CONTINUE MONITORING

DEWETRON

De wet van Ohm dynamisch toegepast bij reliability testen

Andries de Bué – Dewetron Benelux BV

Reguliere testprocedure

Test:

UUT

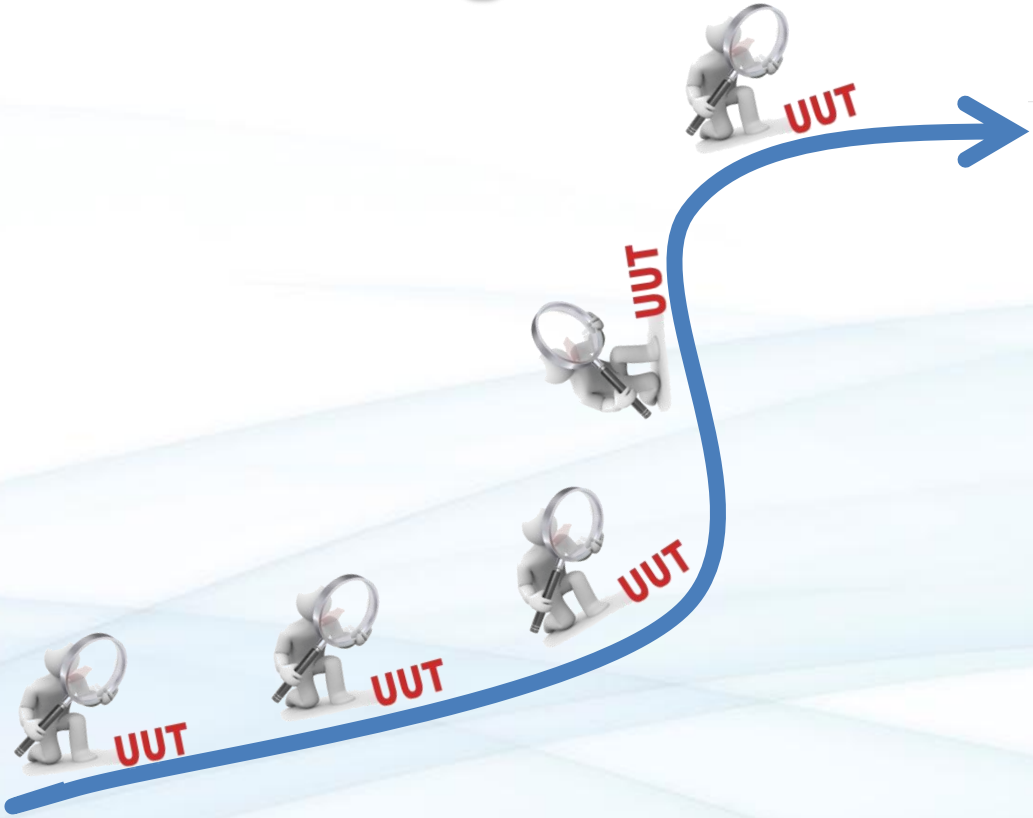
Start

Eind

UUT

Test met monitoring

Start



Eind

Functionele test UUT:

- Faalmechanisme detectie
- Prestatie monitoring
- Interventie tijdens test cyclus

Parameters

- Temp en/of vibratie stress van de kamer
- Externe stress b.v. variatie voeding
- Test procedures b.v. start/stop
- Functionele tests passend bij de UUT
- Online mathematische functies

spanning

video

druk

flow

temperatuur

dc - rms

rek

trilling

status/counters

CONTINUE Monitoring is…..

DEWETRON

- Registratie van alle beschikbare parameters
- Voldoende meetsnelheid om alle (on)verwachte faal modi vast te leggen
- Voldoende opslag capaciteit (GB's)

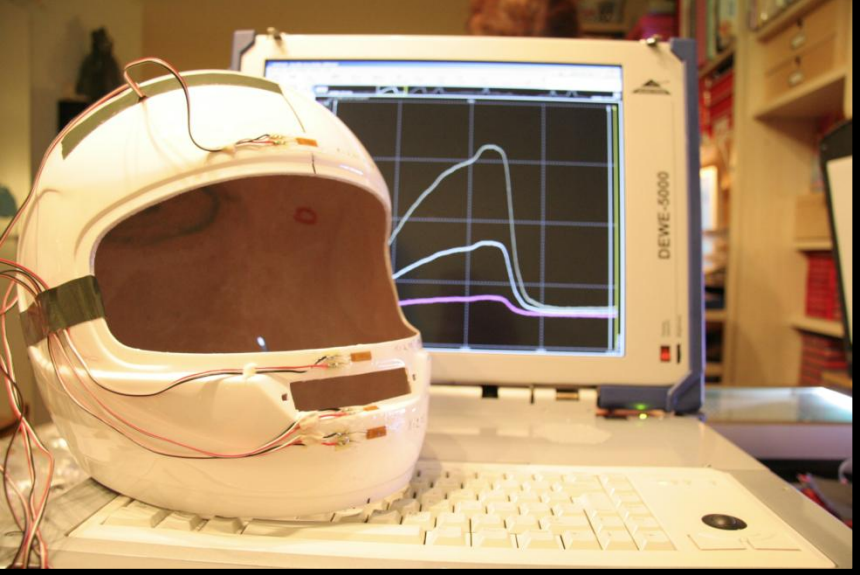
DOEL:

- Analyse van procesflow parameters
- Snelle on-line evaluatie i.v.m. correctie / hertest

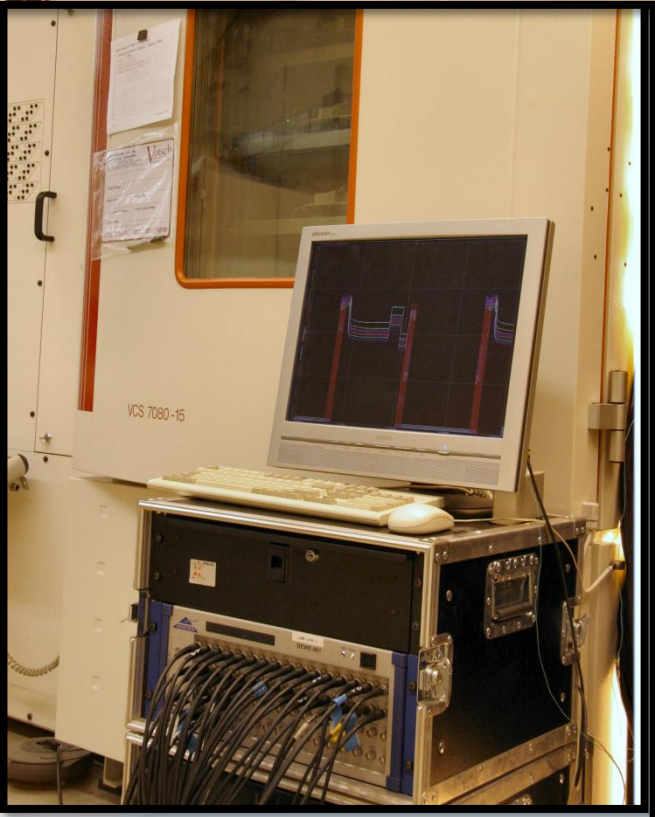
Conclusie

DEWETRON

Een meetsysteem met voldoende ingangen, snelheid en capaciteit.


