



iUP-200/iUP-201



iUP-200/iUP-201 UNIVERSAL PROM PROGRAMMERS

FUNCTIONAL DESCRIPTION

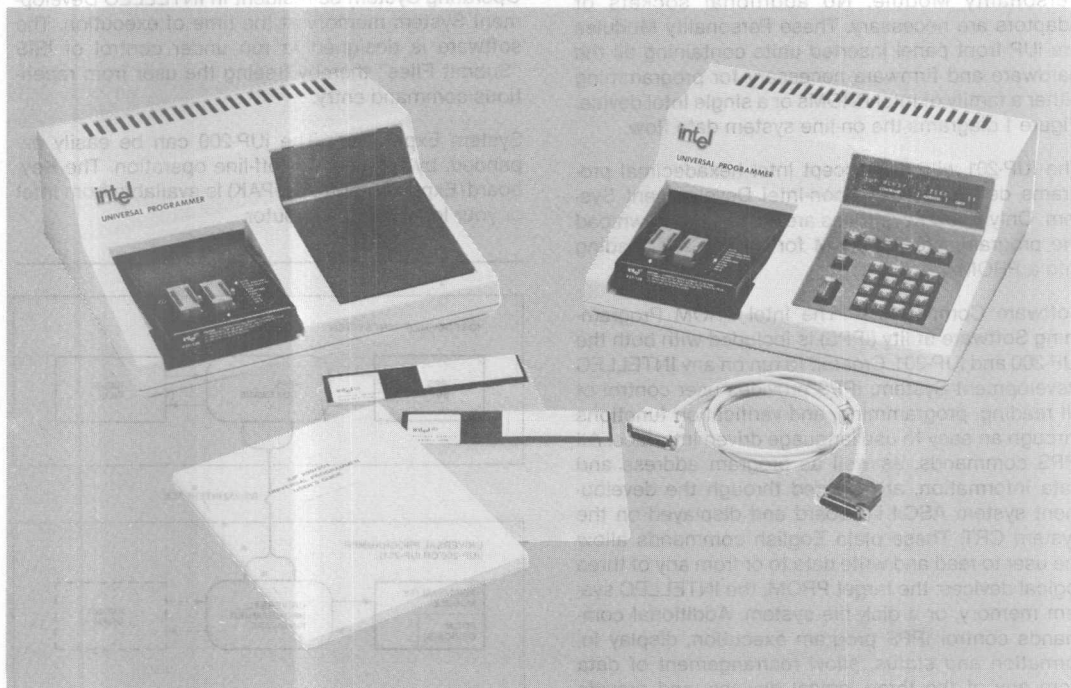
MAJOR iUP-200/iUP-201 FEATURES:

- **Serial interface to all INTELLEC® Development Systems**
- **Powerful PROM Programming Software utility (iPPS)**
- **Support for all Intel PROM families through multiple device Personality Modules**
- **iUP system self-tests plus device integrity checks**

The iUP-200 and iUP-201 Universal Prom Programmars provide programming and verification of data in all the Intel programmable ROMs (PROMs). They can also be used for programming the PROM memory portions of Intel's single-chip microcomputer and peripheral devices. When used with any INTELLEC Development System, the iUP-200 and iUP-201 provide on-line programming and verification with the aid of the Intel PROM Programming Software utility (iPPS). In addition, the iUP-201 supports off-line, stand-alone, program editing and PROM duplication. The iUP-200 is completely expandable to the iUP-201.

ADDITIONAL iUP-201 FEATURES:

- **24-character alpha-numeric display**
- **Full hexadecimal plus 11-function keypads**
- **Off-line editing and device duplication**
- **16K bytes RAM expandable to 32K bytes**



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FUNCTIONAL DESCRIPTION

On-Line System

Hardware Components—The basic iUP-200 and iUP-201 consist of a free-standing unit that, when interfaced directly to any Intel Development System equipped with at least 64K bytes of user memory, provides "on-line" PROM programming and verification of Intel programmable devices. In addition, the units can read the contents of the ROM versions of these devices. Communication with the host is accomplished through a standard RS232C serial data link. A serial converter is needed when using the MDS-800 as a host system. These converters are available from other manufacturers. Each unit contains an 8085 CPU, selectable power supply, 2.3K bytes of static RAM, 8K bytes of pre-programmed EPROM, a programmable timer, and circuitry for interfacing to a Personality Module, keyboard, display, and host system. The pre-programmed EPROM contains the firmware needed for all iUP edit and control functions.

