

Quick & Flexible

Product Catalog for Device programmers

For Inquiries regarding All Products

■Supported Devices

Programmer Series devices which are already supported can be confirmed using the Device Lists or Device Search on our website. For new devices, support is being provided as required. Regarding devices that are not listed, please make inquiries using "Contact Us" on our website or the contact details listed below.

■Custom Support

Support is being provided for all kinds of requests relating to customers' original memory boards, modules, special packages, and in-circuit programming. Please make your inquiries using "Contact Us" on our website or the contact details listed below.

■Free Upgrades

Customers who carry out user registration on our website will be able to receive the latest versions of the algorithm software and various kinds of information free of charge.

* Note that charges will be made in the case where upgrades are provided on CD-ROM.

Contact Us: E-mail

Technology-related items : support@j-fsg.co.jp
Sales-related items : sales@j-fsg.co.jp
Programming service : ps@j-fsg.co.jp

Contact Us: Telephone and Fax

TEL +81-53-459-1050 / FAX +81-53-455-6020

 Flash Support Group

TOA ELECTRONICS, Inc.
Flash Support Group Company

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URL <http://www.j-fsg.co.jp/en/>

Note in advance that changes may be made to the described items without prior notice for reasons such as improving the functions and quality. In the case where the products described in this catalog are to be exported outside Japan, permission may be required from the Japanese government according to the stipulations of the Foreign Exchange and Foreign Trade Act.

March 25, 2016

Quick & Flexible

Responding swiftly and flexibly to customer demands and market changes, we precisely support your business needs

Following the increasing capacities of semiconductor memories including NAND flash memories, the expanding of application sizes, and the shortening of product development cycles, there is a demand for high speed programming of large capacity memories. In addition, the continued miniaturization and increasing capacities in the semiconductor memory market has the potential for dramatic technological progress and endless possibilities. In the semiconductor memory tool market, mainly comprising flash memories and flash microcontrollers, Flash Support Group is developing and producing device programmers, automatic programming systems and accessories as well as providing high quality programming services utilizing its own company's products.

Free Downloads of Algorithm Software

After carrying out user registration on our website (<http://www.j-fsg.co.jp/en/index.html>), you will be able to download the latest versions of algorithm software (*1) and operation manuals free of charge (*2). In addition, various types of information are also distributed.

*1 Algorithm software is the software that is used for controlling the programming according to the system and device specifications.

*2 In the case of using in-circuit programmers, an extra memory card will be required when carrying out device additional registration.

Programmers for free algorithm updates

- Gang Programmers
- Flash Programmers
- In-Circuit Programmers
- Auto Programming Systems

(Except for products in which support has finished.)

Please confirm the latest supported devices on our website.

Device Search

Device List

Large-Capacity Mass Production-type Device Programmers

AG9730B with buffer memory 256Gbit for high-speed download debuts ! Super high speed multi-programmers

AG9730/30B/31

P.04



Small to Medium-Capacity Mass Production-type Device Programmers

Programs of up to 8/16 devices Highly functional programmers capable of meeting the needs at production sites

AF9724/25

P.06



In-Circuit Programmers

Compact, low-cost in-circuit programmers Can also be customized to mass production systems

AF9101/03 AF9201

P.08



Small to Medium-Capacity Development-type Device Programmer

Ideal for R&D and small-scale production Single site flash programmer

AF9711

P.10



Adapters P.10

List of Specifications P.11

Auto Programming Systems

Labor-saving and large capacity manufacturing systems Various memories from small to large capacities and many kinds of packages are supported

TEH2724/30C TEH2124/25 TEH2800H TEH2024/24H TEH1600

P.12



Using our own products, short-delivery period high quality services are provided, offering support from small-lot high-variety production to mass production

Programming service

P.14



Profile		TOA ELECTRONICS, Inc. Flash Support Group Company	
Domestic			
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Founded	May 24, 1956	Number of Employees	220 persons
Capital	JPY 100 million	Customers	Micron Technology, Inc. / Macronix Japan / Lapis Semiconductor Co., Ltd. / Renesas Electronics Corporation / Panasonic Semiconductor Systems and Technology Co., Ltd. / Fujitsu Devices Inc./ Cypress Semiconductor Corporation / Toshiba Corporation / and others (not listed in order)
Chairman	Makoto Tanaka		
President&CEO	Takanori Tanaka		
Scope of Business	<ul style="list-style-type: none"> ● Planning, manufacturing, sales, and servicing of device programmers and accessories ● Planning, manufacturing, sales, and servicing of applied microcomputer products ● Business relating to the items described above, such as programming services for devices 		

