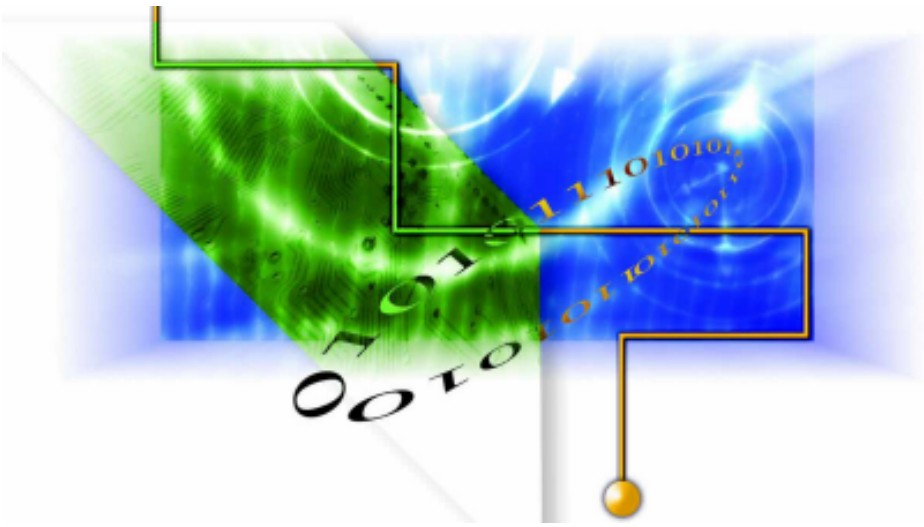
ICD DIAGNOSTICS



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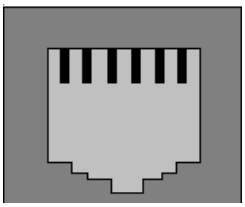


1 2 3 4 5 6

ICD Socket	Target Socket	Target Pin
1	6	B3 on target PIC - This is optional, used for advanced debugging
2	5	(ICSP clock) B6 on target PIC (See table on page 3 for exceptions)
3	4	(ICSP data) B7 on target PIC (See table on page 3 for exceptions)
4	3	Ground
5	2	Vdd from target to ICD. The ICD-S40 is powered by this pin (5V) and the ICD-U40 uses it to pull up the signals (3V-5V).
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. No capacitor is desired on MCLR or it would cause programming problems with the ICD.

Notes:

1. ICD-U40 is powered by the USB.

2. The ICD-S40 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 can be used. This technique may also be used to power both the ICD and the target through the ICD connectors.

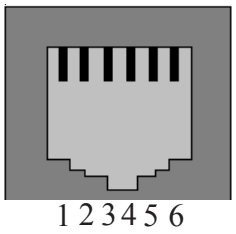
3. To program and/or debug in circuit, two I/O pins (B6, B7) are reserved. If debugging is not to be done, then these pins may also be used in the target circuit. However, take care to ensure the target circuit has high impedance during programming.

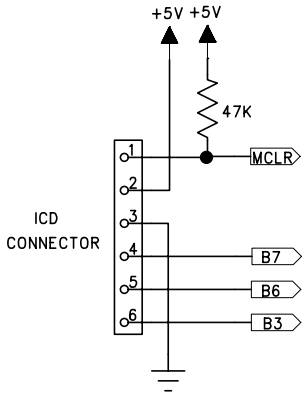
4. The ICD does not use the Low Voltage Programming mode. C programs should set the NOLVP Fuse.

5. The target chip oscillator must be running for the ICD to work with a debugger. Programming can be done without an oscillator.

6. The B3 pin is optional and is not used for programming. However, the Monitor feature of the debugger does use B3. It is possible to program and debug (without monitor) and allocate B3 to the target hardware. In this case, do not connect B3 to the ICD connector. If the monitor feature is not used, userstream can be disabled in the configure tab and the connection from 1-6 does not matter. In the old version of the software, where you cannot disable the userstream using the configure tab, the pin needs to be pulled high at all time. Although B3 is recommend, any PIC pin can be used for this feature.

7. The MCLR pin is used for programming and debugging. Note that during programming the voltage is 13V. The 47K resistor to 5V is sufficient isolation for the 13V. However, if anything else is connected to the MCLR pin be sure that the 13V will not damage or interfere.





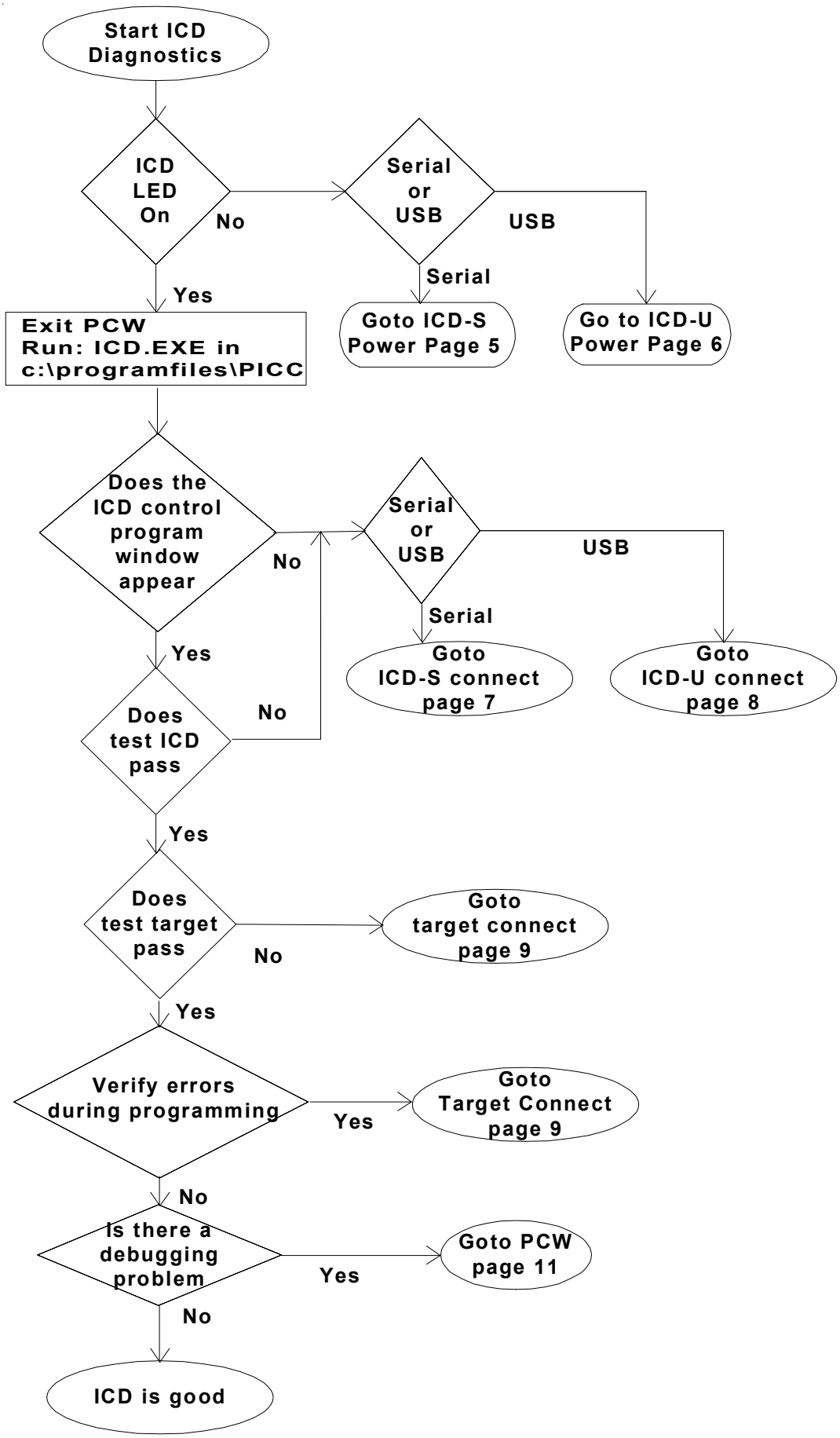
- Note that the ICD to target cable reverses the pins so the MCLR signal is ICD pin 6 and connects to the target pin 1.

