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1. Quick start for developing the program

The steps of quick start are as following

1. Wire the connection of I-7188/I-7188X/I-7188E series module
   User can follow steps to do hardware installation.
2. Compiler and Linker for C programming
   To develop programs for 7188/7188X/7188E/8000 series, you can use the compilers below:

   1. BC++ 3.1~5.02
   2. MSC
   3. MSVC (before version 1.52)
   4. TC 2.01
   5. TC++ 1.01

   From Borland's web site, you can download the free TC 2.01 and TC++ 1.01 compilers.

   Web site: http://community.borland.com/museum/

3. Download the program file to I-7188/I-7188X/I-7188E series module
   When you finish above-mentioned paths, you can load program to the I-7188EF-016 and run it.

1.1 Wire connection

Step 1: Connect the CA0910 download-cable between program port of the module and COM1/2 of the PC, as shown in the diagram below.

Notes:

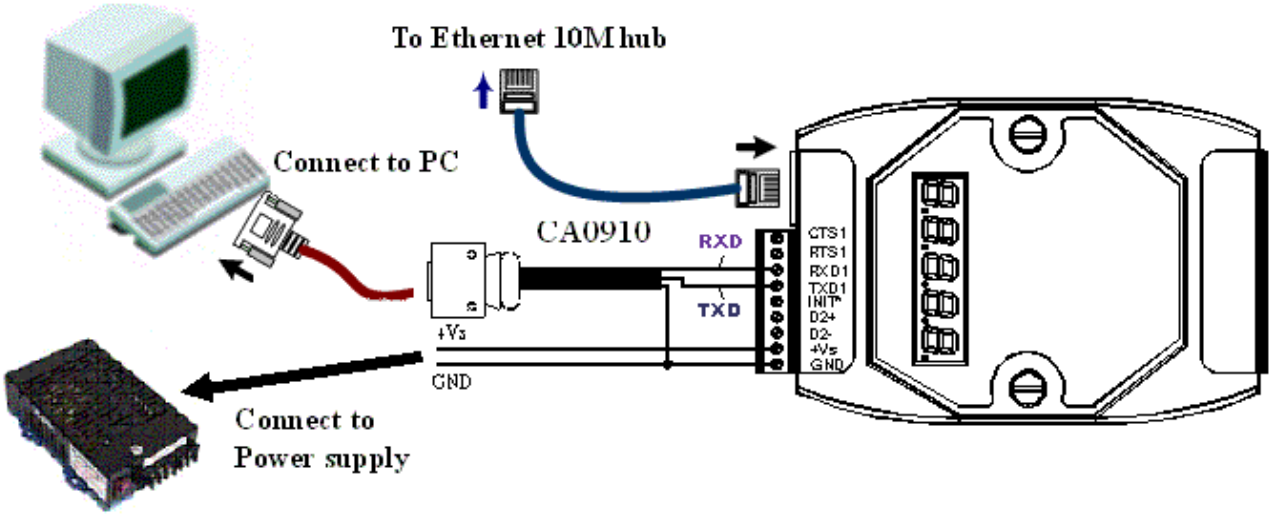
1. The default program port of the modules are shown as following table

Module	7188	7188XA	7188XB	7188XC	7188E	8000
Program Port	COM4	COM4	COM1	COM1	COM1	COM1

