



SL LASER – FREQUENTLY ASKED QUESTIONS.

How exactly does the laser plotter work?

The laser unit produces a pencil thin beam of light which is then directed onto two small movable mirrors set at right angles to each other.

These mirrors are attached to galvanometers driven by electronics under precise computer control. By sweeping the mirrors through angular movements which are exactly timed with one another, it is possible to move the laser dot along the contours of a pattern dictated by the program in the computer. If the dot is moved quickly enough, the pattern appears to exist over its entirety even though the dot is continuously moving.

What would I use such a system for?

Think of the SL Laser System as a plotter, capable of “drawing” images directly onto any flat surface. No longer is it necessary to plot drawings to paper and then manually translate those dimensions onto the work surface through laborious measuring and marking. The system simply “floats” the image onto the surface instantly - in precisely the exact location and orientation you specify. And the image always remains on top of whatever material you place on that surface so it's always visible. The SL Software converts most CAD files instantly, projecting the entire image on the casting bed.

What exactly is included with the system? Do I need to provide my own computer to control it?

The system can be supplied with a control computer as an option, but it is also possible to utilise one of your existing computers for the job. The included graphical control software runs on the Windows operating system, but the basic projection and control functions can be accessed by any computer or controller capable of sending text strings over a standard COM port. The projector's main unit, which is mounted overhead the projection surface, is a sealed metal case containing the laser, power supplies, mirrors, galvanometers, and an onboard computer.

Image file data and image control functions can be transferred directly to this onboard computer from the controlling computer through an RS232 cable or by using the windows graphical interface through a network connection. Once the data has been transmitted to the system, the system assumes all the duties of controlling the projection of the image. Your host computer is available to do other work until it's time to pass additional information to the system. Naturally, the system comes with all necessary power and data cables.

What sort of data files can be used to define the patterns?

The Model CPS Laser Pattern Generator natively understands standard HPGL (Hewlett Packard Graphics Language) files just as you would use for plotting to paper. Most CAD systems can easily provide output in this format and third party graphics file translation utilities are available which can translate from other formats into HPGL. The included Windows graphical control software includes a built in DXF interpreter for direct projection of AutoCad compliant DXF files.

How large is the projection unit? How is it physically mounted?

The main projector unit weighs about 22 kilograms and is about 800 x 300 x 180mm in size. The case is of sturdy metal construction and comes with a basic mounting bracket for bolting the unit to a user supplied mounting structure. The included mounting brackets provide some degree of rotational adjustment in at least two axes to facilitate set-up and alignment.

You say this system will project onto any flat surface. How large a surface will it cover?

Typically, a single standard unit will cover an area up to 5m x 5m when mounted about 4m above the surface it is projecting onto. The actual height and angle at which the unit is mounted will of course determine the exact area of coverage. The basic CPS model offers mirror movement up to 80 degrees in both axes. Larger areas can be covered by mounting the unit higher or by moving the unit toward one edge of the projection area and angling it back toward the centre. Both of these approaches, however, will have an impact on maximum accuracy and the preferred installation is to centre the unit over the projection area for optimum results. For high accuracy, you can project within an area of 1.4h x 1.4h (h = height from surface to laser). For +/- 3mm accuracy, you can project within an area of 1.7h x 1.7h.



How does the system know what surface I'm projecting onto? What if the surface is not exactly flat and what about cases where the projector is mounted at an angle to the surface?

Part of each installation routine is to "calibrate" the Model CPS Laser for the real world conditions under which it will be used. After the projection head is mounted above the projection surface and aligned as closely with the centre of the surface as possible, the calibration routine begins. The installation software provides a graphical representation of the geometry of the installation and allows the installer to input the precise values for the locations of the corners of the rectangular projection area. These form the basis for the initial calibration of the system. The beam from the projector is steered to each of the corners in turn and the system "memorises" the position of the corner points. The internal set-up routine then uses this information to compute a complete map of the entire projection area and to compute the position of the laser projector in relation to the users' coordinate system. This data is stored within the projector's non-volatile memory where it provides the basis for accurate projection of any pattern anywhere within the projector's field.

Is this installation and calibration something I have to do myself, or is help available?

Though the process is straightforward and simple, we're available to provide optional installation services if desired. In most cases, the customer will provide the physical structure to which the projection head will attach and can then complete the set-up routine on his own. A detailed operation and installation manual is shipped with each projection unit. Reids will provide full technical phone support and on site support when required. We'll also gladly provide information on our on-site installation services and rates upon request.

What happens if either the projection surface or the projector itself shifts its position later on? Will this entire process have to be repeated?

No, that shouldn't be necessary unless the movement is very large. As part of the initial calibration set-up, reflecting elements will be permanently attached to the structure of the projection surface. The positions of these special permanent calibration points are internally stored within the system. At any time, you may run a very simple routine to compare the actual positions of these points with their stored positions. If there has been any change in position, the system will take it into account and automatically recalculate the projection parameters accordingly. This correction routine is so quick, it can easily be done each time a pattern is projected, if desired.

Can the laser determine the difference between near and far face?

The system software includes a parameter for defining the height offset from the base surface for which it has been calibrated. By specifying an offset height value exactly equal to the height of your components or formwork in the CAD file, you will cause the system to automatically resize and reposition patterns so that their shape and dimensions remain exactly right.

What about repeat panels on opposite beds?

In addition to height offsets, you can specify that a pattern be projected with a particular offset in both the X and Y directions. This means that the same pattern used on one table can, with the proper offsets specified, be used to project onto the opposite table.

I have very large assemblies and would need to cover patterns larger than the dimensions mentioned earlier. Is there any way this can be done? Yes there is. The advanced version of the system allows a single computer to control more than one projection head. The overall pattern is divided into sections, each of which is projected by a different projection head. Each projection head would be mounted over the area of the projection surface appropriate to the section of pattern it is responsible for. In this way, very large patterns can be produced. Such installations are generally custom in nature and we will work with you to help you determine exactly what is needed to meet your requirements.

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