

**i-Sense Monitor:** 0073-1490-0896  
**Model:** 1608S-3V480K (Voltage Sag Detector (3 Channel))  
**Location:** LA  
**Report Date:** May 15, 2017 CDT  
**Monitoring Period:** October 30, 2015 CDT through October 30, 2016 CDT

## REPORTING OVERVIEW

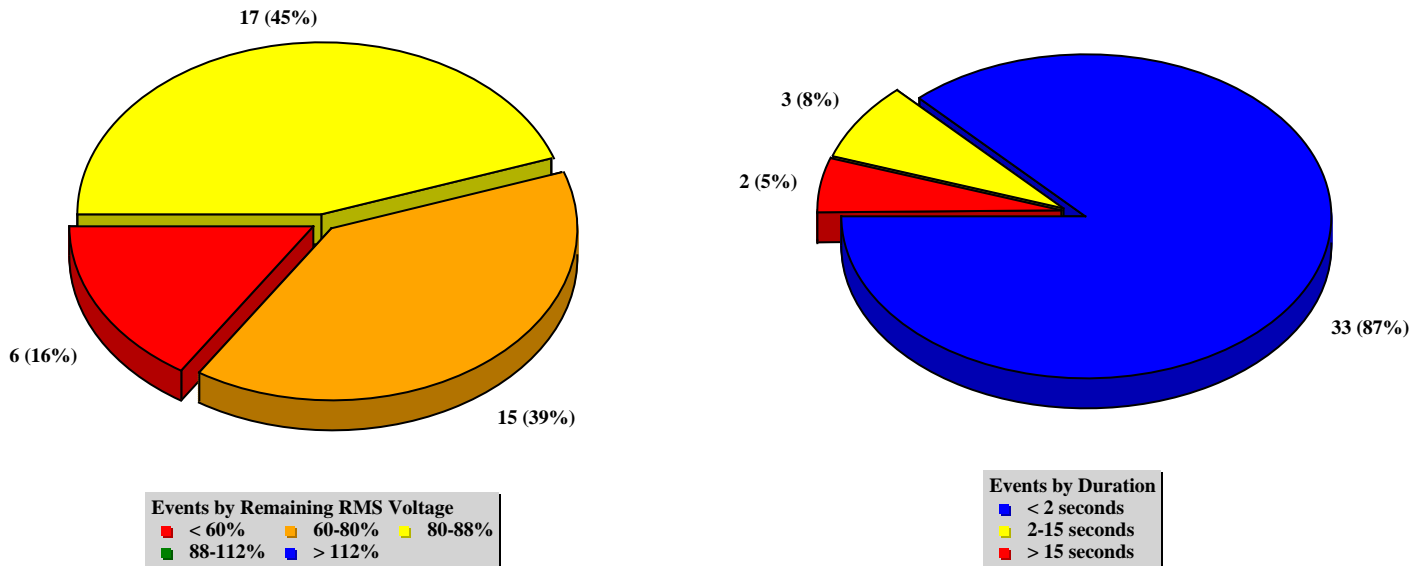
This report provides detailed power quality information for one or more i-Sense monitors. Power quality events have been aggregated using a 2 minute time period. Transient events are NOT included in this report. For a more detailed explanation of terms, see Appendix A. This report contains the following sections:

- \* **Figure 1:** shows the event overview by remaining RMS voltage and duration.
- \* **Figure 2:** displays a monthly summary of each type of event.
- \* **Figure 3:** shows the magnitude and duration (MAG-DUR) of all the recorded PQ events in this interval.
- \* **Figure 4:** displays the chronology of the event record.
- \* **Figure 5:** shows voltage regulation and imbalance.
- \* **Figure 6:** shows waveform and RMS voltage profiles.
- \* **Figure 7:** displays an event log for captured PQ events at this site during the specified time period.

