

Weller's WTBR1000 - Great choice!

The robotic soldering process allows not only an increase in productivity, but also to obtain soldering joints of constant and repeatable high quality.

by Edoardo Banfi

ECIE ELECTRONICS is the business unit of ECIE S.r.l. located in Lainate (MI), where prototyping and production of electronic boards for the sensors and automotive sectors takes place. Having had to upgrade its sensors production, the company opted for an automatic selective soldering solution to be used to complete PCBA with THT components and the choice fell on the new Weller four-axis WTBR1000 robot.

After about four months from the launch of the production, we asked to give us their

opinion on the choice made. The outcome, we were told by ICIE, has been positive and appreciated as the machine was able to fully satisfy all of their expectations and those of their current client. In fact, a significant increase in production was promptly verified and the end customer also noted an appreciable improvement in the quality of the soldering joints of the final product. All this was possible also thanks to the careful and punctual collaboration between Weller and ECIE, which since the initial evaluations

has continued with the installation and preparation of the production launch, during the production itself, in order to optimize all the process (Fig. 2).

High level technical and functional characteristics

The technicians who work on the machine, thanks to its simplicity, have quickly obtained a good degree of knowledge of the system and have immediately identified some



important aspects that highlight its rare peculiarities. The software is intuitive and is well configured and stable.

Furthermore, a precious collaboration has been given by the technicians of Weller HQ in Besigheim, a real-time availability to respond to every possible need and also to evaluate every single aspect of the production process in order to optimize the flow. Thanks to the characteristics of the robot, it was possible to customize the firmware upon customer request, as well (Fig. 3).

The quality of the images given by the camera, located on the head, is excellent and makes itself particularly valuable during programming, both for precisely identifying the coordinates that allow punctual positioning of the soldering tip, and for adjusting the angles of heating element inclination necessary to adapt the head to the density and characteristics of the components and joints on the circuit board.

The many possible adjustments of the

head and its rotation on the theta axis allow operating on any product. The automatic alloy wire feeding device is close to the tip and therefore reliable and easy to adjust when changing the coil (Fig. 4).

For the study of suitable solutions for the holder to support the products, Weller has made available some of its own proposals and the willingness to carry them out. ECIE was inspired by the initial experiences made together and opted for a solution of its execution that is proving to be absolutely effective (Fig. 5).

The surface of the drawers, intended for fixing the tray support for the products, is equipped with reference pins that are easy to use to better block the tray and without impediments of any kind.

The double drawer of the machine allows, as in this case, important speeding up of the production in the presence of a single product code or if it is necessary it facilitates the simultaneous processing of two different

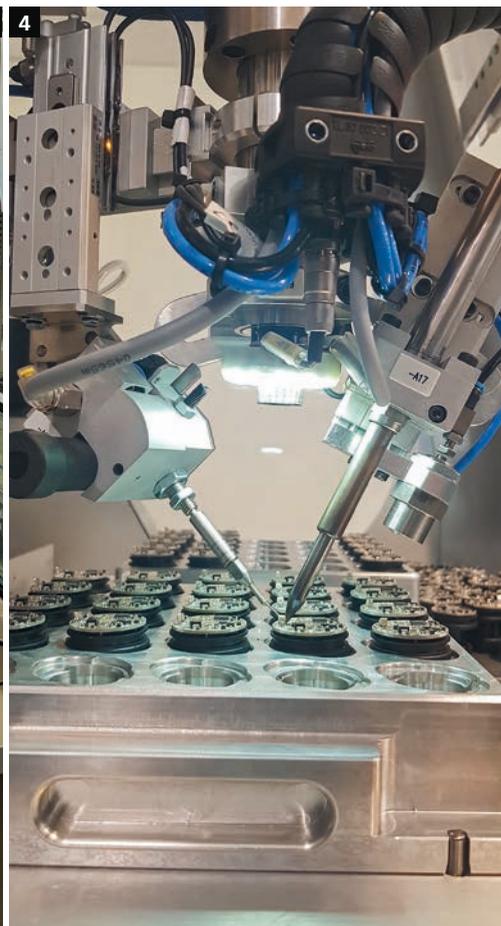
codes. The preparation of the new tray and its fixing in the drawer can take place while the head is working on the other one.

The versatility (in the case of ECIE production not yet tested) is one of the fundamental points that make Weller's WTBR 1000 soldering system a highly topical robot machine (Fig. 6).

Increased productivity with robotic soldering

"The productivity - explains Francesco Tallarico, ECIE's Electronic Business Unit

1. WTBR1000 Weller
2. ECIE production department
3. Programming
4. The camera with LED crown





5. Loading the tray



6. Inserting the tray



7. The head in the operational phase

Manager - has even tripled compared to the previous workings, guaranteeing at the same time volumetrically well-defined soldering joints, geometrically regular and repetitive. The machine, when operational, has not

undergone or caused any stoppages, other than technical ones such as changing the alloy reel or the soldering tip " .

The powerful and precise technology of Weller's WT control units combined with the machine, allowed operating at ideal temperatures of 350 ° C, thus ensuring the quality of soldered joints and preventing any possible damage to the circuit and components. No missed or partial joints have occurred and the constant volume of the meniscuses has well certified the high precision of the automatic wire auto-feeding device. The soldering tip, on average, showed a duration of 7 working days, for a cycle of about 6 hours a day. This made it possible to carry out up to about 34,000 soldering joints per week, of excellent workmanship, which in our case correspond to the production of 8,500 sensors, weekly. During processing, the good quality of the images allowed the operator an excellent visual control of the stability of the contact devices and the automatic feeding of the solder wire.

In the case of ECIE the fume extraction system is centralized, but it is still possible to organize it as an island using the Weller Zero Smog 4V stand-alone unit, of which the robot is fitted as standard. Zero Smog allows good suction and adequate filtering of soldering fumes, thus limiting the frequency of cleaning maintenance inside the working area (Figure 7).

In essence: Weller created, not only an absolutely valuable robotic selective soldering solution, but it has also created a pre and post sales service that is absolutely respectful and up to the expectations of users. This shows how Weller is able to provide solutions and answers to the customer in practically real time, through the availability of personnel able to attend in a short time with the user if necessary. The characteristics of the WTBR1000 robot allow it to enter fully into the large family of machines and technologies of the Industry 4.0 generation.

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