right. Save these tags in the event you ever want to return the printer to its original factory configuration.

Experience has shown the following settings to be a good starting point for the most common types of tag material. Each individual application may then be fine-tuned to achieve the right balance of cycle time, fineness of detail, and black/white contrast.

Calibration Tag
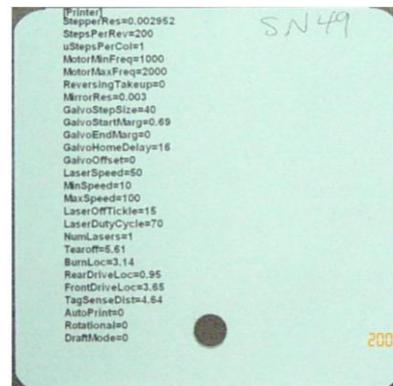
Factory Settings

Typical Laser Settings (DRAFT mode OFF)

|	InfoTag® Hi - Temp	Pic-Anneal®	PermaLabel®	X-Tag™
Laser Speed	70	60	55	20
Tickle	15	15	15	15
Duty Cycle	95%	95%	95%	95%

CYCLE TIME CONSIDERATIONS

Tag layout and printer configuration can have a significant influence on cycle time. Here are a few techniques that in many cases can significantly speed printing.

1. Select DRAFT mode. When DRAFT mode is on, stepper and mirror resolution, laser speed, font sizes, and barcode and graphic scales are automatically adjusted.

2. Increase laser speed (move slider bar to LIGHTER). It may be necessary to increase Laser Duty Cycle to maintain black/white contrast.
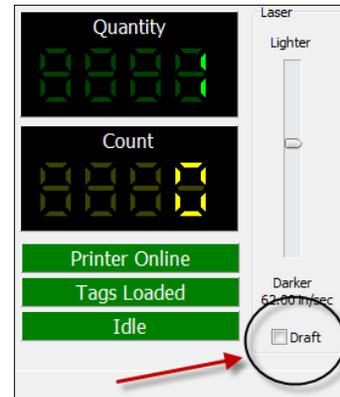
3. Use ARIAL BLACK font for text, to create darker easier-to-read characters. Also try using the BOLD font setting instead of a larger font size.
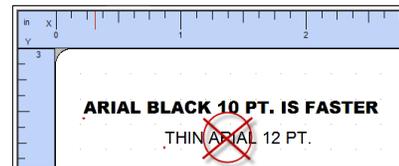
4. Design printing to run ACROSS the tag at 90° rotation (right angles to tag feed) rather than down the tag at 0° rotation (printing parallel to tag feed is slower).
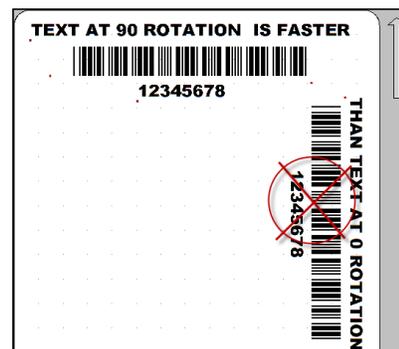
5. Avoid drawing graphic boxes around text or other graphics with long vertical (parallel to tag feed) lines.

6. Combine text strings into fewer lines. A single long line of text is more efficient than several short lines of text (at 90° rotation, parallel to tag feed).
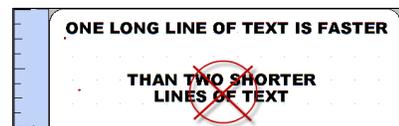
7. Keep graphics/logo X-scale and Y-scale factors equal to 1. If the graphic or logo must be re-sized to fit on the tag, use an external application such as MS PAINT to change the dimensions of the image and re-save the BMP file before importing into Producer™.
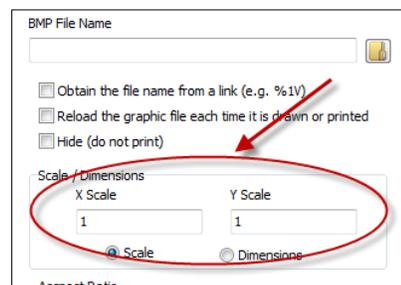
BASIC TROUBLE SHOOTING

Service during normal business hours (Monday-Friday, 8am-5pm):
　　　1.888.642.3600 (outside the USA call +1.740.642.3600)
Emergency after-hours service:
　　　1.800.401.0716 (outside the USA call +1.740.642.4666)

Red LED Status Light:
- STEADY ON: ready to print.
- OFF: no power to laser (power cord, key switch, power switch, fuses).
- SLOW BLINK: out of tag stock.
- FAST BLINK: E-STOP.