DEWE-5000

DEWETRON


VCS 7080-15

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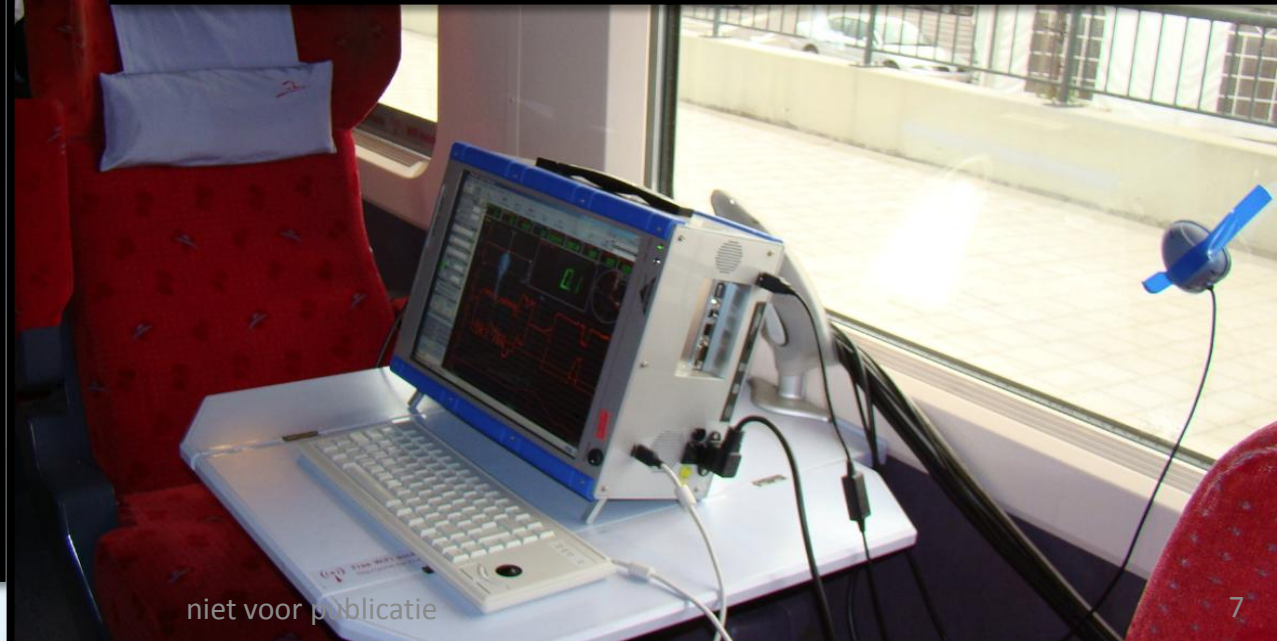


Philips Healthcare – Q-LAB

Cable re-route reliability test

DEWETRON

Applicatie # 1

- Levensduur bekabeling
- 16 kabels
- Diverse control signalen
- Video
- Testduur: 8 weken

Cable re-route reliability test

DEWETRON

Wensen

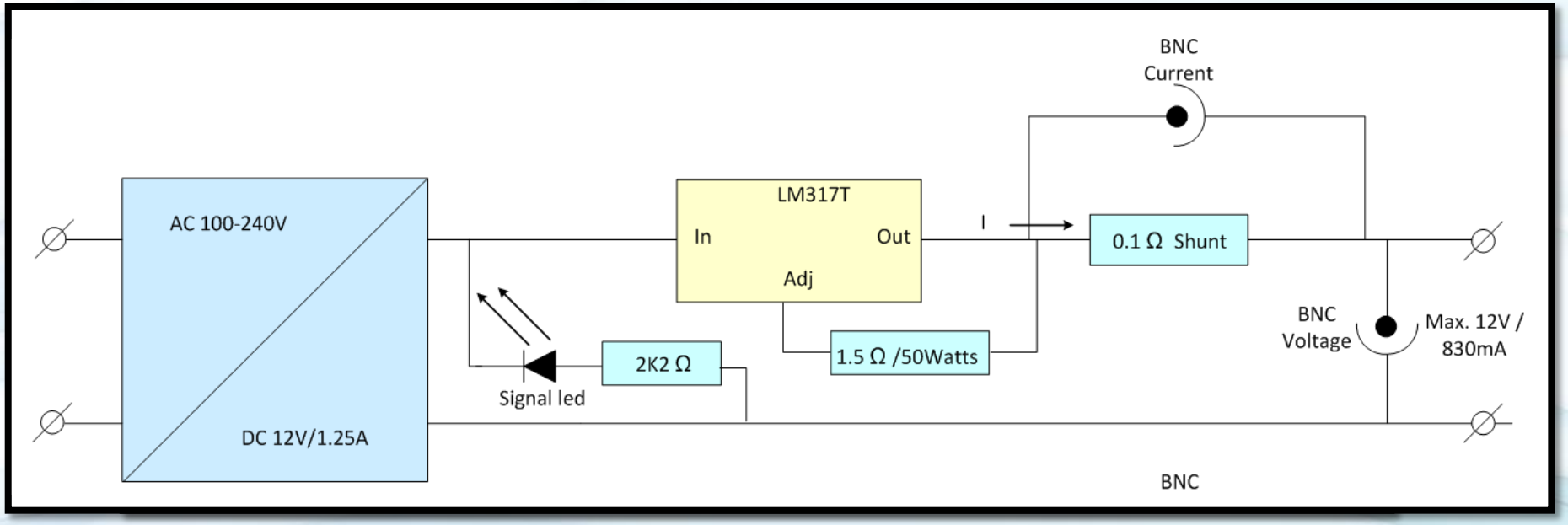
- Standaard meetinstrumentatie
- 16 tot 32 low-cost current sources
- Stabiele stroomvoorziening bij kabel onderbreking
- On-line calculatie weerstand
- Zo veel mogelijk pre-processing van data
- Hoge stabiliteit meetinstrumentatie
- Testduur: 8 weken

Cable re-route reliability test

DEWETRON

Realisatie

- **Current sources op basis van analoge LM317**
  (stabiel bij snelle open/close circuit wisseling)
- **Teststroom 1A – Meetshunt 100mΩ**

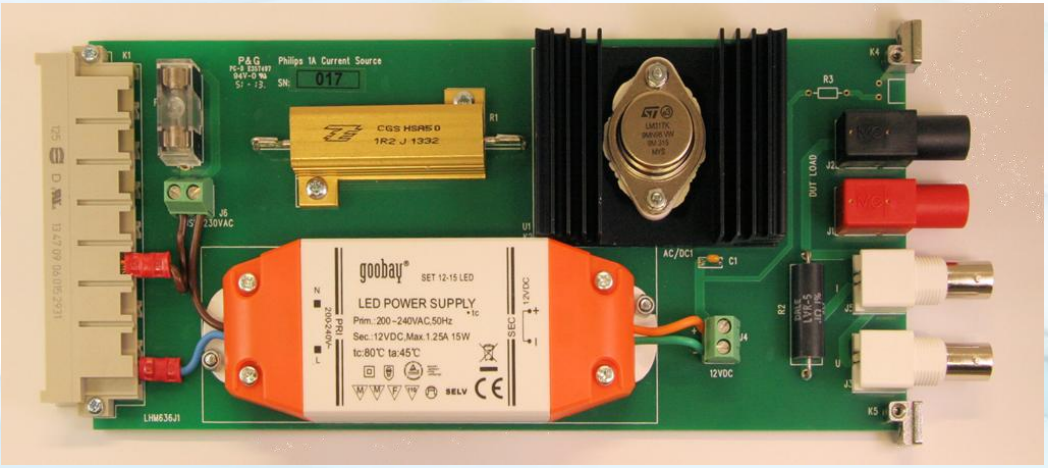


Cable re-route reliability test

DEWETRON

Aandachtspunten / tricks

- Gescheiden voeding per current source
- Lage kortsluitspanning: galvanisch gesch. ingangen
- Teststroom 800mA ipv 1A ivm temperatuur drift
- Spanningsdeler om 12V te verlagen naar 10V
- Dynamisch gedrag van kabelweerstand

