



ezPick

Bench Top SMT Pick & Place System

The innovative, patent pending, ezPick SMT vacuum pick and place system provides an elegant, low cost and highly efficient solution to overcome the difficulties of manual SMT prototyping and small batch SMT printed circuit board assembly.

The ezPick system features the magical combination of multi-axis-multi-direction motion, high quality RF remote controlled vacuum pump, agile finger controlled pickup head and gliding X and Y axis operator hand rest. Together, these features assist the operator in assembling SMT circuit boards with fine precision, speed and with maximum comfort.

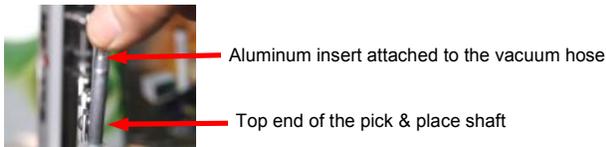


- High quality 12VDC, wireless controlled, diaphragm vacuum pump
- DC power supply included
- Wireless Vacuum ON/OFF control via miniature handheld RF transmitter
- Configurable for Left handed or Right handed operators
- Smooth Ball bearing slides provide effortless motion
- Includes Interchangeable component pick and place tips and vacuum cups
- Includes case of 20 component storage canisters
- 360° rotating PCB deck, ball bearing assisted
- X and Y axis Gliding hand rest
- Spring assisted Z axis pick & place for up, down and center-rest positions
- Multi-axis-Multi-direction motion for rapid component picking & placing
- Assembled and fully operation in minutes
- Small 12in. x 17in. footprint for bench top use
- Approx. 24in. x 17in. operating footprint
- Accommodates PCB sizes up to 9 x 9 inches.
- Companion to the ezShot solder paste dispensing system and the ezFlow soldering hotplate
- Perfect for R&D labs
- Perfect for small batch surface mount component assembly and SMT prototyping

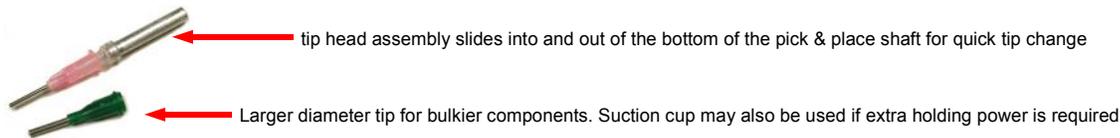
Setup

The ezPick system is supplied fully assembled, with the exception of the vertical support pillar of the pickup expansion arm. This is to economize on freight costs and to prevent possible damage during shipping. Assembly of the support pillar takes just a few minutes requiring only four screws to secure the pillar into position. ezPick may be configured for left hand or right handed operators.

1/ The vacuum hose is supplied with an aluminum tube insert at one end. This end fits intimately into the top opening of the pick and place shaft. The opposite end of the vacuum hose slips onto the vacuum port on the front panel of the wireless controlled ezPick vacuum pump. The vacuum hose is secured in position by feeding it through clips located on back of the vertical expansion arm support pillar. Tip: Sufficient slack must be provided on the vacuum tube to allow full expansion of the arm.



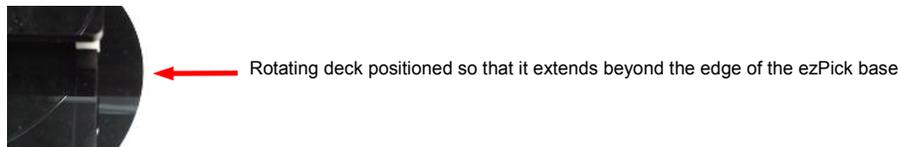
2/ Insert (or exchange) the interchangeable pickup tip of the desired size into the bottom end of the tip head assembly. The tip head assembly slides easily into and out of the pickup shaft to facilitate tip changes. The smaller diameter tips are ideal for small components such as 0805 and smaller chip components such as 0603 and 0402. The larger diameter tip is ideal for larger SMT components such as SOIC packages. For the bulkier components such as 44pin PLCC's, the included suction cup may be inserted onto the smaller diameter tip end to provide extra pick and place. This provides the extra holding power that may be required for bulky components.



