DS-186

MICROPROCESSOR

DEVELOPMENT

SYSTEM

OPERATING INSTRUCTIONS - UPDATE

USB INSTALLATION

Debug V5.xx - V6.xx

USB SUPPORT

DS-186 has been updated and the system supports UBS connection only.

RS-232 connection has been discontinued.

Please follow the instructions to install the USB driver.

Installing the USB Driver (Windows XP, 7) – Not Necessary for Windows 10

C5131_CDC.INF configuration file is used to install the new USB device. This driver is for Windows XP and Windows 7/32-bit only.

Use Ceibo_Windows64.INF for Windows 7/64 bit. Windows 10 does not require a driver.

Connect the USB cable to DS-186 and your computer.

Connect the DS-186 power supply to the DS-186 emulator.

Turn on DS-186 power supply and wait until the Hardware Wizard is displayed on the computer screen.

Setup process example for Windows XP:

FIGURE 1: ***XP Wizard***

1. Select "Install from a list or specific location"

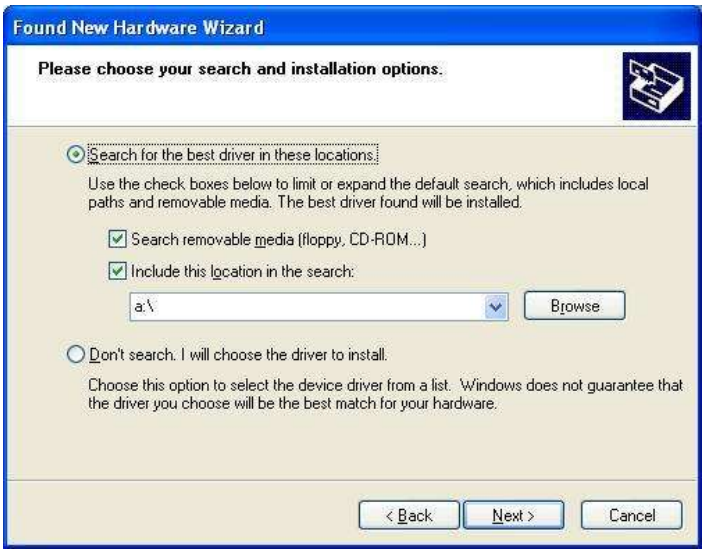


FIGURE 2: ***Locate inf File***

2. Select location of c5131_cdc.inf file. This file is in the Ceibo CD.

FIGURE 3: ***Skip XP Checking***

3. Press “Continue anyway”.

FIGURE 4: ***Installing the Software***

4. Press “Finish”

5. Restart the computer.

6. Open Windows Device manager, COM and LPT ports. If the driver was successfuly installed, you will see **an additional COM port**, "AT89C5131 CDC USB to UART MGM".

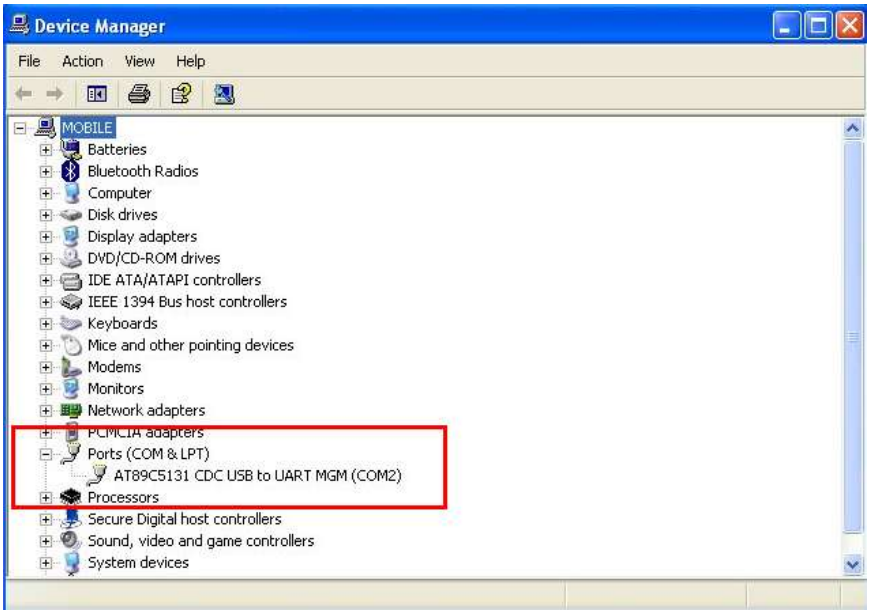


FIGURE 5: ***Device Manager***

7. Launch the Paradigm Debugger and select Debug >> Connect:

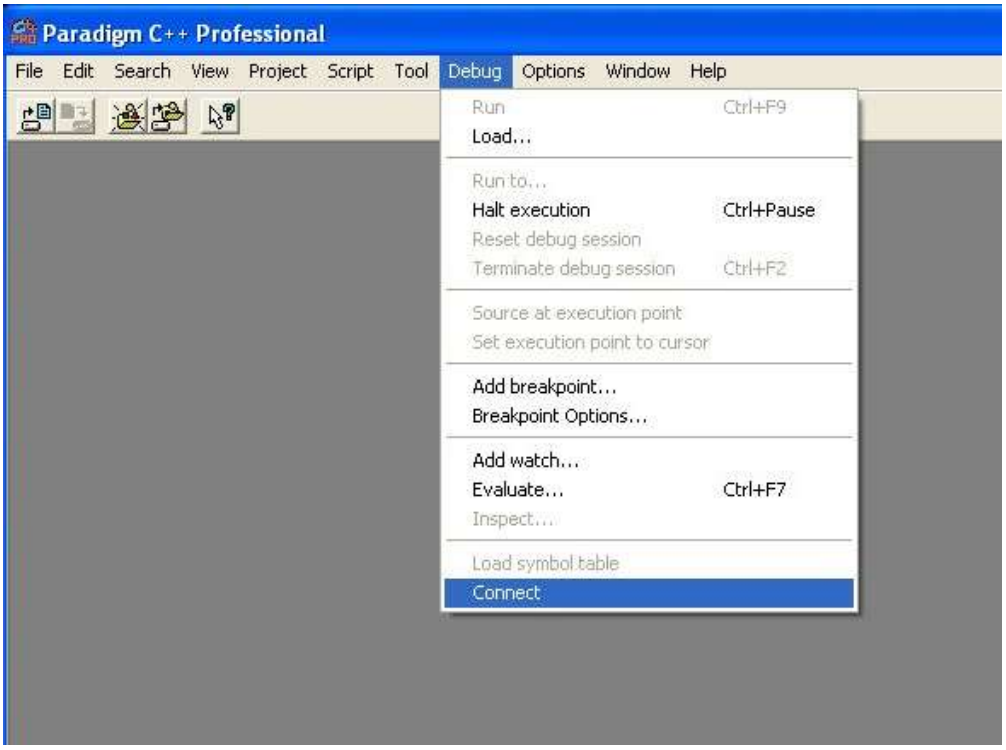


FIGURE 6: ***Connection***

Then select Ceibo DS-186 for Remote connection and in Device **the COM port number that was detected by the Windows Device Manager**. Installing the USB driver adds to Windows a virtual new COM port (like COM5) and that is the virtual COM port that you have to select in the Remote link options menu.

SELECT TIMEOUT = 4000 AND BAUD RATE = 57600

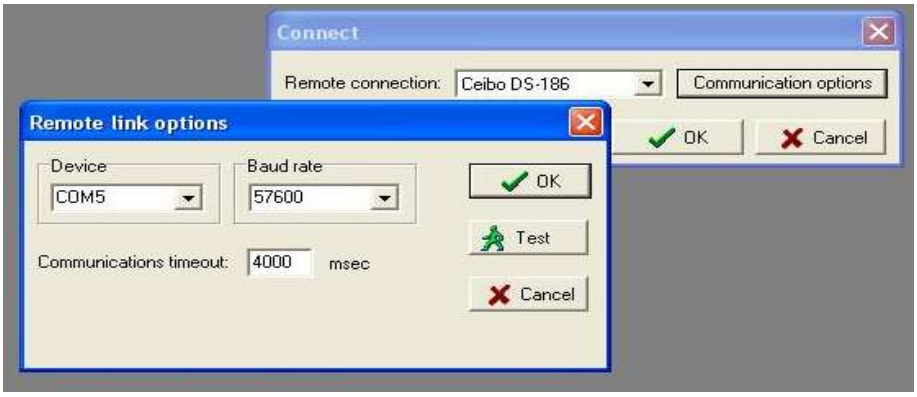


FIGURE 7: ***Device Selection and Remote Connection***

Paradigm Software will connect to DS-186:

FIGURE 8: ***Connecting***

Once the connection finished, you can start debugging any .AXE file.

FIGURE 9: ***Loading a Program***

DS-186 LED indicators

PWR - means Power status

RST - indicates 80x86 Reset pin state

TX/RX - indicates PC communication activity and also used for self test reporting

RDY - this LED shows 80x86 READY pin state

HLDA - indicates HLDA output pin state

Connectors

USB- used for connection to PC

RS-232 - is not used for latest devices

Power Connector - connect +5V power supply

Pushbutton

Reset Pushbutton - Resets DS-186 emulator (located near the USB connector)

Power Up sequence

Upon Power On , DS-186 will carry out a self-test s for several seconds.

During self-test RST LED will blink for 5 to 7 seconds.

After finishing the self –test, TX/RX LEDs will light on continuously. If the TX/RX LEDs blink with a 1second period the self-test failed.

Note: USB driver will be not recognized during Self-test or in case Self-test failed. Then you may get a "Unknown device" display message .

Trouble Shooting

If TX/RX LEDs are blinking with a 1second period , check the other LED indicators and make sure XTAL clock is working properly and clock jumpers are set to internal (factory setup). Then press Reset button or turn off/on the Power switch of the power supply.

The Correct LED status after Power Up is:
PWR - ON
RST - OFF or blinking several times
TX/RX - ON after self-test
RDY -weak ON
HLDA - OFF

For targets with wait state generators is recommended External XTAL selection.

DS-186

MICROPROCESSOR

DEVELOPMENT

SYSTEM

OPERATING INSTRUCTIONS

AND HARDWARE INSTALLATION

CONTENTS

IMPORTANT !!!
DS-186 POWER UP SEQUENCE

Always turn on the target <u>first</u>
and then the emulator.

SOFTWARE DOCUMENTATION

Use Paradigm's Help File

Need Tech Support?
support@ceibo.com

DS-186 QUICK START-UP

A. *THE SYSTEM*

DS-186 includes the following parts:

1. DS-186 Emulator
2. USB Cable
3. Power Supply
4. Paradigm Software
5. This User's Manual

Check that you have all the above parts.

B. *CONNECTING THE EMULATOR*

1. Attach the header to the ribbon cable.

2. Connect the Power Supply to the emulator. Please note that the plug has a guide that fits into the notch of the jack.

3. Place the Paradigm DEBUG disk in the drive and install the software.

4. Connect the USB cable to the emulator and your PC.

5. Press the reset push-button.

6. During self-test RST LED will blink for 5 to 7 seconds. After finishing the self-test, TX/RX LEDs will light on continuously. If the TX/RX LEDs blink with a 1 second period the self-test failed.

