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TROUBLESHOOTING I2C ERRORS

A quick fix to I2C error headaches

Some of you have had trouble connecting MAX PRO 3+ or MAX PRO 4+ to our SE4 DSP+ stereo encoder via provided I2C cable. As reasons for this can vary quite a bit we decided to write it all up in a guide to make the process as easy as possible. This document offers a quick solution to any such problems in a straight-forward form.

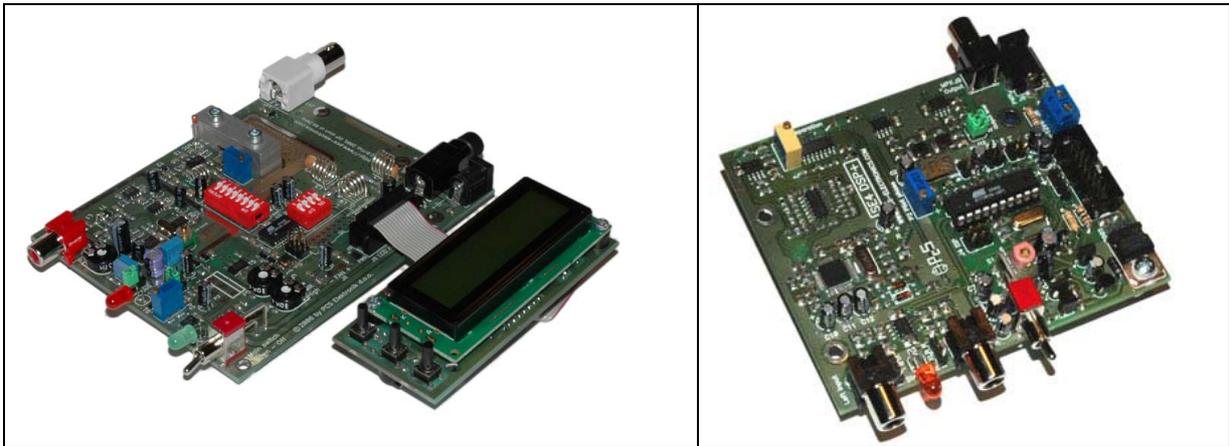


Fig. 1: MAXPRO3+ and SE4 DSP+, a marriage made in heaven. Amazing performance and versatility can be obtained from these two units connected together via I2C cable to enable control from the single LCD control module.



Do you think you can handle it ??

Fig.2: Wiring MAXPRO3+ and SE4 DSP+ together is easy and offers great benefits. Do you think you can handle it?

1. GENERAL CAUSES FOR THE I2C ERROR PROBLEMS

The I2C protocol used in many of our products is great and makes it possible to easily connect a number of devices with 2 wires only (plus ground). However, a few important considerations must be observed:

- Always use RF-blocked stabilized mains power supply of appropriate amperage and voltage. A struggling power supply with sagging voltage can cause all kinds of problems, I2C error being just one of them.
- Keep I2C cable as short as possible. Note that the flat cable from LCD unit to the main PCB is actually I2C cable as well.
- Route I2C cable away from strong RF fields. These are usually present close to the transmitter's output stage or generally wherever coils are present.
- Bundling and routing many cables together can increase the capacitance towards ground and between the signal lines, leading to signal degradation. Also, some of those cables could be radiating RF so do not for example route I2C cable in a bundle containing coaxial cables.
- I2C errors could also be caused by strong RF fields close to the equipment, such as when your entire antenna system is very poor and your coaxial line to the transmitter itself radiates a lot of RF (RF feedback problems). However, this is extremely rare.

2. I2C ERROR WHEN USING MAXPRO 3+ IN STAND-ALONE MODE

This applies to your problem if you're seeing the I2C error message when operating MAX PRO 3+ in stand-alone mode without stereo encoder.

Symptoms:

I2C error message appears when operating LCD display settings, for example when changing output power.