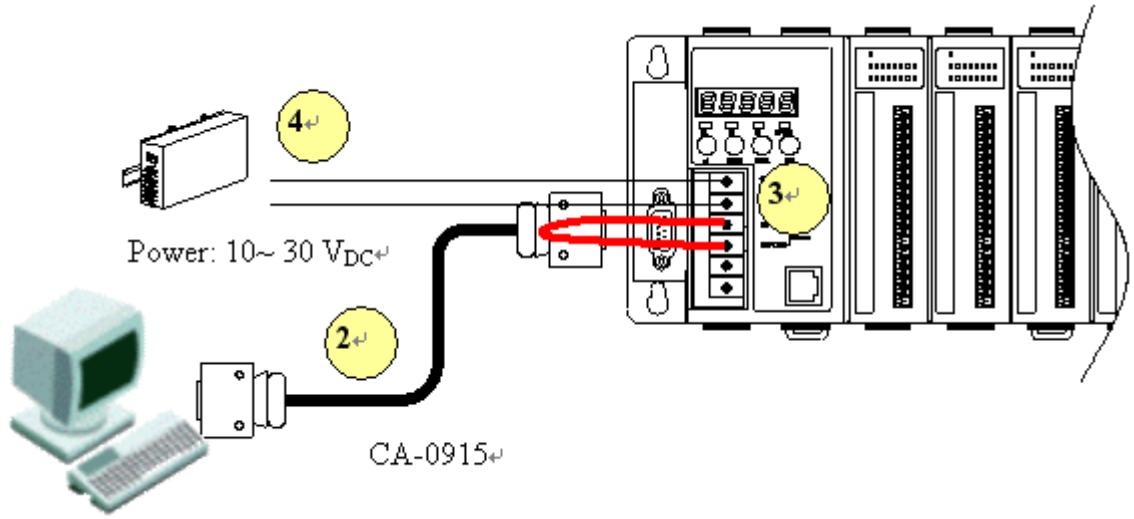
2. The program port can be modified to the other COM port.
3. Please refer to each user manual of the modules for more detail wire connection.

Step 2: Apply power (+Vs, GND) to the I-7188EF-016, +Vs can be range from +30V to +10V DC.

Wire connection for 7188E module



Wire connection for 8000 module



Step 3: Short Init* and GND (or Init*COM for 8000 module).

Step 4: Check the 5-digits of the 7-SEG LED will continuously show as follows:

Hour.Minute.Second

00000->00001->00002……..

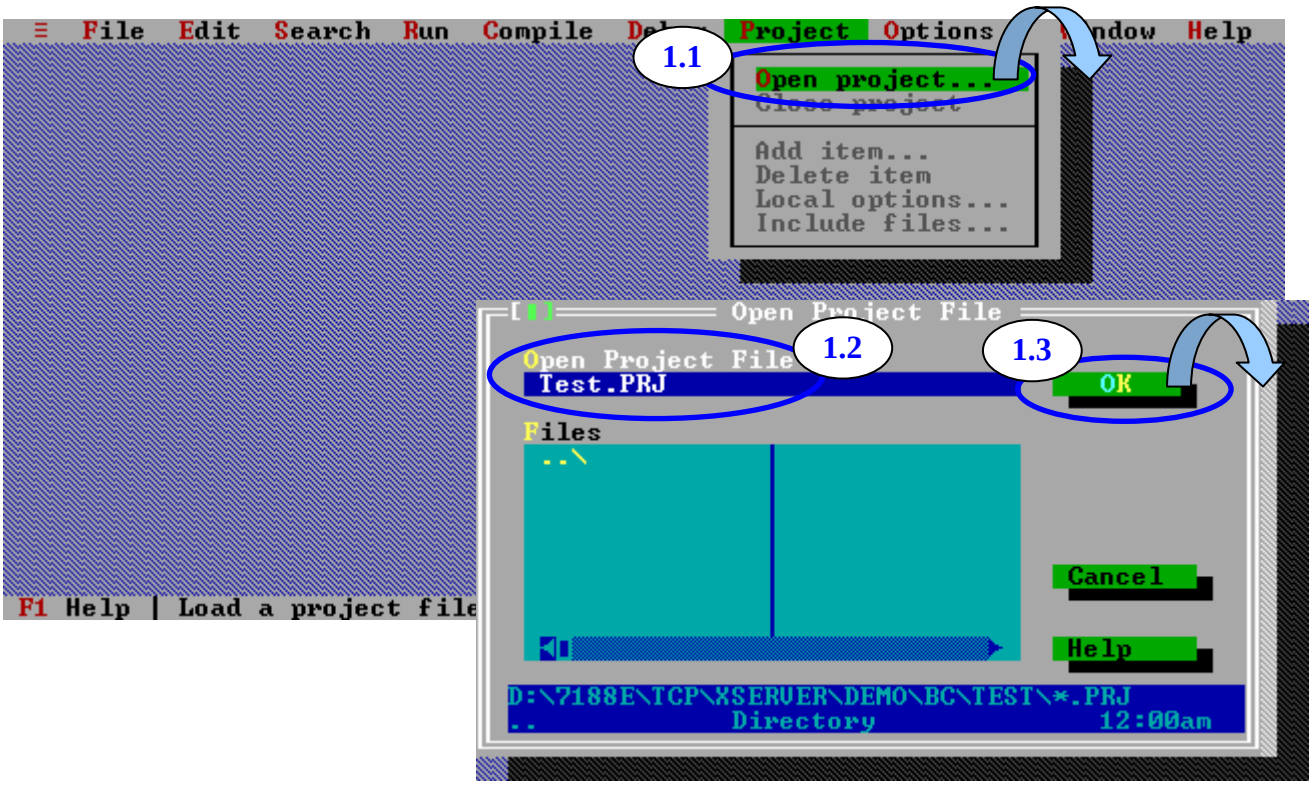
Note:

