

SUCCESS CASE 12.2026

Fault Detect

USING SMART METER DATA TO
DETECT LOOSE SCREWS AND
INSTALLATION ERRORS IN
APARTMENT METER-BANKS



THE CHALLENGE

Fluvius was confronted with several cases of over-heated and melted meter-banks.



Using the smart meter voltage data, we detect small voltage differences between meters installed in the same meter-bank. Normally they should have same voltage at same time stamp. **Physical check of a meter-bank after installation is quite labor intensive. We want to screen our meter-banks using the smart meter voltage data, and only the suspected ones are visited based on a report giving indication of the problem.**

THE SOLUTION – DETECTION & REPORT

First challenge is to cluster all the meters on the correct phase

As explained in the Fluvius success case of 2025 we developed the Piri-tool together with OGT that clusters the phases of the meters in groups by phase.

Building further on this algorithm we built the Libra-tool that analyses all the meters and finds suspicious voltage drops during the timestamps where there is sufficient load – current flowing. (Piri-tool & Libra-tool – commercialised by OGT Technologies)

			difference	Legende
Maximale spreiding V binnen 1 fase [V]			0 - 0.3 V	
max V diff L1 max V diff L2 max V diff L3			0.3 - 0.6 V	
0,69	0,55	0,62	≥ 0.6 V	

On phase 1 two highly suspected meters with lose contacts are detected and one on phase 3

Meter ID	zekerheid	L1			L2			L3		
		klem	Vgem	diff Vref	klem	Vgem	diff Vref	klem	Vgem	diff Vref
1SAG3100744593	Hoog	kl1	230,08	0	kl4	231,06	0	kl7	230,69	0
1SAG1100765740	Hoog		229,6	0,49						
1SAG1100765470	Hoog		229,54	0,54						
1SAG1100765743	Hoog		229,5	0,59						
1SAG1100766484	Hoog		229,49	0,6						
1SAG1100765746	Hoog		229,39	0,69						
1SAG1100765732	Hoog					230,77	0,29			
1SAG1100765787	Laag					230,7	0,36			
1SAG1100765779	Hoog					230,68	0,38			
1SAG1100765728	Hoog					230,51	0,55			
1SAG1100766502	Hoog								230,16	0,45
1SAG1100765733	Hoog								229,99	0,62

For more information about the project, please contact:

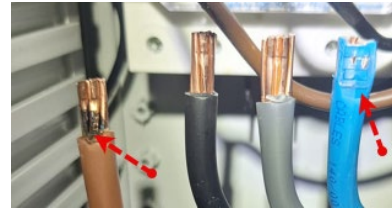
BRUNO.MACHARIS@FLUVIUS.BE - KOEN.VANTHOURNOUT@ORION.BE

THE SOLUTION – VALIDATION IN THE FIELD

Second challenge was to optimise and validate the algorithm in the field.

The tool was run on a large set of meter-banks.
Up to 5% of the meter banks returned suspicious voltage drops

40 meter-banks with suspicious contacts were visited and opened for inspection
In almost every case we found loose contacts.
We also find installation mistakes (insulation)



At this moment it is still unclear if these are installation faults or if the contacts become more loose over time due to vibrations or heating-cold cycle. This is still under investigation.

At this moment we are scaling up the screening of meter-banks. Fluvius has about 100 000 meter-banks and all will be screened using the Libra –tool. As a preventative action we plan to screen newly installed meter-banks after 3-months and again 1 year after installation. This is however not yet implemented. Based on our findings, also manufacturing- and testing at installation process were reviewed and altered to have a better-quality check of all screwed contacts.

MAIN ACHIEVEMENTS

Overall, this solution has helped Fluvius increasing efficiency and effectiveness when it comes to detecting faults:

- A very labour-intensive inspection task for a technician was simplified using the digital meter data and a detection algorithm. Only 5% of the meter-banks need inspection.
- The report clearly indicates the meters of joints to inspect for loose contacts
- Fluvius technicians are very positive about this solution
- To run a case takes only 2 days (1. getting the meter data – 2. running the algorithms & report)

KEY SUCCESS FACTORS

The following have been identified as key success factors for this approach on fault detection:

- Collaboration between Fluvius and OGT using real cases
- Testing and validation by more than 20 real field case of Fluvius
- The validation in the field with real cases and feedback from technicians.
- The visualisation of the problem in an easy-to-read A4 report for the technicians.

WAY FORWARD

- In 2026 - 2028 Fluvius will be screening its meter-banks on loose contacts
- An automatic screening 3-months after installation, and again 1 year after installation is currently explored as a project proposal.