THE 29B UNIVERSAL PROGRAMMING SYSTEM
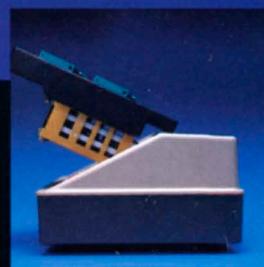
DATA I/O

THINK BIG

Easy-to-read 16-character alphanumeric display

Self-diagnostics with descriptive error readout

Interchangeable programming paks give broad capabilities including logic programming, gang programming and universal programming

Stand-alone operation or PC control

Universal Programmer

SELF TEST-OK

7	8	9	A
4	5	6	B
1	2	3	C
0	F	E	D

COPY DEVICE
VERIFY RAM
SELECT PORT
EDIT REVIEW

START

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29B

GangPak™

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Hex keypad for convenient data editing and command entries

User guide for quick reference

Standard 64k x 8 RAM handles EPROM sets and future devices

Logical, easy-to-remember keystroke sequence for controlling operations

RS232C and 20 mA serial I/O with 27 data formats (including 16-bit) allows interfacing with all popular development systems

THINK BIGGER

Data I/O's modular approach makes it possible.

The concept behind Data I/O's 29B Programming System is simple: develop a basic mainframe unit that can accommodate a variety of interchangeable paks. These paks give you the advantage of programming a wide range of devices and, thus, selecting the devices best suited to your application.

A variety of different paks is available for the 29B. The most widely used are the UniPak 2™, GangPak™ and LogicPak™. Other paks, designed to support less frequently used devices, are also available.

The beauty of the system is the ease with which the 29B can be updated in the future. As new devices become available, paks will be updated or developed to accommodate your programming needs. And instead of becoming obsolete, the 29B will continue to expand its programming capability.
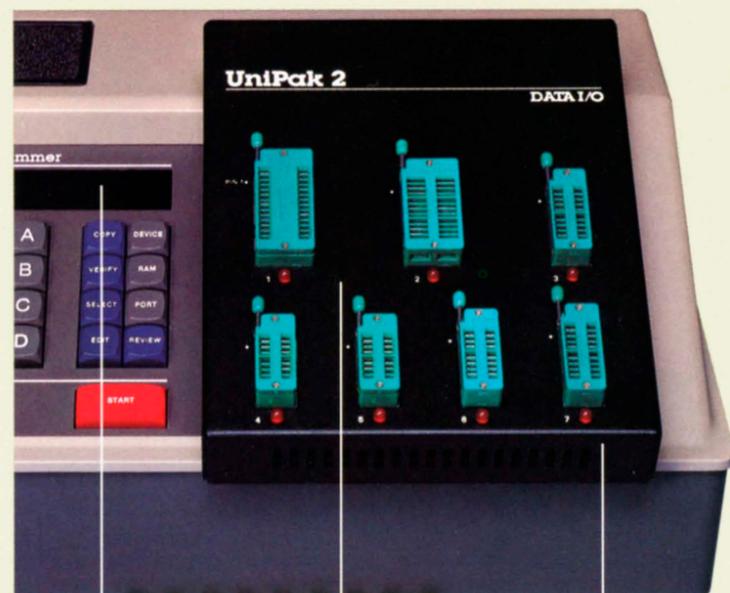
Four-digit codes identify the device to be programmed

Fast algorithms for large parts

Programming algorithms for over 800 devices

Design adapters for reducing logic designs to fuse maps

Programming/ test adapters for complete functional testing of devices

Designing, programming and testing for over 125 logic devices

Loads master device from the same socket as the programming sockets

Programs over 100 types of EPROMs and EEPROMs

Identical or set programming for up to 8 devices simultaneously

UniPak 2™ supports more than 800 MOS and bipolar PROMs.

Data I/O's UniPak 2 provides you with maximum flexibility in choosing the proper device for each application. It can program practically every MOS and CMOS EPROM, EEPROM, fuselink, AIM, DEAP bipolar PROM and 40-pin microcomputer on the market, including devices manufactured by AMD, Fujitsu, Harris, Hitachi, Intel, Mitsubishi, MMI, Mostek, Motorola, National, NEC, Signetics, TI and many others (including the newest startups).

Instead of forcing you to choose a device that fits your programmer, Data I/O's 29B with a UniPak 2 lets you choose devices that fit your needs.