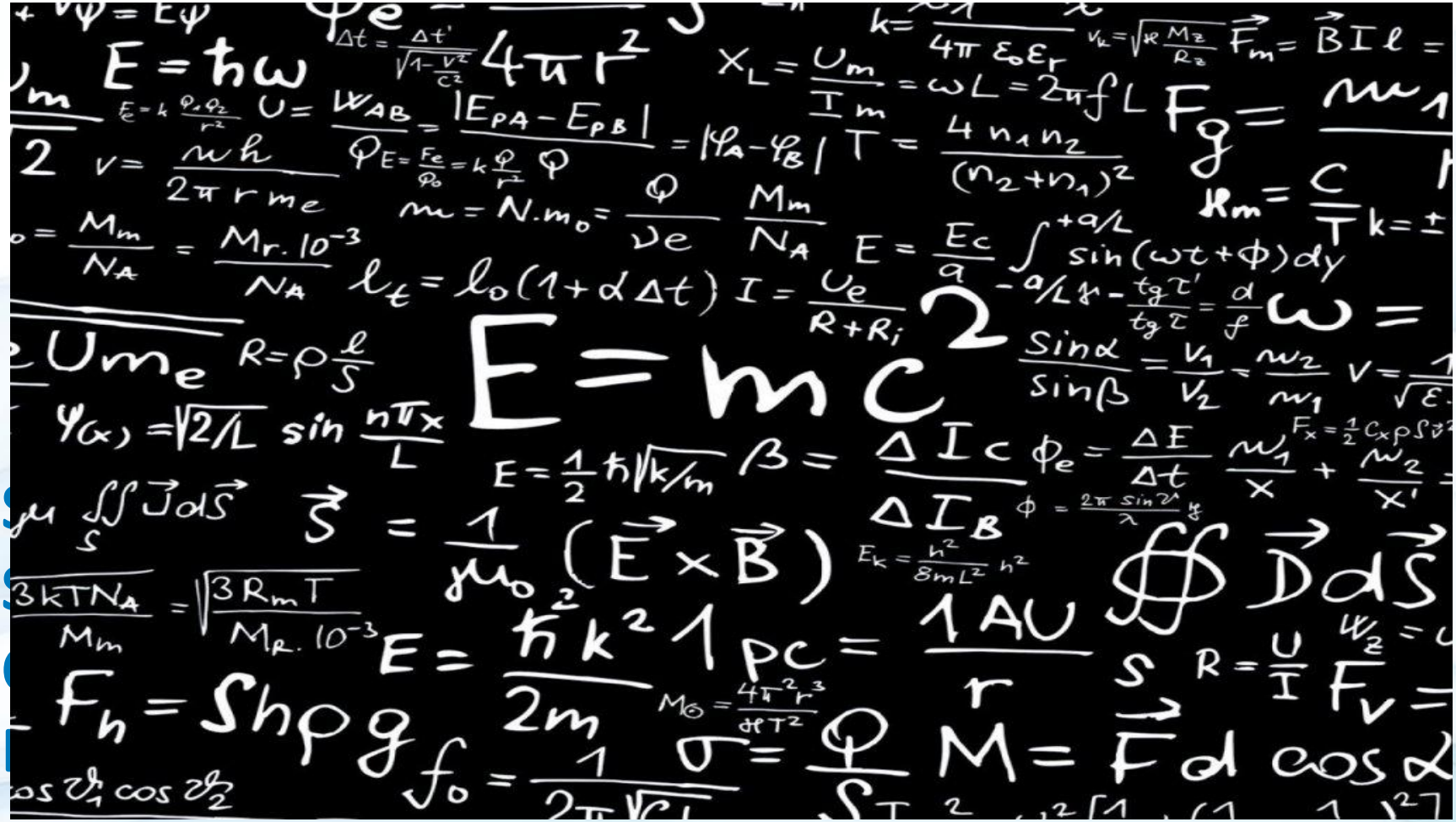


Cable re-route reliability test

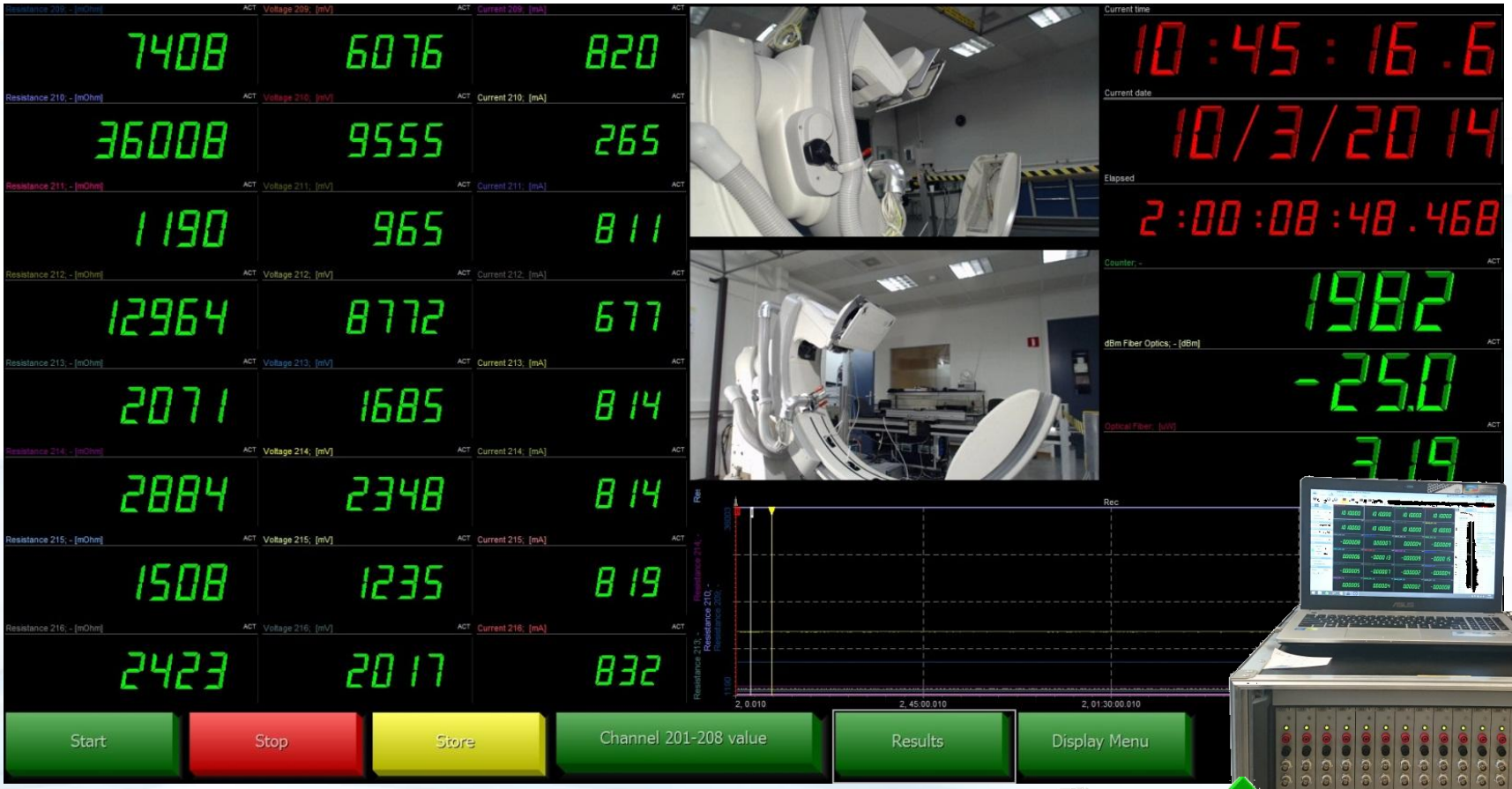
Test Setup Dewesoft DS-NET

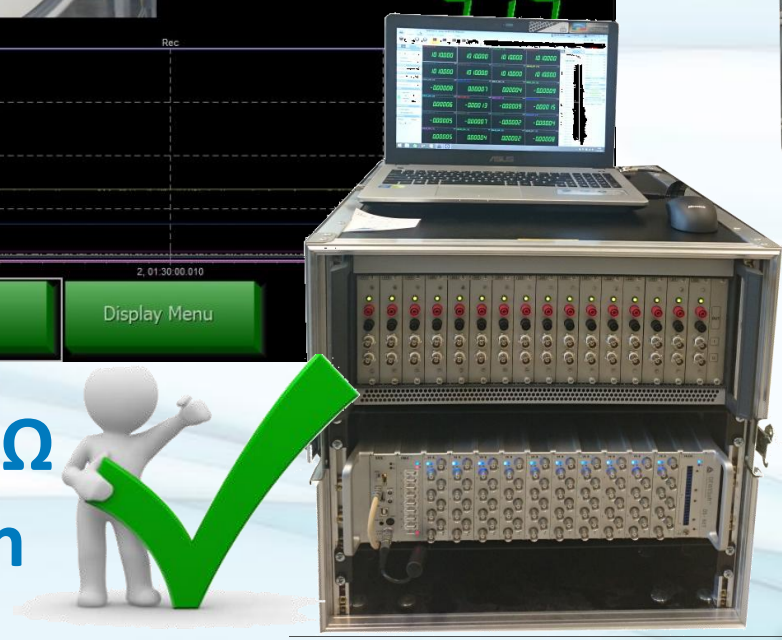
Cable re-route reliability test

On-line calculatie kabelweerstand



Cable re-route reliability test



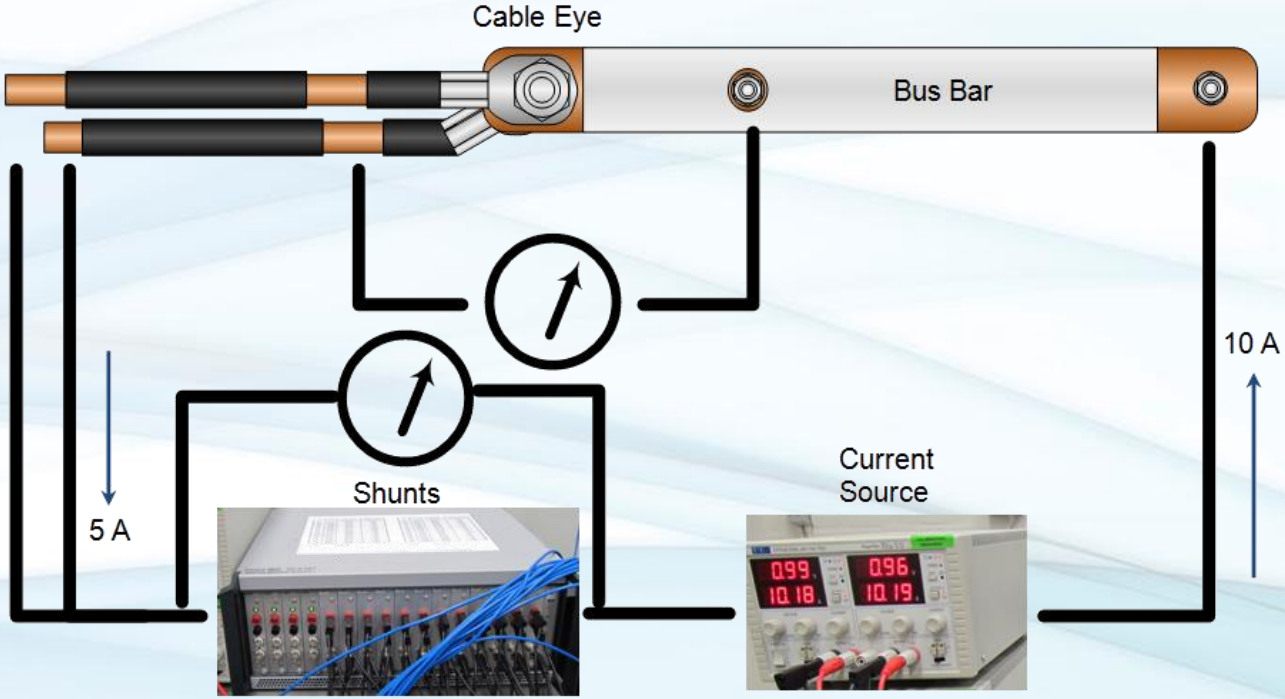