The interface between the iUP and the target PROM is accomplished using a family or single-device Personality Module. No additional sockets or adaptors are necessary. These Personality Modules are iUP front panel inserted units containing all the hardware and firmware necessary for programming either a family of Intel PROMs or a single Intel device. Figure 1 diagrams the on-line system data flow.

The iUP-201 will also accept Intel hexadecimal programs developed on a non-Intel Development System. Only a few keystrokes are required to download the program into iUP RAM for editing and loading into a PROM.

Software Components—The Intel PROM Programming Software utility (iPPS) is included with both the iUP-200 and iUP-201. Created to run on any INTELLEC Development System, iPPS provides user control of all reading, programming, and verification functions through an easy to use language driven interface. All iPPS commands, as well as program address and data information, are entered through the development system ASCII keyboard and displayed on the system CRT. These plain English commands allow the user to read and write data to or from any of three logical devices: the target PROM, the INTELLEC system memory, or a disk file system. Additional commands control iPPS program execution, display information and status, allow rearrangement of data from any of the three logical devices, and provide user assistance information in the form of a HELP command. Figure 2 summarizes these commands.

Loading programs into a PROM from INTELLEC system memory or directly from a disk file is accomplished under iPPS control. Access to the disk allows the user to create and manipulate data in a virtual buffer with an address range up to 16M. This large block of data can be formatted into different PROM word sizes for program storage into several different PROM types. In addition, a program from any of the three logical devices can be "interleaved" with a second program and entered into a specific target PROM or PROMS.

iPPS supports data manipulation in any Intel format: 8080 hexadecimal ASCII, 8080 absolute object, 8086 hexadecimal ASCII, 8086 absolute object, and 286 absolute object. Addresses and data can be displayed in one of several number bases including binary, octal, decimal, and hexadecimal. The user can easily change defaulted data formats as well as number bases.

iPPS requires that version 3.4 or later of Intel's ISIS-II Operating System be resident in INTELLEC Development System memory at the time of execution. The software is designed to run under control of ISIS "Submit Files" thereby freeing the user from repetitive command entry.

System Expansion—The iUP-200 can be easily expanded, by the user, for off-line operation. The Keyboard/Expansion Kit (iUP-PAK) is available from Intel or your local Intel Distributor.

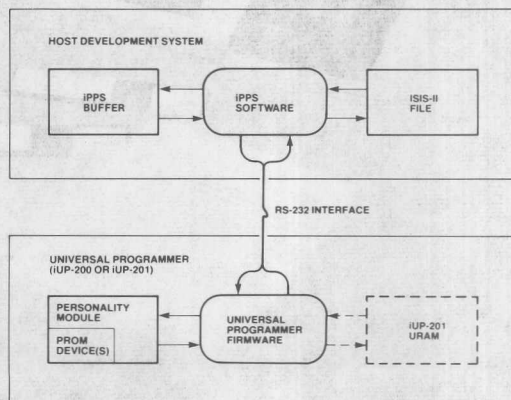


Figure 1. On-Line System Data Flow

Program Control Group—Controls the program execution of iPPS.

EXIT
<ESC>
REPEAT
ALTER

Exits iPPS and returns control to ISIS-II
Terminates current command
Repeats full execution of previous command
Allows edit and re-execution of previous command

Utility Group—Displays user information, status, and sets default values.

DISPLAY
PRINT
HELP
MAP
BLANKCHECK
OVERLAY
TYPE
INIT
WORKFILES

Displays PROM, Buffer, or File data on the console
Prints PROM, Buffer or File data on a printer
Selectively displays user assistance information
Displays Buffer structure and status
Checks for unprogrammed PROM
Checks if non-blank PROM can be programmed
Selects PROM type
Initializes the default number base and file type
Specifies drive device for temporary work files

Buffer Group—Edits, modifies, and verifies data in the Buffer.

SUBSTITUTE
LOADDATA
VERIFY

Examines and modifies Buffer data
Loads a section of the buffer with a constant
Verifies data in PROM with Buffer data

Formatting Group—Permits rearrangement of data from PROM, Buffer, or File.

FORMAT

Interactively formats the Buffer, PROM, or File data and places the result in a workfile

Copy Group—Provides for variations of the general purpose COPY command.

