

***Future Designs, Inc.***

**Your Development Partner**

**[www.teamfdi.com](http://www.teamfdi.com)**



**In-Circuit Programming  
for  
NXP Flash Microcontrollers**



# ISP / ICP defined

- In-system programming (ISP) mode  
In System Programming occurs when an outside device causes the processor to execute code at a location that contains memory erase and programming routines (a boot loader), rather than executing its normal application code.
- In-circuit programming (ICP) mode  
ICP is different from ISP (In System Programming) because it is done completely by the microcontroller's hardware and does not require a boot loader.

# USB-ICP Basics



- FDI offers three versions of USB-ICP with unique cables and features for different microcontrollers
- Provide a virtual USB to serial port interface to allow hex file transfer from the PC to a User Target Board
- Also provide timing and control signals needed for true ICP programming
- USB powered so no power supply required
  - Supports USB 2.0
- All versions use NXP free Flash Magic Software

# USB-ICP Family

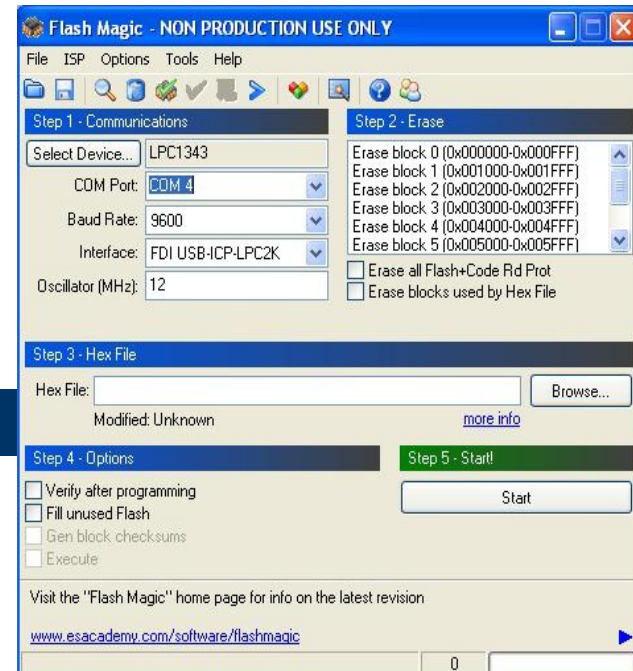


- Three versions of the USB-ICP device
  - USB-ICP-LPC2K (ISP programming mode)
  - USB-ICP-LPC9xx (ICP programming mode)
  - USB-ICP-80C51ISP (ISP programming mode)
- 2 wire serial interface to program and erase the target
- Use NXP free Flash Magic Software
- USB powered so no power supply required
- Target Cables included

<http://www.teamfdi.com/USB-ICP>

# Flash Magic Software

- Download Flash Magic at <http://www.flashmagictool.com/>
- Configuring Flash Magic
  - Select Device: drop down list for available microcontrollers
  - COM Port: the port assigned to the USB-ICP device
  - Baud Rate: set to 9600
  - Interface: drop down list for FDI available programmer  
FDI USB-ICP-LPC2K
  - Oscillator: 12 MHz





# USB-ICP-LPC2K

- **In-System Programmer (ISP) for NXP ARM Devices**
  - ARM7 based LPC2xxx family
  - Cortex-M3 based LPC17xx family
  - Cortex-M3 based LPC13xx family
  - Cortex-M0 based LPC11xx family



<http://www.teamfdi.com/USB-ICP>

# USB-ICP-LPC2K



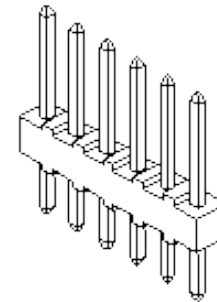
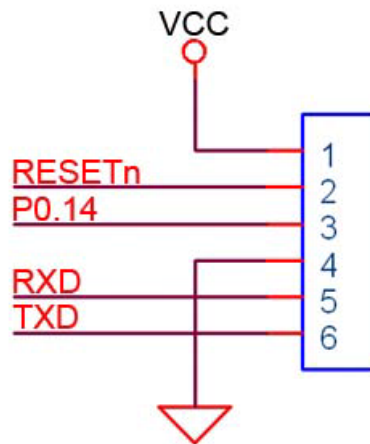
- Can be used with customer target boards
- Works with the SAB-TFBGAxxx BGA adapter boards
- USB powered so no power supply required
  - Supports USB 2.0
- 18" Target Cable included
- Cable for SOMDIMM-LPC2478 also included
- Price \$79.00, in stock for immediate shipment