Problem: 　　　　　**Marker does not respond to print button.**
- Check power cord.
- Check key switch.
- Check E-STOP.
- Check tag stock.
- Check serial cable to PC.
- Producer™ software must be running on the connected PC.
- Main Producer™ screen indicates printer status – "ONLINE", "ESTOP" or "UNKNOWN MODE". If UNKNOWN MODE, check communications cable and settings.
- From within Producer™, click on HELP-ABOUT. If the FIRMWARE VERSION is blank, your PC does not see the printer. Check communications cable and settings.

Problem: 　　　　　**Out of tag message on PC screen.**
- This is normal for the LL1000P Plate Printer. No action required.

Problem: 　　　　　**Printing seems to stop unexpectedly and/or printed information seems to be missing at the beginning or end of the tag.**
- Check the tag layout for any print fields in the reserved "non-printing" areas of the plate (see previous section in this manual).
- Verify that the programmed plate length matches the actual physical plate length. From the LAYOUT DESIGNER, go to SETUP…GEOMETRY.

Problem: 　　　　　**Tag print appears very light, fine lines appear to drop out.**
- Reduce laser speed (DARKER)
- Increase Laser Duty Cycle.
- Increase Laser Off Tickle (SETUP-PRINTER CONFIGURATION).
- Final output lens may require cleaning (see Maintenance section below).

Problem: 　　　　　**Tag print shows "shadows"**
- Decrease Laser Off Tickle (SETUP-PRINTER CONFIGURATION).

Problem: **Tag print not aligned correctly on the tag**
- Use Producer™ Layout Designer to adjust the layout.
- The printer may need to be re-calibrated. See the Troubleshooting & Maintenance / Feed and Tag Adjustment section of the built-in help in Producer™.

Problem: 　　　　　**Barcode too long for tag size.**
- Reduce number of characters in barcode data.
- Use more efficient barcode symbology.
- Reduce barcode scale.

 　　　LL1000P® Plate printer

Problem: **Tag print doesn't look normal, some lines are missing, the barcode is stretched and/or compressed.**

- ❑ The tag may be moving in the plate pocket. See the section of this manual on Diagnosing Print-Quality Issues.
- ❑ The plate may be slipping in the drive rollers. Reduce the maximum and minimum stepper frequencies. From the Producer™ main menu, go to SETUP…PRINTER CONFIGURATION…STEPPER MOTOR. See the built-in help screens for more information.

Problem: **Printer seems to function correctly and sounds normal, but the tag is blank with no printing.**

- ❑ Check the laser speed setting, if it is too fast (LIGHTER setting) there may be insufficient laser power to activate the tag coating. Move the slider bar to a DARKER setting.
- ❑ Check the final pass-through lens to be sure it is properly installed and not blocked.
- ❑ Check the tag layout to make sure it contains printable data. In the FIELD EDITOR of the Producer™ layout utility, look under the EFFECTS tab and make sure the HIDE box is not checked.
- ❑ An over-temperature condition may have caused a temporary automatic shutdown of the laser tube. Refer to the over-temperature shutdown section of this manual for more information.

NORMAL MAINTENANCE & SERVICING

Regular maintenance that can be performed by the operator includes only cleaning and/or replacing the rear air filter. That process is described below.

Fuse replacement may be required at times. The process for that is below.

A qualified service technician is required to perform additional maintenance. Periodic cleaning of both surfaces of the final pass-through lens to remove dust is necessary. Additional cleaning or maintenance requires the removal of the laser cover. Specific training is required for this maintenance.

AIR FILTER REMOVAL & REPLACEMENT

The LabeLase® 1000P Plate printer includes a light-duty foam filter element, intended for use in a normal office environment. It is not intended to protect the printer from industrial contaminants or vapors, typical of a factory or mill environment.

As the filter element accumulates dust and pollen over time, air flow through the printer may be reduced. This may cause excessive dust to accumulate on the internal optics (lenses and mirrors), which may shorten their life considerably. Therefore, it is important to monitor the condition of the filter and determine the appropriate cleaning frequency for your specific environment.

At high duty cycles when printing large batches of tags with a high percentage of black (printed) area, reduced air flow may also cause the internal temperature sensor to automatically shut down the laser tube until it cools back to its normal operating temperature – this is normal.

The filter cover is located on the rear of the printer, and is held in place by two thumb screws.

Loosen the thumb screws and carefully remove the cover and the foam filter element underneath.

Carefully blow any lint or dust off the filter, or gently wash it in soap and water. Dry the filter thoroughly before reinstalling.

FUSE REPLACEMENT

The incoming AC line is fused on both legs. Before replacing the fuses, first determine and fix the cause of the blown fuses.

CAUTION: BE SURE TO REMOVE THE AC POWER CORD <u>BEFORE</u> REMOVING THE FUSE HOLDER OR PERFORMING ANY OTHER TROUBLESHOOTING OR MAINTENANCE!

