

Neutron Star 4



Neutron Star 4 is the current version. In the next couple of days i will build a guide for using the NS4 here. The NS4 is similar in function to its predecessor NS3, it has exact same size, and it has the same functions, with a few differences.

Differences.

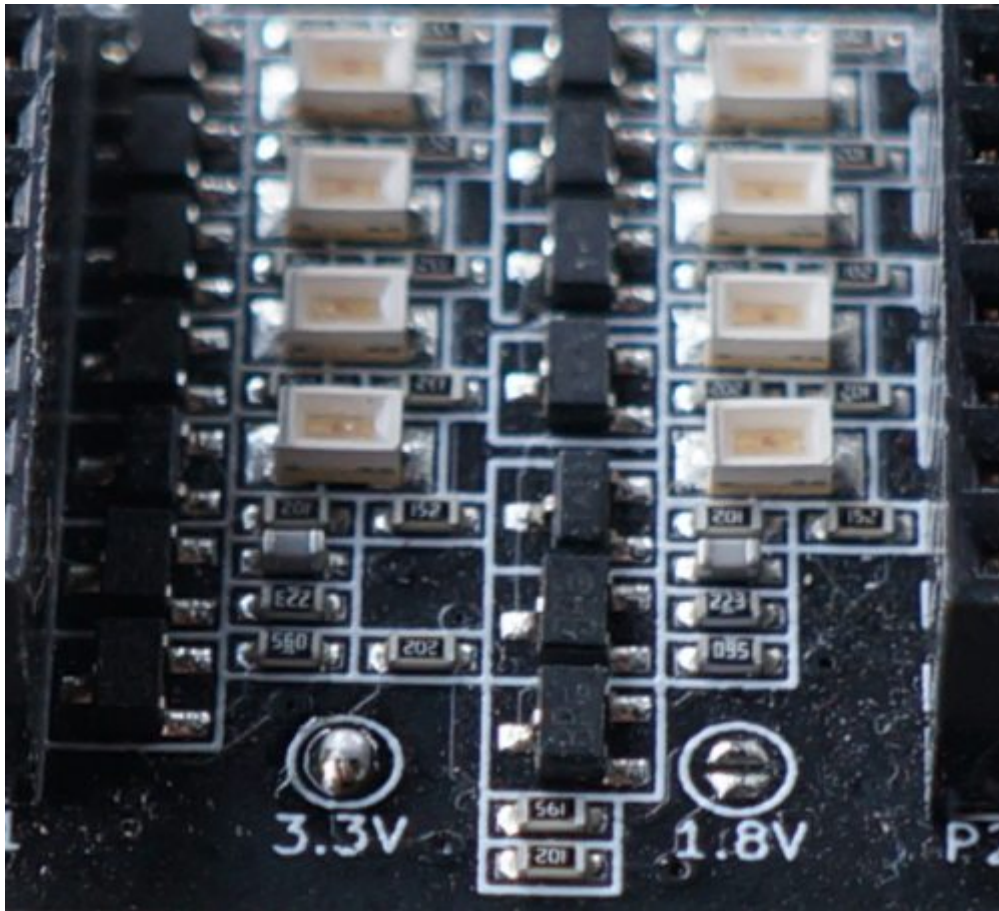
NS3 is powered by 10 - 18V DC, nominally 15V. But NS4 is powered with 10V - 15V DC nominally 12V. The current consumption is the same about 250 mA. (Including the heater). The rail capacitors of 100 uF in NS3 has now been upgraded to 1000 uF in NS4. This gives a slightly better sound performance. The signal traces of the PCB layout has been optimized, with round corners, and shorter signal path. This gives lower susceptibility to airborne digital noise. The preregulators have been replaced with ultra low noise low drop regulators from Analog Devices. This is to facilitate the functionality down to 10V power supply.

