USB-ICP-SAB9 Quick Start Guide

The USB-ICP-SAB9 is a Socket Adapter Board designed to be used with the USB In-Circuit Programmer for NXP Semiconductors LPC9xx devices. The SAB9 allows the user to program and test these microcontrollers outside of the application circuit. Throughout this document we will just refer to the SAB9 rather than using the complete part number since it simplifies the flow of information.

THE USB-ICP-SAB9 WILL NOT WORK WITHOUT A USB-ICP PROGRAMMER!

MAKE SURE TO INSTALL THE USB-ICP BEFORE USING THE SAB9!

LPC900 family overview

Part Number	On-chip Memory		Timers/Counters*		I/O Pins	Serial Interfaces			A/D b/ch	F. max (MHz)	Package
	Flash	RAM	PWM	CCU		UART	I²C	SPI			
P89LPC938	8K	768B	Y	Y	26	Y	Y	Y	8/4x2	18	TSSOP28, HVQFN28
P89LPC936	16K	768B	Y	Y	26	Y	Y	Y	8/4x2	18	TSSOP28, HVQFN28
P89LPC935	8K	768B	Y	Y	26	Y	Y	Y	8/4x2	18	TSSOP28, HVQFN28
P89LPC934	8K	256B	Y	N	26	Y	Y	Y	8/4	18	TSSOP28
P89LPC933	4K	256B	Y	N	26	Y	Y	Y	8/4	18	TSSOP28
P89LPC932A1	8K	768B	Y	Y	26	Y	Y	Y	—	12	TSSOP28, HVQFN28
P89LPC931	8K	256B	Y	N	26	Y	Y	Y	—	12	TSSOP28
P89LPC930	4K	256B	Y	N	26	Y	Y	Y	—	12	TSSOP28
P89LPC925	8K	256B	Y	N	18	Y	Y	N	8/4	18	TSSOP20, DIP20
P89LPC924	4K	256B	Y	N	18	Y	Y	N	8/4	18	TSSOP20, DIP20
P89LPC922	8K	256B	Y	N	18	Y	Y	N	—	12	TSSOP20, DIP20
P89LPC921	4K	256B	Y	N	18	Y	Y	N	—	12	TSSOP20, DIP20
P89LPC920	2K	256B	Y	N	18	Y	Y	N	—	12	TSSOP20, DIP20
P89LPC917	2K	256B	Y	N	14	Y	Y	N	8/4	18	TSSOP16
P89LPC916	2K	256B	Y	N	14	Y	Y	Y	8/4	18	TSSOP16
P89LPC915	2K	256B	Y	N	12	Y	Y	N	8/4	18	TSSOP14
P89LPC914	1K	128B	Y	N	12	Y	N	Y	—	IRC	TSSOP14
P89LPC913	1K	128B	N	N	12	Y	N	Y	—	12	TSSOP14
P89LPC912	1K	128B	Y	N	12	N	N	Y	—	12	TSSOP14
P89LPC9107	1K	128B	Y	Y	10	Y	N	N	8/4	18	TSSOP14
P89LPC9103	1K	128B	Y	Y	10	N	N	N	8/4	18	HVSON10
P89LPC9102	1K	128B	Y	Y	10	N	N	N	8/4	18	HVSON10
P89LPC908	1K	128B	N	N	6	Y	N	N	—	IRC	SO8
P89LPC907	1K	128B	N	N	6	Y	N	N	—	IRC	SO8
P89LPC906	1K	128B	Y	N	6	N	N	N	—	12	SO8
P89LPC904	1K	128B	N	N	6	Y	N	N	8/2	12	SO8, DIP8
P89LPC903	1K	128B	N	N	6	Y	N	N	—	IRC	SO8
P89LPC902	1K	128B	N	N	6	N	N	N	—	IRC	SO8, DIP8
P89LPC901	1K	128B	Y	N	6	N	N	N	—	12	SO8, DIP8

* includes 4 timers and a WatchDog

Notice above that not all parts come in all packages. For instance, in the LPC93x family none of the devices come in a DIP package. Therefore, for simplicity this document is arranged by package type rather than by part family.

