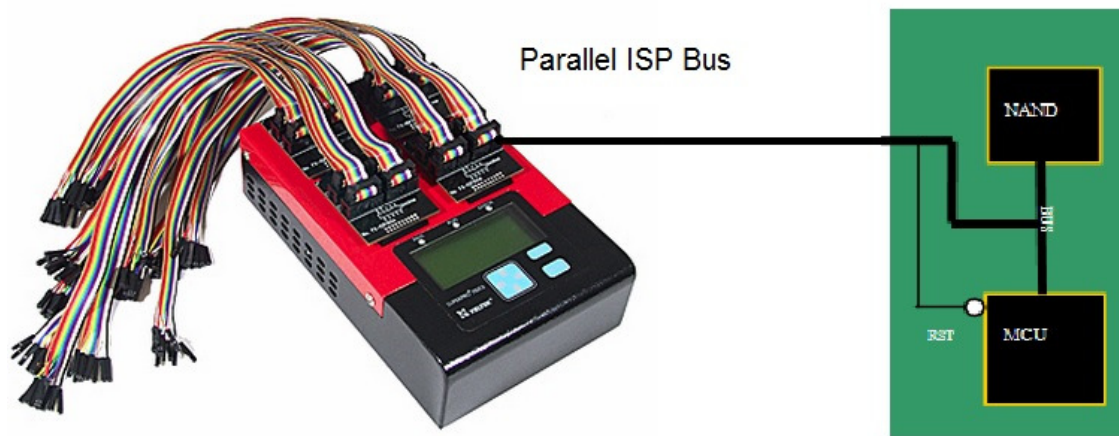


NOR / NAND FLASH ISP Programming Solutions

Xeltek ISP programmers such as [SuperPro IS01](#) and [SuperPro IS03](#) are a multi-function, high-speed professional ISP programmers which can be used to program parallel NOR / NAND chips in-circuit. The following two methods of NAND/NOR ISP programming are discussed in detail with their advantages and limitations:

- 1) **Intrusive method** of programming parallel NOR/NAND chips in-circuit (Direct programming).



Programming Parallel Nor/Nand flash chip: Intrusive Method

SuperPro IS03 in-circuit gang programmer can be used for programming NAND / NOR flash chips that are already soldered on the PCB. This is called direct parallel programming of parallel chips; up to 50 I/Os may be needed in this case. Data / Address / Control Bus are connected to ISP lines. ISP lines reset the CPU connected to the FLASH chip by activating the RESET pin of the CPU. This way, very high in-circuit programming speed can be achieved as data is transferred in parallel mode. Moreover, up to 4 parallel chips can be programmed using SuperPro IS03. This method is not applicable if nail access (all pin access) is not available. In such cases, non-intrusive ISP methods can be used and is discussed below.

2) **Non-Intrusive method** of programming parallel NOR / NAND chips in-circuit
(Indirect programming via JTAG):



Programming Parallel NOR/NAND chip indirectly via JTAG: Non-Intrusive Method

Indirect programming of parallel NOR / NAND flash memories is possible if the flash memories are connected to a JTAG-compliant device (CPU/FPGA/CPLD).

