

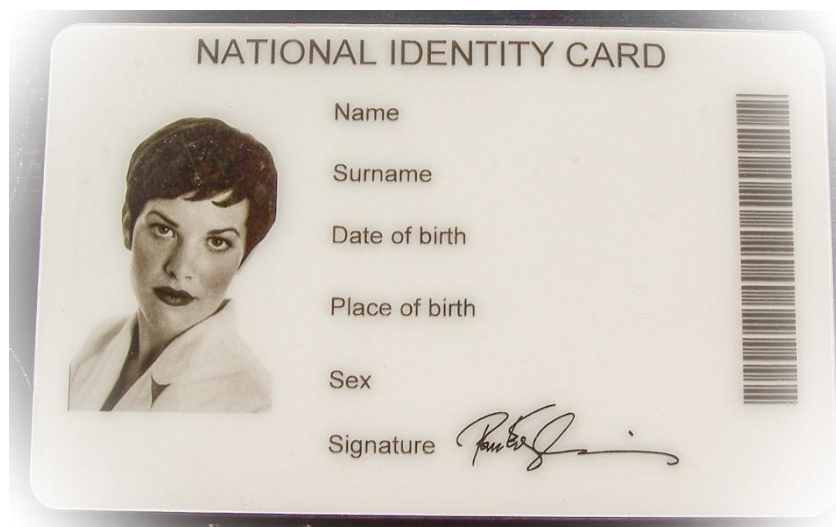


Pulse Energy Modulation and ID card marking

ID document personalization requires specific performances, mainly due to security purpose. Laser sources play an important role in this industrial field because they can provide a permanent and high quality marking on polymeric cards that represent an ideal solution for documents and cards personalization.

Typically the ID cards are composed of multilayer polycarbonate and PVC with selected pigments added in the inner layers (during card fabrication) in order to be suitable for efficiently absorbing 1064nm radiation.

Thanks to the high peak power of Q-switched DPSS sources, the laser radiation can change the color of the inner layers of the card without affecting the top transparent layer; this leads to the capability of producing a high quality marking protected from counterfeiting, since the inner layer is not accessible. Typical [process](#) that can be made with lasers on ID cards involves vector files marking (texts, codes, logos, etc..) and graphic files marking like photos.



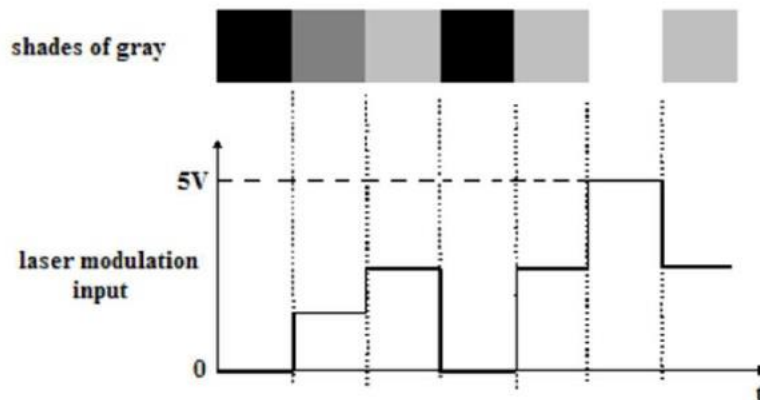
Bright Solutions can provide different options for this application field. Looking to our laser families, a standard and versatile solution for vector and bitmap marking is represented by [Sol 10W 1064nm](#) laser source. Thanks to its short pulse duration (from 8 up to 60 ns) and to its high beam quality, it can be focused on the inner layer of the plastic cards without heating and altering the top layer. In this way a permanent, protected and non tactile high quality marking is achieved.



In order to obtain grayscale images with [Sol](#) laser, a fast output power modulation is needed. This fast Pulse Energy Modulation can be achieved connecting a dedicated input signal present in the IO electronic interface of the laser to an analog output port of the marking hardware that can be modulated from 0 to 5V according to software commands.

The Pulse Energy Modulation input is directly connected with the internal Q-Switch modulation circuitry and allows varying the laser pulse energy without any changes in pumping power and repetition rate signals.

Through such unique feature it is possible to create the correct grayscale curve that associates each gray level to a specific value of laser pulse energy, resulting in a high quality grayscale image (up to 600 dpi of resolution) with impressive production rate.



Other Bright Solutions' lasers suitable for this application field are [One 1064nm](#) and [Onda 1064nm](#). The extreme compactness (only 13 x 7 x 4 cm³ size and 0.5 kg weight) of One 1064nm makes it the perfect solution for low cost desktop machines with tight integration level; the achievable photo resolution is the same as Sol 1064nm (up to 600 dpi) but the productivity rate is lower.

On the other hand, Onda 1064nm provides shorter pulse duration (2 to 10 ns) and a superior beam quality; thanks to these optical features the laser can be focused tightly on ID cards, achieving higher resolution without heating the samples. We demonstrated that a resolution of up to 1000 dpi can be reached.

Visit our websites www.brightsolutions.it and www.brightsystem.it and write to sales@brightsolutions.it for more detailed information.