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USB-ICP-SAB9 socket layout:
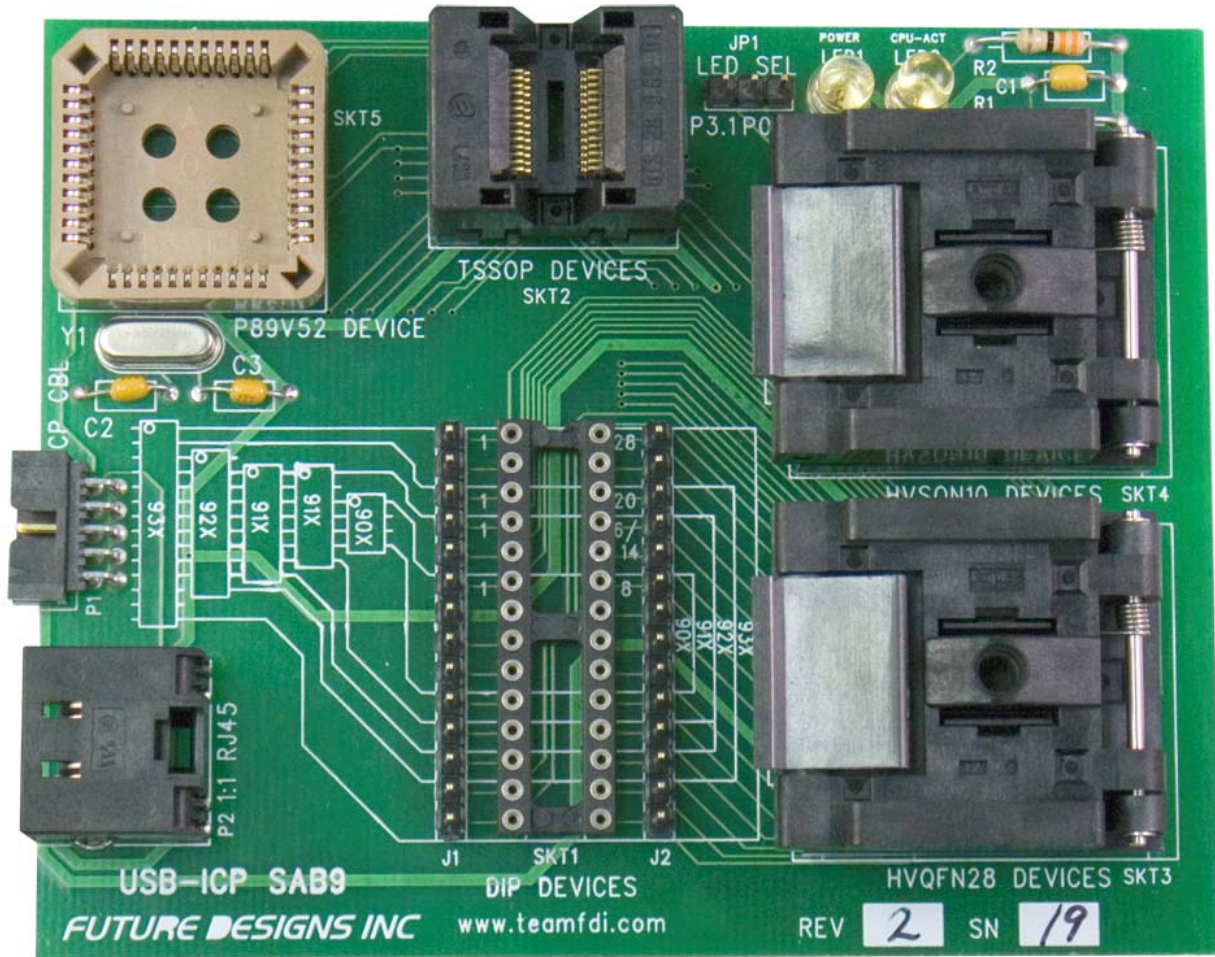
Each socket on the board is clearly labeled for the type of part that is programmed in it. When this document refers to the 'top' of the board, this is referring to the top of the board when it is in the orientation shown in the picture above.

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Connecting the USB-ICP-SAB9 to a USB-ICP

To use the SAB9, it must first be connected to a PC through a USB-ICP with a USB-ICP-LPC9xx cable to P1, as shown above. Or, if you do not have the USB-ICP-LPC9xx, the SAB9 may be connected to the PC with regular Ethernet Patch cable to P2, as shown below. The USB-ICP must then be connected to the USB port on your PC. To learn more about using the USB-ICP, please visit www.teamfdi.com/usb-icp

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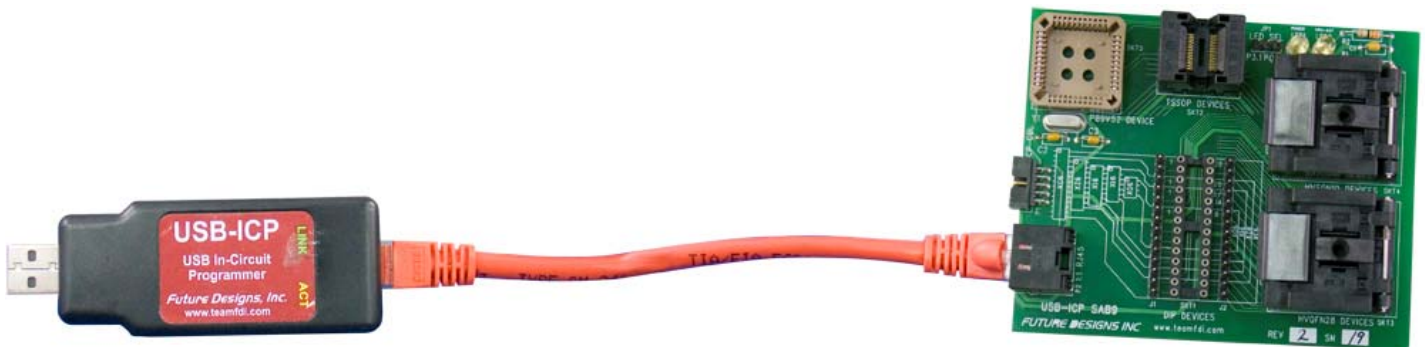
Frequently Asked Questions