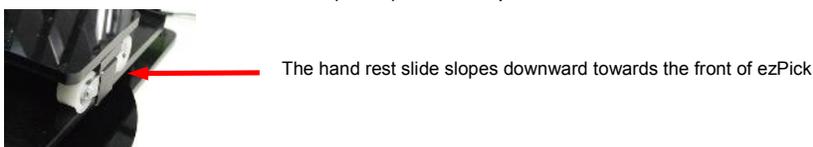
3/ Plug in the 12Vdc wall adaptor to the connector at the rear of the wireless remote controlled vacuum pump. If the pump switches on when plugged in, key the transmitter to switch the pump off.

4/ Position the removable rotating deck so that it is offset to the right of the ezPick base (or to the left for left handed models)

The ideal position is with two of the four rubber feet in line with the right edge of the ezPick base. (or to the left edge of the ezPick base for left-handed configurations)



5/ Position the hand rest slide (truck) on the top deck



6/ Place your PCB onto the rotating PCB deck and organize your canister component feeders on the rotating PCB deck, ready for picking and placing.



7/ ezPick should now be set up and ready for duty. With the right hand resting on the truck and the pickup pencil gripped between thumb and forefinger move to pickup a component from a components canister. Momentarily key the remote control transmitter (held in the other hand) to switch the vacuum pump ON for component picking. After picking up a component move to its location and place the component, then momentarily key the remote transmitter again to switch the vacuum pump OFF to finish placing the component.

TIP: For smooth downward motion when placing components, initially move slightly past the component placement target position in the forward or backward direction then finely adjust to the target position, then place the component.

The above, assumes the PCB has the solder paste already pre-applied with companion **ezShot** solder paste dispensing system, or by an alternative solder paste application method. A simple method of applying solder paste **directly to the component leads** using **ezPick** (versus directly to the PCB pads) is described below.

Operating Suggestions

With just a few minutes of practice will have you operating the ezPick with speed and agility. Practice your own techniques to discover your preferred operating regime. Start by experiencing the mutli-axis-multi-direction motion of the ezPick slides and pencil. You will immediately recognize the extraordinary control you have at your finger tips to begin picking and placing components with the ease, agility and remarkable precision.

SMT Components for Volume production and for Small batches for ezPick

When SMT components are purchased for volume applications, they are typically supplied in taped reels which are attached to automatic reel feeders on high end CNC pick and place machines costing tens of thousands of dollars. For prototyping and small production batches, SMT components are available and supplied in small quantities of 'cut tape'. Cut tape is simply a small quantity that has been physically cut from a large quantity reel. ezPick system is designed to adapt to the use of cut tape, where the components are removed from the cut tape and organized into the small component canisters included with ezPick. The ezPick canisters serve as components storage, component organizing and as **canister component feeders** for **ezPick pick and place**.



ezPick canister component feeders. The adhesive labels sheet allows for labeling the lid **and** canister for ultimate organization and component management

Applying solder paste

The companion ezShot solder paste system or custom solder paste stencils are typical methods for applying solder paste to your PCB. However, without these tools, you can try the solder paste application method described as follows:

