EmonTX Calibration

Internal serial number EmonTX3

Measurement standard (reference) Voltcraft Energy Logger 4000F

Voltage calibration

Vcal initial 260

V étalon (V)	241,7	238,2	238,2	240,9	240	238,9	237,3	238	236,8	238,8
Vrms (V)	256,53	252,99	252,47	255,63	253,31	253,15	251,89	252,47	251,51	253,73

New calibration = existing calibration × (correct reading ÷ emonTx reading)

Vcal estimated	244,969	244,8	245,304	245,018	246,338	245,364	244,94	245,098	244,793	244,701
deviation to the mean	0,16343	0,33263	0,17157	0,11463	1,20565	0,23158	0,19257	0,0344	0,33938	0,43176

Vcal new 245,13

standard RMS deviation 0,47458

RMS:root mean square

Current Calibration

CT1

Ical1 initial	90,9									
I étalon (A)	15,82	15,72	15,73	15,89	15,9	15,92	15,87	15,88	15,81	15,87
Irms ct1 (A)	15,33	15,04	15,08	15,25	15,25	15,28	15,24	15,23	15,23	15,27
Ical1estimated	93,8055	95,0098	94,8181	94,7148	94,7744	94,7073	94,6577	94,7795	94,3617	94,4717
deviation to the mean	0,80458	0,39978	0,20804	0,10476	0,16436	0,09727	0,04762	0,16945	0,24834	0,13835

Ical1 new 94,61

standard RMS deviation 0,33495

CT2

Ical2 initial	90,9									
I étalon (A)	14,39	14,09	14,15	14,31	14,39	14,25	14,13	14,3	14,29	14,26
Irms ct2 (A)	14,4	14,1	14,32	14,44	14,52	14,4	14,28	14,49	14,41	14,38
Ical2estimated	90,8369	90,8355	89,8209	90,0816	90,0862	89,9531	89,9452	89,7081	90,143	90,1414
deviation to the mean	0,68168	0,68034	0,33431	0,07354	0,06904	0,20207	0,21003	0,44712	0,01217	0,01375

Ical2 new 90,16

standard RMS deviation 0,3851

CT3

Ical3 initial	90,9									
I étalon (A)	14,05	14,14	14,35	14,49	14,26	14,5	14,34	14,45	14,21	14,5
Irms ct3 (A)	14,2	14,34	14,5	14,65	14,44	14,68	14,54	14,62	14,39	14,65
Ical3estimated	89,9398	89,6322	89,9597	89,9072	89,7669	89,7854	89,6497	89,843	89,763	89,9693
deviation to the mean	0,11817	0,1894	0,13804	0,08562	0,05472	0,03619	0,17196	0,02141	0,05865	0,14767

Ical3 new 89,82

standard RMS deviation 0,12284

Phase calibration

Average current consumption	9	9	9	8	6	6	6	6	4	4
phase_shift	1,4	1,7	1,35	1,4	1,35	1,4	1,45	1,5	1,5	1,4
power factor	1	1,01	1	1	0,99	0,99	0,99	0,99	1	1

Adopted phase shift 1,35

Final voltage calibration

Vcal 245,13

V étalon (V)	242,20	237,00	234,50	238,60	241,40	242,20	239,50	242,80	243,60	239,50
Vrms (V)	242,03	237,23	236,19	238,76	240,90	242,15	240,25	242,65	243,26	238,46
Vcal estimated	245,305	244,895	243,379	244,969	245,642	245,183	244,368	245,284	245,475	246,202
deviation to the mean	0,23481	0,17503	1,69136	0,10164	0,57142	0,11325	0,70261	0,21417	0,40525	1,13174