For frequently asked questions regarding the USB-ICP please visit: www.teamfdi.com/usb-icp

Error Messages when Using Flash Magic

Flash Magic is the PC GUI interface software used with the USB-ICP programmer. If you are receiving error messages when you try to program parts, go to ISP -> Read Device Signature and check below.

1. **If the device signature reads all FF's verify the following**:
    a. The part is oriented in the socket correctly.
    b. The USB-ICP is connected to the SAB9 board according to one of the two methods mentioned on Page 3.
    c. That you do have a part in the socket.
    d. That there is only one part in the board (you cannot program in two different sockets at the same time)

2. **If Flash Magic tells you that it failed to autobaud**:
    a. Make sure that the correct device is selected in the device drop-down menu.

3. **If you receive the error message 'Unable to communicate. (in use) Ensure no other applications are using the COM Port. Try raising or lowering the baud rate."**
    a. Make sure that you have the correct port selected and that the baud rate you have selected is the rate recommended for the USB-ICP

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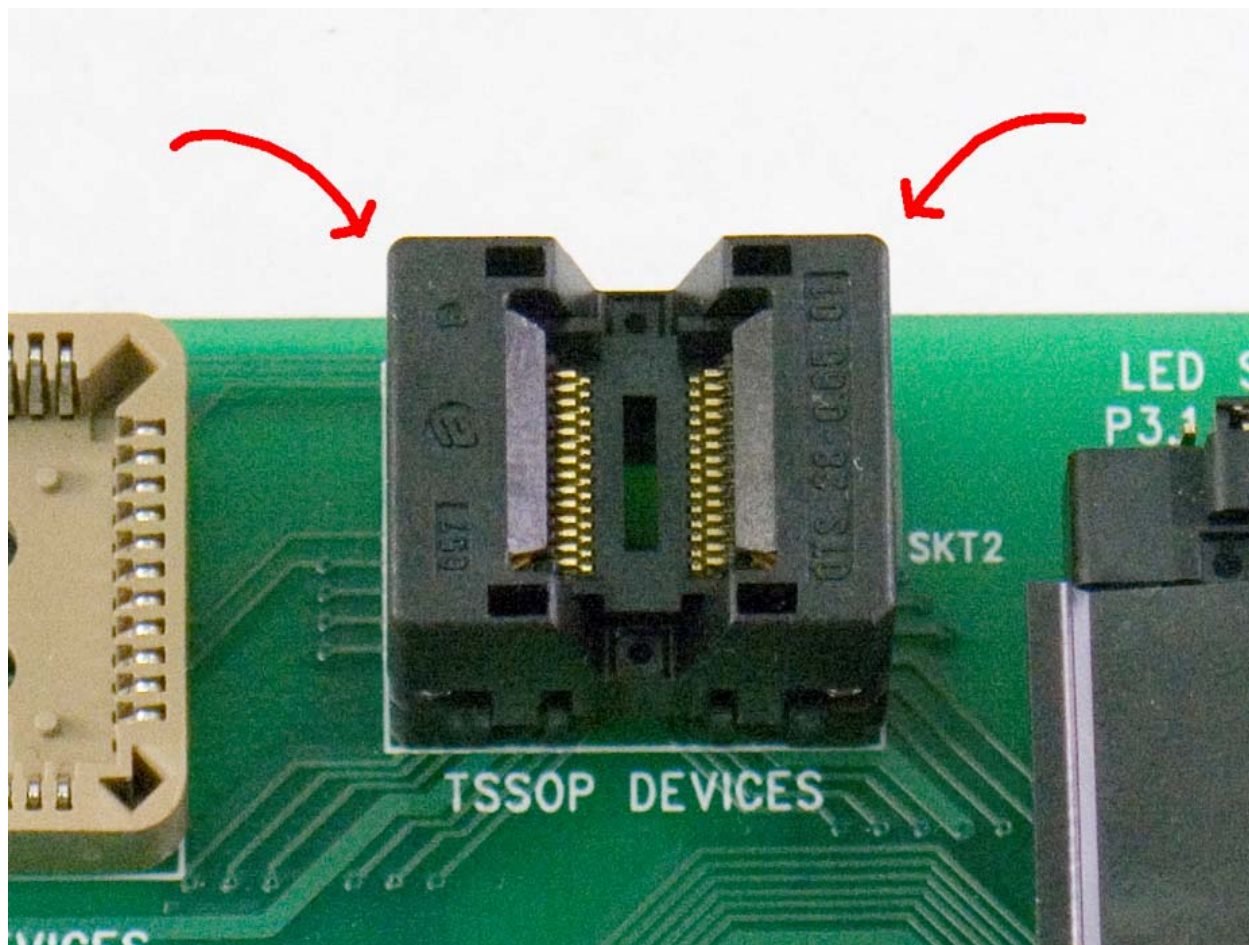# P89LPC90x Devices in DIP8 Package:

SKT1
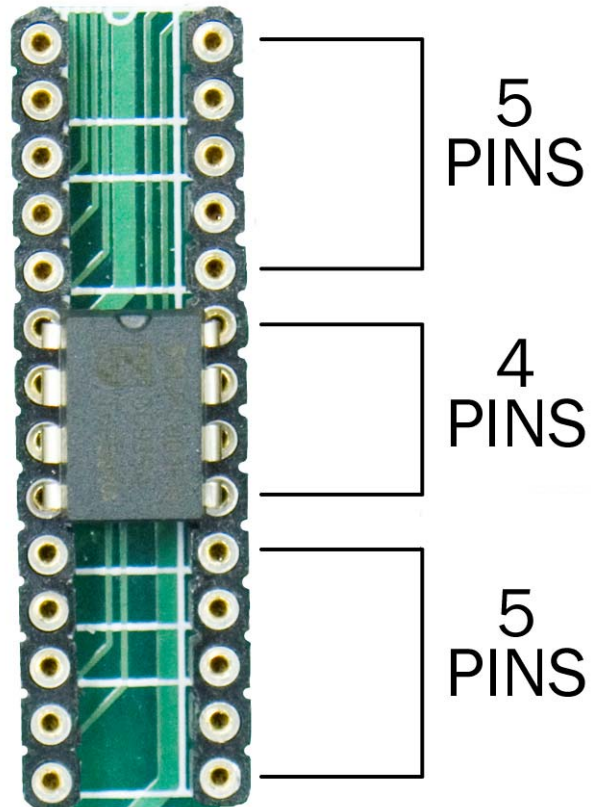
When placing any DIP8 Part in the SAB9 for programming, there must be 5 pins empty above and below the part being programmed. The pin one identifier (notch in chip) should be toward the top of the board.
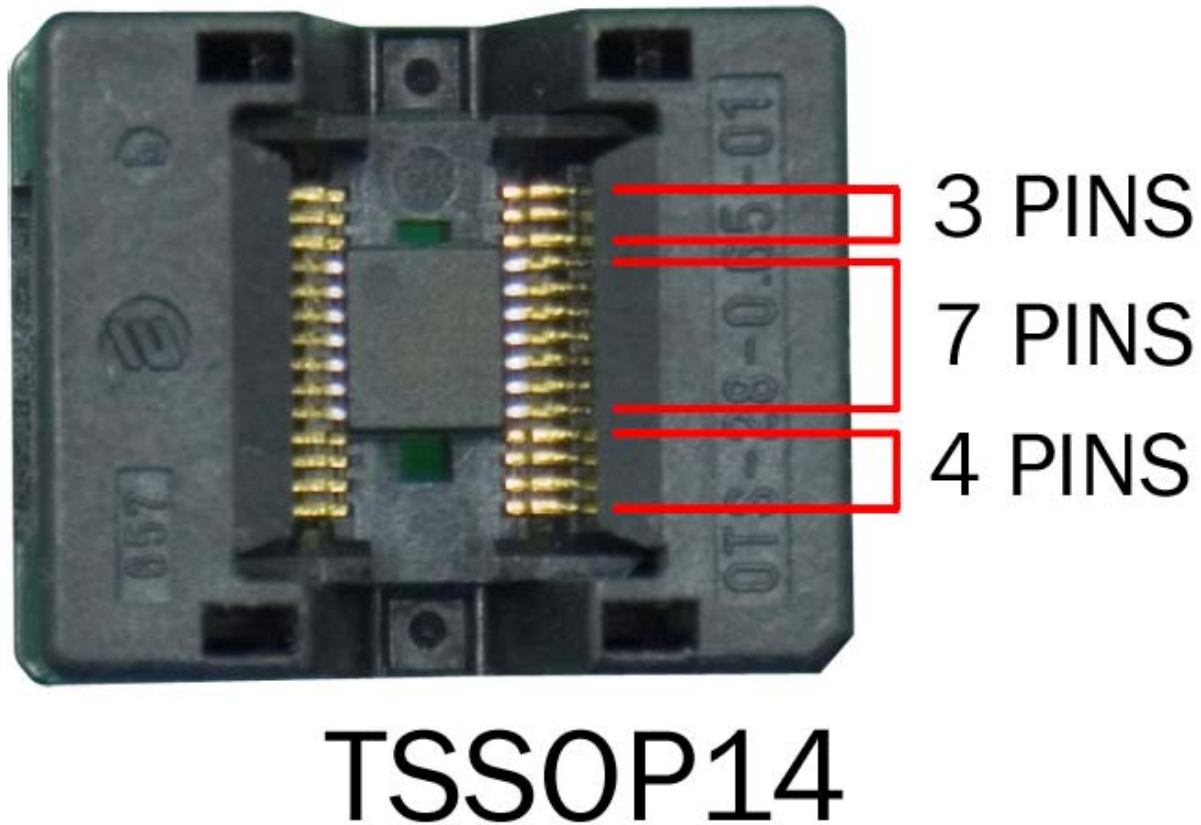
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P89LPC2x Devices in DIP20 Package:

SKT1
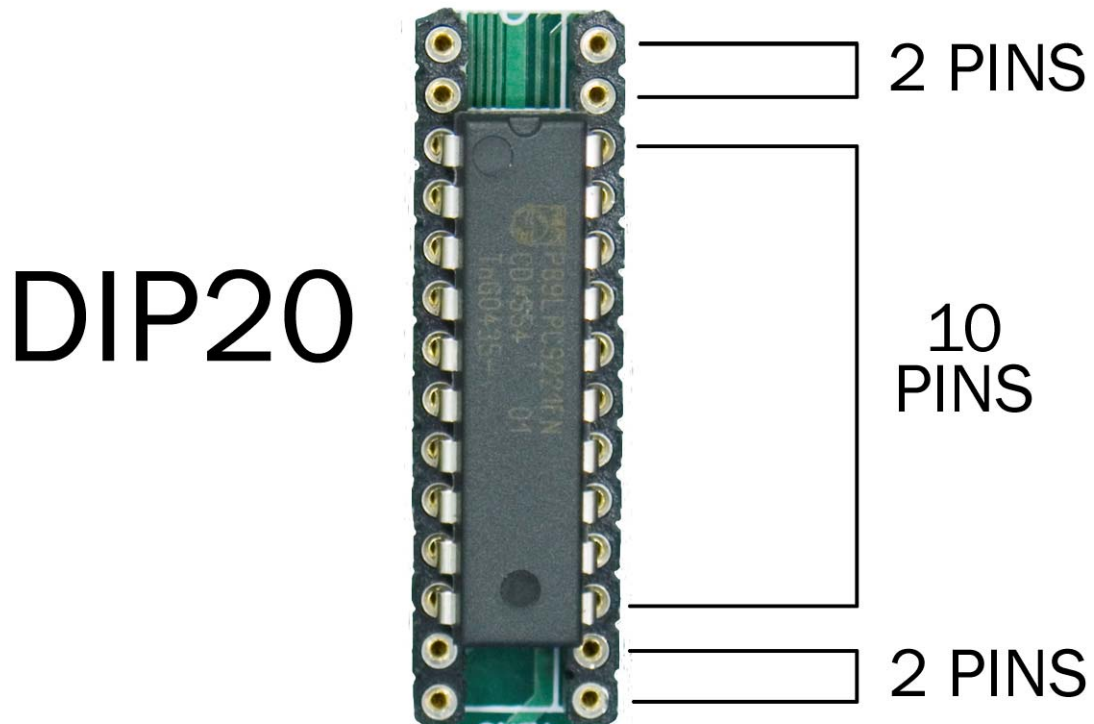
When placing any DIP20 Part in the SAB9 for programming, there must be 2 pins empty above and below the part being programmed. The pin one identifier (notch in chip) should be toward the top of the board.

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Using the TSSOP Socket (SKT2)

To place a part in the TSSOP socket for programming, first push down on both sides of the socket with two fingers. Then, once the socket is 'open' drop the part into the socket and nudge it into place to match the documents below. When you release the sides of the socket the part will be locked in and ready for programming.

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P89LPC91x Devices in TSSOP14 Package:

SKT2

3 PINS

7 PINS

4 PINS

TSSOP14

When placing any TSSOP14 Part in the SAB9 for programming, there must be 3 empty pins above and 4 empty pins below the part being programmed. The pin one identifier (circle in top left corner) should be toward the top of the board.