- Calculatie kabelweerstand in mΩ
- 5x levensduur getest in 8 weken

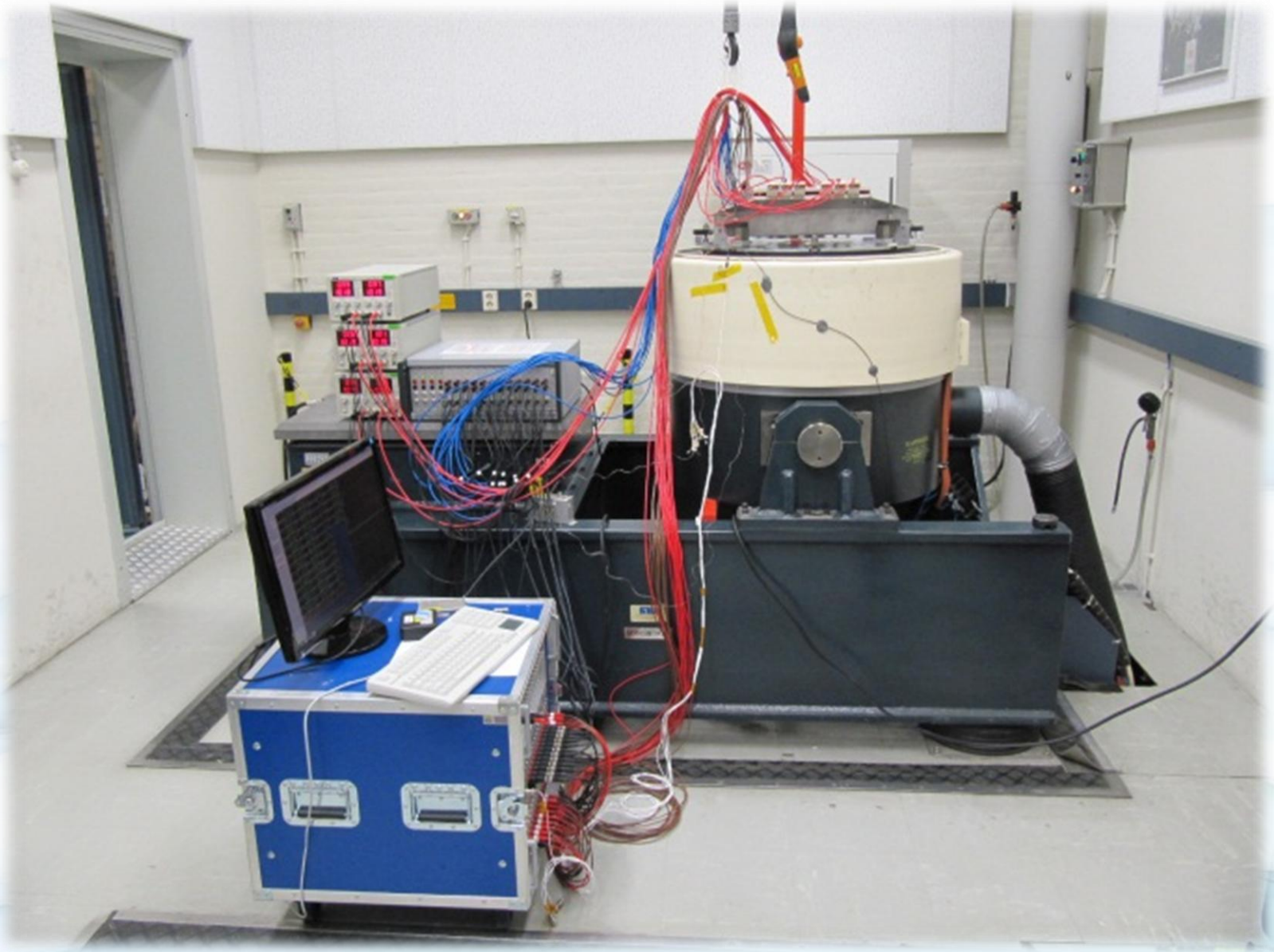
Busbar mechanical fatigue

Applicatie # 2

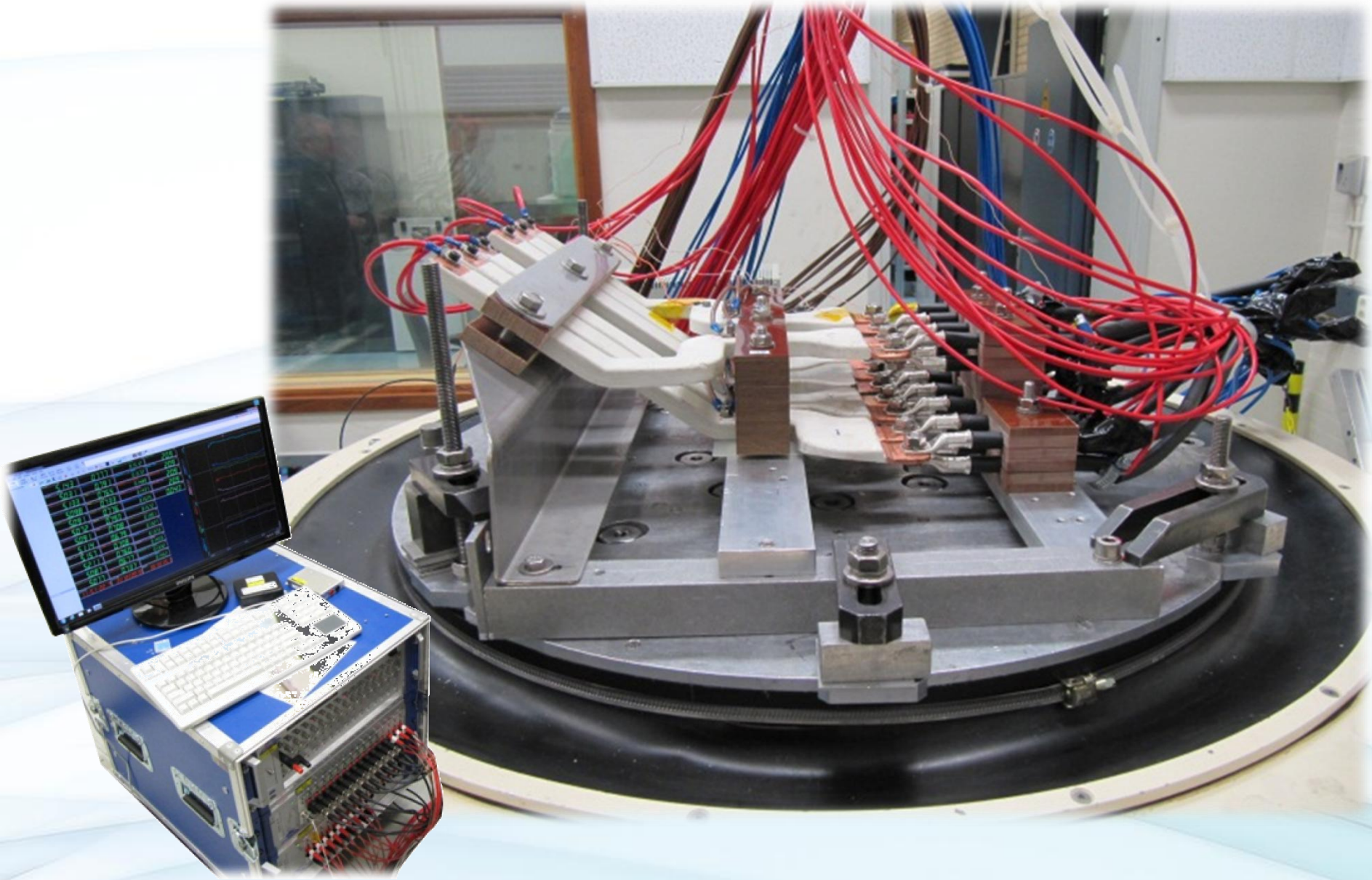
- Mechanische beproeving busbar op shaker
- 3x levensduur van 10-jaar
- Focus op overgangsweerstand / breuk