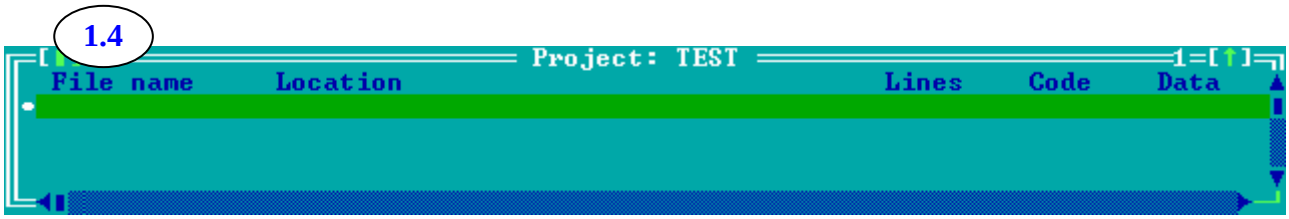
Only display versions of the module will include a 5-digit 7-SEG LED.

1.2 Compiler and Linker for C programming

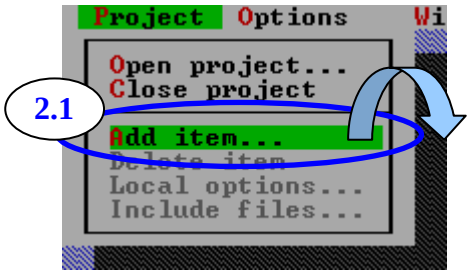
User must use C Language to write application program. You can use the compilers below:
TC, TC++, BC++, MSC or MSVC++.
We suggest user to use BC3.1 for compiler, because we offer the related library that is built by BC3.1 compiler.
Please follow the steps below to obtain how to use BC++ 3.1's IDE to compile a project.

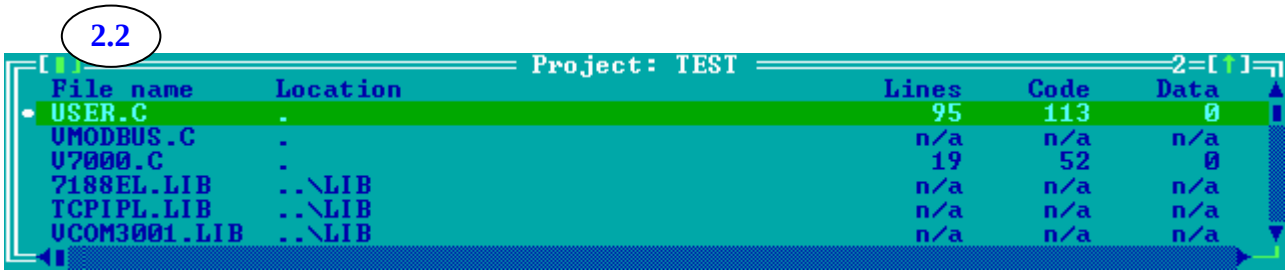
Step 1: Create a new project.



