# CDI theory

CDI: Capazitor Discharging Ignition

It is the most common technology for two stroke bikes.

See also: https://en.wikipedia.org/wiki/Capacitor_discharge_ignition
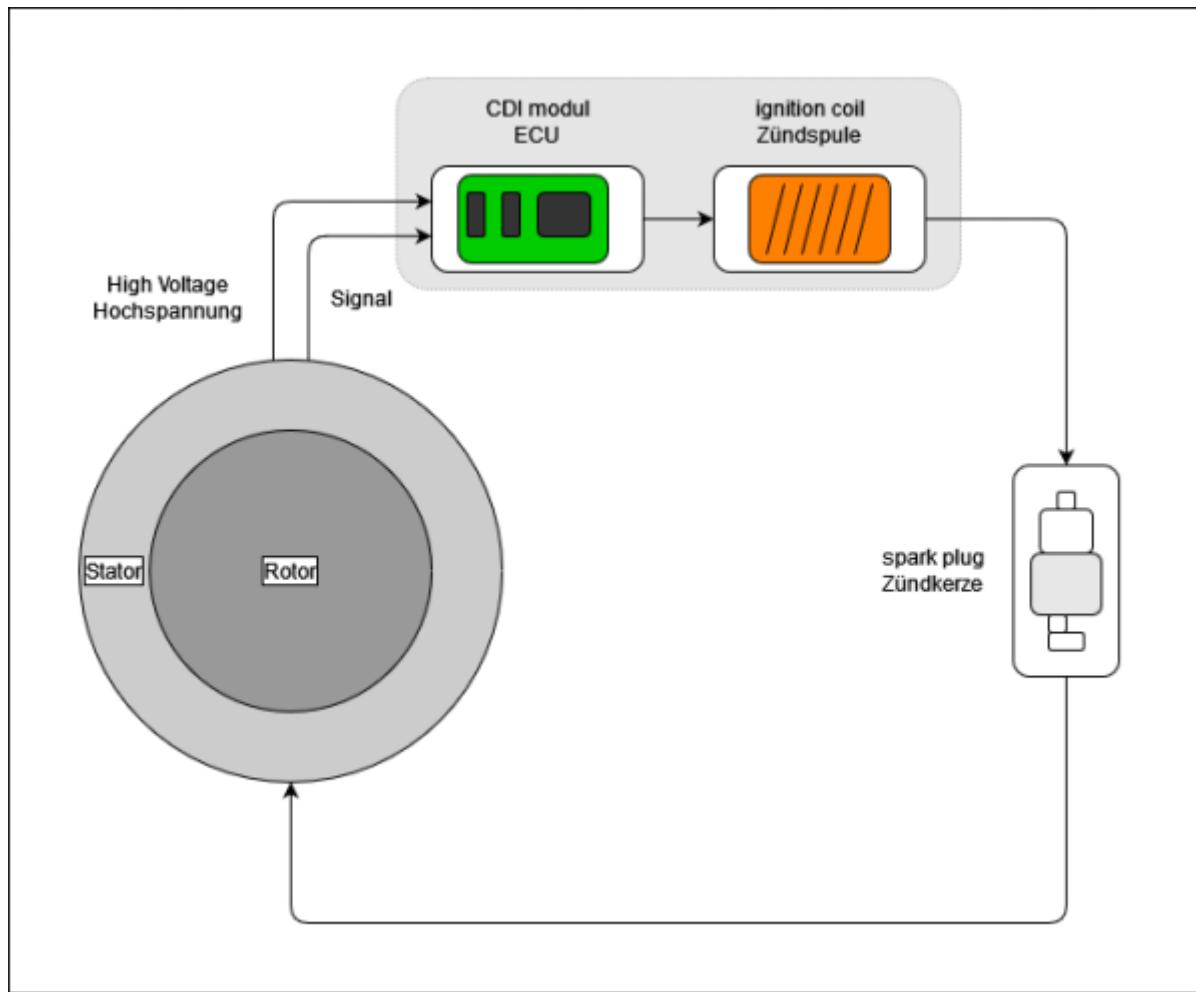
The stator-rotor-combination creates a high voltage source for the spark energy and a signal impulse for triggering the ignition point. The CDI modul (also called ECU = electronic control unit) stores the spark energy, until the triggering signal releases the current to the ignition coil. In this coil the voltage gets transformed to several 10k volt and then creates the spark in the spark plug. This is the moment where the combustion in the engines is started.

General Spare Circuit Diagram

There is not one general structure which is valid for all CDI types. But an often used structure looks like this. This structure will also be used for OpenSimSpark.