P89LPC91x Devices in TSSOP16 Package:

SKT2
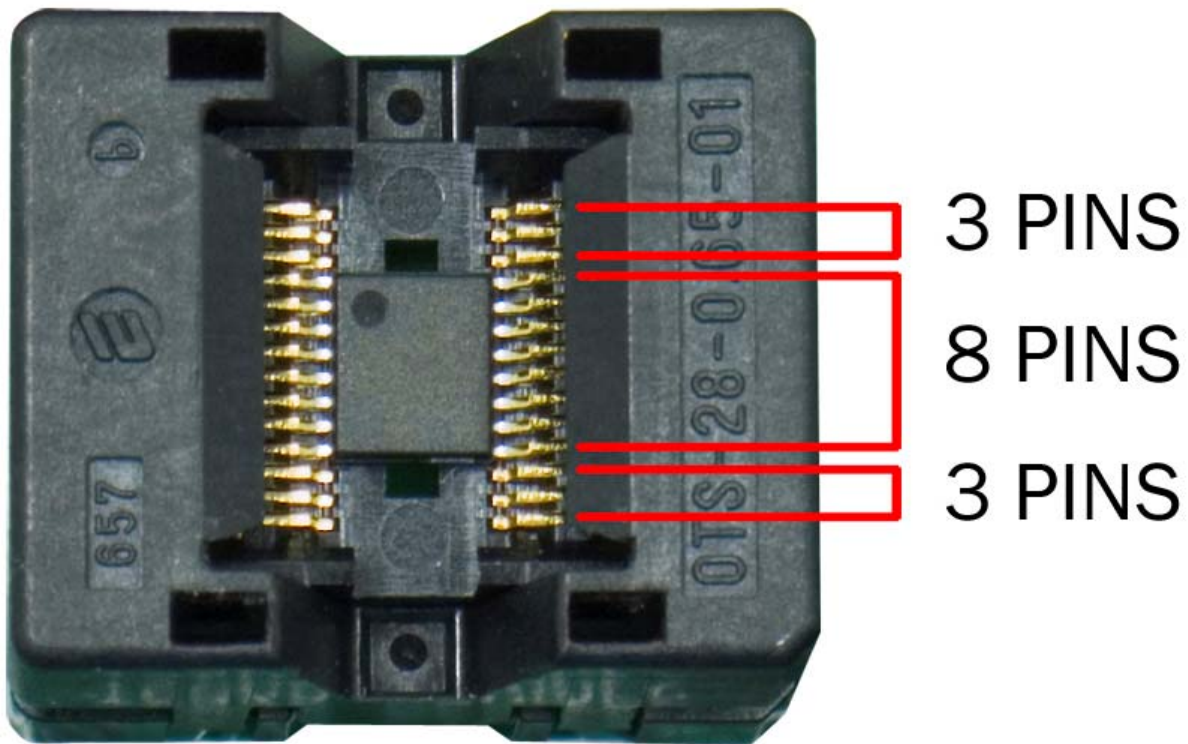
When placing any TSSOP16 Part in the SAB9 for programming, there must be 3 empty pins above and below the part being programmed. The pin one identifier (circle in top left corner) should be toward the top of the board.

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P89LPC92x Devices in TSSOP20 Package:

SKT2

2 PINS
10 PINS
2 PINS
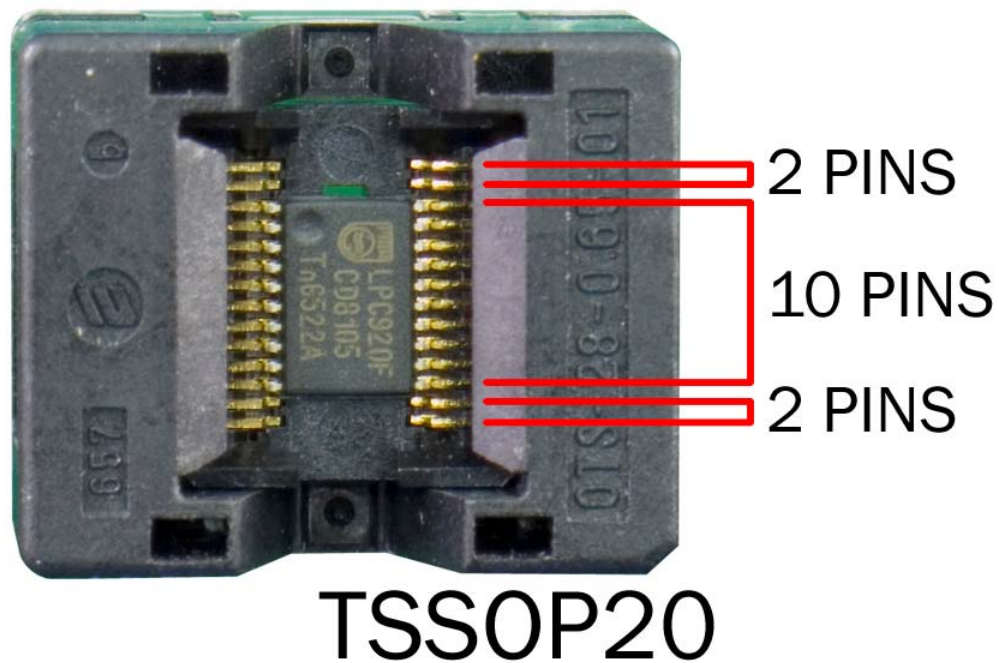
TSSOP20

When placing any TSSOP20 Part in the SAB9 for programming, there must be 2 pins empty above and below the part being programmed. The pin one identifier (circle in top left corner) should be toward the top of the board.