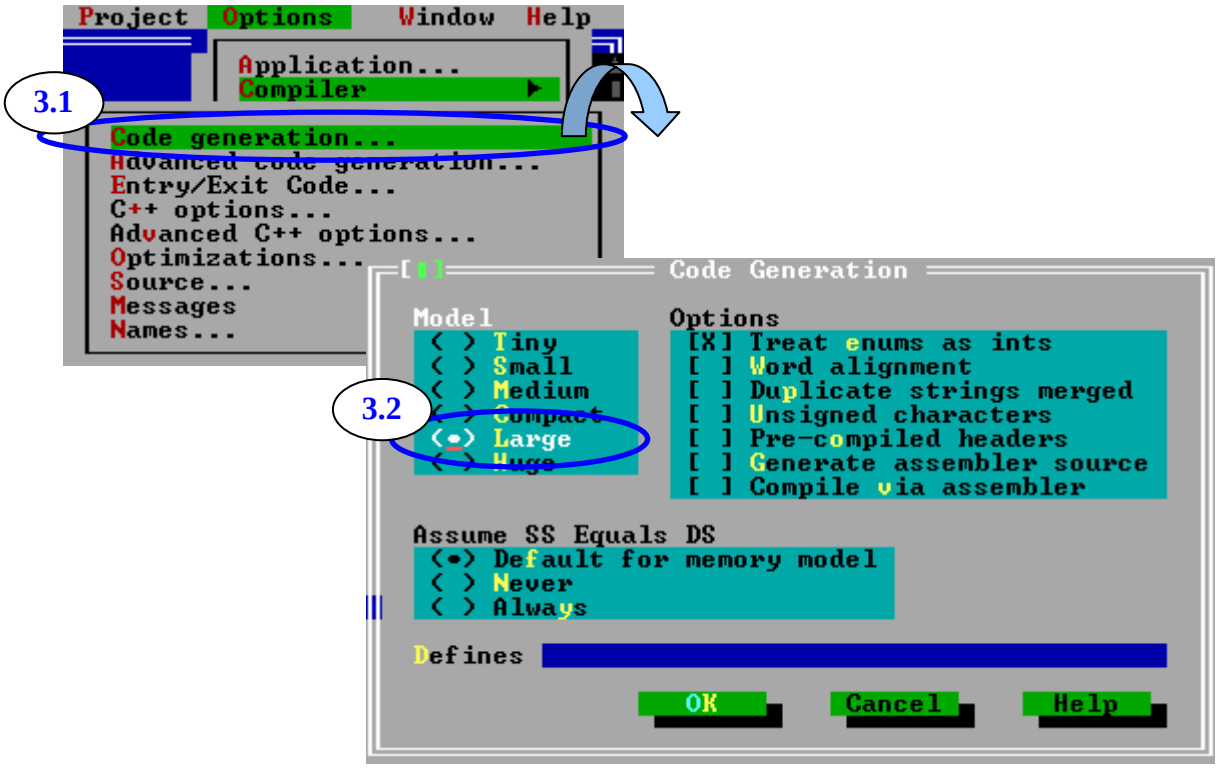


Step 2: Add all necessary files into the project.