<http://www.teamfdi.com/USB-ICP>

# USB-ICP-LPC2K Interface

- A small connector is all that is needed to interface your ISP application to the USB-ICP-LPC2K programmer



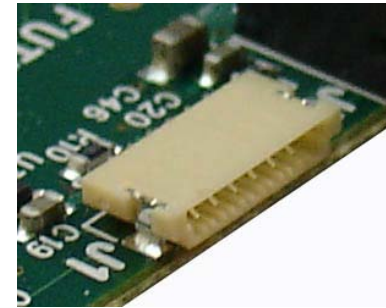
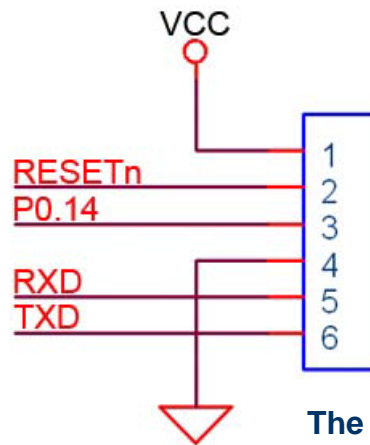
6-pin 0.1" Header  
Standard ISP

The ISP function uses only six pins: VCC, GND, RXD, TXD, P0.14 (or P2.10) and RESETn. The simple example circuit above is all that must be added to the user's application to use ISP with USB-ICP

# USB-ICP-LPC2K Interface



- A mini ISP cable is also provided for direct programming of SOMDIMM-LPC2478 from FDI Touch Screen LCD Kits like DK-57TS-LPC2478



The ISP function uses only six pins: VCC, GND, RXD, TXD, P0.14 (or P2.10) and RESETn. The simple example circuit above is all that must be added to the user's application to use ISP with USB-ICP

# BGA Socket Adapter Boards

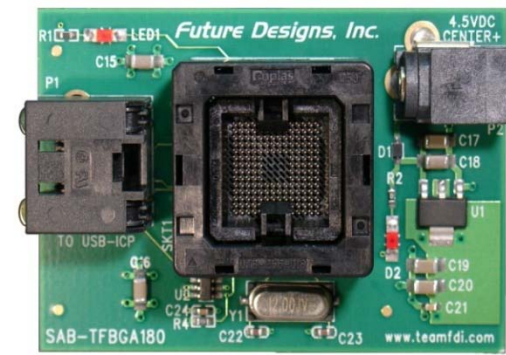
for use with USB-ICP-LPC2K



- Program & test NXP micros **before** the user's board is available
- Available for TFBGA100, TFBGA180, TFBGA208 devices
- Plugs directly into USB-ICP-LPC2K
- RJ45 Ethernet style cable included
- Two test LEDs, blink.hex test program at [www.teamfdi.com](http://www.teamfdi.com)



USB-ICP-LPC2K shown with SAB-TFBGA180  
(USB-ICP Sold Separately)



# BGA Socket Adapter Boards

## Part Number

## Supports

SAB-TFBGA100

LPC2364, LPC2368

SAB-TFBGA180

LPC2458

SAB-TFBGA208

LPC2468, LPC2478

- SAB-TFBGA100 \$149.00 each
- SAB-TFBGA180/208 is \$249.00 each
- In Stock for immediate shipment

<http://www.teamfdi.com/USB-ICP>

# USB-ICP-LPC9xx



- In-Circuit Programmer (ICP) for LPC9xx family
- Works with the SAB9 adapter board
- Can also be used with customer provided boards
- USB powered so no power supply required
  - Supports USB 2.0
- Target Cable included
- Price \$69.00, in stock for immediate shipment

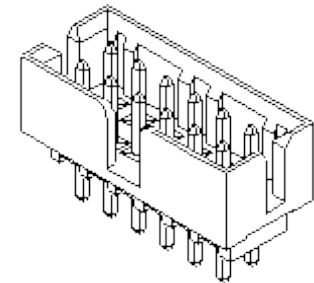
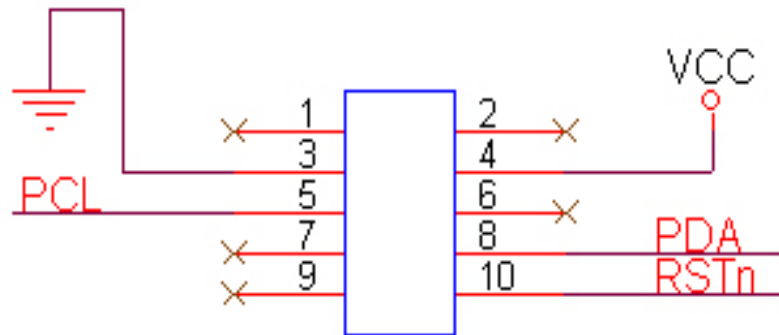


