

Project:
Location:
Contract:
Engineer:
Filename: tes

ETAP
12.6.0H
Study Case: SM

Page: 1
Date: 03-21-2017
SN:
Revision: Base
Config.: Normal

Electrical Transient Analyzer Program

Short-Circuit Analysis

**ANSI Standard
3-Phase, LG, LL, & LLG Fault Currents
1/2 Cycle Network**

	<u>Swing</u>	<u>V-Control</u>	<u>Load</u>	<u>Total</u>
Number of Buses:	1	0	1	2

	<u>XFMR2</u>	<u>XFMR3</u>	<u>Reactor</u>	<u>Line/Cable</u>	<u>Impedance</u>	<u>Tie PD</u>	<u>Total</u>
Number of Branches:	1	0	0	0	0	0	1

	<u>Synchronous Generator</u>	<u>Power Grid</u>	<u>Synchronous Motor</u>	<u>Induction Machines</u>	<u>Lumped Load</u>	<u>Total</u>
Number of Machines:	0	1	0	1	0	2

System Frequency: 50.00 Hz
Unit System: English
Project Filename: tes
Output Filename: C:\ETAP 1260\tes\Untitled.SQ1

Project:
Location:
Contract:
Engineer:
Filename: tes

ETAP
12.6.0H

Study Case: SM

Page: 2
Date: 03-21-2017
SN:
Revision: Base
Config.: Normal

Adjustments

<u>Tolerance</u>	<u>Apply Adjustments</u>	<u>Individual /Global</u>	<u>Percent</u>
Transformer Impedance:	Yes	Individual	
Reactor Impedance:	Yes	Individual	
Overload Heater Resistance:	No		
Transmission Line Length:	No		
Cable Length:	No		

<u>Temperature Correction</u>	<u>Apply Adjustments</u>	<u>Individual /Global</u>	<u>Degree C</u>
Transmission Line Resistance:	Yes	Individual	
Cable Resistance:	Yes	Individual	

Project:
Location:
Contract:
Engineer:
Filename: tes

ETAP
12.6.0H

Study Case: SM

Page: 3
Date: 03-21-2017
SN:
Revision: Base
Config.: Normal

Bus Input Data

ID	Bus				Initial Voltage	
	Type	Nom. kV	Base kV	Sub-sys	%Mag.	Ang.
Bus1	SWNG	63.000	70.000	1	111.11	0.00
Bus2	Load	6.600	6.600	1	100.00	-30.00

2 Buses Total

All voltages reported by ETAP are in % of bus Nominal kV.
Base kV values of buses are calculated and used internally by ETAP.

Project:
Location:
Contract:
Engineer:
Filename: tes

ETAP
12.6.0H

Study Case: SM

Page: 5
Date: 03-21-2017
SN:
Revision: Base
Config.: Normal

Branch Connections

CKT/Branch		Connected Bus ID		% Impedance, Pos. Seq., 100 MVAb			
ID	Type	From Bus	To Bus	R	X	Z	Y
T1	2W XFMR	Bus1	Bus2	0.97	26.54	26.56	

Project:
 Location:
 Contract:
 Engineer:
 Filename: tes

ETAP
 12.6.0H

Study Case: SM

Page: 6
 Date: 03-21-2017
 SN:
 Revision: Base
 Config.: Normal

Power Grid Input Data

Power Grid ID	Connected Bus ID	Rating		% Positive Seq. Impedance 100 MVA Base			Grounding Type	% Zero Seq. Impedance 100 MVA Base		
		MVA/SC	kV	X/R	R	X		X/R	R0	X0
U1	Bus1	63.000	70.000	1.00	112.23920	112.23920	Wye - Solid	1.00	99.428500	99.42850

Total Power Grids (= 1) 63.000 MVA

Project:
 Location:
 Contract:
 Engineer:
 Filename: tes

ETAP
 12.6.0H
 Study Case: SM

Page: 7
 Date: 03-21-2017
 SN:
 Revision: Base
 Config.: Normal

Induction Machine Input Data

Induction Machine			Rating (Base)			Positive Seq. Imp.				Grounding			Zero Seq. Imp.		
ID	Type	Qty	kVA	kV	RPM	X"/R	% R	% X"	% X'	Conn.	Type	Amp	X/R	% R0	% X0
Mtr1	Motor	1	2857.38	6.600	1500	33.81	0.455	15.38	23.08	Wye	Open		33.81	0.455	15.38

Total Connected Induction Machines (= 1): 2857.4 kVA

Project:
 Location:
 Contract:
 Engineer:
 Filename: tes

ETAP
 12.6.0H

Study Case: SM

Page: 8
 Date: 03-21-2017
 SN:
 Revision: Base
 Config.: Normal

SHORT- CIRCUIT REPORT

Fault at bus: **Bus2**

Prefault voltage = 6.600 kV = 100.00 % of nominal bus kV (6.600 kV)
 = 100.00 % of base kV (6.600 kV)

Contribution		3-Phase Fault		Line-To-Ground Fault					Positive & Zero Sequence Impedances Looking into "From Bus"			
From Bus ID	To Bus ID	% V From Bus	kA Symm. rms	% Voltage at From Bus			kA Symm. rms		% Impedance on 100 MVA base			
				Va	Vb	Vc	Ia	3I0	R1	X1	R0	X0
Bus2	Total	0.00	6.251	0.00	93.04	81.78	8.644	8.644	7.02E+001	1.21E+002	9.72E-001	2.65E+001
Bus1	Bus2	16.48	4.884	69.19	111.11	48.07	7.362	8.644 *	1.13E+002	1.39E+002	9.72E-001	2.65E+001
Mtr1	Bus2	100.00	1.624	100.00	100.00	100.00	1.497	0.000	1.59E+001	5.38E+002		
U1	Bus1	100.00	0.461	100.00	100.00	100.00	0.368	0.000	1.12E+002	1.12E+002	9.94E+001	9.94E+001

Indicates fault current contribution is from three-winding transformers

* Indicates a zero sequence fault current contribution (3I0) from a grounded Delta-Y transformer

Project:
Location:
Contract:
Engineer:
Filename: tes

ETAP
12.6.0H

Study Case: SM

Page: 9
Date: 03-21-2017
SN:
Revision: Base
Config.: Normal

Short-Circuit Summary Report

1/2 Cycle - 3-Phase, LG, LL, & LLG Fault Currents

Prefault Voltage = 100 % of the Bus Nominal Voltage

Bus		3-Phase Fault			Line-to-Ground Fault			Line-to-Line Fault			*Line-to-Line-to-Ground		
ID	kV	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.
Bus2	6.60	3.135	-5.408	6.251	4.025	-7.650	8.644	4.683	2.715	5.414	2.020	9.146	9.367

All fault currents are symmetrical momentary (1/2 Cycle network) values in rms kA

* LLG fault current is the larger of the two faulted line currents

Project:
Location:
Contract:
Engineer:
Filename: tes

ETAP
12.6.0H

Study Case: SM

Page: 10
Date: 03-21-2017
SN:
Revision: Base
Config.: Normal

Short-Circuit Summary Report

Bus		Positive Sequence Imp. (ohm)			Negative Sequence Imp. (ohm)			Zero Sequence Imp. (ohm)		
ID	kV	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance
Bus2	6.600	0.30574	0.52735	0.60957	0.30574	0.52735	0.60957	0.00424	0.11563	0.11571

Project:
Location:
Contract:
Engineer:
Filename: tes

ETAP
12.6.0H

Study Case: SM

Page: 11
Date: 03-21-2017
SN:
Revision: Base
Config.: Normal

Sequence-of-Operation Event Summary Report

Symmetrical 3-Phase Fault between Bus2 and Mtr1. Adjacent to Bus2.

<u>Time (ms)</u>	<u>ID</u>	<u>If (kA)</u>	<u>T1 (ms)</u>	<u>T2 (ms)</u>	<u>Condition</u>
------------------	-----------	----------------	----------------	----------------	------------------

Tabel Lanjutan Hasil Pengukuran THD Arus orde 1 sampai 50

Date	Time	% THD A L1 Max	% THD A L2 Max	% THD A L3 Max
4/8/2016	15:18:34 252msec	4.67	7.07	12.23
4/8/2016	15:18:44 252msec	3.63	3.68	3.38
4/8/2016	15:18:54 252msec	3.66	3.57	3.34
4/8/2016	15:19:04 252msec	3.56	3.51	3.28
4/8/2016	15:19:14 252msec	3.66	4	3.26
4/8/2016	15:19:24 252msec	3.45	3.46	3.22
4/8/2016	15:19:34 252msec	3.54	3.55	3.38
4/8/2016	15:19:44 252msec	3.68	3.64	3.36
4/8/2016	15:19:54 252msec	3.55	3.53	3.33
4/8/2016	15:20:04 252msec	3.54	3.38	3.46
4/8/2016	15:20:14 252msec	3.67	3.48	3.32
4/8/2016	15:20:24 252msec	3.6	3.57	3.47

Date	Time	% THD A L1 Max	% THD A L2 Max	%THD A L3 Max
4/8/2016	15:20:34 252msec	3.56	3.49	3.42
4/8/2016	15:20:44 252msec	3.55	3.55	3.42
4/8/2016	15:20:54 252msec	3.56	3.52	3.35
4/8/2016	15:21:04 252msec	3.65	3.5	3.3
4/8/2016	15:21:14 252msec	3.64	3.58	3.32
4/8/2016	15:21:24 252msec	3.72	3.47	3.54
4/8/2016	15:21:34 252msec	3.5	3.45	3.32
4/8/2016	15:21:44 252msec	3.49	3.5	3.31
4/8/2016	15:21:54 252msec	3.53	3.52	3.32
4/8/2016	15:22:04 252msec	3.52	3.53	3.43
4/8/2016	15:22:14 252msec	3.56	3.52	3.53
4/8/2016	15:22:24 252msec	3.52	3.56	3.21
4/8/2016	15:22:34 252msec	3.52	3.5	3.28
4/8/2016	15:22:44 252msec	3.63	3.42	3.38

Date	Time	% THD A L1 Max	% THD A L2 Max	%THD A L3 Max
4/8/2016	15:22:54 252msec	3.57	3.49	3.47
4/8/2016	15:23:14 252msec	3.51	3.56	3.37
4/8/2016	15:23:24 252msec	3.49	3.65	3.48
4/8/2016	15:23:34 252msec	3.53	3.74	3.46
4/8/2016	15:23:44 252msec	3.54	3.67	3.59
4/8/2016	15:23:54 252msec	3.53	3.46	3.39
4/8/2016	15:24:04 252msec	3.49	3.51	3.35
4/8/2016	15:24:14 252msec	3.62	3.55	3.38
4/8/2016	15:24:24 252msec	3.68	3.53	3.49
4/8/2016	15:24:34 252msec	3.62	3.5	3.39
4/8/2016	15:24:44 252msec	3.52	3.49	3.55
4/8/2016	15:24:54 252msec	3.49	3.49	3.34
4/8/2016	15:25:04 252msec	3.49	3.55	3.44
4/8/2016	15:25:14 252msec	3.55	3.59	3.44

Date	Time	% THD A L1 Max	% THD A L2 Max	%THD A L3 Max
4/8/2016	15:25:24 252msec	3.57	3.62	3.39
4/8/2016	15:25:34 252msec	3.59	3.61	3.39
4/8/2016	15:25:44 252msec	3.58	3.77	3.38
4/8/2016	15:25:54 252msec	3.61	3.86	3.61
4/8/2016	15:26:04 252msec	3.64	3.66	3.28
4/8/2016	15:26:14 252msec	3.69	3.6	3.65
4/8/2016	15:26:24 252msec	3.64	3.61	3.51
4/8/2016	15:26:34 252msec	3.83	3.65	3.46
4/8/2016	15:26:44 252msec	3.62	3.64	3.49
4/8/2016	15:26:54 252msec	3.68	3.78	3.43
4/8/2016	15:27:04 252msec	3.68	3.49	3.53
4/8/2016	15:27:14 252msec	3.67	3.51	3.47
4/8/2016	15:27:24 252msec	3.91	3.51	3.66
4/8/2016	15:27:34 252msec	3.77	3.56	3.55

Date	Time	% THD A L1 Max	% THD A L2 Max	%THD A L3 Max
4/8/2016	15:27:44 252msec	3.82	3.53	3.5
4/8/2016	15:27:54 252msec	3.73	3.55	3.46
4/8/2016	15:28:14 252msec	3.73	3.52	3.38
4/8/2016	15:28:24 252msec	3.8	3.52	3.33
4/8/2016	15:28:34 252msec	3.78	3.65	3.36
4/8/2016	15:28:44 252msec	3.82	3.61	3.36
4/8/2016	15:28:54 252msec	3.89	3.66	3.4
4/8/2016	15:29:04 252msec	3.89	3.71	3.32
4/8/2016	15:29:14 252msec	3.72	3.48	3.41
4/8/2016	15:29:24 252msec	3.68	3.56	3.35
4/8/2016	15:29:34 252msec	3.7	3.61	3.38
4/8/2016	15:29:44 252msec	3.83	3.56	3.3
4/8/2016	15:29:54 252msec	3.8	3.51	3.32

Date	Time	% THD A L1 Max	% THD A L2 Max	%THD A L3 Max
4/8/2016	15:30:04 252msec	3.69	3.51	3.41
4/8/2016	15:30:14 252msec	3.95	3.61	3.49
4/8/2016	15:30:24 252msec	3.87	3.79	3.4
4/8/2016	15:30:34 252msec	3.81	3.7	3.43
4/8/2016	15:30:44 252msec	3.85	3.62	3.46
4/8/2016	15:30:54 252msec	3.85	3.66	3.54
4/8/2016	15:31:04 252msec	3.9	3.52	3.43
4/8/2016	15:31:14 252msec	3.87	3.65	3.52
4/8/2016	15:31:24 252msec	3.77	3.62	3.39
4/8/2016	15:31:34 252msec	3.95	3.74	3.5
4/8/2016	15:31:44 252msec	4.06	3.71	3.54
4/8/2016	15:31:54 252msec	3.99	3.82	3.63
4/8/2016	15:32:04 252msec	4.1	3.75	3.63
4/8/2016	15:32:14 252msec	4.15	3.86	3.67

Date	Time	% THD A L1 Max	% THD A L2 Max	%THD A L3 Max
4/8/2016	15:32:24 252msec	3.92	3.77	3.51
4/8/2016	15:32:34 252msec	3.9	3.76	3.6
4/8/2016	15:32:44 252msec	4	3.88	3.52
4/8/2016	15:32:54 252msec	3.9	3.71	3.71
4/8/2016	15:33:14 252msec	4.12	3.72	3.66
4/8/2016	15:33:24 252msec	3.99	3.67	3.61
4/8/2016	15:33:34 252msec	4.08	3.81	3.45
4/8/2016	15:33:44 252msec	4.02	3.73	3.48
4/8/2016	15:33:54 252msec	4.13	3.72	3.7
4/8/2016	15:34:04 252msec	4.04	3.88	3.58
4/8/2016	15:34:14 252msec	4.13	3.8	3.69
4/8/2016	15:34:24 252msec	4.13	3.98	3.69
4/8/2016	15:34:34 252msec	4.26	3.8	3.75
4/8/2016	15:34:44 252msec	4.06	3.83	3.67

Date	Time	% THD A L1 Max	% THD A L2 Max	%THD A L3 Max
4/8/2016	15:34:54 252msec	4.26	4.08	3.58
4/8/2016	15:35:04 252msec	4.09	3.95	3.74
4/8/2016	15:35:14 252msec	3.99	4.07	3.64
4/8/2016	15:35:24 252msec	3.92	3.98	3.62
4/8/2016	15:35:34 252msec	3.94	3.93	3.59
4/8/2016	15:35:44 252msec	3.91	4.01	3.72
4/8/2016	15:35:54 252msec	3.98	4.04	3.68
4/8/2016	15:36:04 252msec	4.13	3.97	3.64
4/8/2016	15:36:14 252msec	4.17	4.05	3.73
4/8/2016	15:36:24 252msec	4.14	3.93	3.75
4/8/2016	15:36:34 252msec	4.02	3.89	3.71
4/8/2016	15:36:44 252msec	3.95	4.07	3.67
4/8/2016	15:36:54 252msec	3.98	4.01	3.69
4/8/2016	15:37:04 252msec	4.09	3.89	3.59