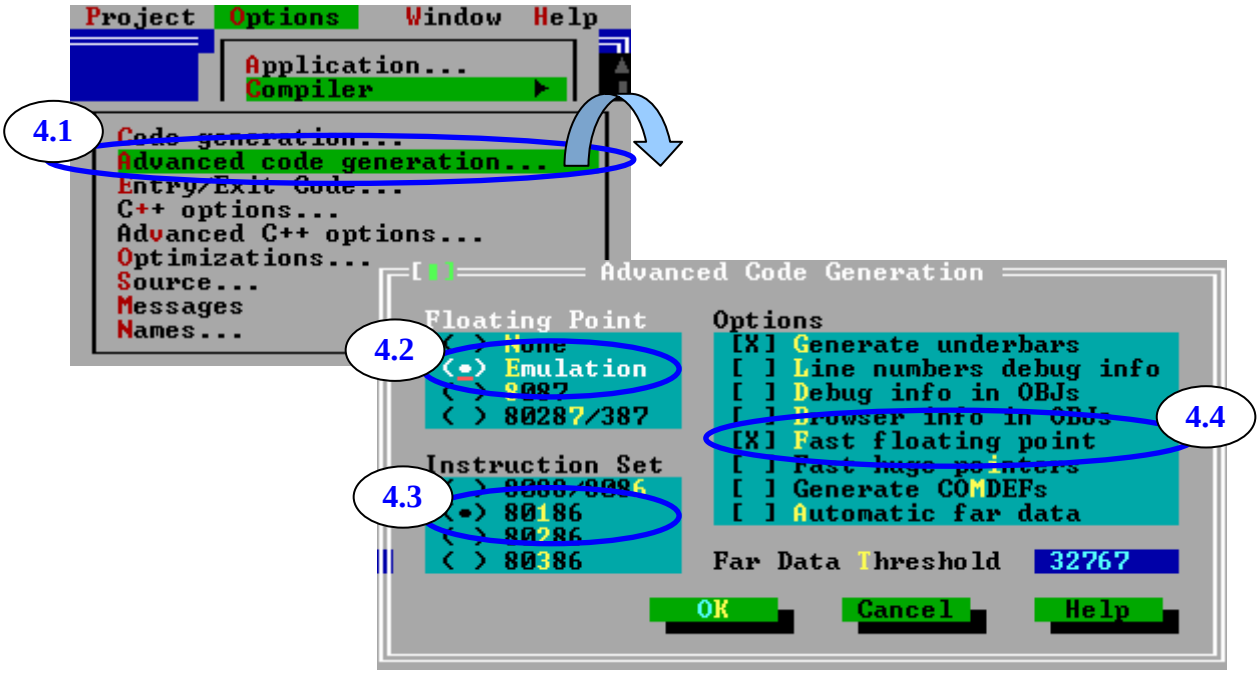




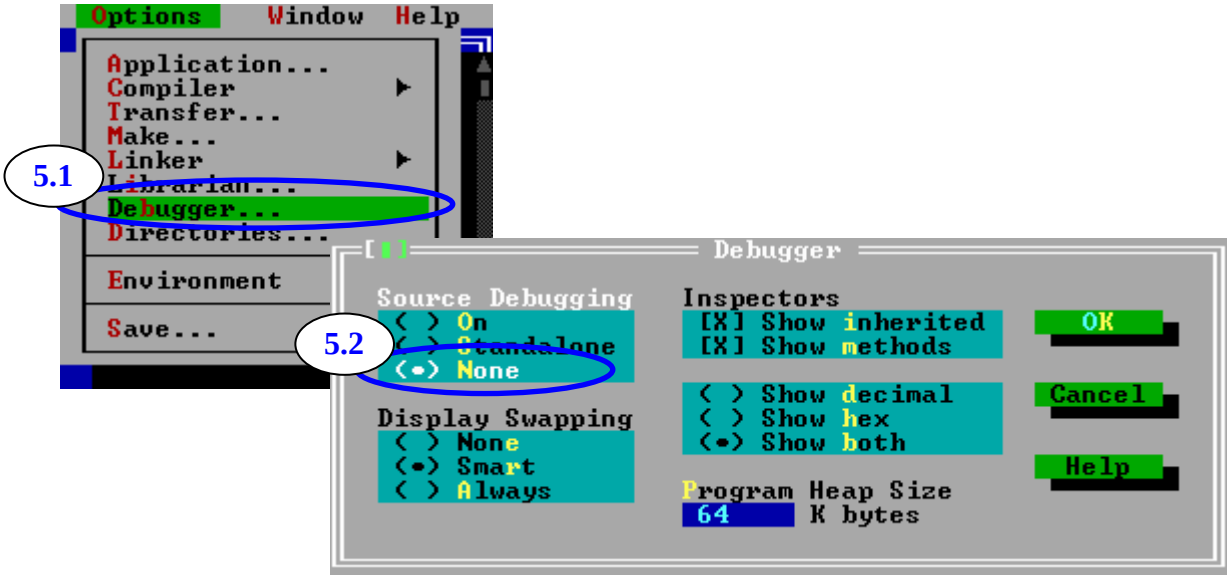
Step 3: Set Code generation options.