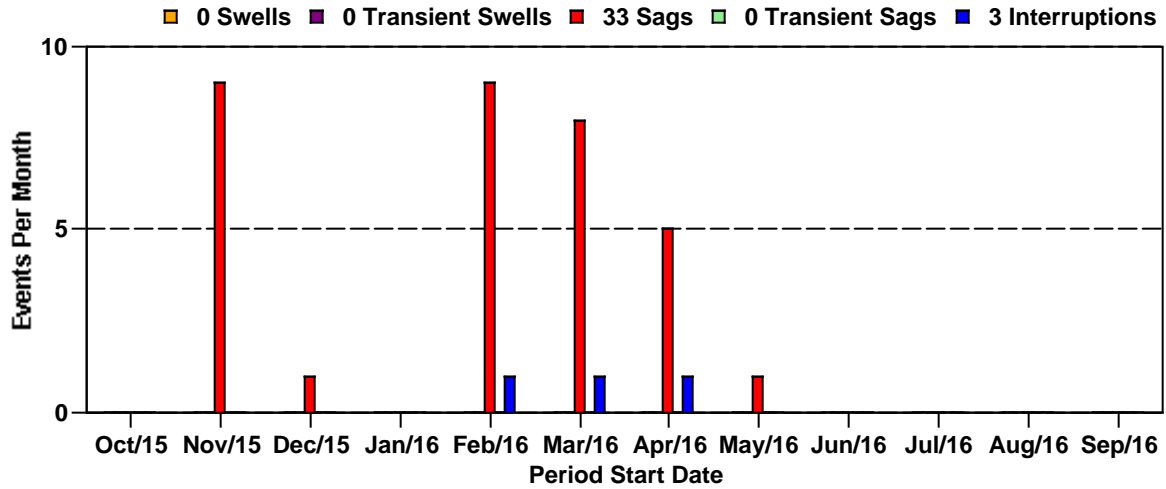
## MONITORING SUMMARY

A total of 38 significant power quality and power reliability events were recorded during the 12-month monitoring period. Of these, 13 events fell below the ITI/CBEMA curve and would be expected to cause problems with sensitive equipment.

**Figure 1: Event Overview (by Remaining RMS Voltage and Duration)**

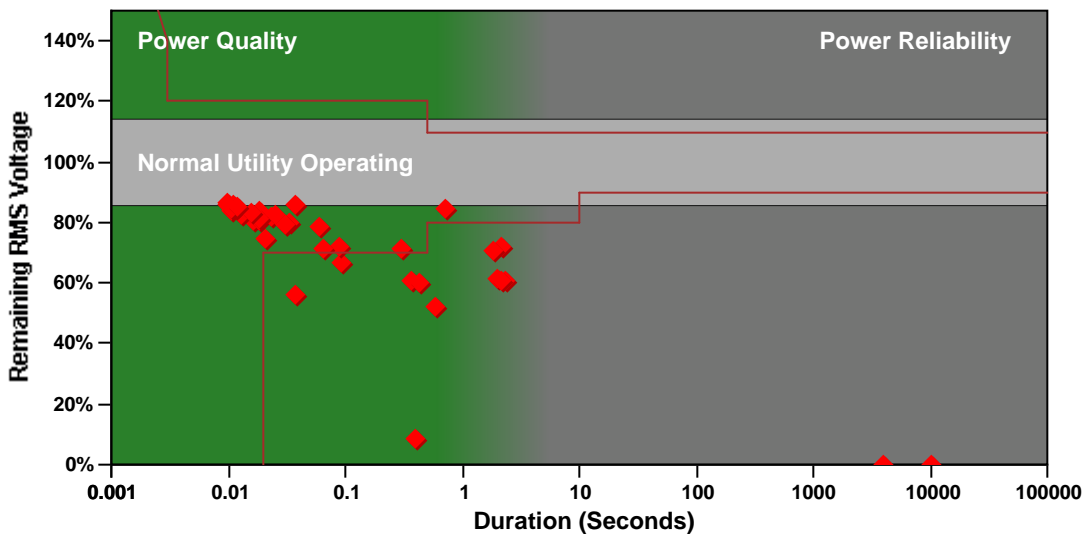


**Figure 2: Monthly Summary of Recorded PQ Events**



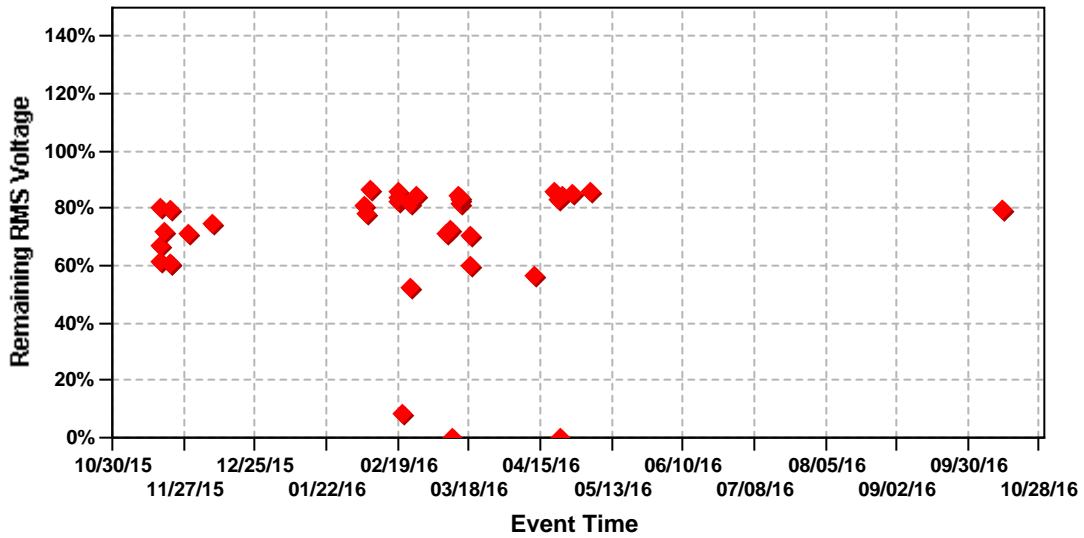
**Figure 3: Magnitude Duration Plot of Recorded Events**