Date	Time	% THD A L1 Max	% THD A L2 Max	%THD A L3 Max
4/8/2016	15:37:14 252msec	4.11	4	3.72
4/8/2016	15:37:24 252msec	4.13	4.05	3.7
4/8/2016	15:37:34 252msec	4.18	4.03	3.75
4/8/2016	15:37:44 252msec	4.08	4.12	3.76
4/8/2016	15:37:54 252msec	4.26	4.12	3.8
4/8/2016	15:38:14 252msec	4.27	4	3.78
4/8/2016	15:38:24 252msec	4.15	4.07	3.74
4/8/2016	15:38:34 252msec	4.39	4.01	3.82
4/8/2016	15:38:44 252msec	4.17	3.91	3.76
4/8/2016	15:38:54 252msec	4.68	3.97	3.89
4/8/2016	15:39:04 252msec	4.48	4.09	3.91
4/8/2016	15:39:14 252msec	4.14	3.86	3.75
4/8/2016	15:39:24 252msec	4.41	4.07	4.02
4/8/2016	15:39:34 252msec	4.25	4.05	3.97

Date	Time	% THD A L1 Max	% THD A L2 Max	%THD A L3 Max
4/8/2016	15:39:44 252msec	4.3	3.88	3.92
4/8/2016	15:39:54 252msec	4.12	4.06	3.82
4/8/2016	15:40:04 252msec	4.03	4.03	3.88
4/8/2016	15:40:14 252msec	4.08	4.02	4.05
4/8/2016	15:40:24 252msec	3.94	4.07	3.66
4/8/2016	15:40:34 252msec	4.06	4.14	3.8
4/8/2016	15:40:44 252msec	4.01	3.89	3.73
4/8/2016	15:40:54 252msec	4.1	4.01	3.75
4/8/2016	15:41:04 252msec	4.22	4	3.87
4/8/2016	15:41:14 252msec	3.99	3.82	3.91
4/8/2016	15:41:24 252msec	3.93	3.86	3.72
4/8/2016	15:41:34 252msec	4.06	3.99	3.78
4/8/2016	15:41:44 252msec	4.12	4.07	3.66
4/8/2016	15:41:54 252msec	4.03	3.95	3.59

Date	Time	% THD A L1 Max	% THD A L2 Max	%THD A L3 Max
4/8/2016	15:42:04 252msec	3.93	3.96	3.75
4/8/2016	15:42:14 252msec	4.11	4	3.81
4/8/2016	15:42:24 252msec	4.1	4.01	3.58
4/8/2016	15:42:34 252msec	4.01	3.87	3.55
4/8/2016	15:42:44 252msec	4.07	3.92	3.62
4/8/2016	15:42:54 252msec	4.01	3.9	3.67
4/8/2016	15:43:14 252msec	3.95	3.81	3.76
4/8/2016	15:43:24 252msec	3.94	3.87	3.95
4/8/2016	15:43:34 252msec	3.89	3.79	3.82
4/8/2016	15:43:44 252msec	3.9	3.73	3.74
4/8/2016	15:43:54 252msec	3.97	3.79	3.66
4/8/2016	15:44:04 252msec	4.15	3.94	3.95
4/8/2016	15:44:14 252msec	3.93	3.85	3.91
4/8/2016	15:44:24 252msec	3.87	3.79	3.74

Date	Time	% THD A L1 Max	% THD A L2 Max	%THD A L3 Max
4/8/2016	15:44:34 252msec	3.97	3.85	3.59
4/8/2016	15:44:44 252msec	3.96	3.76	3.68
4/8/2016	15:44:54 252msec	3.96	3.85	3.8
4/8/2016	15:45:04 252msec	3.97	3.81	3.74
4/8/2016	15:45:14 252msec	3.95	3.78	3.78
4/8/2016	15:45:24 252msec	4.02	3.9	3.81
4/8/2016	15:45:34 252msec	3.91	3.87	3.71
4/8/2016	15:45:44 252msec	3.82	3.81	3.61
4/8/2016	15:45:54 252msec	3.87	3.99	3.8
4/8/2016	15:46:04 252msec	4.14	3.84	3.77
4/8/2016	15:46:14 252msec	3.93	3.78	3.98
4/8/2016	15:46:24 252msec	4.13	3.87	3.74
4/8/2016	15:46:34 252msec	4	3.78	3.83
4/8/2016	15:46:44 252msec	4.09	3.8	3.7

Date	Time	% THD A L1 Max	% THD A L2 Max	%THD A L3 Max
4/8/2016	15:46:54 252msec	4.03	3.84	3.82
4/8/2016	15:47:04 252msec	3.9	3.83	3.86
4/8/2016	15:47:14 252msec	4.1	3.81	3.68
4/8/2016	15:47:24 252msec	3.91	3.75	3.66
4/8/2016	15:47:34 252msec	4.05	3.83	3.73
4/8/2016	15:47:44 252msec	4.02	3.76	3.77
4/8/2016	15:47:54 252msec	3.93	3.75	3.64
4/8/2016	15:48:14 252msec	3.88	3.83	3.53
4/8/2016	15:48:24 252msec	3.94	3.84	3.67
4/8/2016	15:48:34 252msec	4.12	3.89	3.48

Tabel Lanjutan Hasil Pengukuran THD Tegangan orde 1 sampai 50

Date	Time	%THD V L1N Max	%THD V L2N Max	%THD V L3N Max
4/8/2016	15:18:34 252msec	1.35	1.35	1.37
4/8/2016	15:18:44 252msec	1.34	1.35	1.37
4/8/2016	15:18:54 252msec	1.33	1.35	1.35
4/8/2016	15:19:04 252msec	1.36	1.35	1.37
4/8/2016	15:19:14 252msec	1.35	1.35	1.36
4/8/2016	15:19:24 252msec	1.35	1.35	1.36
4/8/2016	15:19:34 252msec	1.35	1.36	1.36
4/8/2016	15:19:44 252msec	1.35	1.36	1.36
4/8/2016	15:19:54 252msec	1.36	1.36	1.39
4/8/2016	15:20:04 252msec	1.35	1.37	1.36
4/8/2016	15:20:14 252msec	1.35	1.36	1.36
4/8/2016	15:20:24 252msec	1.35	1.37	1.37
4/8/2016	15:20:34 252msec	1.36	1.38	1.37

Date	Time	%THD V L1N Max	%THD V L2N Max	%THD V L3N Max
4/8/2016	15:20:44 252msec	1.36	1.38	1.37
4/8/2016	15:20:54 252msec	1.35	1.36	1.36
4/8/2016	15:21:04 252msec	1.35	1.36	1.36
4/8/2016	15:21:14 252msec	1.35	1.36	1.36
4/8/2016	15:21:24 252msec	1.35	1.36	1.36
4/8/2016	15:21:34 252msec	1.33	1.36	1.37
4/8/2016	15:21:44 252msec	1.34	1.36	1.36
4/8/2016	15:21:54 252msec	1.34	1.35	1.35
4/8/2016	15:22:04 252msec	1.34	1.35	1.35
4/8/2016	15:22:14 252msec	1.34	1.36	1.35
4/8/2016	15:22:34 252msec	1.37	1.38	1.38
4/8/2016	15:22:44 252msec	1.36	1.38	1.37
4/8/2016	15:22:54 252msec	1.35	1.37	1.37
4/8/2016	15:23:04 252msec	1.37	1.37	1.37

Date	Time	%THD V L1N Max	%THD V L2N Max	%THD V L3N Max
4/8/2016	15:23:14 252msec	1.35	1.36	1.36
4/8/2016	15:23:24 252msec	1.35	1.36	1.35
4/8/2016	15:23:34 252msec	1.34	1.35	1.35
4/8/2016	15:23:44 252msec	1.34	1.35	1.35
4/8/2016	15:23:54 252msec	1.34	1.35	1.34
4/8/2016	15:24:04 252msec	1.34	1.35	1.35
4/8/2016	15:24:14 252msec	1.34	1.35	1.35
4/8/2016	15:24:24 252msec	1.35	1.36	1.35
4/8/2016	15:24:34 252msec	1.33	1.35	1.34
4/8/2016	15:24:44 252msec	1.35	1.37	1.37
4/8/2016	15:24:54 252msec	1.35	1.36	1.36
4/8/2016	15:25:04 252msec	1.34	1.36	1.35
4/8/2016	15:25:14 252msec	1.34	1.35	1.35
4/8/2016	15:25:24 252msec	1.34	1.35	1.35

Date	Time	%THD V L1N Max	%THD V L2N Max	%THD V L3N Max
4/8/2016	15:25:34 252msec	1.34	1.35	1.37
4/8/2016	15:25:44 252msec	1.35	1.36	1.35
4/8/2016	15:25:54 252msec	1.34	1.36	1.35
4/8/2016	15:26:04 252msec	1.36	1.36	1.38
4/8/2016	15:26:14 252msec	1.36	1.38	1.38
4/8/2016	15:26:24 252msec	1.34	1.36	1.35
4/8/2016	15:26:34 252msec	1.35	1.37	1.35
4/8/2016	15:26:44 252msec	1.35	1.37	1.36
4/8/2016	15:26:54 252msec	1.34	1.37	1.35
4/8/2016	15:27:14 252msec	1.35	1.36	1.35
4/8/2016	15:27:24 252msec	1.35	1.37	1.36
4/8/2016	15:27:34 252msec	1.34	1.35	1.35
4/8/2016	15:27:44 252msec	1.34	1.35	1.35
4/8/2016	15:27:54 252msec	1.34	1.35	1.35

Date	Time	%THD V L1N Max	%THD V L2N Max	%THD V L3N Max
4/8/2016	15:28:04 252msec	1.34	1.35	1.35
4/8/2016	15:28:14 252msec	1.35	1.36	1.36
4/8/2016	15:28:24 252msec	1.35	1.36	1.35
4/8/2016	15:28:34 252msec	1.35	1.37	1.36
4/8/2016	15:28:44 252msec	1.35	1.36	1.36
4/8/2016	15:28:54 252msec	1.35	1.36	1.36
4/8/2016	15:29:04 252msec	1.35	1.35	1.35
4/8/2016	15:29:14 252msec	1.33	1.35	1.35
4/8/2016	15:29:24 252msec	1.35	1.36	1.35
4/8/2016	15:29:34 252msec	1.35	1.36	1.35
4/8/2016	15:29:44 252msec	1.35	1.37	1.35
4/8/2016	15:29:54 252msec	1.34	1.36	1.35
4/8/2016	15:30:04 252msec	1.36	1.37	1.36
4/8/2016	15:30:14 252msec	1.36	1.37	1.36

Date	Time	%THD V L1N Max	%THD V L2N Max	%THD V L3N Max
4/8/2016	15:30:24 252msec	1.36	1.37	1.36
4/8/2016	15:30:34 252msec	1.36	1.37	1.36
4/8/2016	15:30:44 252msec	1.37	1.38	1.37
4/8/2016	15:30:54 252msec	1.36	1.37	1.36
4/8/2016	15:31:04 252msec	1.36	1.37	1.36
4/8/2016	15:31:14 252msec	1.36	1.37	1.36
4/8/2016	15:31:24 252msec	1.34	1.35	1.35
4/8/2016	15:31:34 252msec	1.34	1.35	1.34
4/8/2016	15:31:54 252msec	1.36	1.37	1.36
4/8/2016	15:32:04 252msec	1.35	1.36	1.36
4/8/2016	15:32:14 252msec	1.36	1.37	1.35
4/8/2016	15:32:24 252msec	1.36	1.37	1.36
4/8/2016	15:32:34 252msec	1.35	1.37	1.35
4/8/2016	15:32:44 252msec	1.36	1.37	1.35

Date	Time	%THD V L1N Max	%THD V L2N Max	%THD V L3N Max
4/8/2016	15:32:54 252msec	1.36	1.37	1.36
4/8/2016	15:33:04 252msec	1.36	1.37	1.36
4/8/2016	15:33:14 252msec	1.35	1.36	1.35
4/8/2016	15:33:24 252msec	1.35	1.36	1.35
4/8/2016	15:33:34 252msec	1.34	1.36	1.35
4/8/2016	15:33:44 252msec	1.35	1.35	1.35
4/8/2016	15:33:54 252msec	1.36	1.37	1.36
4/8/2016	15:34:04 252msec	1.35	1.36	1.35
4/8/2016	15:34:14 252msec	1.35	1.36	1.35
4/8/2016	15:34:24 252msec	1.36	1.37	1.36
4/8/2016	15:34:34 252msec	1.37	1.38	1.37
4/8/2016	15:34:44 252msec	1.36	1.38	1.37
4/8/2016	15:34:54 252msec	1.36	1.38	1.37
4/8/2016	15:35:04 252msec	1.38	1.4	1.38

Date	Time	%THD V L1N Max	%THD V L2N Max	%THD V L3N Max
4/8/2016	15:35:14 252msec	1.38	1.4	1.39
4/8/2016	15:35:24 252msec	1.39	1.41	1.4
4/8/2016	15:35:34 252msec	1.39	1.4	1.39
4/8/2016	15:35:44 252msec	1.38	1.4	1.38
4/8/2016	15:35:54 252msec	1.37	1.38	1.37
4/8/2016	15:36:04 252msec	1.37	1.38	1.37
4/8/2016	15:36:14 252msec	1.37	1.37	1.36
4/8/2016	15:36:34 252msec	1.32	1.32	1.31
4/8/2016	15:36:44 252msec	1.32	1.33	1.31
4/8/2016	15:36:54 252msec	1.32	1.32	1.3
4/8/2016	15:37:04 252msec	1.32	1.33	1.31
4/8/2016	15:37:14 252msec	1.32	1.32	1.3
4/8/2016	15:37:24 252msec	1.31	1.32	1.31
4/8/2016	15:37:34 252msec	1.33	1.33	1.32

Date	Time	%THD V L1N Max	%THD V L2N Max	%THD V L3N Max
4/8/2016	15:37:44 252msec	1.32	1.32	1.32
4/8/2016	15:37:54 252msec	1.32	1.32	1.31
4/8/2016	15:38:04 252msec	1.34	1.34	1.33
4/8/2016	15:38:14 252msec	1.34	1.34	1.32
4/8/2016	15:38:24 252msec	1.35	1.35	1.36
4/8/2016	15:38:34 252msec	1.33	1.34	1.34
4/8/2016	15:38:44 252msec	1.33	1.34	1.33
4/8/2016	15:38:54 252msec	1.33	1.34	1.32
4/8/2016	15:39:04 252msec	1.33	1.34	1.32
4/8/2016	15:39:14 252msec	1.33	1.34	1.32
4/8/2016	15:39:24 252msec	1.32	1.33	1.32
4/8/2016	15:39:34 252msec	1.31	1.32	1.31
4/8/2016	15:39:44 252msec	1.3	1.31	1.3
4/8/2016	15:39:54 252msec	1.32	1.34	1.33

