

## A Versatile Automated Programming System



**Quad  
Nuzzles**

### Product Highlights

- Bench-top layout in compact dimension
- Proprietary 4-nozzle gantry for handling 4 devices at each programming cycle
- Up to 16 (4 sockets x 4 sites) programming sockets
- Throughput up to 600 units per hour for programming time of 60 seconds or less
- Easy-to-use "Teach" mechanism with minimum overheads for change-over
- Adjustable pushers driven by stepping motors for reliable socket actuations
- 4-site H9800 Universal Programmers with 16 Gbits of RAM on each programmer
- Insertion alignment for pick-up offset by "Precisor" or dual CCD cameras
- Default manual tray input/output interface
- Optional tape (reel) and tube input/output interfaces

# AP900 – A Versatile Automated Programming System

The bench-top AP900 was designed to replace programming labor and thus cut down on operating costs for device programming centers.

The AP900 inherits the “teach” and alignment mechanisms from previous System General AP Series Handlers – this makes programming-job changeovers as quick and easy as those for manual operations.

The new socket pusher is a plug-in type, and each can be adjusted to fit different socket profiles and sizes – with gentle actuation, the new pusher design extends the usable life of sockets which saves on the purchases for these consumable items.

The AP900 performs at over 600 units per hour when 4-site socket boards are used – in contrast to manual operations, one AP900 delivers throughput equivalent to the productivity of up to three laborers.



## Flexible Architecture to Interface with Different Input/Output Device Carriers

The AP900 comes standard with tray interface. Tape and tube interfaces are also available to handle different device carrier combinations. For example, the AP900 can be set up for tape-input to tape-output or tray-input to tape-output, or any other input/output combination.

Configurable I / O Media and Integrated Processing



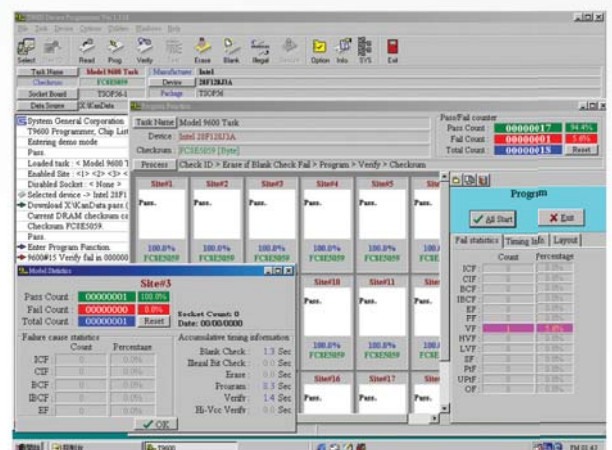
Following standard operating procedure for the programming industry, users program first-article devices on a desk-top T9800 and save the programming settings under a Task file. Once the first-article devices are verified on the target system and approved by the end users, the same Task is downloaded to the H9800 programmers on the AP900 to reinstate the same settings for mass production.

Additionally, users can save the handler-related settings on a Job file. Examples include input/output processing flow, predetermined failure rate threshold, and other statistics management.

With software management and flow control, the AP900 minimizes the possibility for human errors and optimizes operating efficiency, saving time, frustration and money.

## TASK and JOB Software to Minimize Operating Errors

The AP900 leverages previous System General AP Series Handler methodologies by using Task and Job software as integral parts of the programmer and handler software systems.



## 9800 – The New-Generation Universal Programmer

The AP900 comes equipped with four sets of the 9800 Universal Programmer – programming speed is up to 20% faster than its predecessor, the model 9600.

Each 9800 programmer is provided with 16 gigabits of RAM – with the exception of those few extreme applications, users won't need to budget for RAM upgrades.

Inclusive of its backward-compatibility, the 9800 can accept socket boards previously purchased for the 9600 – our customers benefit from faster programming speeds while taking advantage of prior investments.

