

PC-ISP-FLASH[®]

Quick Start Manual



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INTRODUCTION

The PC-ISP-FLASH Windows-based Programmer provides support for the new In **S**ystem **P**rogrammable (**ISP**) and In **A**pplication **P**rogrammable (**IAP**) Flash Microcontrollers from many major manufacturers. The PC-ISP-FLASH adaptor interfaces directly to the standard RS232 Serial Port on any IBM-compatible PC and is compatible with most PC's. The PC-ISP-FLASH software runs on Windows 95/98/2000/NT. Using simple drop-down menus, the software allows the user to select a Flash microcontroller from the list of supported vendors and devices.

PC-ISP-FLASH can be used to program FLASH microcontrollers in a PLCC 44 package directly in the On Board Programming Socket or in a variety of different packages in the Family Adaptor Board 1 (FAB1). PC-ISP-FLASH also allows direct programming via ISP or IAP of Flash parts already installed on your Target Board.

PC-ISP-FLASH CONTENTS

- PC-ISP-FLASH Adaptor
- Family Adaptor Board 1 (FAB1)
- Software on floppy disk(s)
- PC-ISP-FLASH Quick Start Manual
- Power Supply
- PC Serial Cable
- DB9M – DB25F Adapter
- ISP/IAP Target Cable

BEFORE YOU BEGIN

Requirements

- Windows 95, Windows 98, Windows NT4.0, or Windows 2000
- 2MB Disk Space
- 3 ½" 1.44MB Floppy Disk Drive (used for software installation only)
- Standard RS232 Serial Port

Power Requirements

The PC-ISP-FLASH Adaptor is powered by a wall mounted UL and CSA listed power supply designed for 110VAC outlets which provides 6V DC at 500 milliamps. The power connector is a 2.1 mm phono plug with center positive polarity.

For some International Applications a universal input Power Supply may be required. A suitable replacement power supply is the Condor part # SA-061A5F-11-205IP, with a 6VDC 1.5 A output. Contact Condor Power Supplies at (408) 745-7141 or www.buycondor.com for pricing and availability.

Note: Do not replace the factory power supply with anything other than the universal power supply listed above. Doing so may cause problems to occur.

GENERAL OPERATION

Installing the PC-ISP-FLASH Software

- Insert the floppy into the appropriate floppy drive
- Select "START", "RUN.", and enter "x:\setup" where x is the drive letter for the floppy drive, typically A. Then select "OK" with the mouse.
- Follow the instructions provided by the software installation program.

Connecting the PC-ISP-FLASH Adaptor to your computer

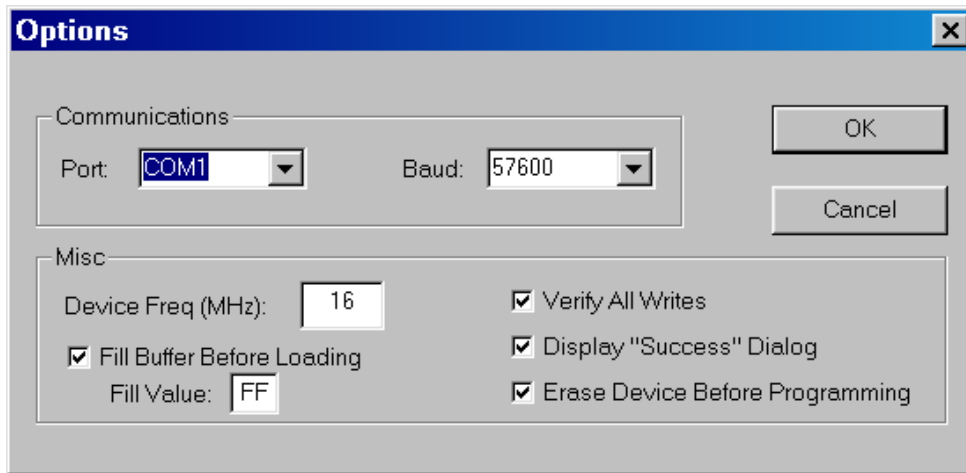
- Ground yourself before handling the PC-ISP-FLASH adaptor by touching the bare metal on the rear of your computer.
- It is not necessary to power-down the PC before connecting the PC-ISP-FLASH adaptor.
- Remove the PC-ISP-FLASH Adaptor from the anti-static bag.
- Select an available RS232 Serial Port.
- Connect the PC-ISP-FLASH Adaptor to the PC Serial Port with the supplied cable.