Note: **While using the latest Paradigm C++ environment, select Debug, Connect and Communication Options to define the COM port and Timeout.**

1. DESCRIPTION OF THE SYSTEM

1.1 *INTRODUCTION*

DS-186 is a real-time in-circuit emulator dedicated to the 8086/8 and 80C186/80C188 family of microprocessors manufactured by Intel, AMD, Rochester, Siemens and NEC.

The emulator provides a versatile and efficient tool for debugging, developing and manufacturing of systems designed with these microprocessors.

The system can be adapted to the different derivatives of the 80C186 by replacing adapters with standard microprocessors. DS-186 operates with a PC computer. The software includes a state-of-the-art source-level-debugger designed to support embedded system applications by Paradigm.

1.2 *FEATURES*

* Support of 8086/8, 80C186/8/XL/EA/EB/EC and other Microprocessors

* Full Speed Emulation up to 50MHz (crystal frequency)

* 1 MBytes of Zero Wait-State Mapped Memory

* 8K Frames Dynamic Trace Buffer with Triggers

* 1M Hardware Breakpoints

* USB Communication Link

* Numeric Coprocessor Support

* High-Level Language Source Debug

* Support for Borland, Microsoft and Intel Compilers

* Full C, Pascal and Assembler Expression Evaluation

* Full Support for C++

1.3 *SPECIFICATIONS*

EMULATION MEMORY

DS-186 provides 1Mbyte of zero-wait state mapped memory.

MEMORY MAPPING

Memory can be mapped in boundaries of 64 KByte with programmable number of wait states.

EMULATION SPEED

The system operates up to 50MHz (crystal frequency). Emulation speed is limited by the maximum frequency of the microprocessor placed on the adapter.

TRACE AND LOGIC ANALYZER

The Trace Buffer has the capability of recording 8K frames. The Trace display shows the source, assembler and bus cycles.

HARDWARE BREAKPOINTS

DS-186 has the ability to set 1M hardware breakpoints. The program is executed until a specified breakpoint condition is reached.

LANGUAGES AND FILE FORMATS

DS-186 accepts Intel OMF-86 and .EXE files. These files are converted by DS-186 utilities to absolute executable format. Assembler and High-Level-Language files are supported by DS-186.

SUPPORTED COMPILERS AND ASSEMBLERS

Most of the popular compilers are supported by DS-186: Borland C++, Turbo C++, Turbo C, Microsoft C, Microsoft C++, Intel C-86, Intel PLM-86 and more. DS-186 also accepts files generated by Turbo Assembler, Microsoft Assembler and ASM86.

PERSONALITY ADAPTERS

DS-186 uses standard microprocessors for hardware and software emulation. The selection of a different microprocessor is made by replacing the microprocessor in the adapter if it is pin-to-pin compatible or changing the adapter. The system runs at the frequency of the crystal on the adapter or from the clock source supplied by the user hardware.

HOST CHARACTERISTICS

Windows XP or later.

MICROPROCESSOR VIEWS

Assembler and Disassembler windows support the entire instruction set. The peripheral device views allow display and modification of any on-chip peripheral register.

DATA VIEWS

Data views allow the examination of source modules in native or disassembled formats, breakpoints, CPU registers, memory contents, complex data structures like pointers, arrays, structures, unions, bit fields and linked lists, watches and
inspectors, and many more.

EXECUTION CONTROL

DS-186 can execute a step forward or backward, halt the program execution, run to a function call, and execute functions or procedures with parameters to test individual routines.

ON-LINE HELP

A custom context-sensitive help is always available.

1.4 *DS-186 ADAPTERS*

ADAPTER	SUPPORTED DEVICES
AD-186	80C186, 80C188, 80C186XL, 80C188XL, 80C186EA, 80C188EA.
AD-186EB	80C186EB, 80C188EB.
AD-186EC	80C186EC, 80C188EC.
AD-V50	V40, V50.
AD-V25	V25.
AD-86	8086, 8088, 80C86, 80C88, V20, V30

1.5 *EMULATION RESTRICTIONS*

The following list of restrictions is valid for DS-186:

1. DS-186 uses a 64 KByte segment of the memory space. This portion of the 1 MByte emulation memory is relocatable. The software refers to this memory as guarded. The memory cannot be changed by any user access including chip-selects.

2. NMI input is shared by the system. The user NMI input can be accessed by doing the following:

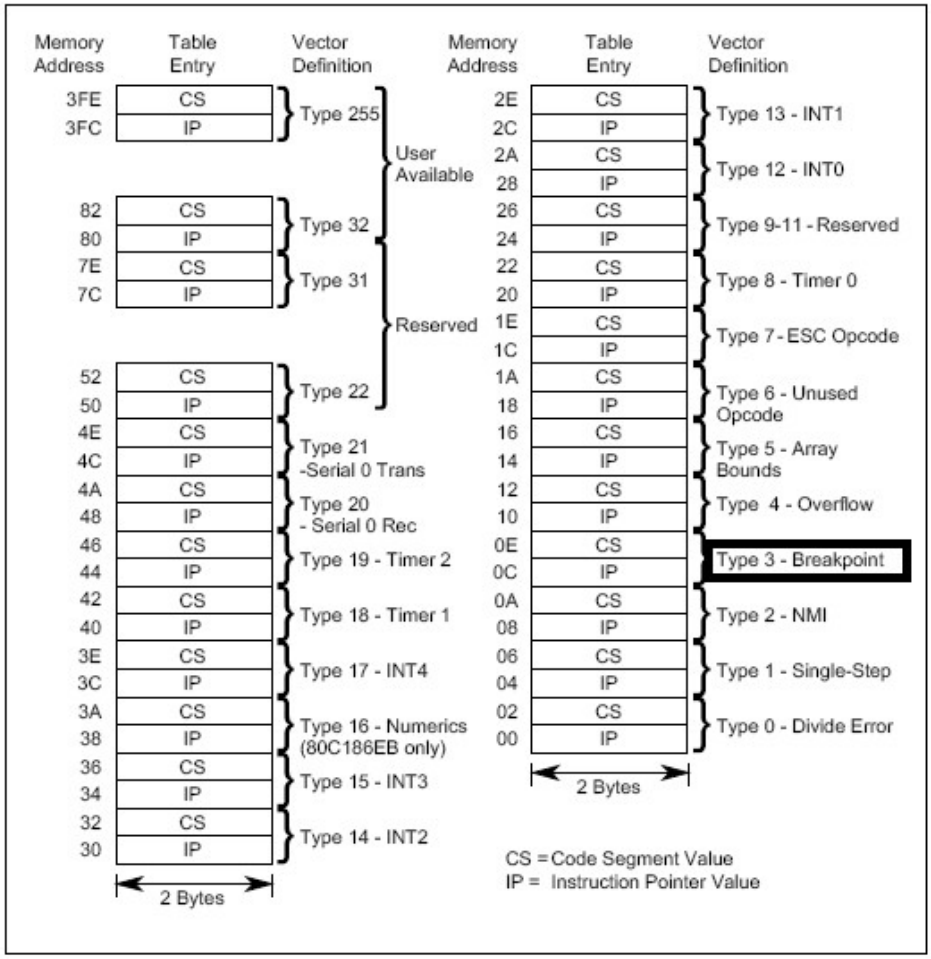
a. Do not initialize your NMI vector in your program.

b. Select the REMOTE Command in the Paradigm window. Activate SETNMI Command and select the same cs:ip your program uses to carry out the NMI interrupt service routine. Type for example: SETNMI 0100:0000.

c. Select the REMOTE Command in the Paradigm window and activate the NMIENA Command to enable your NMI signal. Type for example: NMIENA.

d. The NMIDIS Command may be used to disable your NMI signal.

3. Type 3 pointer is reserved by the system. Type 3 is the breakpoint interrupt and not the INT3 hardware interrupt. Please see the attached figure.



Interrupt Vector Table

2. INSTALLING THE DS-186

2.1 *INTRODUCTION*

This section describes hardware and software installation procedures. It also details the connection steps required to starting up.

2.2 *USB INTERFACE*

DS-186 is serially linked to a host computer, through a USB interface. Follow the instructions to install the USB driver.

2.3 *SYSTEM SETUP*

Although the system is supplied with factory setup, you may wish to replace the adapter, select a different clock source, etc.

Opening the box is very easy. Just turn the four white legs on the bottom of the box and the upper cover will be released.

2.4 *FREQUENCY SELECTION*

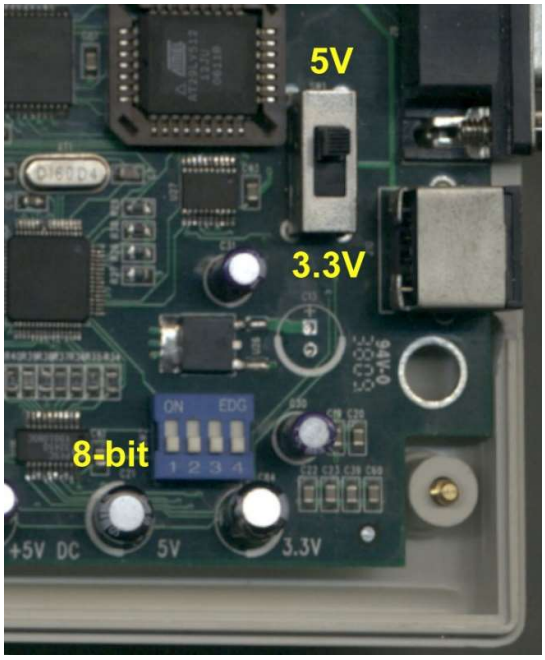
The jumper on the adapter and near the microprocessor is used to select the internal crystal or an external clock source. Both jumpers are used to connect or disconnect XTAL1 (clock in) and XTAL2 (in case of availability) to and from the microprocessor.

2.5 *REPLACING THE ADAPTER*

The adapter can be replaced by disconnecting the 50-pin ribbon cable and then pulling up the small printed circuit board with the microprocessor on it.

2.6 *DIP AND SLIDE SWITCHES*

Bus size is internally set to 8 or 16-bit. This selection is done by means of a DIP switch #1:



ON means 16-bit (8086, 80186xx, etc.) and OFF means 8-bit (8088, 80188, etc.).

A slide switch on the main board and inside the emulation box is used to select 5V or 3.3V emulation.

2.7 CONNECTING THE DS-186 COMPONENTS TOGETHER

For proper installation procedures the host must be properly configured and the power should be OFF.

Perform the following steps to connect the emulator components.

a) Verify that the power supply is in the "OFF" position and connect the plug to the emulator.

b) Connect the USB cable into the USB connector on the DS-186 and tighten the retaining screws.

c) Connect the other end of the USB cable to computer.

d) Plug the AC power cable into the back of the power supply. Plug the other end of the cable into a power outlet.

3. OTHER TOPICS

3.1 MAPPING

1. The available user memory is 1MByte less the reserved 64KByte.

2. The Guarded block is only 64 KByte. If the user selects a larger block, 64K is automatically mapped as guarded and the rest as ICERDWR.