History	
1984	Hamamatsu TOA Electronics, Inc. started development and production of device programmer products for Ando Electric Co., Ltd.
1994	Established TOA System Engineering, Inc. by separating the product development and production departments from Hamamatsu TOA Electronics. TOA System Engineering, Inc. continued the development and production of Ando brand device programmers.
2001	TOA System Engineering, Inc. entered into a programmer OEM contract with Ando Electric Co., Ltd. to take over all their programmer business activities, and began supplying products.
2002 March	Established Flash Support Group, Inc. by separating the device programming business development and sales from TOA System Engineering, Inc.
April	Flash Support Group, Inc. began the OEM supply of device programmer products to Ando Electric Co., Ltd.
December	Started sales of device programmer products in overseas markets under the Flash Support Group brand.
2003 March	Obtained ISO14001 certification, (Throughout the company)
October	Established a programming center in the Group company Nagoya TOA Electric, Inc., and started programming services.
2004 April	Obtained ISO9001 certification. (For the Sales Department and Technology Department)
October	Consolidated all programmer series products into the Flash Support Group brand and started sales.
2005 November	Increased capital to JPY 50 million, as a result of mergers and spin-outs to rearrange the TOA Group capital structure.
2006 June	Relocated the programming center from inside the Group company Nagoya TOA Electric, Inc. to the Flash Support Group headquarters to provide total support including programming services to customers.
August	Increased capital to JPY 100 million.
2007 April	Relocated headquarters to Itaya-machi in Hamamatsu, Expanded business of the Miyakoda Programming Center as the base for programming services.
	Opened Tokyo sales branch.
2008 January	Opened Tokyo sales branch.
2009 March	Obtained ISO9001 certification in programming center.
2010 August	Established Shanghai TOA FSG Technology Co., Ltd. as a subsidiary in Shanghai, China.
2013 March	Flash Support Group, Inc., TOA Electric Industry, Inc. and Hamamatsu TOA Electronics, Inc. merged to form TOA ELECTRONICS, Inc., Flash Support Group, Inc. was renamed "TOA Electronics, Inc. Flash Support Group Company".
August	Opened Shenzhen sales branch of Shanghai TOA FSG Technology Co., Ltd.

Mass Production-type
Device Programmer

AG9730

For High-Capacity Memories
High-Speed GANG PROGRAMMER

High-speed processing of large-capacity memories from development to mass production

Buffer memory
16 Gbit
Up to
16
devices

Industry-fastest level

Fastest R/W cycle speed 20nsec, maximum 64-bit data bus access

Downloading of master data from CF cards

Even in environments where PCs cannot be used, downloading of master data will be possible using commercially available CF cards (*).

* The CF card standards that can be used are limited to FAT12, FAT16, or FAT32.



4-slot Concurrent Operation

For each slot, 4 types of data programming (*1), and 4 types of adapter mounting (*2) are possible.

*1: However, this is limited to when utilizing the same adapters and devices.
*2: However, the programming execution is carried out in slot units. Simultaneous execution is not possible. (For more details, please contact Flash Support Group.)



Example of Mounting Different Adapters

(Seconds)

Multi programming of up to 16 devices

Simultaneous programming is possible of up to 16 devices including SPI flash, eMMC NAND memories (moviNAND and iNAND), NOR56TSOP, and NAND48TSOP using the 4-socket adapter.



All-Pin Checking

By carrying out detection of defective before programming, high quality programming will be possible without adversely affecting the production efficiency.

AG9730 Processing Speed Examples

Device	Program	B.P.V
4Gbit×16-bit bus memory	195	275
8Gbit×32-bit bus memory	524	557
16Gbit×64-bit bus memory module	305	514
SPI Flash 8SOP200mil(8Mbit)	16	19
SPI Flash 8SOP200mil(64Mbit)	47	56

Highly efficient
16-slot model

AG9731

Mass-Production Gang Programmer for Large-Capacity Memories
GANG PROGRAMMER

Gang Programming of high-capacity memories

Buffer memory
64 Gbit
Up to
64
devices

High power of Vcc Max. 2 amperes for each slot

Use of the 4-slot adapter enable simultaneous programming of up to 64 devices

* Depending on the devices, the maximum number of units will be different.

Up to 32 140 LGA multipin devices can also be programmed simultaneously

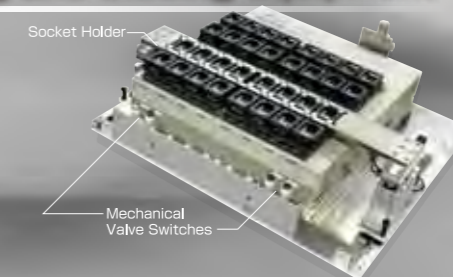
High-speed download is available by extension to 256Gbit (optional)

*For amusement memory devices only

Option TES100 Socket Opening and Closing Equipment

- Simultaneous opening and closing of 8 sockets (lined up side-by-side) using an air cylinder
- Utilization of an air cylinder enables opening and closing without switching on electric power
- Realization of light weight and low cost due to the socket opening and closing stay transfer system (Manual)

Releases you from the need to carry out 140 LGA socket operations!



Work Procedures

- ① Slide the socket holder to fix the sockets.
- ② Lower the socket holder by pressing the mechanical valve switch red button.
- ③ The sockets will be opened, allowing the devices to be mounted or removed.
- ④ Raise the socket holder by pressing the mechanical valve switch green button.
- ⑤ The sockets will close. (Programming will be possible.)

