# PowerManagementSystem

The PowerManagementSystem (PMS) will be in charge of providing energy to all components of the Water Quality Monitoring device. The device has the following components that require power:

# Preventing Noise

It is important to prevent noise that may be caused by some more power hungry components in the device. That’s the reason why I will try create power lines for 12V, 9V, 5.2V and possibly 3.3V. The 12V rail will use a lot of power where the 5.2 and 3.3 are on the lower side of power usage. The use of capacitors will also smooth out the voltage dips that may occur while load becomes high.

# Planes on PCB

There are multiple benefits to using ground planes, something that is already widely known. It improves thermals for heat inducing chips and it helps preventing EMC issues. It may however be wise to keep analog and digital grounds separated, to prevent ground loops and the noise it creates. We may use positive 12V or 5.2V planes as well, so we can transfer high currents to some loads without heating up the PCB, but this may introduce interference (EMC) with signal lines, something that is not tolerable.

More current means, more noise for sensitive components. Reference voltage is important.

Buck is wise (except for analog -> linear regulators)

Isolated dc-dc converters (24V-> isolated 5V, floating)

Keep analog and digital grounds of uC separate. Ground planes, not power planes.