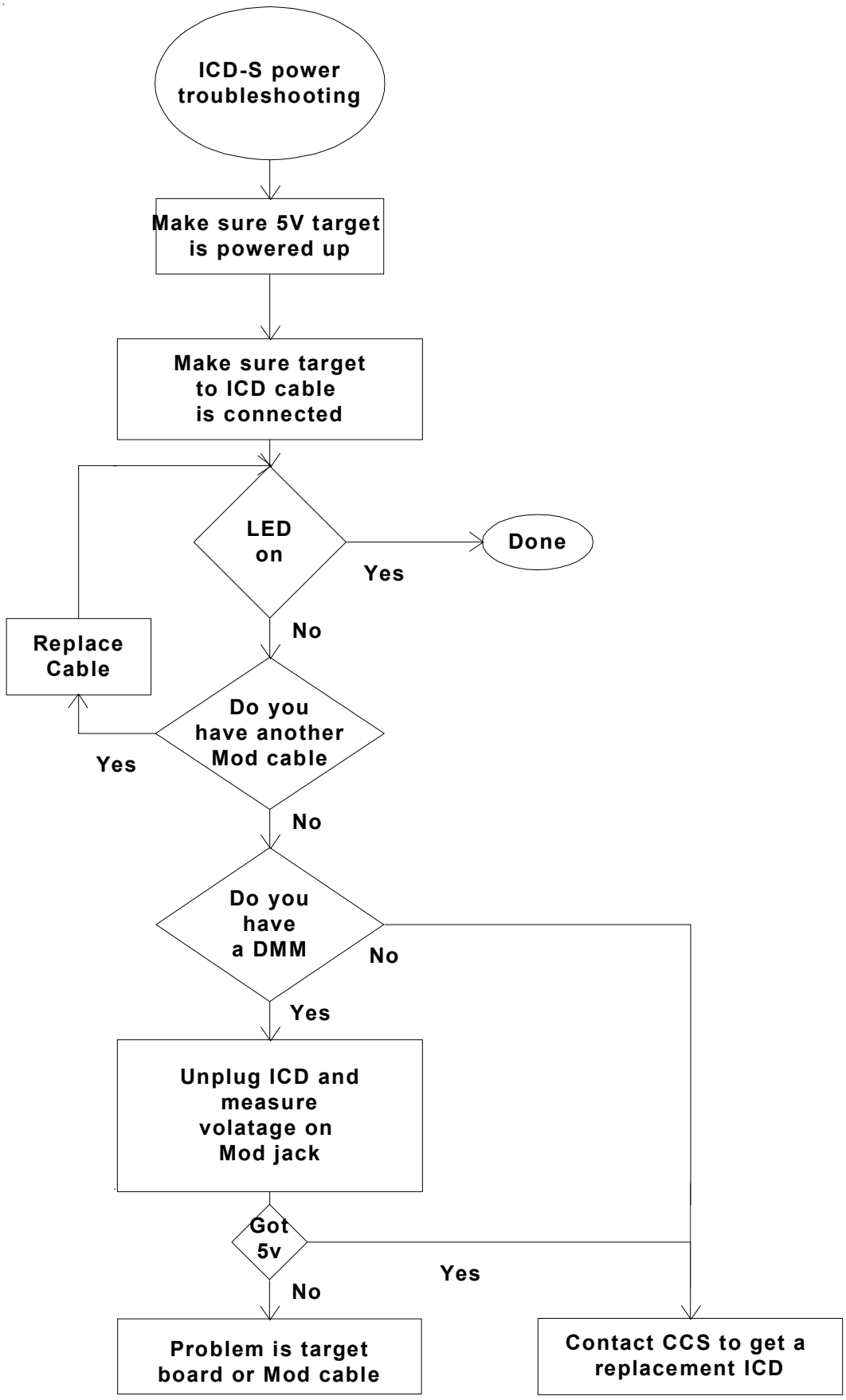
Chips that do not use B6, B7

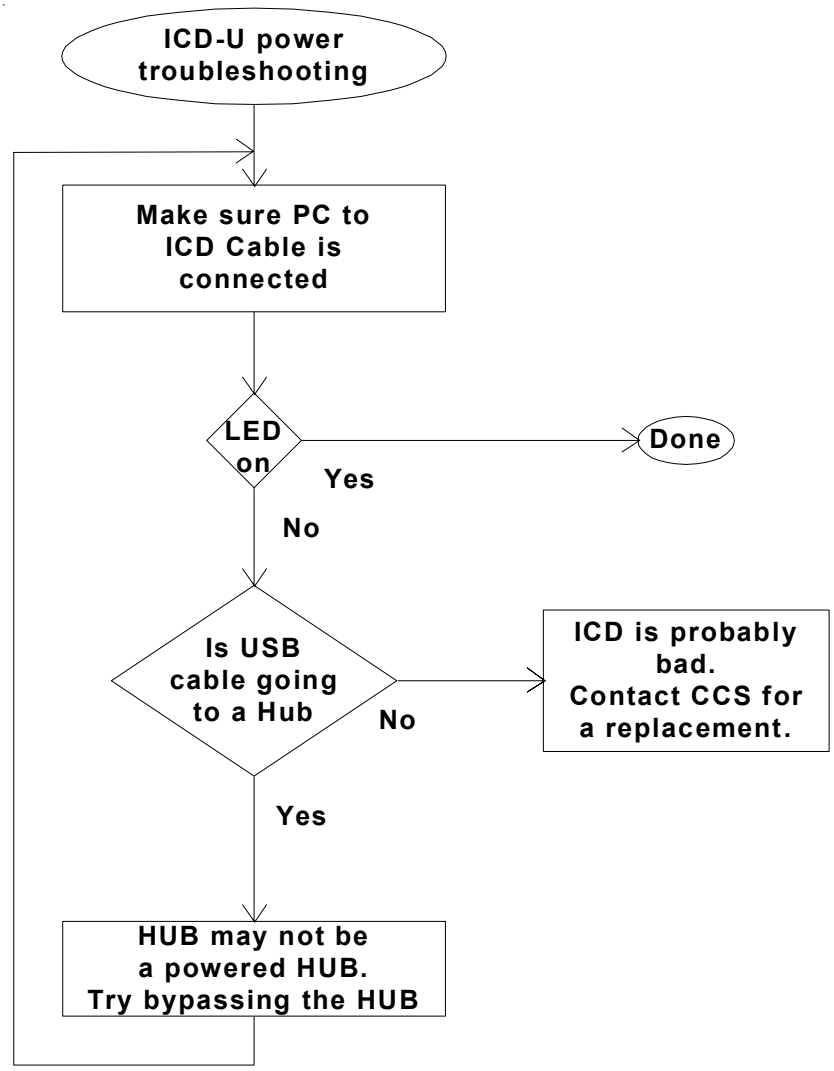
Chip	Instead of B6	Instead of B7
PIC12F629	GP1	GP0
PIC12F675	GP1	GP0
PIC12F683	GP1	GP0
PIC16F630	RA1	RA0
PIC16F676	RA1	RA0
PIC16F684	RA1	RA0
PIC16F688	RA1	RA0

