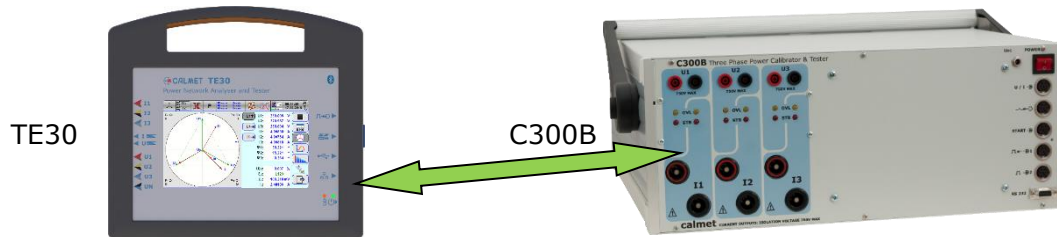


Calmet C300B 3-phase power calibrator can be used as an event generator when testing Power Quality analyzers. Below are examples of events together with diagrams and oscillograms.

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.



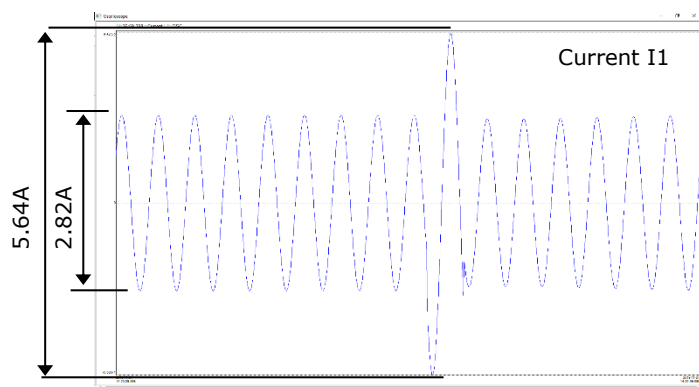
Tests are performed for PU (nominal value) 110V and 50Hz.

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.

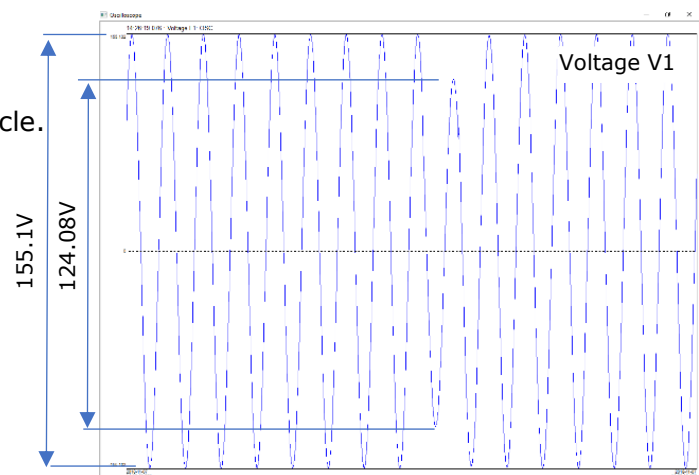
Test points		Point parameters			
No	Point name	L1	L2	L3	
1	Dip 0.8 0.7 0.6 2A to 4A St	U [V]	88.000	77.000	66.0000
2	Dip 0.8 0.7 0.6 2A to 4A Dip	I [A]	4.00000	4.00000	4.00000
3	Dip 0.8 0.7 0.6 2A to 4A St	ϕ [°]	0.00	0.00	0.00
		P [W]	924.000		
		Q [var]	0.00000		
		S [VA]	924.000		
		f [Hz]	50.300		
		ω	L123		
		T	20 ms		

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.