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P89LPC93x Devices in TSSOP28 Package:

SKT2

14
PINS
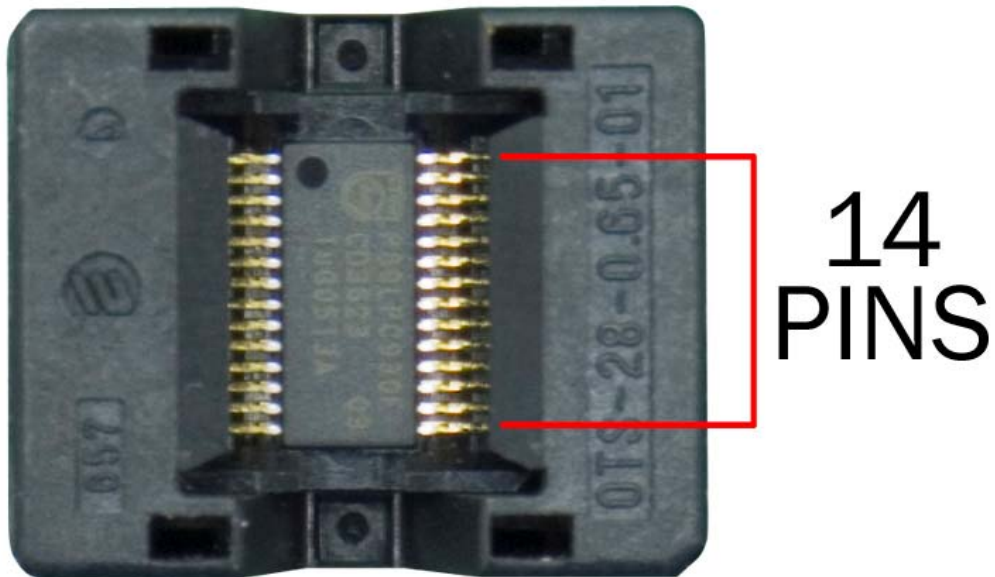
TSSOP28

When placing any TSSOP28 Part in the SAB9 for programming, the part should take up the entire socket and there should be no empty pins. The pin one identifier (circle in top left corner) should be toward the top of the board.

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P89LPC910x Devices in HVSON10 Package:

SKT4

HVSON10
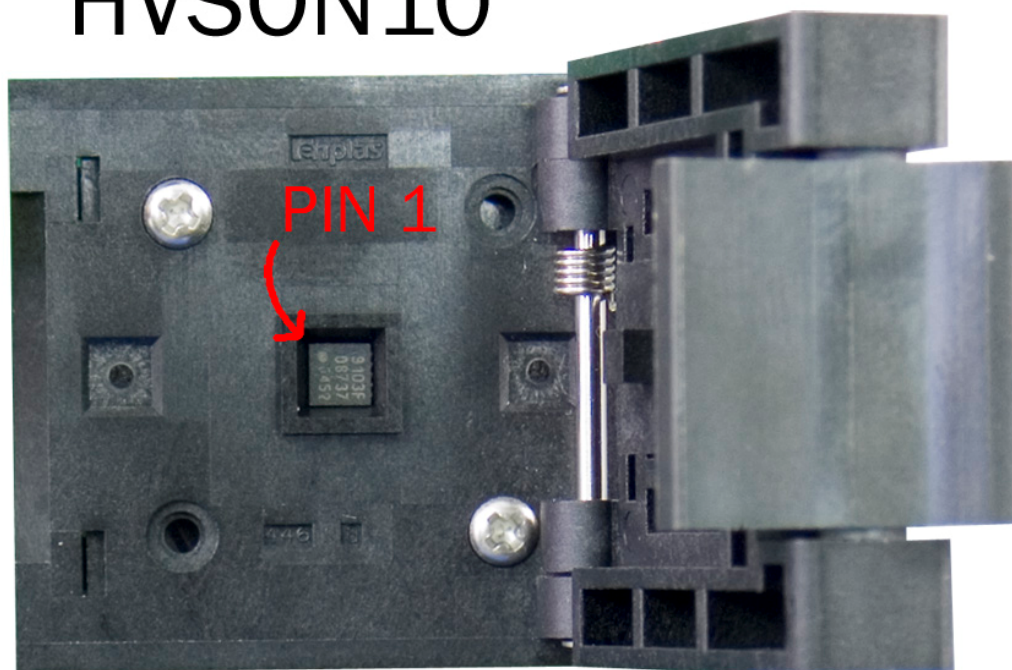
PIN 1

When placing any HVSON10 Part in the SAB9 for programming, the part should be turned so that the pin 1 identifier is in the upper left corner of the socket.