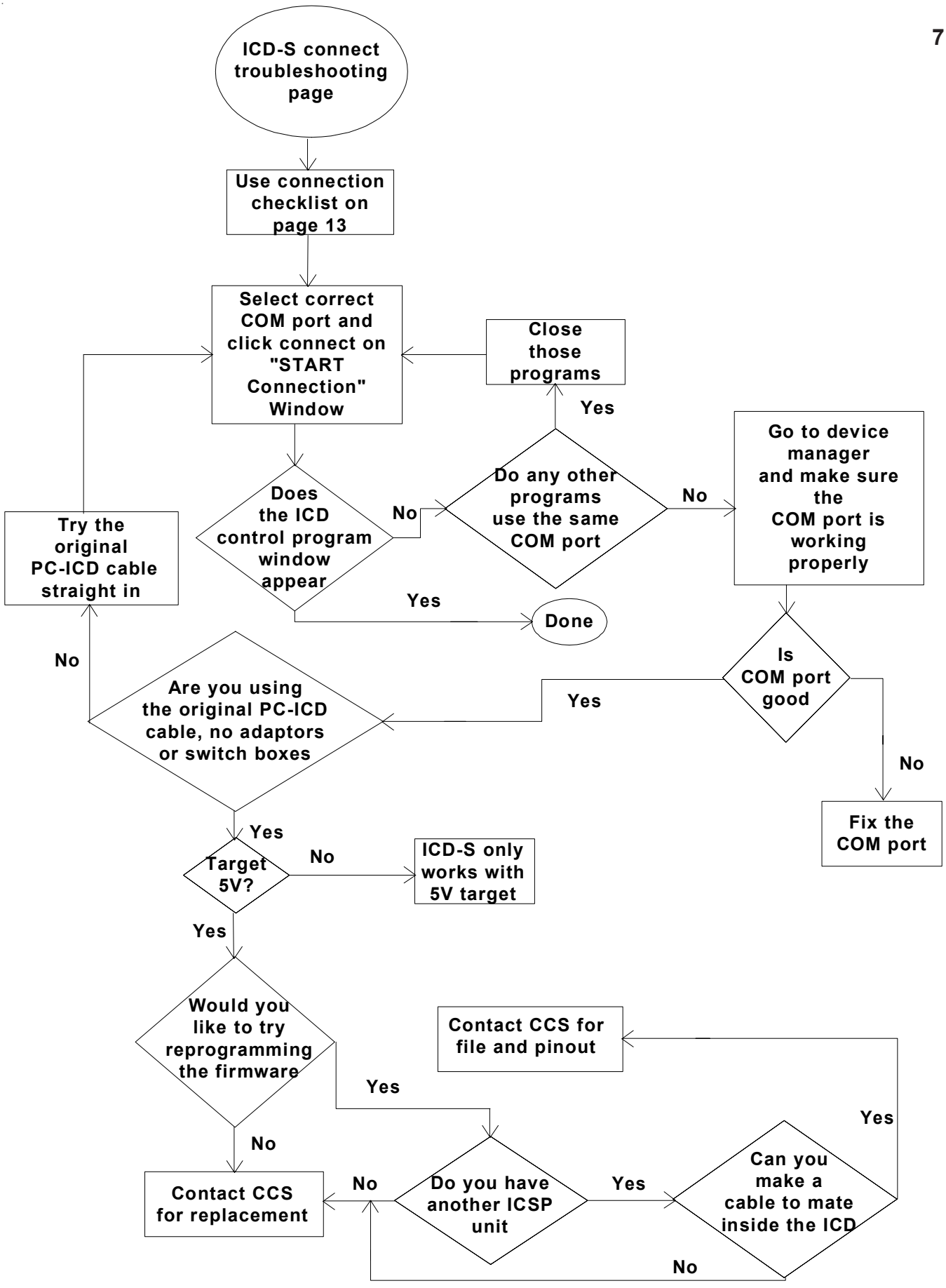
The following chips do NOT have debugging capability in the standard version of the part. A specific -ICD version of the chip is needed for debugging. The -ICD chip will have more pins.

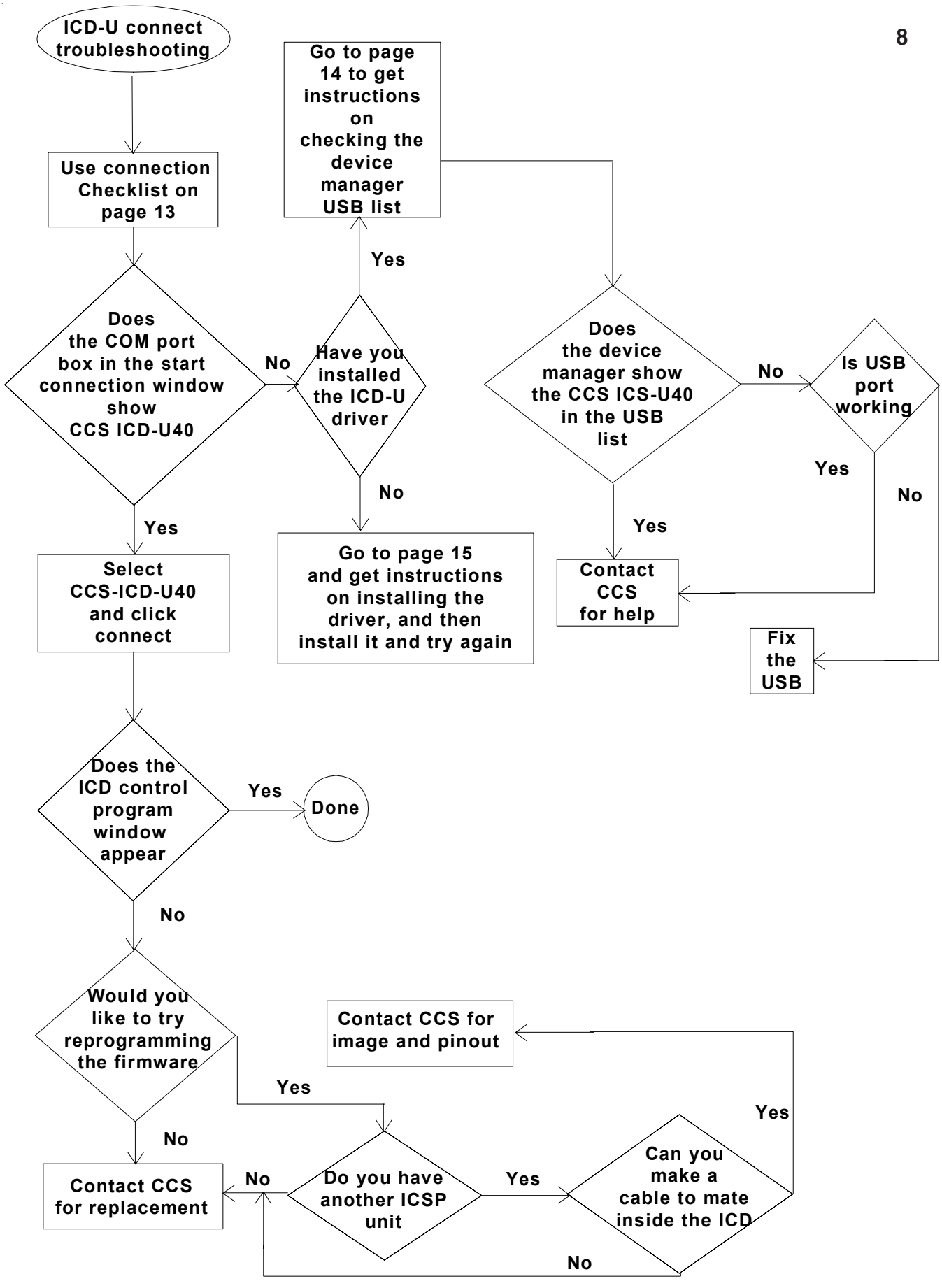
ICD-Chip	Pins
PIC12F629	14
PIC12F675	14
PIC12F683	14
PIC16F630	20
PIC16F676	20
PIC16F627A	28
PIC16F628A	28
PIC16F648A	28
PIC16F684	20
PIC16F688	20