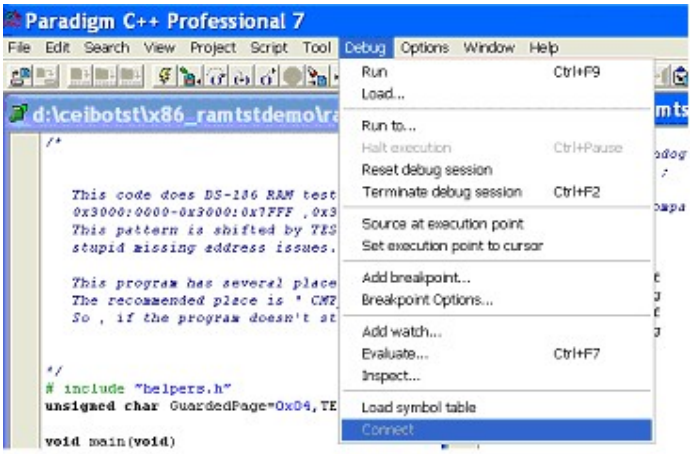
3. By mapping the 1MByte as belonging to the Target the following occurs: all the memory is mapped as Target except a guarded 64KByte block that is set to a default of 30000 - 3ffff. The system automatically checks if the target memory
is present and in case of a failure the low 1KByte of the memory is mapped as internal. By selecting 1M GUARDED or 1M ICERDWR the boundary 30000-3ffff is mapped as guarded and the rest is mapped as internal.

Internal Data access

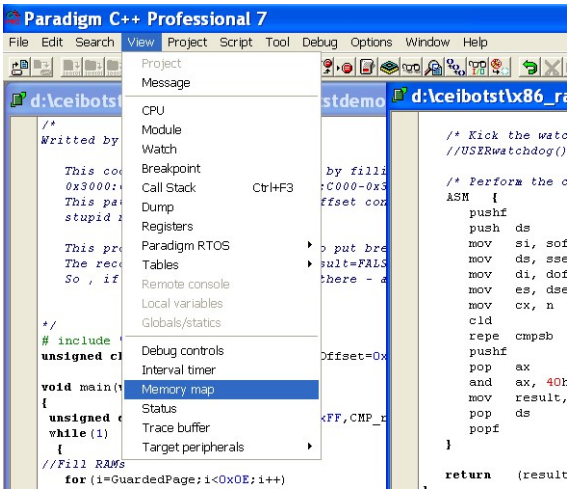
1. Target and Emulator Power = off

2. Connect emulator to target board. Target and Emulator Power and emulator = on.

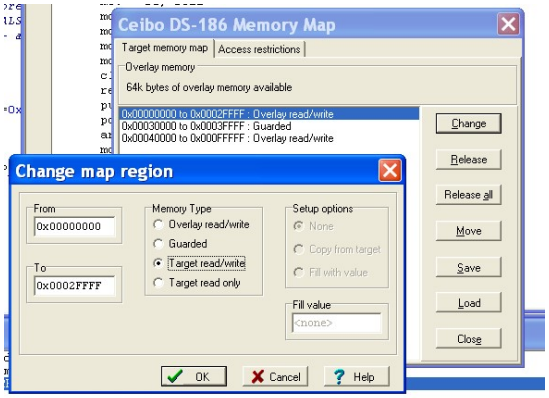
3. Invoke Paradigm, Debug, Connect:



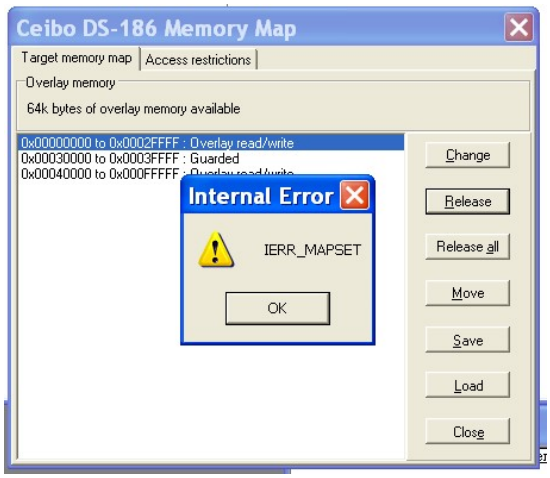
4. Select Menu View-Memory Map:



Select first memory block and press CHANGE button. Modify memory type to target Rd/Wr and press Ok.

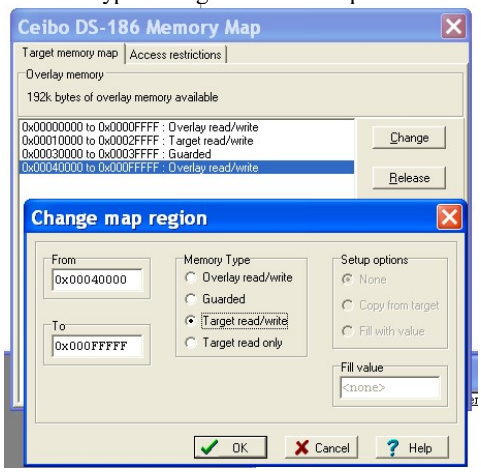


If there is an error message like this:

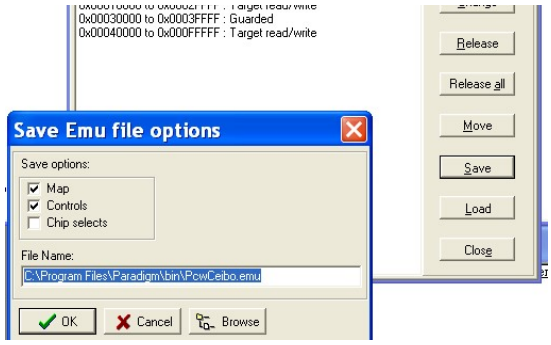


the emulator is not accessing properly the target memory; in such a case, addresses 00:0000-00:02FFFFh with the interrupt vectors are automatically mapped back to the emulator memory.

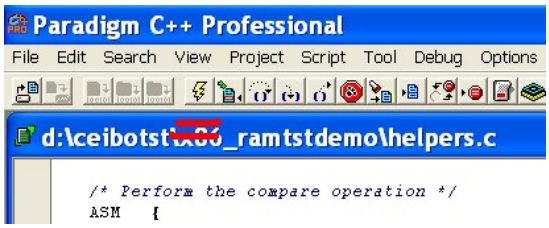
5. Select last memory block (0x40000 to 0xfffff) and press CHANGE button. Modify memory type to target Rd/Wr and press Ok.



6. save setup as follows:



7. Press the Run button:



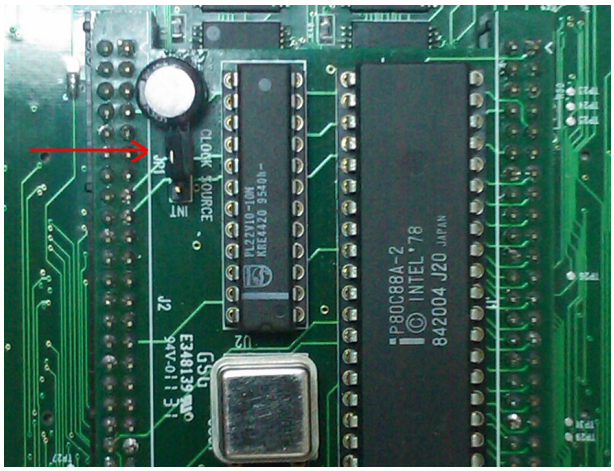
If the target is working properly, then no additional settings are necessary. Otherwise, it will require a setup that synchronizes the Reset or Power On from the target to the Run function. Ceibo will need more information to prepare it:

a) Are the 8086 board and others powered with the same power supply?
b) Do you have a common Reset button to all the CPUs?
c) What is the time gap between the 8086 wake up and other CPUs to ensure a normal operation?

External code access

1. Connect Emulator to target.

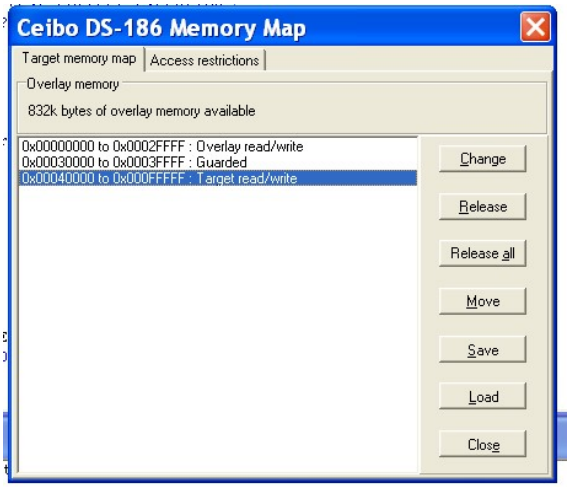
2. Select clock to External – setup the XTAL jumper as in the following picture:



3. Turn the Emulator and Target power On.

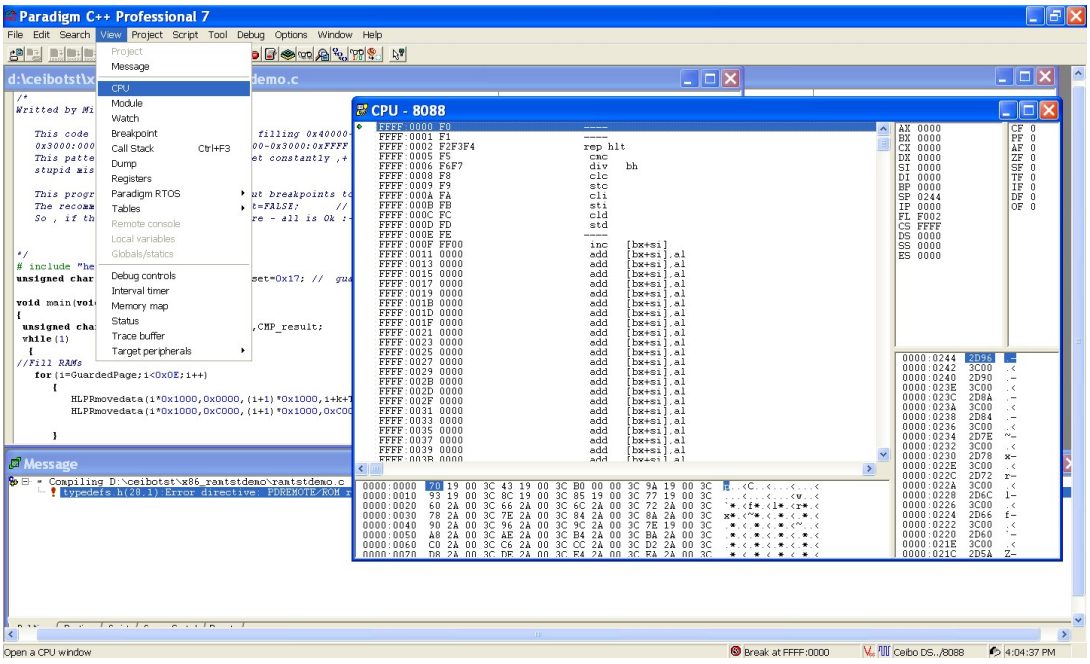
4. Invoke the Paradigm debugger and connect to Emulator. In case of error - check the target is properly connected to the device. You should not get any error.

