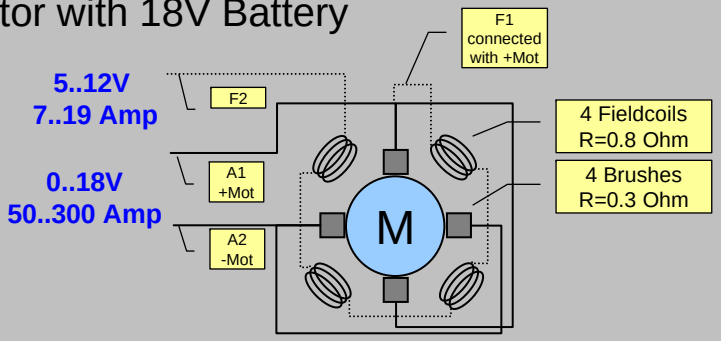
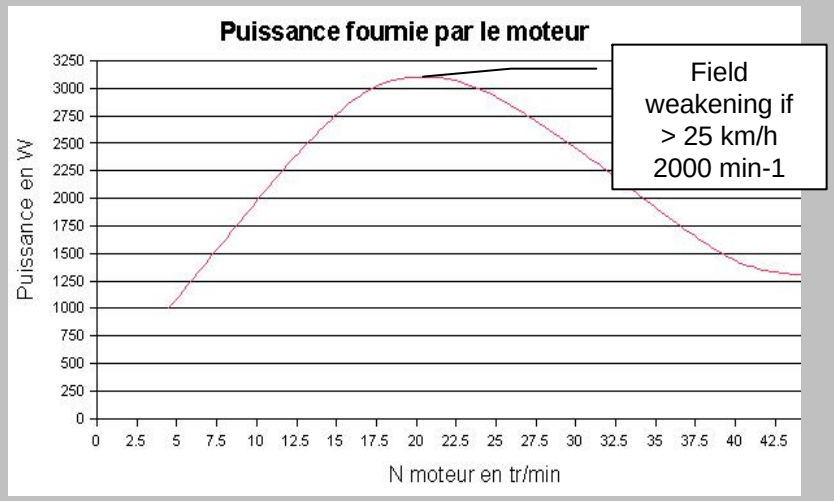
EV-conversion Peugeot Scootelec
with Quantya-Battery and DCX300

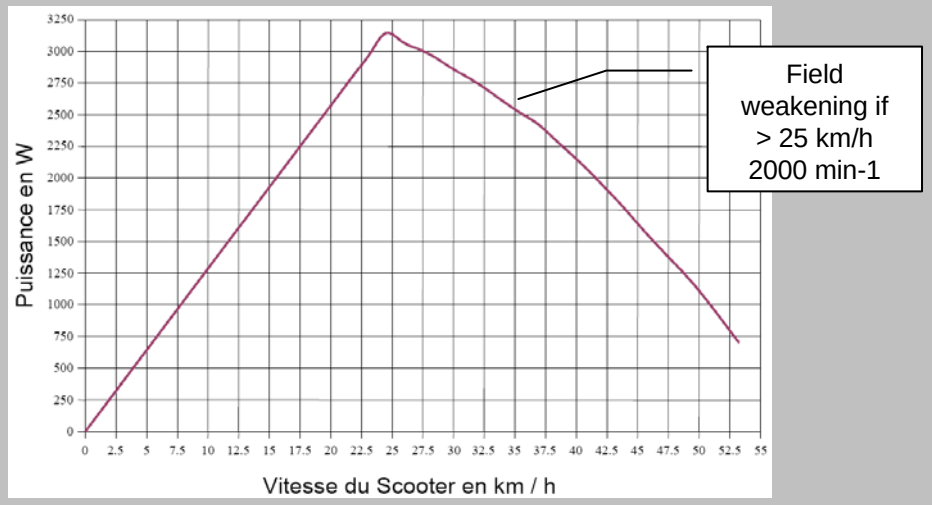
- Specification of the original motor with 18V Battery

