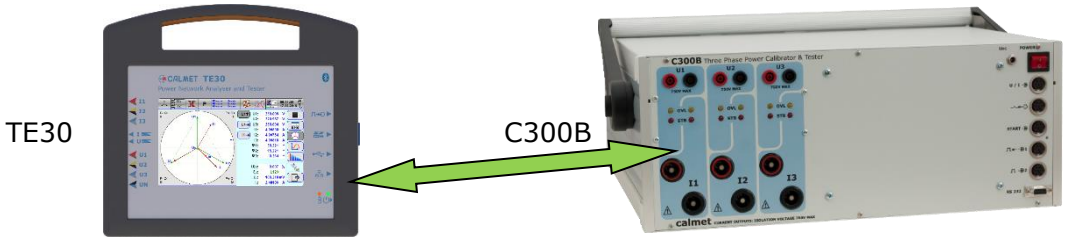
Calmet C300B 3-Phase Power Calibrator as a Power Quality events generator

Application Note No 34

Calmet C300B 3-phase power calibrator can be used as an event generator when testing Power Quality analyzers. Below are examples of events together with diagrams and oscillograms.

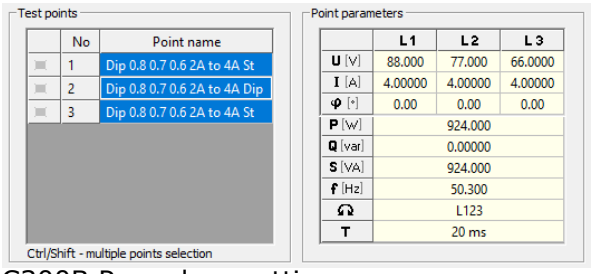
The picture below illustrates the connection between the C300B 3-phase calibrator and the TE30 power quality analyzer. The results generated by the C300B are recorded by the TE30.



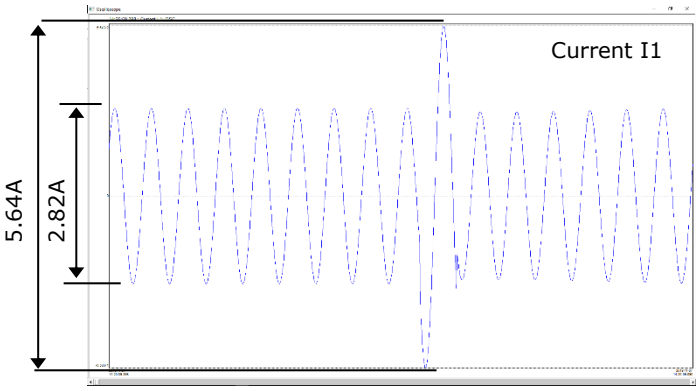
Tests are performed for PU (nominal value) 110V and 50Hz.

Test 1a: One single cycle dip

V1 dip to 0.8 PU, V2 dip to 0.7 PU, V3 dip to 0.6 PU; while all currents swell from 2A to 4A.

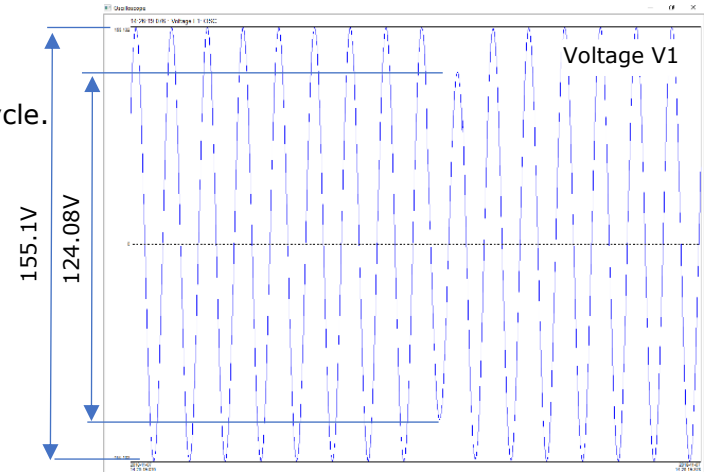


C300B Procedure settings



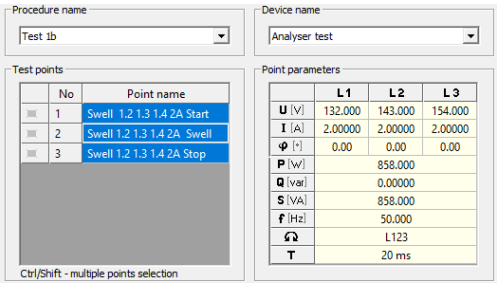
The picture on the right shows the voltage dip to 0.8PU caused by changing the current from 2A to 4 A RMS over one cycle.