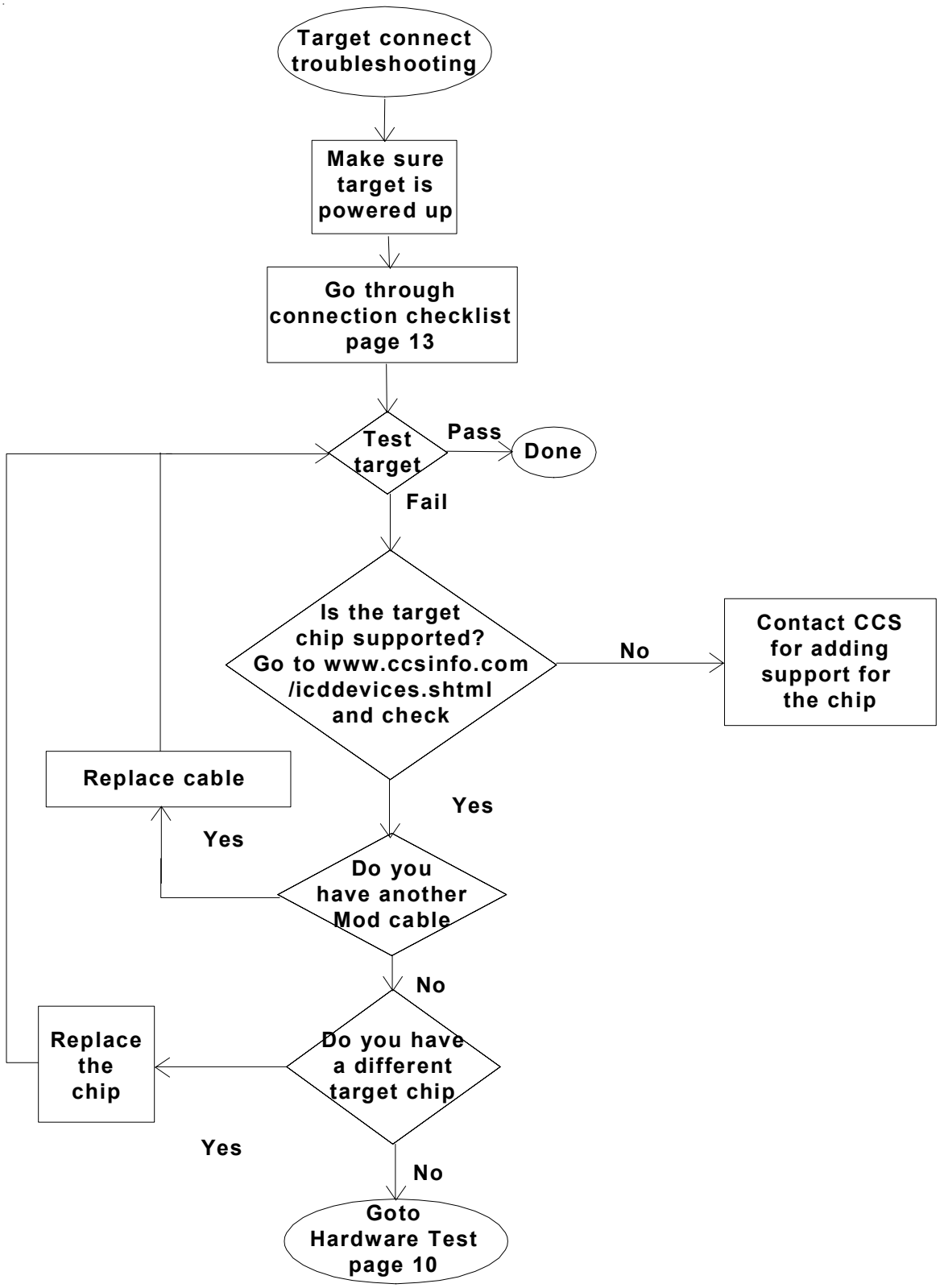

Start ICD Diagnostics
ICD LED On
No
Serial or USB
USB
Serial
Yes
Goto ICD-S Power Page 5
Go to ICD-U Power Page 6
Exit PCW Run: ICD.EXE in c:\programfiles\PICC
Does the ICD control program window appear
No
Serial or USB
USB
Serial
Yes
Goto ICD-S connect page 7
Goto ICD-U connect page 8
Does test ICD pass
No
Yes
Does test target pass
Goto target connect page 9
No
Yes
Verify errors during programming
Yes
Goto Target Connect page 9
No
Is there a debugging problem
Yes
Goto PCW page 11
No
ICD is good