To replace the fuses, remove the fuse holder on the back of the printer between the power cord input and the on-off rocker switch. The fuse holder only goes back in one-way. If it does not fit easily, turn it upside down and then insert it gently so that it snaps in place.
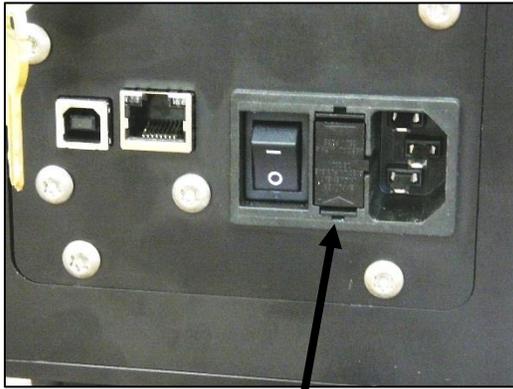
FUSE HOLDER
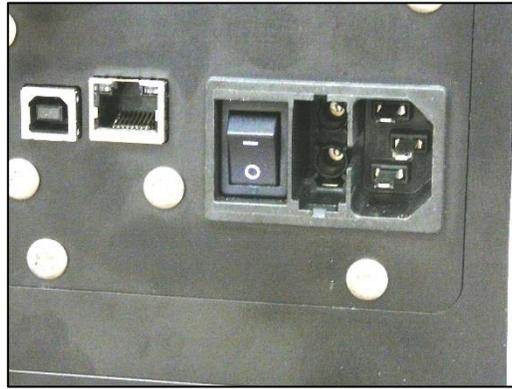
FUSE HOLDER REMOVED

FUSES ARE RATED FOR 250V / 5A AC

LENS CLEANING PROCEDURE

<div style="border:1px solid red">

CAUTION: LASER OPTICS <u>ALIGNMENT</u> SHOULD ONLY BE PERFORMED BY A QUALIFIED TECHNICIAN.

</div>

The lens slide is secured with a SECURITY TORX screw to prevent unintended opening.
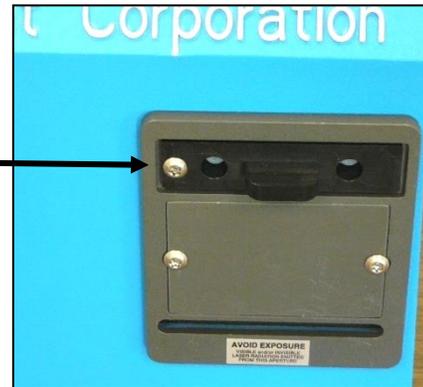
After removing the security screw, carefully open the slide to expose the lens.

Carefully perform the cleaning procedure described below, then re-insert the lens slide and secure it with the security screw.

<div style="border:1px solid red">

CAUTION: <u>DO NOT</u> TOUCH LENS WITH FINGERS OR ANY SUBSTANCE CONTAINING ALCOHOL, OR PERMANENT DAMAGE MAY RESULT.

</div>

LENS CLEANING PROCEDURE:
- ❑ Use a cloth that will not leave any fibers and is not abrasive.
- ❑ White vinegar is recommended. <u>DO NOT USE ALCOHOL</u>!!
- ❑ <u>Gently</u> wipe the moistened cloth across the lens so that the liquid evaporates behind the cloth, avoiding streaks.
- ❑ DO NOT RUB HARD!
- ❑ DO NOT USE COMPRESSED AIR TO CLEAN OPTICS!
- ❑ DO NOT USE EYE GLASS WIPES CONTAINING ALCOHOL!
- ❑ For optics that are severely contaminated or damaged, contact InfoSight for replacement.

CLEANING THE INTERNAL DRIVE MECHANISM

In some environments with excessive ambient dust, limited airflow through the printer and high rates of operation, dust and debris may collect in the drive mechanism area of the printer. Over time this dust and debris may block the laser beam and/or affect the operation of internal sensors and drive rollers.

> **CAUTION**: <u>ALWAYS</u> UNPLUG <u>BOTH</u> THE PRINTER POWER CORD AND <u>ALL</u> COMMUNICATION CABLES <u>BEFORE</u> SERVICING THE DRIVE UNIT.

The front cleanout plate may be removed to clean the drive mechanism without removing the printer cover. <u>Extreme care must be used to avoid damaging laser optics, pass-through lens, optical tag & notch sensors, and other delicate components.</u> The pass-through lens should be left in place to avoid introducing dust into the laser optics.

A soft brush or long Q-Tip can be used to loosen any debris, and a small PC keyboard vacuum with a 90-degree or flexible nose piece can be used to remove the loosened debris.