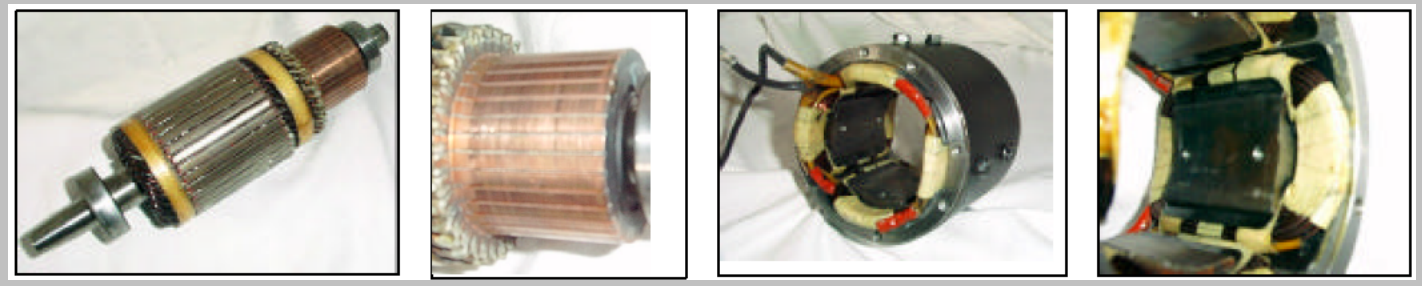
DC Motor SepEx Leroy Somer T12
Original Spec: 1.5kW/4000min-1
4 poles
Main/rotor: 18V, 120Amp
Field: 5V, 7Amp







