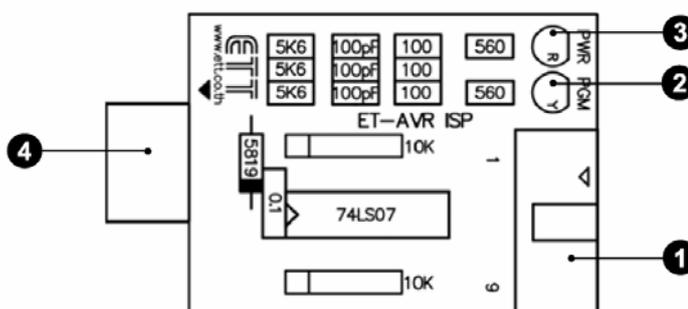


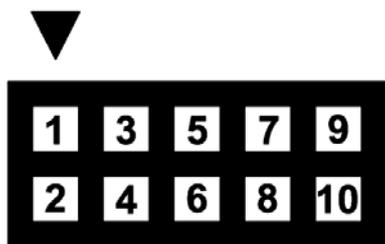
ET-AVR ISP

ET-AVR ISP which is a Board is designed for download HEX File into MCU AVR family from Atmel by using Serial Programming and we can download this Hex File through Parallel Port of computer. We use this board with ET-CAP 10P from ETT and Software PonyProg2000 that is Program Download HEX File into CPU AVR family by using Serial Programming uses with ET-AVR ISP. It can use with ETT Board AVR family well. The method for using this program, user can learn from HELP of program by self, in this case, we would like to introduce only method to setup program PonyProg2000 to use with all ETT Board AVR family.

Board Structure of ET-AVR ISP



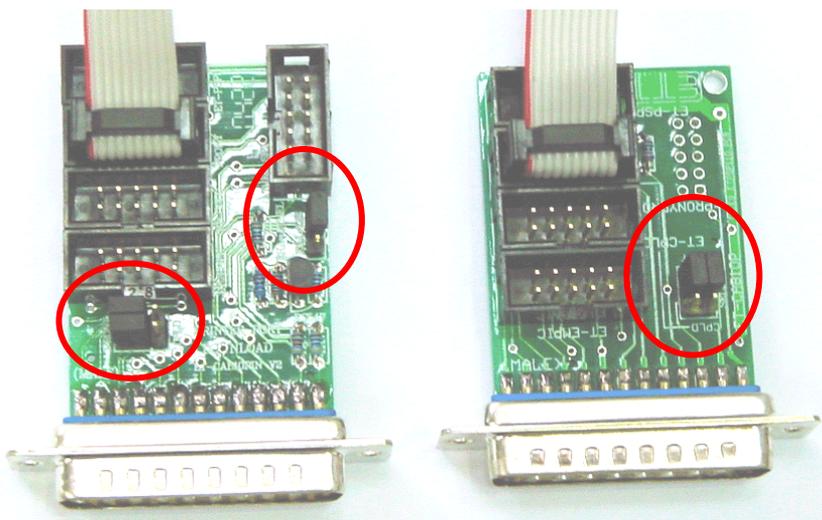
- **No.1** is Port for connecting with **ET-CAP 10P** from ETT. It uses to program HEX File into MCU.
- **No.2** is LED PGM (GREEN). It use to display status of proramming and downloading Hex File into MCU.
- **No.3** is LED PWR (RED). It uses to display status of Power Supply on board.
- **No.4** is Port for connecting with board Target. It can program Hex File into board ET-AVR STAMP Atmega64 by inserting board ET-AVR ISP into port of ET-PSPI and feature of Pin arrangement is in the picture.



