

## Use the ATE Port to Control ISP Programmers

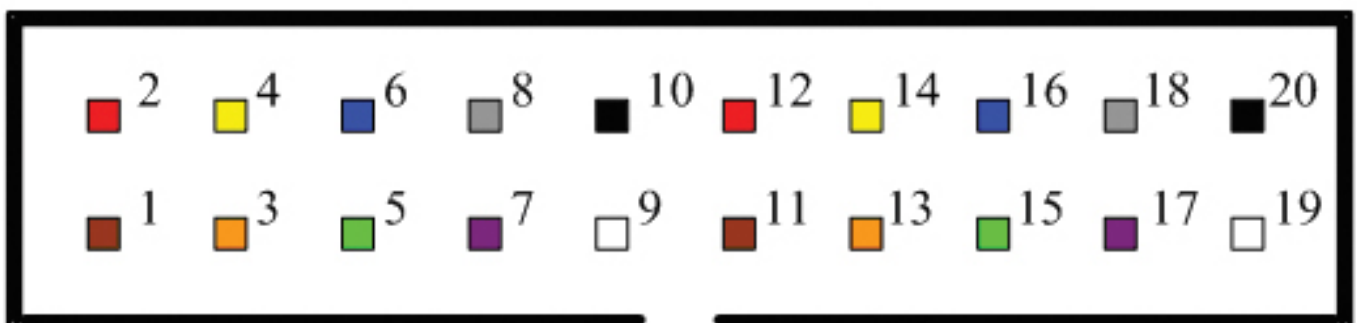
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In-system programming is the ability of programming an IC which is already soldered into the circuit using serial programming algorithms. The major advantage of ISP programming is that the manufacturer can have a single production phase, eliminating the programming stage prior to assembling the system.

Code or design changes are also possible during the production process without desoldering the chip. The chip can be reprogramming on the target PCB. Xeltek ISP programmer; SuperPro IS01, is a portable, stand-alone, self-powered universal ISP programmer. It supports most ISP protocols, such as I2C, SPI, UART, BDM, MW, JTAG, CAN and RS-232. It also operates in standalone mode using SD cards. It comes with standard ATE (Automated Test Equipment) which provides the possibility of operating and controlling the programmer through external signals. This article will help you to understand ATE interface and its functionality in a better way.

The ATE control port is used for communication with an external host or is integrated into the automatic programming or test equipment. Therefore, besides the keyboard, the user can also operate ISP programmer through the ATE interface. The ATE equipment interface adopts an opto-coupling device to isolate signals, in order to ensure security and accuracy of signals between the two equipments. In addition, while using ATE interface, it is required to set the power voltage of the external equipment signal and appropriate reference voltage point correctly.

The pinout for the ATE port:



For the signals of ATE port, please refer to the diagram below:

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Pin #	Signal Name	Description
1	SEL0	Optoisolated, flow select input BIT0 (5-24 VDC, 20mA max)
2	SEL1	Optoisolated, flow select input BIT1 (5-24 VDC, 20mA max)
3	SEL2	Optoisolated, flow select input BIT2 (5-24 VDC, 20mA max)
4	SEL3	Optoisolated, flow select input BIT3 (5-24 VDC, 20mA max)
5	SEL4	Optoisolated, flow select input BIT4 (5-24 VDC, 20mA max)
6	SEL5	Optoisolated, flow select input BIT5 (5-24 VDC, 20mA max)
7	OPTO_GND1	Optoisolated input ground
8	OPTO_GND1	Optoisolated input ground
9	START	Optoisolated, flow START, (5-24 VDC, 20mA max)
10	RESET	Optoisolated, flow RESET, (5-24 VDC, 20mA max)
11	PASS	Optoisolated, flow PASS, (open-drain, 25mA max)
12	FAIL	Optoisolated, flow FAIL, (open-drain, 25mA max)
13	OPTO_GND2	Optoisolated output ground
14	OPTO_GND2	Optoisolated output ground
15	OPTO_VCC	Optoisolated output VCC(24V differential max)
16	OPTO_VCC	Optoisolated output VCC(24V differential max)
17	VCC	Non-isolated isp system power supply
18	VCC	Non-isolated isp system power supply
19	GND	Non-isolated isp system GND
20	GND	Non-isolated isp system GND

Description of signals:

**OPTO\_VCC:** Working power of ATE controlling port is supplied by exterior controlling equipment and it should match signal voltage.