Connect The Power Supply

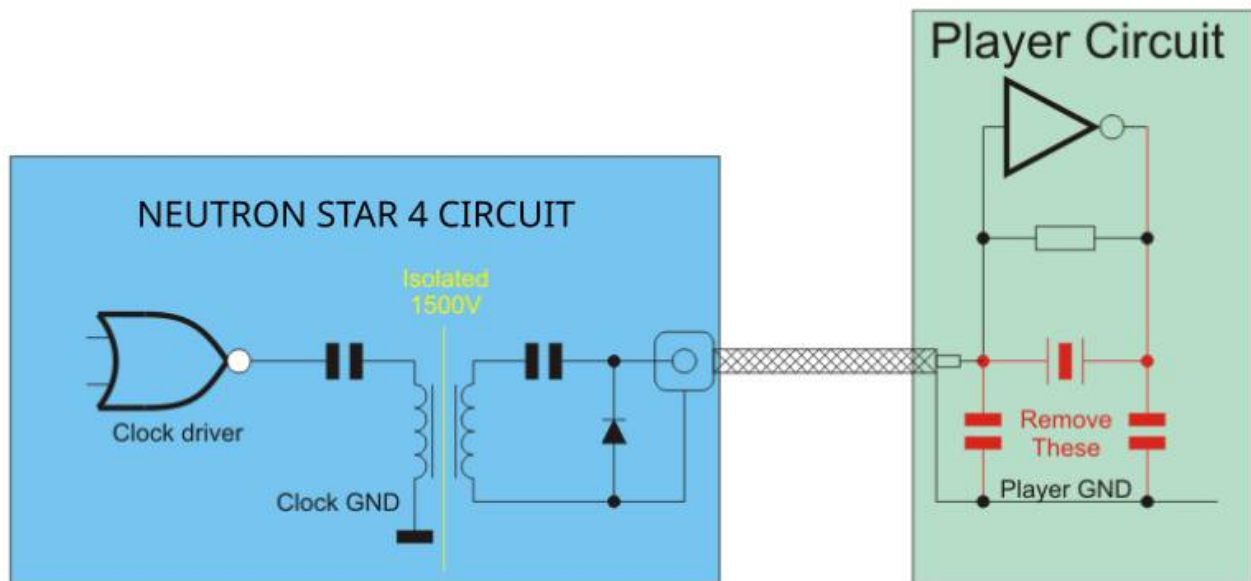


To install NS4 you have connect the power supply, and the clock signal into the player, DAC, network switch or what ever you want to reclock. Then you have to set the output level of the clock signal, which is by default 5V (too high for most players). This is how you connect the power supply. Always use a low noise power supply based on a non switched mode transformer, using preregulator like 7812. There is also a dedicated power supply available with low noise regulators, and separate power supply for the oscillator and the wave shaper of the clock. This is also why you have to connect all 4 wires of the cable, because these two parts are completely separated on the clock module. The power supply cable is included in the clock kit, if you order