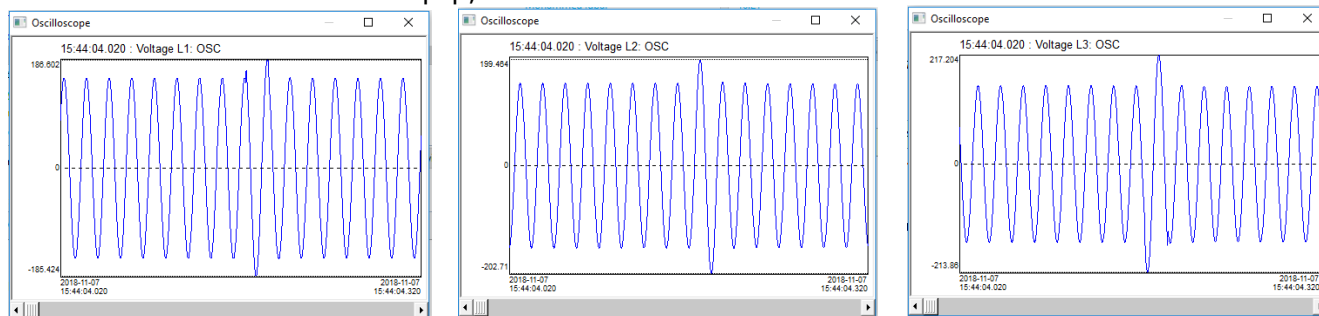
Test 1b: Single cycle swell

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

Procedure name		Device name			
No	Point name	L1	L2	L3	
1	Swell 1.2 1.3 1.4 2A Start	U [V]	132.000	143.000	154.000
2	Swell 1.2 1.3 1.4 2A Swell	I [A]	2.00000	2.00000	2.00000
3	Swell 1.2 1.3 1.4 2A Stop	ϕ [°]	0.00	0.00	0.00
		P [W]	858.000		
		Q [var]	0.00000		
		S [VA]	858.000		
		f [Hz]	50.000		
		ω	L123		
		T	20 ms		

C300B Procedure settings

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



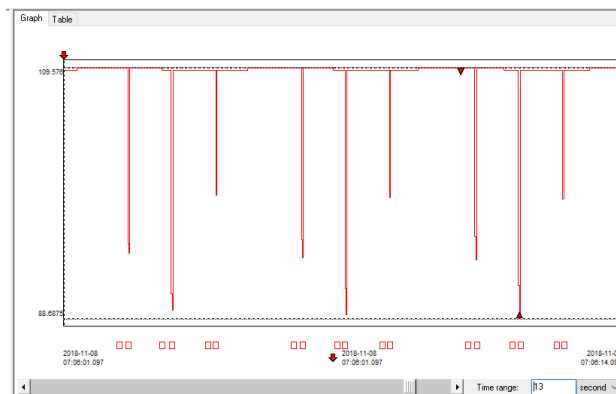
Test 2: 3 consecutive dips on one phase (V1) with interval

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)

Procedure name: Test 2
 Device name: Analyser test

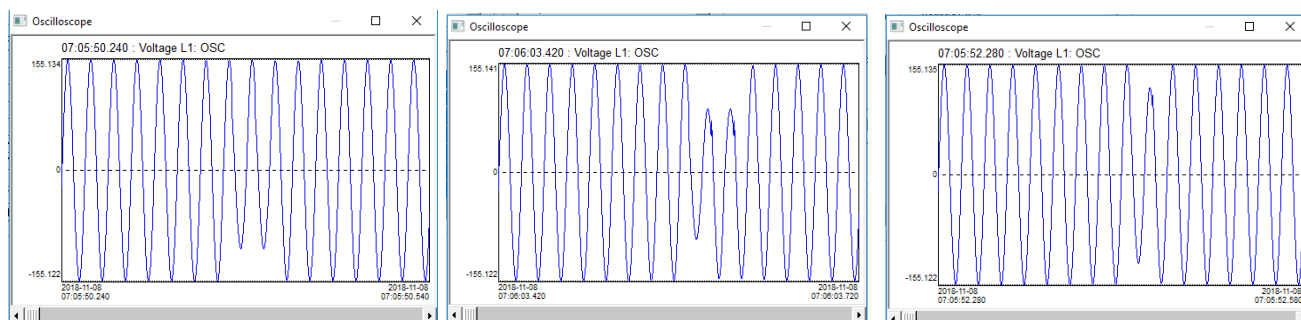
No	Point name
1	V1 110V 1s 2A Start
2	V1 77V 20ms 2A
3	V1 110V 1s II 2A
4	V1 66V 20ms 2A
5	V1 110V 1s III 2A
6	V1 88V 20ms 2A
7	V1 110V 1s IV 2A

	L1	L2	L3
U [V]	77.0000	77.0000	77.0000
I [A]	2.000000	2.000000	2.000000
φ [°]	0.00	0.00	0.00
P [w]		462.0000	
Q [var]		0.000000	
S [VA]		462.0000	
f [Hz]		50.0000	
↻		L123	
T		20 ms	



C300B Procedure settings

Auto repeated events V1 0.7, 0.6 and 0.8 PU.