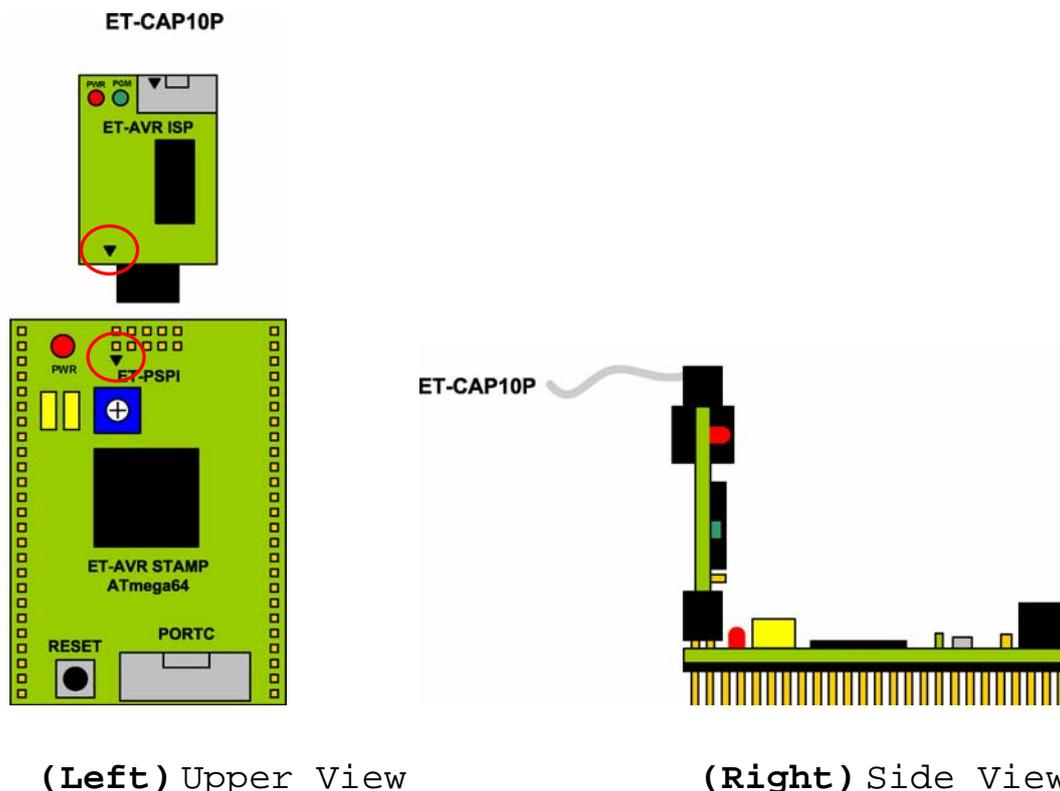
Pin Position	Signal's name
1	MOSI
2	VCC
3	Not use
4,6,8,10	GND
5	RESET
7	SCK
9	MISO

To Interface Devices for Programming Hex File

To program Code Hex File into AVR MCU, we use with ET-CAB10PIN and Program PonyProg2000 by connecting ET-CAP10PIN with Printer Port. Select Jumper to use program PonyProg2000, interface Download cable in point of ET-PSPI Download of board and then supply electricity into board completely. If there's any devices are connected from external at Port PB, user need to take off first. The feature of connection is in the picture.



(Left) ET-CAP10P V2.0 **(Right)** ET-CAP10P V1.0
 Picture displays Jumper selection and Download Cable connection of ET-CAP10P for using with AVR.



Picture displays the connection between ET-AVR ISP and ET-AVR SATMP ATmega64. To interface both boards, the position of triangle symbol in one board need to coincide with other one board.

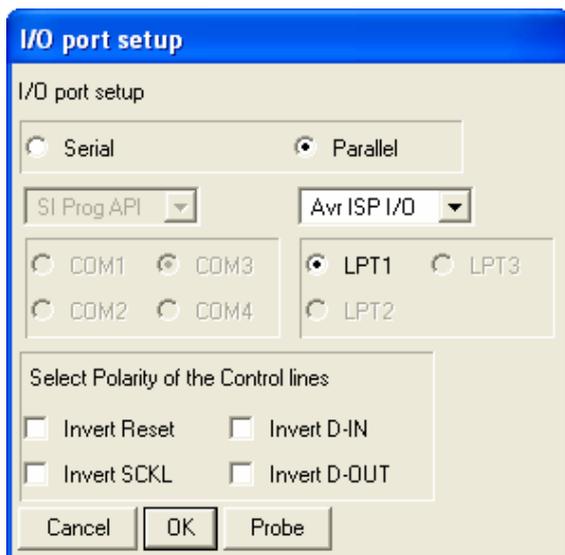
Programming Board ET-AVR STAMP ATMEGA64 with program PonyProg2000