Similarly, changes are generated for phases L2 and L3.



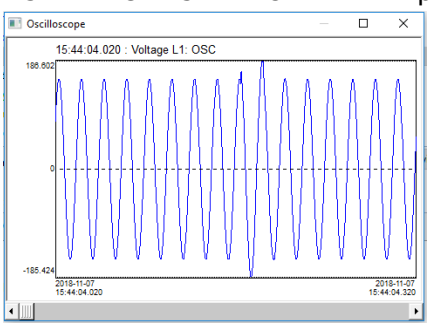
Test 1b: Single cycle swell

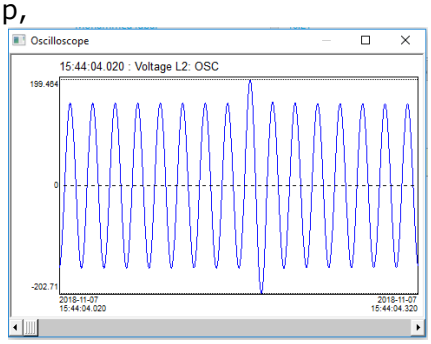
V1 swell to 1.2 PU, V2 swell to 1.3 PU, V3 swell to 1.4 PU

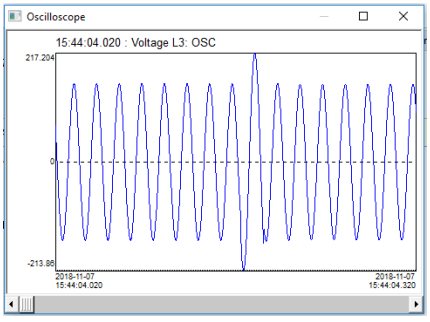


C300B Procedure settings

Recorded results for swell V1=1.2PU=132Vrms=186.12Vp-p, V2=1.3PU=143Vrms=201.63Vp-p, V3=1.4PU=154Vrms=217.14Vp-p,

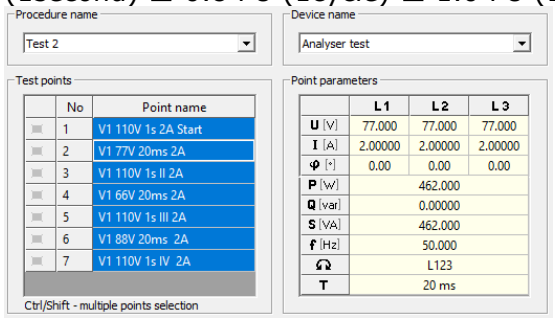




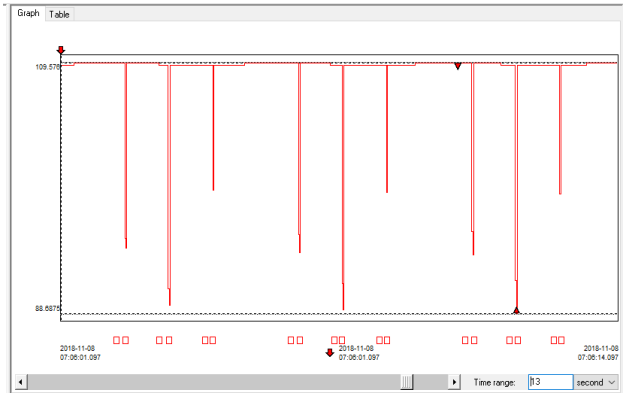


Test 2: 3 consecutive dips on one phase (V1) with interval

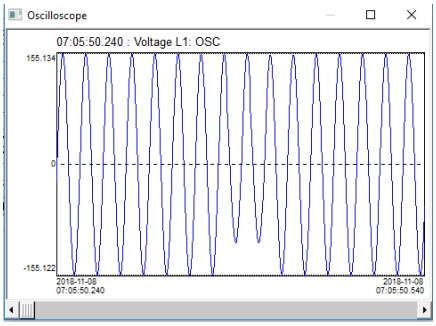
V1 ☐ 1.0 PU (1second) ☐ 0.7 PU (1cycle) ☐ 1.0 PU (1second) ☐ 0.6 PU (1cycle) ☐ 1.0 PU (1second) ☐ 0.8 PU (1cycle) ☐ 1.0 PU (1second)