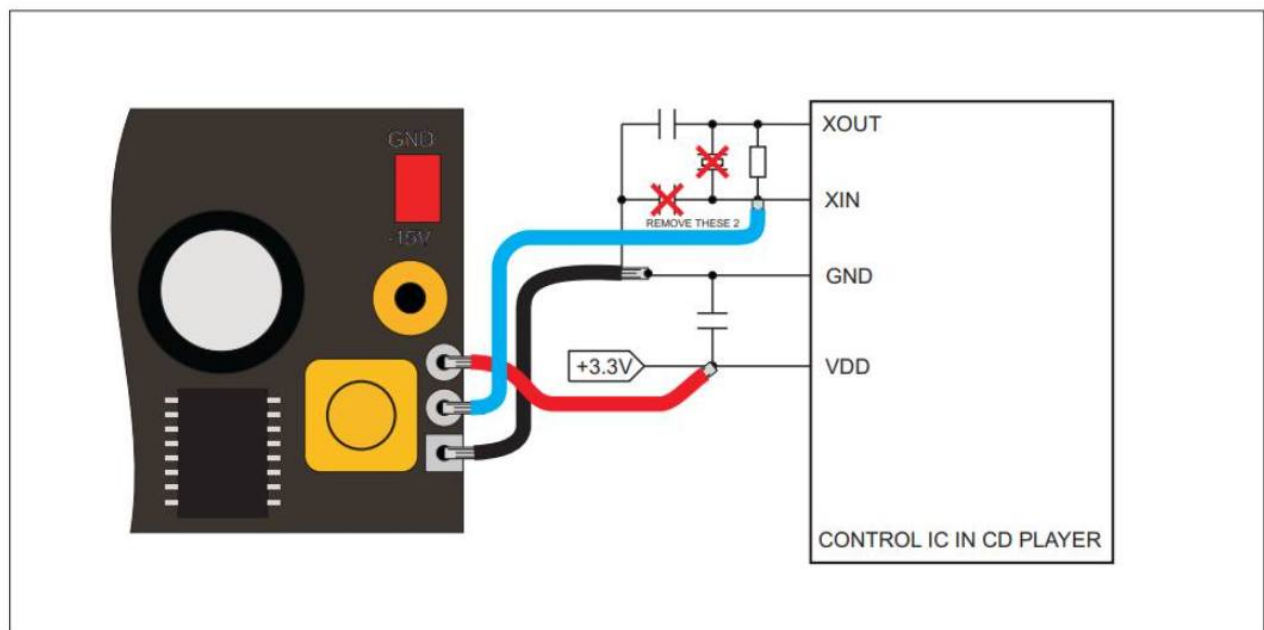
with the dedicated power supply there will be 2 connectors on the cable, so you can just place the connector on both power supply and clock, to connect it correctly. Pins 1 and 2 are GND, and pins 3 and 4 are +12V.