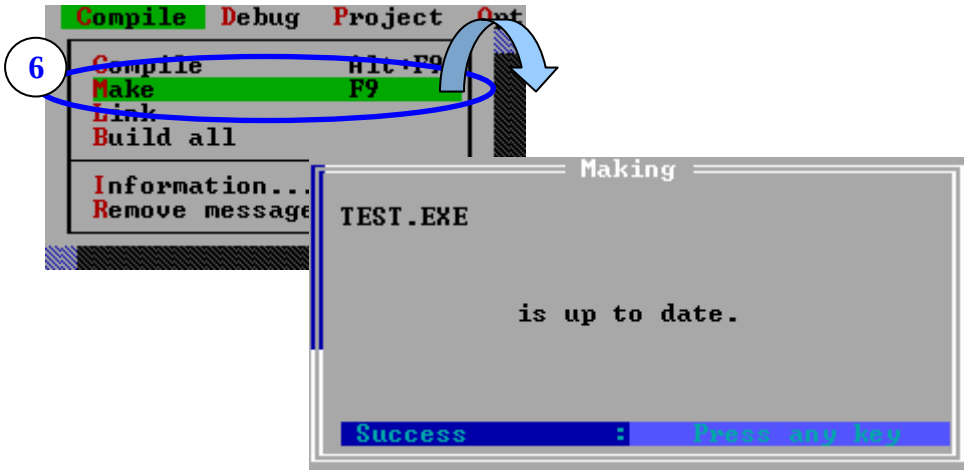
Step 4: Set Advanced code generation options.



Step 5: Set Debugger options.



Step 6: Make the project.



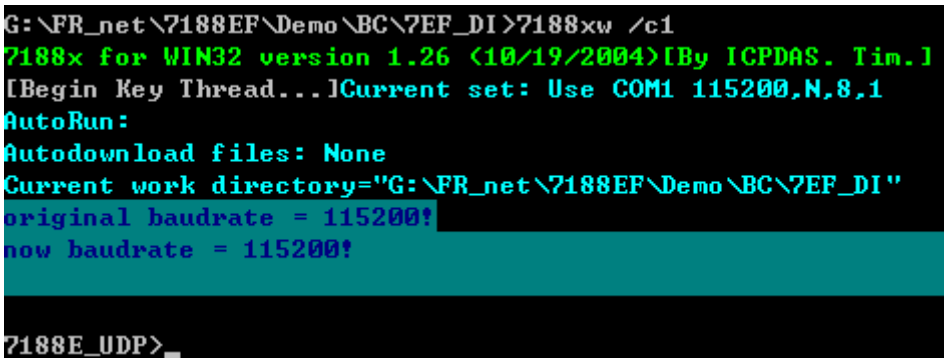
1.3 Download program

7188xw.exe is a utility running on PC for I-8000 & I-7188 series controllers. 7188xw.exe basically is a terminal program. It sends out the data that user key-in to COM port and show the data received from COM port on the screen of PC.

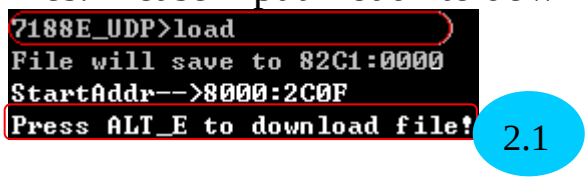
7188xw.exe Location:

1. http://ftp.icpdas.com.tw/pub/cd/8000cd/napdos/minios7/utility/ (Included 7188xw document.)
2. CD:\napdos\minios7\utility\ (Included 7188xw document.)