Possible causes:

- Check for and eliminate potential causes from the point 1 above.
- Make sure all DIP switches are set to OFF!!!!
- It may be necessary to remove two SMD capacitors on the MAX PRO 3+. It was found that these are unnecessary and removing them sometimes even helps eliminate the problem.

Solution:

- Check for and eliminate potential causes from the point 1 above.
- Set all DIP switches to OFF!!
- Try to remove the two SMD capacitors and see if this fixes the problem, this will not do any harm to the transmitter and you can do it even if you are not having any problems:

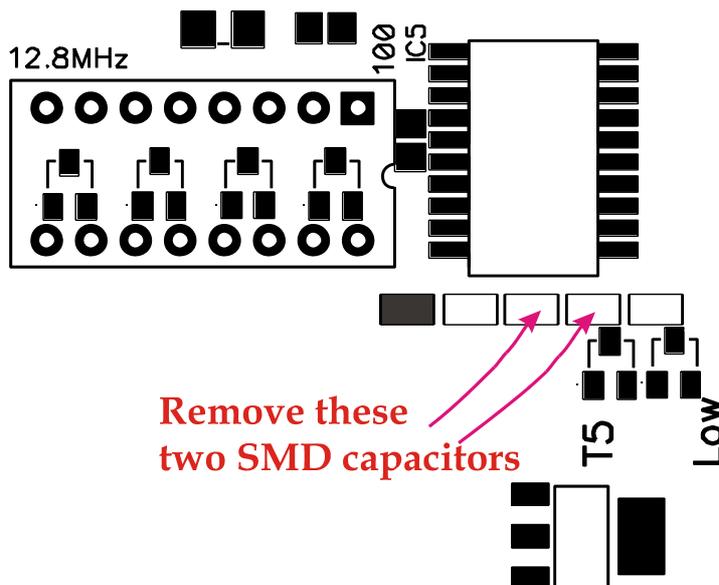


Fig.3: Remove the two capacitors on the MAXPRO3+ PCB, they are close to the DIP switches.

3. I2C ERROR WHEN USING MAXPRO 4+ IN STAND-ALONE MODE

This applies to your problem if you're seeing the I2C error message when operating MAX PRO 4+ in stand-alone mode without stereo encoder.

Symptoms:

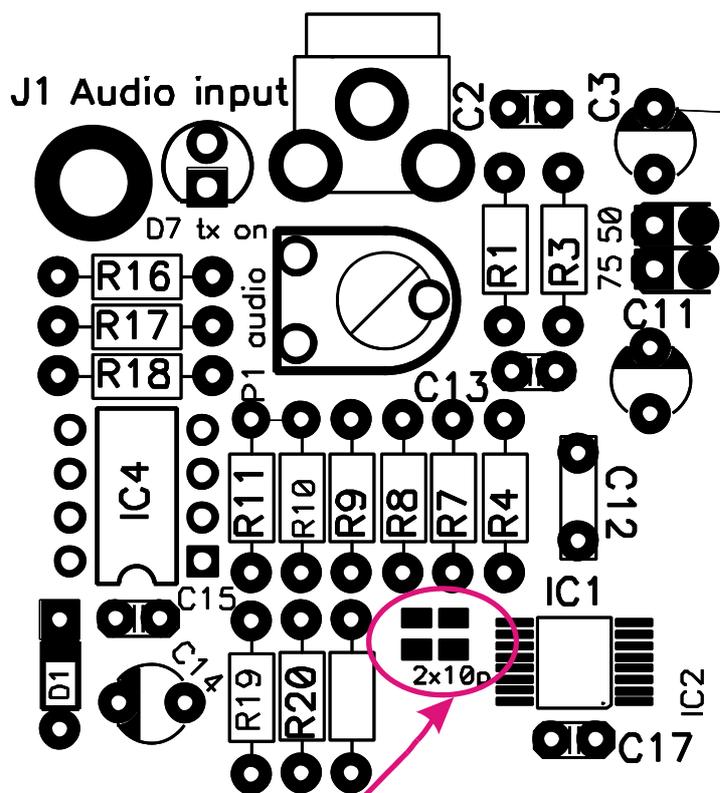
I2C error message appears when operating LCD display settings, for example when changing output power.