The front cleanout plate is secured with two SECURITY TORX screws to prevent unintended opening
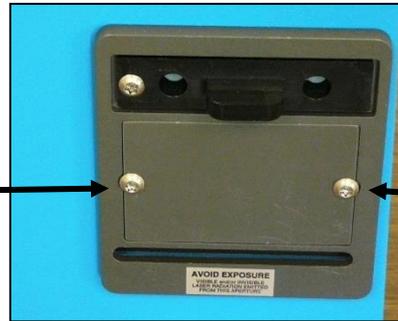
REAR NOTCH SENSOR

FRONT TAG SENSOR
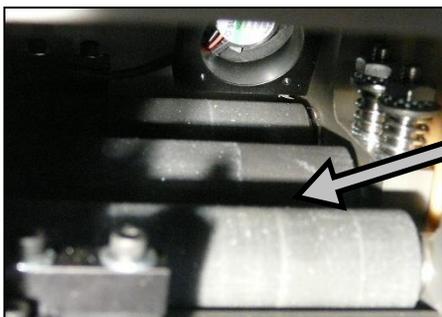
Laser Beam hits the tag between Front and Middle drive rollers. Dust may collect at the extreme left and right-hand sides of this area.

> **CAUTION**: <u>ALWAYS</u> REPLACE THE FRONT CLEANOUT PLATE <u>BEFORE</u> CONNECTING POWER AND OPERATING THE PRINTER.

> **NEVER OPERATE THE PRINTER WITH THE FRONT CLEANOUT PLATE OR THE PASS-THROUGH LENS REMOVED!!**

OVER-TEMPERATURE SHUTDOWN

CAUTION: **NEVER OPERATE THE PRINTER IN PRODUCTION WITH THE COVER REMOVED**

Internal to the LabeLase® 1000 printer, heat is generated by the laser tube and other components. The printer is designed with internal cooling and ventilation fans to help dissipate this heat and ensure long, trouble free operation. As an added measure, the laser tube includes an internal temperature sensor and automatic shutdown circuit. A temporary over-temperature fault shutdown occurs when the laser tube temperature reaches 60°C ± 2°C.

Under normal conditions in an environment suitable for typical PCs and printers, the internal operating temperature will remain below this level.

However, many factors may affect the internal operating temperature of the printer and shutdown may occur even if the ambient air temperature is below this level. Some of the factors affecting internal operating temperature include:
- Environmental – ambient temperature, humidity, radiant heat.
- Laser Settings – slower laser speeds and higher duty cycles may generate more heat.
- Tag Design – a higher proportion of black/printed area to white/unprinted area on a given tag may generate more heat.
- Application – longer runs of tags may generate more heat.
- Maintenance – reduced airflow (e.g., caused by dirty filters) and slower laser speed than necessary (e.g., due to dirty laser optics) may raise the internal temperature.
- Location – blockages at the back of the machine (filter area) and/or bottom of the machine (beneath tag exit area) may reduce air flow and increase the internal operating temperature.

Should over-temperature fault shutdown occur, only the laser tube will stop firing. The rest of the printer will continue to function as normal, but the tag will feed out with no printing.

This condition can be confirmed by observing the two LEDs at the back of the laser, by viewing through the air flow grating behind the removable air filter. A green LED indicates 30V supply to the laser and it can be cycled on and off by pressing & releasing the large red E-STOP button on the top of the printer. The red LED lights only when the laser is signaled to fire by the internal control board. If the green LED is on and the red LED flashes, but there is no printing on the tag, it is likely there is an over-temperature condition.

First disconnect AC power from the printer, correct the source of the problem(s), and then reconnect AC power.

CAUTION: ALWAYS WEAR EYE PROTECTION AND OBSERVE SAFE MAINTENANCE PRACTICES WHEN SERVICING ANY LASER PRINTER.

If the printing soon disappears again, the over-temperature condition has not been corrected.

If the green LED does not light, the power supply many need servicing. Contact the factory for assistance.

If the red LED does not light during printing, the control board may need servicing. Contact the factory for assistance. This page intentionally left blank.

     LL1000P® Plate printer

CUSTOMER SERVICE

How to reach customer service:

Phone Support	InfoSight Corporation Customer Service offers free phone support to answer questions during normal non-holiday working hours, Monday through Friday 8am to 5pm Eastern time (New York, USA). Call +1.888.642.3600, or outside the USA call +1.740.642.3600.
Emergency Service	After regular business hours, call: +1.800.401.0716 (USA or Canada) or +1.740.642.4666 (International).
On-Site Service	InfoSight Corporation can dispatch a Field Service Engineer to your facility to perform equipment start-up, repair, maintenance, and training.
Service Contracts	Periodic scheduled on-site maintenance, technical service and extended warranties can be arranged by contacting Customer Service at the number below.
Factory Service	Call Customer Service for a Return Authorization Number before returning equipment to our factory for repair and/or major maintenance.

For more information regarding any of these services, call +1.888.642.3600 (outside the USA call +1.740.642.3600) and ask for Customer Service.