On Board programming socket

The On Board programming socket (Socket #1, S1) is located on the PC-ISP-FLASH adaptor itself and is the Primary location for programming parts in PLCC44 package. See the specific list of supported devices in the PC-ISP-FLASH software for actual programming location for each device.

PC-ISP-FLASH Software Options

The PC-ISP-FLASH Software has several user-settable options available on the “Options” screen.



Communications

- Port – This window selects the desired PC serial port utilized by the PC-ISP-FLASH software to communicate with the PC-ISP-FLASH Adaptor.
- Baud – This window selects the desired baud rate the PC-ISP-FLASH software will utilize to communicate with the PC-ISP-FLASH Adaptor.

Due to the method of programming utilized by certain Philips devices, some combinations of baud rate and crystal frequency will not work together. If communications errors occur, try a different baud rate. If you are using socket S1 or the FAB1 with the default 3.6864 MHz oscillator, you should select 57600, 19200, 9600, or 4800 baud as the communications rate.

Note: Not all parts operate at all baud rates. If an error occurs while using the PC-ISP-FLASH, try cycling power and/or changing baud rates.

Miscellaneous

- Device Frequency (MHz) – This window selects the operating frequency of the device being programmed. The value entered should be an integer number only. For example, if your target frequency is 11.0592MHz, you should enter 11MHz.

When programming devices located in the PC-ISP-FLASH Adaptor socket (Socket #1, S1), this setting should be 11MHz.

If the device being programmed is located on the Family Adaptor Board 1 (FAB1), the Device Frequency should be set to 4MHz.

If the device being programmed is located on a Target Board, the Device Frequency should be configured to match the operating frequency of the target device (the crystal or oscillator value).

- Fill Buffer Before Loading – If this box is selected, the software will fill the buffer with the desired value (in hex) before loading a file from the PC disk. This option is normally selected and the default fill value is FF.
- Verify All Writes – If this box is selected, the software will verify all writes and report any failures. This option is normally selected.
- Display “Success” Dialog – If this box is selected, the software will display a dialog box at the completion of each command that indicates the successful completion of the command. This option is normally selected.
- Erase Device Before Programming – If this box is selected, the software will erase the device before programming. This option is normally selected.

Family Adaptor Board (FAB1)

The FAB1 contains programming sockets #2 – 8 and is the primary location for programming Atmel parts and Philips DIP parts. See the online help for a detailed list of supported devices. The Family Adaptor Board 1 contains the following sockets:

- 2 PLCC 44-pin sockets
- 2 Dip 40 (Wide) Sockets
- 1 Dip 28 (Narrow) Socket

- 1 Dip 20 (Narrow) Socket
- 1 Dip 8 (Narrow) Socket

Installing and Removing Devices

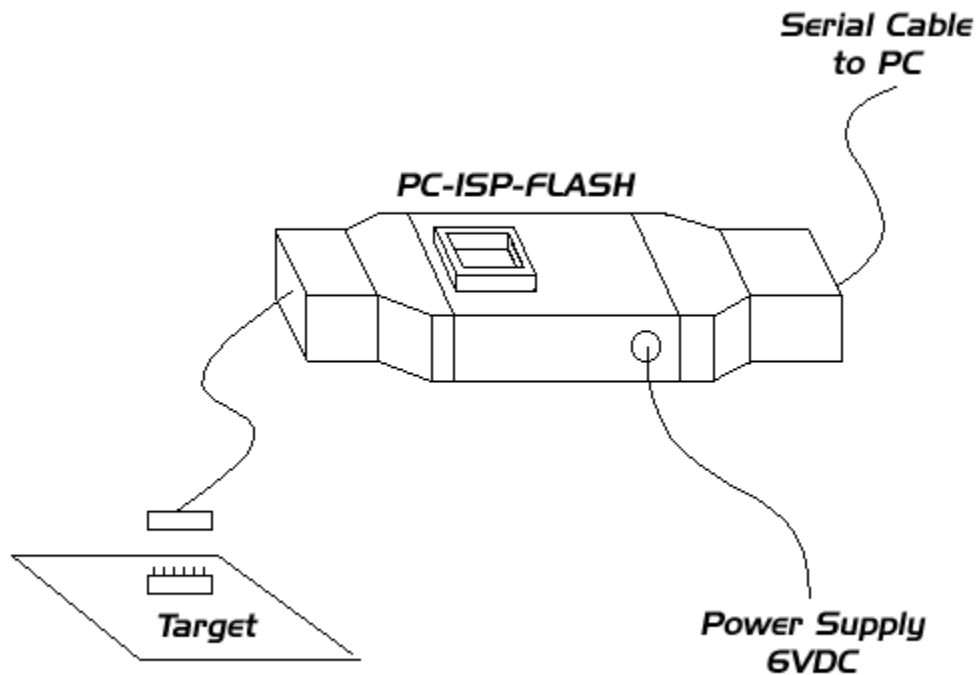
Important Note: When inserting or removing devices from the PC-ISP-FLASH adapter or FAB1 sockets power must be removed. Before applying power to the PC-ISP-FLASH adapter, make sure the device to be programmed is correctly installed in the socket on the Adapter or the FAB1.