NEW

Large-capacity
High-speed download

AG9730B

GANG PROGRAMMER For Amusement Memory Devices

High-speed download 15sec/1Gbit!

High performance in large capacity memories & module in amusement market

256Gbit buffer memory

High power of Vcc Max.2 amperes for each slot

2 socket adapter for 140/144 LGA available

Large capacity memory module supported

Buffer memory
256 Gbit
Up to
8
devices



Target Devices

Flash memories higher than 256Mbit and with 1.8 to 3.3V or equivalent, memory modules, and SPI flash Memory devices (including HDD/SSD) which has interface supporting ATA standards. (customized support)

Processing Speed

Fastest R/W cycle 20nsec
Data transfer : AG9730 20 sec / AG9730B 15 sec (per 1Gbit)
AG9731 standard model 27 sec / AG9731 256Gbit version 18 sec

Support for
RoHS

The speeds described at left will differ according to the devices and environment.

Specifications

Maximum Number of Devices
Speed
Buffer Memory
Data Bus
External Interfaces
Size
Weight

AG9730	AG9730B	AG9731
16 devices (4 slots)	8 devices (4 slots)	64 devices (16 slots)
Fastest R/W cycle 20nsec		
16Gbit (Optional up to 256Gbit)	256Gbit	64Gbit (Optional up to 256Gbit)
Maximum 64-bit		
USB 2.0, CF slot External trigger I/O line		USB2.0
W235×D290×H100mm		W500×D540×H70mm
Approximately 3.6kg		Approximately 12kg

AG9730/30B/31 is able to utilize the conversion adapter of the previous product AG9860 gang unit.

* When using the AG9860 conversion adapter, it will be necessary to purchase the separate conversion board TRG3011Base.

Mass
Production-type
Device Programmer

AF9724/25

Operation is possible in both stand-alone and PC remote modes

Using the built-in USB host function, all usage environments are supported!



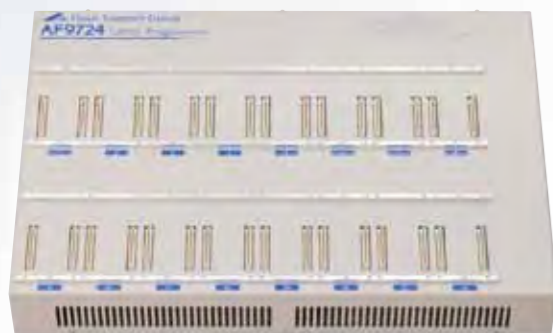
Buffer memory
1 Gbit
Up to **16**
devices

Buffer memory
1 Gbit
Up to **8**
devices

AF9724

AF9725

Example of DIP unit + Conversion Adapter Specification



High speed programming

High speed programming and reading is possible due to the fastest R/W cycle speed of 80nsec, 10 times faster than the previous AF9845 model, and the maximum 16-bit data bus access.

Processing Time Example (NOR Flash 256Mbit) (Seconds)

Programmer	Program	B.P.V
AF9724/25	75	85
Previous Models(AF9723B+AF9845B/C)	175	270

Target Devices | Up to 1Gbit size 1.8V-5V type flash memories, flash microcontrollers, and other memories

Processing Speed | Fastest R/W cycle 20nsec | Data transfer: 20 sec/1Gbit



The speeds described at left will differ according to the devices and environment.

High Speed Data Transfer

Large capacity data high-speed transfer is possible due to the incorporation of a remote control high-speed transfer USB 2.0 interface.

1Gbit binary data transfer: Approximately 20 sec

All-Pin Checking

This checks whether all the pins of the device mounted in the adapter are properly connected before programming. Detection is carried out of connection defects, mis-mounting, and short-circuits between the socket terminals caused by degradation of the socket terminals in order to enhance the programming efficiency and reliability.

High-speed programming to SPI flash

AF9724/25 is capable of high-speed programming that does not interfere with the device actual value by the use of the dedicated adapters. In addition, it supports Single/Dual/Quad mode.

Processing Time Example (W25Q64FVSSIG 64Mbit)

	Combination of product	Program
Previous model	AF9724+AF9851A+TEF005-SIR8SPI-200	100 sec
New product	AF9724+TK001-SPI8SOP-200	18 sec

* Processing time will differ according to the devices and environment.

Auto Recognition and Concurrent Operation

A concurrent function is incorporated that begins automatic processing when the device mounting is detected.

* Limited to the case of using 2 slots

USB 2.0 Host Function

Enables connection of commercially available USB flash memories. This will be convenient for downloading master data and algorithm data in places where PCs cannot be used. It is also possible to acquire and save log information.