5. Open the Mapping window, select the line 40000-FFFFF and press Release button



6. Save Map setting

7. Select Menu View-CPU



8. Print Screen CPU window and send it to Ceibo.

3.2 EXIT CODES

Should a serious error be detected during a debugging session the system will terminate the user application and have the debugger report the cause of the error by means of an exit code. The following is the list of exceptions used by the system.

EXIT CODE	DEBUGGER REPORTS	MEANING
246	-10	Abort called
245	-11	Stack overflow
244	-12	Floating point exception
243	-13	Null pointer assignment
255	- 1	Memory checksum error
254	- 2	Bad command packet
253	- 3	Unexpected interrupt
252	- 4	Zero divide
251	- 5	ESC opcode exception
250	- 6	Unused opcode exception
249	- 7	I/O trap
248	- 8	Array bounds exception
247	- 9	INT0 exception

4. PLM86 SUPPORT

Following are the rules for working with the PLM86 environment. These include LINK86 and LOC86.

The final file to be loaded into the CEIBO DS-186 emulator is named *.LOC.

1. The first phase is to compile the source files. An example may be the following three files:

```
PLM86 file1.src DEBUG OPTIMIZE(0)
PLM86 file2.src DEBUG OPTIMIZE(0)
PLM86 file3.src DEBUG OPTIMIZE(0)
```

Please note that you have to use the option OPTIMIZE(0). When not chosen, the default is OPTIMIZE(1) and that is not suitable for using the files with CONSRC utility, which will be explained later.

Also note that you have to compile with the option DEBUG.

PLM86 allows the module names of the above files to be different than the name of the module itself. However, when using the PARADIGM Debugger the name of the files must be equivalent to the name of the module.

The PAGEWIDTH parameter is also important to adapt the listing file to the debugger. It must be 15 characters above the maximum line width that is contained in your source file. For example, if the longest line in your source has 80 characters, you should define at least 80+15 = 95 characters per line.

2. The second phase is the correction of the source lines. For example, carry out the following conversions:

```
CONSRC file1.src
CONSRC file2.src
CONSRC file3.src
```

The CONSRC.EXE software converts the lines in the source PLM86 files according to the lines in the list files.

This conversion should not result in errors or warnings.

Before retrying a conversion, make sure to delete the former object files, otherwise an error will occur.

3. The third phase is to link all the files together:

```
LINK86 file1.obj, &
 file2.obj, &
 file3.obj, &
 PLM86.lib &
 To example.lnk
```

This operation should not result in errors or warnings.

4. The fourth phase is to locate all the files in the physical address space:

```
 LOC86 example.lnk to example.loc &
 AD(CS(code(0F000H), &
 stack(800H), &
 data(0C00H))) &
 SS(stack(+100)) BS &
 RS(0200H TO 0400H)
```

This operation should not result in any errors or warnings.

The recommended stack allocation is 800H.

The RS directive is used to reserve the memory space dedicated to the interrupt table.

5. The final phase is to use the OMFCVT.EXE software on the example.loc file. This permits PARADIGM Debugger to recognize PLM86 symbols and variables:

```
 OMFCVT -Xpsrc -Ml example.loc
```

This example assumes that the memory module is large (-Ml).

The -Xpsrc directive defines the .src as the source extension for the PLM86 files.

All the options are described in the OMFCVT manual.

5. 80C186EC SUPPORT

The 80C186EC and 80C188EC microprocessors can be used with any of the following Emulation Technology adapters.

All the possibilities for the PQFP (SQUARE) package are:

EPC-100QF01-SM3 - PQFP surface mount clip

EP5-100QF01-ASM - PQFP plug for AMP socket

EP5-100QF01-TSM - PQFP plug for Textool socket

EP5-100QF01-SSM - PQFP surface mount plug soldered to pads

All the possibilities for the EIAJ (RECTANGULAR) package are:

EPC-100QF06-SMA - EIAJ surface mount clip

EPP-100QF06-SM - EIAJ surface mount plug soldered to pads

6. 8/16 BIT SUPPORT

The DS-186 supports both the 86/186 and 88/188 microprocessors.

Two actions are required to setup the system:

1. Check that the personality adapter has the appropriated microprocessor. For example, if you are emulating the 80C188EB, the adapter must have an 8-bit 80C188EB and not a 16-bit 80C186EB microprocessor.

2. Check that the DIP switch is set to the right microprocessor type, 8086 or 80186 for 16-bit microprocessors and 8088 or 80188 for 8-bit microprocessors.

7. 8086/8 and V20/V30 SUPPORT

Two accessories are required to support the 8086 and 8088 microprocessors: ADP-86 adapter and HDR-86 header. These accessories also provide support for NEC V20/30.

ADP-86 is installed inside the emulator, while HDR-86 is attached to the ribbon cable.

8-bit Setup

The 8-bit bus microprocessors (8088 and NEC V20) need the following setups:

1. Pull off the jumper cap of JP2 on ADP-86.

2. Check that an 8088 or NEC V20 microprocessor is placed in the U1 socket.

3. Check that the DIP switch is set to 8-bit type.

16-bit Setup

The 16-bit bus microprocessors (8086 and NEC V30) need the following setups:

1. Put the jumper cap of JP2 on ADP-86.

2. Check that an 8086 or NEC V30 microprocessor is placed in the U1 socket.

3. Check that the DIP switch is set to 16-bit type.

Clock Source

The clock source for the CPU is derived by **dividing the oscillator frequency by 3**. For example, if the oscillator supplied on ADP-86 is 24MHz, the microprocessor clock in will be 8MHz. Set JP1 to EXT on ADP-86 to select an external frequency source.

Mode Selection

The HDR-86 supports both the minimum and maximum modes of operation. Set W1/2/3 jumper to MIN or MAX for minimum or maximum mode respectively.

8. V25 SUPPORT

Two accessories are required to support the V25 microprocessors: ADP-V25 adapter and HDR-V25 header.

1. P1.7 may be used as READY input only. The user must tie to GND if not used as Ready input in target.

2. P1.0 may be used as user NMI input only. The user should tie to GND if not used as NMI in target. (NMI is shared with the DS-186 system.)

3. The clock source only supports Internal/External oscillator. The crystal option is not supported.

4. Reset button does not affect the PRC setting.

5. Trace is not supported by V25.

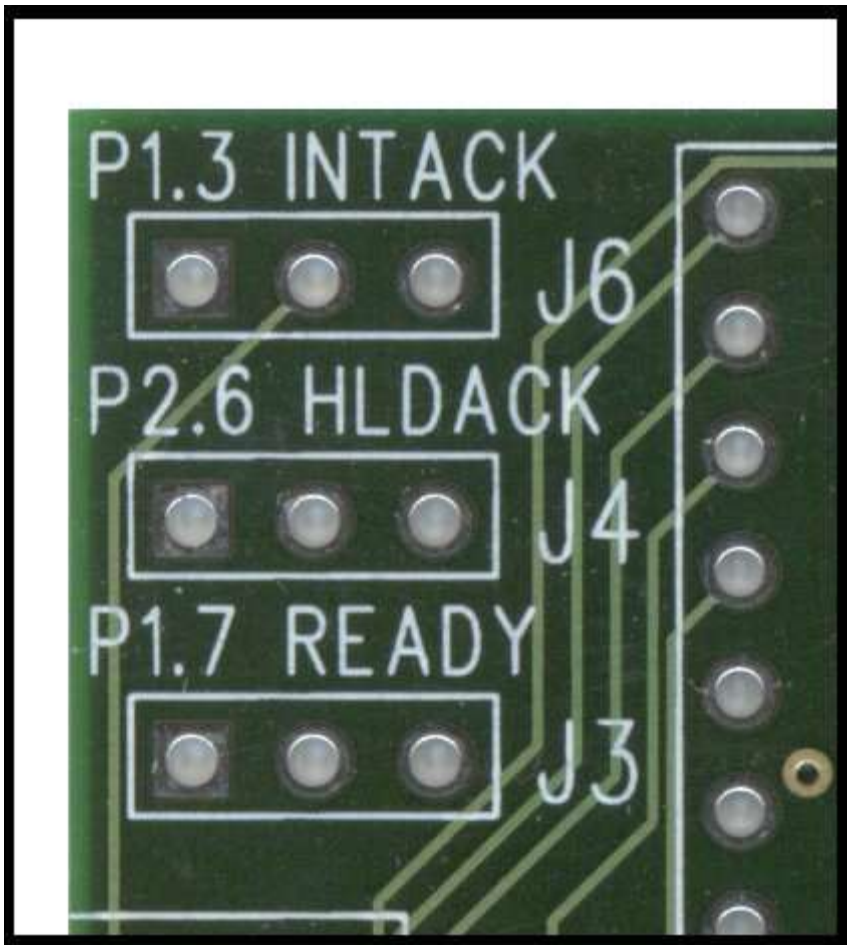
While working with V25, the system is set to the default clock division (1/8). This limits the time response of the system and. Clock division can be changed in user software or manually in the PRC register.

Following are examples of the different setups:

PRC: 40H - divide by 2 and internal RAM access enabled.
PRC: 41H - divide by 4 and internal RAM access enabled.

Clock Oscillator	Divide By	V25 FREQ
10MHz	2	5MHz
16MHz	4	4MHz
32MHz	4	8MHz
40MHz	4	10MHz

The three setup jumpers on the adapter (inside the DS-186 system) must be set according to the following table:



JUMPER	PORT	OPTION
J4	P2.6	HLDA control
J6	P1.3	INTAK control
J3	P1.7	READY control

Left position on the above picture selects Ports.

Right position of the above picture selects alternate function.

CEIBO

DS-186 REGISTRATION CARD

Thank you for registering your DS-186 package. By completing this card and returning it to Ceibo, you will receive a free software update and other product information.

NAME:_____

COMPANY:_____

ADDRESS:_____

CITY:_____

STATE:_____ ZIP:_____

FAX #:_____

PHONE #:_____

DATE PURCHASED:_____

DS-186 SERIAL #:_____

Mail or Fax in USA to:
Ceibo Inc.
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DS-186

MICROPROCESSOR

DEVELOPMENT

SYSTEM

HARDWARE INSTALLATION

CONTENTS

1. Replacing the Adapter

Adapter is the board that has the ***emulated microprocessor***. Follow the steps described below to replace the adapter:

a) Ensure that the power is OFF to DS-186.

b) Loosen the four screws in the bottom of the box. No tools are needed and this operation can be done manually.

Figure: *Opening the Emulator Box*

c) To connect a different adapter to DS-186, first remove the adapter that is connected to the motherboard by two connectors. In the following figure, the connectors are J1 and J2.