COPY (File to PROM)
COPY (PROM to File)
COPY (Buffer to PROM)
COPY (PROM to Buffer)
COPY (Buffer to File)
COPY (File to Buffer)
COPY (File to URAM)
COPY (URAM to File)
COPY (Buffer to URAM)
COPY (URAM to Buffer)

Programs PROM with data in a file on disk
Saves PROM data in file on disk
Programs PROM device from Buffer
Loads Buffer with data in PROM
Saves Buffer in file on disk
Loads Buffer from file on disk
Loads file data into iUP URAM (iUP-201 only)
Save iUP URAM data in a file (iUP-201 only)
Loads Buffer into iUP URAM (iUP-201 only)
Loads iUP URAM data into the Buffer (iUP-201 only)

Figure 2. iPPS Command Summary**iUP-200 On-Line System Configuration**

Off-Line System

While capable of performing all the on-line functions, the iUP-201 allows program editing, PROM duplication, and program verification independent of the host system. In addition to the hardware components included as part of the iUP-200, the iUP-201 contains a 24-character alphanumeric display, full HEX and 11-function keypads, and 16K bytes of user RAM (URAM) expandable to 32K bytes. This expansion provides memory needed to store data for PROMs exceeding 16K bytes (128K bits) in size. Figure 3 illustrates the iUP-201 keyboard and display.

The two logical devices accessible during off-line operation are the PROM device and iUP-201 RAM. Typical operation would entail copying the data from a PROM (or ROM) into iUP RAM, modifying this data in RAM, and programming the modified data back into a PROM device. The address range of the needed RAM is automatically determined by the iUP when PROM type selection is made.

Figure 4 summarizes the off-line commands.

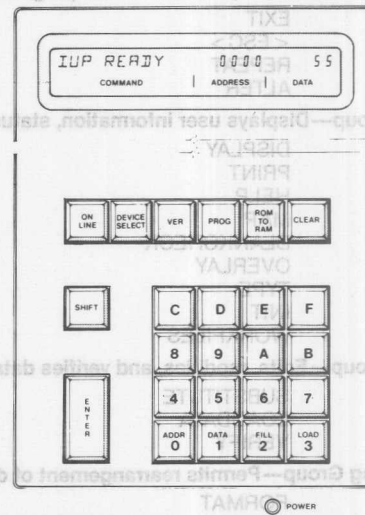


Figure 3. iUP-201 Keyboard and Display












	Selects either the on-line or the off line operation. When on-line, all other function keys are disabled.
	Selects the PROM type when a Personality Module capable of programming multiple devices is used. The selected device is indicated by an adjacent LED on the installed module.
	Verifies the contents of the installed PROM device with that of the iUP RAM. The iUP display indicates address and the 2's complement of any expected vs. actual mismatch.
	Performs a device Blank Check and then programs the target PROM with data from iUP RAM. If Blank Check fails, pressing PROG again will perform a stuck bit check to further verify PROM/Program compatibility.
	Loads the iUP RAM with the data from the PROM device installed in the Personality Module.
	Terminates the current off-line function, clears a user entry, or restores the display after an error condition.
	Pressing the ENTER key transfers information from the iUP display (addresses or data) into URAM.
	Pressing the shift key and ADDR/0 key selects the address field for keypad entry.
	Pressing the shift key and DATA/1 key selects the data field for keypad editing and entry.
	Pressing the shift key and FILL/2 key selects the fill function, which allows a contiguous section of RAM locations to be loaded with a constant.
	Pressing the shift key and LOAD/3 initiates a download of Intel hexadecimal data from any development system with an RS-232C port.

Figure 4. Off-Line Command Summary

SYSTEM DIAGNOSTICS

Both the iUP-200 and iUP-201 include self-contained system diagnostics that provide verification of system operation and aid the user in fault isolation. Diagnostics are performed on the power supply, CPU, internal firmware ROM, internal RAM, timer, and on the iUP-201 keyboard and URAM. In addition, tests are made on any Personality Module installed in the programmer the first time the module is accessed. They include tests on the power select circuitry and the 2K of module firmware. Easy to read status messages are provided on the development system display in the on-line mode and the iUP-201 display in the off-line mode.

PERSONALITY MODULES

The iUP-200 and iUP-201 interface with a selected PROM (or ROM) through an associated Personality Module. These modules contain all of the hardware and firmware needed to read and program a family of Intel devices. Each module is a single molded unit, front panel inserted on either programmer. No additional adapters or sockets are needed. Figure 5 lists the available modules.