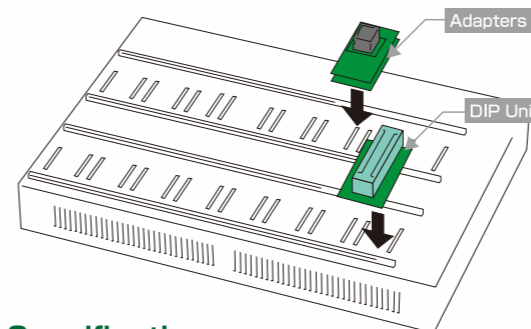


Utilization of the Conversion Adapters of Previous models by using DIP units

Joint use with the dedicated DIP units (paid option) enables you to utilize previous product conversion adapters. This allows efficient utilization of equipment and products. It may not be possible to use some items, depending on the device specifications.

Model Name	Subject Adapters	Previous Product Name
48DIP Unit AF9851A	48-pin DIP adapter	AF9845 Series, AF9708/09 Series, AF9710
40DIP Unit AF9852A	40-pin DIP adapter	AF9837
32DIP Unit AF9853B	32-pin DIP adapter	AF9833, AF9708/09 Series

* Support using algorithm software may be required. (Free of charge)



Example of DIP Unit Mounting



Example of DIP Unit + Adapter Mounting



Specifications

	AF9724	AF9725
Maximum Number of Devices	16 devices (16 slots)	8 devices (8 slots)
Speed	Fastest R/W cycle 80nsec	
Buffer Memory	1Gbit(Optional up to 16Gbit)	
Data Bus	Maximum 16bit	
External Interfaces	USB 2.0 and USB host function	
Size	W465×D330×H67mm	W465×D330×H67mm
Weight	Approximately 6kg	Approximately 5.9kg

In-Circuit
Programmer

AF9101/03

Allows use in a variety of situations such as development sites and on production lines

For serial programming to various companies' flash microcontrollers and serial flash interfaces (SPI)



Processing Speed | FR80 Flash microcontrollers : In PROGRAM approximately 10 sec for a 1Mbyte product

The speeds described at left will differ according to the devices and environment.

Features

- Buffer memory standard 256Mbit
- Stand-alone or PC remote modes
- High speed transfer using USB 2.0
- Management of master data using dedicated memory cards
- Development of algorithm software supporting the devices at no cost

For Production
1

Gang Programming by Linking Units

OPTION Simple control by dedicated software

By connecting units to a PC, it will be possible to easily control up to 8 units by PC operation. Selection can be made between remote programming in which gang programming is carried out to all connected units, and manual programming where programming is carried out to each single unit. It will also be possible to carry out customized gang programming using a master/slave system.

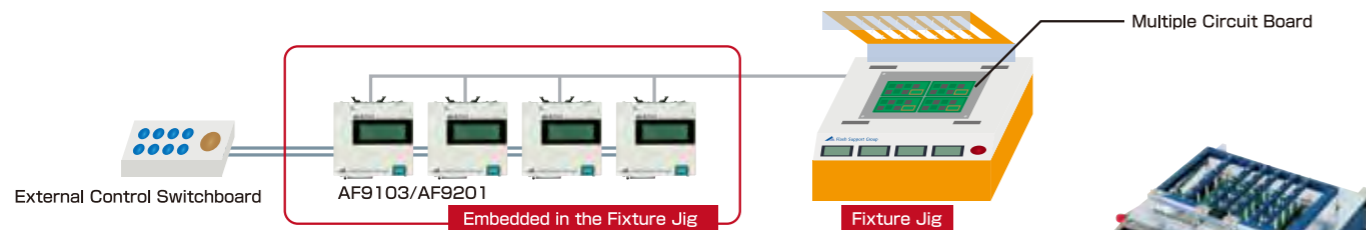


For Production
2

Gang Programming to Multiple Circuit Board

Enables jig creation and customization

Using the dedicated external control interface, it will be possible to input actions according to an external trigger signal and to output results externally. The operability and productivity will be increased by incorporating several programmer main units.



Example System

FH9000 シリーズ
In-Circuit Programming System

- Two types, consisting of a mechanical system and air system
- Board sizes and mounting positions support customization
- Different product types can also be simultaneously programmed by one operation
- Stand-alone use is possible

We can customize for your production system

NEW
For SPI Flash
In-Circuit Programmer

AF9201

High-speed programming of SPI Flash

- Buffer memory 1Gbit
- Acceptable to Single / Dual / Quad Mode
- High-speed programming that doesn't interfere with the device actual value by the hard design for SPI flash.



Processing Speed | 64Mbit SPI Flash : In PROGRAM approximately 35 sec (Including VERIFY)

The speeds described at left will differ according to the devices and environment.

Features

- Buffer memory standard 1Gbit
- Stand-alone or PC remote modes
- High speed transfer using USB 2.0
- Management of master data using dedicated memory cards
- Development of algorithm software supporting the devices at no cost

Target Devices | Flash microcontrollers and serial flash ROM programmable by SPI/ UART/ I²C/ JTAG/ CLK synchronization methods.

Selection of Modes according to the Usage Environment



Stand-alone Mode

The stand-alone mode should be utilized in environments where PCs cannot be used, and when programming fixed data. Operation is possible by easy button handling.



PC Remote Mode

This mode is convenient when successively programming data during development or multiple pieces of data. It enables easy operation and control from a PC that is connected by USB.