Program PonyProg2000 which is Program Download HEX File into CPU AVR family by using Serial Programming can use with ETT Board AVR family well. The method for using this program, user can learn from HELP of program by self, in this case, we would like to introduce only method to setup program PonyProg2000 to use with ETT Board AVR family. In case of using CPU AVR family No.ATmega64, user should be careful because there's various Fuse Bits for assignment CPU operation inside structure of ATmega64. These Fuse Bits effect on Serial programming download because if user select Fuse bit incorrectly, may not be use Serial programming

download until modify Fuse Bit of CPU correctly with Parallel Program first.

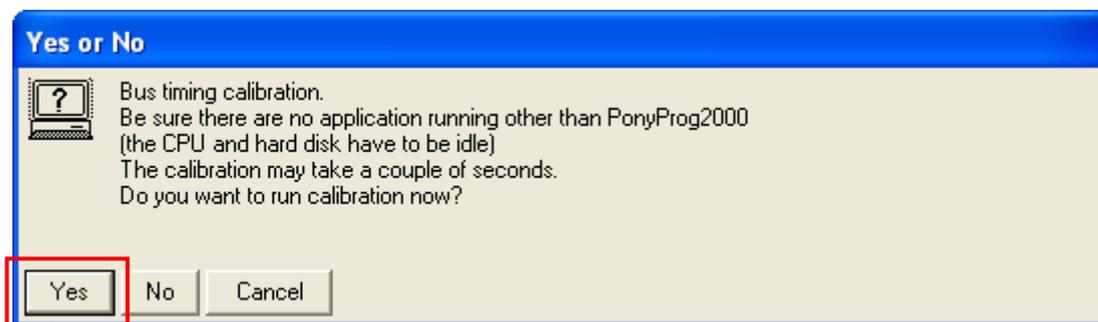
If using program PonyProg2000 to program CPU AVR family into ETT Board, user need to assign Option of program as followig.

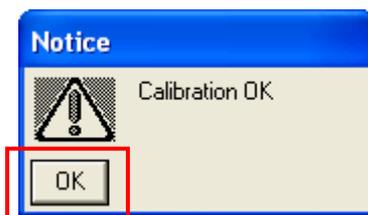
1. Assign **Setup** → **Interface Setup...** as following.



- Select I/O Port as Parallel and select mode programming as Ave ISP I/O.
- Select truly Printer Port. For example, select LPT1 in case of using with Printer Port LPT1.
- Do not select Polarity Control Line.
- Setup program only one time when use it in the first time.

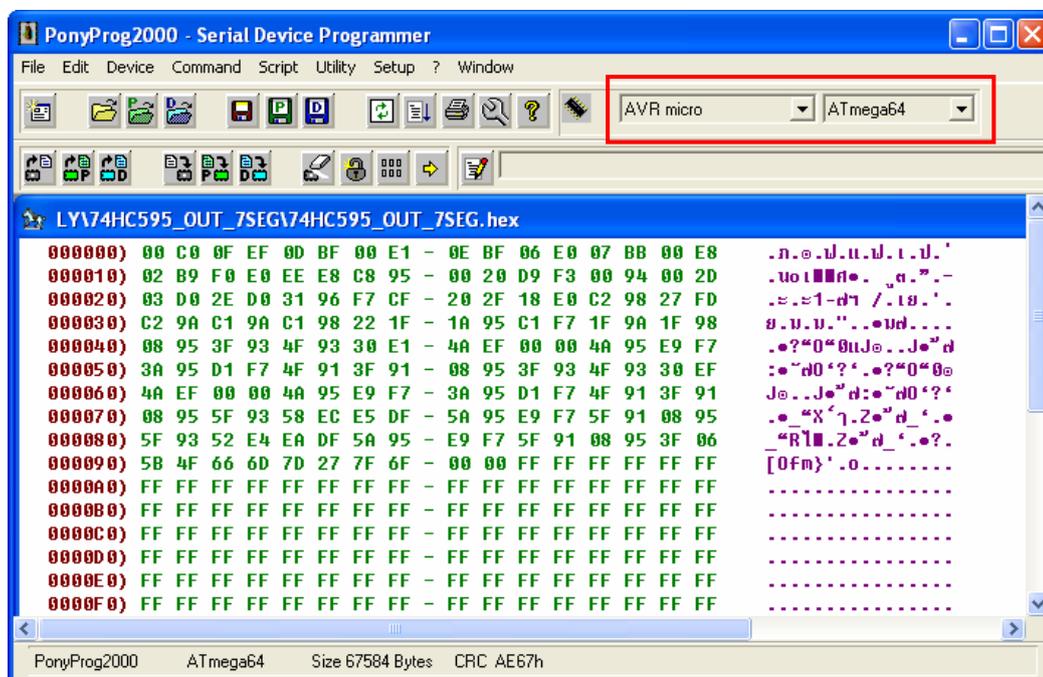
2. Run program PonyProg2000 to calculate the suitable speed for sending signal into program CPU. Can select from **Setup** → **Calibration**.