Oscillograms of events.

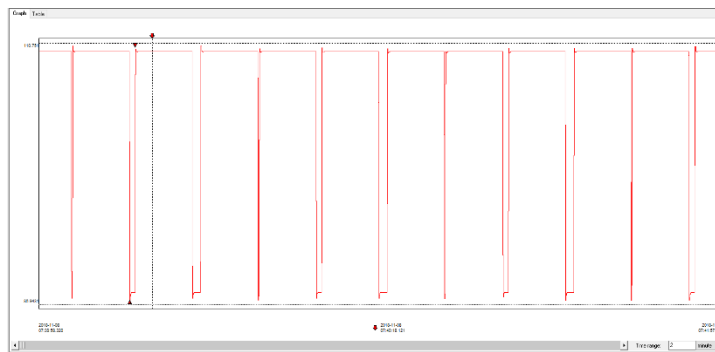
Test 3a: 3-phase voltage dip (V1 – 0.8 PU, V2 – 0.7 PU, V3 – 0.6 PU)

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

Procedure name: Test 3a
 Device name: Analyser test

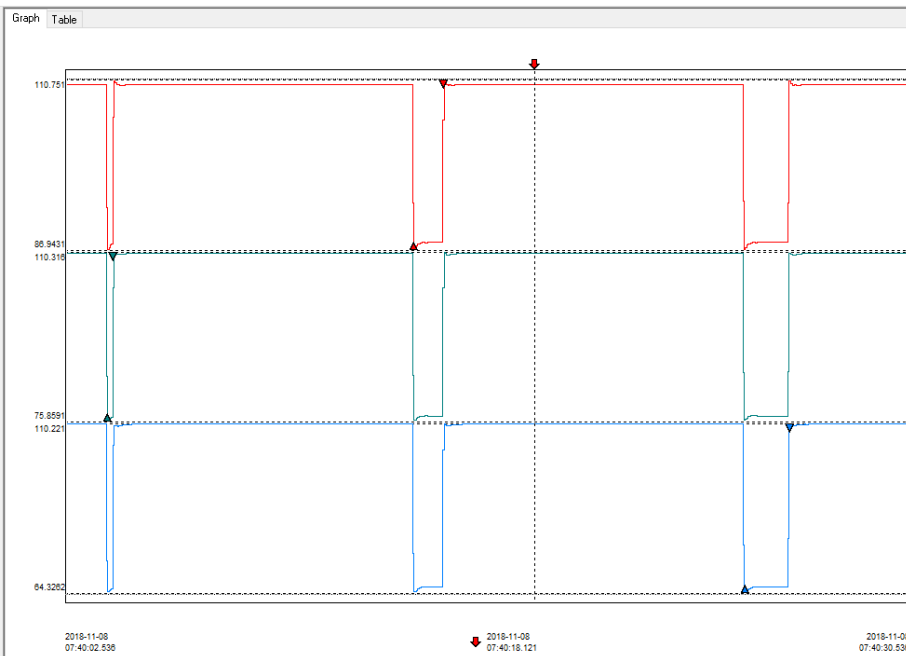
No	Point name
1	V 110V 10s 2A Start
2	V 88 77 66V 200ms 2A
3	V 110V 10s II 2A
4	V 88 77 66V 1000ms 2A
5	V 110V 10s III 2A
6	V1 88 77 66V 1500ms 2A

	L1	L2	L3
U [V]	88.0000	77.0000	66.0000
I [A]	2.000000	2.000000	2.000000
φ [°]	0.00	0.00	0.00
P [w]		462.0000	
Q [var]		0.000000	
S [VA]		462.0000	
f [Hz]		50.0000	
↻		L123	
T		200 ms	