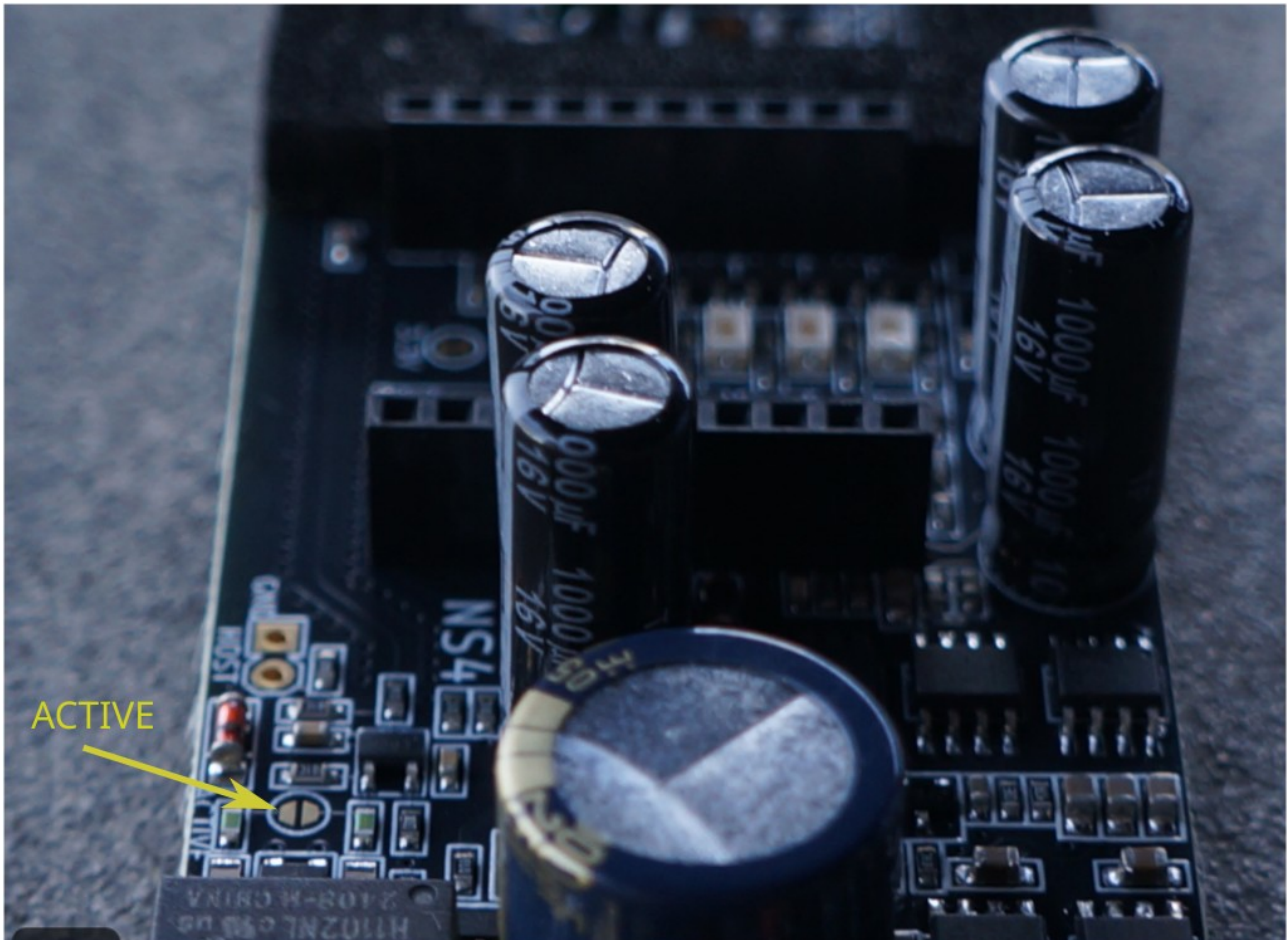
The output clock level in Vpp (Volts Peak to Peak) must fit with the player you are installing the clock in. It should be the same as the power supply of the receiving chip in the player. The default setting is 5Vpp which is fitting for older CD players. For modern players you should probably set it to 3.3V like shown on the photo. The 1.8V setting is for use in Raspberry Pi reclocking. The settings are placed around the middle of the module close to the 8 green LEDs, which are by the way the voltage references for the ultra low noise second stage voltage regulators. NOTE only set one bubble at a time. If you are using the ACTIVE output there is no need to set the output level, it will be set automatically.



How to connect the COAX output. This is a 75 Ohms output and cable. So for longer distances you should terminate the cable by connecting a 75 Ohms resistor at the output end to GND. See other post here on my facebook page. The output is isolated from the rest of the clock with a small transformer, so you will not get any ground loops when connecting GND of the clock signal and the power supply to the player. This is not a problem when using NS4. Remove the old crystal, and the 2 capacitors going to GND, but NOT the resistor. Then connect the COAX cable (included) from GND to the input signal pin of the old crystal footprint. If you have a schematic the signal should go into XI or XIN. If you have no information try to take a look at the NewClassD website, where there is a generic instruction how to find the right connection. <https://lctechs.dk/newclassd/index.php?page=37&hv=1>