On the left side there is the stator-rotor-unit. It generates with L1 the high-voltage for the spark and also with L2 the triggering signal for the ignition point.
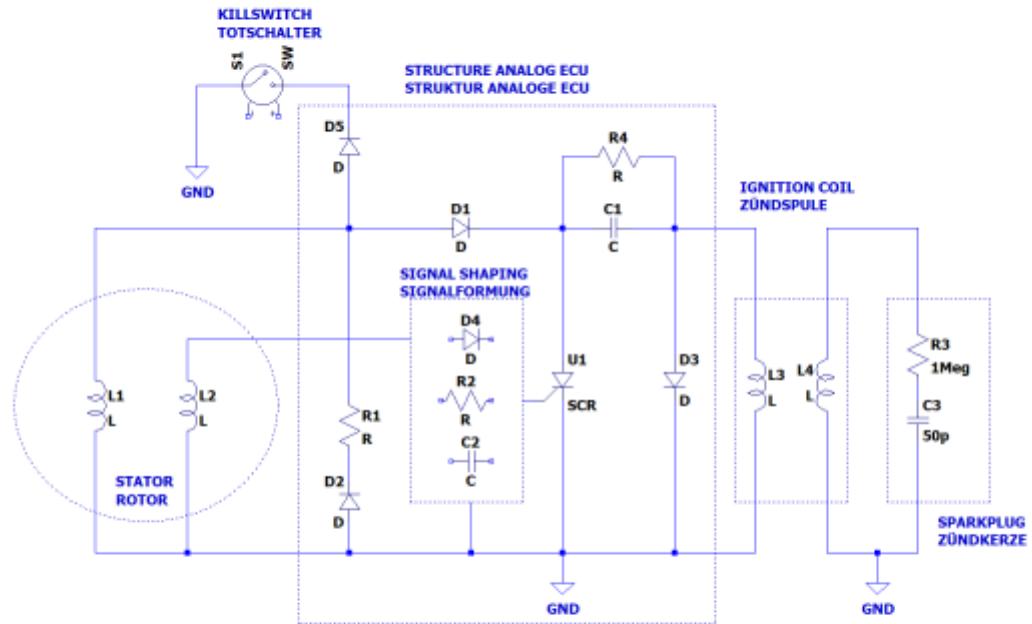
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ECU structure

Now take a closer look at the core of the CDI: The ECU (green bordered).
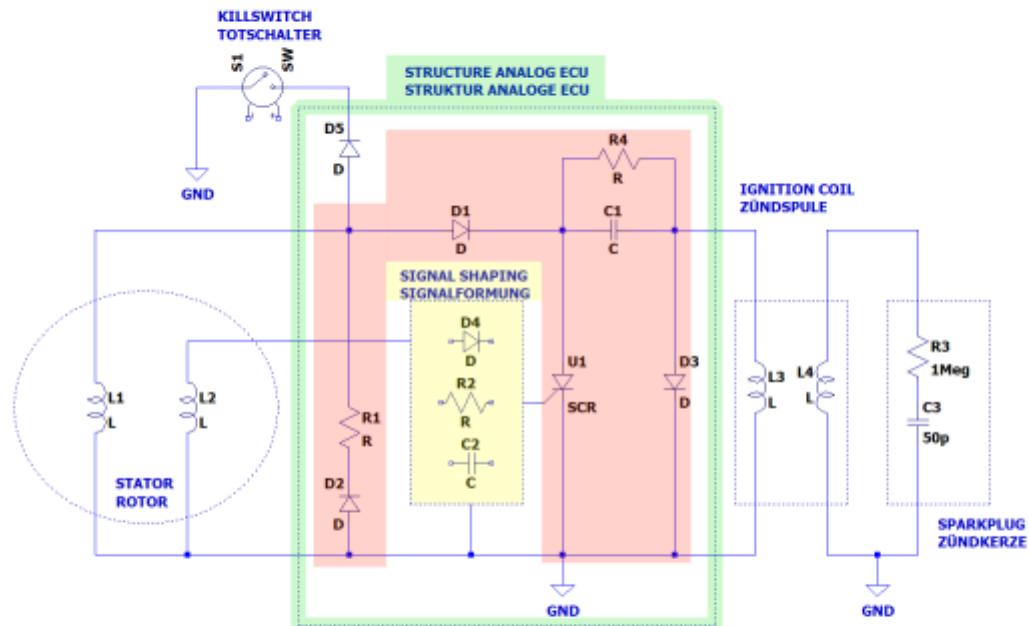
signal shaping

The yellow bordered region is responsible for signal shapping of the ignition signal. It exists mainly of some resistors, diodes and capacitors. The amount and arrangement varies pending on the stator-rotor-unit and the ignition timing you want to create.

power section

The red bordered region is the power section. Its task is storing and releasing the energy for the spark.

Note: The reistor R4 (high impedance) is not needed for the actual function, but very important for the safety of DIY self CDI. Without casting compound the connections of the capacitor C1 are accessible. And because there is energy stored with several 100 Volts this is a big risk. So if the engines stops, the capacitor C1 is quickly discharged with R4

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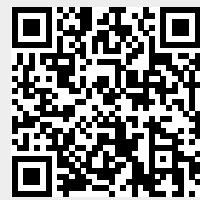
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