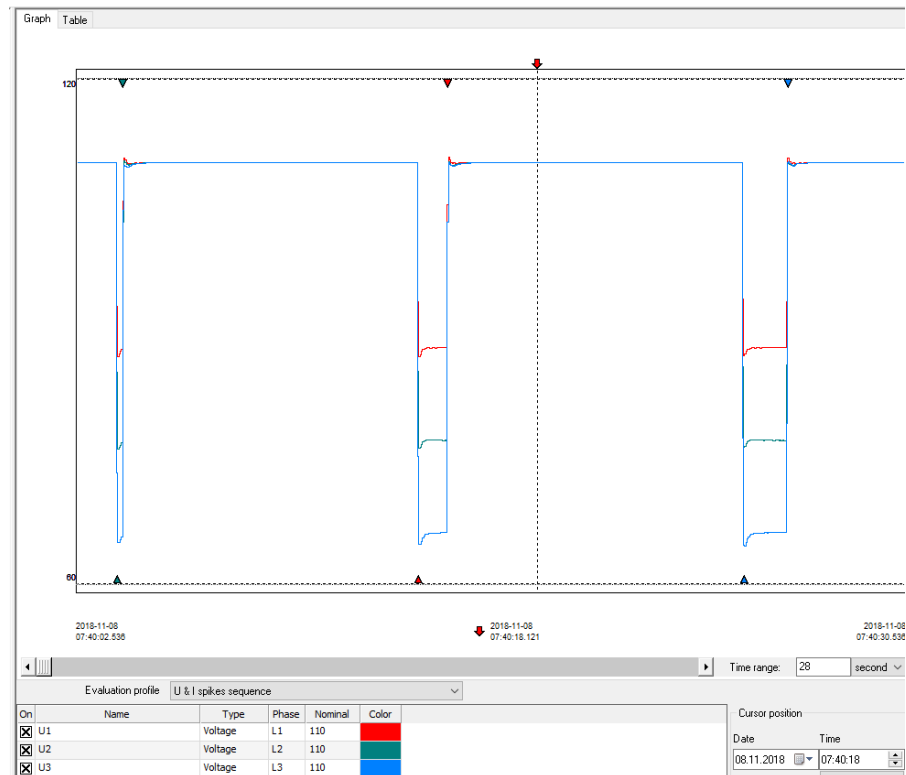


C300B Procedure settings

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)