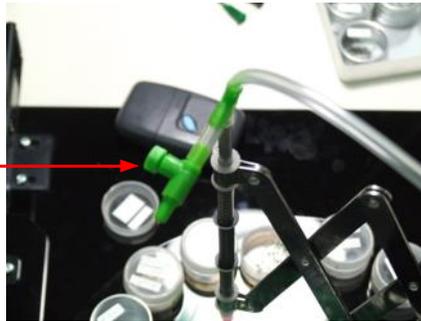
Dispense a small bead of solder paste onto a non absorbant substrate of your choice and have it located in your picking area on the **ezPick** rotating deck. After picking a component and before placing the component, lightly bump or daub the component leads or component lead ends against the solder paste bead. This, results in the component leads or lead ends collecting a small amount of paste from the bead. Thanks to the 360° rotation of the **ezPick** pickup pencil and the high vacuum suction achieved with the vacuum pump, all component sides are easily prepared with solder paste in the above manner. **Note, that using this method, however, may require the use of a suction cup inserted on the end of the pickup tip to provide additional stability.**

Typically, a very small amount of solder paste is all that is required for a good solder joint and minimizes inter-lead bridging after the solder reflow process.

Using vacuum cupped tips

The air flow and vacuum pressure is sufficient for most components to be placed without the use of vacuum cups. However for those bulkier components, and for the solder paste application process described above, the use of vacuum cups may be necessary. When using the vacuum cup tips to place components, ezPick has a vacuum regulator valve which allows the operator to make fine adjustments to the vacuum release time to prevent vacuum persistence and allow for quick component (vacuum) release when placing the component.

Vacuum and airflow
adjustment valve



Vibration Damping

Gentle vibration from the vacuum pump may be dampened by placing the pump on top of a sheet of soft foam.

ezShot Solder Paste Dispensing System (see our website for details)

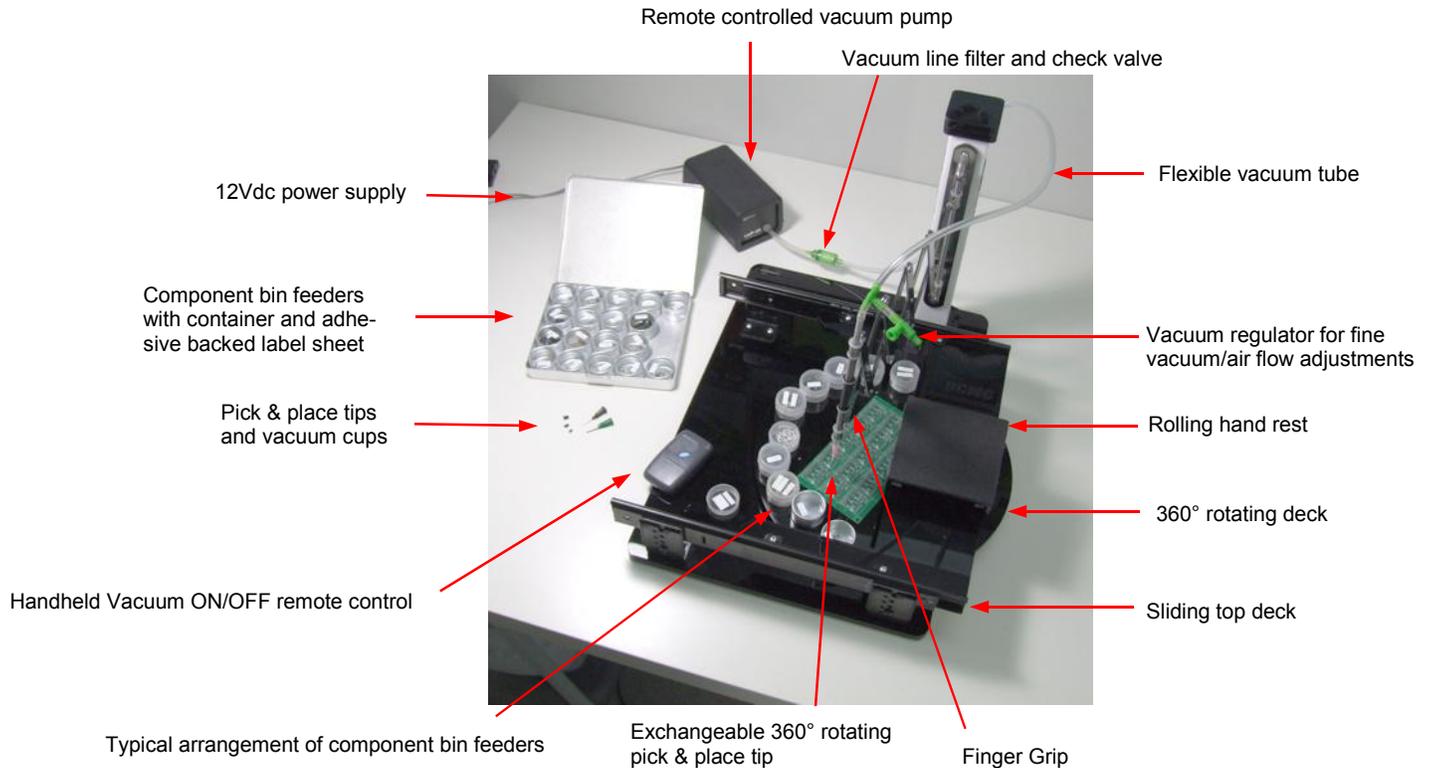
The **ezShot** solder paste dispensing system is the perfect companion to the **ezPick** pick and place system. The **ezShot** and **ezPick** units, side by side on the bench, provide the ultimate system for small batch SMT assembly. Preparing a board with solder paste using **ezShot** is fast and accurate. Users are able to upload dispensing profiles via computer connection to ezShot which makes ezShot a highly versatile, accurate and simple to operate. By design, the form factor of ezShot and ezPick, and the human operation of both systems are identical which eliminates any learning curve when transitioning from ezPick to ezShot and vice versa.