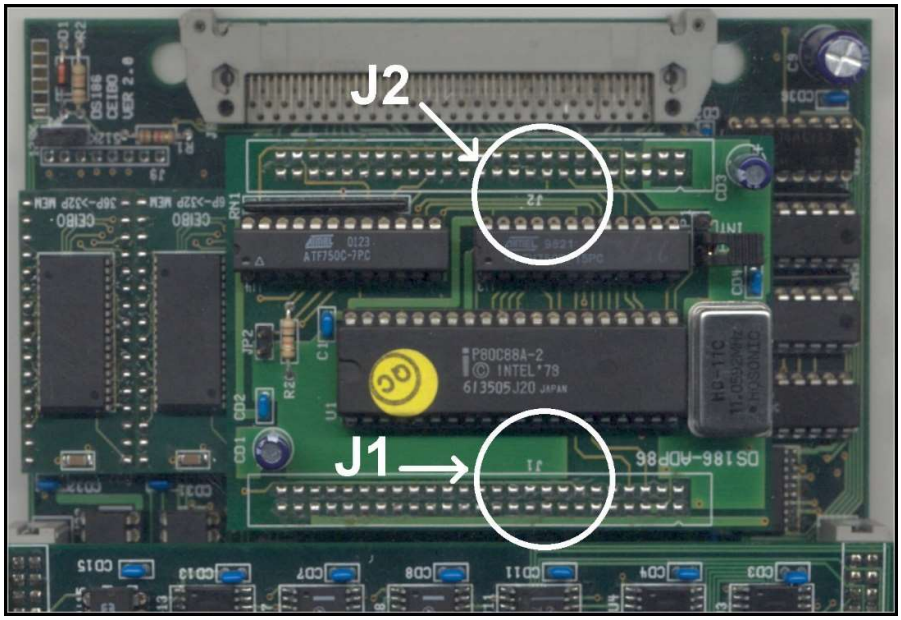


Figure: ***Locating the Adapter Connectors***

d) After removing the adapter, you will see the female connectors on the DS-186 motherboard, which are marked J4 and J5.

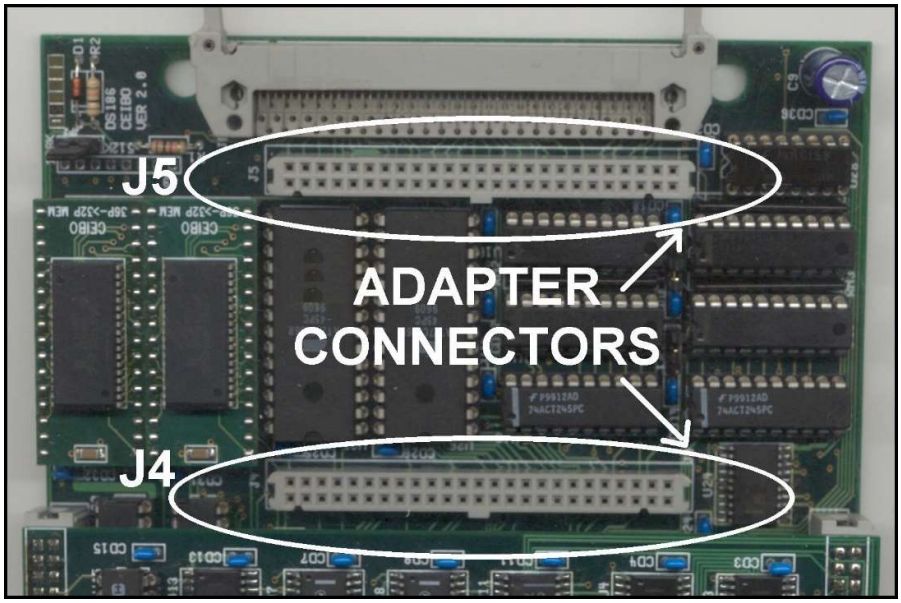


Figure: ***Adapter Connectors on the Motherboard***

e) To connect a different adapter to DS-186, align and press the J1 and J2 adapter connectors on the J4 and J5 motherboard connectors until they are firmly plugged together.

2. Replacing the Emulation Header

Emulation Header is the board attached to the ribbon cable and that has the plug with the mechanical characteristics of the emulated microprocessor. It has to be ***plugged into the target board socket***.

a) Ensure that the power is OFF to DS-186 and that the emulation header is not connected to a target board.

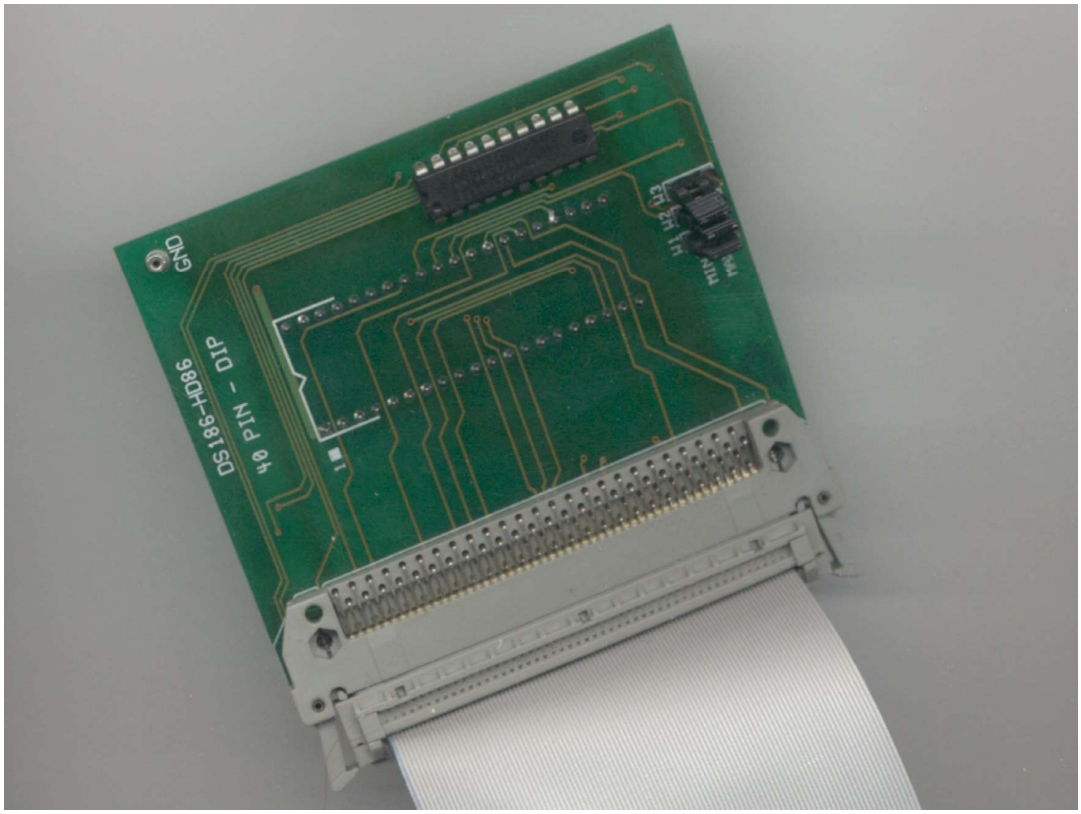


Figure: ***Emulation Header Connected***

b) Release the connector locks.

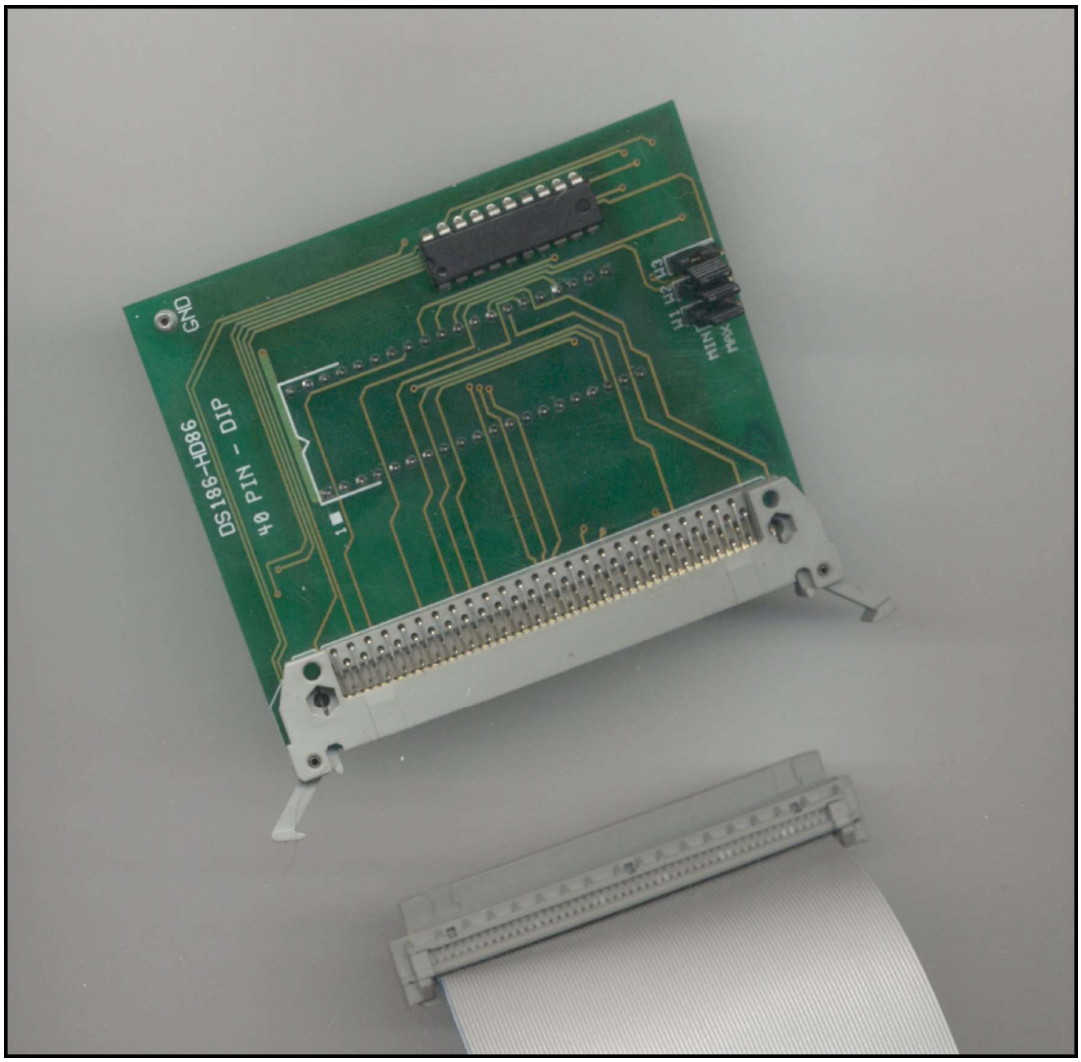


Figure: ***Emulation Header Disconnected***

c) Replace the emulation header according to the adapter you installed in the emulator.