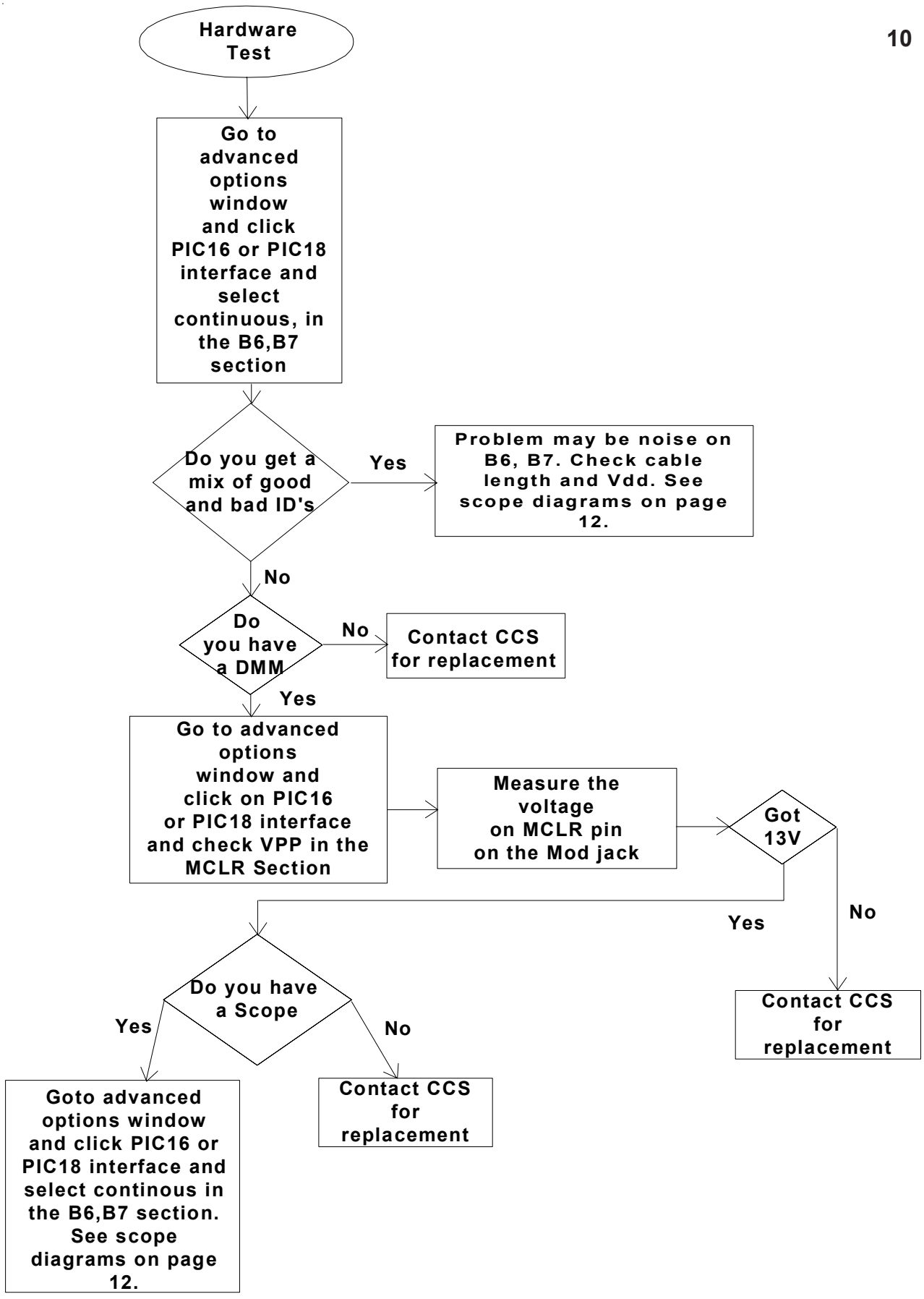

ICD-S power troubleshooting
Make sure 5V target is powered up
Make sure target to ICD cable is connected
LED on
Yes
Done
No
Replace Cable
Do you have another Mod cable
Yes
No
Do you have a DMM
No
Yes
Unplug ICD and measure volatage on Mod jack
Got 5v
Yes
No
Problem is target board or Mod cable
Contact CCS to get a replacement ICD

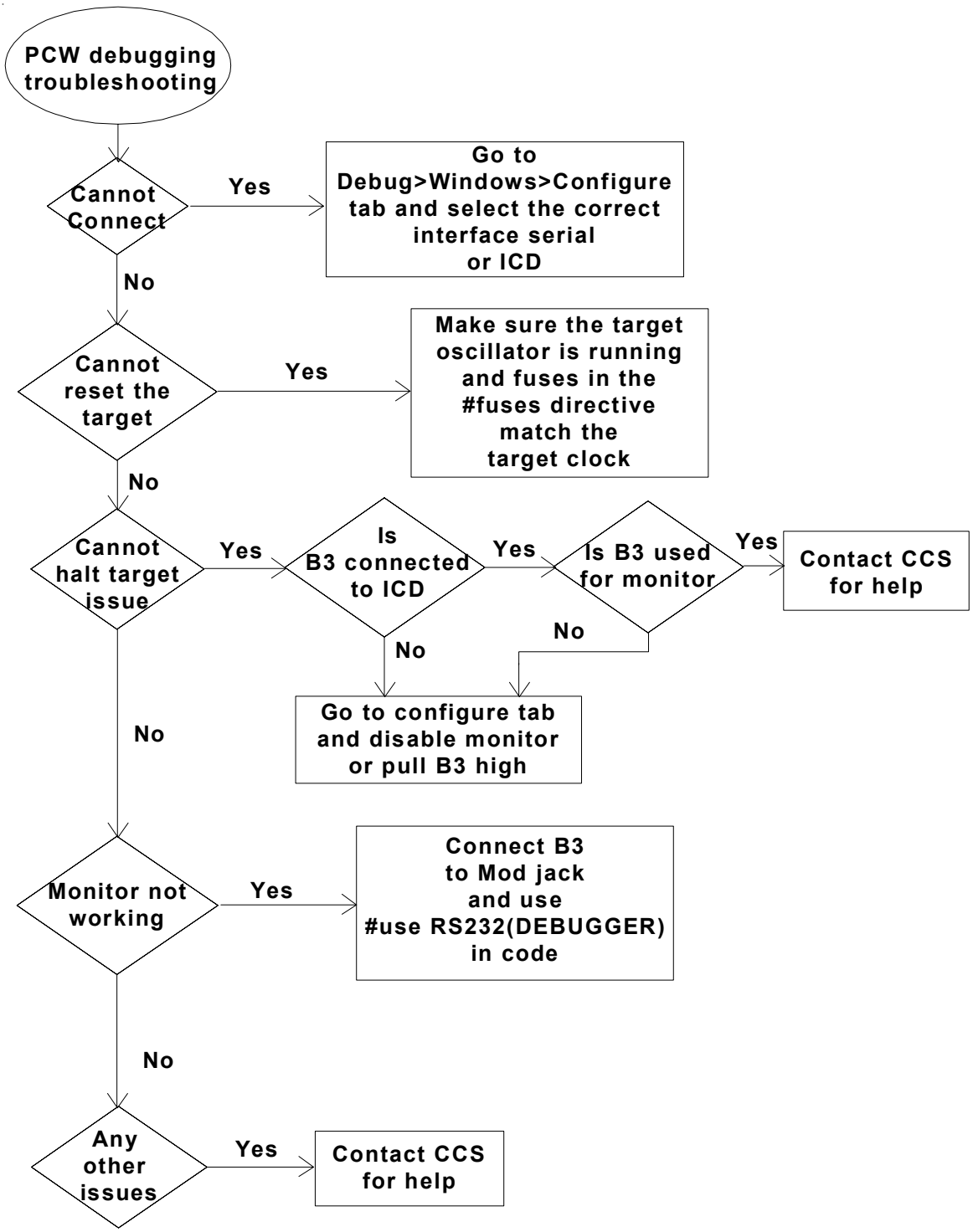

ICD-U power troubleshooting
Make sure PC to ICD Cable is connected
LED on
Yes
Done
No
Is USB cable going to a Hub
No
ICD is probably bad. Contact CCS for a replacement.
Yes
HUB may not be a powered HUB. Try bypassing the HUB