Date	Time	%THD V L1N Max	%THD V L2N Max	%THD V L3N Max
4/8/2016	15:40:04 252msec	1.34	1.34	1.33
4/8/2016	15:40:14 252msec	1.32	1.33	1.32
4/8/2016	15:40:24 252msec	1.32	1.33	1.31
4/8/2016	15:40:34 252msec	1.32	1.32	1.32
4/8/2016	15:40:44 252msec	1.31	1.32	1.3
4/8/2016	15:40:54 252msec	1.31	1.33	1.31
4/8/2016	15:41:14 252msec	1.31	1.32	1.31
4/8/2016	15:41:24 252msec	1.33	1.34	1.33
4/8/2016	15:41:34 252msec	1.31	1.32	1.31
4/8/2016	15:41:44 252msec	1.3	1.32	1.29
4/8/2016	15:41:54 252msec	1.3	1.32	1.3
4/8/2016	15:42:04 252msec	1.3	1.32	1.3
4/8/2016	15:42:14 252msec	1.29	1.31	1.29
4/8/2016	15:42:24 252msec	1.29	1.3	1.29

Date	Time	%THD V L1N Max	%THD V L2N Max	%THD V L3N Max
4/8/2016	15:42:34 252msec	1.28	1.29	1.29
4/8/2016	15:42:44 252msec	1.29	1.32	1.3
4/8/2016	15:42:54 252msec	1.3	1.32	1.31
4/8/2016	15:43:04 252msec	1.3	1.31	1.3
4/8/2016	15:43:14 252msec	1.3	1.32	1.3
4/8/2016	15:43:24 252msec	1.29	1.31	1.3
4/8/2016	15:43:34 252msec	1.28	1.3	1.29
4/8/2016	15:43:44 252msec	1.28	1.29	1.29
4/8/2016	15:43:54 252msec	1.3	1.31	1.32
4/8/2016	15:44:04 252msec	1.32	1.33	1.32
4/8/2016	15:44:14 252msec	1.3	1.31	1.32
4/8/2016	15:44:24 252msec	1.31	1.33	1.34
4/8/2016	15:44:34 252msec	1.31	1.34	1.33
4/8/2016	15:44:44 252msec	1.31	1.33	1.34

Date	Time	%THD V L1N Max	%THD V L2N Max	%THD V L3N Max
4/8/2016	15:44:54 252msec	1.32	1.33	1.33
4/8/2016	15:45:04 252msec	1.3	1.32	1.32
4/8/2016	15:45:14 252msec	1.3	1.32	1.31
4/8/2016	15:45:24 252msec	1.3	1.32	1.31
4/8/2016	15:45:34 252msec	1.3	1.31	1.32
4/8/2016	15:45:54 252msec	1.3	1.31	1.3
4/8/2016	15:46:04 252msec	1.29	1.31	1.31
4/8/2016	15:46:14 252msec	1.3	1.32	1.32
4/8/2016	15:46:24 252msec	1.3	1.31	1.32
4/8/2016	15:46:34 252msec	1.3	1.31	1.31
4/8/2016	15:46:44 252msec	1.29	1.31	1.32
4/8/2016	15:46:54 252msec	1.31	1.31	1.32
4/8/2016	15:47:04 252msec	1.31	1.32	1.33
4/8/2016	15:47:14 252msec	1.33	1.34	1.34

Date	Time	%THD V L1N Max	%THD V L2N Max	%THD V L3N Max
4/8/2016	15:47:24 252msec	1.33	1.34	1.34
4/8/2016	15:47:34 252msec	1.33	1.34	1.34
4/8/2016	15:47:44 252msec	1.32	1.33	1.33
4/8/2016	15:47:54 252msec	1.32	1.33	1.33
4/8/2016	15:48:04 252msec	1.31	1.33	1.32
4/8/2016	15:48:14 252msec	1.3	1.32	1.31
4/8/2016	15:48:24 252msec	1.3	1.32	1.31
4/8/2016	15:48:34 252msec	1.3	1.32	1.31

Instrument Information

Model Number FLUKE 430-II
Serial Number 24933105
Firmware Revision V04.00

Software Information

Power Log Version 4.0.2
FLUKE 345 DLL Version 11.20.2006
FLUKE 430 DLL Version 1.8.0.0
FLUKE 430-II DLL Version 1.0.0.19

General Information

Recording location
Client
Notes

Measurement Summary

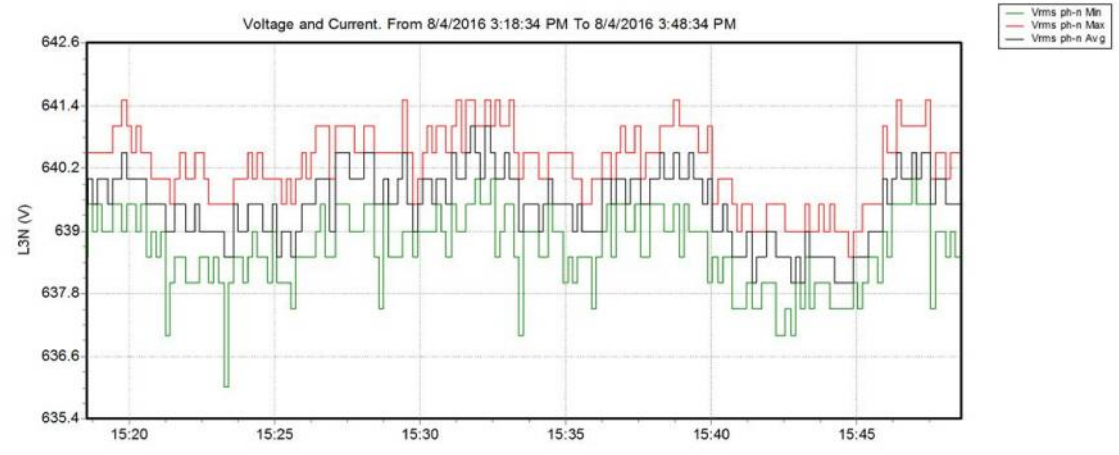
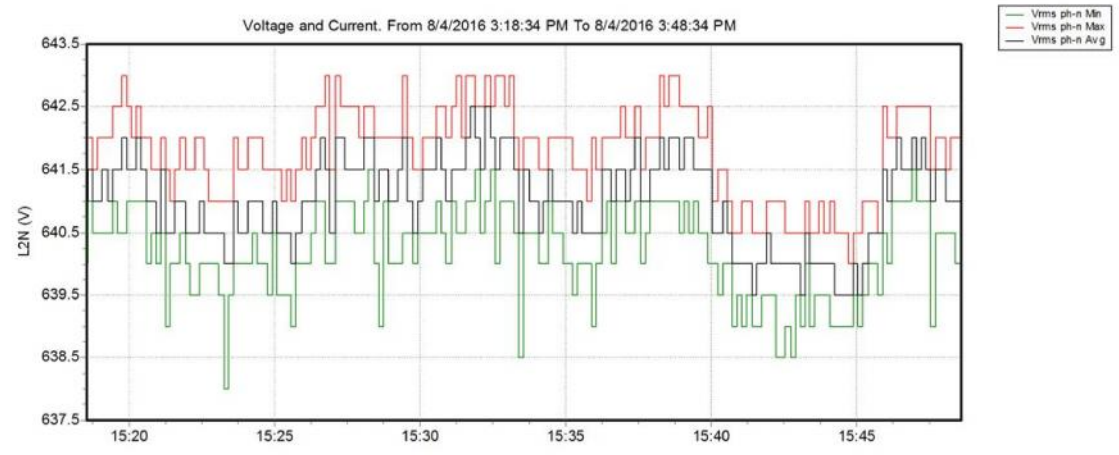
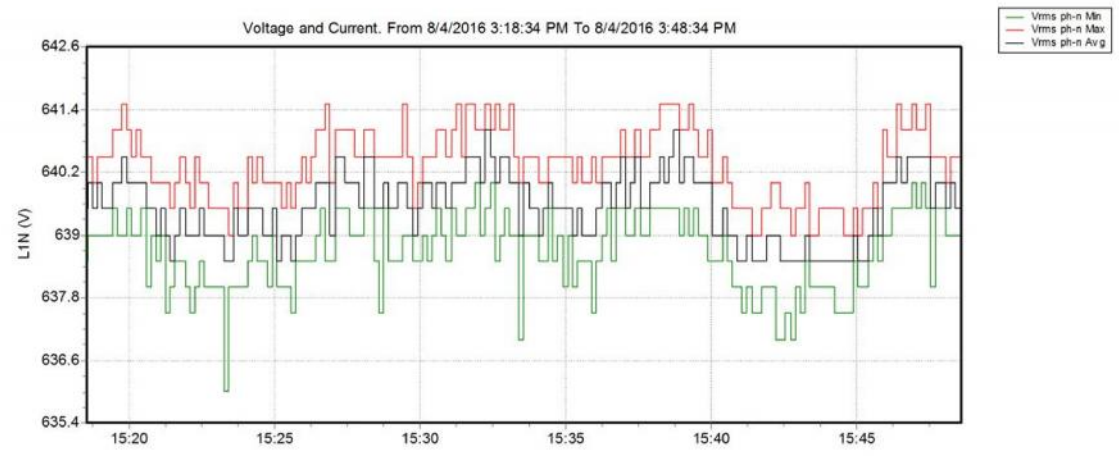
Measurement topology	Wye mode
Application mode	Harmonics
First recording	8/4/2016 3:18:34 PM
Last recording	8/4/2016 3:48:34 PM
Recording interval	0h 0m 10s 0msec
Nominal Voltage	660 V
Nominal Current	400 A
Nominal Frequency	50 Hz
File start time	8/4/2016 3:18:34 PM
File end time	8/4/2016 3:48:34 PM
Duration	0d 0h 30m 0s 0msec
Number of events	0
Events downloaded	Yes
Number of screens	0
Screens downloaded	No
Power measurement method	Unified
Cable type	Copper
Harmonic scale	%H1
THD mode	THD 40
CosPhi / DPF mode	Cos Phi

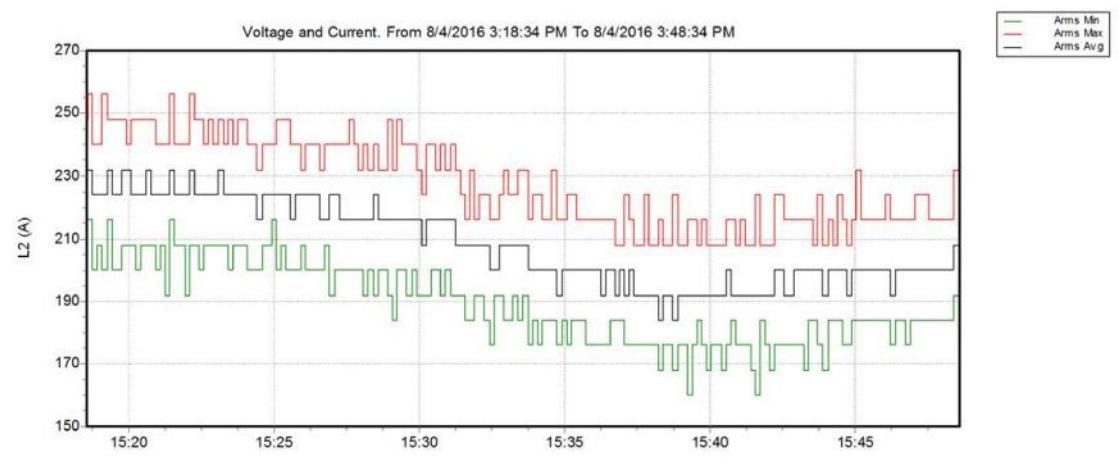
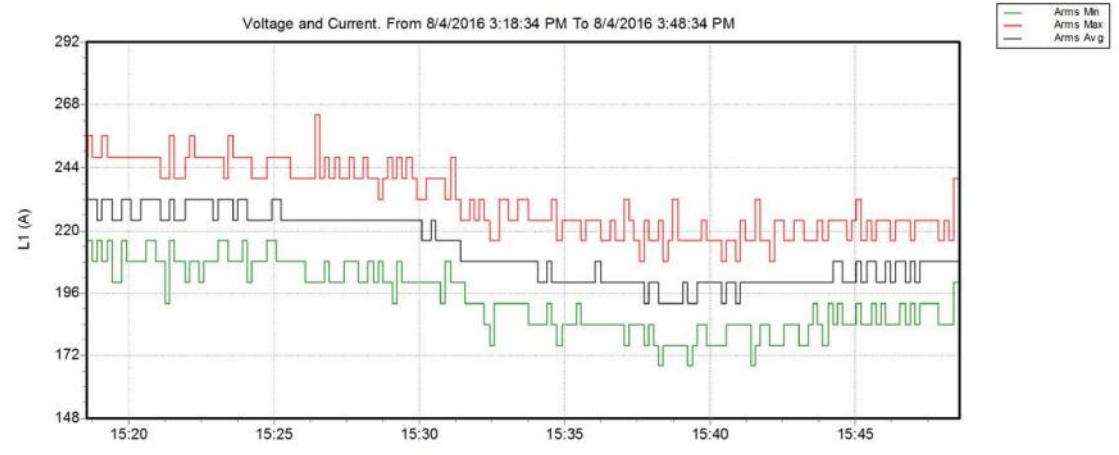
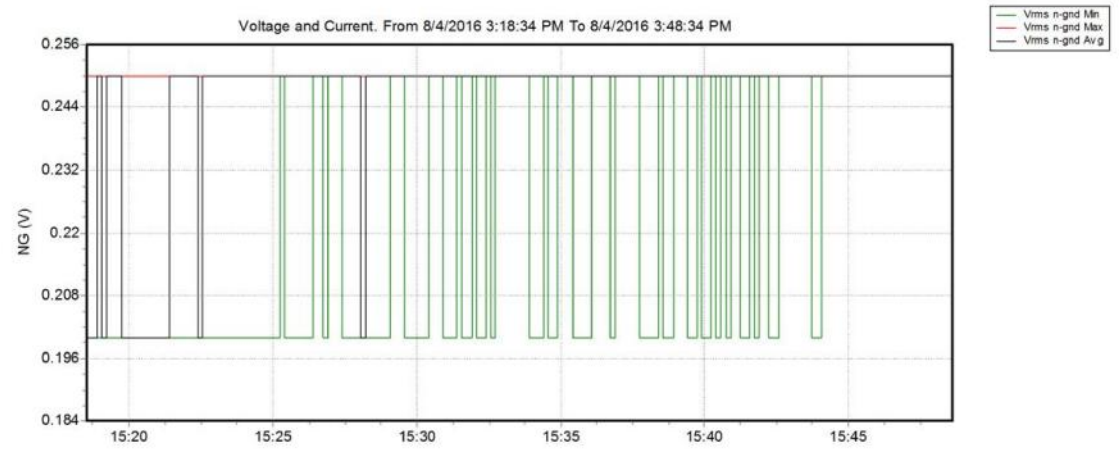
Recording Summary