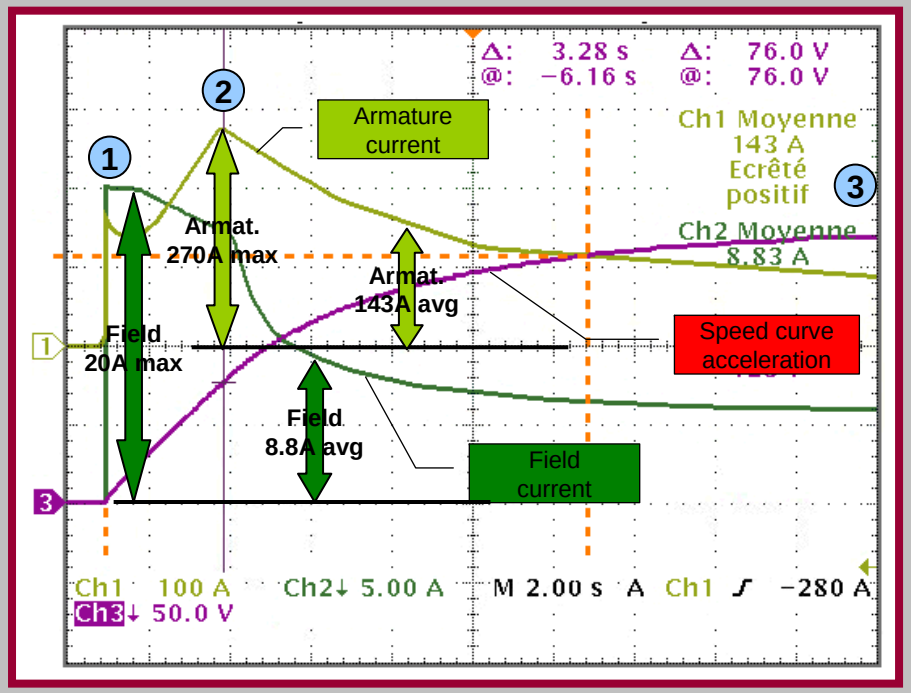




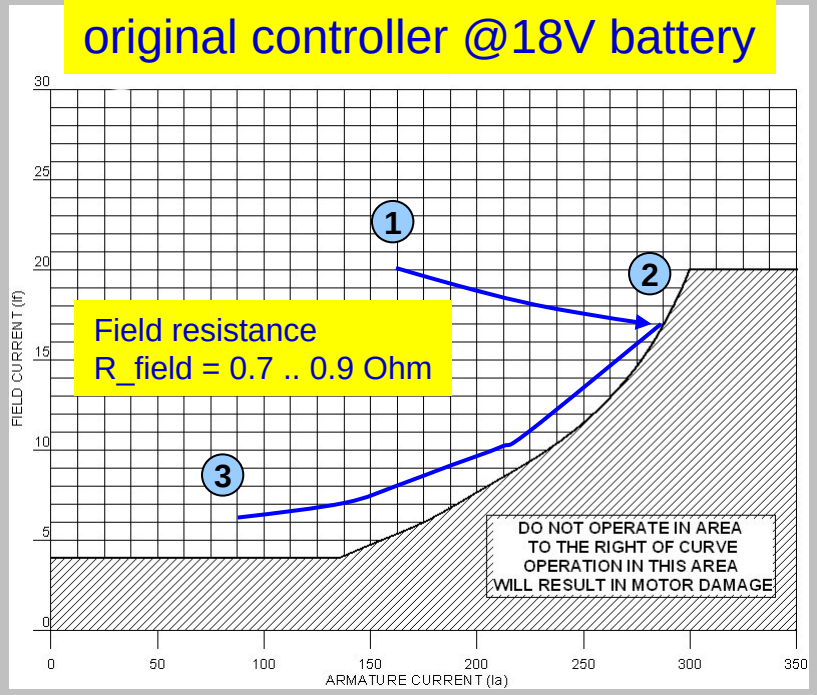
EMPA
Materials Science & Technology

EV-conversion Peugeot Scootelec
with Quantya-Battery and DCX300

- Original Motor: Acceleration with 18V Battery



Field curve of motor with original controller @18V battery



Armature resistance
R_arm = 0.2 .. 0.4 Ohm

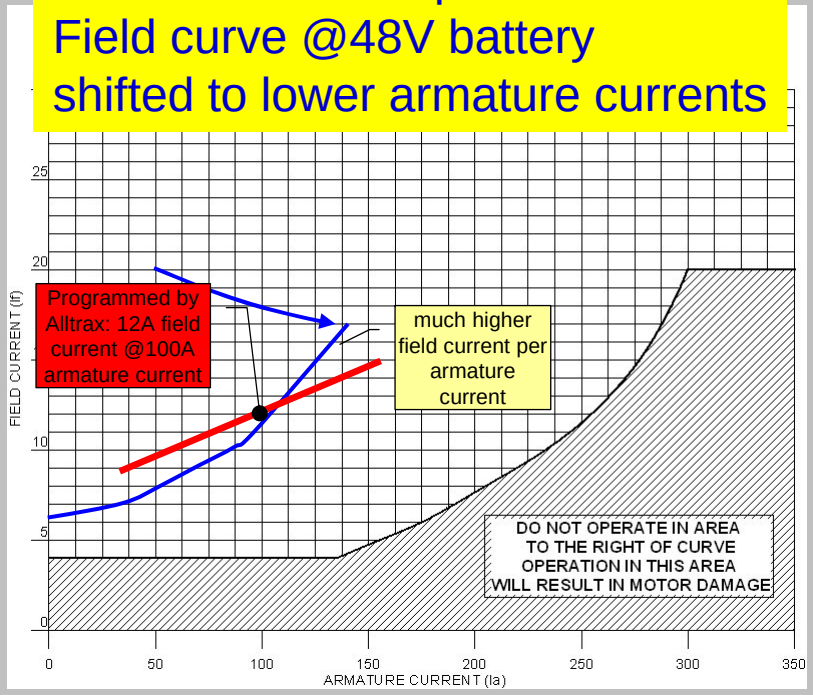
We would like to operate this original motor at 48V instead of 18V, but at much lower currents around 100 Amp.
- Best controller settings/excitation map?

EMPA
Materials Science & Technology

EV-conversion Peugeot Scootelec
with Quantya-Battery and DCX300

- Conversion: Operation at lower currents due to higher voltage of 48V

Idea for DCX setup:
Field curve @48V battery
shifted to lower armature currents



Armature resistance spec.
R_arm = 0.2 .. 0.4 Ohm

Field resistance spec.
R_field = 0.7 .. 0.9 Ohm

measured field resistance:
R_field = 0.7 Ohm

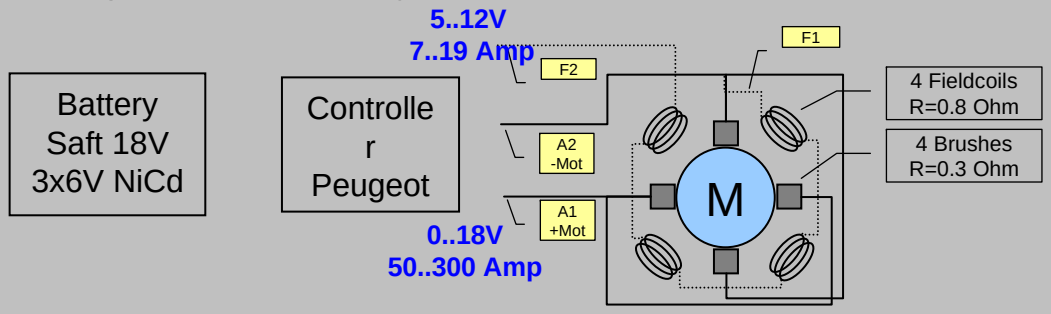


Original motor shall be used because replacement is mechanically nearly impossible.