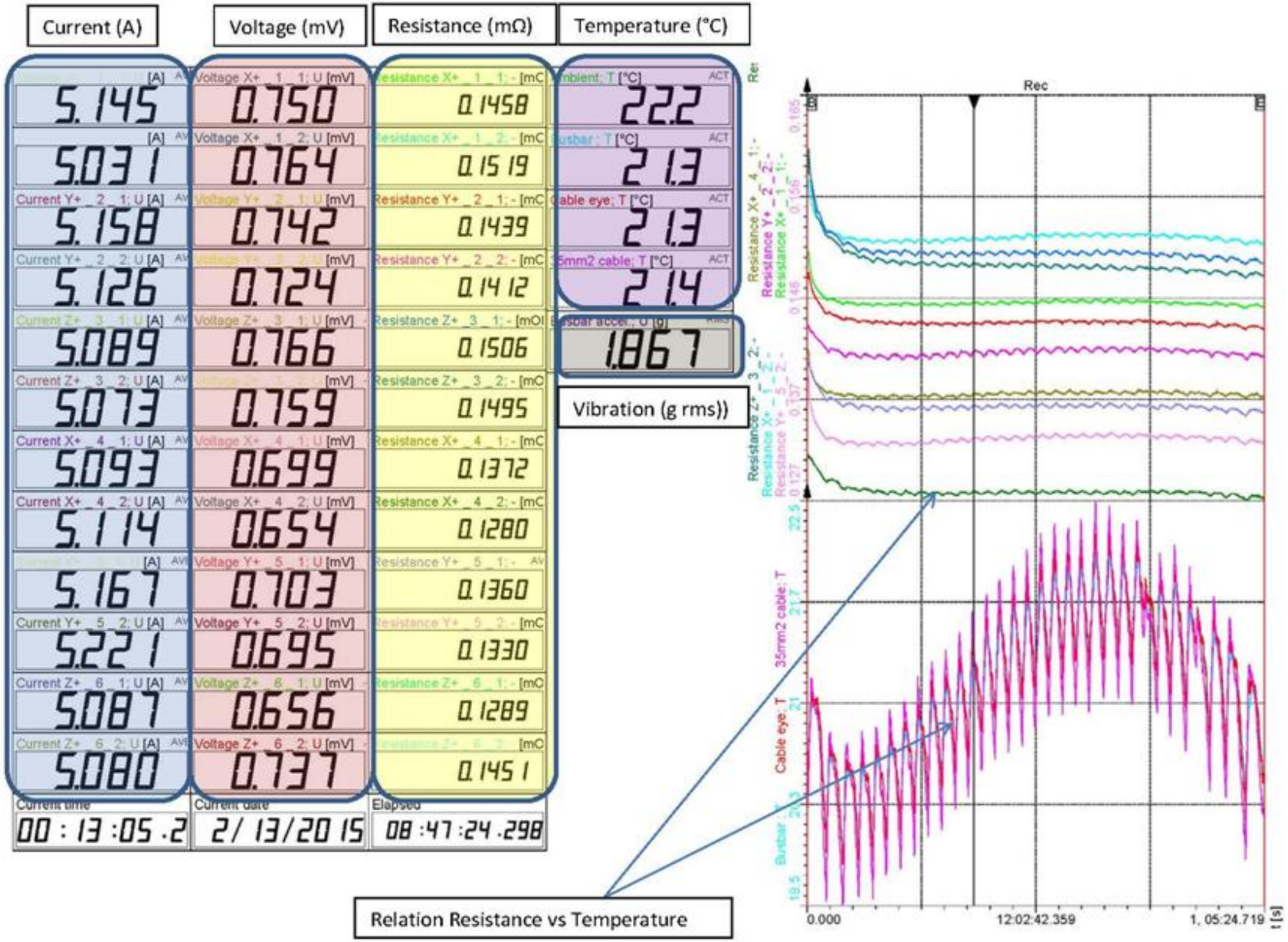
Busbar mechanical fatigue



Busbar mechanical fatigue



Busbar mechanical fatigue



Busbar mechanical fatigue

Conclusie

- Overgangsweerstand van ± 0.13 mΩ
- Na 72 uur was de verandering <10 µΩ

Foil switch reliability test

DEWETRON

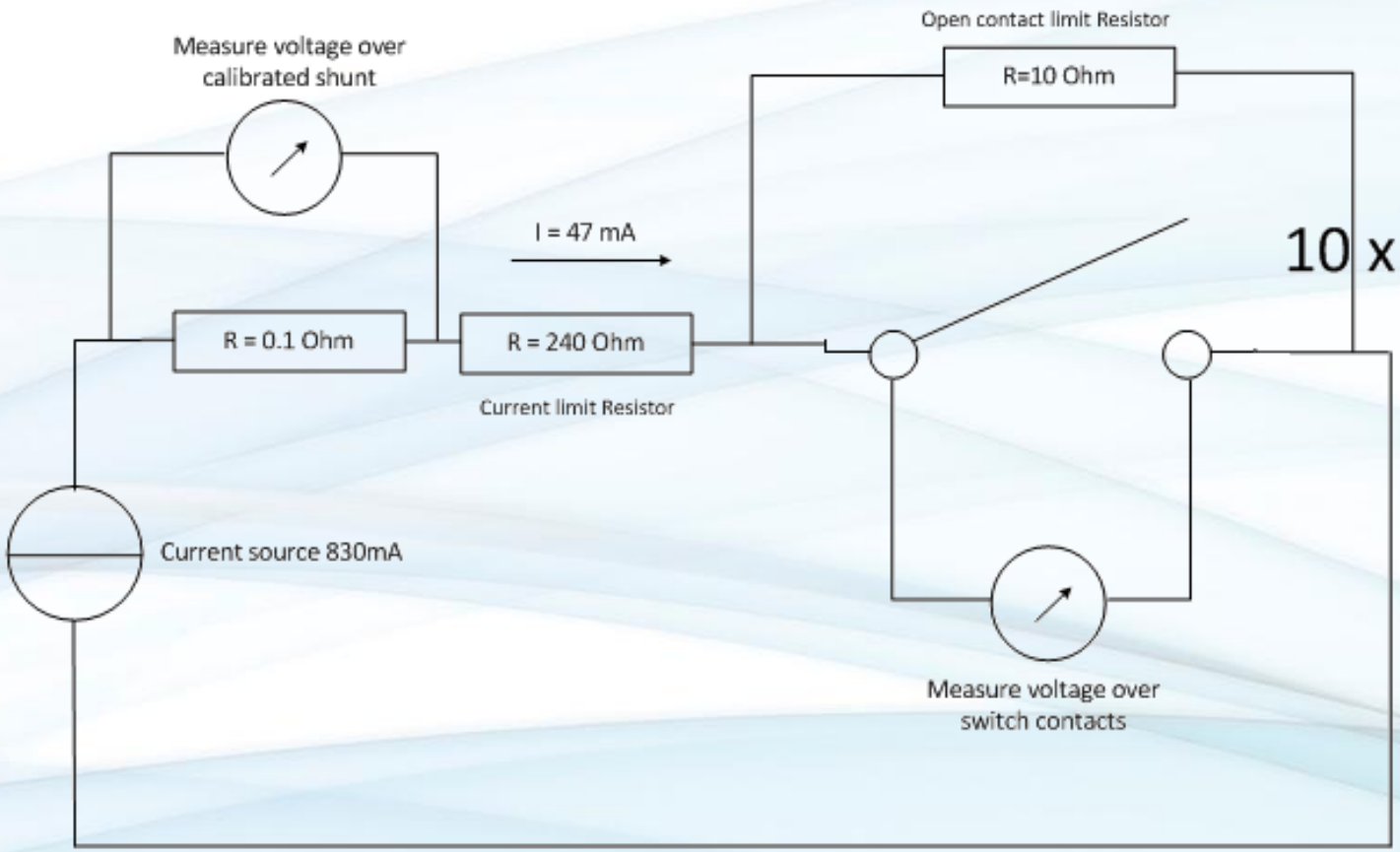