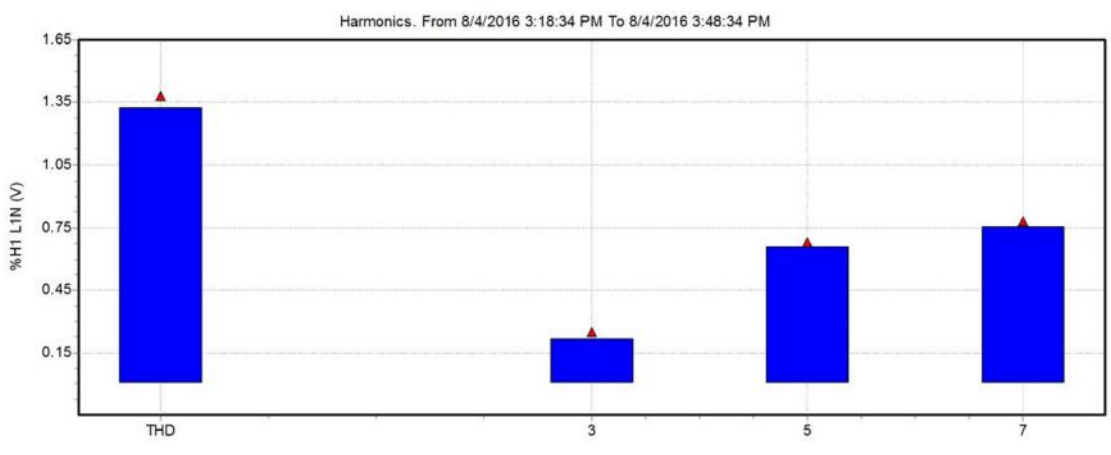
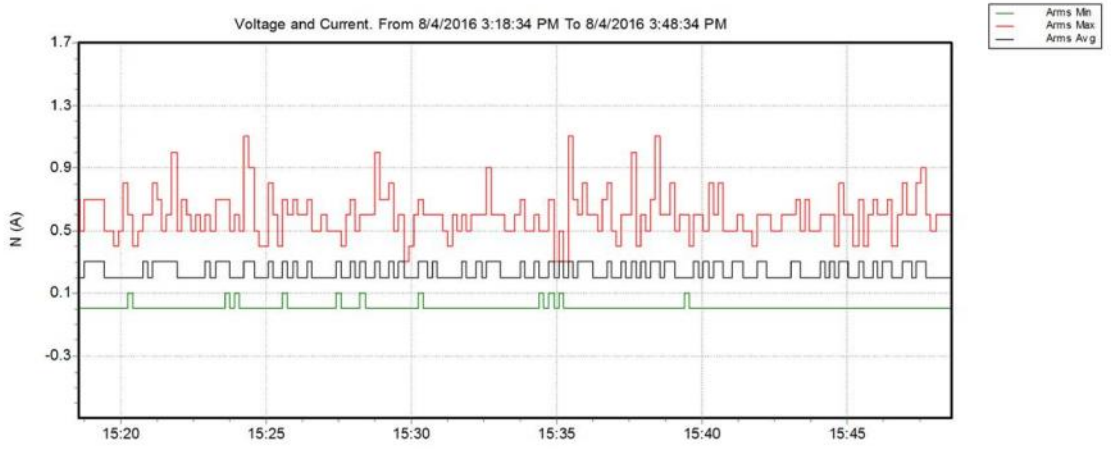
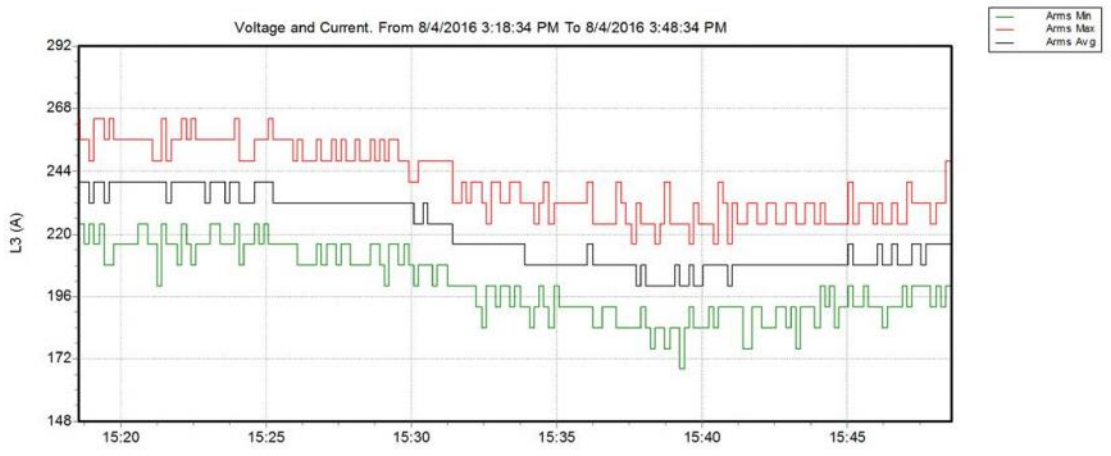
RMS recordings	181
DC recordings	0
Frequency recordings	181
Unbalance recordings	0
Harmonic recordings	181
Power harmonic recordings	181
Power recordings	0
Power unbalance recordings	0
Energy recordings	0
Energy losses recordings	0
Flicker recordings	0
Mains signaling recordings	0

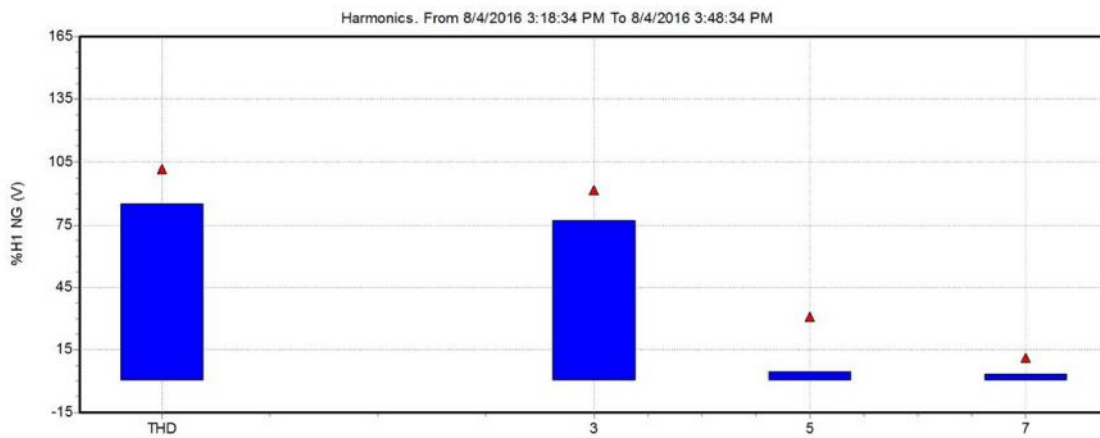
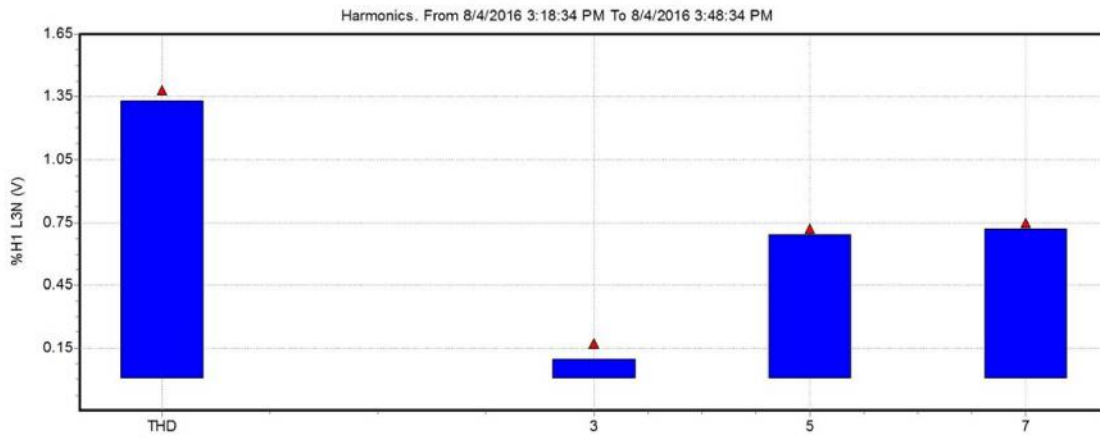
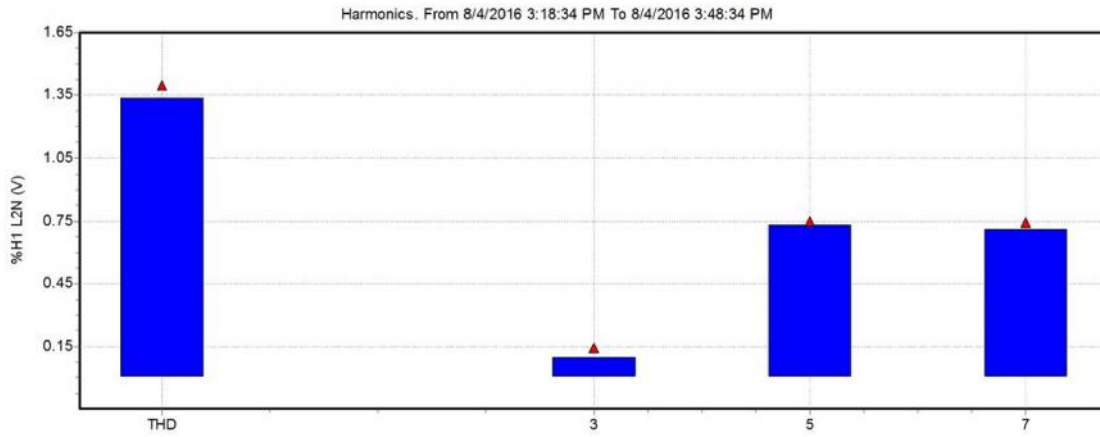
Events Summary

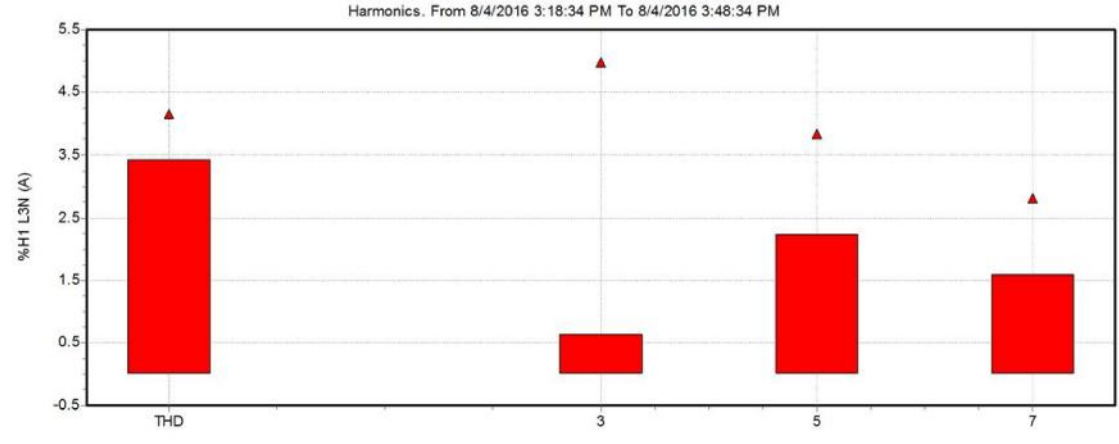
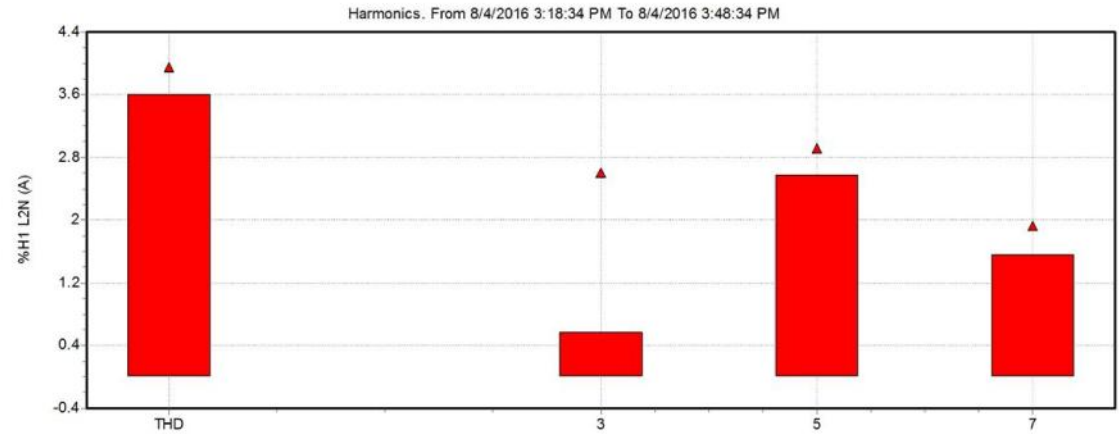
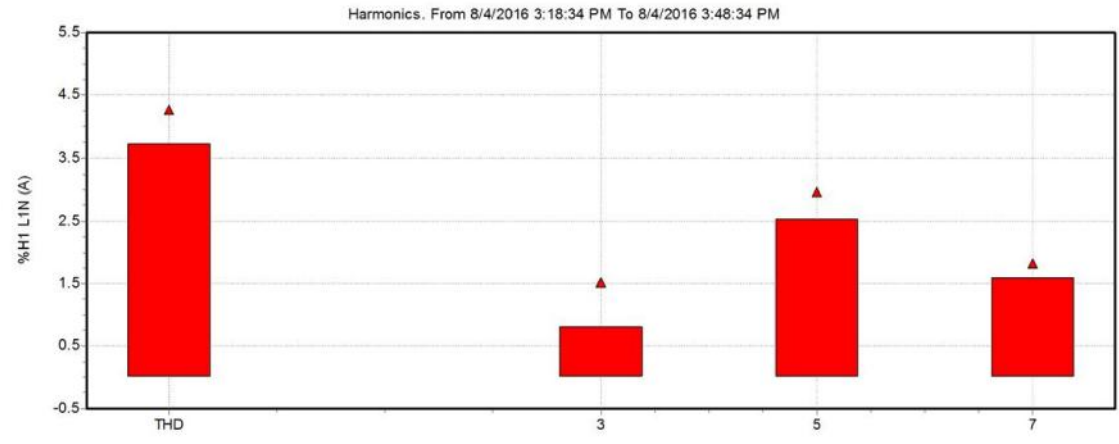
Dips	0
Swells	0
Transients	0
Interruptions	0
Voltage profiles	0
Rapid voltage changes	0
Screens	0
Waveforms	0
Intervals without measurements	0
Inrush current graphics	0
Wave events	0
RMS events	0

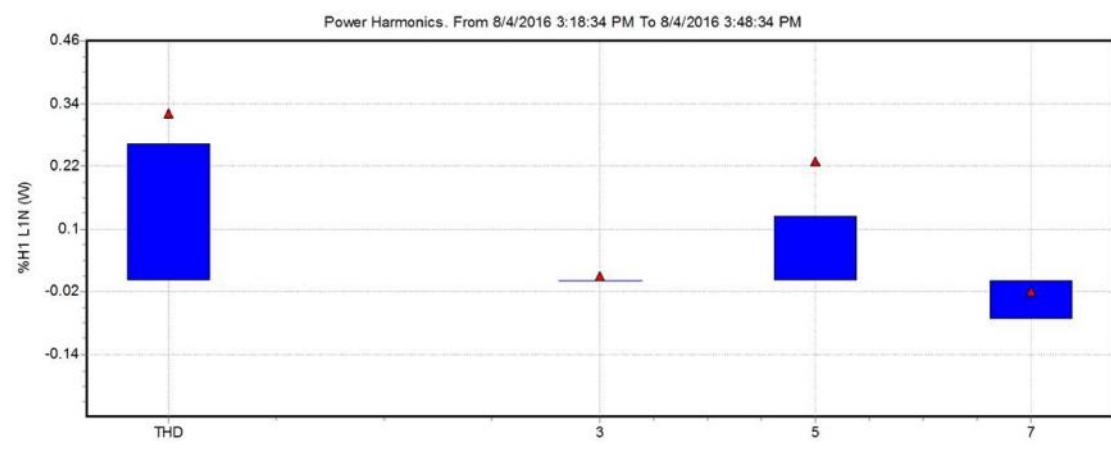
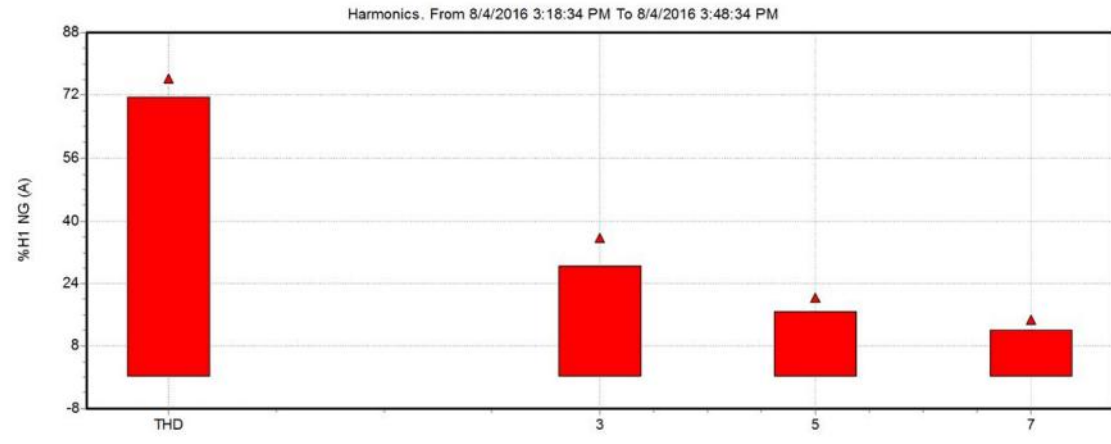