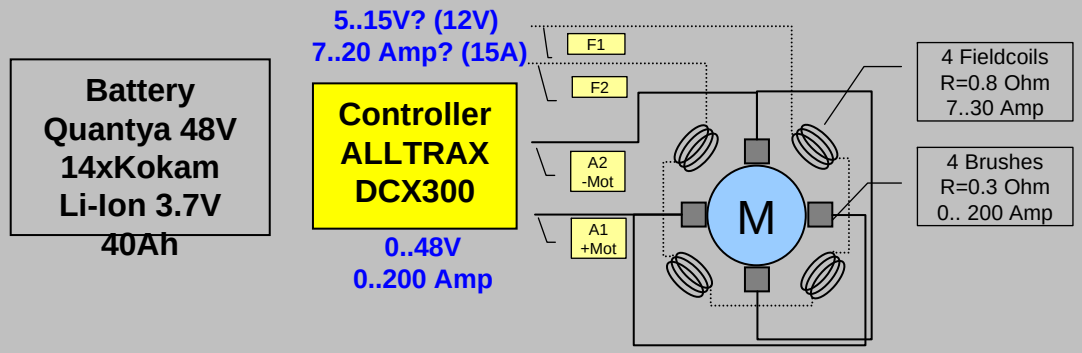
Higher field current per armature current.
- Best controller settings/excitation map?

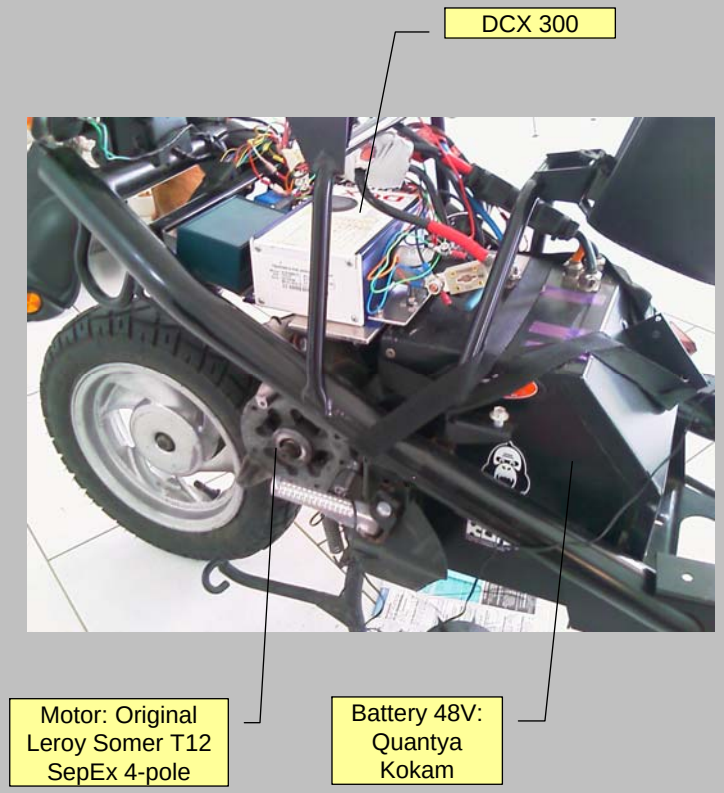
EV-conversion Peugeot Scootelec
with Quantya-Battery and DCX300