TARGET BOARD APPLICATION

Connecting the PC-ISP-FLASH Adaptor to your target board

Included in the PC-ISP-FLASH is a 16" six-conductor ISP/IAP cable for connecting the PC-ISP-FLASH adaptor to your target board. Extreme care should be taken to verify the proper power & ground connections. The PC-ISP-FLASH or your target board may be damaged by improper connection of this cable.

Example of ISP or IAP connection to Target Board



Summary of Target Board Requirements to support PC-ISP-FLASH

- **Reset** – For proper operation the PC-ISP-FLASH *must* have complete control over the reset input to the microcontroller on the Target Board. If there are any active components controlling the reset input to the target microcontroller, the PC-ISP-FLASH will not work properly unless those components are socketed so they can be removed or can have the Reset output pin lifted. In addition, if the Target Board utilizes an external watchdog timer (WDT), such as the Dallas Semiconductor DS1232, the PC-ISP-FLASH will not work properly unless the WDT can be removed or disconnected from the Reset input to the microcontroller being programmed.
- **Serial Port Interface** - The Target Board ISP/IAP connector is typically connected directly to the Serial Port pins (TxD, RxD). The PC-ISP-FLASH must have complete control over the TxD and RxD signals for proper operation. If the Target Board contains RS232 transceivers such as the Maxim MAX232, then the part must be disabled or removed so that it does not interfere with the proper operation of TxD and RxD.
- **SPI Interface** - The Target Board ISP/IAP connector is typically connected directly to the SPI pins (SCK, MOSI, MISO). The PC-ISP-FLASH must have complete control over these SPI signals for proper operation.
- **EA** – The microcontroller on the Target Board must be configured to boot from internal code space (normally EA low) to support ISP/IAP programming with PC-ISP-FLASH. If the normal operation of this target microcontroller is to boot from external code space, a jumper is required to configure the microcontroller for internal code space when the PC-ISP-FLASH is utilized.

PC-ISP-FLASH Adaptor Target Connector Pinout

The PC-ISP-FLASH Adaptor Target Connector is a 15-pin HD15 connector utilized to interface the PC-ISP-FLASH to a wide variety of ISP/IAP Target Boards. The complete pinout is listed below. Normal ISP/IAP operation will only utilize 6 of the signals as detailed in the next section. The other pins are provided for expansion and to allow support for additional ISP/IAP features and devices in the future.

Pin	Description
1	Power output (not normally used, max 10mA)
2	SCL (I2C, not supported)
3	SDA (I2C, not supported)
4	Spare I/O, unused
5	Power input (not normally used)
6	Clock output (not supported)
7	Spare I/O, unused
8	PSEN (Philips) or SCK (SPI)
9	Reset output
10	TXD TTL-level output (Serial Port) or MOSI output (SPI)
11	RXD TTL-level input (Serial Port) or MISO input (SPI)
12	TXD RS232-level output (Serial Port)
13	RXD RS232-level input (Serial Port)
14	Ground
15	Ground

ISP/IAP Target Board Connector Pinout

The ISP/IAP Target Board Connector is a 6-pin connector located on the target board that is utilized for connecting the PC-ISP-FLASH adaptor to the target board for on-board programming of ISP/IAP-capable devices. The standard connector utilized should be a single-row 6-pin header with 0.100" pin spacing, (using 0.025" square posts). There are three distinct modes of operation for the ISP/IAP target interface:

1. Serial Port Devices (high true Reset) - these include the 89C51RX2 and 89C66x type devices. These microcontrollers utilize a serial port based (TxD and RxD) command interface for ISP or IAP programming.
2. Serial Port Devices (low true Reset) - these include the Philips XA-G49 devices. These microcontrollers utilize a serial port based (TxD and RxD) command interface for ISP or IAP programming.
3. SPI-based devices - these include the Atmel 8051 devices and AVR devices. These microcontrollers typically utilize a slave-mode SPI interface (SCK, MOSI, MISO)