Applicatie # 3

- Mechanische beproeving switch
- 10x levensduur zonder enige fout
- Focus weerstandsverloop per 100.000 cycles

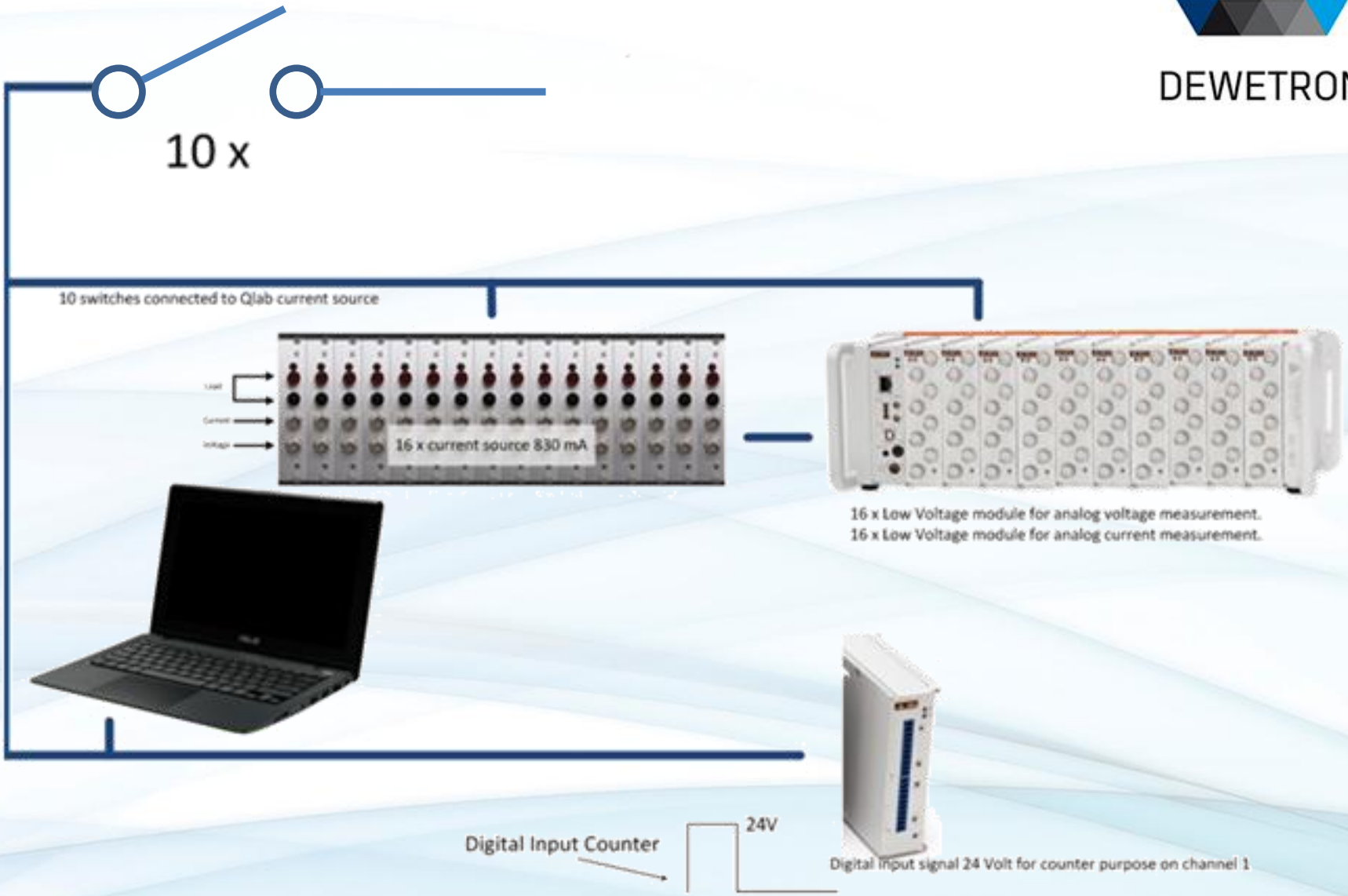
Foil switch reliability test

Applicatie # 3

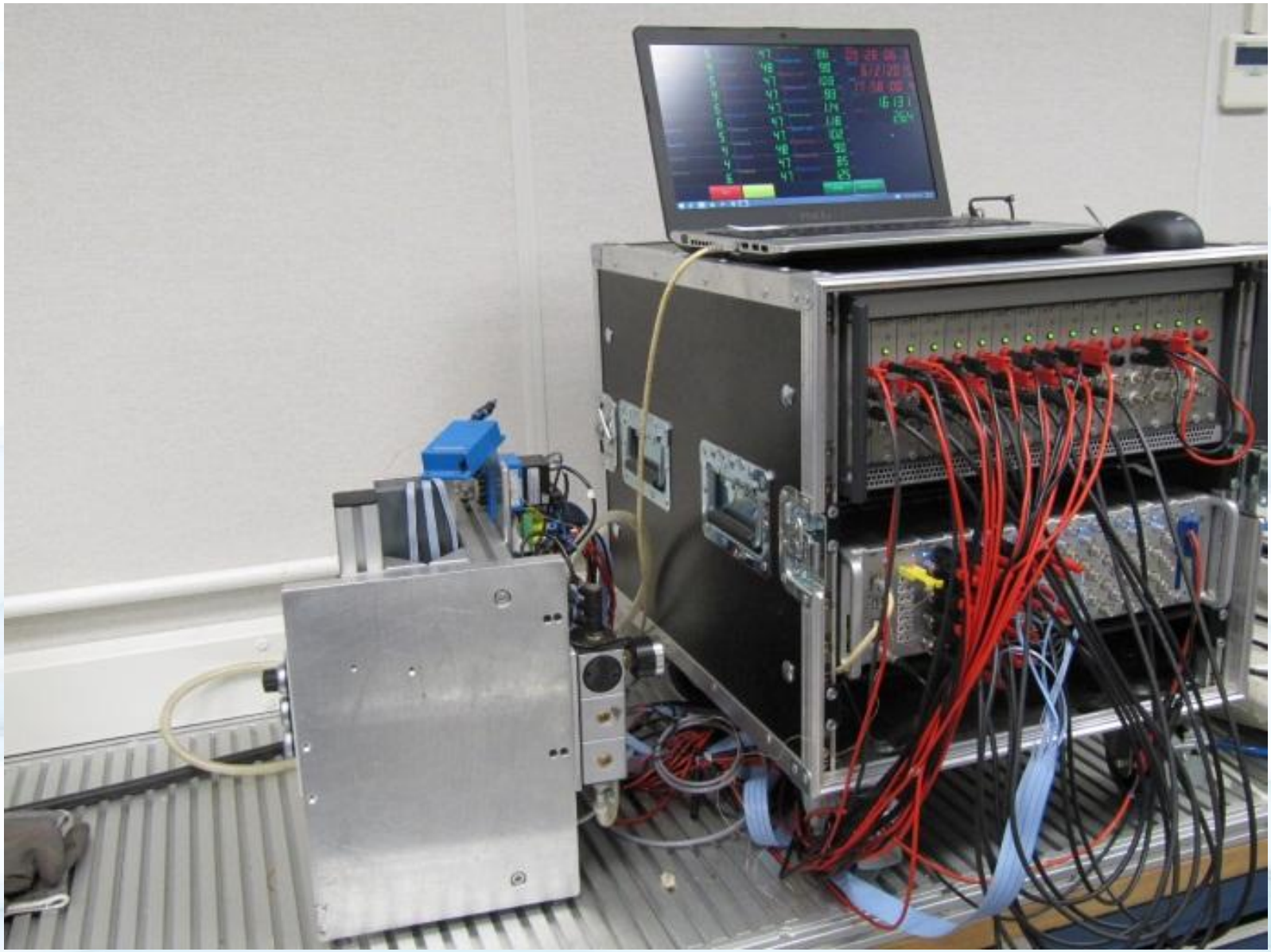
- **De wet van Ohm nog eens toegepast….**



