ICD-S Reference Manual

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ICD-S

What is the ICD-S

The In Circuit Debugger for Serial ports allows for easy downloading and debugging of programs for certain microcontrollers. The ICD-S does not work with all chips. The chip must have ICD capability.

The ICD-S connects to the microcontroller via MCLR, B7 and B6. Using these pins, the ICD-S can download programs and communicate with a debug module in the microcontroller.

When debugging certain RAM and ROM locations, one stack location and the B6,B7 pins are used during program execution.

The ICD-S module is powered by the target board.

The ICD-S software only has the capability to download to the target and to update its own firmware. In order to debug, a separate debugger must be used.

Connecting the ICD-S hardware

The ICD-S software requires a serial port that supports 19200 baud rate.

The ICD-S must be connected to a PC serial port and to the target system.

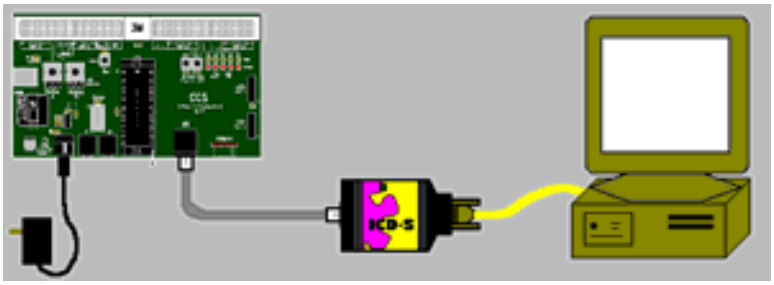
The power for the ICD-S comes from the target system.

Once the target hardware is powered up, the blinking LED indicates the ICD-S has power.

After the ICD-S software is started, the solid LED indicates communication with the PC.

Long cables from the target to the ICD are not recommended.

In order to power the ICD independent of the target, see "Connecting the ICD-S to user hardware".



ICD-S Firmware

The ICD-S ships with CCS firmware installed. The firmware contains a bootloader that allows for user firmware upgrades. The current firmware is located in the same directory as ICD-S.EXE and is named CCSICD.HEX. The latest software/firmware may be downloaded from the CCS website at:

http://www.ccsinfo.com/download.shtml

In order to use the ICD-S with Microchip's MPLAB, load their firmware into the ICD-S. The MPLAB firmware is usually found in the MPLAB directory and as of this writing was named MPL876.HEX.

Reload the bootloader to put CCS firmware back into the ICD-S after downloading Microchip's firmware. Press the "Update ICD F/W" button and select the CCSICD.HEX file. The bootloader and the new CCS firmware will automatically load.

Firmware may be changed in the ICD-S by selecting the UPDATE ICD FIRMWARE button in the ICD-S software.

Note: If the bootloader in the ICD-S becomes damaged the ICD-S will need to be returned to CCS to be reloaded.

Loading a program into the target

Click the DOWNLOAD TO TARGET button in the ICD-S software to download a HEX file to the target. The ICD-S only reads Intel 8 bit hex files.

The ICD-S software will download the program and, if in the HEX file, data EEPROM data. The previous contents of memory are erased before the download. The memory contents are verified and the configuration word from the HEX file will be programmed. If the DEBUG flag is enabled in the configuration word, it is disabled by the ICD-S since the ICD-S software may not be used for debugging.

Testing the setup

Use the CHECK COMM button to check the PC port is working.

The TEST ICD button tests that the ICD-S is operating and that the cable to the ICD is functional.

Use the TEST TARGET button to test the communication to the target chip.

Running a program

The RUN PROGRAM button will release the MCLR so the target program may run. The ICD-S will not interfere with B6 or B7 after the program is started.

The button changes to STOP PROGRAM when the program is running and pressing this button will again assert MCLR.

Debugging a program

The ICD-S software does not have debug capability.

Use the PCW debugger or the MPLAB debugger to debug.

The ICD-S hardware will work with both these debuggers.

Diagnosing problems

- No LED light on ICD-S
- LED remains blinking
- PC cannot establish communication and LED is solid
- Could not detect target chip
- Current CCS firmware needs reloading
- The device does not acknowledge the command
- No response from the ICD

No LED light on ICD-S

Ensure target has power and cable from target to ICD is connected.

LED remains blinking

Check PC-ICD cable and comm port settings at PC.

PC cannot establish communication and LED is solid

Bootloader in ICD-S may be damaged. Unit should be returned to CCS for reload.

Could not detect target chip

Verify target oscillator is working.
Check cable from ICD to target.
Make sure that the target chip is a supported PIC16 or PIC18

Current CCS firmware needs reloading Current CCS firmware needs reloading

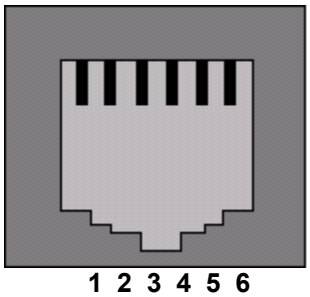
The current firmware is not loaded or only partially loaded.
Load CCSICD.HEX.

Either "The device does not acknowledge the command __" or "No response from the ICD"

There was a problem communicating with the ICD.
Check the cable from the serial port to the ICD.
Check the cable from the ICD to target.
ICD-S will automatically try to reconnect.

Connecting the ICD-S to user hardware

When the ICD-S program starts, it will automatically try to connect using the last connection settings. If this fails an option will come up to change the connection settings and retry. To change the connection settings after already connected, press the CONFIGURE SERIAL PORT button.



ICD Socket	Target Socket	Target Pin
1	6	B3 on target PIC – This is optional, used for advanced debugging
2	5	B6 on target PIC
3	4	B7 on target PIC
4	3	Ground
5	2	+5V from target to ICD. The ICD is powered from this pin.
6	1	MCLR - Connect to target PIC and pull up to +5V on target board with 47K resistor. The ICD will drive this with 13V during chip programming,

Notes:

1. The ICD-S requires 50 ma. If the target power is not to be used the connection from 5-2 may be cut and an external 5V power supply used. This technique may also be used to power both the ICD-S and target through the ICD-S connectors.

2. Avoid connecting B6, B7 to other components on the target board.

3. The ICD-S does not use the Low Voltage Programming mode.

4. The target chip oscillator must be running for the ICD-S to work.

Internet Resources

CCS PIC Home Page http://www.ccsinfo.com/picc.html
Software Download http://www.ccsinfo.com/download.shtml#ICD
Technical Support support@ccsinfo.com