

How to test 3 units of single phase energy meters using TS33 Test System?

Application Note No07

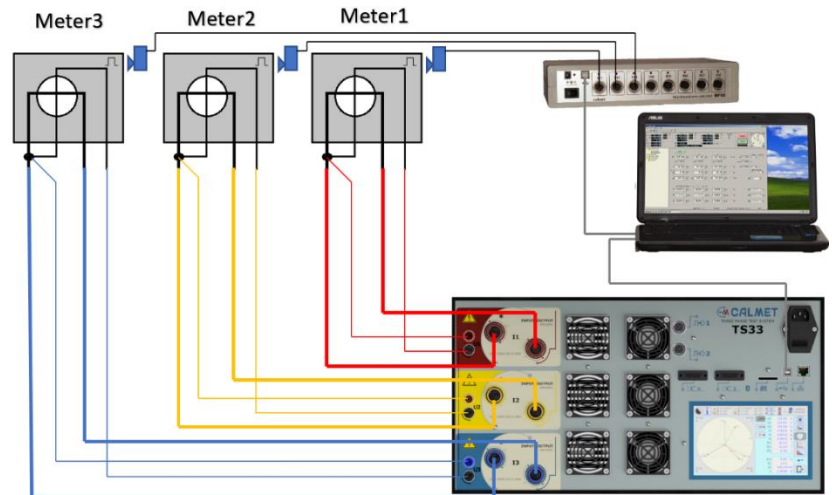
The measurement system consists of:

- **TS33** Three-phase Test System with Reference Standard and Integrated Current and Voltage Source;
- **MPX8** Eight-channel Meter Error Calculator;
- Laptop with installed **TB PC-Soft** Software;
- Devices under test – 3 units of single-phase meters.

The test is performed in a measurement system where each energy meter under test (DUT) is connected to the TS33 Test System separately on each phase, respectively: DUT1 to L1, DUT2 to L2, and DUT3 to L3, as presented below:



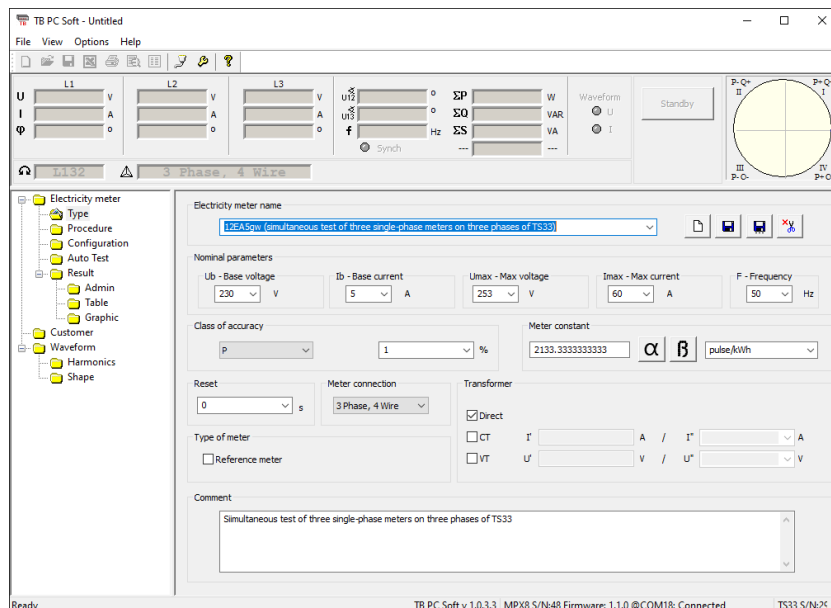
Front plate of meters under test



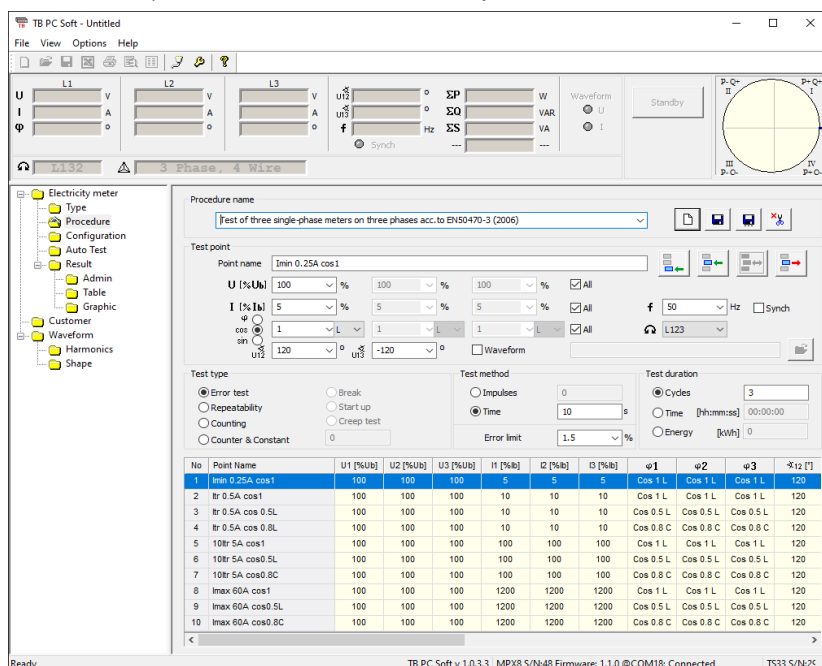
The TS33 Test System works as three-phase voltage, current source and reference meter.

To initiate the test, the user should perform the following steps in *TB PC-Soft*:

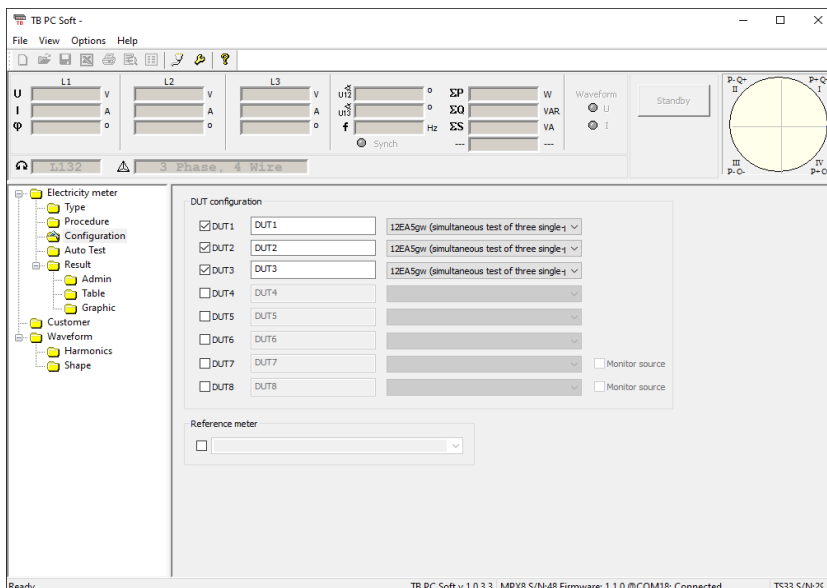
1. In *Type* function – set all parameters of the tested energy meters.
Attention: Because the TS33 generates energy in three phases and the *Meter connection* field is set to *3 Phase, 4 wire*, the value of impulse constant entered in the *Meter constant* field must be divided by 3 (instead of 6400 imp/kWh, 2133.333333 imp/kWh is entered).



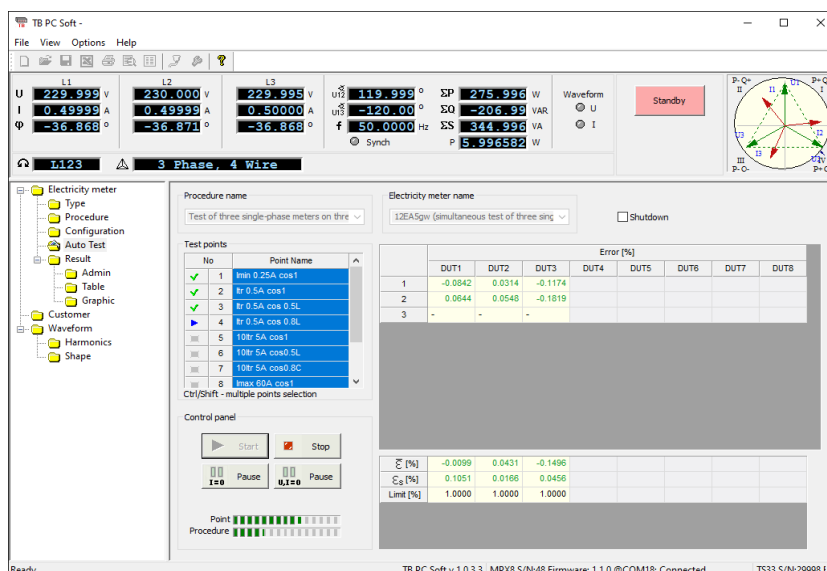
- The *Procedure* function allows the user to prepare a set of load points acc. to requirements of standard (in this case acc. to EN 50470-3) or acc. to the individual requirements of the user.