- iUP-F27/128** - E²EPROM Personality Module capable of reading and programming the 2716, 2732, 2732A, 2764, 27128, 2815, and 2816.
- iUP-F87/51** - MICROCONTROLLER Personality Module capable of reading and programming the 8748, 8748H, 8048, 8749, 8049, 8750, 8050, 8751, and 8051.
- iUP-F87/44** - PERIPHERAL Personality Module capable of reading and programming the 8741A, 8041A, 8742, 8042, 8744, 8044, and 8755A.
- iUP-F36/32** - BIPOLAR Personality Module capable of reading and programming the 3628, 3632, 3632A, 3636, 3636B, and 3624.

Figure 5. iUP Personality Modules

Interfaces

Each personality module, an example is shown in Figure 6, interfaces with the programmer through a 41-pin connector. Module firmware is uploaded into iUP RAM and executed by the onboard 8085A processor. This firmware contains routines needed to Read and Program a number of PROMs. In addition, the personality module sends specific information regarding the selected PROM to the iUP to aid in performing PROM device integrity checks.

Operational status is indicated through individual LEDs on each module. A column of device selection LEDs indicate which PROM device type the user has selected. After device selection, an LED below each socket (on modules containing more than one socket) indicates the socket to be used. A red indicator light (Hot Socket) warns the user when power is being supplied to the selected device.

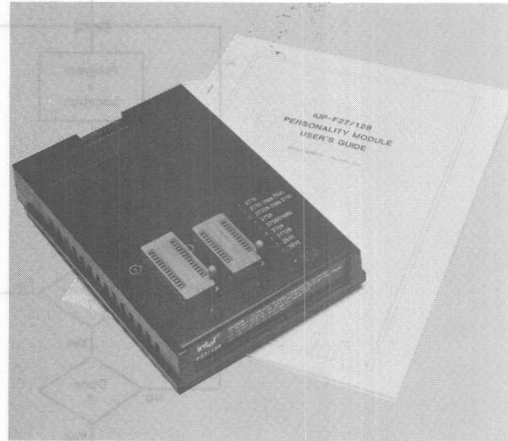


Figure 6. iUP-F27/128

Device Integrity Checks

In addition to the iUP system self-tests, each Personality Module contains diagnostics in firmware that perform selected PROM tests and indicate status. These tests are performed in both the on-line and off-line modes. A PROM installation test is performed to insure the device is installed in the module correctly and the ZIF socket is closed. A PROM Blank Check is

performed to determine whether a device is in its erased state. The iUP automatically determines whether this erased state is all zeros or all ones. A stuck bit check is performed when a PROM is found to be not blank. This test determines which bits are pre-programmed, compares those bits against the program to be loaded, and allows programming to continue if they match. As with the system self-tests,

easy to read status messages are provided. All of the PROM device integrity checks, with the exception of the installation test which occurs automatically any time an operation is selected, can be invoked by the user.

Figure 7 illustrates a typical on-line and off-line programming sequence.