- Original: 18V Battery, Scooter limited to 45 km/h



- Conversion: 48V Battery and Alltrax DCX 300





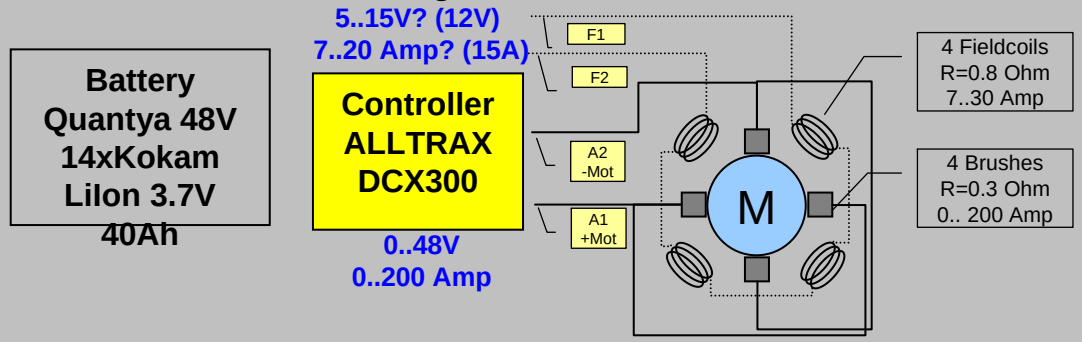
- Motor is original, F1 and F2 connected to DCX 300
- Battery same as for Quantya, able to deliver 200A cont. @ 48V
- Motor speed expected: >8000 min-1 (>80 km/h) (original 4500 min-1 (45 km/h))
- Performance limited by thermal limit of motor (will be measured)

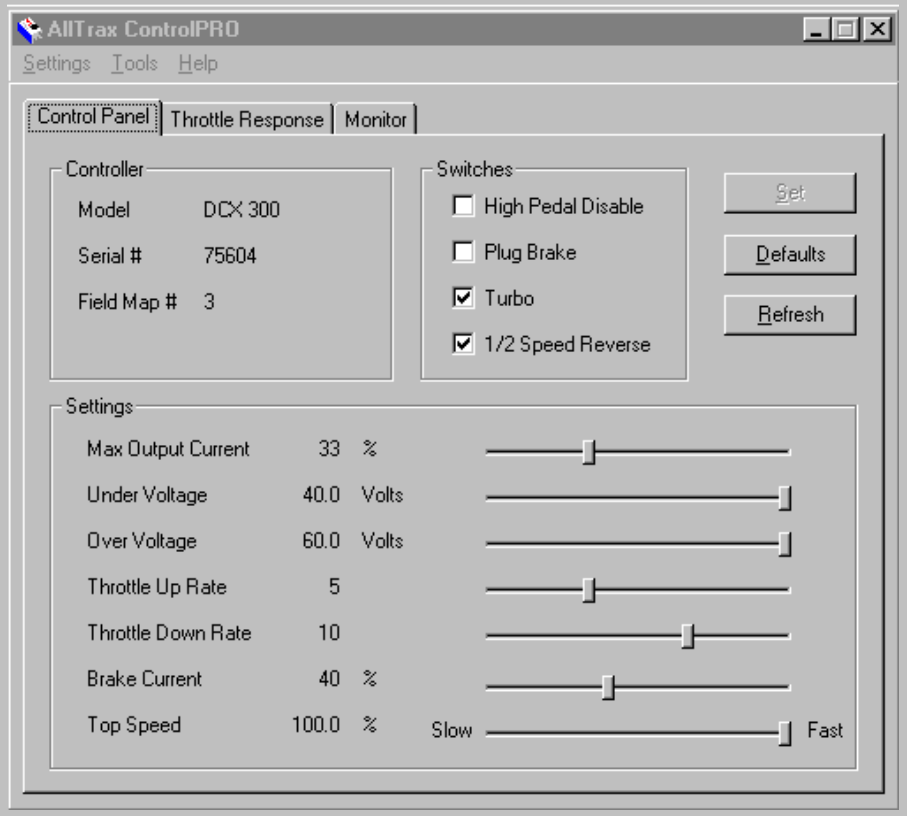
EMPA
Materials Science & Technology

EV-conversion Peugeot Scootelec
with Quantya-Battery and DCX300



- Controller Pro Settings:





What is the optimum setting for the DCX 300?
-> With original DCX300 Serial-# 75604
Field Map #3: extremely low torque!

Field map around 12V 15Amp?
Best-suited Field Map #?

Marcel Gauch
TSL Technology and Society Lab @ EMPA
Swiss Federal Laboratories for Materials Testing and Research

EMPA
Materials Science & Technology

EV-conversion Peugeot Scootelec
with Quantya-Battery and DCX300



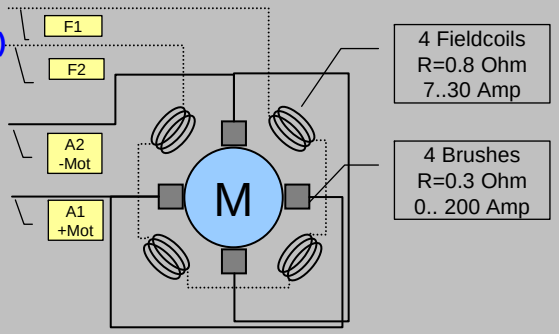
- Controller Pro Settings:

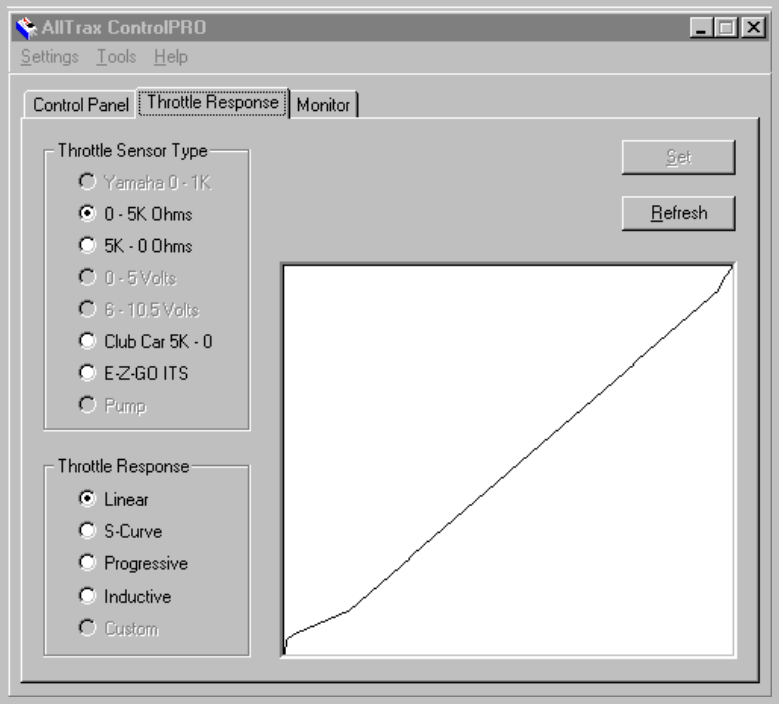
Battery
Quantya 48V
14xKokam
LiIon 3.7V
40Ah

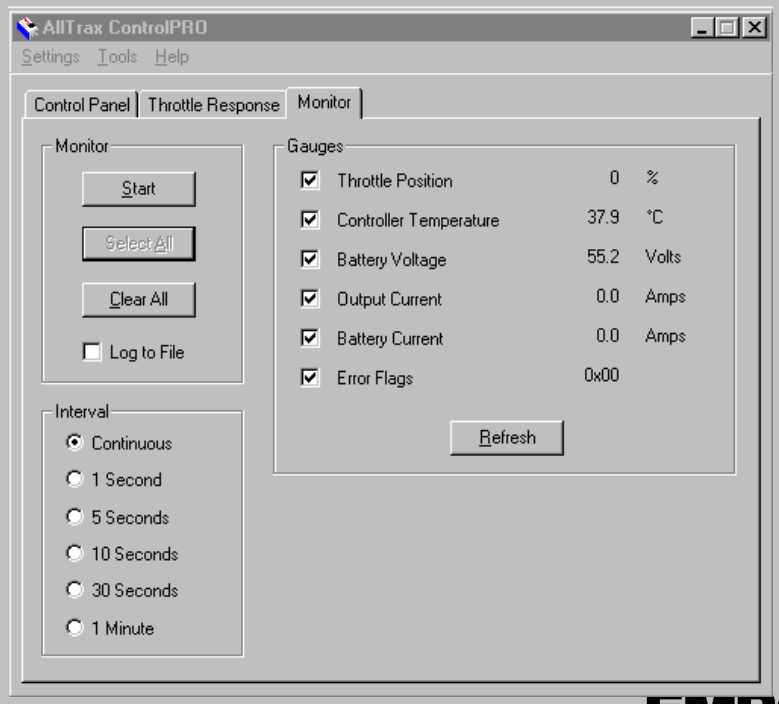
5..15V? (12V)
7..20 Amp? (15A)