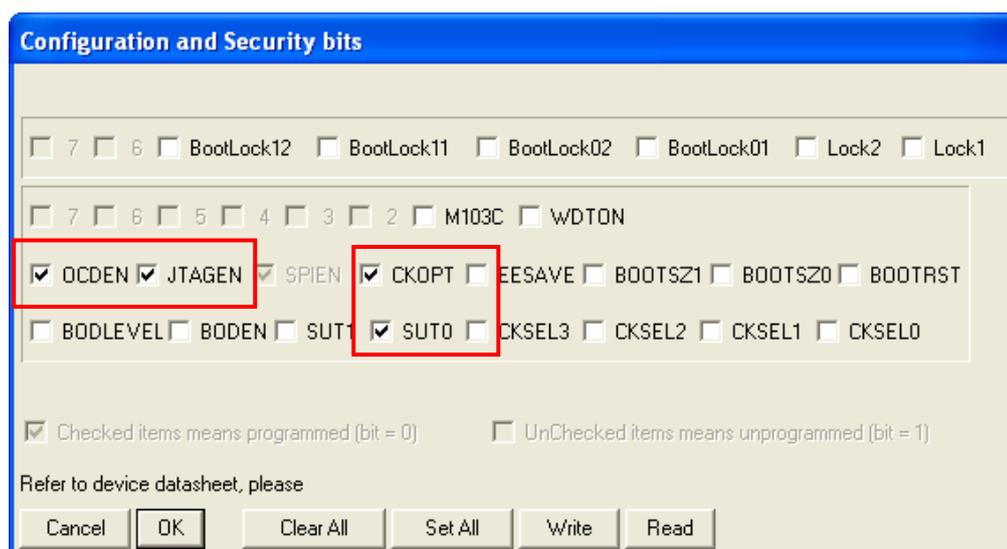


- Run Calibration only one time when use this program in the first time.

3. Select CPU No. from **Device** → **AVR Micro** → such as **Atmega64**.



4. Assign **Command** → **Security and Configuration Bits**. If it is other AVR No., user can assign operation of Fuse Bit as required and can learn details of Fuse Bit from Data Sheet of CPU by self. In case of using with ATmega64, user should be careful and need to assign Fuse Bit correctly because if user assign Fuse Bit incorrectly, it can not run program CPU by using Serial programming. User can assign as following.



Picture displays Fuse Bit assignment for using with CPU No. Atmega64.

The Fuse Bits's Meaning of ATmega64

- In case of selecting [] in front of any Fuse Bit. It means that assign Fuse Bit as "0" or runs program Fuse Bit.
- In case of not selecting [] in front of any Fuse Bit. It means that assign Fus Bit as "1" or not run program Fuse Bit.

The Fuse Bits's Meaning of ATmega64 that effects on Serial Programming

- **SPIEN** is Serial programming Enable Bit. User always need to assign this function for downloading Program into CPU by In-System Serial programming. Normally, this Fuse Bit is assigned from manufacturer, so user can not erase or modify them with Mode Serial programming. If CPU is programmed by Parallel programming, user does not remember to program the Fuse Bit again.
- **OC DEN** and **JTAGEN** both Bit use in case of debugging MCU operation and programming through JTAG Interface and it need to use with AVR JTAG

Debugger. If user do not use this function, it is not necessary to select both bits.