Step 1: Download 7188xw.exe and run it.

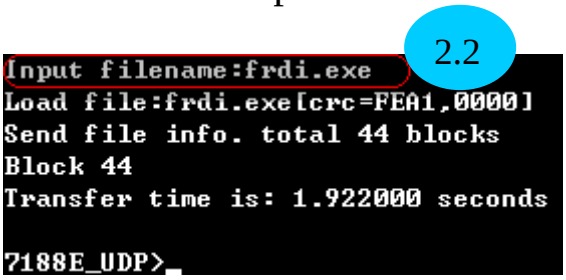


Step 2: Downloads user's programs from host-PC into 7188, 7188X, 7188E and 8000 families. Please input "load" to download file.

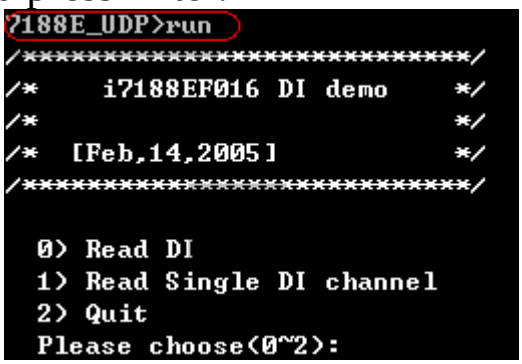


Step 2.1: Press ALT_E to download file.

Step 2.2: Input the filename and press Enter.



Step 3: Input Run and press Enter.



1.4 Important Note

INIT* pin can be used as follows:

A. **Programming Stage** --> Let Init* pin connect to GND.
MiniOs7 will find the Init* pin is connected to GND, so it will don't care the Autoexec.bat and will enter the programming mode. In this mode, PC's monitor will act as the standard output of i-7188/i-8000 series. PC's keyboard will act as the standard input of i-7188/i-8000 series.
User can perform the following actions to design and debug program.
- Download & execute program
- Delete & erase the Flash-Memory
- Read/write the memory of the module
- Test all hardware of the module
- Upgrade the MiniOs7

B. **Running Stage** --> Let Init* pin is floating (No connection).
MiniOs7 will search & execute AUTOEXEC.BAT.

Appendix A: 7188xw command set and hot-key

7188XW.EXE Utility for Host-PC

7188xw.exe is **the Win32 version of 7188x.exe**.

7188xw.exe: Supports RS-232 COM ports using USB and PCMCIA interfaces.

Command line options of 7188xw.exe:

Option	Description
/c#	Uses PC's COM#
/b#	Sets baudrate of PC's COM port (default is 115200)
/s#	Sets screen's display-rows (default is 25, max. is 50)

Hot-key of 7188xw.exe:

Command	Description
F1	Shows help messages of 7188xw.exe
Alt_F1	Shows the Chinese (Big5) help messages of 7188xw.exe
Ctrl_F1	Shows the Chinese (GB2312) help messages of 7188xw.exe
Alt_1	Uses PC's COM1
Alt_2	Uses PC's COM2
Alt_3	Uses PC's COM3
Alt_4	Uses PC's COM4
Alt_5	Uses PC's COM5
Alt_6	Uses PC's COM6
Alt_7	Uses PC's COM7
Alt_8	Uses PC's COM8
Alt_9	Uses PC's COM9
Alt_A	Switches between normal mode and ANSI-Escape-code-support mode
Alt_C	Switchs to command mode. Supports commands: b#: sets new baudrate of PC's COM ports. c#: Uses PC's COM#. n/e/o: sets parity to none/even/odd. 5/6/7/8: sets data bits to 5/6/7/8. p#: sets PC's working directory. q: quits command mode.