Controller
ALLTRAX
DCX300

0..48V
0..200 Amp





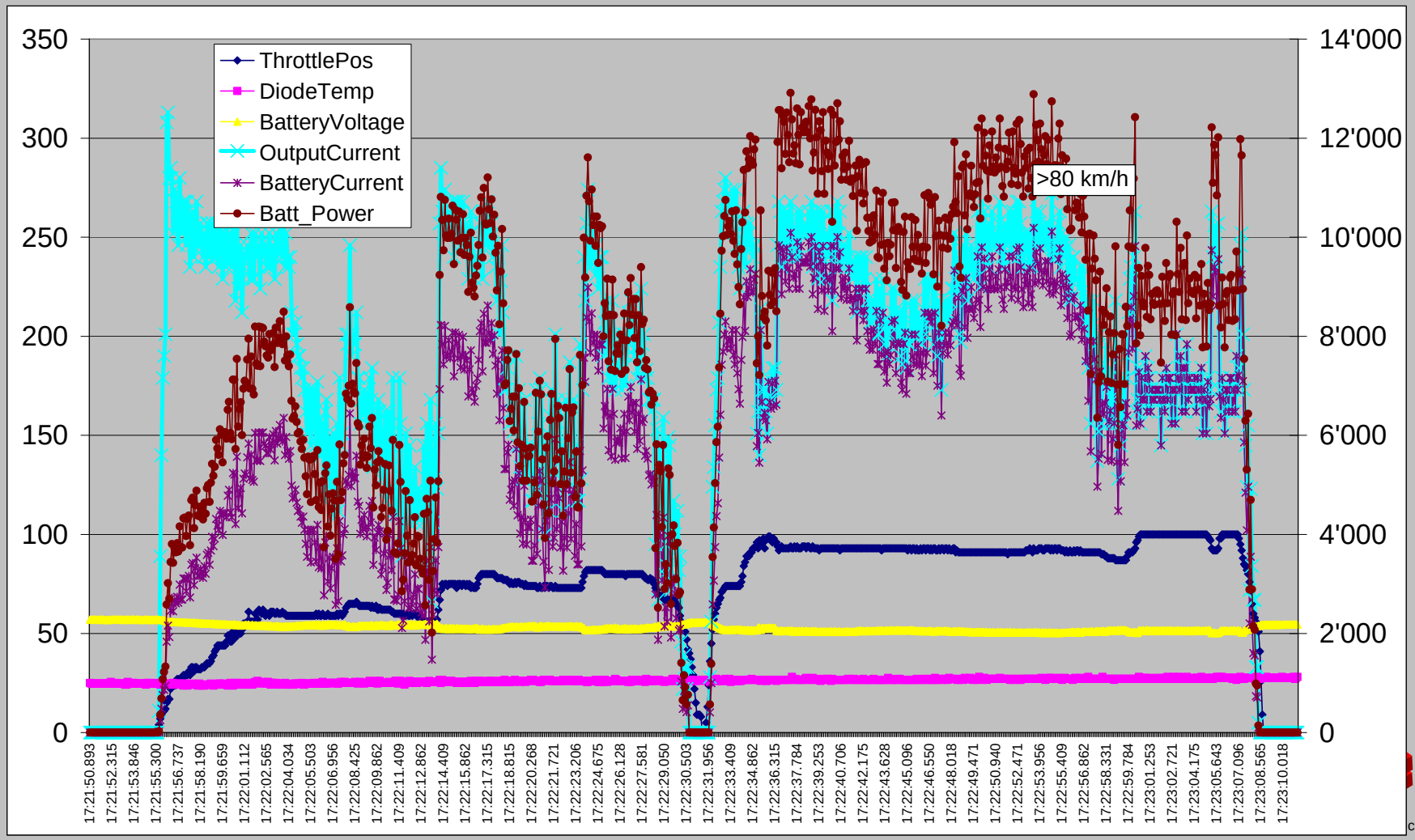


EMPA
Materials Science & Technology

EV-conversion Peugeot Scootelec
with Quantya-Battery and DCX300

- RESULTS:
  very smooth driving experience
  estimated speed: 90 km/h (tacho scale ends at 80 km/h)





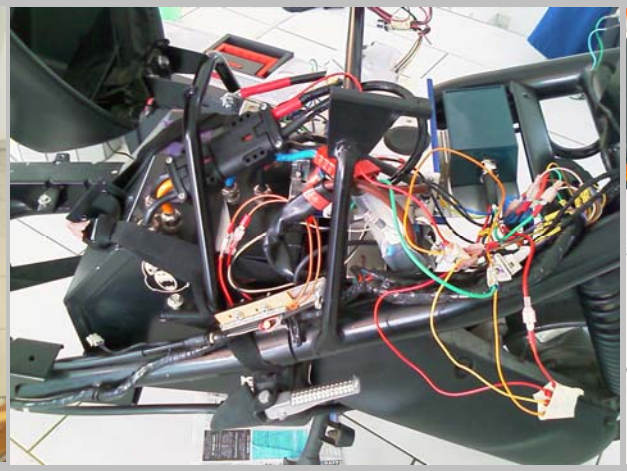
EV-conversion Peugeot Scootelec
with Quantya-Battery and DCX300