Foil switch reliability test



Foil switch reliability test

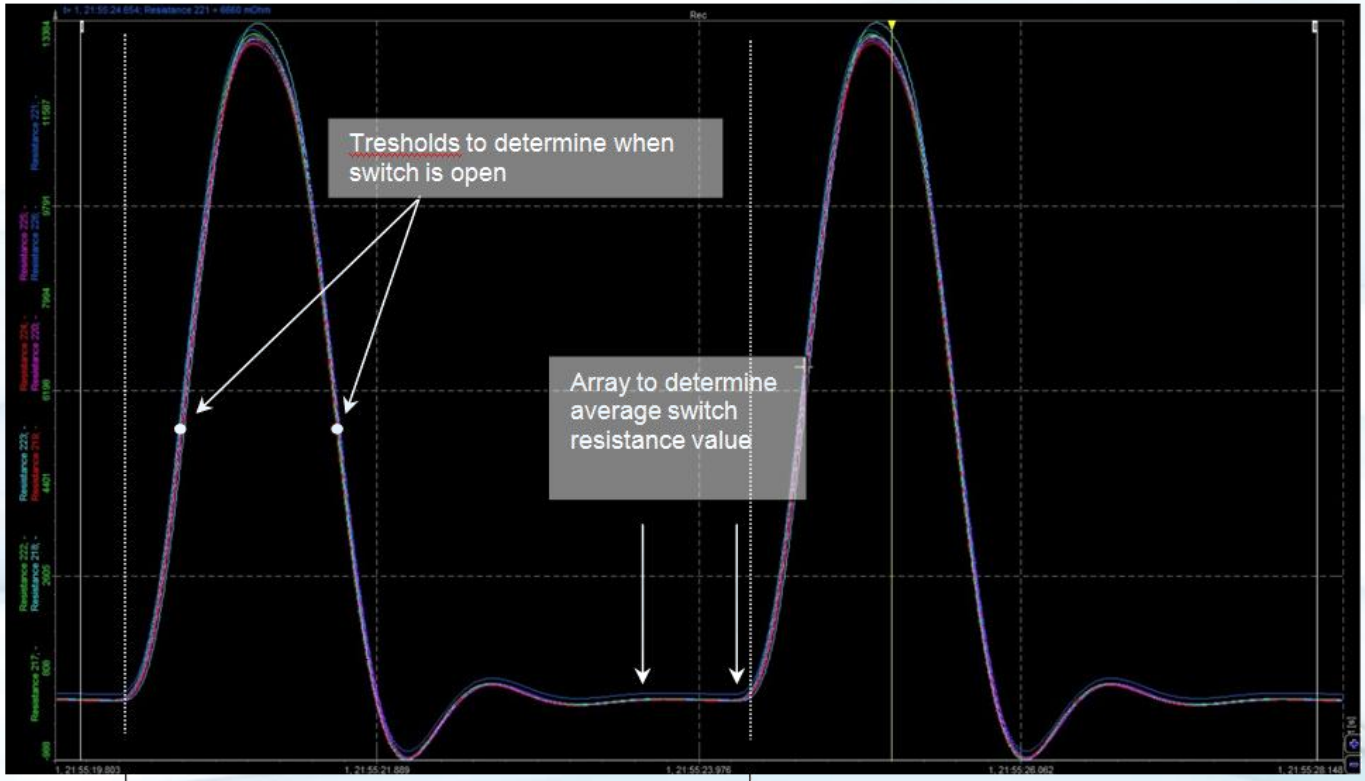


Foil switch reliability test

DEWETRON

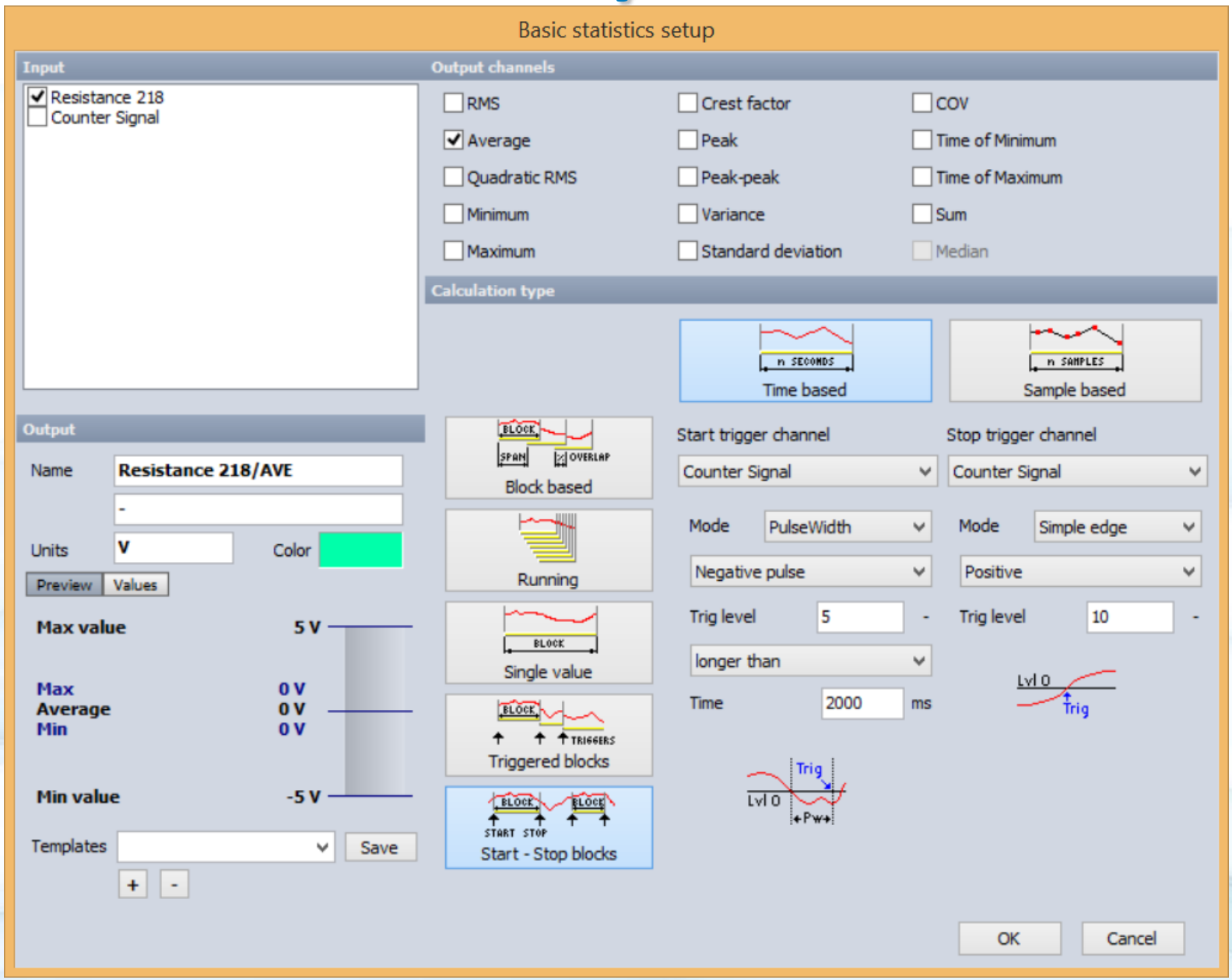
“Uitdaging”