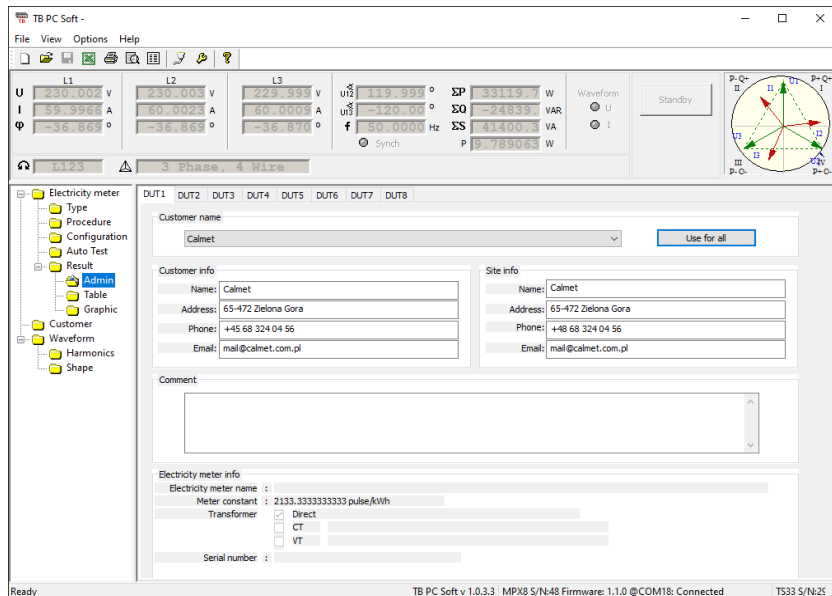
- In *Configuration* function the specific type of energy meter, defined earlier, is assigned to the specific input of the MPX8 Multiplexer.



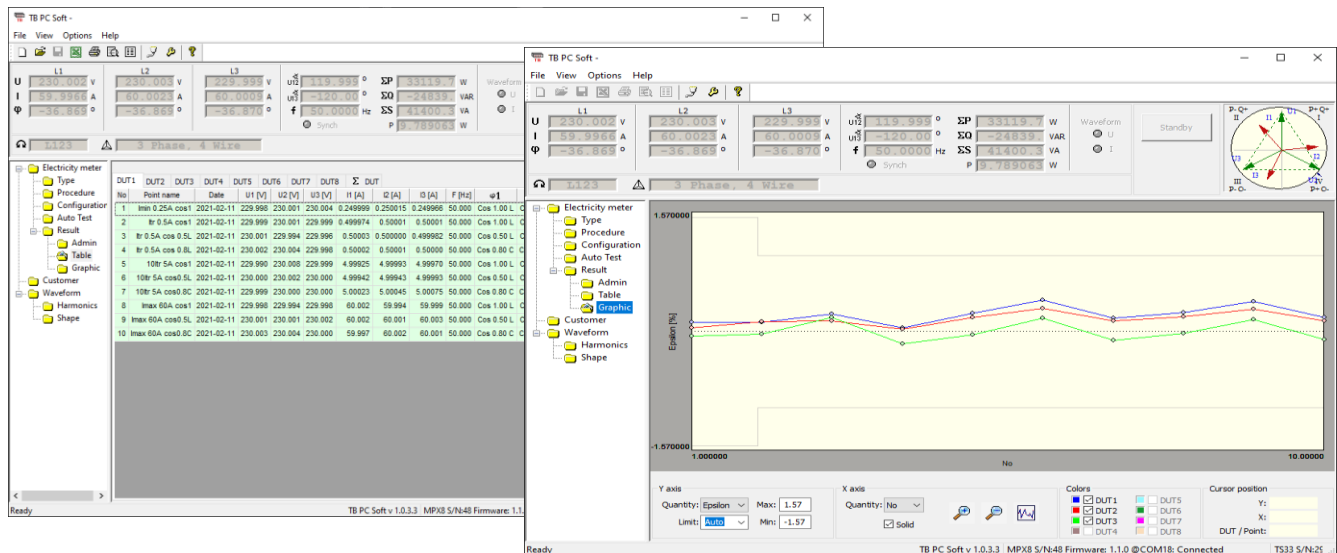
- The *AutoTest* function takes the load points set acc. to the procedure and generates them automatically. For each load point, the accuracy of the energy meter under test is calculated.