Or, visit us on the worldwide web at www.infosight.com

FUNCTIONAL BLOCK DIAGRAM
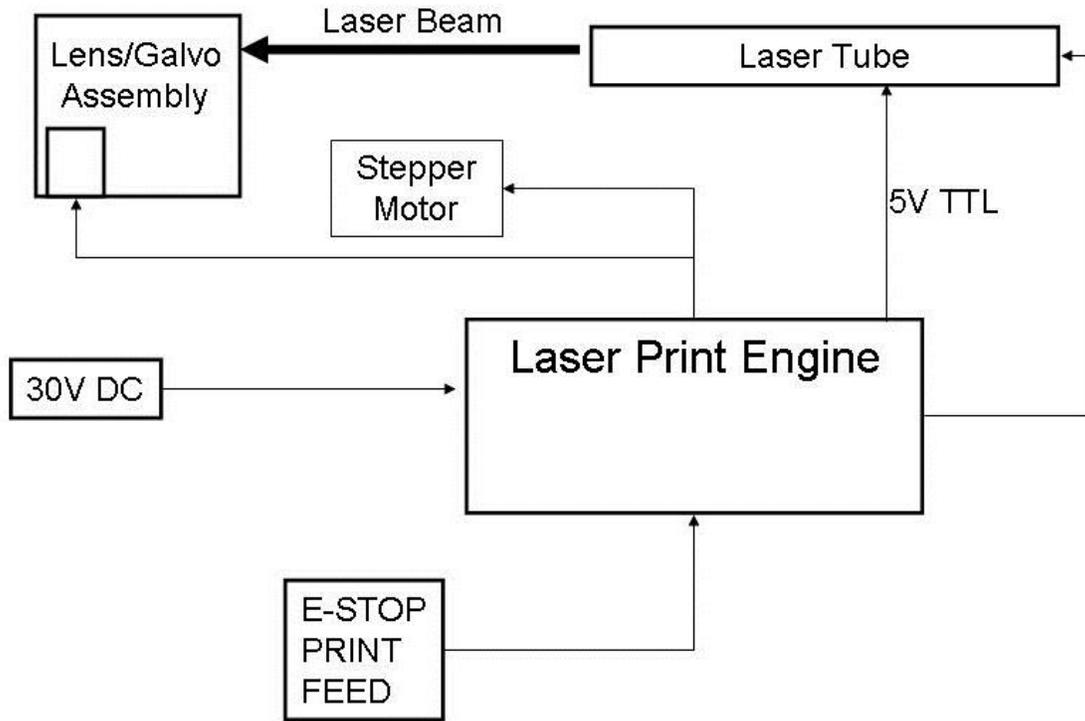
LabeLase® 1000P Serial port connection to an IBM-PC or equivalent.
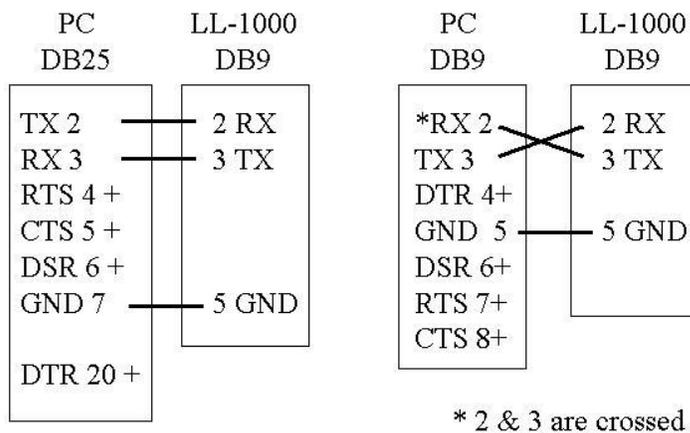
Note: Handshake protocol is XON / XOFF. Communications adapters such as USB to RS232 must support XON / XOFF.
   XON is DC1   CTL-Q or 11h or 17 decimal
   XOFF is DC3   CTL-S or 13h or 19 decimal

       LL1000P® Plate printer

LASER SAFETY

Section I: Introduction to Laser Safety

Lasers, like arc welders, are sources of intense light that require certain precautions to insure a safe, comfortable and compliant working environment. This is especially true since the laser included in this marking equipment operates in the infrared (invisible) portion of the light spectrum. The enclosure surrounding the marking area is designed to prevent human exposure to the light emitted by the laser. The following information covers the procedures taken to design a safe, efficient environment for laser marking equipment.

Laser products are categorized into one of four classes based upon the power of the laser light that is accessible to any person during normal operation. These classes range from Class 1, the lowest class requiring no additional safeguards other than those provided by the manufacturer, to Class 4, the highest class that requires additional operator and working environment safeguards for safe operation. Class 1 laser marking systems include enclosures integral to the workstation that are constructed to prevent human access to the laser beam.

Class 1 systems are safe in all working environments; they are installed and operated as any other industrial machine tool. Class 1 laser systems do not require the use of any special laser safety equipment by operators or bystanders during their normal operation.