Programming algorithms are software-selectable. And operation is easy: just identify a PROM by keying in a four-digit family and pinout code, and the Unipak 2 indicates the correct programming socket to use.

LogicPak™ gives you a complete Programmable Logic Development System (PLDS).

As a PLDS, the LogicPak supports more than 125 programmable logic devices, including PAL®s, FPLSs, FPLAs and FPGAs. It's the first system to design, program, and functionally test a wide range of devices.

Data I/O's new logic-design software package, ABEL™, provides a powerful new option in design automation, letting you design logic for IFL, PROM and PAL devices by using your PC or VAX.

Once you're finished with programming, the LogicPak also tests your devices. A fuse verify checks that all fuses have been programmed as specified. A structured test applies user-defined input states and compares the outputs with your expected outputs. And Data I/O's unique Logic Fingerprint™ test applies a sequence of pseudorandom inputs to the programmed device to derive a signature from the outputs. This signature can be used to confirm the correct operation of subsequent devices.
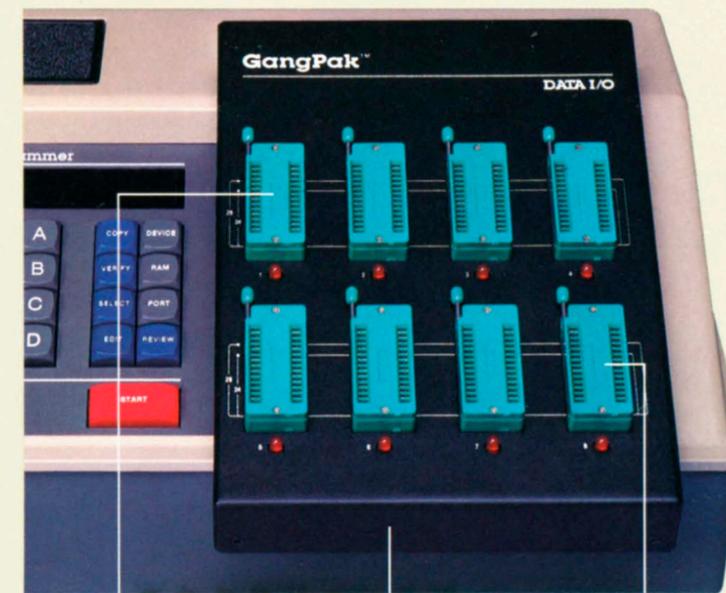
GangPak™ gives you MOS production.

Insert a GangPak into a 29B mainframe unit and you have all the advantages of programming multiple MOS EPROM sets in one operation. More than 80 MOS EPROMs are supported.

Set programming allows the GangPak to partition a program into one or more sets of EPROMs. For example, a 64k x 8 program can be partitioned into a set of four 128k EPROMs, and two sets can be programmed simultaneously.

Set programming saves you time by eliminating separate downloading and programming operations for each EPROM in a set, enabling you to rapidly produce sets of firmware for prototyping or limited-scale manufacturing. After downloading, you simply key in the device type and set size and you're ready to program.

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No other programming system gives you more flexibility.

It's a production programmer. It's a development programmer. It can be used in the field.

It can work with a personal computer. Or it can work as a stand-alone.

Fully equipped, it programs nearly 1,000 different devices: MOS and CMOS EPROMs and EEPROMs, fuse-link and vertical-fuse bipolar PROMs, Intel 40-pin microcomputers, and more than 125 different logic devices including PAL®, FPLS, FPLA and FPGA.

With its standard 64k x 8 RAM, it supports even the newest 512k EPROMs.

Data I/O's 29B Programming System gives you universal programming capability. It is backed by Data I/O's commitment to giving you state-of-the-art programming technology. As device technology advances, so will the 29B, ensuring that you have continued programming support in the future.

Use it with an IBM®-PC. Or use it by itself.

Data I/O's 29B gives you an important choice: You can interface it with a personal computer and enjoy the convenience of menu-driven operation, or you can use the system by itself and free your PC for other purposes. Twenty-seven I/O formats also let you interface it with virtually any development system.

To make computer interfacing easy and productive, Data I/O has developed two convenient software packages: PROMlink™ and ABEL™.