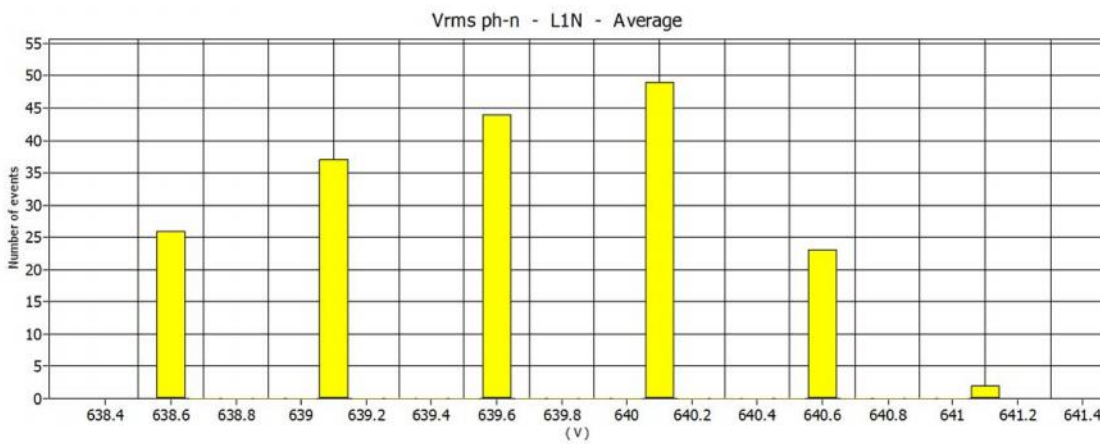
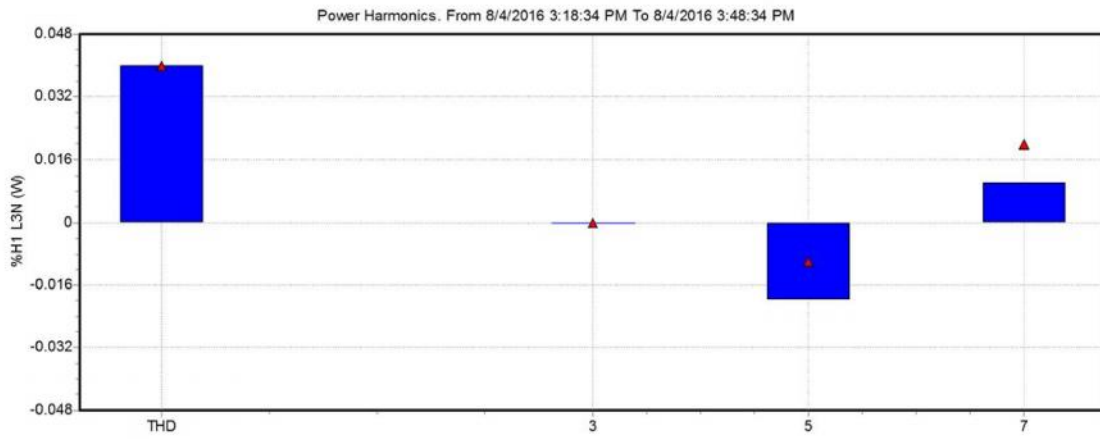
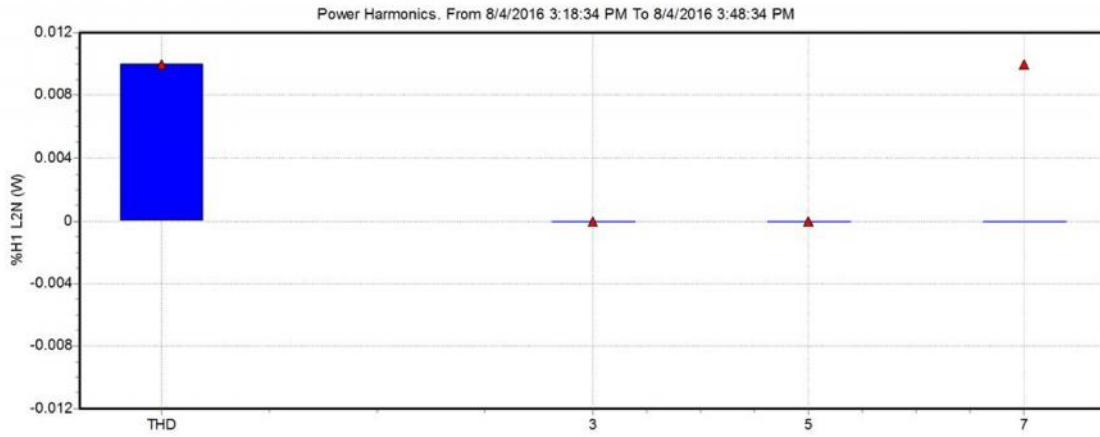












Instrument Information

Model Number FLUKE 430-II
Serial Number 24933105
Firmware Revision V04.00

Software Information

Power Log Version 4.0.2
FLUKE 345 DLL Version 11.20.2006
FLUKE 430 DLL Version 1.8.0.0
FLUKE 430-II DLL Version 1.0.0.19

General Information

Recording location
Client
Notes

Measurement Summary

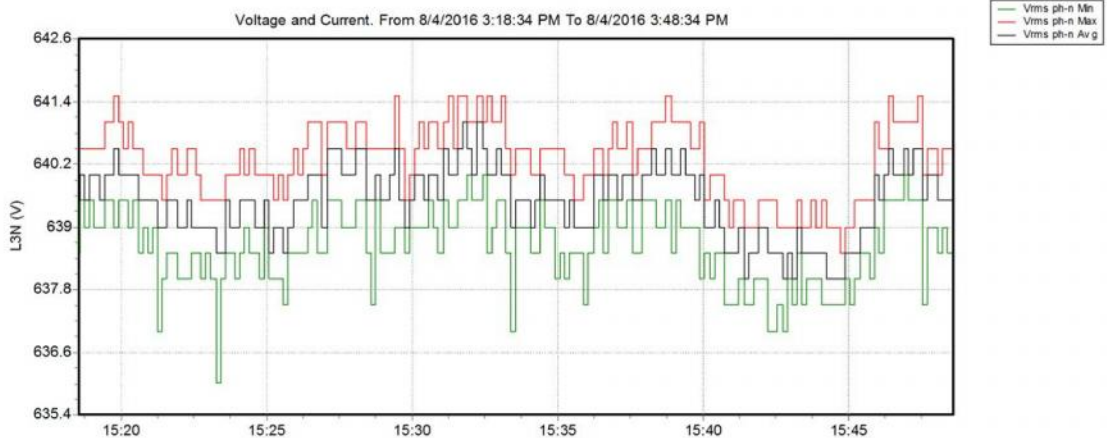
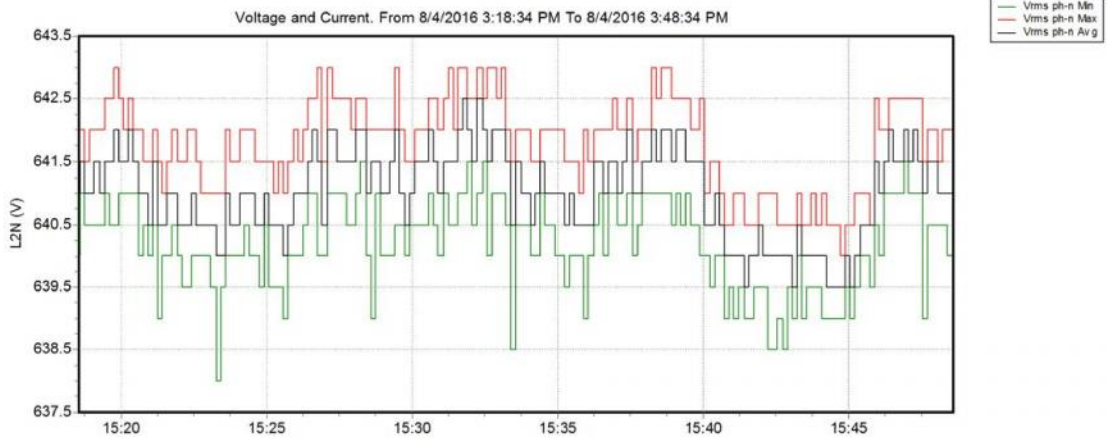
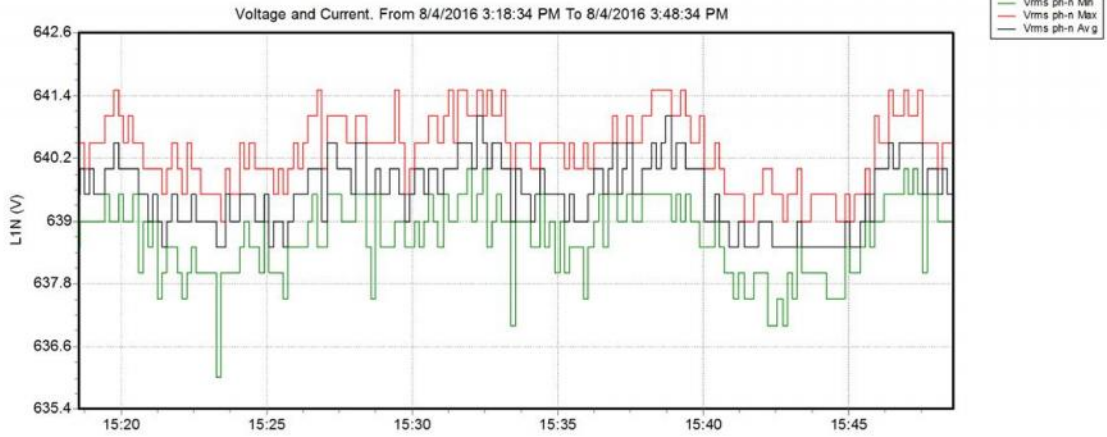
Measurement topology	Wye mode
Application mode	Harmonics
First recording	8/4/2016 3:18:34 PM
Last recording	8/4/2016 3:48:34 PM
Recording interval	0h 0m 10s 0msec
Nominal Voltage	660 V
Nominal Current	400 A
Nominal Frequency	50 Hz
File start time	8/4/2016 3:18:34 PM
File end time	8/4/2016 3:48:34 PM
Duration	0d 0h 30m 0s 0msec
Number of events	0
Events downloaded	Yes
Number of screens	0
Screens downloaded	No
Power measurement method	Unified
Cable type	Copper
Harmonic scale	%H1
THD mode	THD 40
CosPhi / DPF mode	Cos Phi

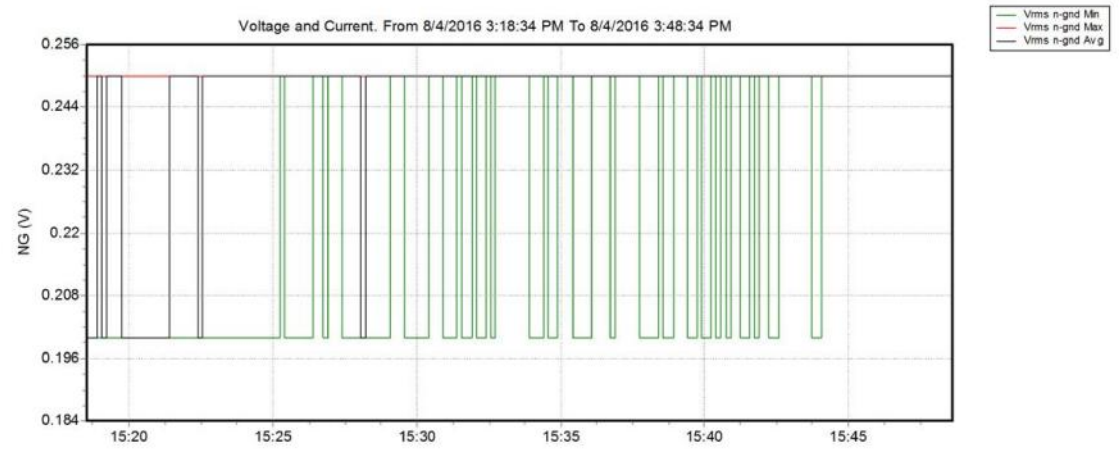
Recording Summary

RMS recordings	181
DC recordings	0
Frequency recordings	181
Unbalance recordings	0
Harmonic recordings	181
Power harmonic recordings	181
Power recordings	0
Power unbalance recordings	0
Energy recordings	0
Energy losses recordings	0
Flicker recordings	0
Mains signaling recordings	0

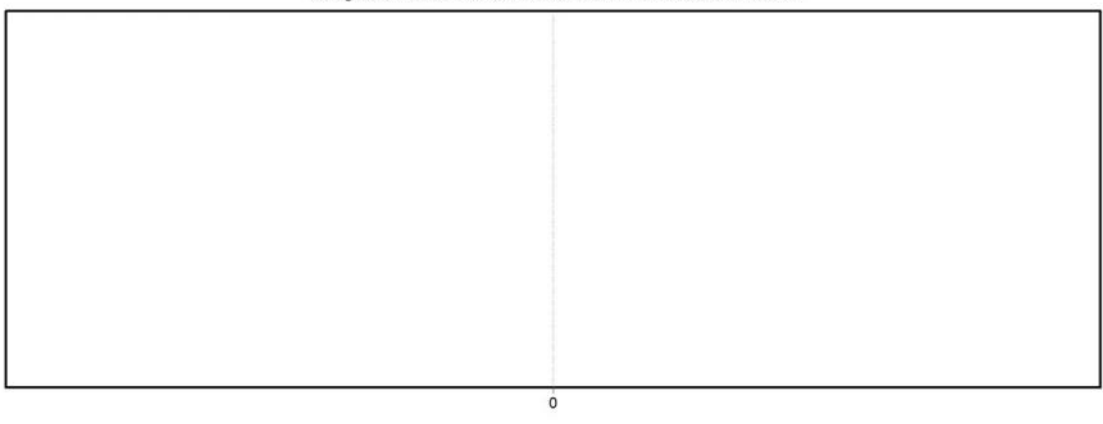
Events Summary

Dips	0
Swells	0
Transients	0
Interruptions	0
Voltage profiles	0
Rapid voltage changes	0
Screens	0
Waveforms	0
Intervals without measurements	0
Inrush current graphics	0
Wave events	0
RMS events	0

