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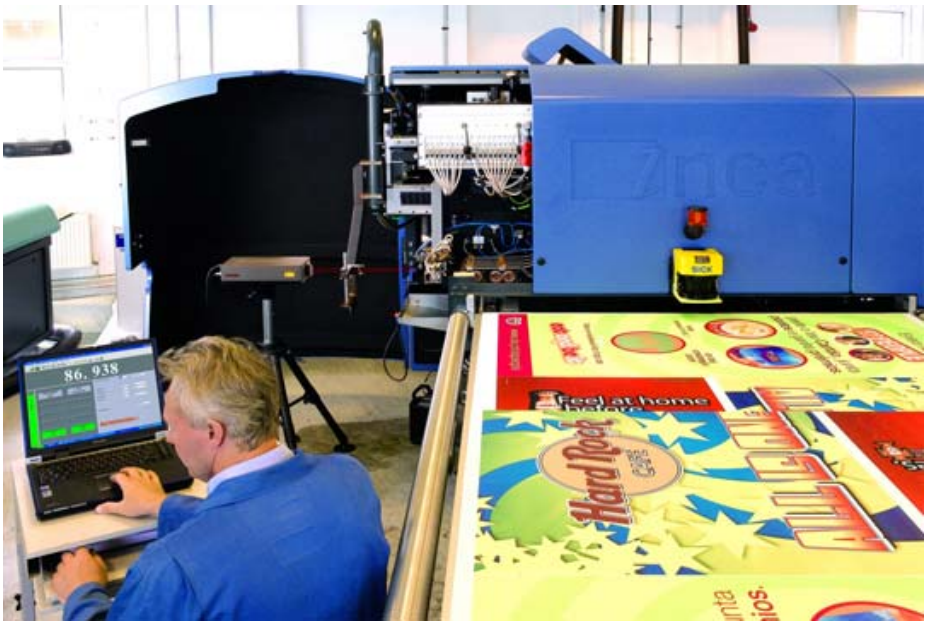
Laser calibration system spot on

Inca Digital Printers has developed the first ever flatbed inkjet press, which looks set to revolutionise a major sector of the screen print market. Such hi-tech printing equipment demands advanced manufacturing techniques to ensure supreme accuracy, which in this case is provided by Renishaw RG2 encoders and assured by the use of the Renishaw ML10 laser calibration system, widely used across manufacturing industry.



Inca flatbed printer undergoing calibration of the positional accuracy of the printing head, using the Renishaw ML10 laser measurement system.

The new printers produce top quality large format print directly onto rigid or flexible materials. Used in conjunction with UV cure inks, there is no need for post-print lamination or coating. This is particularly appealing to the signage, point-of-sale and backlit poster markets.

Sixteen print heads, carried on a cross beam, traverse the entire surface area to be printed. Absolute geometrical alignment of the moving table and crosshead, and precise positional accuracy of the print heads, are guaranteed to within microns. The motion control feed back to achieve this is provided by Renishaw RG2 linear encoders, important because even tiny errors in print head motion would result in banded images or 'out of focus' effects that are easily visible to the naked eye.

With a print area of up to 3.2 metres x 1.6 metres, and the machine's rapid linear motors capable of print rates of more than 120 m^2/hr., forces involved during acceleration and deceleration can be high. Minute dynamic displacements of the ink jet nozzles have to be compensated.

Vital positional and dynamic data

The ML10 system is used for calibration during the assembly of the printers. According to Inca's Director of Technology, Dr Will Eve: "The system's ability to grab a high rate of displacement data means that not only does it provide the essential linear measurements needed, but it also gives valuable dynamic data".

Linear encoder system, used to ensure very precise print head positioning

As well as building up a computerised error table of direct and fully-automated positional compensation for use when printing, the dynamic effects of rapid movements can also be accommodated.

Problems overcome

A major problem with printing in this manner, and one that has undoubtedly deterred others from investing in this technology, is the printer's nightmare of moiré-effects becoming evident and ruining what would otherwise be a huge and visually stunning display. Inca's use of the laser calibration system during machine build has been so successful, that this and other accuracy problems have been completely overcome. Customers can now build up huge multi-panel murals and displays where each panel fits perfectly with its neighbour to form an apparently seamless entity.

Using the system

Isabel Losantos, the Inca technician who carries out most of the alignment checks with the ML10, says that it is easily set up and also easy to carry out the series of incremental travel checks necessary in all axes.

The robust nature of the shop-floor hardened interferometer system is especially praised as it is constantly taken from machine to machine and is also, on occasion, taken to customers should on-site checks be required.

Renishaw's Laser 10 software suite can be accessed from a laptop, with full-colour screen display. The comprehensive range of optics and other measurement options make for a very flexible and easy-to-use system.

High accuracy with environmental control

The ML10 system, used at Inca, has a helium neon laser source that in conjunction with the EC10 environmental compensation unit, can offer linear accuracy down to +/- 0.7 ppm. This unit has the capability to feed in certain environmental data, enabling material temperature, ambient temperature and relative humidity adjustments to be incorporated in the compensation program for an individual machine's control system. This real-time compensation ensures that accuracy is consistent across the full environmental range.

Product development

Dr Eve says that he recognised the potential value of the system to Inca after seeing one of his own suppliers use it and confirms that it has amply justified its purchase. Inca has a very strong R & D facility and the Renishaw equipment now plays a key part in the work of this laboratory.

Exports worldwide

Although Inca is a new company on the digital printing scene, it is already at the forefront of the technology involved, and has sold nearly 50 printers to 15 countries, with America currently leading the export market. There are now three models in the range, and Inca has even sold several machines to what some consider to be the spiritual home of screen printing machinery, Sweden.