3. 80C186EC Setup

80C186EC support requires the following setup:

a) Installing the ADP-186EC Adapter - follow the instructions given in the previous pages.

b) Installing the HD-186EC Emulation Header - this step is optional as you may connect the ribbon cable directly to your target board. Otherwise, follow the instructions given in the previous pages.

c) Frequency Selection. The emulator can be used in the full range of frequencies specified by the microprocessor. The jumper on the adapter and besides the microprocessor is used to select the internal crystal or an external clock source. Both jumpers are used to connect or disconnect XTAL1 and XTAL2 to and from the microprocessor.

The user may change the factory setup by setting the CLK jumpers to EXT and used the clock source supplied by the target board or replacing the crystal oscillator on the adapter.

Both 8-pin and 14-pin crystal oscillators can be used.

The following figure shows the INT setup and also how to place an 8 or 14-pin crystal oscillator on the supplied socket.

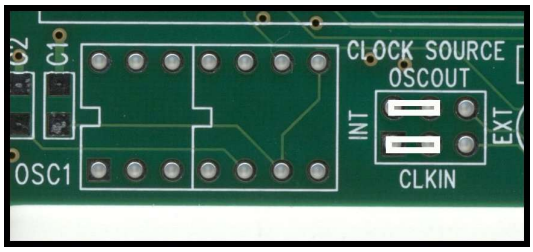


Figure: ADP-186EC - INT Clock Selection

The following figure shows the EXT setup and also how to place an 8 or 14-pin crystal oscillator on the supplied socket.

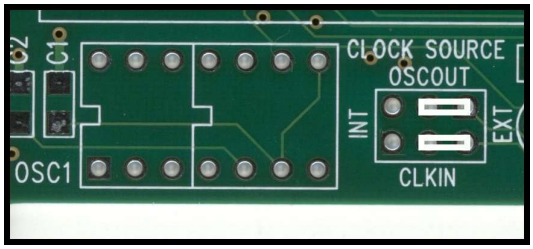


Figure: ADP-186EC EXT Clock Selection

d) ONCE Mode Support. The emulation header has a 560 Ohm resistor to allow entering in ONCE mode. It is connected between AD19 and GND. If you do not use the emulation header and the emulator is connected directly to the target using the ribbon cable, make sure that you have this resistor in the target board.

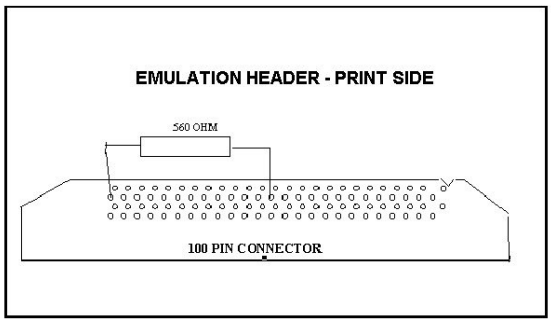


Figure: ADP186EC - ONCE Support

4. 80C186EB Setup

80C186EB or 80C188B support requires the following setup:

a) Installing the ADP-186EB Adapter - follow the instructions given in the previous pages.

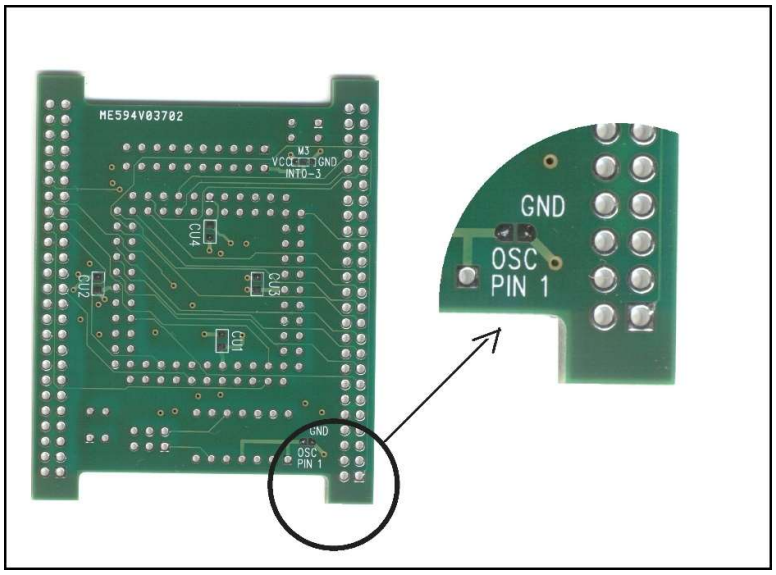
b) Installing the HD-186EB Emulation Header - follow the instructions given in the previous pages.

c) Frequency Selection. The emulator can be used in the full range of frequencies specified by the microprocessor. The jumper on the adapter and besides the microprocessor is used to select the internal crystal or an external clock source. Both jumpers are used to connect or disconnect XTAL1 and XTAL2 to and from the microprocessor.

Figure: ***A-186EB Crystal Oscillator and Clock Jumper***

The user may change the factory setup by setting the CLK jumpers to EXT and used the clock source supplied by the target board or replacing the crystal oscillator on the adapter.

Both 8-pin and 14-pin crystal oscillators can be used. Some crystal oscillators require pin #1 connection to Ground. A-186EB has this pin disconnect. If you replace the crystal and this connection is required, it can be added to the print side of the adapter as shown in the following figure:



The following figure shows the INT setup and also how to place an 8 or 14-pin crystal oscillator on the supplied socket.

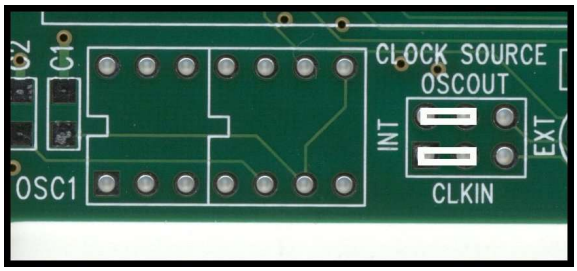


Figure: ADP-186EB - INT Clock Selection

The following figure shows the EXT setup and also how to place an 8 or 14-pin crystal oscillator on the supplied socket.

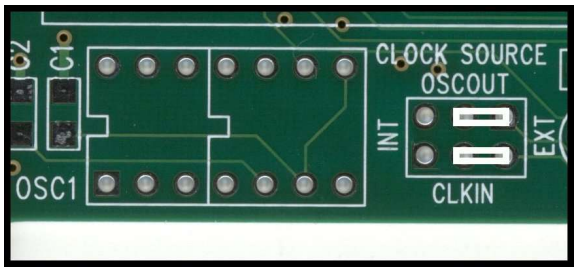


Figure: ADP-186EB EXT Clock Selection

d) Interrupts - INT0-3 are internally connected to 10K pull-down resistors. This factory setup can be changed by 10K-pull-up resistors or left these signals without any added resistance. M3 controls this setup and default setup is shown in the figure.

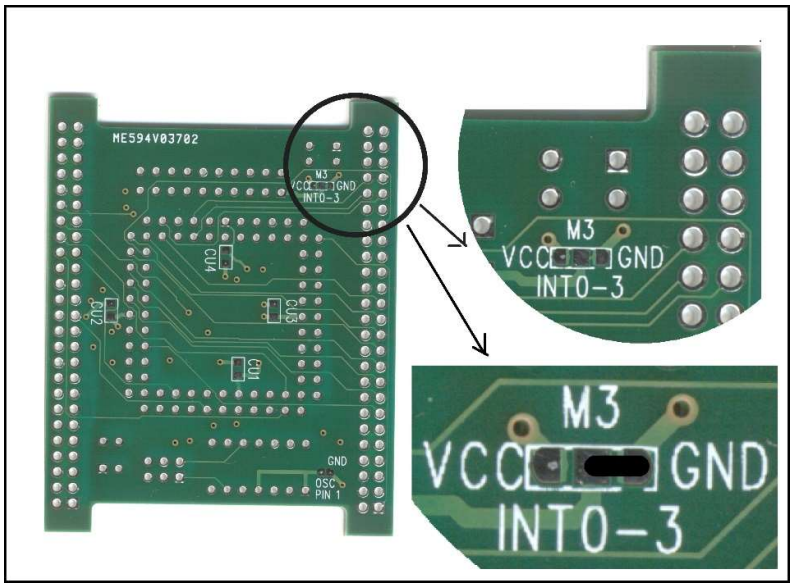


Figure: ADP-186EB - INT0-3 Pull Down Setup

f) ONCE Mode Support. The emulation header has a 560 Ohm resistor to allow entering in ONCE mode. It is connected between AD19 and GND. If you do not use the emulation header and the emulator is connected directly to the target using the ribbon cable, make sure that you have this resistor in the target board.

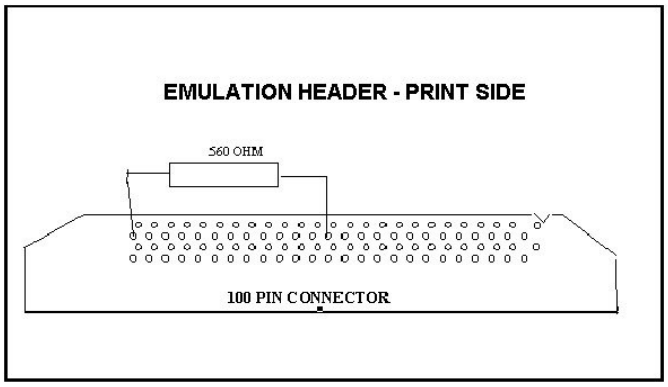


Figure: ADP186EB - ONCE Support

5. 80C186 Setup

80C186 support requires the following setup:

a) Installing the ADP-186 Adapter - follow the instructions given in the previous pages.

b) Installing the HD-186 Emulation Header - this step is optional as you may connect the ribbon cable directly to your target board. Otherwise, follow the instructions given in the previous pages.

c) Frequency Selection. The emulator can be used in the full range of frequencies specified by the microprocessor. The jumper on the adapter and besides the microprocessor is used to select the internal crystal or an external clock source. Both jumpers are used to connect or disconnect XTAL1 and XTAL2 to and from the microprocessor.