Specifications

	AF9101/03	AF9201
Buffer Memory	Dedicated CF card 256Mbit Using 1CF card, registration is only possible for 1 device series. For additional devices, an extra CF card (optional) is required.	Dedicated CF card 1Gbit
External Interfaces	USB 2.0, and external control interface (only provided in the AF9103/AF9201)	
Size	W132×D122×H22mm	W100×D120×H22mm
Weight	Approximately 270g	Approximately 210g

Option (Payment required)

Dedicated CF Card	AF9101/03 : One type support : TECFM-256-20 / Four type support : TECFM-256-20-4 AF9201 : One type support : TECFM-1G-20 / Four type support : TECFM-1G-20-4
Control Software TEM1000 Series	Using the USB connection, you can carry out various settings and device functions from a PC.
Power supply control box	Output of the high voltage and a control signal is possible for every specification of devices.

- One dedicated CF card is included with each unit.
- The control software and algorithm software can be downloaded free from our website at <http://www.jfsg.co.jp/en/index.html>.

Development-type
Device Programmer

AF9711

Buffer memory
1 Gbit
1
device

Compact, For small to Medium-capacity, Low Cost

Availability of stand-alone and PC remote modes enables operation in any environment

USB Host Function

The AF9711 can be connected to USB flash memory devices. This is extremely convenient for downloading master data and algorithm software in locations where PCs cannot be used.



Compatibility with Gang Programmers

The AF9711 is compatible with both the hardware and software of the AF9724 and AF9725, supporting efficient, high-quality programming at a range of sites from development to mass production.

Continuity with Existing Models

Existing product conversion adapters can still be used when paired with a dedicated DIP unit (charged option). This supports continuing effective use of your current items.



48DIP Unit
AF9851A

* Development of algorithm software may be required. Some devices may not be fully supported.

keyboard.
Example of DIP Unit Mounting

Stand-alone Mode

A separate keyboard (charged option) is available to allow use at both development and small-scale manufacturing sites. Easy operation is possible even in locations where PCs cannot be used.

PC Remote Mode

Our free control software allows straightforward management of operations from a PC that is connected via USB. This connection also enables high-speed transfer of large volumes of data.

1 Gbit binary data transfer: Approximately 20 sec

Target Devices | Up to 1Gbit size 1.8V-5V type flash memories, flash microcontrollers, and other memories

Processing Speed | Fastest R/W cycle 20nsec Data transfer: 20 sec/1Gbit



Conversion Adapters

Package Conversion Adapter

Following from the rapid progress in miniaturization, growing capacities, and increasing complexity of flash memories, custom packages that match application specification are becoming the mainstream. In addition, the development of a diversity of customer-unique packages such as DIMM (modules) and various types of cards is also advancing. We offer a lineup of various conversion adapters for programmers corresponding to the memories of each semiconductor manufacturing company. Besides standard products, FSG also swiftly, flexibly, and precisely develops products according to your specifications, and provides total support including device programmers.

TE/TEF/TRF/TEG/TRG/TJ/TK Series Support Table

003 Series	Flash memories	200 Series	Renesas (Former Mitsubishi) microcontrollers
004 Series	EPROMs / OTP memories	300 Series	Renesas (Former NEC) microcontrollers
005 Series	Serial EEPROMs	400 Series	Toshiba microcontrollers
006 Series	NAND flash memories	500 Series	Renesas (Former Hitachi) microcontrollers
029 Series	TEH auto programming system series	800 Series	Dedicated DIMM and custom support
039 Series	* This can also be used in device programmers.	TEG/TRG Series	AG9860 and AG9730/30B/31 adapters
101 (009) Series	Panasonic microcontrollers	TJ Series	AG9730/30B/31 dedicated adapters
110 Series	Spansion microcontrollers	TK Series	AF9724/25/11 dedicated adapters

The TRF, TRG, TJ and TK Series products support RoHS.

Model Transposition Bases and Units

TRG3011Base	Enables the AG9860 adapter to be used in the AG9730/30B/31.
48DIP Unit AF9851A	Enables the former product 48-DIP socket adapter to be used in the AF9724/25/11.
40DIP Unit AF9852A	Enables the former product 40-DIP socket adapter to be used in the AF9724/25/11.
32DIP Unit AF9853B	Enables the former product 32-DIP socket adapter to be used in the AF9724/25/11.

Support using algorithm software may be required. It may not be possible to use some models, depending on the device specifications.