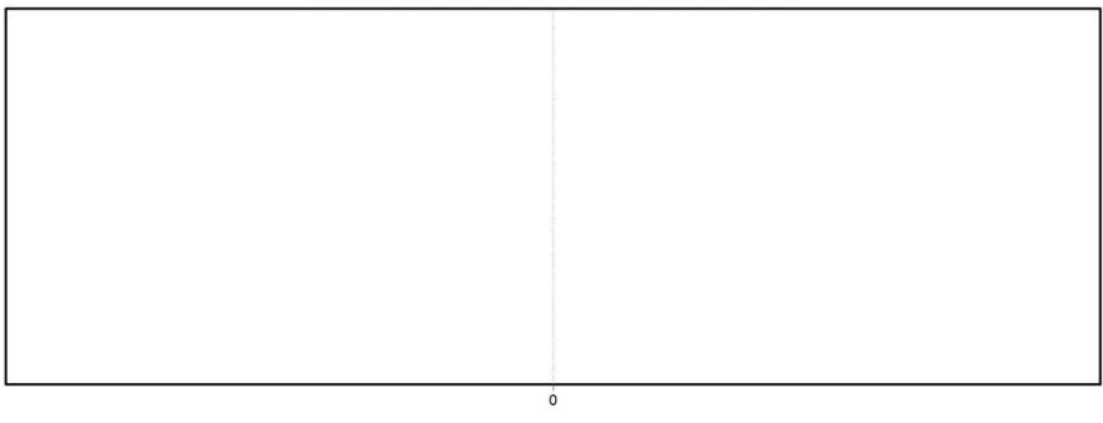




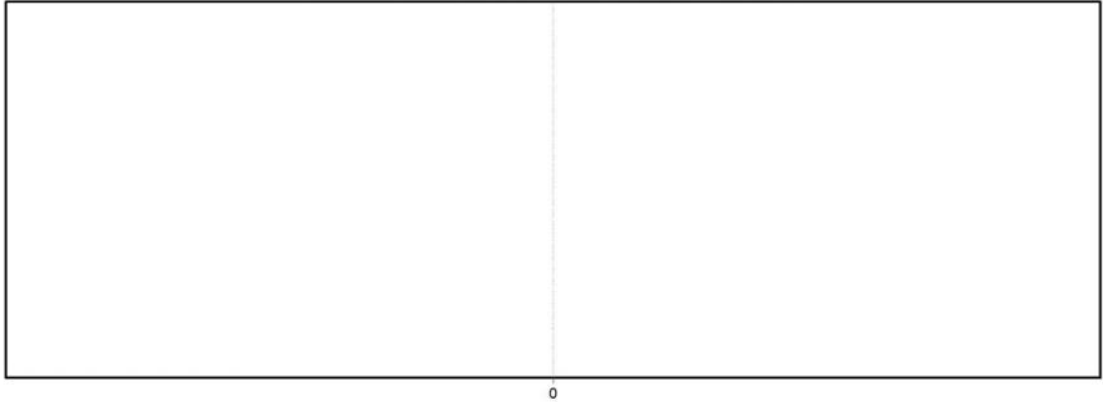
Voltage and Current. From 8/4/2016 3:18:34 PM To 8/4/2016 3:48:34 PM



Voltage and Current. From 8/4/2016 3:18:34 PM To 8/4/2016 3:48:34 PM

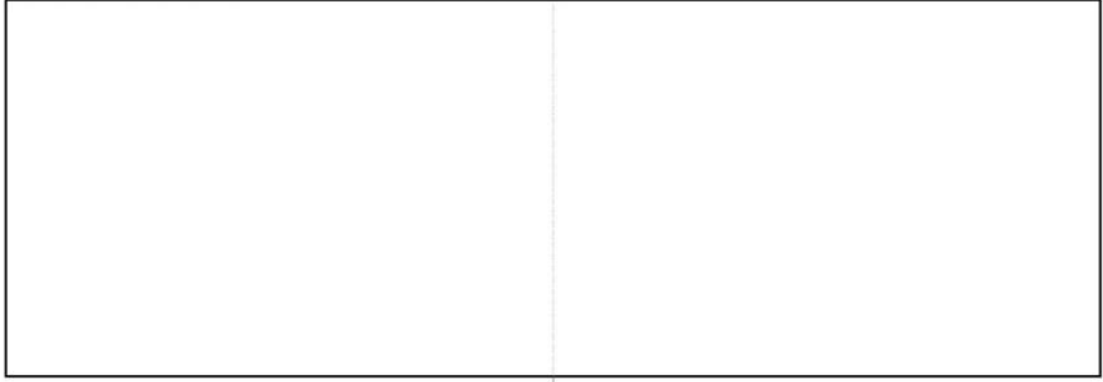


Voltage and Current. From 8/4/2016 3:18:34 PM To 8/4/2016 3:48:34 PM



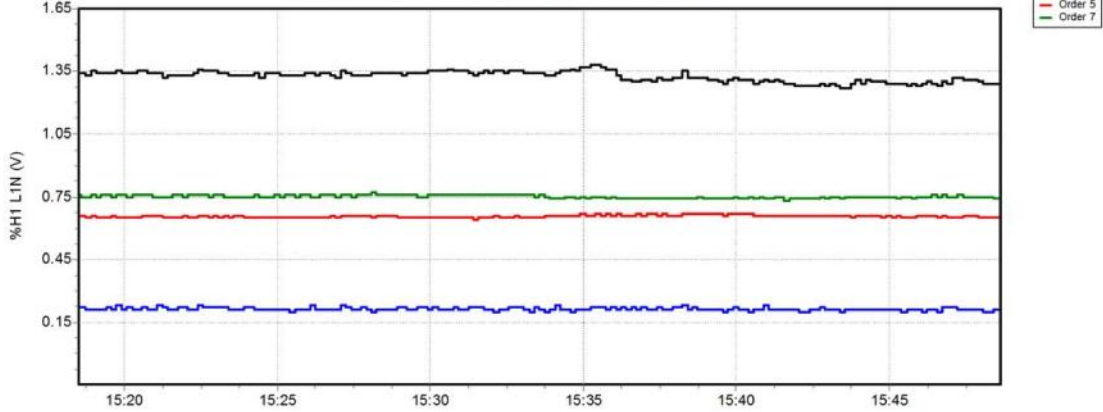
0

Voltage and Current. From 8/4/2016 3:18:34 PM To 8/4/2016 3:48:34 PM

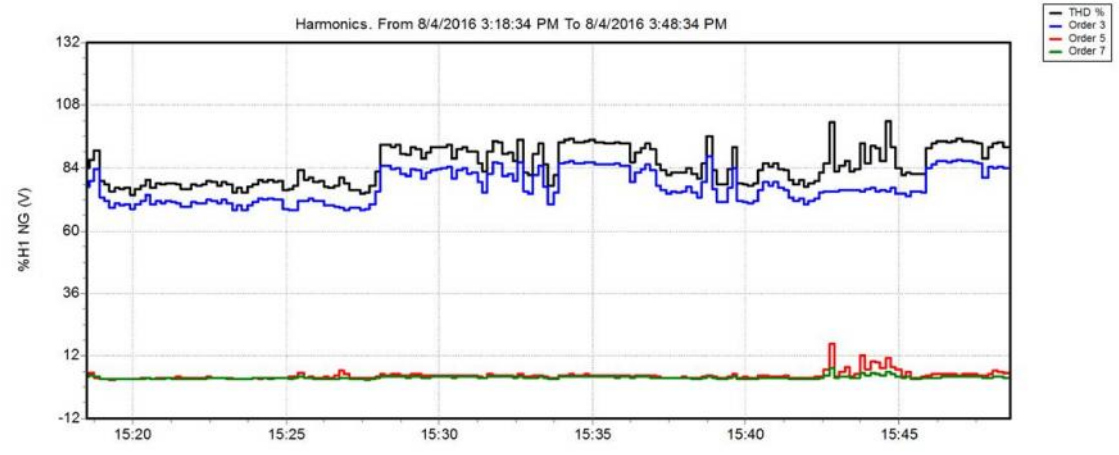
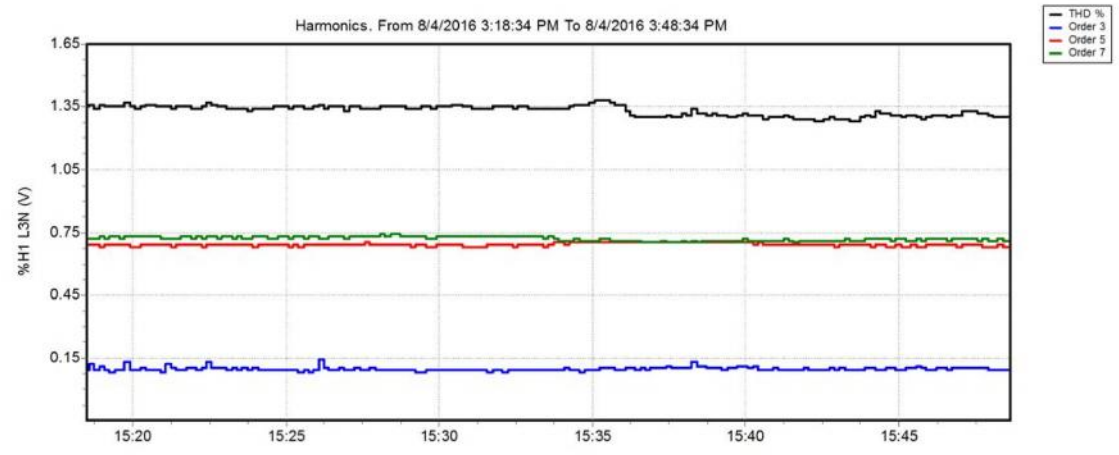
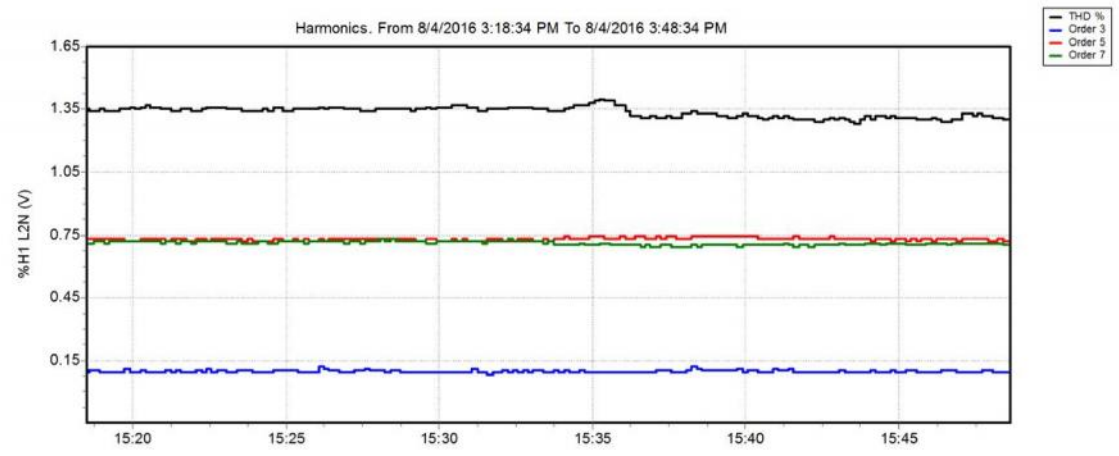


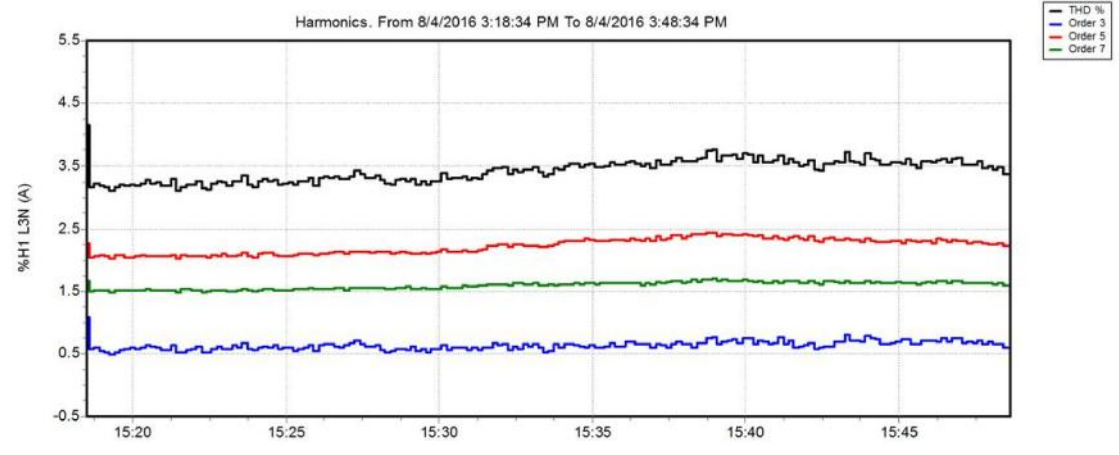
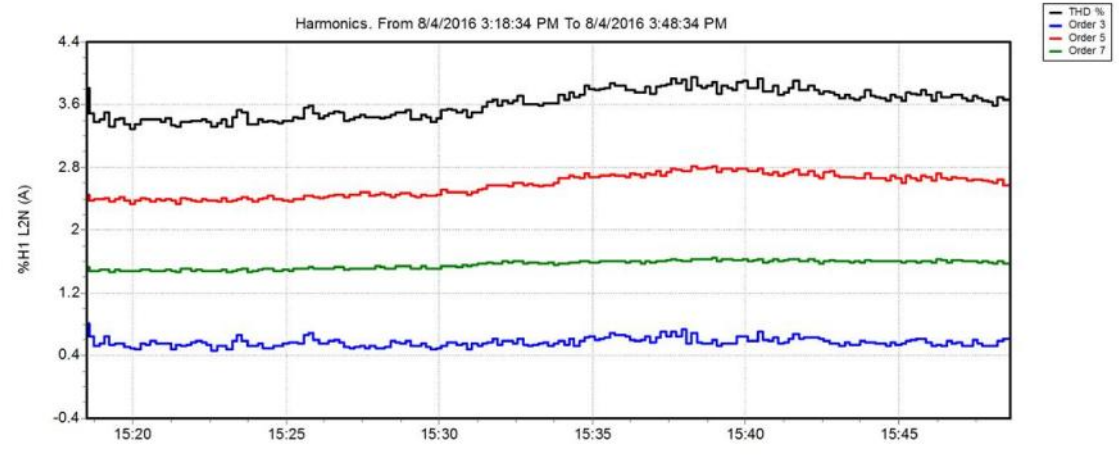
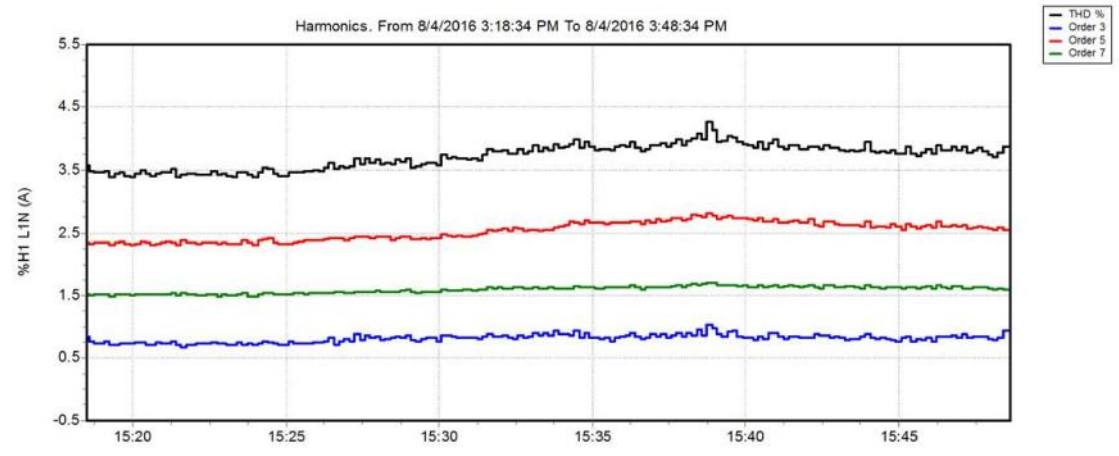
0