Alt_D	Sets the date of RTC to the PC's date.
Alt_T	Sets the time of RTC to the PC's time
Alt_E	For downloading files into memory. Only after the message “Press ALT_E to download file!” is shown on screen, can users press Alt_E.
Alt_H	Switches Hex/ASCII display mode.
Alt_L	Switches normal/line mode. In line-mode, all characters-pressed will not send to COM until the ENTER is pressed. It is designed for testing the 7000 series.
Alt_X	Quits the 7188X.EXE.
F2	Sets the file name for download (without download operation).
F5	Runs the program specified by F2 and arguments set by F6.
Alt_F5	Runs the program stored in SRAM.
F6	Sets the arguments of the execution file set by F2. (10 arguments maximum. If set less than 10 arguments, add ‘*’ to end).
Ctrl_F6	Clears screen.
F8	F8=F9+F5.
F9	Downloads the file specified by F2 into FLASH memory.
Alt_F9	Downloads all files specified by ALT_F2 into FLASH memory.
F10	Downloads the file specified by F2 into SRAM and execute it.
Alt_F10	Downloads the file specified by F2 into SRAM memory.
Ctrl_B	Sends a BREAK signal to the PC’s COM port that is used by 7188xw.exe.
… more …	… more …

Appendix B: Minios7

The MiniOS7 is an embedded O.S. designed for the following families:

- 7188XA/7188XB/7188XC series
- 7521/7522/7523 series
- 7188EA/7188EX/7188EX-256 series
- 7188E1/7188E2/7188E3/7188E4/7188E5/7188E8 series
- 7188EF-016
- 8000 series.
- Iview-100 series
- More new embedded controller families

The MiniOS7 provides more specified functions for the 7188X/7188E/7521/8000 family.
MiniOS7 feature:

Function	**MiniOs7**
Power up time	0.1 sec
Supports I/O expansion bus	Yes
Supports AsicKey	Yes
Supports hardware unique serial number	Yes
Supports MMI, Iview-100 series	Yes
Supports Ethernet 10M interface, 7188E & 8X3X series	Yes
Directly downloads executable programs into Flash ROM	Yes
O.S. updateable (downloadable)	Yes
Built-in hardware diagnostic functions	Yes
Directly controls 7000 series modules	Yes
Customers ODM functions	Yes
Free of charge	Yes

Note: We reserve the right to change the specifications of MiniOS7 without notice.

Command Set of MiniOS7:

Command	Description
LED5 pos value	Shows a HEX value in the specified position of 5-digit LED.
USE NVRAM	Into the service routine for read/write NVARM.
USE EEPROM	Into the service routine of read/write EEPROM.
USE Flash	Into the service routine of read/write Flash-ROM.
USE COM2 /option	Into the service routine of send/receive to/from COM2 (RS-485).
DATE [mm/dd/yyyy]	Sets the date of RTC.
TIME [hh:mm:ss]	Sets the time of RTC.
MCB	Tests current memory block.
UPLOAD	The first step to update the MiniOs7.
BIOS1	The last step to update the MiniOs7.
LOAD	DOWNLOADs the user program into the Flash-Memory.
DIR [/crc]	Shows the information of all files download in the Flash-Memory.
RUN [fileno]	Runs the file with file-number=fileno, no filene→the last file.
Name	Runs the file with file-name=name.
DELETE (or DEL)	Deletes all files stored in the Flash-Memory. It will delete all files.
RESET	Resets the CPU.
DIAG [option]	Hardware Diagnostic.
BAUD baudrate	Sets the new value of communication-baudrate to baudrate.
TYPE filename [/b]	Lists content of the file.
REP [/#] command	Repeats executing the same command # times.
RESERVE [n]	Reserves n Flash Memory sectors for USER's programs.
LOADR	Downloads a file into SRAM.
RUNR [param1 [param2...]]	Runs a program saved into SRAM (downloaded by command LOADR).
I/INP/IW/INPW port	Reads data from the hardware PORT.
O/OUTP/OW/OUTPW port value	Outputs to hardware PORT.
… more …	… more …

*** Refer to **8000 CD\MiniOS7\Document** for user's manual & demo programs for the MiniOS7 ***