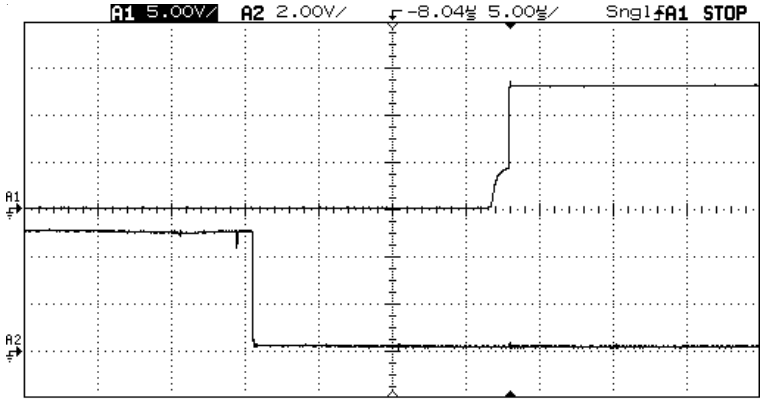

ICD-S connect troubleshooting page
Use connection checklist on page 13
Select correct COM port and click connect on "START Connection" Window
Close those programs
Yes
Does the ICD control program window appear
No
Do any other programs use the same COM port
No
Go to device manager and make sure the COM port is working properly
Try the original PC-ICD cable straight in
Yes
Done
No
Are you using the original PC-ICD cable, no adaptors or switch boxes
Yes
Is COM port good
No
Fix the COM port
Yes
Target 5V?
No
ICD-S only works with 5V target
Yes
Would you like to try reprogramming the firmware
Contact CCS for file and pinout
Yes
No
Contact CCS for replacement
No
Do you have another ICSP unit
Yes
Can you make a cable to mate inside the ICD
Yes
No


ICD-U connect troubleshooting
Use connection Checklist on page 13
Does the COM port box in the start connection window show CCS ICD-U40
No
Have you installed the ICD-U driver
Yes
Go to page 14 to get instructions on checking the device manager USB list
No
Go to page 15 and get instructions on installing the driver, and then install it and try again
Yes
Select CCS-ICD-U40 and click connect
Does the device manager show the CCS ICS-U40 in the USB list
No
Is USB port working
Yes
No
Yes
Contact CCS for help
Fix the USB
Does the ICD control program window appear
Yes
Done
No
Would you like to try reprogramming the firmware
Yes
No
Contact CCS for replacement
No
Do you have another ICSP unit
Yes
Can you make a cable to mate inside the ICD
Yes
No
Contact CCS for image and pinout

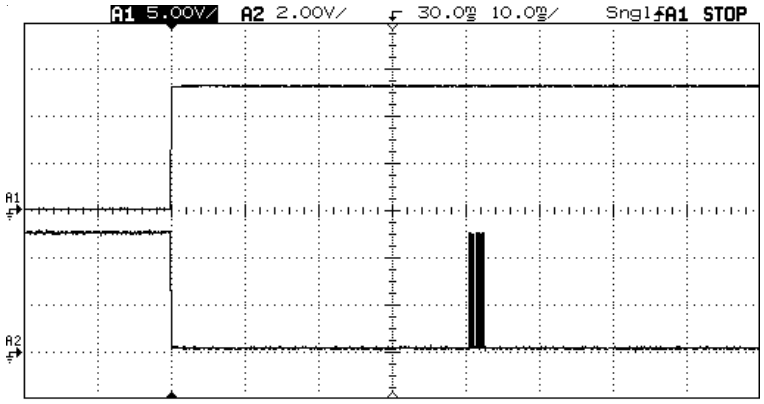

Target connect troubleshooting
Make sure target is powered up
Go through connection checklist page 13
Test target
Pass
Done
Fail
Is the target chip supported? Go to www.ccsinfo.com /icddevices.shtml and check
No
Contact CCS for adding support for the chip
Yes
Do you have another Mod cable
Yes
Replace cable
No
Do you have a different target chip
Replace the chip
Yes
No
Goto Hardware Test page 10


Hardware Test
Go to advanced options window and click PIC16 or PIC18 interface and select continuous, in the B6,B7 section
Do you get a mix of good and bad ID's
Yes
Problem may be noise on B6, B7. Check cable length and Vdd. See scope diagrams on page 12.
No
Do you have a DMM
No
Contact CCS for replacement
Yes
Go to advanced options window and click on PIC16 or PIC18 interface and check VPP in the MCLR Section
Measure the voltage on MCLR pin on the Mod jack
Got 13V
Yes
No
Contact CCS for replacement
Do you have a Scope
Yes
No
Goto advanced options window and click PIC16 or PIC18 interface and select continous in the B6,B7 section. See scope diagrams on page 12.
Contact CCS for replacement

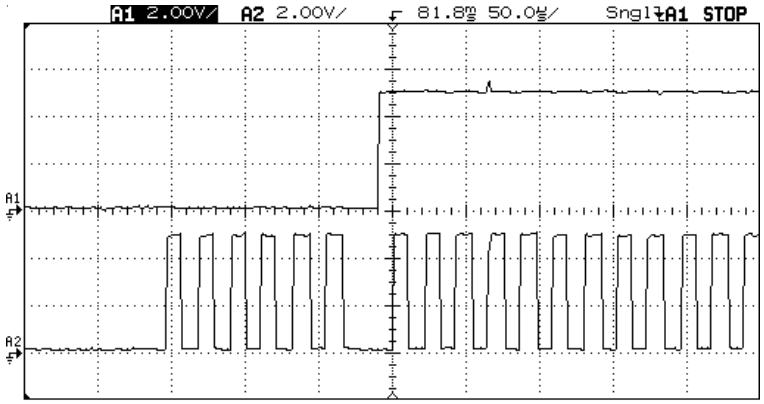

PCW debugging troubleshooting
Cannot Connect
Yes
Go to Debug>Windows>Configure tab and select the correct interface serial or ICD
No
Cannot reset the target
Yes
Make sure the target oscillator is running and fuses in the #fuses directive match the target clock
No
Cannot halt target issue
Yes
Is B3 connected to ICD
Yes
Is B3 used for monitor
Yes
Contact CCS for help
No
No
Go to configure tab and disable monitor or pull B3 high
No
Monitor not working
Yes
Connect B3 to Mod jack and use #use RS232(DEBUGGER) in code
No
Any other issues
Yes
Contact CCS for help



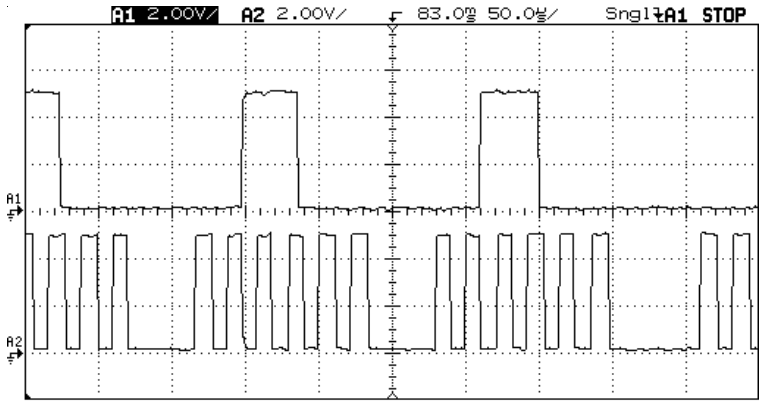
The top line is MCLR, and the bottom line is B6. The MCLR takes less than 2us to reach 5V, and then increases to 13V. B6 is a good low while MCLR rises.



The top line is MCLR, and the bottom line is B6. Approximately 40ms after MCLR goes to 13V, B6 toggles to 5V; the time may vary depending on the PC.



The top line is B7, and the bottom line is B6. This diagram shows activity approximately 81 ms after MCLR goes high.



The top line is B7 and the bottom line is B6. This diagram shows some of the more typical B6,B7 activity. MCLR is at a constant 13V, while the B6,B7 signals toggle from 0V to 5V

Connection Checklist

- ❑ MCLR has a 47K resistor to Vdd.
- ❑ Nothing else connected to MCLR except 47K and ICD (no capacitor).
- ❑ B6, B7 are only connected to the ICD.
- ❑ No more than 12” of cable from B6, B7 and the ICD unit.
- ❑ Target Vdd is connected to the ICD, both ICD-S40 and ICD-U40 require this.