PROMlink is Data I/O's software driver that provides a turnkey interface to an IBM-PC so that you control the 29B from the PC. You get the ease of menu-driven commands without the time-consuming hassle of writing your own programs. And PROMlink makes it easy to download data files because it turns your IBM-PC into a highly flexible data storage system.

ABEL is the revolutionary logic-design software package from Data I/O that lets you specify logic designs for IFL, PROM, and PAL devices using any method or combination of methods you want: state diagrams, Boolean equations or truth tables. It's IBM-PC compatible. It's also compatible with the Digital Equipment Corporation VAX®.

If you choose to use the 29B as a stand-alone, you still get user-friendliness. The 29B comes with an easy-to-read 16-character display which prompts you in English. Data is displayed in hexadecimal, octal or binary. A simple source/destination protocol is used for data transfers. Error messages are displayed in English.

Intelligent algorithms speed up programming.

By checking memory cells after each pulse to see if they've been programmed, intelligent algorithms eliminate redundant programming pulses and increase your throughput—by up to a factor of 10.

And Data I/O's algorithms aren't just intelligent. They're also approved by the device manufacturers—even the small manufacturers.

Electronic identifiers reduce operator errors.

More and more manufacturers are incorporating electronic identifiers in their devices. Data I/O was the first to offer device programmers capable of utilizing these identifiers.

Electronic identifiers in devices contain information that allows the 29B Programming System to adapt its algorithms to the specific characteristics of the devices being programmed. By switching device identification tasks from an operator to the programmer, you avoid programming errors that result from using incorrect algorithms. But electronic identifiers are only helpful in programmers that can read them. And the 29B, with a UniPak 2™ or GangPak™, performs that function.

Proven reliability: the Data I/O advantage.

In many ways, the Data I/O 29B is not new. It's simply the latest in a long line of Data I/O programming systems completely dedicated to one basic mission: reliable programming.

To accomplish this goal, the 29B constantly checks itself, confirms device integrity, checks input, looks for programming errors, verifies reading, monitors memory, signals invalid data, and watches for a host of other hazards that can ruin your devices. Most of this self examination is automatic. All of it is necessary.

THE DATA I/O COMMITMENT TO YOU

Data I/O continues to be the world's largest supplier of microcircuit programming equipment by working closely with you and the people who design and manufacture the devices you program.

Our close relationship with all device manufacturers ensures that the 29B Programming System accurately implements state-of-the-art programming algorithms and is prepared to support new devices as they become available.

Data I/O is fully committed to providing continuing service and support for every programmer we sell.

For more information about the 29B Programming System, consult your Data I/O sales representative.

FUNCTIONAL SPECIFICATIONS

General Architecture:	Microprocessor-controlled (6802)
RAM:	64k x 8 standard
Programming Support:	GangPak™
	LogicPak™
	UniPak 2™
	MOSPak™
	Programming paks
Keyboard:	16-key hexadecimal
	10-key functional
Display:	16-character alphanumeric
Electronic Identification:	Included in programming modules
Intelligent Algorithms:	Included in programming modules
Input/Output:	Serial RS232C and 20 mA current loop
Baud Rates:	50, 75, 110, 134.5, 150, 300, 600, 1200, 1800, 2000, 2400, 3600, 4800, 7200, 9600, 19200
Remote Control:	CRC - standard
	SRC - standard
	TRC - optional
Other Options:	Handler Interface Control
Translation Formats:	27
Select Codes:	29
Error Codes:	45
Accessories Included:	Power cord
	Instruction manual

ELECTRICAL REQUIREMENTS

Operating Voltages:	100, 120, 220 or 240 VAC + 5% or −10%
Frequency Range:	48-52 Hz & 58-62 Hz for 100 & 120V, 48-52 Hz for 220 & 240V
Power Consumption:	115W/175VA maximum w/pak
Fuse Protection:	Primary and secondary fuse protection

PHYSICAL AND ENVIRONMENTAL SPECIFICATIONS

Dimensions:	38.1 x 15.2 x 27.3 cm (15" x 6" x 10.8")
Weight:	6.4 kg (14.1 pounds)
Shipping Weight:	7.3 kg (16.1 pounds)
Operating Temperature:	+5° to +45°C (41° to 113°F)
Storage Temperature:	−40° to +70°C (−40° to +158°F)
Humidity:	To 95% (noncondensing)
Operational Altitude:	To 10,000 feet

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