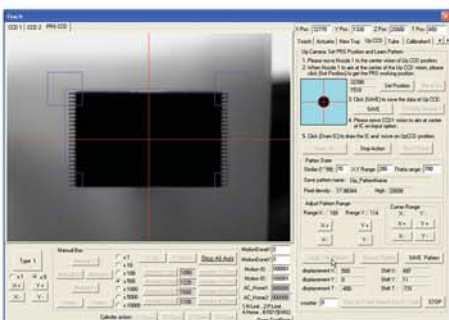


### Proprietary 4-site Gantry and Advanced Hardware Design

The proprietary 4-site gantry on AP900 allows processing of four devices at each programming cycle. With 4-site socket boards installed on each H9800 programmer, a 16-site AP900 is able to generate stable throughput regardless of device programming-time differences.

On AP900, the vacuum and air flow for pick-up and placement were designed to be adjustable. Using the smallest suction cup on the gantry, AP900 is capable of processing devices as small as 2.0x3.0mm.

Two cameras expedite the “teach” process and one camera provides for insertion alignment. Alternatively, the AP900 can substitute a “precisor” for the insertion alignment – this allows the system to insert four devices directly into the 4-site socket boards, resulting in reduced placement overhead.



### The New N4 Socket Boards maximize NAND Flash and Serialization Throughput

While NAND Flash densities grow, customers continue to look for solutions to increase programming throughput. System General responds with the four-site N4 socket board to cater to NAND's unique programming characteristics.

The 9800 base unit was designed with isolated data circuitries and new mapping technologies to tackle the bad-sector algorithm, ECC, and other application-specific schemes. Coupled with the matching isolated circuit design on the N4 socket board, the new 9800 programs four NAND devices, at each cycle, with very little overhead.

The isolated circuit design of the N4 board is also applicable to serialization. With the built-in ESP or BSD serialization algorithm, our 9800 software is able to program four sets of serialized codes simultaneously into each of the devices on the N4 socket board.



# Specifications

## • Placement and General Information •

- ▶ Placement accuracy:  $\pm 0.05$  mm
- ▶ Placement repeatability:  $\pm 0.03$  mm
- ▶ Placement force: 95 grams
- ▶ Pick-and-place method: Four vacuum nozzles
- ▶ Component detection: vacuum sensor
- ▶ Dimension: 64(L) x 75(W) x 67(H) cm;
- ▶ 25.2(L) x 29.5 (W) x 26.4 (H) inch
- ▶ Shipping dimension: 99(L) x 137(W) x 82(H) cm;
- ▶ 39.0(L) x 53.9(W) x 32.3 (H) inch
- ▶ Net Weight: 130 kgs (286 lbs)
- ▶ Shipping Weight: 180 kgs (396 lbs)
- ▶ Safety: CE compliant

## • Placement System •

- ▶ X-Y axes driving system: Stepping motor
- ▶ X axis resolution: 3.125  $\mu$ m
- ▶ Y axis resolution: 3.125  $\mu$ m
- ▶ X-Y axes repeatability: 0.030 mm
- ▶ X-axis maximum velocity: 200 mm/sec
- ▶ Y-axis maximum velocity: 200 mm/sec
- ▶ Z-theta driving system: Stepping motor
- ▶ Z axis resolution: 0.625  $\mu$ m
- ▶ Z axis repeatability: 0.020 mm
- ▶ Z axis maximum velocity: 30 mm/sec

## • Alignment System •

- ▶ Gantry: 4-nozzle gantry
- Alignment Mechanism: Dual CCD cameras or mechanical Precisors for insertion alignment

## • Programming System •

- ▶ Programming sockets: up to 16 sockets
- ▶ Device support: EPROM, EEPROM, Flash, Microcontrollers, PLD, CPLD, FPGA and more.
- ▶ Package types: Supports Standard and Nonstandard (Custom) Package Types
- ▶ H9800 RAM buffer: 16 G-bits standard
- ▶ Communication: USB
- ▶ Safety: CE compliant

## • System Software •

- ▶ User interface: Windows-based HMI
- ▶ Operating system: Windows XP

## • Operating Requirements •

- ▶ Input voltage: 220 VAC, Single-phase, 3-wires.
- ▶ Input line frequency: 50/60Hz
- ▶ Power consumption: 0.6 KVA
- ▶ Compressed air pressure: 75 ~ 95 PSI
- ▶ Air flow: 80 liters/min (Peak)
- ▶ Operation temperature range: 15 ~ 30°C (59~ 86°F)
- ▶ Relative humidity: 35% ~ 90%

## • Optional Subsystems •

Tape and Tube input/output interfaces



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