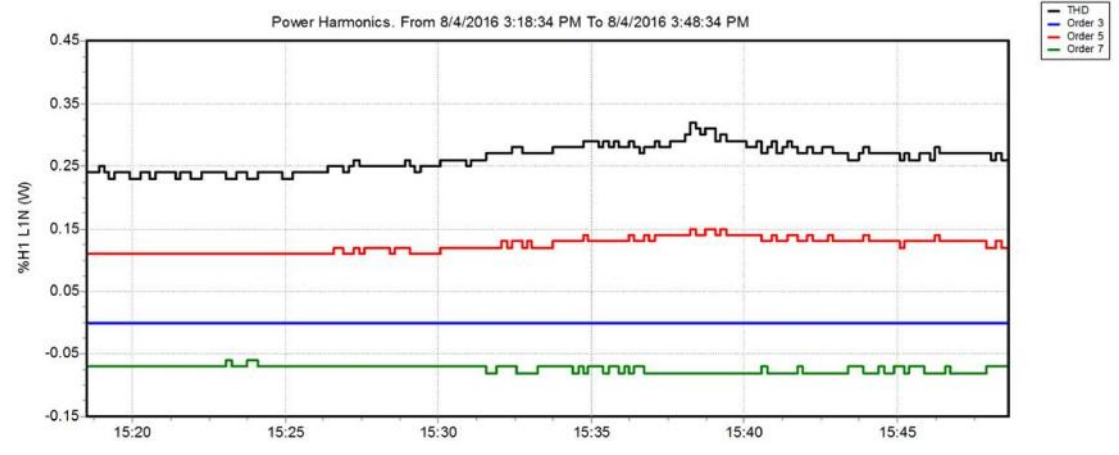
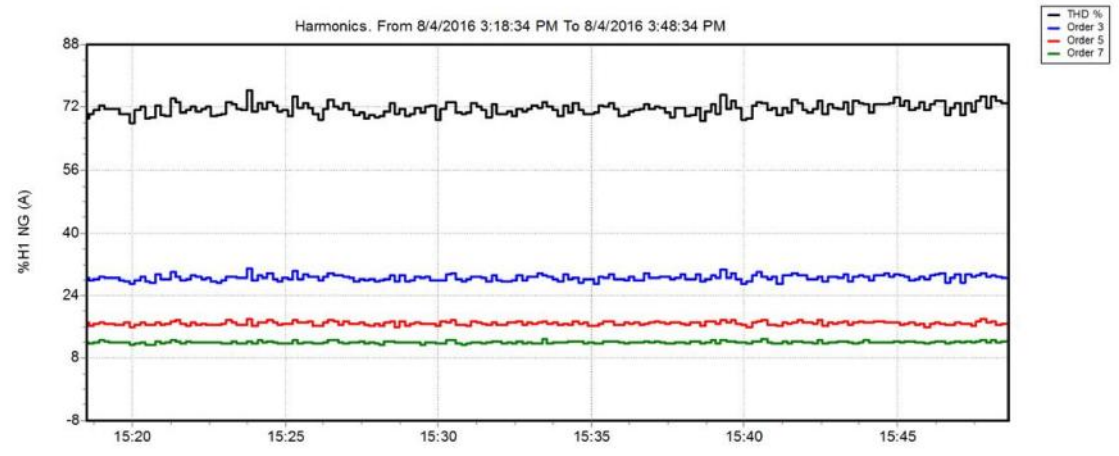
Harmonics. From 8/4/2016 3:18:34 PM To 8/4/2016 3:48:34 PM

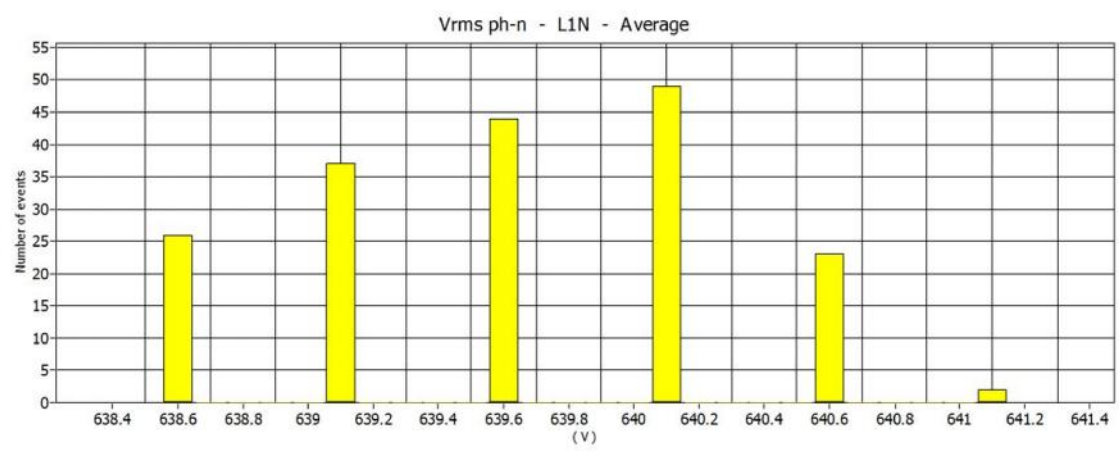
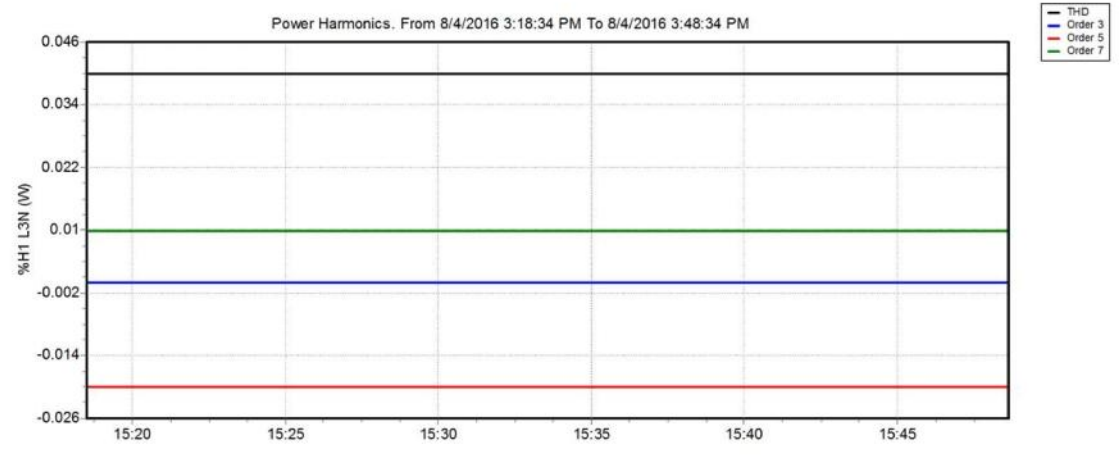


THD %
Order 3
Order 5
Order 7









Instrument Information

Model Number FLUKE 430-II
Serial Number 24933105
Firmware Revision V04.00

Software Information

Power Log Version 4.0.2
FLUKE 345 DLL Version 11.20.2006
FLUKE 430 DLL Version 1.8.0.0
FLUKE 430-II DLL Version 1.0.0.19

General Information

Recording location
Client
Notes

Measurement Summary

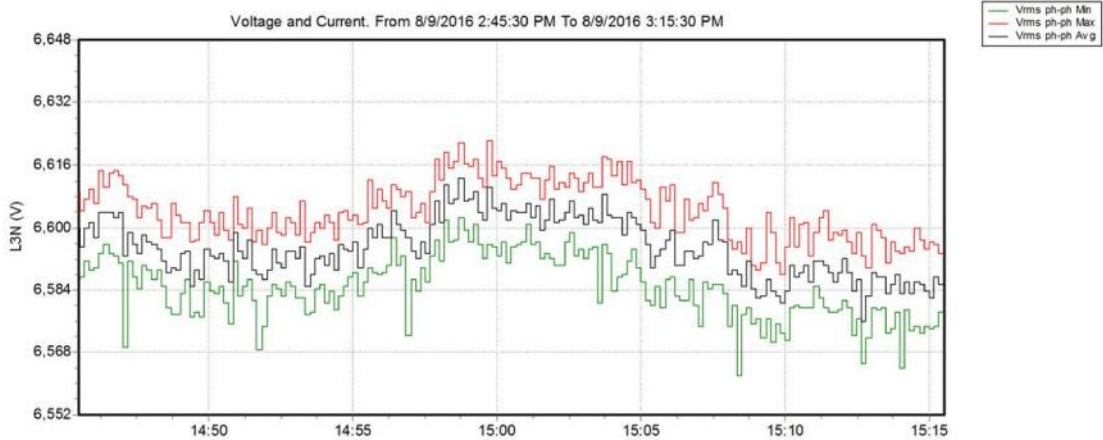
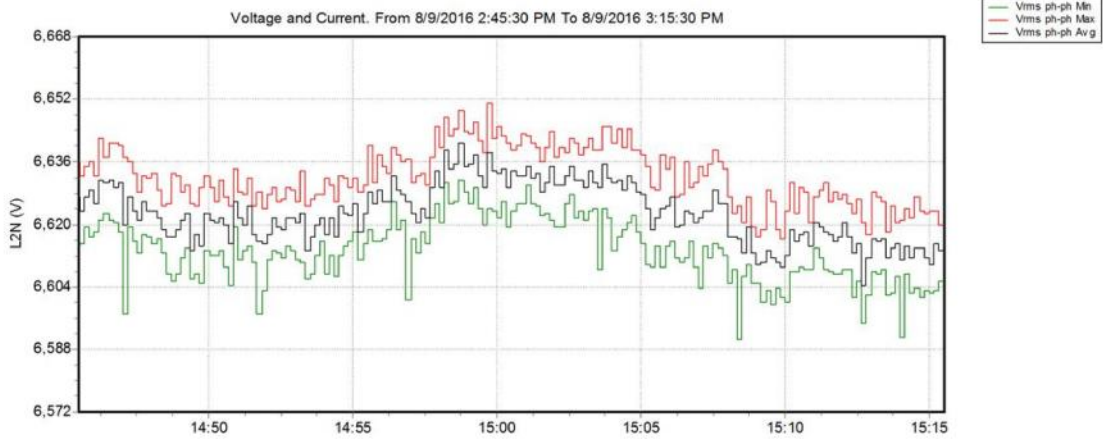
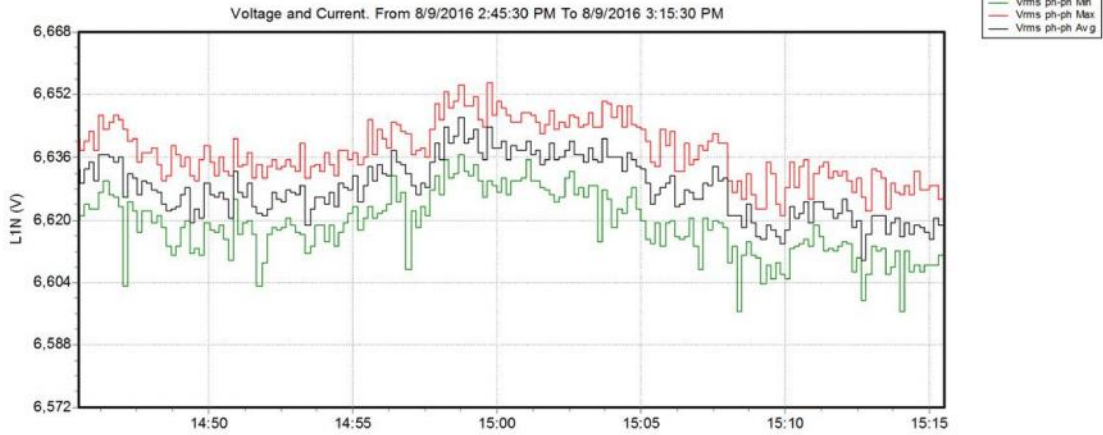
Measurement topology	3-element delta mode
Application mode	Harmonics
First recording	8/9/2016 2:45:30 PM
Last recording	8/9/2016 3:15:30 PM
Recording interval	0h 0m 10s 0msec
Nominal Voltage	110 V
Nominal Current	400 A
Nominal Frequency	50 Hz
File start time	8/9/2016 2:45:30 PM
File end time	8/9/2016 3:15:30 PM
Duration	0d 0h 30m 0s 0msec
Number of events	0
Events downloaded	Yes
Number of screens	0
Screens downloaded	Yes
Power measurement method	IEEE
Cable type	Copper
Harmonic scale	%H1
THD mode	THD 40
CosPhi / DPF mode	Cos Phi

Recording Summary

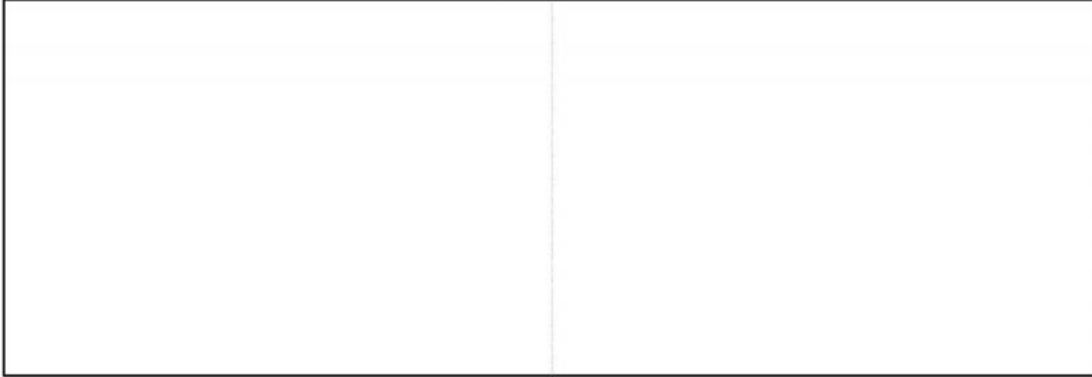
RMS recordings	181
DC recordings	0
Frequency recordings	181
Unbalance recordings	0
Harmonic recordings	181
Power harmonic recordings	181
Power recordings	0
Power unbalance recordings	0
Energy recordings	0
Energy losses recordings	0
Flicker recordings	0
Mains signaling recordings	0

Events Summary

Dips	0
Swells	0
Transients	0
Interruptions	0
Voltage profiles	0
Rapid voltage changes	0
Screens	0
Waveforms	0
Intervals without measurements	0
Inrush current graphics	0
Wave events	0
RMS events	0

