


E-Pro engineering process inc.

Work Envelope	• 160 mm X axis • 160 mm Y axis • 30 mm Z axis • Theta 400 degrees

General Specifications

Motion

4 axis motion

160mm in Y (lateral axis), 10 nm resolution
160mm in X (optical axis), 10 nm resolution
30mm in Z (vertical axis), 100 nm resolution
360 degree RZ (Theta or rotation about the vertical), 0.01 degree resolution

Compliance

Flexure compliance and 10-1000 gram force sensing.

The flexure compliance quill maintains vertical motion to minimize shifting during placements. The force sensor is built into the compliant quill attached to the Theta drive. The placement and pickup force is configurable through the transfer step type database. An additional digital display will present the operator the force value during automated placements and pickups. The force sensing protects fragile components and can yield repeatable 3 um bond line placement.

Vacuum Pick

Vacuum tools.

The system comes equipped with changeable tip capability and analog vacuum sensing for part presence on the tip. The specific tip design depends on the customer's requirements and part specifications. For some applications automatic tip changing for multiple part placement also can be accommodated.

Safety

Safety enclosure.

The safety enclosure will enclose the gantry system and product tooling. The station will be guarded and ensure operator safety. An E-Stop button will disable motion and axis control. The operator will have access to load and unload the feeder tooling without disabling system power.

Digital I/O

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There are 30 input and 30 output I/Os, TTL or 0-24vdc compliant. Typical delay time 100usec.

Analog I/O

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There are 4 analog inputs with 14bit resolution and multi-range capability. There are 4 analog outputs with 16 bits resolution and +- 10 V range.

Station Control

Desk Top PC.

The PC controller will have the following

1. LabView software to control the system and provide the operator interface.
2. Motion control
3. Test System control GPIB, RS232, USB
4. Data logging

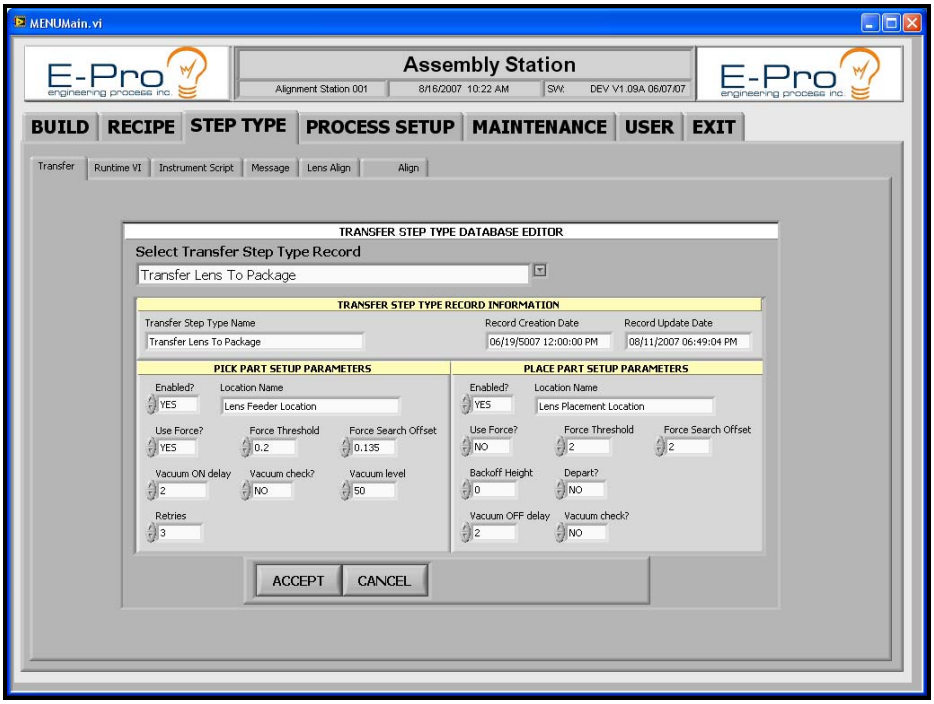
700 Atlantis Road, Suite 303. Melbourne, FL 32904 Voice: 321.723.6262 Fax: 321.574.0663




Software

The software is based on LabView 8.6. The basic package consists of a standard set of features. All scans, step types and recipes use a data base to allow for multiple configurations for all the different parts and devices. A recipe for a given part can use different location record, transfer record, alignment record and cure cycle record.

User Login	Password control
Exit	System software shut down
Maintenance	Analog and digital control
Process Setup	• Motion control jog screen for gantry X, Y, Z, and Theta; flexure X, Y, Z; and high-resolution Z • Test board communication • Location teaching and moving • Scan type development, including graphical display for 1-D and 2-D; selecting output configuration; and performing scans
Step Type	• Instrument scripts; list of specific instruments text • Cure cycle control; cycle TEC trough a temperature ramp • LabView VIs; Home stages; vacuum off • Alignments (each part can have different alignments) • Transfer, pick a part, and move to nest • Message, error, and operator prompt
Recipe Creation	Sequence of Step Types
Build	Recipe execution



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Options

Vacuum Tips/Tools
The system comes equipped with changeable tip capability and analog vacuum sensing for part presence on the tip. The specific tip design depends on the customer's requirements and part specifications. Automatic tip changing for multiple part placement also can be accommodated.

Component Feeders
The station can accommodate matrix tray feeders that are manually-loaded ahead of time. The feeder tray will be designed to hold the specific parts.

Force Sensing
The force sensor is built into or compliant quill-attached to the Theta drive and high accuracy Z axis. Compliance and force sensing (from 10 – 1000 grams) is built into the Theta unit. The force sensing protects fragile components and can yield repeatable 3 um bond line placements.

Package/Device Nest
The customer's package is inserted and biased against their datums and interfaced to the test board by our zero insertion force connections. These connections control the package during the alignment and attachment.

External Fiber Alignment

X,Y, Z flexure cube with fiber mount	2 mm all axes
Resolution	100 nm all axes

Note: A fiber is coupled to the package for optical power out, IL, and wave length testing by the flexure stage.

Vision Alignment
The vision alignment consists of an up- and down-looking camera for locating package/device location (assembly location). The up looking camera locates the part (lens or other) on the vacuum tool tip. The vision system compensates for variation from packages and components. The vision compensation dramatically reduces alignment times.

Laser Measurement and Topography
The high-accuracy laser displacement sensor can measure sub-micron (0.05 um) vertical features. It will map out the optical sub-mounts topography for critical bond line attachments and measure component part features for passive placements.

Dispensing
The dispensing mechanism can consist of pin transfer, shower head or single needle methods, depending on the customer's epoxy selections and process requirements.

Epoxy Curing
After the epoxy is applied and coupling is verified, the epoxy can be cured by a TEC mounted in the package nest or by UV lamp control.

Test Equipment Interfacing
The system comes equipped with standard optical power, diode current and wave length measurements. This is for both GPIB and analog. Additional equipment can be added as required.