Class 4 laser marking systems do not incorporate protective enclosures. Extra precautions are required.

The LabeLase®1000PS Plate Printer complies with Class 1 during normal use because of the numerous interlocks provided as detailed in section II.

During service and/or alignment the LabeLase 1000PS Plate Printer becomes a Class 4 device. Servicing should be performed only by a **Qualified Laser Service/Safety Technician**! Because of the Class 4 classification, InfoSight will provide such a person to be available to the end user of this marker.

The nominal power output of the laser used is 10 watts, with a maximum peak power output of 30 watts. It is a CO_2 infrared (invisible) laser with a wavelength of 10.57 to 10.63 microns. The Radiant energy and the wavelength are less than Class 1 requirements during normal operation.

Section II: Types of safety interlocks.

There are several types of safety features provided on the InfoSight LabeLase 1000PS Plate Printer:

Type 1 includes **mechanical switches**. These switches are located atop the marker and on the rear of the marker. These switches remove power supplied to the laser marker, as shown in electrical drawings.

> Switch A -- Large Red, easily accessible, E-STOP operator Emergency Stop Push Button.
> Switch B -- Key switch
> Switch C -- On/Off rocker switch

Type 2 includes **optical sensors**. Sensors monitor whether tag material is in place and the marker is able to move the tag material. These two sensors are monitored by the marking microprocessor.

Type 3 includes **mechanical design**. Here, narrow slots are provided to minimize the release of laser radiation. The beam path from laser tube to final pass through lens is entirely enclosed in a metal shield, with suitable material that will absorb the heat produced by the beam emitting from the CO2 laser.

Type 4 includes **Password Security access.** The Software requires a **supervisor password** to change layout of tags or to alter the operating parameters of the marker itself.

The features and precautions described above are designed with the safety of the user in mind. Should you have any questions or suggestions please contact InfoSight directly.

DECLARATION OF CONFORMITY
InfoSight Corporation
20700 US Highway 23   Chillicothe, Ohio 45601
+1-740-642-3600 TEL   +1-740-642-5001 FAX

InfoSight herby declares the equipment specified conforms to the Classification(s), Directive(s) and Standard(s) set forth in this document.

InfoSight produces laser systems within one of two classes as identified and classified by the CDRH. These are Class I and Class IV. (See CDRH 21 CFR (J) 1040.1 - 1040 .5). End user of the equipment should be familiar with ANSI, CDRH and OSHA standards for radiation emitting devices as they apply to them also.

ANSI Z136.1 - 1993
We will provide adequate data to the LSO (Laser Safety Officer) enabling LSO to designate NHZ (nominal hazard zone) as required pursuant to Class IV 3.4.1

CDRH 21 CFR (J) 1040.1 1040.5

OSHA Publication 8-1.7
Section II Chapter 6

Certifications:
EMC Emissions
EN 55022:1994/A1:1995/A2:1997 Class A ITE emissions requirements (EU)
FCC 47 CRF Part 15 Class A emissions requirements (USA)

EMC Immunity:
EN 50082-2:1995 EMC heavy industrial generic immunity standard

Laser Safety:
   IEC 60825:2001

Safety:
   EN 60950-1:2001

Name and Publication Date of Standard Used to Evaluate Laser safety:
IEC 60825-1:1003 + A2:2001
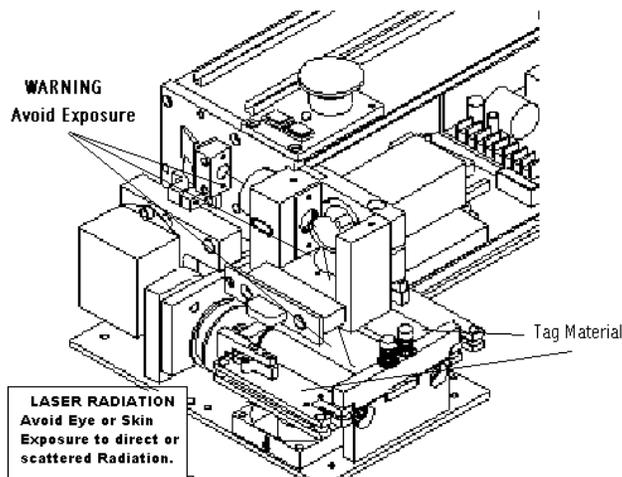
Note: InfoSight guidelines are drawn from ANSI and CDRH

          LL1000P® Plate printer

![CE mark]