<http://www.teamfdi.com/USB-ICP>

# USB-ICP-LPC9xx Interface

- A small connector is all that is needed to interface your ISP application to the USB-ICP-LPC9xx programmer

The target connector is a standard 2mm pitch, 10-pin, shrouded header available from numerous suppliers. Shrouded connectors should be utilized in order to protect the pins and ensure proper connector insertion.

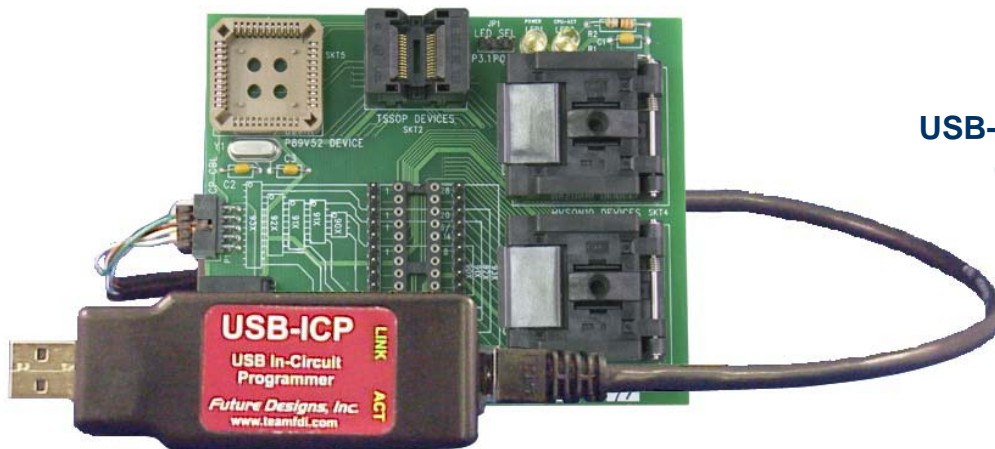


The ICP function uses only five pins: VCC, GND, PCL, PDA, and RSTn. The simple circuit above is all that must be added to the user's application to use ICP with USB-ICP.

# SAB9 – Socket Adapter Board

for use with USB-ICP-LPC9xx

- Program & test NXP micros **before** the user's board is available
- Supports HVQFN28, HVSON10, DIP8-28, TSSOP, PLCC44
- All signals routed to two 14-pin headers except for PLC44
- Plugs directly into USB-ICP-LPC9xx
- P/N USB-ICP-SAB9, Price is \$149.00, In Stock



USB-ICP-SAB9 shown with USB-ICP-LPC9xx  
(USB-ICP-LPC9xx Sold Separately)

<http://www.teamfdi.com/USB-ICP>

# USB-ICP-80C51ISP



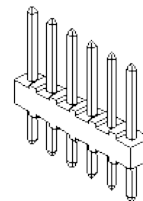
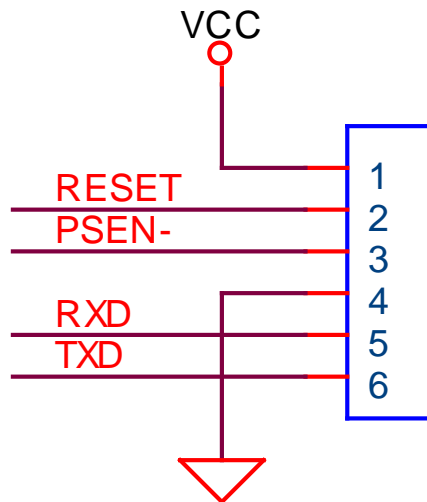
- In-System Programmer (ISP) for NXP's 80C51 flash based microcontroller families
- Used with a customer provided target board
- USB powered so no power supply required
  - Supports USB 2.0
- 18" Target Cable included
- Price \$69.00, in stock for immediate shipment