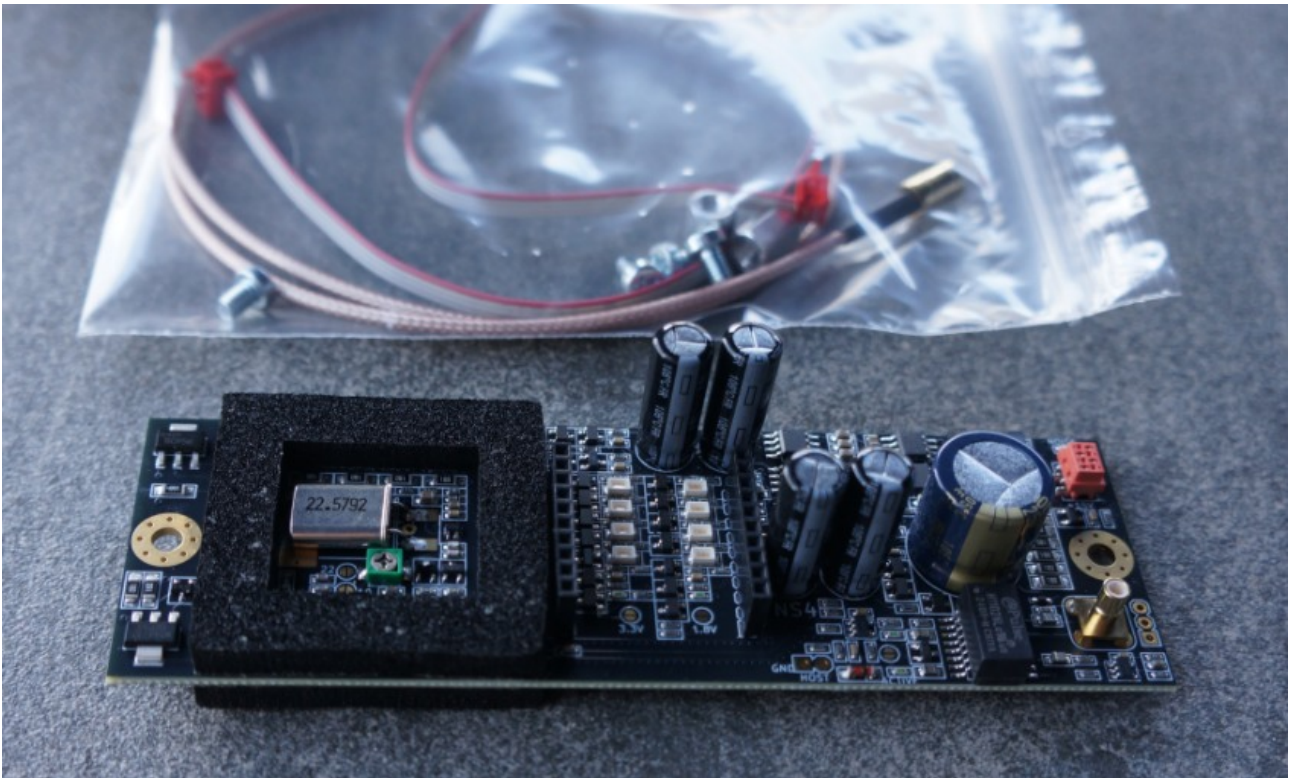
How to connect the ACTIVE output to your player. If you can get the clock within 7-10 cm of the place you have to connect the clock signal, then it is beneficial to use the ACTIVE output. For longer distances the COAX output is the best. This is how to connect the clock signal. NOTE you have to set the ACTIVE output on, before using it. Short the solder bubble placed close to the HOST input of the clock. About 4cm west of the output connector. NOTE you still have to connect 12V power to the 4 pin connector.



Short this bubble with solder to activate the ACTIVE output.

The HOST function.

When using the dedicated power supply unit there is a problem to consider. When you switch the player off, there might still be power on the clock if the power supply is still connected to mains. Sometimes the power supply is always on. So we need to switch off the clock signal while the player is OFF. This is done with the HOST function. The HOST connector is found about 6 cm west of the output, you can see it also on the photo above. Simply connect the square terminal to the player GND and the other round terminal to +3.3V or 5V on the player. Now the clock will turn OFF when ever the 3.3V is going low, and back on when the 3.3V is there, when the player is on.



The clock kit includes power and signal cable, and metal spacers with screws for mounting.



The 16.9344 MHz clock signal, set to 3.3Vpp setting.

Why do you need a clock? Long story short the clock will make your music more fluid and natural. The sound stage will be wide, high and well defined. A digital player will sound just like a LP player, but with much deeper dynamic range. Works on CD players, DVD players, Blu ray, DAC's (if they have reclocking) PC motherboard in music clients, and network switches.