1.1.1   LL1000PS Declaration of Conformity

Declaration of conformity
Konformitätserklärung
Déclaration de conformité
Declaración de Confomidad
Verklaring de overeenstemming
Dichiarazione di conformità
We/Wir/ Nous/WIJ/Noi: **InfoSight Corporation**
　　　　　　　　　　　　20700 US Rt 23
　　　　　　　　　　　　Chillicothe, Ohio 45601 USA
declare under our sole responsibility that the product,
erklären, in alleniniger Verantwortung,daß dieses Produkt,
déclarons sous notre seule responsabilité que le produit,
declaramos, bajo nuestra sola responsabilidad, que el producto,
verklaren onder onze verantwoordelijkheid, dat het product,
dichiariamo sotto nostra unica responsabilità, che il prodotto,

LL1000PS

> ➢ to which this declaration relates is in conformity with the following standard(s) or other normative documents.
> ➢ auf das sich diese Erklärung bezieht, mit der/den folgenden Norm(en) oder Richtlinie(n) übereinstimmt.
> ➢ auquel se réfère cette déclaration est conforme à la (aux) norme(s) ou au(x) document(s) normatif(s).
> ➢ al que se refiere esta declaración es conforme a la(s) norma(s) u otro(s) documento(s) normativo(s).
> ➢ waarnaar deze verklaring verwijst, aan de volende norm(en) of richtlijn(en) beantwoordt.
> ➢ a cui si riferisce questa dichiarazione è conforme alla/e seguente/i norma/o documento/i normativo/i.

EMC Emissions:
• EN 55022:1998/A1:2000/A2:2003 Class A ITE emissions requirements (EU)
• FCC 47 CFR Part 15 Class A emissions requirements (USA)
EMC Immunity:
• EN 55024:1998/A1:2001/A2:2003 ITE - immunity characteristics
Laser Safety:
• IEC 60825:2001
Safety:
• EN 60950-1:2001

1.2 TEST DATES
November 18, 22-24, 29, 30, December 1, 8, and 9, 2004

Edward S. O'Neal
12/29/2006
Chillicothe, Ohio

LASER HAZARD CLASSIFICATIONS

The intent of laser hazard classification is to provide clear distinction of the lasers' properties and hazards to users so appropriate protective measures can be taken. Classification is based on the maximum output available for the intended use. Specific labeling requirements indicate that the class of the laser as well as the emission wavelength(s) and any other applicable precautionary instructions must be included on any signage. Laser classification is also used for determining requirements for medical surveillance for those individuals working with and around lasers.

The Federal United States laser safety standard [21 CFR 1040.10], the ANSI standard [ANSI Z136.1], as well as the international standard [EN 60825], divide lasers into five distinct hazard categories. These classes are based upon the combination of wavelength range, power, and emission duration, which are used to determine the level of risk and the potential to cause biological damage to the eye or skin. The definitions compiled from ANSI Z136.1 are as follows:

Class 1: Any laser, or laser system containing a laser, with wavelength ranges from Ultraviolet through Far Infrared (180 nm – 100,000 nm +), that cannot emit laser radiation levels exceeding Class 1 Accessible Emission Limits (AEL) as defined by ANSI Z136.1. For example this would compute to exposure (for an eight-hour period) for a 488 nm laser of no greater than 0.2 mW. Basically, the laser radiation level emitted by a device classified as Class 1 produces no hazard whatsoever to the user during normal operation. Presently, Class 1 lasers and laser systems are exempt from all control measures. The Class 1 designation does not apply during times of maintenance or service where the safety controls of the device are defeated or otherwise removed. The Class 1 environment resumes once the device is returned to its original state with all safety devices properly reconnected.

Class 2: This classification applies only to continuous wave (CW) and repetitive-pulse lasers and laser systems of the visible part of the electromagnetic spectrum (400 – 700 nm) that exceed Class 1 levels, but do not exceed an average radiant power of 1 mW.

Class 3a: Lasers and laser systems that have an accessible output between one and five times the Class 1 AEL for wavelengths shorter than 400 nm or longer than 700 nm, or less than five times the Class 2 AEL for wavelengths between 400 and 700 nm. Lasers of this class have intermediate power ranges of 1 - 5 mW.

Class 3b: Lasers and laser systems having the power range between 5 - 500 mW. This applies to lasers with wavelength ranges from Ultraviolet through Far Infrared (180 nm – 100,000 nm +). These lasers or laser systems can produce a hazard if viewed directly, and may produce an eye hazard when viewing diffuse reflections off of a shiny surface at angles of less than 5 degrees from the source, however Class 3b lasers should not produce a hazardous diffuse reflection from a matte (not shiny) surface.

Class 4: Lasers and laser systems having power greater than 500 mW. This applies to lasers with wavelength ranges from Ultraviolet through Far Infrared (180 nm – 100,000 nm +). This class of laser poses the greatest hazard, and any and all precautions should be taken to protect oneself from exposure to direct or diffuse laser radiation. Direct exposure to the eye from this class of laser can cause permanent damage. Stray beams are potential fire hazards and combustible material should be kept out of beam paths at all times.