- **CKOPT** is Oscillator Option Bit. If user selects this program Fuse Bit, it means that assignment CPU run with frequency at 16MHz. If do not select this Fuse Bit, it means that assignment CPU run with frequency not greater than 8MHz. If using with ETT standard Board, it uses XTAL as Frequency Generator, so user need to run default value of this Fuse Bit and CPU can run with XTAL Frequency between 1.0MHz-16.0MHz.
- **CKSEL3...0** is Select Clock Source Bit. It uses together for selecting generator and frequency for using with CPU. In case of using with ETT standard Board, user need to select as External Crystal 1.0 MHz - 16.0 MHz but if user select other default values, program will run incorrectly. The important thing that user should remember, if selecting as External Clock or External RC Oscillator, it makes CPU can not run. Because user does not interface clock from external ,so it can not run program CPU by using Serial Programming. So, user need to modify CPU to correct Fuse Bit and select clock as External Crystal.

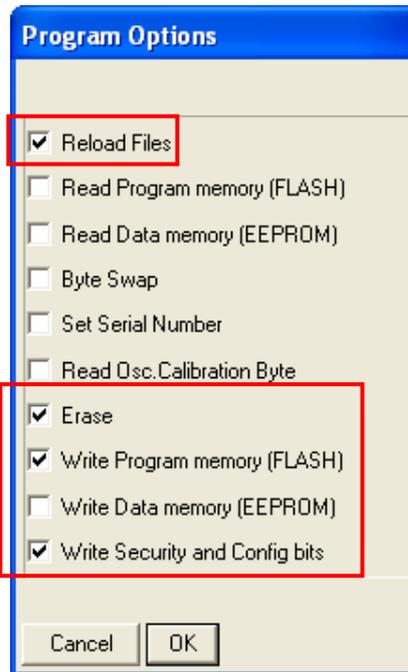
Clock Generator of AVR Atmega64	Fuse Bit assignment of CKSEL[3..0] (0=Program,1=Un-Program)
External Crystal/Ceramic Resonator	1111-1010
External Low Frequency Crystal	1001
External RC Oscillator	1000-0101
Calibrated Internal RC Oscillator	0100-0001
External Clock	0000

Table shows the selection of Frequency Generator from Fuse Bit CKSEL [3..0].