5. In the *Result* function the administrative data for a measurement report is entered,



and the achieved results are presented in the form of a table and diagram.



6. The administrative data and results for each DUT can be exported to MS Excel in order to prepare a measurement report.

Customer info	
1 Customer info	
2 Name:	Calmet
3 Address:	65-472 Zielona Gora
4 Phone:	+48 68 324 04 56
5 Email:	mail@calmet.com.pl
6	
Site info	
7 Name:	Calmet
8 Address:	65-472 Zielona Gora
9 Phone:	+48 68 324 04 56
10 Email:	mail@calmet.com.pl
11	
12	
Comment	
13	
Electricity meter name	
14	
15	
16 Meter connection	Direct
17 Meter constant	2133.333333333 pulse/kWh
18 Serial number	DUT1
19	
20	

No	Point name	Date	U1 [V]	U2 [V]	U3 [V]	I1 [A]	I2 [A]	I3 [A]	F [Hz]	Ph1	Ph2	Ph3	Connection	Rotation	Test power	Limit	Epsilon [%]	Epsilons [%]	OK
1	Imin 0.25A cos1	2021-02-11	229.998	230.001	230.004	0.249999	0.250015	0.249966	50	1 Cos L	1 Cos L	1 Cos L	3P4W	1223	172.49 W	1.5	0.0481	0.0189	+
2	Itr 0.5A cos1	2021-02-11	229.999	230.001	229.999	0.499974	0.500001	0.500001	50	1 Cos L	1 Cos L	1 Cos L	3P4W	1223	344.99 W	1.5	-0.0327	0.0461	+
3	Itr 0.5A cos 0.5L	2021-02-11	230.001	229.994	229.996	0.50003	0.5	0.499982	50	0.5 Cos L	0.5 Cos L	0.5 Cos L	3P4W	1223	172.5 W	1	0.1869	0.0531	+
4	Itr 0.5A cos 0.8L	2021-02-11	230.002	230.004	229.998	0.50002	0.500001	0.5	50	0.8 Cos C	0.8 Cos C	0.8 Cos C	3P4W	1223	276.01 W	1	-1.593	0.0383	+
5	Itr 10tr 5A cos1	2021-02-11	229.999	230.008	229.999	4.99925	4.99993	4.9997	50	1 Cos L	1 Cos L	1 Cos L	3P4W	1223	3449.68 W	1	-0.1939	0.0042	+
6	Itr 10tr 5A cos 0.5L	2021-02-11	230	230.002	230	4.99942	4.99943	4.99993	50	0.5 Cos L	0.5 Cos L	0.5 Cos L	3P4W	1223	1724.85 W	1	0.1823	0.0084	+
7	Itr 10tr 5A cos 0.8L	2021-02-11	229.999	230	230.002	5.00023	5.00045	5.00075	50	0.8 Cos C	0.8 Cos C	0.8 Cos C	3P4W	1223	2760.33 W	1	-0.1128	0.0053	+
8	Itr 10tr 5A cos 0.9L	2021-02-11	229.998	229.994	229.998	60.002	59.994	59.999	50	1 Cos L	1 Cos L	1 Cos L	3P4W	1223	41397.66 W	1	0.1939	0.0046	+