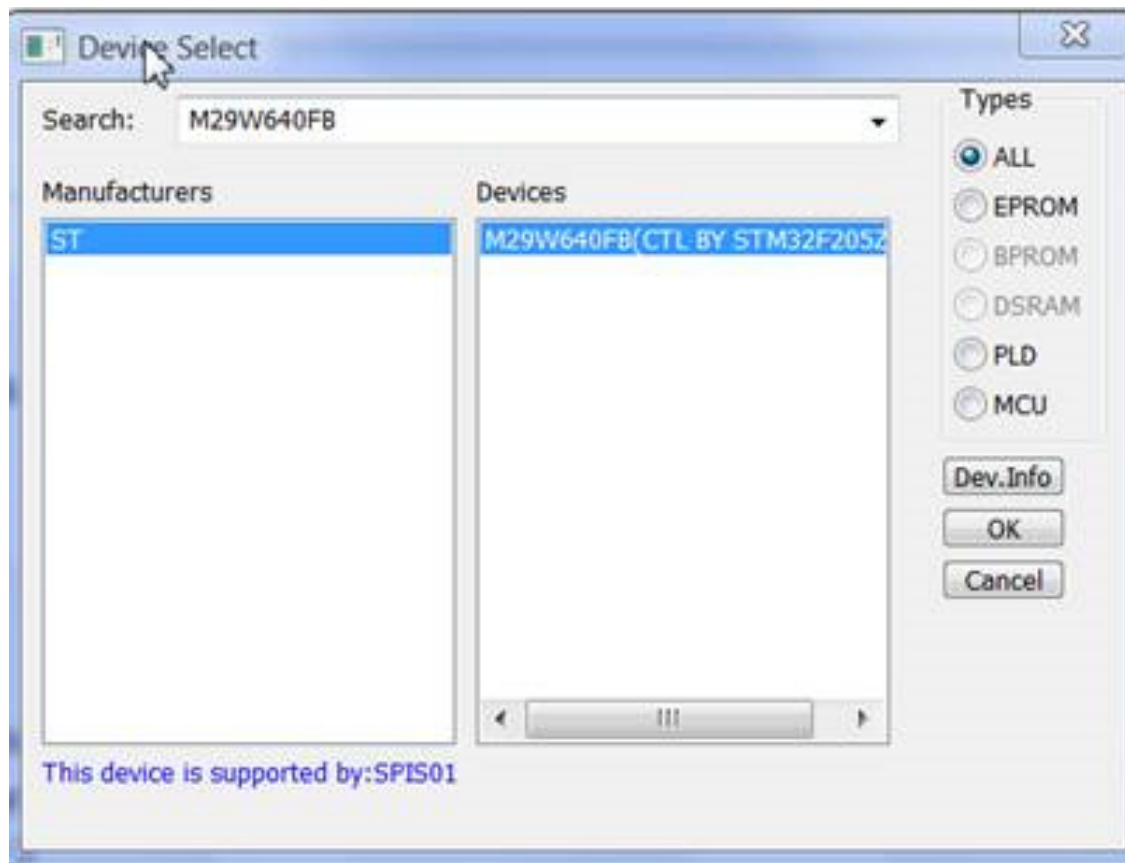
ISP programmers such as SuperPro IS01 or SuperPro IS03 communicate with the CPU via JTAG to program devices by sending codes that will execute device programming. For programming a single PCB, SuperPro IS01 is recommended. For panel (multiple PCBs) programming, SuperPro IS03 (up to 16 PSBs at a time) or SuperPro XPS01 (up to 80 PCBs at a time) is recommended. Indirect programming consists of serially shifting the bits (boundary scan), so this method is slower than the Intrusive method of parallel in-circuit programming. This method is useful nail access is not available on the PCB.

Programming example:

Programming operations and interface while programming Nand/Nor via MCU serial port is same as programming regular serial chips.

For example, following are the steps to program NOR flash M29W640FB which is interfaced to STM32F205ZG using SWD port of STM32F205ZG. These operations can also be done using any other port of MCU on your PCB such as JTAG port.

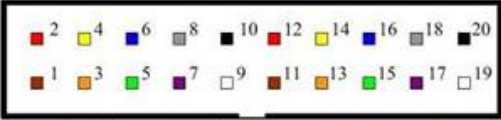
- 1) Select M29W640FB(CTL BY STM32F205ZG) in IS01 software



- 2) Make the connections of ISP cable to SWD port of STM32F205ZG as shown below:

Dev.Info

ISP connector of IS01 programmer:(front view at connector)



Description : This also use STM32F205UG SWD port to program external nor flash M29W640FB

Description of ISP connector pins:

- 1 - GND
- 2 - Don't connect!
- 3 - SWDIO
- 4 - Don't connect!
- 5 - SWCLK
- 6 - Don't connect!
- 7 - Don't connect!
- 8 - NRST
- 9 - Don't connect!
- 10 - Don't connect!
- 11 - Don't connect!
- 12 - Don't connect!
- 13 - Don't connect!
- 14 - Don't connect!
- 15 - Don't connect!
- 16 - Don't connect!
- 17 - UCC (Don't connect! Pls use external power supply)
- 18 - Don't connect!
- 19 - Don't connect!
- 20 - Don't connect!

- 3) Load data file and perform erase, blank check, program and verify just as you do with other chips.

Customer specific algorithms will be available in general software for IS01 but normally those algorithms work only with customer PCB. If other customers use with different PCB, then also will give errors as it is designed for customer PCB.