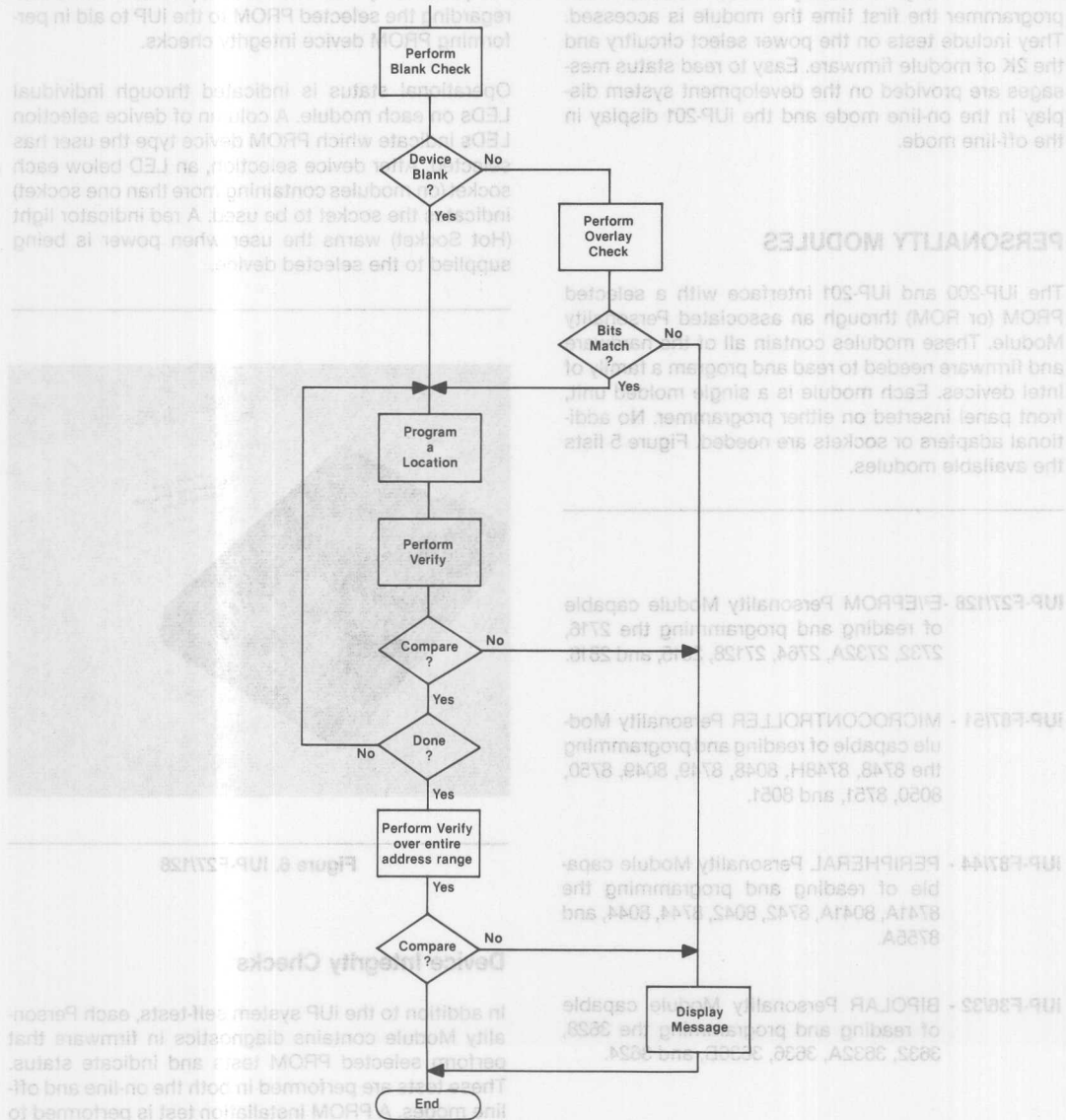


Figure 7. iUP Programming Sequence

iUP-200/201 SPECIFICATIONS
Control Processor

Intel 8085A Microprocessor
6.144 MHz Clock Rate

Memory

RAM—2.3K bytes Static
ROM—8K bytes EPROM

Interfaces

Keyboard—16 character Hexadecimal and 11-function keypad (iUP-201 only)
Display—24 Character Alphanumeric (iUP-201 only)

Software

Monitor—System Controller in pre-programmed EPROM
iPPS—Intel PROM Programming Software utility on supplied diskette

Physical Characteristics

Depth—15 inches (38.1 cm)
Width—15 inches (38.1 cm)
Height—6 inches (15.2 cm)
Weight—15 lbs. (6.8 kg)

Electrical Characteristics

Selectable 100, 120, 200, or 240 Vac \pm 10%;
50 - 60 Hz
Maximum power consumption—80 watts

Environmental Characteristics

Operating Temperature—10°C to 40°C
Operating Humidity—0% to 95% Relative Humidity

Reference Material

iUP-200/201 Universal Programmer User's Guide
iUP-200/201 Pocket Reference Card

PERSONALITY MODULE SPECIFICATIONS
Memory

EPROM — 2K bytes

Physical Characteristics

Width — 5.5 inches (14.0 cm)
Height — 1.6 inches (4.1 cm)
Depth — 7.0 inches (17.8 cm)
Weight — 1 lb. (.45 kg)

Electrical Characteristics

Maximum power consumption (module)—5 watts
Maximum power consumption (device)—2.5 watts
Maximum power consumption (total from iUP)—7.5 watts

Environmental Characteristics

Operating Temperature—10°C to 40°C
Operating Humidity—0% to 95% relative humidity

Reference Material

Selected Personality Module User's Guide

ORDERING INFORMATION

Part Number	Description
iUP-200	Intel On-Line Universal Programmer
iUP-201	Intel On-Line/Off-Line Universal Programmer
iUP-F27/128	E ² EPROM Personality Module
iUP-F87/51	MICROCONTROLLER Personality Module
iUP-F87/44	PERIPHERAL Personality Module
iUP-F36/32	BIPOLAR Personality Module