P89LPC93x Devices in HVQFN28 Package:

SKT3

HVQFN28
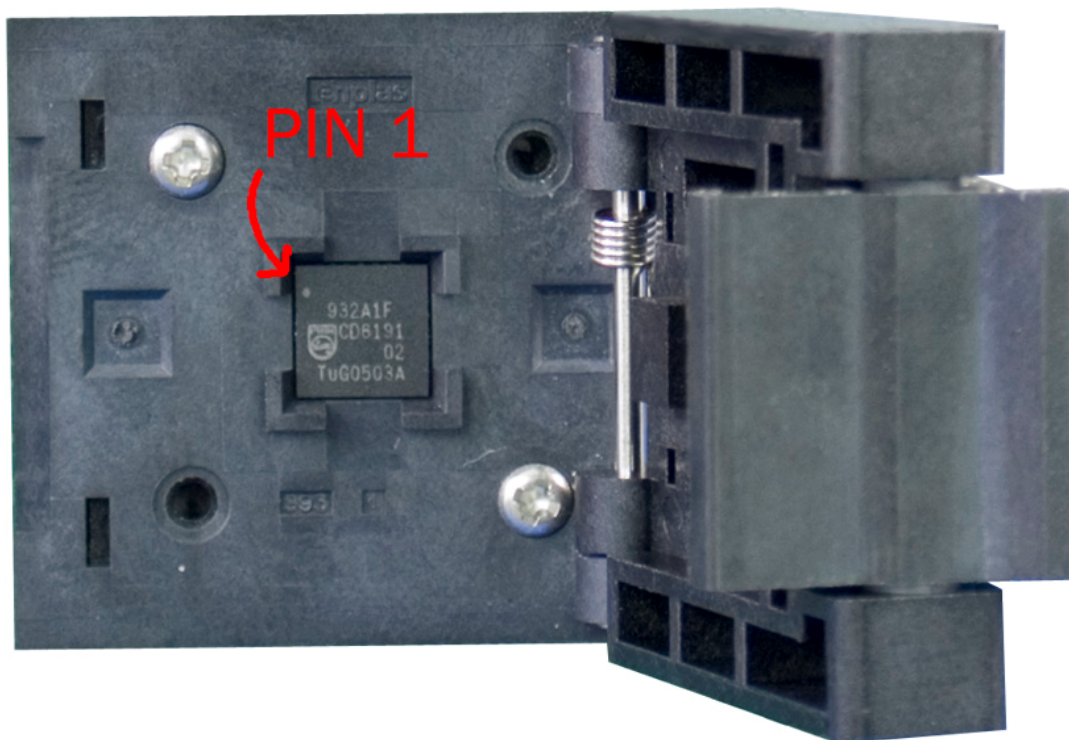
When placing any HVQFN28 Part in the SAB9 for programming, the part should be turned so that the pin 1 identifier is in the upper left corner of the socket.

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LED and Jumper function

LED1: This LED is the power indicator and should be illuminated when the SAB9 board is plugged into an active USB-ICP.

LED2: This LED can be used as the standard 'heartbeat' monitor. By adding code to blink this LED you can verify that your microcontroller has been correctly programmed through the SAB9. This LED can be connected to one of two different I/O pins by using the JP1 jumper as shown. LED2 is routed to these I/O pins on each of the socket options available on the SAB9 so this function can be used on any package type.

> JP1 1-2: LED 2 connected to P0.6
> JP1 2-3: LED 2 connected to P3.1

If you have any further questions, please contact FDI at support@teamfdi.com

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USB-ICP RJ45-TO-RJ45 CONNECTOR
USE SIMPLE NETWORK CABLE

WILL WORK WITH STANDARD CABLE

POWER LED

TEST/DEBUG LED

PROGRAM HVSON10 PARTS
P89LPC9102FTK
P89LPC9103FTK

PROGRAM HVQFN28 PARTS
P89LPC93XFHN

WILL NOT SUPPORT THE
FOLLOWING PARTS:
P89LPC901/902/903
WILL PROGRAM SOIC
DEVICES USING
SIOC-TO-DIP ADAPTER

PROGRAM DIP PARTS
P89LPC93XFN
P89LPC92XFN

PROGRAM TSSOP PARTS
P89LPC93XFDN
P89LPC92XFDH
P89LPC91XFDH
P89LPC9107FDH

PROGRAM PLCC44 PARTS
P89V52xxA ONLY
(WILL NOT PROGRAM
LPC9XX DEVICES)