Listed below are the pinouts for the three different operating modes:

**Serial Port Devices - high true Reset
89C51Rx2 & 89C66x type devices**

Pin	Description
1	Power
2	Reset (high-true reset connected to micro reset input)
3	Program Store Enable (PSEN-)
4	Ground
5	Receive Serial Data (RXD)
6	Transmit Serial Data (TXD)

**Serial Port Devices - low true Reset
Philips XA-G49 device**

Pin	Description
1	Ground
2	Reset (low-true reset connected to XA reset input)
3	Program Store Enable (PSEN-)
4	Ground
5	Receive Serial Data (RXD)
6	Transmit Serial Data (TXD)

**SPI-based devices
Atmel 8051 devices and AVR devices**

Pin	Description
1	Power
2	Reset (high-true reset connected to micro reset input)
3	Slave Clock Input (SCK), SPI Interface
4	Ground
5	Slave Data Output (MOSI), SPI Interface
6	Slave Data Input (MISO), SPI Interface

PC-ISP-FLASH Target Cable Specifications

The PC-ISP-FLASH Target Cable is utilized to connect the PC-ISP-FLASH Adapter to your specific target board that supports In-System-Programming (ISP) via the standard ISP Interface Header. The Target Cable may easily be modified in case your target board does not utilize the standard ISP header. Below are the details for the construction of the Target Cable.

Part List

<u>Qty</u>	<u>Part Description</u>	<u>Part Number</u>
1	HD15, Str, Solder, Male	Digikey A2091-ND
1	D-Submarine Connector Hood	Jameco 15721
1	Cable, 6 Cond, Unsh 22AWG UL2464, 16"	Digikey W124-500
6	.100" Non-Polarized Connector Crimp Pins	Jameco 100765
1	.100" Non-Polarized Connector Housing	Jameco 103211
1	Jumper Wire	No Part Number

Wire Assembly

Strip 1 inch on one end of the 16-inch cable and solder the wires to the HD15 male connector using the color code/pinout below, then add the connector hood over the wires. Strip and Crimp the Connector pins on each wire using Crimping Tool. Place the pins into the .100 connector Housing using the color code/pinout below:

From		To	
Pin	Description	Pin	Description
1	Red	1	Red
9	Green	2	Green
8	Brown	3	Brown
14	Black	4	Black
10	Blue	5	Blue
11	White	6	White
2	Jumper to pin 3		
3	Jumper to pin 2		

PC-ISP-FLASH Adaptor Jumper Settings

JP1 selects the serial interface signal levels utilized on the PC-ISP-FLASH target connector. The normal JP1 setting would be 1-2 for TTL-level interface. This would be used if the PC-ISP-FLASH adaptor is being connected directly to the UART or SPI pins on your target microcontroller.

The JP1 setting would be 2-3 for RS232 signal levels. This would be used if the PC-ISP-FLASH adapter were being connected to a MAX232 device or other RS232 level interface on your target board. If RS232 signal levels are desired, the Target Cable to the PC-ISP-FLASH must be modified to switch the connections for TxD and RxD from pins 10 & 11 to pins 12 & 13.

JP1 Configuration options:

Setting	Description
1-2	Selects TTL signal levels (default)
2-3	Selects RS232 signal levels

APPENDICES

Appendix A: Software Updates

PC-ISP-FLASH Software updates are available directly from the FDI web site at www.teamfdi.com.

Appendix B: Technical Support

Philips Semiconductors, ATMEL, Microchip, and other IC vendors provide technical support for their ISP/IAP Flash microcontrollers. Technical Support for the PC-ISP-FLASH is available directly from FDI via email at support@teamfdi.com. You may also fax your technical support questions to (256) 883-1241 or call us directly at (256) 883-1240. Support questions that are emailed will usually receive faster response times than fax or phone requests.

Appendix C: Disclaimer

ESD may damage electronic components. Be sure to touch the surface of a grounded device (such as the bare metal on the rear of your computer) before handling the PC-ISP-FLASH.

FDI is not responsible for any damage that may be caused by misuse or improper installation of the PC-ISP-FLASH.

Note: Opening the PC-ISP-FLASH by breaking the seal on the “adaptor” will void the warranty.