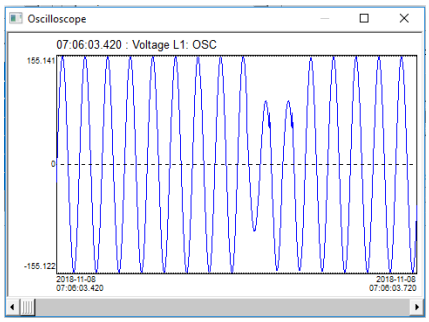


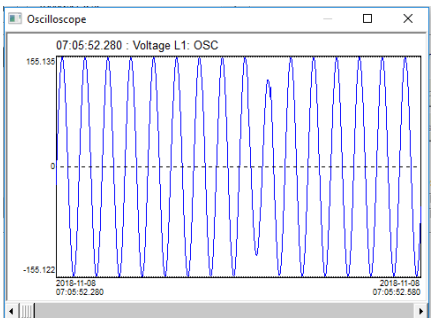
C300B Procedure settings



Auto repeated events V1 0.7, 0.6 and 0.8 PU.



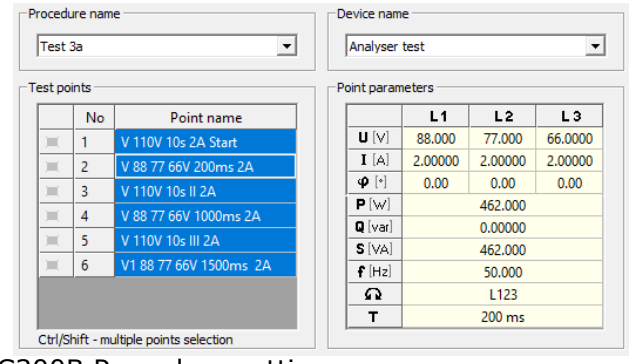




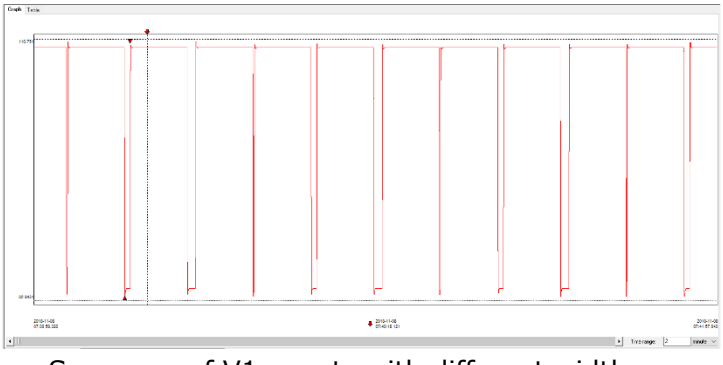
Oscillograms of events.

Test 3a: 3-phase voltage dip (V1 – 0.8 PU, V2 – 0.7 PU, V3 – 0.6 PU)

