AP600
Automated Programming System

Automated IC Programmer for One-Piece-Flow Operation

AP600
Automated Programming System

Up to 36 sockets

Product Highlights

- Up to 9 sites (36 sockets) for IC device programming
- Throughput up to 800 UPH under zero programming time
- Downward CCD camera for vision centering and Fast Teach
- High-speed upward CCD position recognition system
- H9600 high-speed universal programmer expandable up to 448 pin drivers
- Fully integrated subsystems for one-piece-flow operation
- Network-oriented Windows OS JOB management system
- High-speed USB interface for networking with the programmer
- Optional automatic tray stacker accommodating up to 20 JEDEC or Non-JEDEC trays
- Optional subsystems for laser marking and labeling are vavailable
- Optional support for tape and tube I/O media available
- Optional ESD ionizer is available

SYSTEM GENERAL

Automated IC Programming Solution for One-Piece-Flow Operation

The design philosophy of the AP600 is to provide a one-piece-flow programming workstation. By integrating a rapid programmer with state-of-the-art automation technology, the AP600 can accomplish most programming tasks with minimal human intervention.

AP600

Design Philosophy and One-Piece-Flow Architecture

The AP600 is the latest addition to our popular AP Series of automated handlers. It is flexible enough to meet a wide range of application and budget requirements. With fewer programming sites installed and a smaller working area for the gantry, the AP600 is more efficient than its predecessor to program devices with less than 60 second programming cycle.
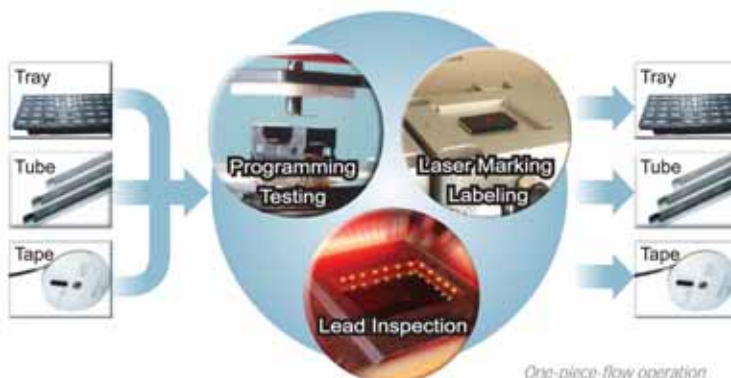
The AP600 is built on the design philosophy of the flagship AP500. It provides the same one-piece-flow hardware architecture. To facilitate programming flow, the AP600 can accommodate a variety of input/output media. Tray, tape, and tube IO are all supported. Further optional features include laser marking, labeling, and a tray stacker accommodating up to 20 JEDEC or non-JEDEC trays for uninterrupted programming operation.

One of the Fastest Universal Programmers on the Market

The AP600 uses the H9600 universal programmer, one of the fastest programmers ever built. With up to 9 sites, the AP600 can automate programming operations for almost any programmable device, including Flash EPROM, Micro-Controller, and PLD devices. The programmer is equipped with 112 pin drivers by default, which is more than adequate for handing next generation devices. An optional EPD adapter adds 336 additional pin drivers to the programming system, as well as the capability to program QuickLogic anti-fuse devices.

Socket adapters, with Gang-4 programming sockets, are available to program four flash memory devices on each site. This means that the handler can support up to 36 sockets for Flash memory programming.

Configurable I/O Media and Integrated Processing

Tray
Tube
Tape

Programming Testing
Laser Marking Labeling
Lead Inspection

Tray
Tube
Tape

One-piece-flow operation

Programming times   (All times represented in seconds)

Flash Device	Blank Check	Program	Verify
Intel 28F640W18 (64M)	5	26	NA*
Intel 28F128K3C (128M)	9	79	NA*
Intel 28F256K3C (256M)	18	160	NA*
Intel PXA263 (256M/32bit)	11	85	NA*
Intel 38F3350 (MCP 256M)	18	103	NA*
ST M28W640EC (64M)	5.7	17.6	5.7
Samsung K9F2808U0B (128M)	15	29	20

*Benchmarks based on the intel EFP/BEFP algorithms.

Verify has been included as a part of the program cycle.

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H9600 Programming Module

Advanced Hardware Design

The AP600 is designed with an advanced synchronous dual-servo gantry system. Driven by two synchronous ball screws, the gantry is able to travel at high speeds. This allows the automated programming system to generate a maximum throughput of 800 UPH (units per hour).

The handler uses a fast-teach mechanism to minimize operating overhead. The downward camera on the gantry will automatically search for the crosshairs on both sides of each socket adapter to align the pick-up head against the center of the socket. An upward CCD camera performs adjustment of the gantry insertion offset.

For ESD-sensitive applications, an optional ESD automatically limits the ESD level to 50 Volts.

The Affordable AP600

Buying an automated handler is a long-term investment. While up-front hardware expenditures are one consideration, the overall maintainance costs and the cost for socket adapters must also be considered.