**SEL0-SEL5:** These input signals are used to select project file which is already stored on SD card.

**START, RESET:** These are Input signals discussed later.

**PASS, FAIL:** These are output signals discussed later.

**OPTO\_GND1:** Exterior controlling equipment GND1, which is used to input signals of SEL0-SEL5, START and RESET.

**OPTO\_GND2 ?** Exterior controlling equipment GND2, which is used to output signals of PASS and FAIL.

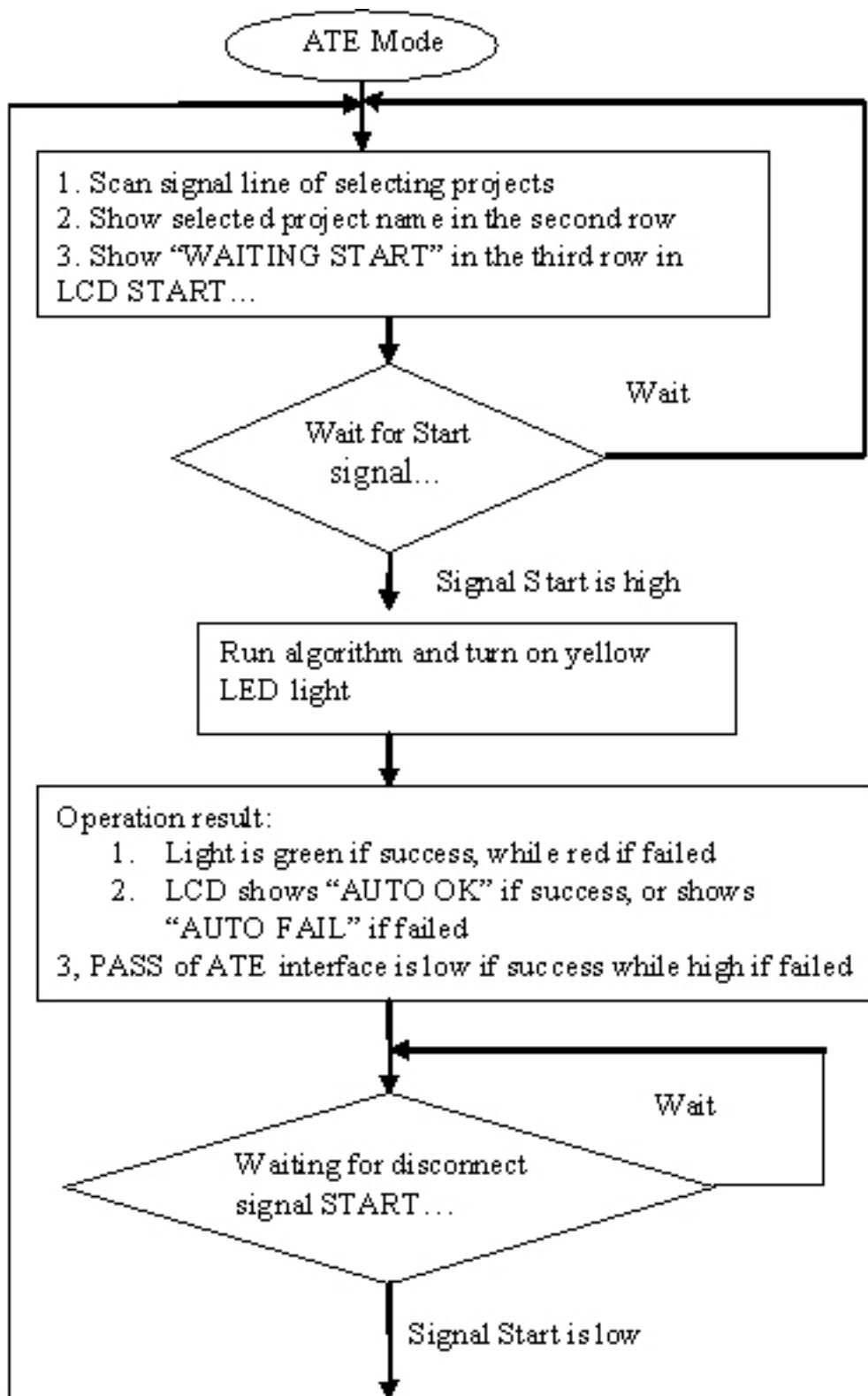
**VCC, GND ?** IS01 supplies 3.3V output, GND output

When the system starts, it performs initialization until "XELTEK IS01" is shown on display screen. After that, it will test the USB, keyboard and ATE interfaces all the time. If any of the signals SEL0-SEL5 of ATE interface is high, then IS01 will enter ATE work mode.

### Create a project:

Create a project by SPIS01 software. After the project is generated, it can be downloaded into SD card by SPIS01 software or a card reader.

### ATE workflow chart



### Project Selection:

SEL0-SEL5 of IS01 ATE interface is used to select projects. Using binary format; from 1 to 63, means, user can select no more than 63 projects. For example, if SEL0 is high and the others are low, project# 1 is selected; if both SEL0 and SEL1 are high, the others are low, project# 3 is selected, etc...

### Run algorithm:

After the user selects the project, set pin START high; then the system starts

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programming.

Thus, the ATE interface is built for easy external hardware control which uses the standalone feature of SuperPro IS01 programmer. A total of six signal lines SEL0 to SEL5 are for project selection (maximum 64 project files); two command lines for START and STOP; three STATUS lines such as PASS, FAIL and BUSY. All signals are optical-isolated thus providing noise free operation.

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