- **Alleen weerstandsmeting tijdens CLOSE status**



1 switch cycle

Foil switch reliability test



Foil switch reliability test

DEWETRON

Interface

Foil switch reliability test

Conclusie

- 10x levensduur = 1.000.000 cycles
- Minimale degradatie in schakelweerstand

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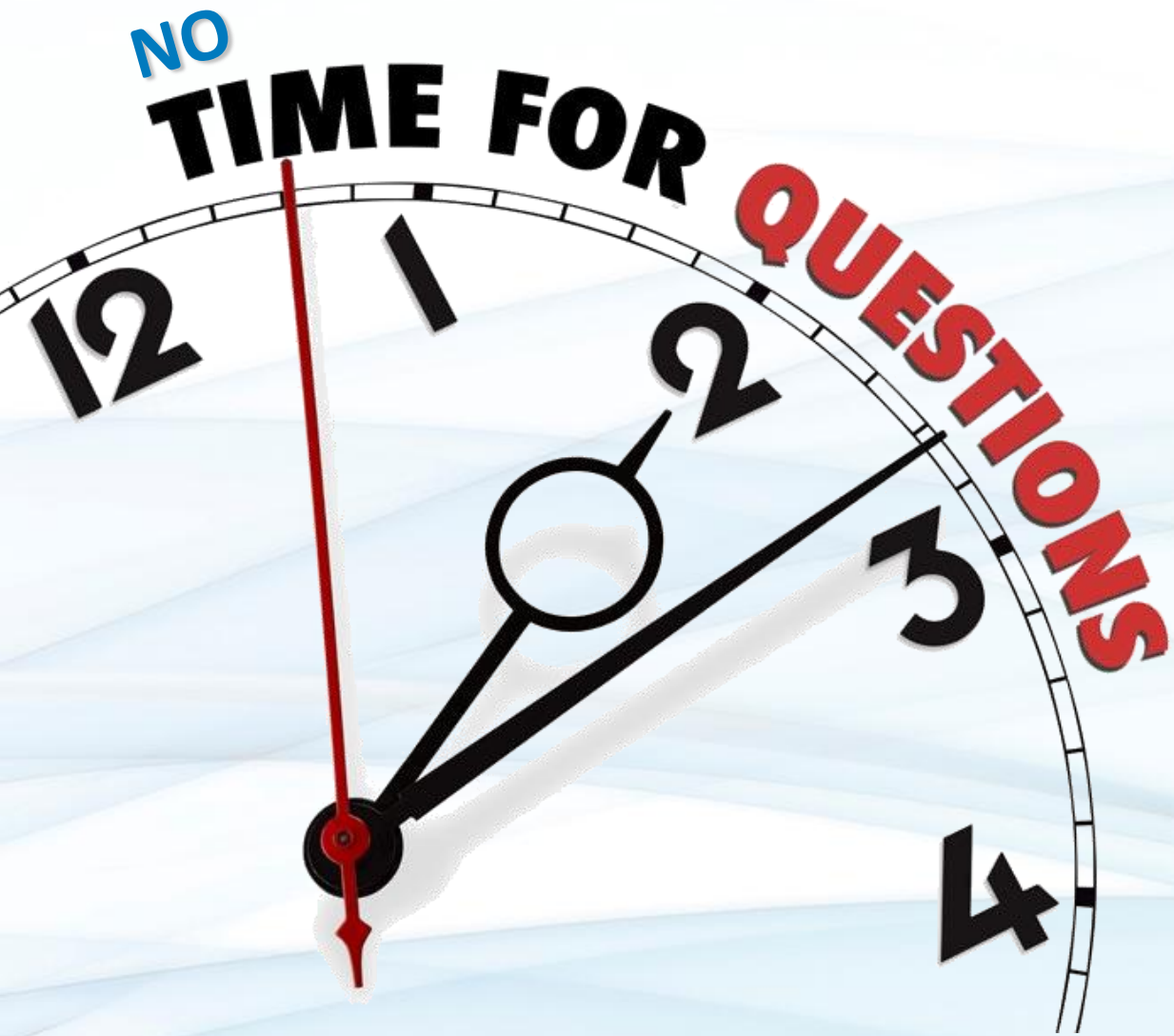

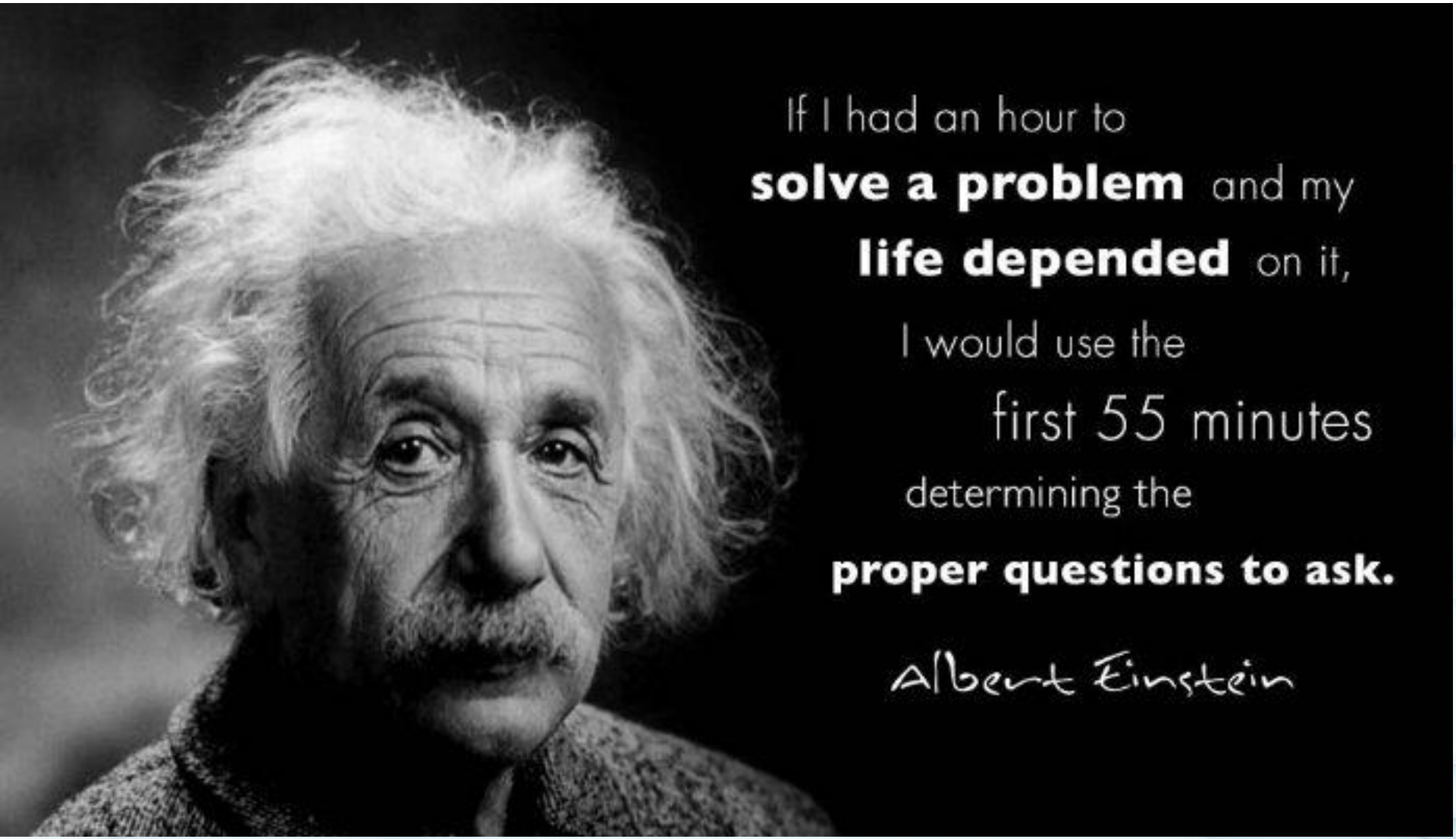
If I had an hour to
solve a problem and my
life depended on it,
I would use the
first 55 minutes
determining the
proper questions to ask.
Albert Einstein