 LL1000P® Plate printer

1.1 CONTROL MEASURES FOR LASER CLASSIFICATIONS

Control Measure	Class 1	Class 2	Class 3a	Class 3b	Class 4
Activation Warning Systems	No requirement.	No requirement.	No requirement.	Should have.	Shall have.
Indoor Laser XE Optics Lasers Controlled Area	No requirement.	No requirement.	No requirement.	Shall have. Nominal Hazard Zone analysis required.	Shall have. Nominal Hazard Zone analysis required.
Labels	Shall have	Shall have	Shall have.	Shall have.	Shall have.
Area Posting	No requirement.	No requirement.	Should have	Shall have. Nominal Hazard Zone analysis required.	Shall have. Nominal Hazard Zone analysis required.
Standard Operating Procedures	No requirement.	No requirement.	No requirement.	Should have.	Shall have.
Education and Training	No requirement.	Should have.	Should have.	Shall have.	Shall have.
Authorized Personnel	No requirement.	No requirement.	No requirement.	Shall have.	Shall have.
Warning Signs and Labels	No requirement	Should have.	Should have.	Shall have. Nominal Hazard Zone analysis required.	Shall have. Nominal Hazard Zone analysis required.

ANSI Z136.1 requires specific control measures for each laser classification and the environment in which they are used. The chart above lists some of the requirements that may need to be implemented in a laboratory setting. The company Laser Safety Officer, or designee, should reference the applicable safety regulations for appropriate control measures to implement in the area the marker will be used.

1.2 BIOLOGICAL EFFECTS OF LASER IRRADIATION

1.2.1 Eye Injury

Because of the high degree of beam collimation, a laser serves as an almost ideal point source of intense light. A laser beam of sufficient power can theoretically produce retinal intensities at magnitudes that are greater than conventional light sources, and even larger than those produced when directly viewing the sun. Eye exposure to a direct beam can cause permanent eye damage including blindness. Protective eyewear should always be worn when potential exposure to direct laser beams exist.

- Due to the lens-like focusing effect of the human eye, it is 100,000 times more vulnerable to injury than the skin.
- Laser safety eyewear should always be available for the wavelengths of lasers in use.
- Eye protective equipment, however, should be considered the last line of defense against laser beam exposure – engineering and administrative controls should be used first.
- Remove all jewelry when working with an open beam to prevent reflection of the beam in unsafe directions.
- When possible, use all protective housings, interlocks and shields.
- Laser Safety Eyewear should always be worn during laser repair, alignment, or installation, or at any time when any laser safety control is not in place.

1.2.2 Thermal Injury

The most common cause of laser-induced tissue damage is thermal in nature, where the tissue proteins are denatured due to the temperature rise following absorption of laser energy.

The thermal damage process (resulting in burns) is generally associated with lasers operating at exposure times greater than 10 microseconds and in the wavelength region from the near ultraviolet to the far infrared. Tissue damage may also be caused by thermally induced acoustic waves following exposures to sub-microsecond laser exposures.

1.2.3 Skin Injury

To the skin, UVA (315-400 nm) can cause hyperpigmentation and erythema (aka: sunburn). Exposure in the UVB (280-315 nm) range is most injurious to skin. In addition to thermal injury caused by ultraviolet energy, there is also possibility of radiation carcinogenesis from UVB. The shorter wavelengths are absorbed in the outer dead layers of the epidermis (stratum corneum) and the longer wavelengths have an initial pigment-darkening effect followed by erythema if there is exposure to excessive levels.

The hazards associated with skin exposure are of less importance than eye hazards; however, with the expanding use of higher-power laser systems, particularly ultraviolet lasers, the unprotected skin of personnel may be exposed to extremely hazardous levels of the beam power if used in an unenclosed system design.

Skin burns caused by lasers can happen quite fast and with great intensity. Protective clothing should be worn when potential exposure to direct laser beams exist.

- UVC: 200-280 nm exposure may cause erythema (sunburn), skin cancer, and burns.
- UVB: 280-315 nm exposure may cause accelerated skin aging, increased skin pigmentation and burns.
- UVA: 315-400 nm exposure may cause pigment darkening and skin burns.
- Visible: 400-700 nm exposure may cause photosensitive reactions and skin burns.
- Infrared 700-100,000 nm exposure may cause skin burns.

         LL1000P® Plate printer

ENGINEERING DRAWINGS

DRAWING ITM19695 – LABELASE 1000P COVER ASSEMBLY

DRAWING ITM19696 – LABELASE 1000P DRIVE ASSEMBLY

DRAWING ITM24439 – LABELASE 1000P OPTICS ASSEMBLY

DRAWING ITM23138 – LABELASE 1000P BASE ASSEMBLY

DRAWING ITM19870 – LABELASE 1000P SPOOL, PAYOFF GENERAL ASSEMBLY

DRAWING ITM19953 – LABELASE 1000P LASER PLATE PRINTER WIRING DIAGRAM