List of Specifications

	Large-Capacity High-Speed Gang Programmers		
	AG9730 P4	AG9730B P4	AG9731 P5
Target Devices	256Mbit or larger 1.8 to 3.3V type flash memories or equivalent products, or memory modules Supports customization of various memories and media incorporating ATA standard interfaces including HDDs and SSDs.		
Buffer Memory	16Gbit (Expandable to 256Gbit using the collecting options)	256Gbit	64Gbit (Expandable to 256Gbit using the collecting options)
No. of concurrent programming (No. of slot)	Standard 4 devices, maximum 16 devices (4 slots)	Standard 4 devices, maximum 8 devices (4 slots)	Standard 16 devices, maximum 64 devices (16 slots)
Device Functions	COPY · ERASE · BLANK · PROGRAM · VERIFY · B.P.V · E.P.V · E.P · P.V		
Program Power Supply (Output voltage, variable units, current)	Individual output ON/OFF control is possible for each slot Vcc: 0.9V to 3.8V in 5mV steps, Max: 500mA Vpp: 0.9V to 13.8V in 20mV steps, Max: 400mA	Individual output ON/OFF control is possible for each slot Vcc: 0.9V to 3.8V in 5mV steps, Max: 2A Vpp: 0.9V to 13.8V in 20mV steps, Max: 400mA	Individual output ON/OFF control is possible for each slot Vcc: +0.9V to +4.0V in 20mV steps, Max: 2A Vpp: +0.9V to +14.0V in 50mV steps, Max: 400mA
External Interfaces	USB Interface (Rev. 2.0) CF slot I/O line for external trigger		USB Interface (Rev. 2.0)
Socket Interfaces	Address bus: Expandable using a 32-bit universal output terminal Data bus: Supports a maximum 64-bit bus Other expansion input/output terminals		
Monitor Display	Full-dot LCD display corresponding to 20-characters x 8 lines		
Input Power Voltage / Frequency	AC90-240V / 50-60Hz		
Power Consumption	Maximum 200VA		Maximum 930VA
Environmental Conditions	Operating temperature range: 0 to +40 °C Storage temperature range: -10 to +60 °C Relative humidity: 80% RH or less (Non-condensing)		
Dimensions	W235×D290×H100 mm (Excluding projections)		W500×D540×H70mm (Excluding projections)
Weight	Approximately 3.6kg (Excluding accessories)		Approximately 12kg (Excluding accessories)
Standard Accessories	Power cable (with ferrite clamp), conversion plug (UL-3P), spare fuse (2 pcs.), USB cable, manual, and PC application (CD)		
Other	Supports RoHS		Comforms with the Electrical Appliances and Material Safety Act

	GANG Programmers	FLASH programmer	In-Circuit Programmers	
	AF9724 / 25 P6-7	AF9711 P10	AF9101 / 03 P8	AF9201 P9
Target Devices	Up to 1Gbit 1.8 to 5V type flash memories, flash microcontrollers or equivalent products, or other memories		Various companies' flash ROMs, flash microcontrollers, and serial flash ROMs that are capable of programming using CSI, UART, I ² C, JTAG, and CLK simultaneous	
Buffer Memory	Standard 1 Gbit (Expandable to 16Gbit using the collecting options)		Standard : 256Mbit (Expandable by changing the dedicated algorithm card)	Standard 1Gbit
No. of concurrent programming (No. of slot)	AF9724 16 devices (16 slots) AF9725 8 devices (8 slots)	1 device (1 slot)	1 device	
Device Functions	COPY · ERASE · BLANK · PROGRAM · VERIFY · B.P.V · E.P.V · E.P · P.V		COPY, ERASE, BLANK, PROGRAM, VERIFY, B.P.V, E.P.V and E.P	
Program Power Supply	Vcc : 1.2V to 6.5V (IccMax=500mA / Two sockets) Vpp : 1.2V to 14.0V (IppMax=400mA / Two sockets)	Vcc : 1.2V to 6.5V (IccMax=250mA) Vpp : 1.2V to 14.0V (IppMax=100mA)	Vcc : 1.5 to 5.0V (Icc : Max. 250mA)	
External Interfaces	· USB Interface (Rev. 2.0) · USB Host Function		· Target interfaces (CSI, UART, I ² C, JTAG, and CLK simultaneous) · USB Interface (Rev. 2.0) · CF Card Interface · External control interface (AF9103/AF9201)	
Socket Interfaces	No. of pins : 60-pin connectors × 2 (1 slot) Address bus: Expandable using a 24-bit universal output terminal Data bus : Supports a maximum 16-bit bus Other control lines and expansion input/output terminals		external control interface (AF9103, AF9201)	
Monitor Display	20-character, 4-line LCD display	20-character, 4-line LCD display (charged option)	20-character, 4-line LCD display	
Input Power Voltage / Frequency	AC100 to 240V / 50 to 60Hz		AC100-240V, DC7V (Main machine) / 50-60Hz (In the situation where the equipment is to be used at voltages of AC200V or above, please contact this company.)	
Power Consumption	Maximum 200VA	Maximum 33VA	Maximum 3VA	
Environmental Conditions	Operating temperature range : 0 to +40 °C Storage temperature range : -10 to +60 °C Relative humidity: 80% RH or less (Non-condensing)		Operating temperature range : 0 to +40 °C Storage temperature range : -10 to +60 °C Relative humidity : 80% RH or less (Non-condensing)	
Dimensions / Weight	AF9724: W465×D330×H67mm/ Approximately 6kg AF9725: W465×D330×H67mm/ Approximately 5.9kg	W135×D180×H50mm/ approximately 0.7kg	W132×D122×H22mm(Excluding projections)/ Approximately 270g(Excluding accessories)	W100×D120×H22mm(Excluding projections)/ Approximately 210g(Excluding accessories)
Standard Accessories	Power cable, USB cable, fuse, manual, and PC control software (CD)	Power cable, AC adapter, USB cable, manual, and PC control software (CD)	Dedicated algorithm card, USB cable, target cable, external control interface cable (AF9103, AF9201), AC adapter, manual, and PC control software (CD)	
Other	Supports RoHS		—	