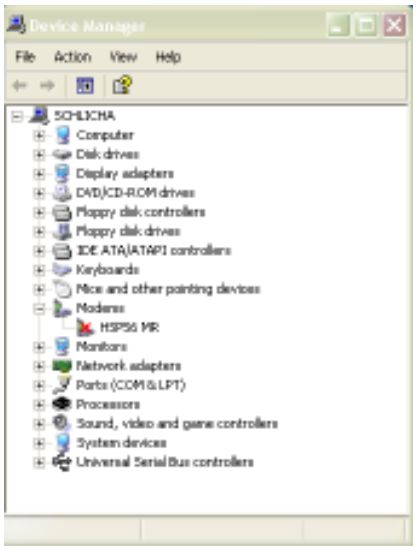
Note:

- Even if the above does not represent your final hardware, please start with this until your unit is working.

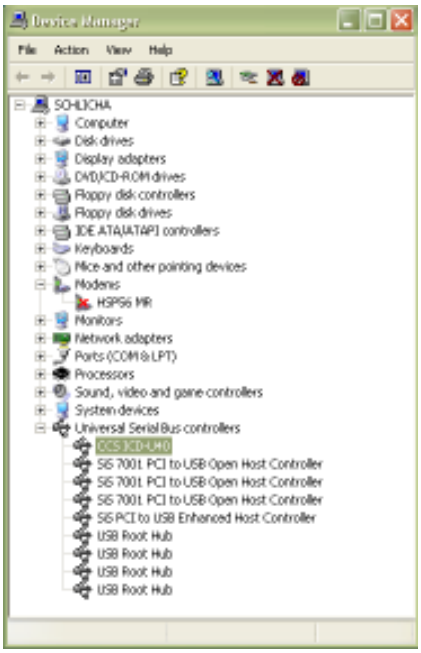
These instructions are for Windows XP. Other versions of Windows may have slightly different setup procedures, although it will be similar enough that these directions will suffice.

- ❑ Right click on “My Computer” and select Properties.

- ❑ Select the Hardware tab and click on the Device Manager button.



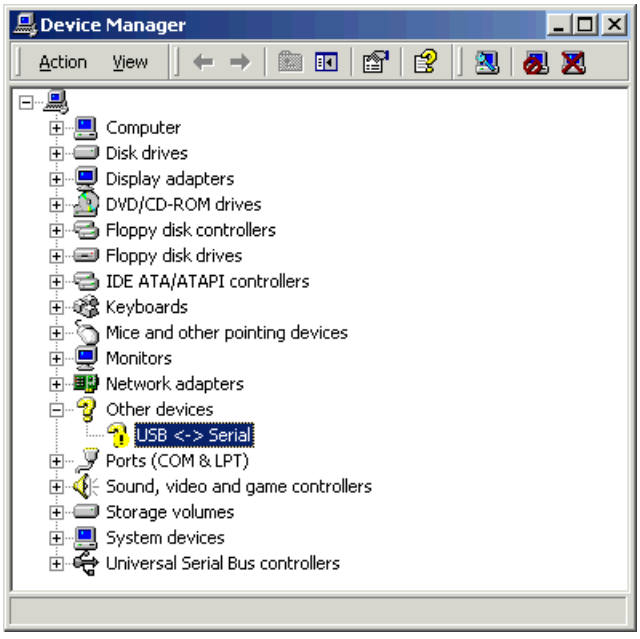
- ❑ Expand the USB Controllers list.
- ❑ You should see a CCS ICD-U40 in the list.



How to Install the ICD-U

These steps explain how to install drivers in Windows 2000. Other versions of Windows may have slightly different setup procedures, although it will be similar enough that these directions will suffice.

When you look in the Device Manager, you should see a CCS ICD or CCS ICD-U40 listed with a question mark next to it. For example:



If you connect your ICD-U to the windows and do not see a CCS ICD or CCS-U40 in the Device Manager with a question mark next to it, please contact CCS before proceding.

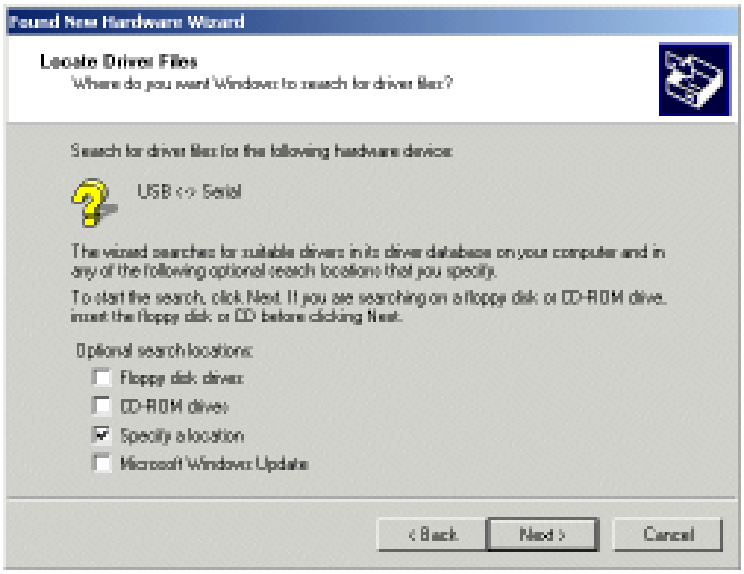
1. Download the CCS ICD-U drivers, located here. Unzip this and download it into C:\ICDUDRV\.

2. Start the Add Hardware Wizard so you are at the following screen:

You can bring up the Add Hardware Wizard by plugging in your ICD-U. Or go to the device Manager, right click on CCS ICD-U (or CCS ICD-U40), choose properties, and press the Reinstall Driver button.

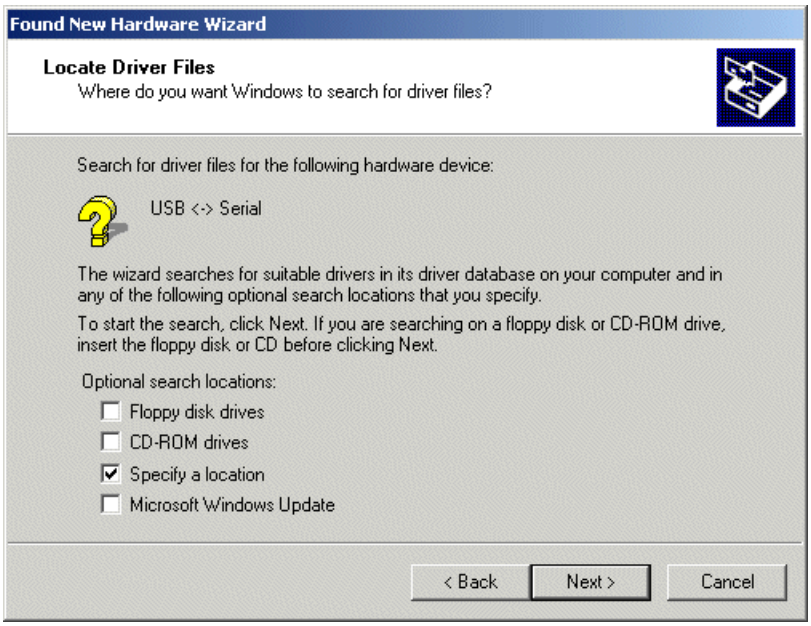
Press the Next button

3. You will now see the following screen.



Make sure “Search for suitable driver for my device (recommended)” is selected and press the Next button.