Possible causes:

- Check for and eliminate potential causes from the point 1 above.
- It may be necessary to remove two SMD capacitors on the MAX PRO 4+. It was found that these are unnecessary and removing them sometimes even helps eliminate the problem.

Solution:

- Check for and eliminate potential causes from the point 1 above.
- Try to remove the two SMD capacitors and see if this fixes the problem, this will not do any harm to the transmitter and you can do it even if you are not having any problems:



Remove these two SMD capacitors

Fig.4: Remove the two capacitors on the MAXPRO3+ PCB, they are close to the DIP switches.

4. I2C ERROR WHEN USING MAXPRO 3+ or MAX PRO 4+ CONNECTED VIA I2C CABLE

This applies to your problem if you're seeing the I2C error message when operating MAX PRO 3+ or MAX PRO 4 connected to the SE4 DSP+ stereo encoder.

Symptoms:

I2C error message appears immediately after power up or when operating LCD display settings, for example when changing output power or DSP parameters.

Possible causes:

- Check for and eliminate potential causes from the point 1 or 2 above.
- It may be necessary to remove two SMD capacitors on the MAX PRO 3+ or MAX PRO 4+. See points 2 and 3 above for graphic representation.
- Make sure all DIP switches on the MAX PRO 3+ board are set to OFF!
- Make sure to install LCD control board to the FM exciter board only! Do not install LCD control board to the SE4 DSP stereo encoder board!
- Ensure that DC power is connected to both, stereo encoder and the FM exciter board.
- Ensure that I2C cable is wired correctly

Solution:

- Check for and eliminate potential causes from the point 1 or 2 above.
- Try to remove the two SMD capacitors and see if this fixes the problem, this will not do any harm to the transmitter and you can do it even if you are not having any problems.
- Set all DIP switches on MAX PRO 3+ board to off.
- Remove LCD control module from SE4 stereo encoder and install it to the FM exciter board only!
- Connect DC power to stereo encoder and fm exciter board! Watch polarity
- Ensure proper wiring of the I2C cable. See point 5 below for details.

5. WIRING I2C CABLE

I2C cable connections require 3 wires. Two of these are signal wires and the third one is ground. The best wiring procedure is as follows:

a.) Find ground on both boards

This is easy, ground is usually pin 1 on the 3-pin I2C header. You can also verify this by measuring resistance towards ground, which should obviously read zero ohms. Connect both ground points via wire.

b.) Once you got ground covered you're left with 2 wires only. What we usually do is here is just connect these two randomly and see what happens. If we get I2C error we power both boards off and swap the two signal lines.

c.) Bingo! You've got a working system.

6. TIP: KEEP THE I2C CABLE SHORT

It is often easier to wire stereo encoder directly to the LCD control unit. The procedure is the same as above, the only difference being that you are not connecting the wires to MAX PRO 3+ or MAX PRO 4+ but to the dedicated I2C header on the LCD control unit.

Why? This keeps the I2C cable shorter, looks more tidy and sometimes eliminates I2C errors.

7. SO, DO YOU THINK YOU CAN HANDLE IT?

Wiring I2C cable is easy. You are most likely not going to see any of the above listed problems anyway so do not get intimidated, give it a try today! You won't regret it!

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LEGAL INFO

It may be illegal to operate this device in your county. Please consult local authorities before using CYBER MAX LCD!

THANK YOU FOR PURCHASING MAXPRO3+!

We hope you'll enjoy it as much as we do and remember to tell your friends about it. From all of us we wish you happy broadcasting!

PCS Electronics team
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