System General understands the importance of keeping customers competitive in the programming industry. On average, System General socket adapters are substantially more affordable than those of other leading competitors. A variety of AP600 maintenance contracts are available at reasonable prices.
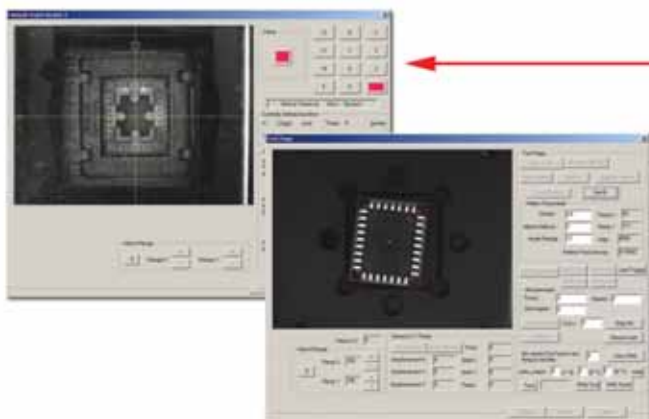
CCD camera systems for accurate insertion alignments and fast teach

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S p e c i f i c a t i o n s

• Component Handler System •

- ▸ Throughput: 800 UPH
- ▸ Placement accuracy: ± 0.10 mm
- ▸ Placement repeatability: ± 0.03 mm
- ▸ Placement force: 95 grams
- ▸ Pick-and-place method: Single vacuum nozzles
- ▸ Component detection: CCD inspection and vacuum sensor
- ▸ Dimension*: 130 x 120 x 170cm (51 x47 x 66.9 in)
- ▸ Shipping dimension*: 160 x 150 x 200cm (63 x59x78.7 in)
- ▸ Net weight*: 1000 kg (or 2200 lb)
- ▸ Shipping weight*: 1250 kg (or 2750 lb)
- ▸ Safety: CE compliant
- * Actual dimension and weight depend on the options and subsystems orderd.

• Positioning System •

- ▸ X-Y drive system: Servo motor drive system
- ▸ X-axis resolution: 0.001 mm
- ▸ Y-axis resolution: 0.001 mm
- ▸ X-Y axes repeatability: 0.010 mm
- ▸ X-axis maximum velocity: 1.50 M/sec
- ▸ Y-axis maximum velocity: 1.50 M/sec
- ▸ Z-theta drive system: Servo motor
- ▸ Z-axis resolution: 0.001 mm
- ▸ Z-axis repeatability: 0.01 mm
- ▸ Z-axis maximum velocity: 0.5 M/sec
- ▸ Theta-axis resolution: 0.001°
- ▸ Theta-axis repeatability: 0.01°

• Positioning Recognition System •

- ▸ Upward camera: (Standard) Component position recognition system for dimensions from 6X6 mm to 40X40 mm
- ▸ Downward camera: Socket and I/O position recognition system
- ▸ Local fiducials: Socket position reference coordinate system

• Programming System •

- ▸ Programming sites: Up to 9 sites
- ▸ Type: H9600 high-speed Universal programmer on each site
- ▸ Pin drivers: 112 standard, extendable to 448 per site
- ▸ Devices supported: EPROM, EEPROM, Flash, micro-controllers, PLD, CPLD, Anti-Fuse, FPGA and more
- ▸ Packages supported: PLCC, TSOP, TSSOP, TQFP, PQFP, SOIC, SSOP, uBGA, CSP and more
- ▸ File formats supported: Intel Hex, Microchip INHX, Tektronix Hex, Motorola S, Signetics Hex, Extended Tekhex, HP 64000 Absolute, Spectrum, TI SDSMAC, ASCII Hex, ASCII Oct, ASCII Binary, Formatted Binary, Binary, JEDEC, POF, DIO, JAM, STAPL, LOF
- ▸ RAM buffer: 512 Mbits standard, expandable to 2G
- ▸ Communication: RS-232 and USB link
- ▸ Safety: CE compliant

• AP600 System Software •

- ▸ User interface: Windows-based HMI
- ▸ Operating system: Windows 2000 English

• Operating Requirements •

- ▸ Input voltage: Standard 200V/220V/240V, Single-phase, 3-wires (Adaptable 380/400/415/440V with optional transformer)
- ▸ Input line frequency: 50/60 Hz
- ▸ Power consumption: 1.2 kVA
- ▸ Air pressure: 75~95 PSI
- ▸ Air flow: 120 liters/min (4.2 CFM at peak)
- ▸ Operating temperature range: 15~30 °C
- ▸ Relative humidity: 35%~90%

• Optional Subsystems •

- ▸ Auto tray stacker (with Reject Tray)
- ▸ CO2 laser marking
- ▸ Tape-and-Reel input/output media
- ▸ Tube input/output media
- ▸ ESD ionizer

User's Manual