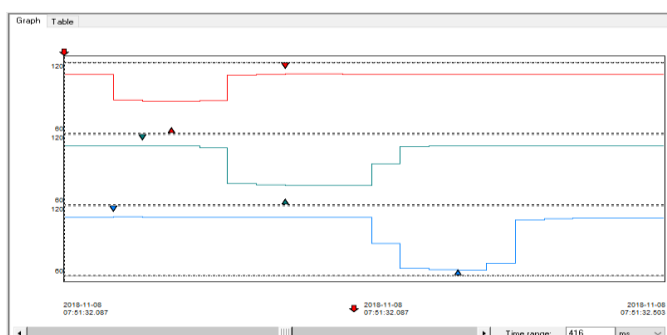
Procedure name: Test 3b

Device name: Analyser test

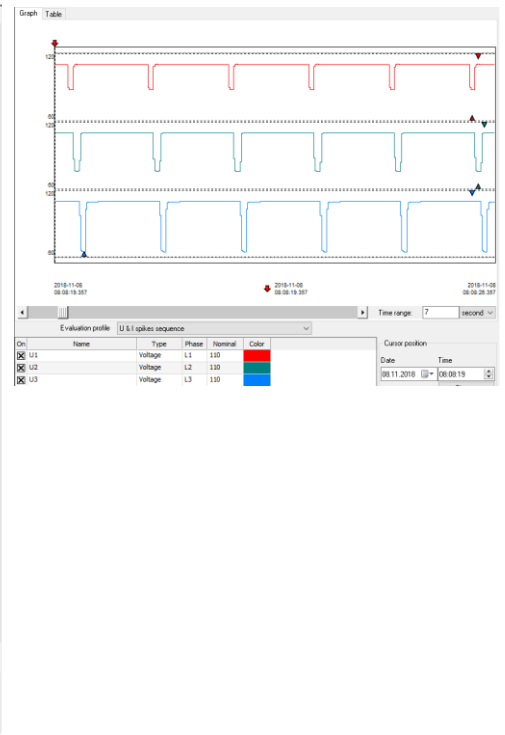
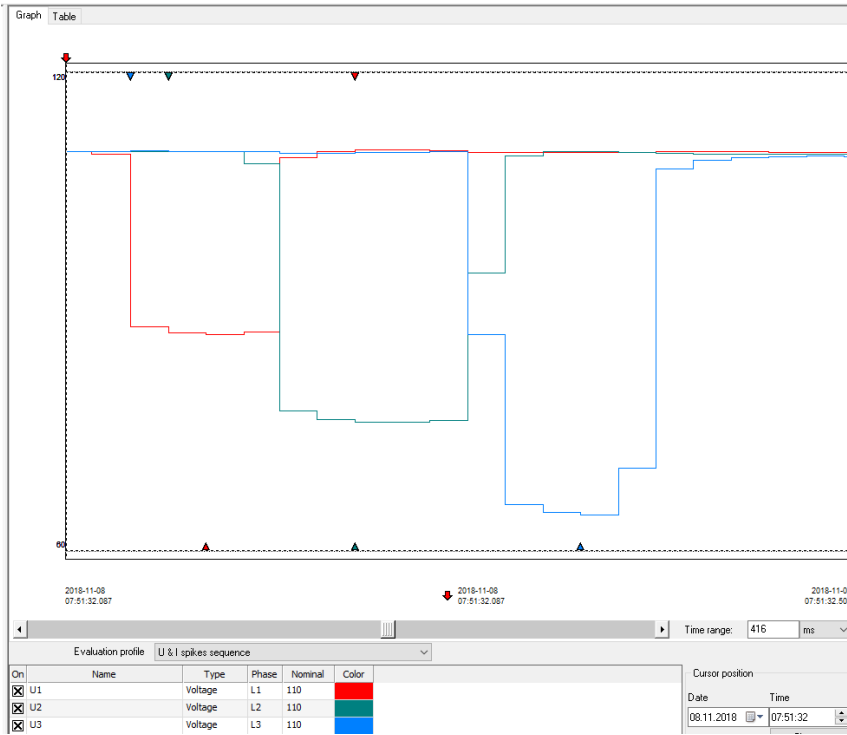
No	Point name
1	V 110V 1s 2A Start
2	V 88 110 110V 80ms 2A
3	V 110 77 110V 110ms 2A
4	V 110 110 66V 90ms 2A

	L1	L2	L3
U [V]	88.0000	110.0000	110.0000
I [A]	2.000000	2.000000	2.000000
φ [°]	0.00	0.00	0.00
P [w]		616.0000	
Q [var]		0.000000	
S [VA]		616.0000	
f [Hz]		50.0000	
		L123	
T		80 ms	

C300B Procedure settings



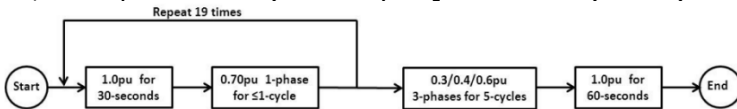
A sequence of events for the RMS value



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.

Procedure name: Test 4

Device name: Analyser test

No	Point name
1	V 110V 30s 2A Start
2	V 77 110 110V 20ms 2A
3	V 110 110 110V 30s II 2A
4	V 77 110 110V 20ms II 2A
5	V 110 110 110V 30s III 2A
6	V 77 110 110V 20ms III 2A
7	V 110 110 110V 30s IV 2A
8	V 77 110 110V 20ms IV 2A

	L1	L2	L3
U [V]	77.0000	110.0000	110.0000
I [A]	2.000000	2.000000	2.000000
φ [°]	0.00	0.00	0.00
P [w]		594.0000	
Q [var]		0.000000	
S [VA]		594.0000	
f [Hz]		50.0000	
t		L123	
T		20 ms	

C300B Procedure settings

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