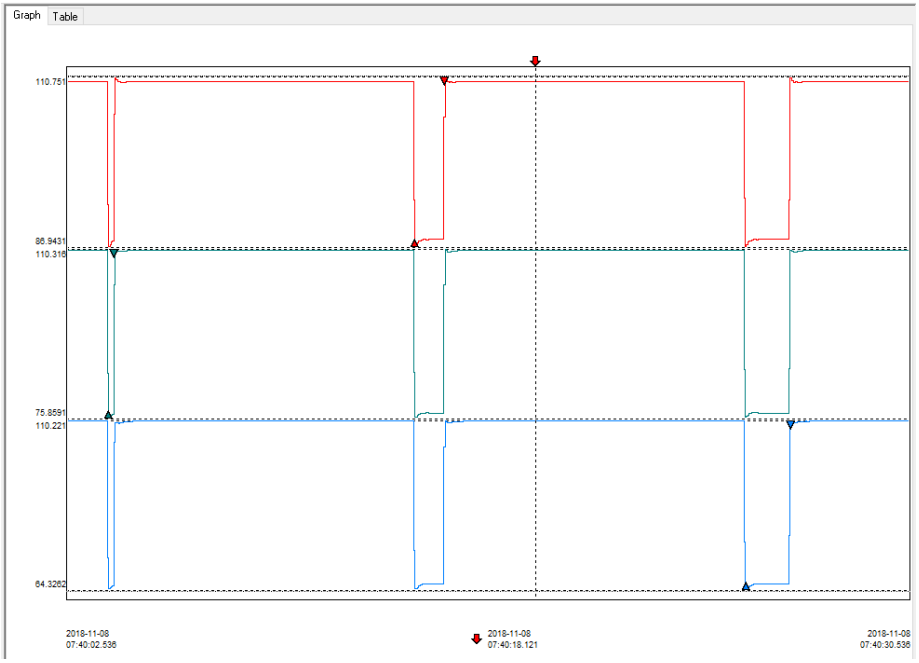
Duration: (V1 dip to 0.8 PU, V2 dip to 0.7 PU, V3 dip to 0.6 PU) for 10 cycles ☐ 1.0 PU 10seconds ☐ (V1 dip to 0.8 PU, V2 dip to 0.7 PU, V3 dip to 0.6 PU) for 50cycles ☐ 1.0 PU 10seconds ☐ (V1 dip to 0.8 PU, V2 dip to 0.7 PU, V3 dip to 0.6 PU) for 75 cycles



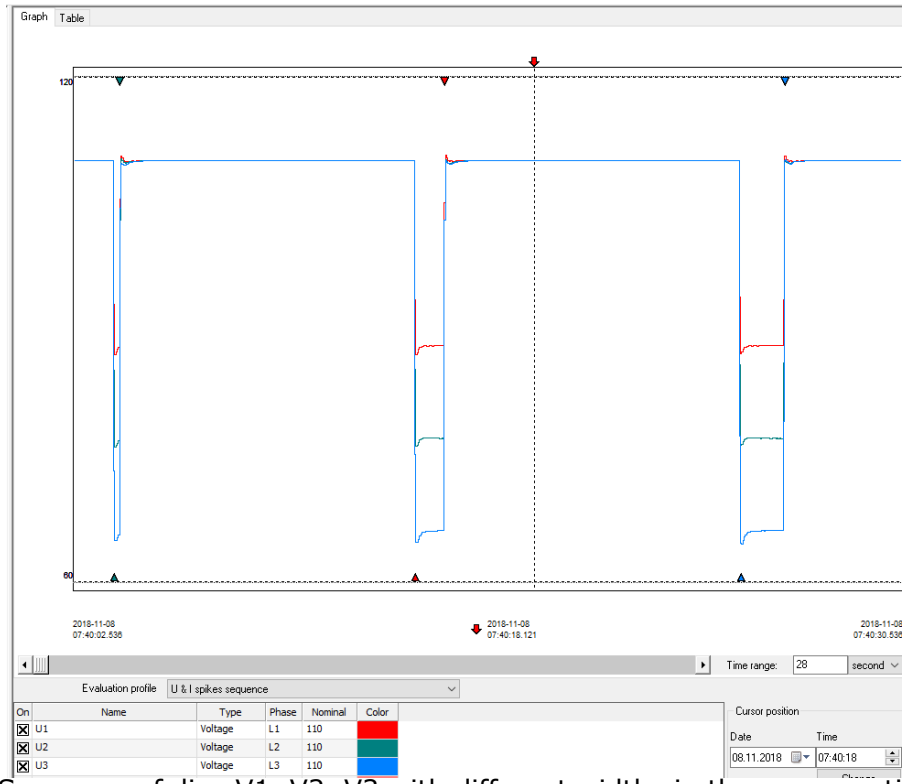
C300B Procedure settings



Sequence of V1 events with different widths



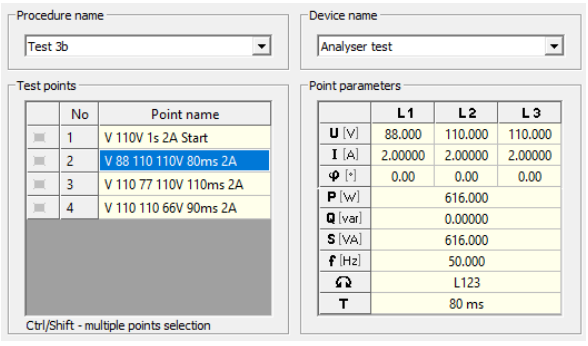
Sequence of dips V1, V2, V3 with different widths