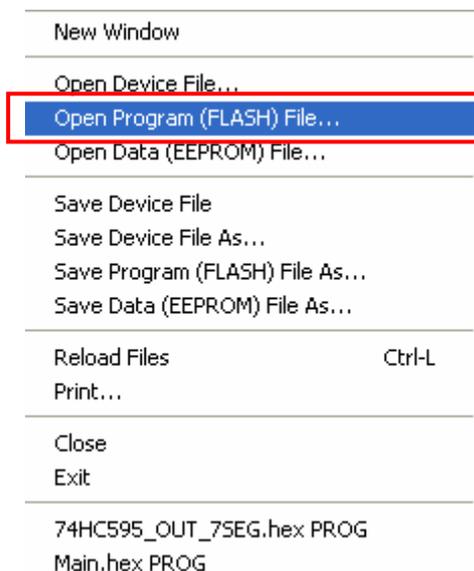
*****NOTICE*****

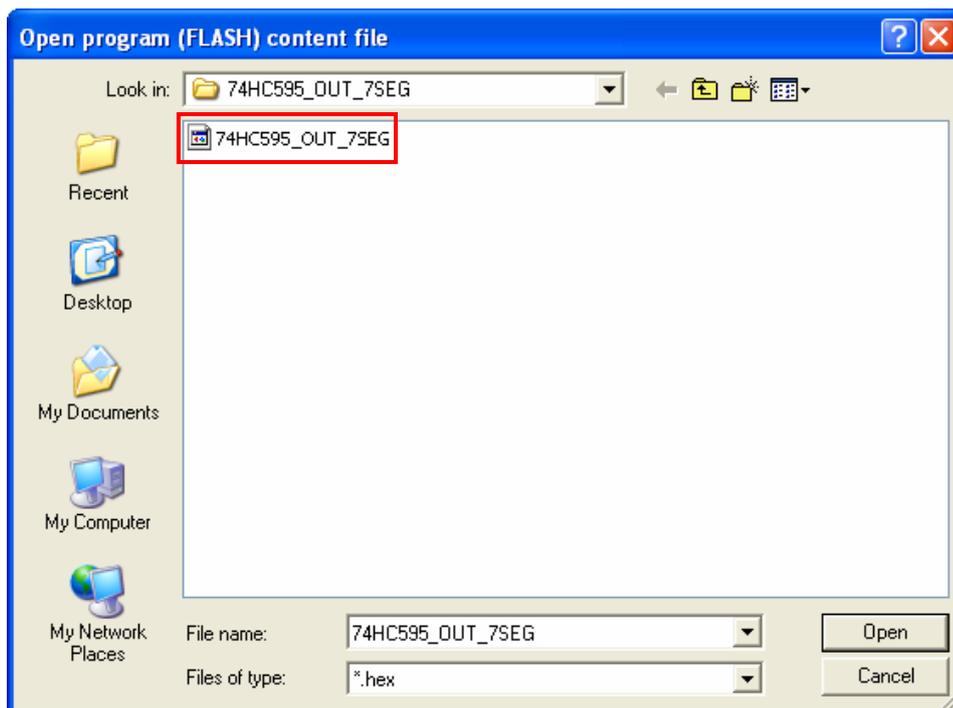
- Default value as 1, it means that not assign program Fuse Bit to run and not put [√] in front of any Fuse Bit.
- Default value as 0, it means that assign program Fuse Bit to run and put [√] in front of Fuse Bit.
- Should assign program Fuse Bit of CKOPT to run at frequency as 1.0MHz-16.00MHz.
- Do not run program Fuse Bit of CKSEL[3..0] because its operation will run incorrectly. For example, if user assign all program Fuse Bit of CKSEL[3..0] as 0, CPU does not run after program PonyProg2000 wrote Fuse Bit into CPU completely. It makes CPU cannot use with ETT board and can not run program to modify new Fuse Bit into CPU by using Serial Programming. To assign all Fuse Bit of CKSEL[3..0] as 0, it means that CPU runs with External Clock and Frequency Generator of External Crystal stops running and CPU will wait for External Clock only. For ETT Board uses only External Crystal. When CPU can not run, we can not modify any Fuse Bit by using Serial Programming. So, user need to modify CPU by Parallel Program first and after that we can use Serial Programming.
- Fuse Bit Position of Lock[2..1], user can assign as required.

5. Assign **Command** → **Program Option** as following.

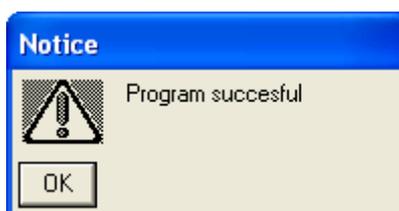
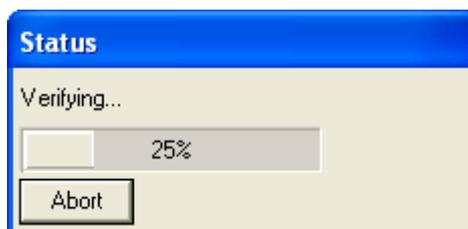


6. Open File for programming into CPU by selecting from **File** → **Open Program (FLASH) File...** → and then specify name and address of HEX File completely.





7. Start to program data into CPU by selecting from **Command** → **Program** and after that program starts to run as instructions in No.5 as following; **Load File** → **Erase** → **Write Program memory (FLASH)** and **Write Security and Config Bits** respectively and user need to wait for program run completely.



After programmed completely, CPU starts to run as downloaded data in program.

The basic verification when can not download any program.

If there's some error in step of programming, user can verify problems as following;

- Read User Manual of Board and User Manual of Method to download program AVR with PonyProg2000 well.
- Check all cable connection and download program by usig PonyProg2000, user need to use with Cable Download ET-CAP10PIN from ETT and need to assign Jumper as truly PonyProg (See all details on page 2).
- Check power supply of board.
- Check all default values of program for downloading PonyProg2000.
- Check signal from PORT-PB of CPU is connected with devices from external while downloading data or not. For example, it is connected with LED or signal from PORT PB is connected with other circuits while downloading data.