Auto Programming System

Offers support for various types of memories and diverse packages, including small to large capacities

Enables realization of high quality and low cost production by automating the shop floor, from device programming to labeling and marking.

We accept custom order!
Original Programmers

Compact but high performance!
Low price model with CCD cameras appeared!

TEH2724/30C

NEW

TEH2724 : Incorporates a AF9724 W990xD990xH1400mm (Excluding projections) / approx. 450 Kg
TEH2730C : Incorporates two AG9730C units

- Compact model in the floor area less than 1 m²
- High productivity of 1000 UPH !
- Excellent cost performance



Higher productivity



◆Device Transfer Time Open-top socket 3.6 sec

It is also possible long-term unmanned by 20-tray stacking. When the device is switched, the conversion adapters and socket open/close stays must also be changed. This can easily be performed by the customer without any special tools.

Adjustment-free with 2CCD cameras



The camera attached to the X-Y robot automatically acquires the socket position information (auto-teaching function), while the position correction camera reads the position status of devices suctioned by the transfer head. This allows the devices to be loaded into the sockets without placing any stress on their leading edges.

Realization of the Optimum System Configuration



Excluding protruding sections, the TEH2724/30C have a footprint of less than 1 m². Drawer on the back is available for storage, such as maintenance supplies and replacement adapters.

Option



- Stamp Marking
- By changing to the 2 million-pixel CCD camera, it is possible to support for the devices of 30 millimeters square
- Barcode Reader (Including QR Codes)

New standard model that can be customized to match the scope of production and customer needs

TEH2124/25

TEH2124 : Incorporates a AF9724 W1990xD1336xH1600mm (Excluding projections) / approx. 800kg
TEH2125 : Incorporates a AF9725 W1914xD1130xH1600mm (Excluding projections) / approx. 700kg

- Support for open-top and clamshell sockets
- Adjustment-free, due to the incorporation of CCD cameras



Supports both open-top and clamshell sockets



Both kinds of sockets can be used simply by exchanging the opening and closing stays. Support is provided for devices with package sizes from a minimum of 6x6mm (excluding leads) to a maximum of 32x32mm (including leads).

* Depending on device size, exchange of adsorption heads may be required.

Option

- Stamp Marking
- Lead Inspection Function using the CCD Camera (Specify at the time of shipment)
- * May not be supported depending on device and tray specifications.
- Barcode Reader (Including QR codes)
- Socket Opening and Closing Stay Jig (Stipulated according to the device and adapter)
- Device Pick-up Head (Stipulated according to the device)

Realization of the Optimum System Configuration

Due to our own development system, customization and specification changes can be made to match your manufacturing environment, both before and after the system introduction. Trays can be allocated before and after programming. Long unattended operation is possible, allowing the introduction of 35-tray stocker.

Shorter takt time by using twin heads



The two heads used for mounting and ejection

The head movement has been made the shortest possible distance by using separate heads for device mounting and device ejection.

◆Device Transfer Time Open-top socket 4.0 sec
Clamshell socket 6.5 sec

* Including the mounting, ejection, socket opening and closing, and image processing times. The times may differ according to the device and tray specifications.

Ultra high-speed programming from SPI flash to large-capacity NOR/NAND devices

TEH2800H

Incorporates two AG9730 units W1850xD1230xH1600mm (Excluding projections)/ Approximately 680kg

- Concurrent Programming of 32 Sockets
- Adjustment-Free thanks to CCD Cameras



High-Speed Processing

The programmer section is equipped with two high-speed AG9730 gang programmers, enabling separate processing. This has improved the device transport capacity and reduced the transfer time by around 20% from earlier models. The takt time is also significantly shorter thanks to efficiency improvements including better sliding movement for the trays and the adoption of a controller supporting high-capacity image processing.

Capable of 35-tray Stacking



Long-period automated operation is possible, allowing the introduction of up to 35 trays during supply. NG products are transported to the dedicated NG tray so that there will be no mixing of defective products with good products.

Option

- Stamp Marking and Marking Inspection Function
- Lead Inspection Function using the CCD Camera (Specify at the time of shipment)
- Barcode Reader (Including QR codes)
- * May not be supported depending on device and tray specifications.
- Socket Opening and Closing Stay Jig (Stipulated according to the device and adapter)
- Device Pick-up Head (Stipulated according to the device)

<B.P.V. processing count>

including the transfer time for the device tray
128 Mbit NOR Flash 900 devices per hour

*Results may vary depending on the device type and operating environment.