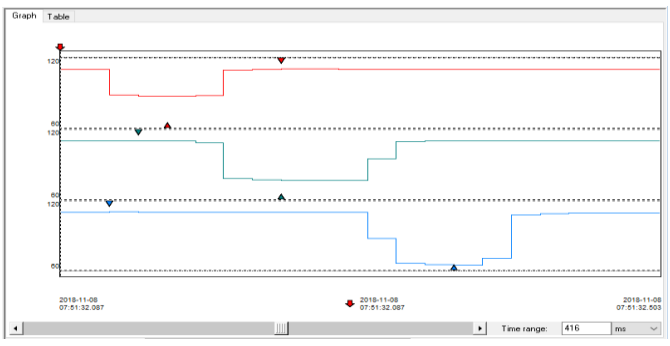
Sequence of dips V1, V2, V3 with different widths in the same vertical scale

Test 3b: 3-phase voltage dip (V1 – 0.8 PU (80ms), V2 – 0.7 PU (110ms), V3 – 0.6 PU (90ms))

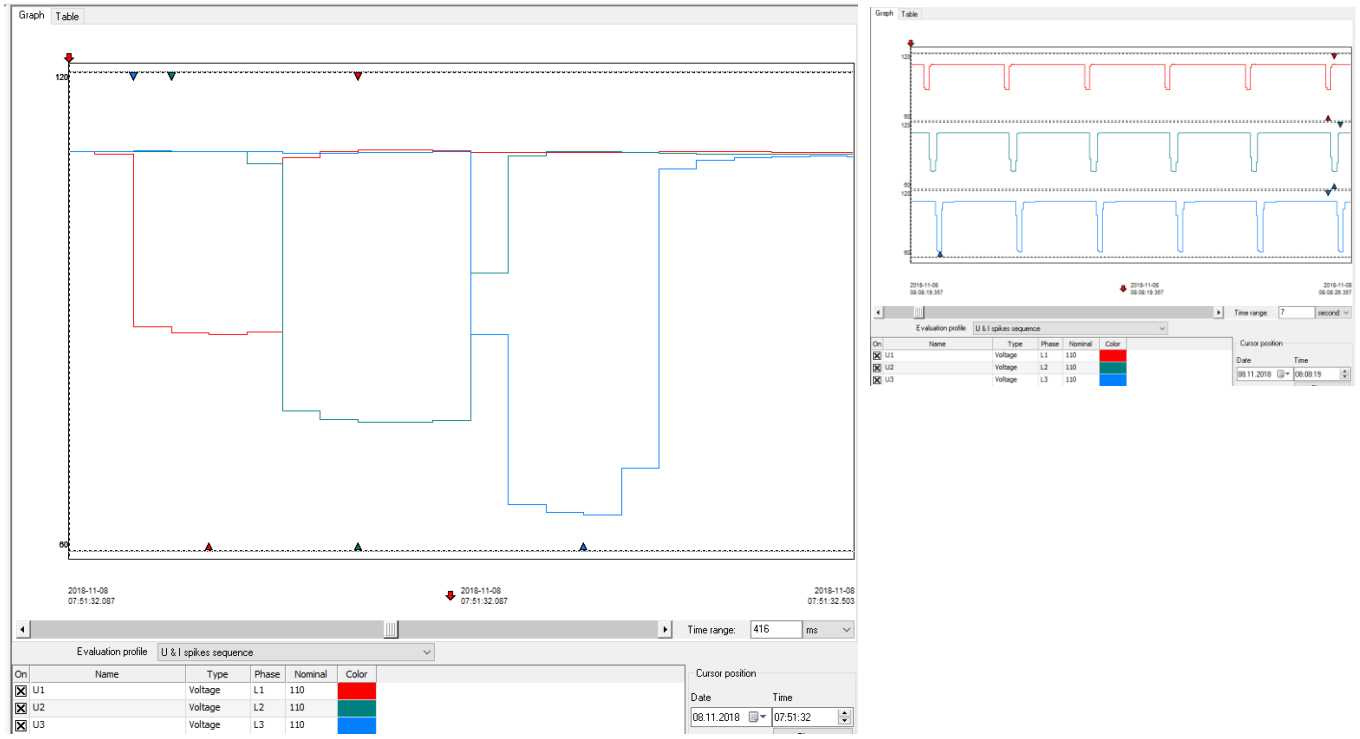
Duration: V1 dip to 0.8 PU for 80ms (4 cycle) (V2, V3 at 1.0 PU) ☐ V1 back to 1.0 PU, V2 dip to 0.7 PU for 110ms (V1, V3 at 1.0 PU) ☐ V2 back to 1.0 PU, V3 dip to 0.6 PU for 90ms (V1, V2 at 1.0 PU)



