

7.1 Automatic control

It is not the good place to develop a full control-course. It will only be listed some domain in electric traction where controls are used.

Many levels can be distinguished:

1. Fast control, which cannot be executed by man: Current control of a DC-motor driven by a chopper, control of static switches on a three-phase inverter, sequence control in a serial-parallel transition ...
2. Controls which help the driver, allowing him to focus on train circulation: timing of switch movements in a rheostatic drive, optimal set point on a diesel-electric group, control of regenerative braking, anti-sliding devices, ...
3. Guard functions where the driving is taken by the system in case of driver's failure: braking of a train before a closed signal by insufficient deceleration (European Train Control System (ETCS) level 1). Central control of trains without lateral signals (ETCS level 2).
4. Circulation control, where personal has only a survey function (ETCS level 3, RATP : line 1) or is totally absent (Lille : VAL, RATP : Meteor). It is necessary to know very well speed and position of each train to guarantee security and availability of circulations.

An engineer who installs such control has not only to insure good performance, but also to respect legacy, which can be quite different from a country to another.