<http://www.teamfdi.com/USB-ICP>

# USB-ICP-80C51ISP Interface

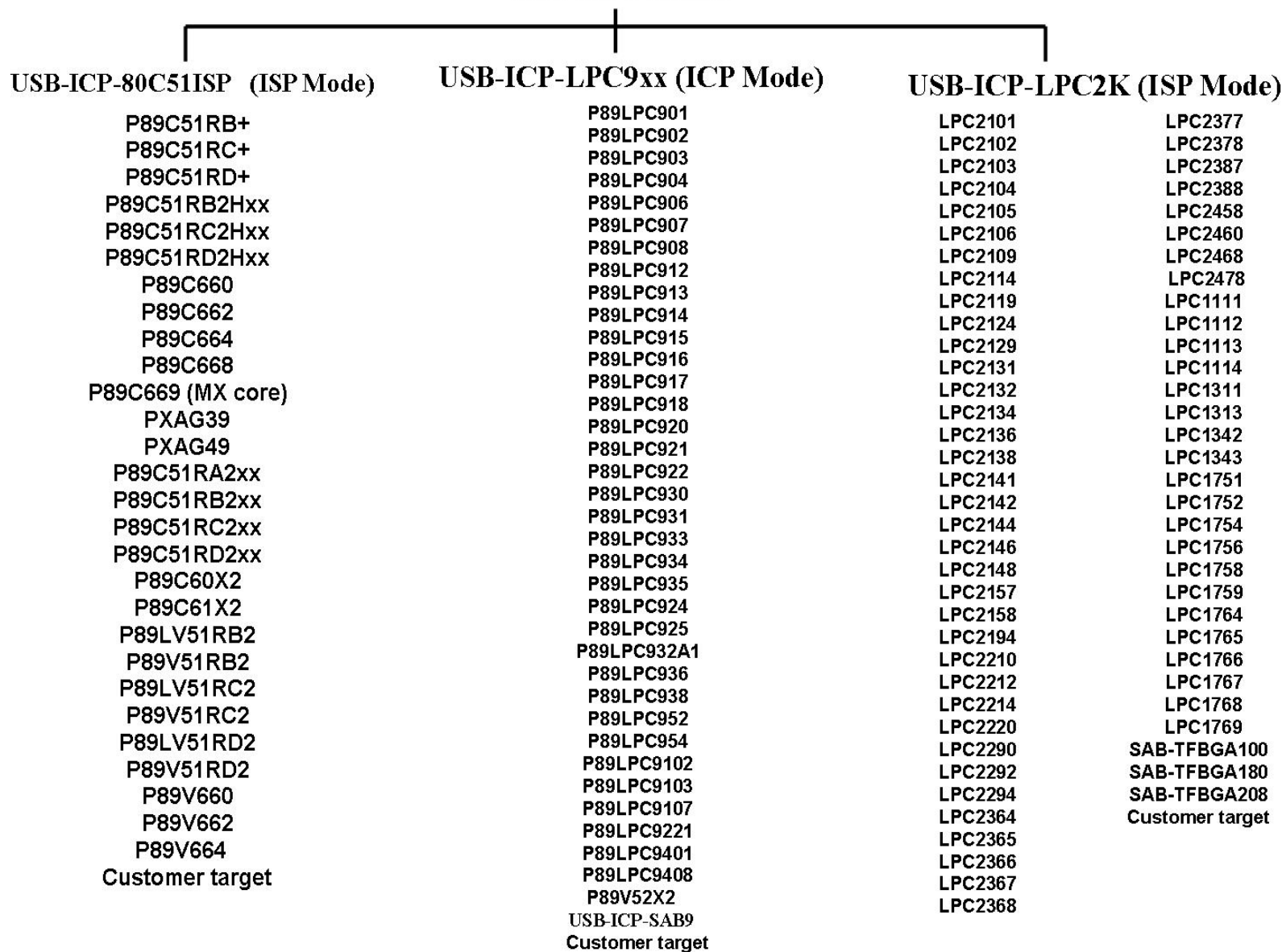
- A small connector is all that is needed to interface your ISP application to the USB-ICP-80C51ISP programmer



The target connector utilized is a standard 0.100" pitch 6-pin header available from numerous suppliers.

**The ISP function uses only six pins: VCC, GND, RXD, TXD, PSEN- and RESET. The simple circuit above is all that must be added to the user's application to use ISP with USB-ICP.**

USB-ICP-FAMILY



# USB-ICP Distribution

- USB-ICP-LPC2K (ISP programming mode) \$79.00
- USB-ICP-LPC9xx (ICP programming mode) \$69.00
- USB-ICP-80C51ISP (ISP programming mode) \$69.00



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