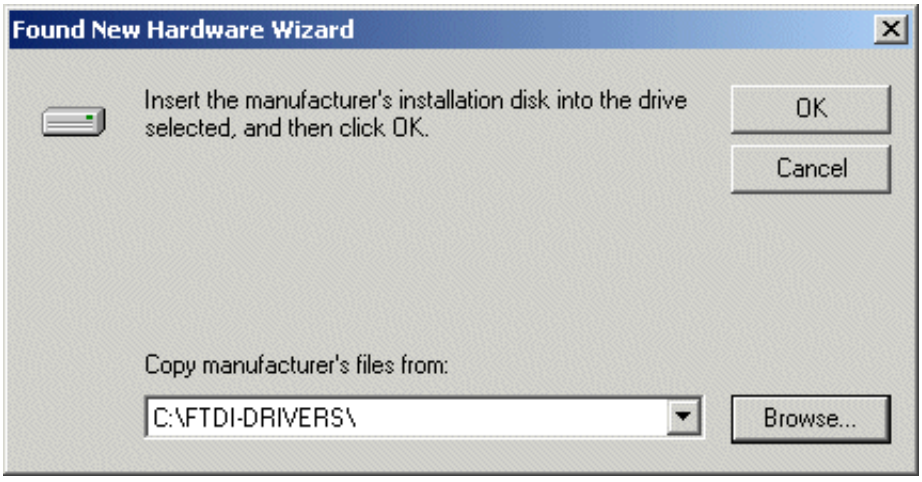
4. You will now see the following screen:



Make sure only “Specify a Location” is selected. No other choices should be selected.

Press the Next button.

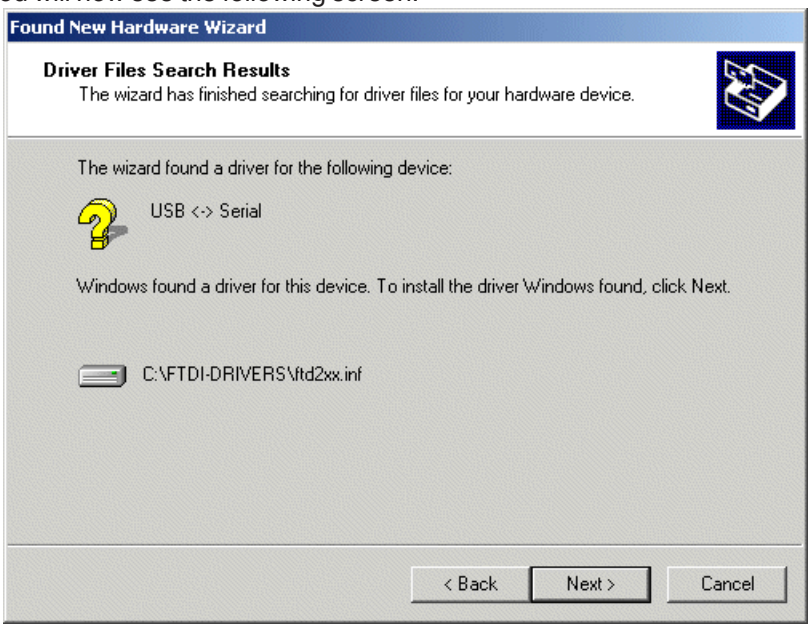
5. You will now see the following screen:



Use the browse button to enter C:\ICDUDRV\ into the location field.

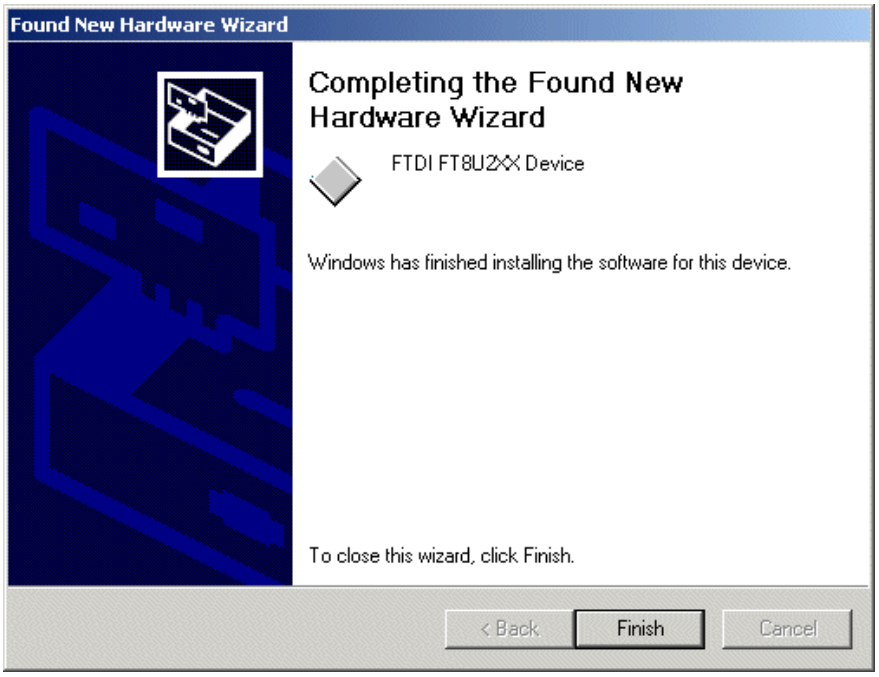
Press the Next button.

6. You will now see the following screen:



Press the Next button.

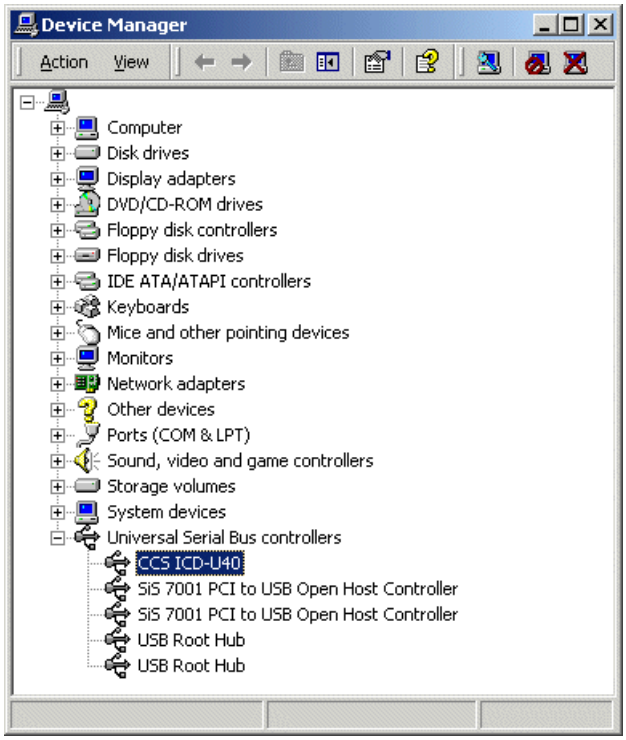
7. You will now see the following screen:



Press the Finish button.

Re-boot your PC if it asks you.

8. When you go to the Device Manager, you should see the following:



9. When finished, you can delete the C:\ICDUDRV\. This is the folder where you un-zipped the driver files.