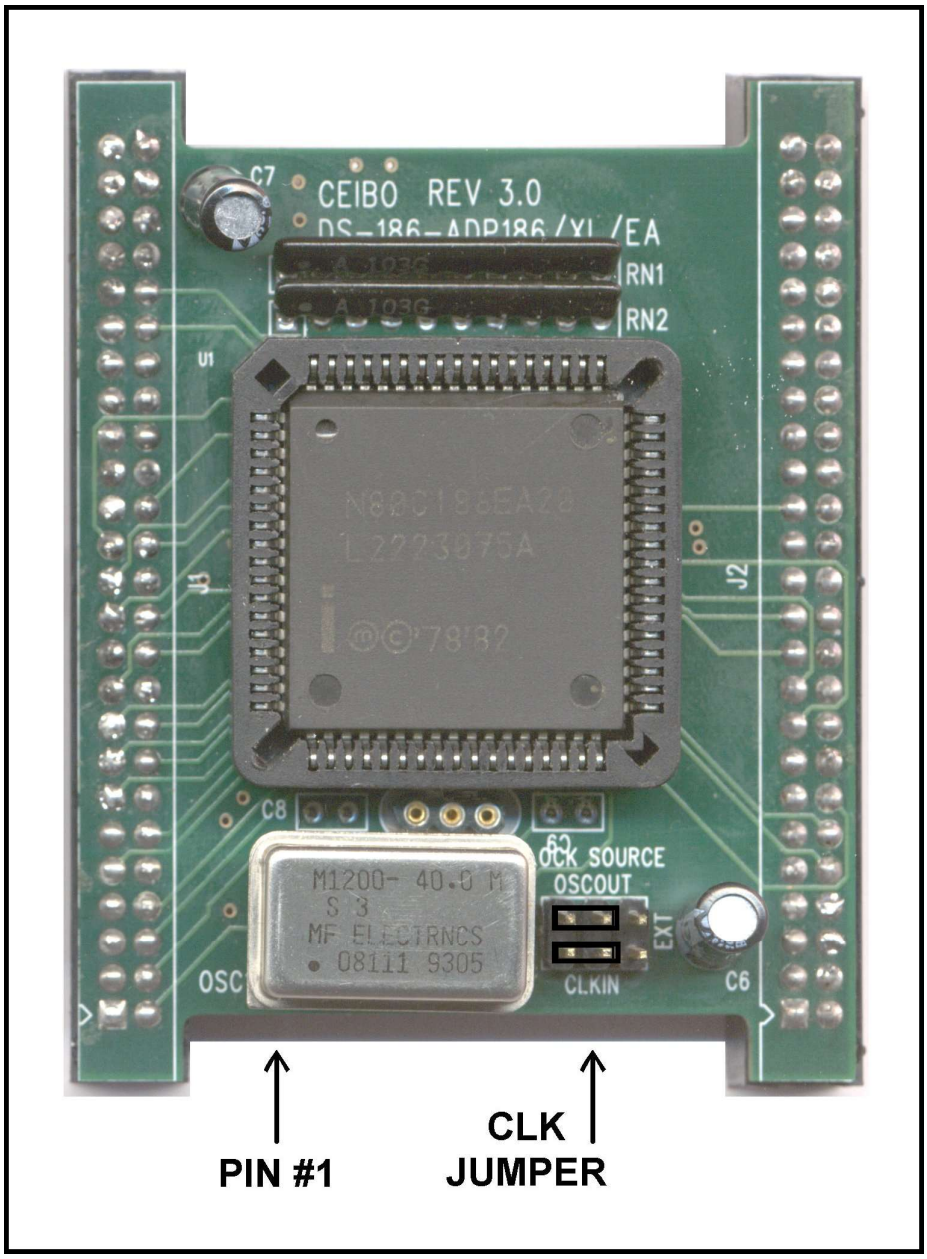


Figure: ***A-186 Crystal Oscillator and Clock Jumper***

The user may change the factory setup by setting the CLK jumpers to EXT and used the clock source supplied by the target board or replacing the crystal oscillator on the adapter.

Both 2-pin crystals or 8/14-pin crystal oscillators can be used. The 2-pin crystal is not a factory setup, but can be used. In this case, remove the 8/14-pin oscillator, place the crystal on the 2-pin socket (if the board has a 3-pin socket, only two of them are connected) and also solder 27pF on C8 and C9 holes. Please note that if you use an 8-pin oscillator, pin 1 is

not the same as for the 14-pin oscillator; ground pins are aligned and you have to place the oscillator as marked on the board.

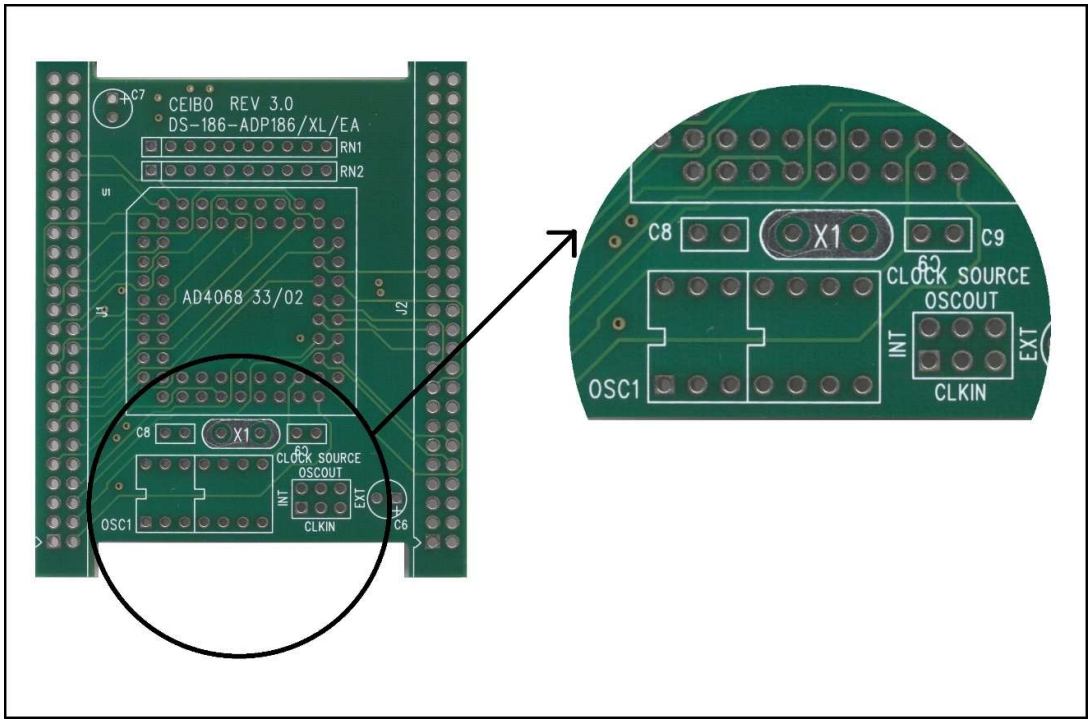


Figure: ***A-186 Clock Options***

Some crystal oscillators require pin #1 connection to Ground. A-186 has this pin disconnect.

If you replace the crystal and this connection is required, it can be added to the print side of the adapter as shown in the following figure (solder together the two contacts named OSC PIN 1 and GND).

The adapter has 4 interrupt lines connected to 10K pull down resistors: Int0-3. This is a factory setup and it can be changed to 10K pull up resistors or left them without resistor connections.

M1 connected to GND is the factory setup.

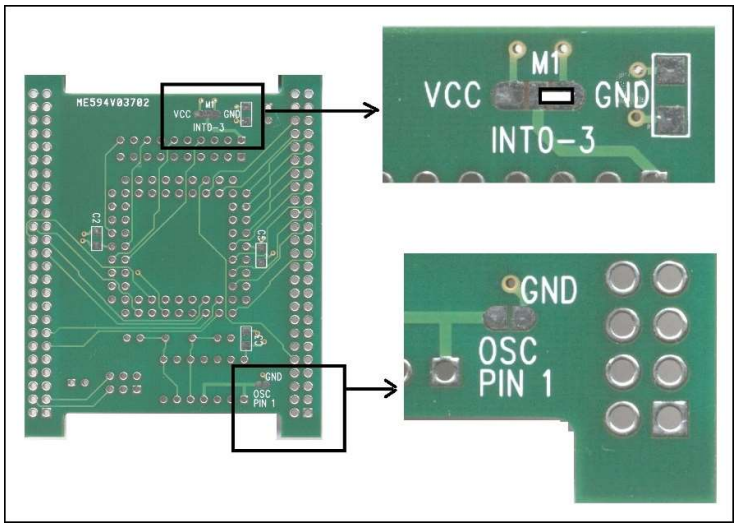


Figure: ADP-186 -Oscillator Pin 1 and Interrupt Factory Setup

The following figure shows the INT setup; that means, clock source belongs to the emulator oscillator.

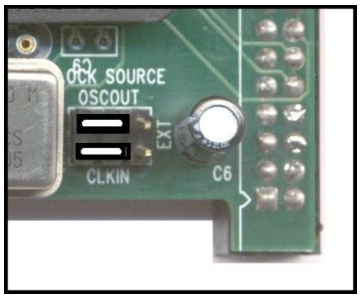


Figure: ADP-186 - INT Clock Selection

The following figure shows the EXT setup; that means, clock source belongs to the target board, which must be powered and supplying a valid clock signal, otherwise the emulator will not work.

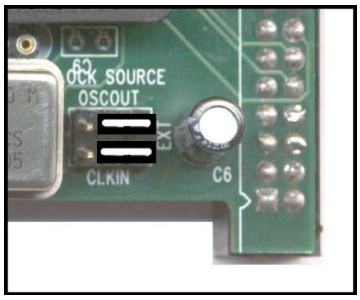


Figure: ADP-186 EXT Clock Selection

d) Replacing the Microcontroller.

ADP-186 supports the following microcontrollers:

ADP-186	80C186, 80C188, 80C186XL, 80C188XL, 80C186EA, 80C188EA.

The user may replace the microcontroller on the adapter. The emulator does not differentiate between them, except for the 8 or 16-bit configuration, which is described in the User's Manual:

ADP-186 - 8-bit	80C188, 80C188XL, 80C188EA
DIP switch #1 = OFF	

ADP-186 - 16-bit	80C186, 80C186XL, 80C186EA
DIP switch #1 = ON	

f) ONCE Mode Support. Add a 560 Ohm resistor on the emulation header to allow entering in ONCE mode. It has to be connected between AD19 and GND. Otherwise make sure that you have this resistor in the target board.

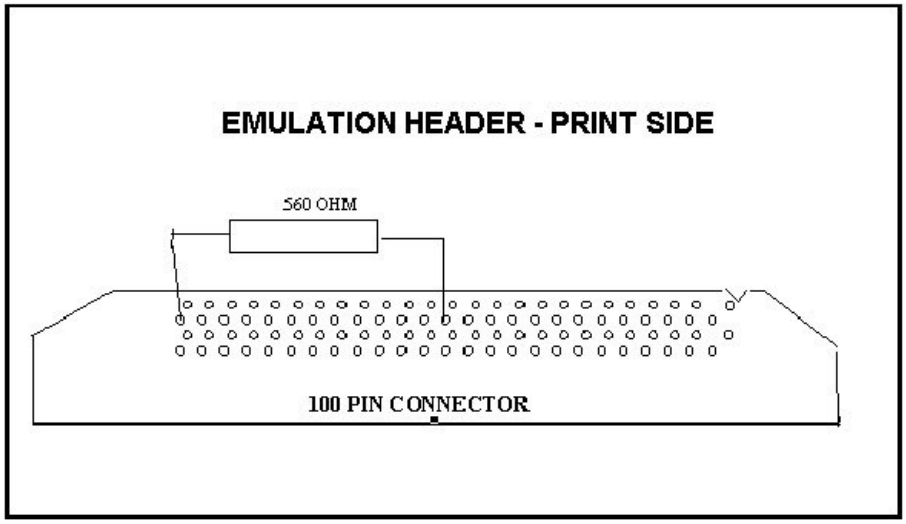


Figure: ADP186 - ONCE Support

6. 80C86 Setup

80C86 support requires the following setup:

a) Installing the ADP-86 Adapter - follow the instructions given in the previous pages.

b) Installing the HD-86 Emulation Header - Follow the instructions given in the previous pages.

c) Frequency Selection. The emulator can be used in the full range of frequencies specified by the microprocessor.

