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High voltage tetrode replacement in the LHC klystron modulator

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The 400MHz/300kW LHC klystrons are powered by 58kV DC supply. The klystron cathode current is controlled by a means of "modulation anode (MA)". Variation of the MA potential between 5kV and 35kV provide klystron current regulation from zero up to the nominal 9A.
A high voltage tetrode (Thomson TH5186) used in the klystron modulator allows to control the MA voltage. Many of the currently used tubes were recuperated from the LEP machine and they are reaching end of their life time. Very high price of the new replacement tubes triggered development of a new "tubeless" MA voltage source. A novel, step-controlled high voltage resistive divider based on reed switches is presented.

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