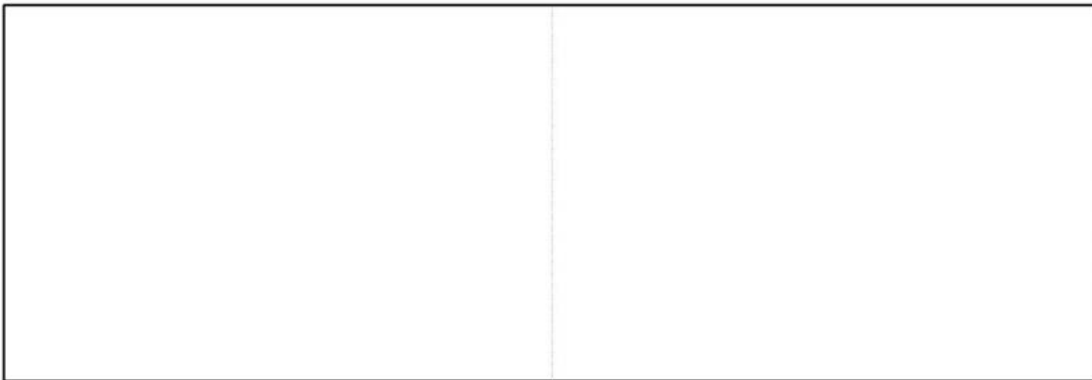


Voltage and Current. From 8/9/2016 2:45:30 PM To 8/9/2016 3:15:30 PM



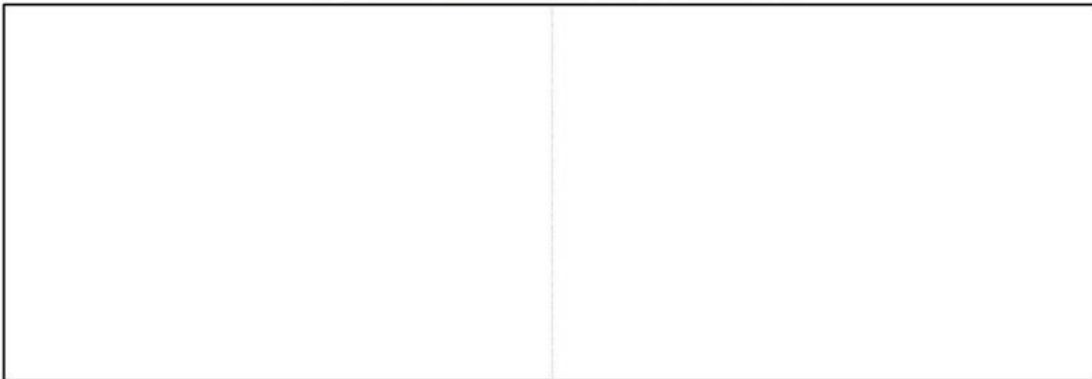
0

Voltage and Current. From 8/9/2016 2:45:30 PM To 8/9/2016 3:15:30 PM

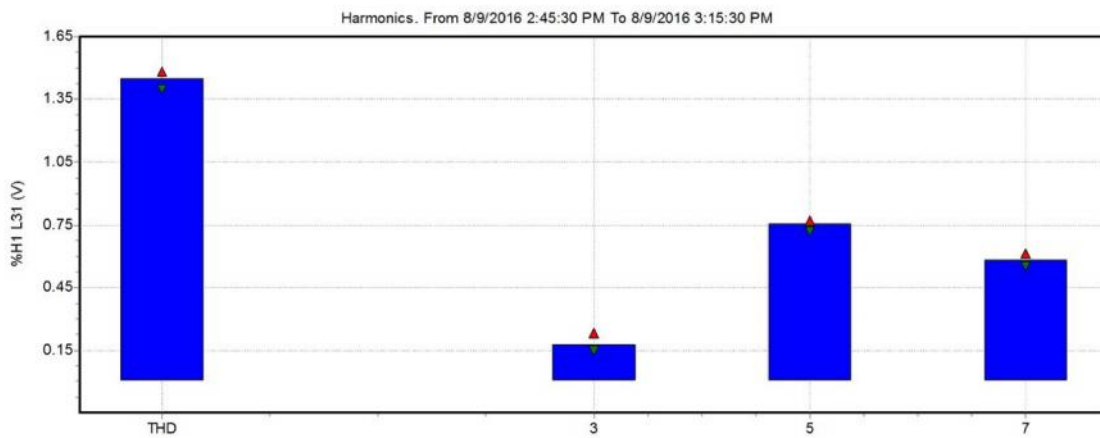
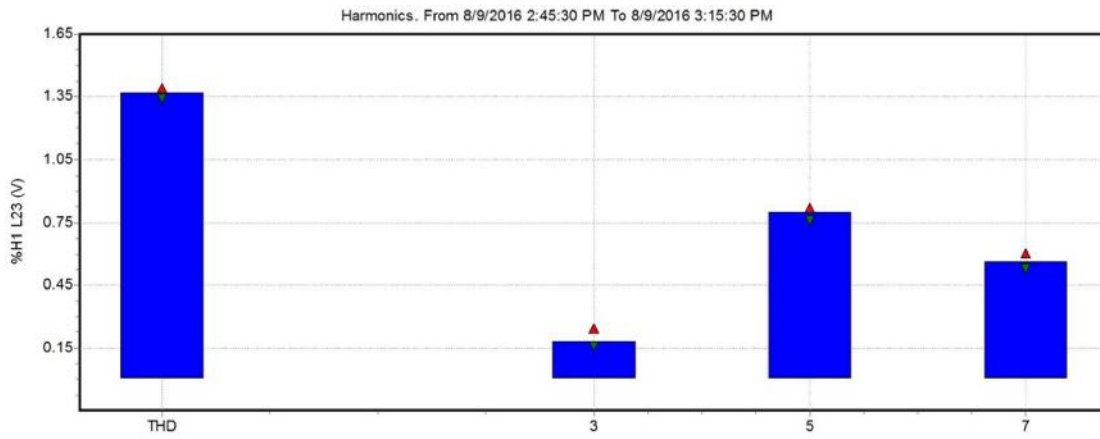
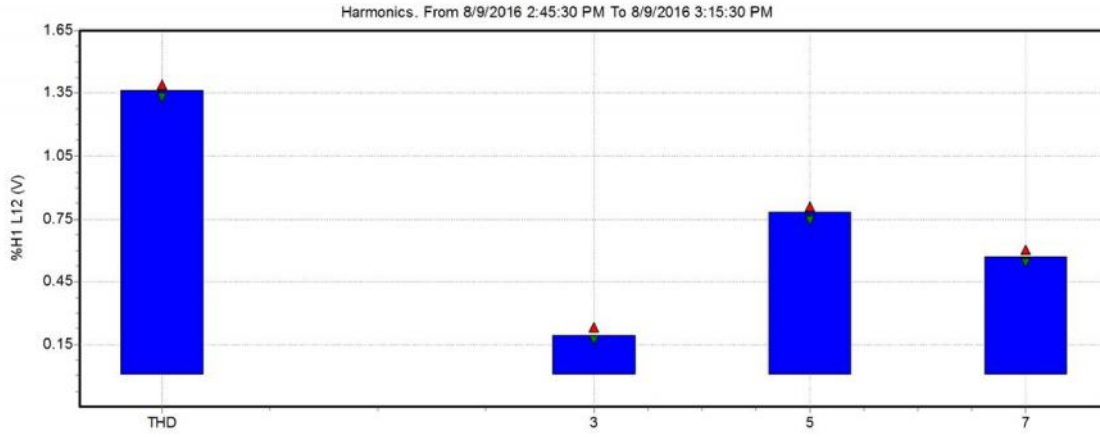


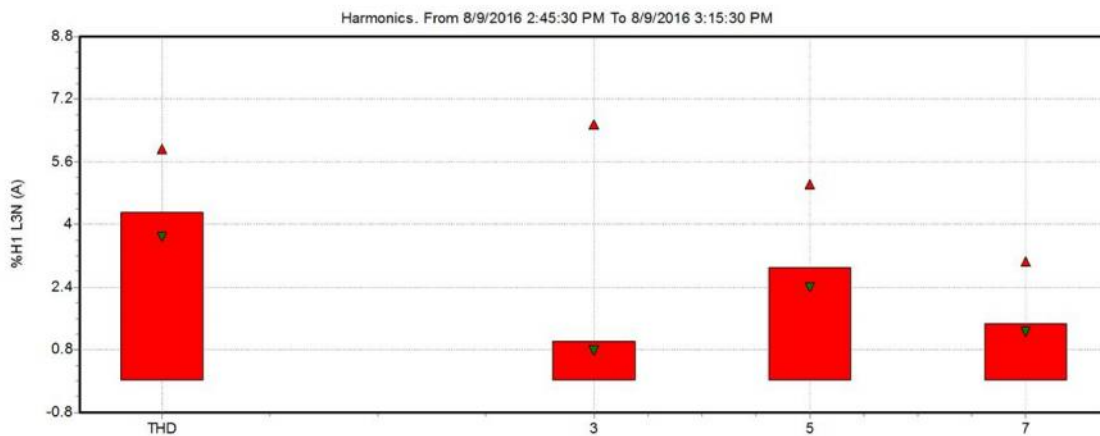
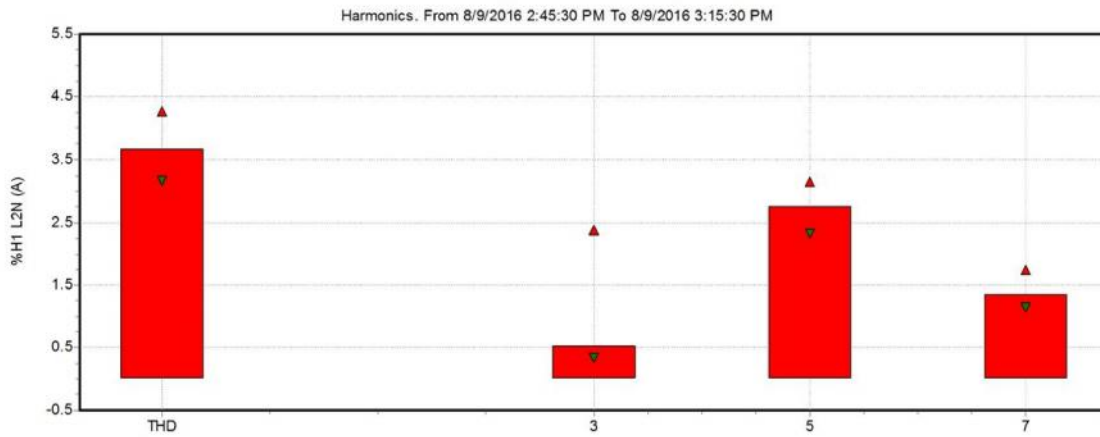
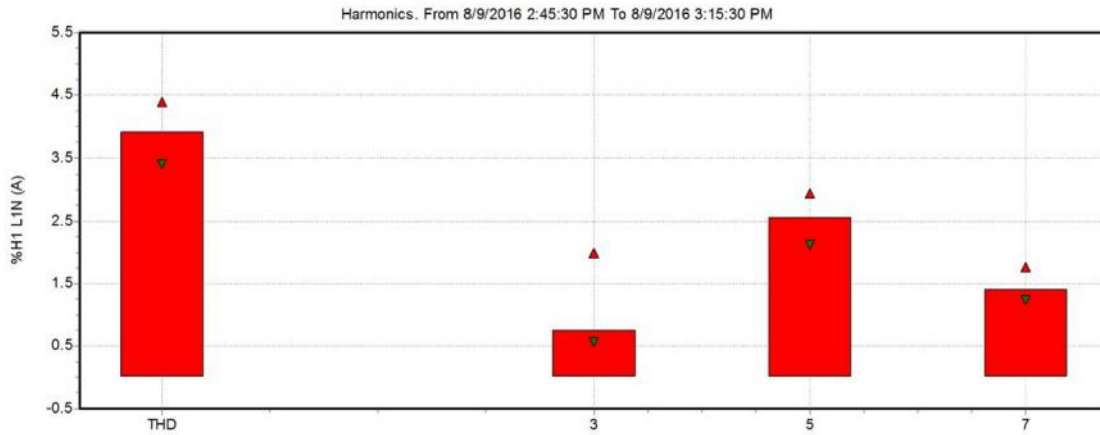
0

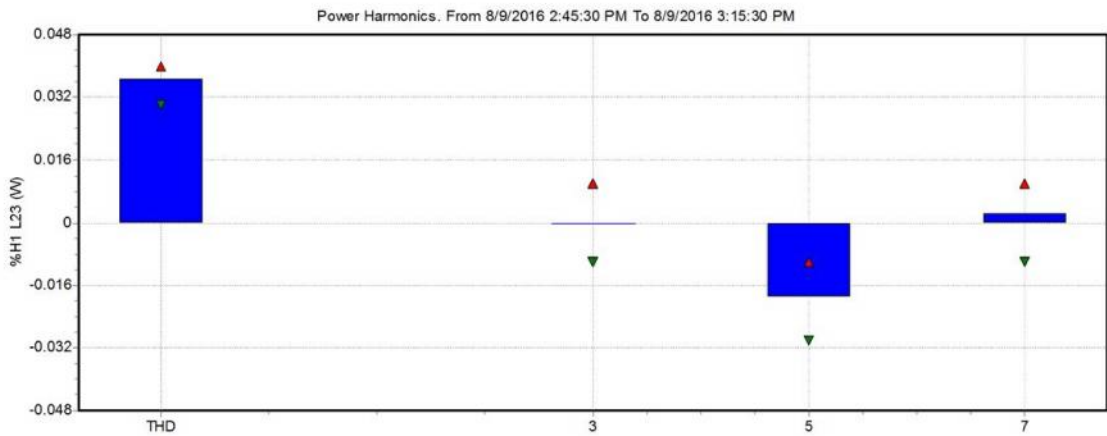
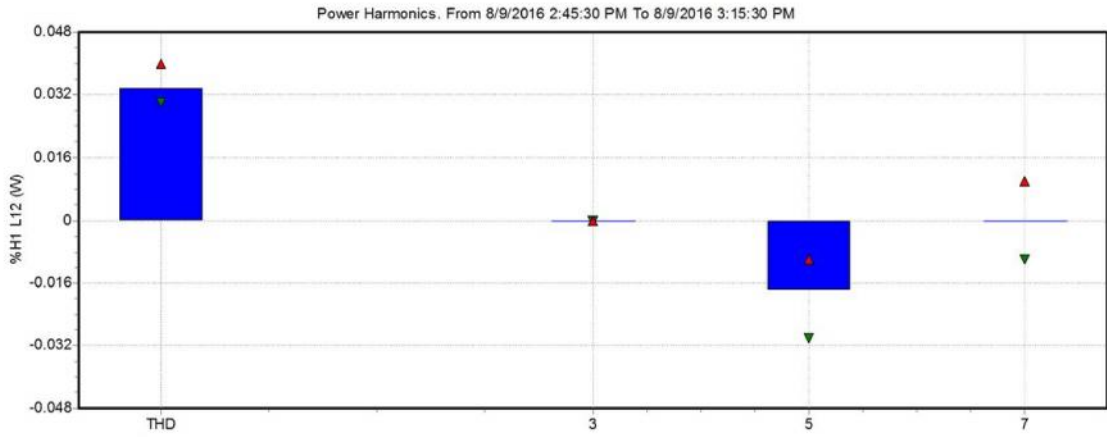
Voltage and Current. From 8/9/2016 2:45:30 PM To 8/9/2016 3:15:30 PM



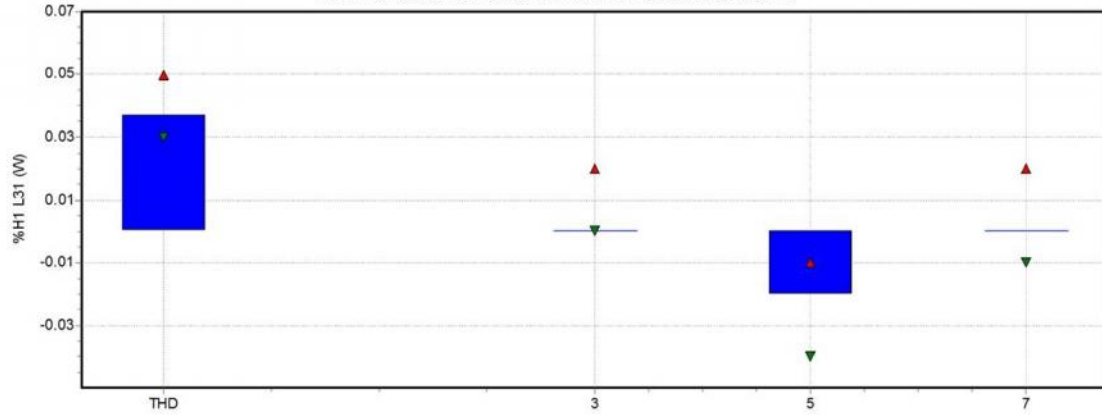
0







Power Harmonics. From 8/9/2016 2:45:30 PM To 8/9/2016 3:15:30 PM



Vrms ph-ph - L12 - Average