Soldering the Assembled PCB

There are several methods used for soldering prototype and small batch surface mount printed circuit boards including hand soldering, hot plate reflow, batch oven reflow, hot air reflow etc. We recommend using the ezFlow hot plate reflow method which we find to be simple, fast, inexpensive and the process can be clearly viewed.

After **exhaustive** trials using various processes, our own R&D lab chooses the ezPick, ezShot and the ezFlow hot plate reflow method for our SMT prototyping and small production batches and thousands of boards later, continue to enjoy the extraordinary efficiency and success provided by this low cost innovative system. We trust you will enjoy the same experience with the ez... system.

ezPick Anatomy



Left Handed or Right Handed Re-Configuration

ezPick may be re-configured for left handed or right handed operators by simply (1) moving the vertical post (z-axis assembly) to the adjacent side and (2) by rotating the XY slide assembly 180 degrees.

The reconfiguration takes only a few minutes.

ezPick and ezShot Workstation

For those space constrained labs, the **ezPick** SMT pick and place system and **ezShot** solder paste application system both fit comfortably side by side on a small a 4ft x 2.5ft bench top or table top. They are also lightweight and portable and can easily be moved from one area to another



Package Checklist

- Base assembly
- Rotating platen
- 3x Pickup tips –White (17 gauge), Black (22 gauge), Green (14 gauge)
- 3x Small, Medium ,and Large suction cups
- Vacuum pump
- 12Vdc power supply (for North American orders) (International customers please see *note below)
- RF remote control transmitter
- Remote control battery
- Expanding Arm Assembly
- 4x #6-32 cap head socket screws with 4 nuts and 8 washers
- Vacuum hose with regulator valve and filter trap check valve
- Hand rest truck
- 1x case of CBF20 component bin feeders (or 2x case of 10 bin component bin feeders)
- 1x sheet miniature vinyl adhesive labels
- Manual

Note:

Due to different mains outlet plug styles and operating voltages around the world, the vacuum pump DC power supply is included for North American orders only. International customers are required to provide their own DC power supply. Any wall adaptor type power supply, that provides the following output characteristics will be suitable to power the ezPick vacuum pump:

- 12V DC
- 1000 mA
- Standard 2.1 mm barrel type connector with centre positive polarity