C300B Procedure settings



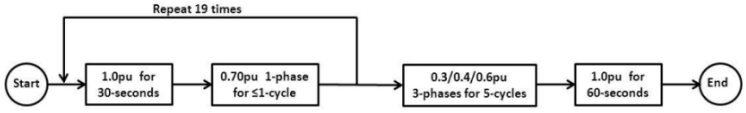
A sequence of events for the RMS value



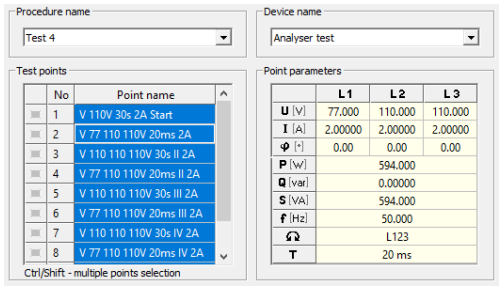
A sequence of events for the RMS value on the same vertical scale

Test 4: Event storm (Interval 5 mins)

[1.0 PU (10sec) ☐ V1 dip to 0.7 PU (1cycle) x repeat 19 times] ☐ [(V1 dip to 0.8 PU, V2 dip to 0.7 PU, V3 dip to 0.6 PU) for 5 cycle] ☐ 1.0 PU (60sec)

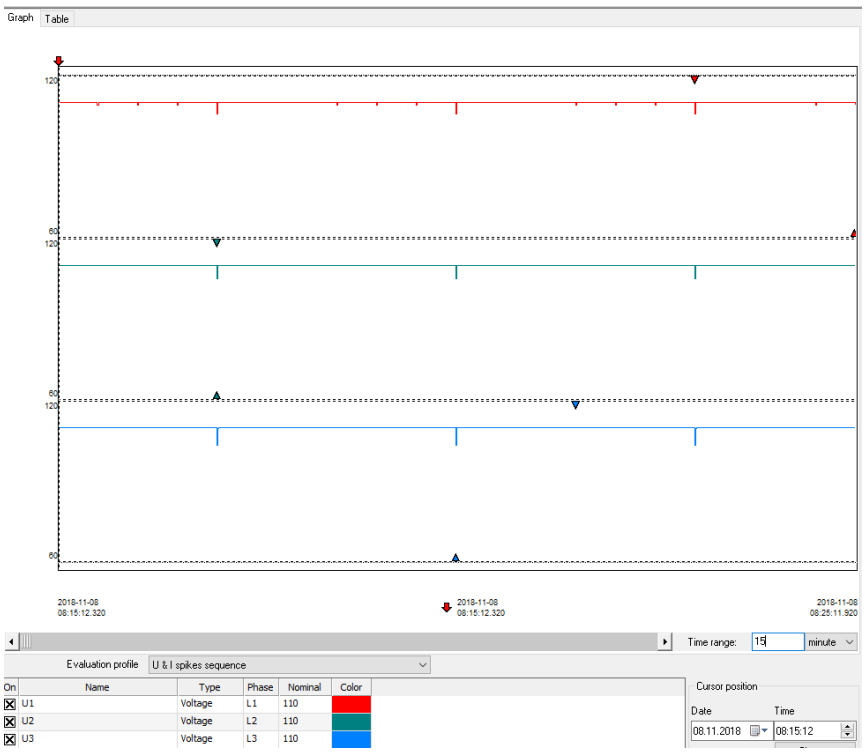


Test made for 3 repetitions (instead of 19, which can also be done, but the test will be longer) and final 0.8, 0.7, 0.6 PU values.



C300B Procedure settings

The right side picture shows the sequence of events in V1 and final dip for all three (V1, V2, V3).



Calmet sp. z o.o.
Kukulcza 18, 65-472 Zielona Gora, Poland Phone +48 68 324 04 56
E-mail: mail@calmet.com.pl Fax +48 68 324 04 57