Vcal new 245,07

standard RMS deviation 0,76599

Realized by

A.CUER

On

14/06/18

EmonTX verification **CT2 & CT3**

Internal serial number EmonTX3

Measurement standard (reference) Voltcraft Energy Logger 4000F

uref from 5W to 3500W 0,10%

	Power measured (W)									
	Meas.1	Meas.2	Meas.3	Meas.4	Meas.5	Meas.6	Meas.7	Meas.8	Meas.9	Meas.10
average intensity (A) 4										
reference	939	924	910	902	942	940	901	938	937	940
EmonTX CT2	954	947	917	920	960	948	916	959	958	950
EmonTX CT3	940	935	910	928	950	929	914	950	944	948
Square deviation CT2	225	529	49	324	324	64	225	441	441	100
Square deviation CT3	1	121	0	676	64	121	169	144	49	64
u repet			CT2	17,3909		CT3	12,5122			
u ref	0,939	0,924	0,91	0,902	0,942	0,94	0,901	0,938	0,937	0,94
u ref max	0,942									
u verif			**CT2**	**17,416**		**CT3**	**12,548**			
				1,88%			**1,35%**			
average intensity (A) 6										
reference	1407	1385	1370	1370	1375	1333	1357	1376	1395	1412
EmonTX CT2	1427	1406	1401	1379	1392	1356	1375	1384	1410	1432
EmonTX CT3	1417	1395	1389	1366	1375	1352	1357	1359	1442	1420
Square deviation CT2	400	441	961	81	289	529	324	64	225	400
Square deviation CT3	100	100	361	16	0	361	0	289	2209	64
u repet			CT2	20,3142		CT3	19,7203			
u ref	1,407	1,385	1,37	1,37	1,375	1,333	1,357	1,376	1,395	1,412
u ref max	1,412									
u verif			**CT2**	**20,363**		**CT3**	**19,771**			
				1,48%			**1,43%**			
average intensity (A) 8										
reference	1815	1740	1770	1792	1805	1760	1799	1807	1793	1783
EmonTX CT2	1845	1770	1801	1818	1854	1795	1847	1838	1822	1813
EmonTX CT3	1838	1798	1793	1805	1838	1779	1816	1815	1808	1805
Square deviation CT2	900	900	961	676	2401	1225	2304	961	841	900
Square deviation CT3	529	3364	529	169	1089	361	289	64	225	484
u repet			CT2	36,6197		CT3	28,0931			
u ref	1,815	1,74	1,77	1,792	1,805	1,76	1,799	1,807	1,793	1,783
u ref max	1,815									
u verif			**CT2**	**36,665**		**CT3**	**28,152**			
				2,05%			**1,58%**			
average intensity (A) 14										
reference	3212	3301	3228	3244	3152	3285	3262	3280	3372	3240
EmonTX CT2	3239	3335	3237	3290	3178	3353	3277	3332	3393	3263
EmonTX CT3	3192	3304	3210	3271	3150	3300	3252	3299	3368	3256
Square deviation CT2	729	1156	81	2116	676	4624	225	2704	441	529
Square deviation CT3	400	9	324	729	4	225	100	361	16	256
u repet			CT2	38,4144		CT3	16,4114			
u ref	3,212	3,301	3,228	3,244	3,152	3,285	3,262	3,28	3,372	3,24
u ref max	3,372									
u verif			**CT2**	**38,562**		**CT3**	**16,754**			
				1,18%			**0,51%**			

EmonTX verification **CT1**

Internal serial number EmonTX3

Measurement standard (reference) Voltcraft Energy Logger 4000F

uref from 5W to 3500W 0,10%

		Power measured (W)									
		Meas.1	Meas.2	Meas.3	Meas.4	Meas.5	Meas.6	Meas.7	Meas.8	Meas.9	Meas.10
average intensity (A)	4										
reference		953	947,2	935,4	937,2	933,2	946,7	947,5	948,5	920,4	926,7
EmonTX CT1		938	927	917	920	927	930	930	934	905	913
Square deviation CT1		225	408,04	338,56	295,84	38,44	278,89	306,25	210,25	237,16	187,69
u repet	CT1	16,7535									
u ref		0,953	0,9472	0,9354	0,9372	0,9332	0,9467	0,9475	0,9485	0,9204	0,9267
u ref max		0,953									
u verif	**CT1**	**16,781**									
		1,79%									

average intensity (A)	7,5										
reference		1815	1825	1834	1840	1846	1847	1835	1838	1831	1831
EmonTX CT1		1789	1797	1808	1816	1817	1836	1815	1814	1820	1810
Square deviation CT1		676	784	676	576	841	121	400	576	121	441
u repet	CT1	24,0647									
u ref		1,815	1,825	1,834	1,84	1,846	1,847	1,835	1,838	1,831	1,831
u ref max		1,847									
u verif	**CT1**	**24,136**									
		1,32%									

average intensity (A)	10,5										
reference		2573	2549	2540	2542	2513	2471	2470	2507	2550	2549
EmonTX CT1		2539	2519	2514	2513	2482	2437	2433	2468	2507	2513
Square deviation CT1		1156	900	676	841	961	1156	1369	1521	1849	1296
u repet	CT1	36,094									
u ref		2,573	2,549	2,54	2,542	2,513	2,471	2,47	2,507	2,55	2,549
u ref max		2,573									
	CT1	**36,186**									
		1,43%									

average intensity (A)	16										
reference		3705	3651	3643	3639	3632	3636	3633	3653	3641	3657
EmonTX CT1		3643	3596	3568	3573	3574	3581	3577	3596	3575	3623
Square deviation CT1		3844	3025	5625	4356	3364	3025	3136	3249	4356	1156
u repet	CT1	62,482									
u ref		3,705	3,651	3,643	3,639	3,632	3,636	3,633	3,653	3,641	3,657
u ref max		3,705									
	CT1	**62,592**									
		1,72%									