- RESULTS:
  very smooth driving experience
  estimated speed: 90 km/h (tacho scale ends at 80 km/h)

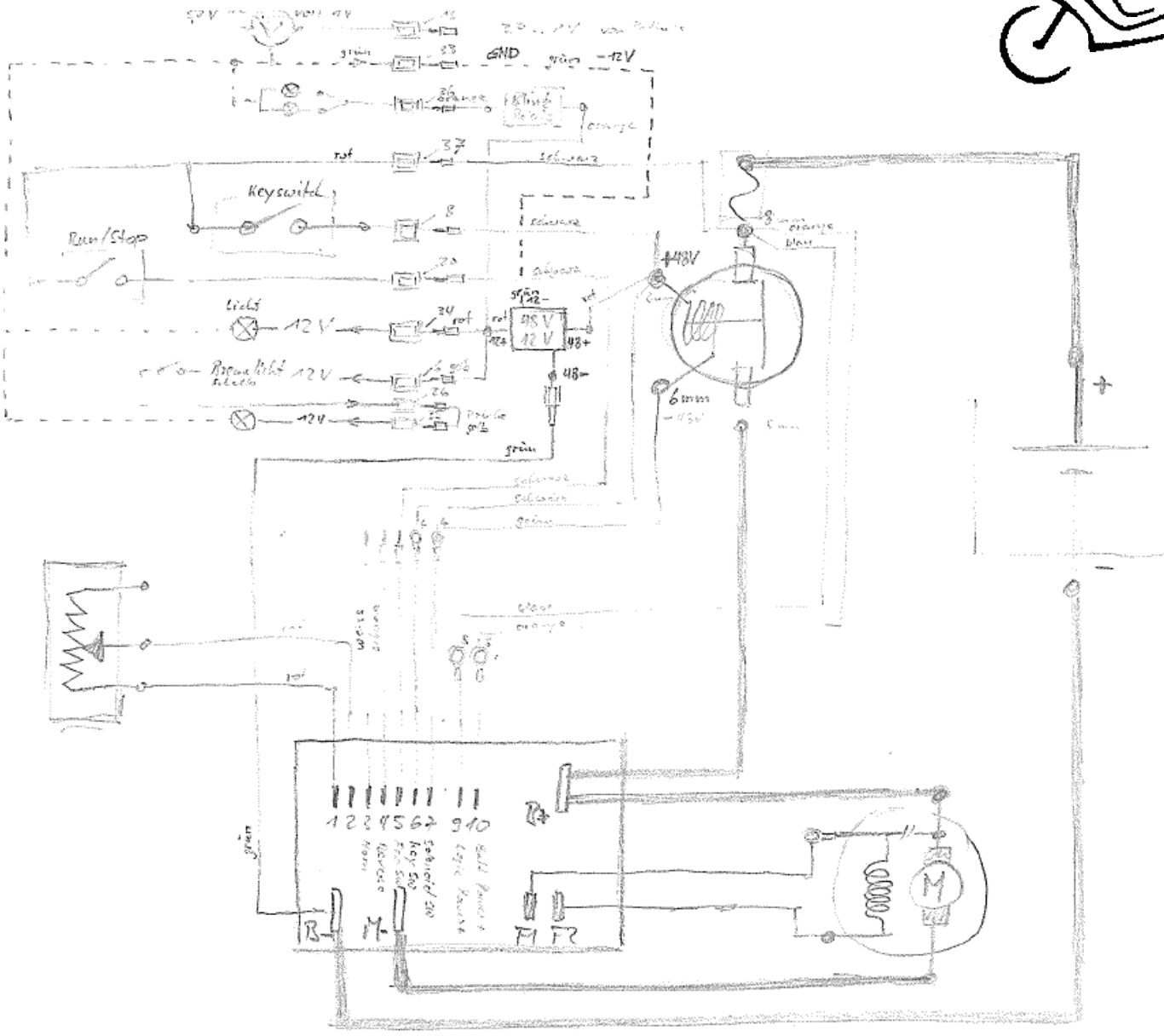







EV-conversion Peugeot Scootelec

Wiring diagram



MPA

Materials Science & Technology