◆Device Transfer Time Open-top socket 4.0 sec

Option Marking Function

Dot marking function and marking inspection function using a dedicated stamp



Stamp Head



Stamp Block

High productivity realized through space saving; concurrent multi programming of up to 16 devices

TEH2024/24H

Incorporates a AF9724 unit
W1120xD690xH715mm(Excluding projections) Approximately 180kg



- Compact desktop model
- Concurrent multi programming of up to 16 devices
- Transports 2 devices at a time

◆Device Transfer Time (Open-top socket)
TEH2024 : 8.3sec
TEH2024H : 6.0sec

*Including the mounting, ejection, socket opening and closing times. The times may differ according to the device and tray specifications.

Option

- Socket Opening and Closing Stay jig (Stipulated according to the device and adapter)
- Device Pick-up Head (Stipulated according to the device)
- Ionizer (Equivalent to OMRON ZJ-FA01)
- Stamp Marking Function
- Barcode Reader (Including QR codes)



Enables high-speed attaching of 1 label every 5 sec, and also allows inspection after labeling

TEH1600 series

Auto Labeling System
W1200xD1000xH1600mm (Excluding projections) Approximately 450kg



Label Inspection



Attaching Example

- High-speed, high quality label attachment using image recognition processing
- Installs up to 40 trays. (Number of trays varies depending on tray brand.)



Programming Service

We provide programming services from programming to marking and inspection at low cost with high quality and short delivery periods.

As a manufacturer of programmers, we offer proven, detailed, and swift responses and assured high quality.



The Flash Support Group's programming services employ its own products in the processes

Support for the Latest Devices

Swift support is offered for the latest devices through cooperation with each of device manufacturers. Support is provided for custom specifications.

High Quality

By the automatic inspection equipments, a unified inspection level is realized and missed inspections are prevented. The use of automatic lead inspection system eliminates the issue of lead's deformations.

Short Delivery Periods

Short delivery periods and mass production are supported by using automatic programming and inspection systems. Standard operation of 16 hours per day, while 24-hour operation is also possible.

After receiving devices and master, support is provided in 1 to 3 days TAT.

Low Cost

Efficiency is realized by utilizing our own products and automatic inspection systems.

Environment

Activities are tackled in response to ISO 14001 and RoHS directives. Services can be provided using customers' management standards.

Total Support from Small-lot Trial to Mass Production

Stable Production is possible using the Optimum Equipment

Swift Support for the Latest Devices

Supported Devices	Flash Memories NAND Flash Memories EPROMs	Flash Microcontrollers OTP Microcontrollers EEPROMs	Compact Flash SD/MicroSD Cards USB Memories	Custom Modules Supported Devices by Our Programmers HDD
Equipment	Device Programmers AF9723 Gang Programmer AF9833 Gang Unit AF9843 Compact Flash Gang Unit AF9848 NAND Flash Gang Unit AF9845 Gang Unit AF9834 Gang Unit AG9860 High-speed Gang Unit TE/TEF Series Various Adapters Automatic programming Equipment TEH3000 Two Units TEH1200 TEH1210 Two Units TEH1002 TEH1220 TEH2010 TEH2024 TEH2110	Automatic Laser Marking Equipment TEH1521 and TEH1530 Automatic Lead Inspection Equipment CI-3050 Icos Vision Systems: Three units Automatic Label Inspection Equipment: Two units Vacuum Packing Equipment: Two units	Automatic Label Attaching System TEH1600 Duplicator (CF/SD/USB) Baking Equipment: 3 units	

Basic Process Examples

Programming service

Preparation	Programming Requests / Inquiries Verification is carried out of the contents of the customer-specified programming requests and the master data checksum values.
	Acceptance Acceptance inspections are carried out, and notification of the acceptance records are made using E-mail when supplied articles are received.
	Sample Programming When new requests are received, sample programming will be carried out, and operation confirmation will be implemented using the customer's system.
	Confirmation and "Go" Notification After receiving the evaluation results, the programming work will be started.
Programming	Programming According to the product types and volumes, it will be possible to select automatic programming equipment or manual device programmers.
	Marking and Labeling Dot marking, label production and attaching, and laser marking are supported, and the supplied labels can also be attached.
	OPTION
Programming	Baking High temperature testing is carried out under the conditions (temperatures and times) stipulated by customers.
	OPTION
	Verifying Data verification is carried out between the master data and the data that has been programmed in the product for all products or for sampled products.
Shipping	Inspection In addition to carrying out visual inspections, lead inspection equipment and image inspection equipment are used to inspect the outer leads and labels.
	Packing After tray bundling, vacuum packing is carried out using the vacuum sealer to protect against moisture absorption.
	Shipment Products are shipped in packing containers using courier services. Notifications of dispatches are made using E-mail or fax.

The above are example processes. Changes can be made to the processes based on customer specifications. Swift responses are made to problems relating to each process according to the quality control stipulations.

For Inquiries relating to Programming Services

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