The jumper on the adapter and besides the microprocessor is used to select the internal crystal or an external clock source.

One jumper (JP1) defines the clock source: generated by the emulator (INT) or taken from the user target.

The user may change the factory setup by setting the CLK jumpers to EXT and used the clock source supplied by the target board or replacing the crystal oscillator on the adapter.

14-pin crystal oscillators can be used. For 8-pin oscillators, align pin 4 of the 8-pin oscillator to pin 7 of the 14-pin socket (GND pin).

Crystal oscillator frequency is divided by 3 to supply the microprocessor clock input.

The following figure shows the INT setup and also how to place 14-pin crystal oscillator on the supplied socket.

Figure: ADP-86 - INT Clock Selection

The following figure shows the EXT setup and also how to place a 14-pin crystal oscillator on the supplied socket.

Figure: ADP-86 EXT Clock Selection

e) Replacing the Microcontroller. ADP-86 supports the following devices:

ADP-86	8086, 8088, 80C86, 80C88, V20, V30

The user may replace the microcontroller on the adapter. The emulator does not differentiate between them, except for the 8 or 16-bit configuration, which is described in the User's Manual:

ADP-86 - 8-bit	8088, 80C88, V20
DIP switch #1 = OFF	JP2 on ADP-86 = OFF

AD-86 - 16-bit	8086, 80C86, V30
DIP switch #1 = ON	JP2 on ADP-86 = ON

e) Selecting MIN/MAX Mode: The setup is in the emulation header and it is as follows:

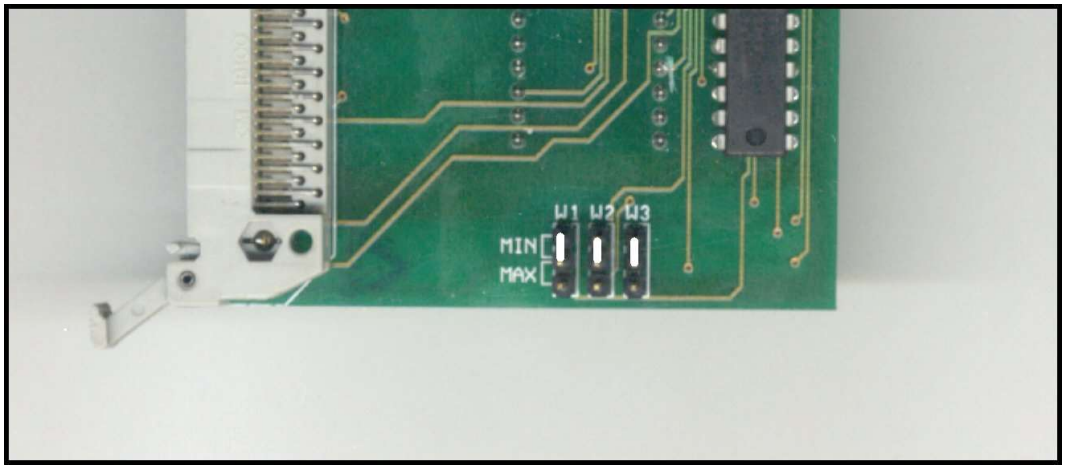


Figure: HD-86 MIN Mode

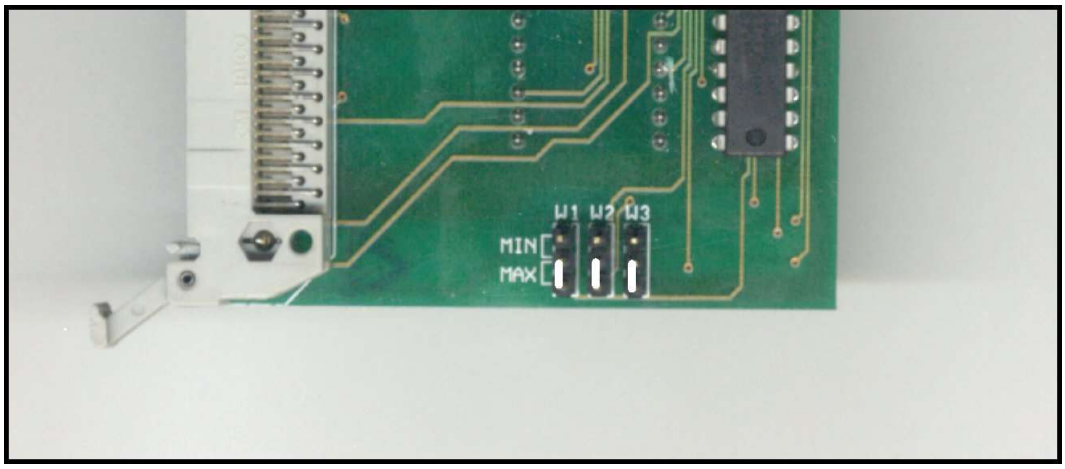


Figure: HD-86 MAX Mode

7. NEC V25 Setup

NEC V25 support requires the following setup:

a) Installing the ADP-V25 Adapter - follow the instructions given in the previous pages.

b) Installing the HD-V25 Emulation Header. Follow the instructions given in the previous pages.

c) Frequency Selection. The emulator can be used in the full range of frequencies specified by the microprocessor. The jumper on the adapter and besides the microprocessor is used to select the internal crystal or an external clock source. Both jumpers are used to connect or disconnect XTAL1 and XTAL2 to and from the microprocessor.

The user may change the factory setup by setting the CLK jumpers to EXT and used the clock source supplied by the target board or replacing the crystal oscillator on the adapter. Both 8-pin and 14-pin crystal oscillators can be used. They fit on the OSC1 14-pin socket as marked on the printed circuit board.

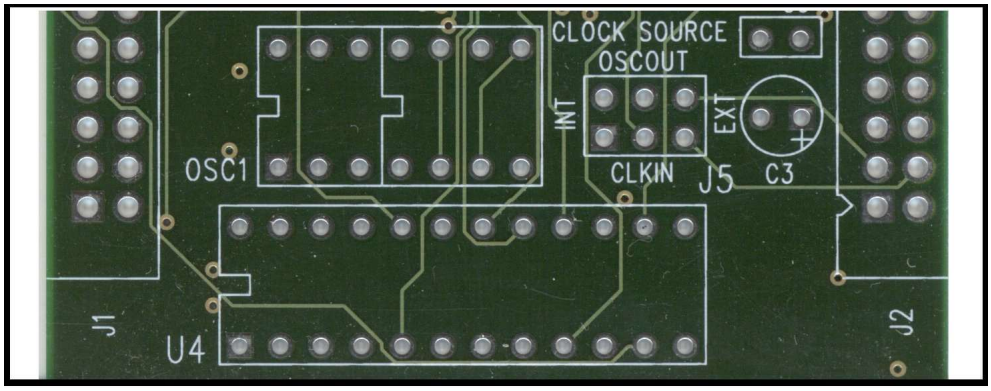


Figure: ADP-V25 - 8/14 PIN Oscillator

The following figure shows the INT setup.

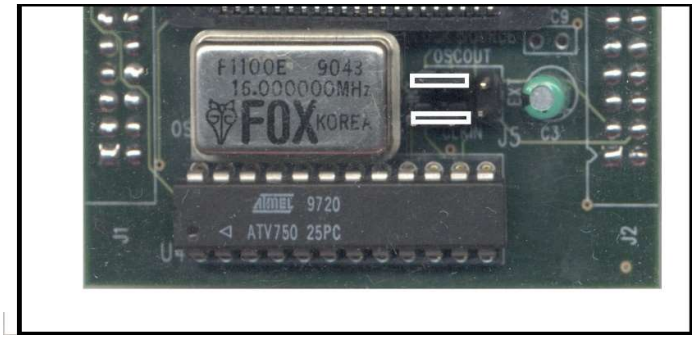


Figure: ADP-V25 - INT Clock Selection

The following figure shows the EXT setup.

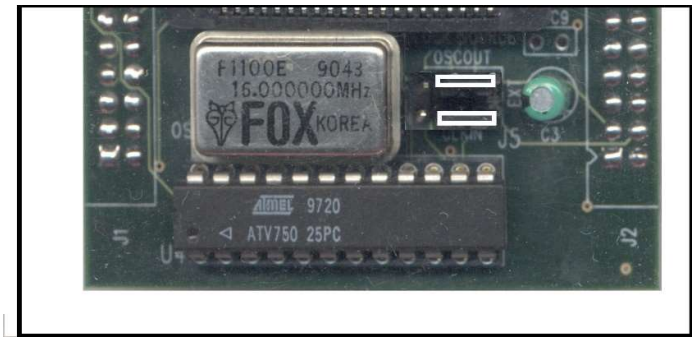


Figure: ADP-186EC EXT Clock Selection

Port Options are selected by J3, J4 and J6:

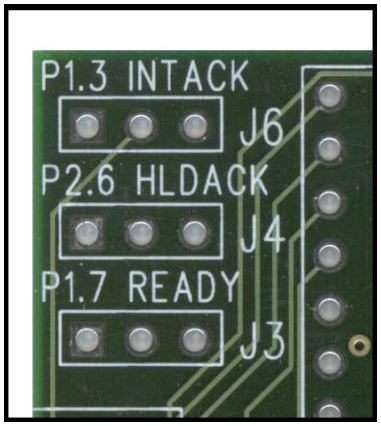


Figure: ADP-V25 Port Options

JUMPER	PORT	OPTION
J4	P2.6	HLDA control
J6	P1.3	INTAK control
J3	P1.7	READY control

Left position on the above picture selects Ports.

Right position of the above picture selects alternate function.

The following figure shows the Port selection for all lines:

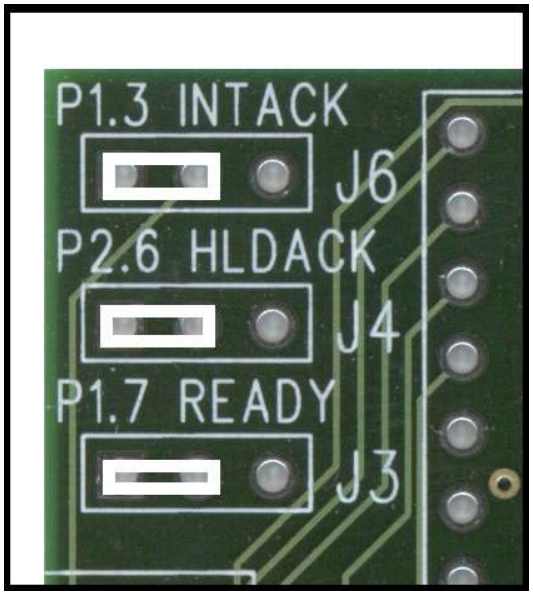


Figure: ADP-V25 Port Selected

Systems supplied with ADP-V25 already installed have a Jumper selection on the motherboard (J9), which is located near U31. This is a factory setup.