Magnitude vs. Duration

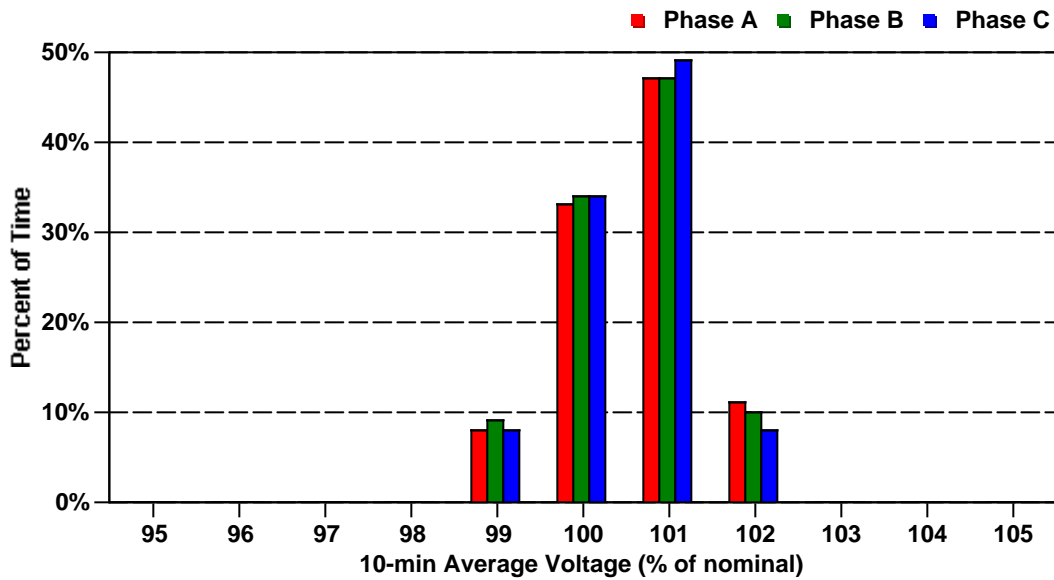


Last year in Kenner LA 70065

**Figure 4: Chronology of Events**  
Magnitude vs. Event Time

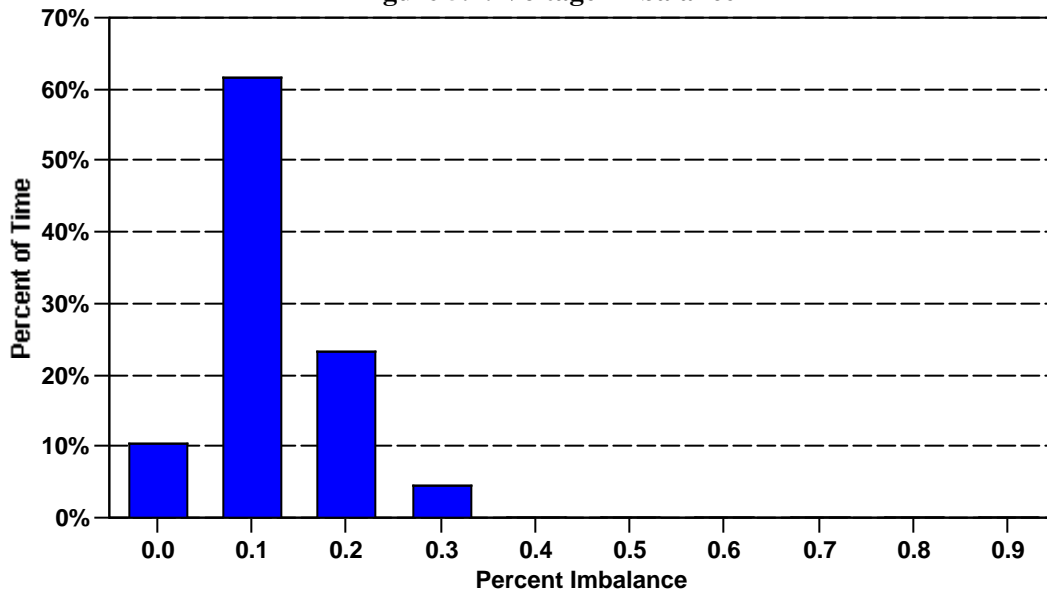


**Figure 5.1: Voltage Regulation**



Note: Deviations greater than +/-5% from 100% on the above chart may indicate equipment stress.

Figure 5.2: Voltage Imbalance



Note: Depending on equipment type, greater than 1% imbalance may indicate equipment stress.

Last year in Kenner LA 70065

**Figure 6: Waveform & RMS Voltage Profiles**

Profiles of the 3 events with worst-case RMS voltage magnitude between 10% and 60% are included. Profiles are presented in ascending order by RMS voltage magnitude.

Monitor: 0073-1490-0896

Event: 8071 (Momentary Sag)

Time: Tuesday Feb 23 2016 11:06:39.189 PM CST

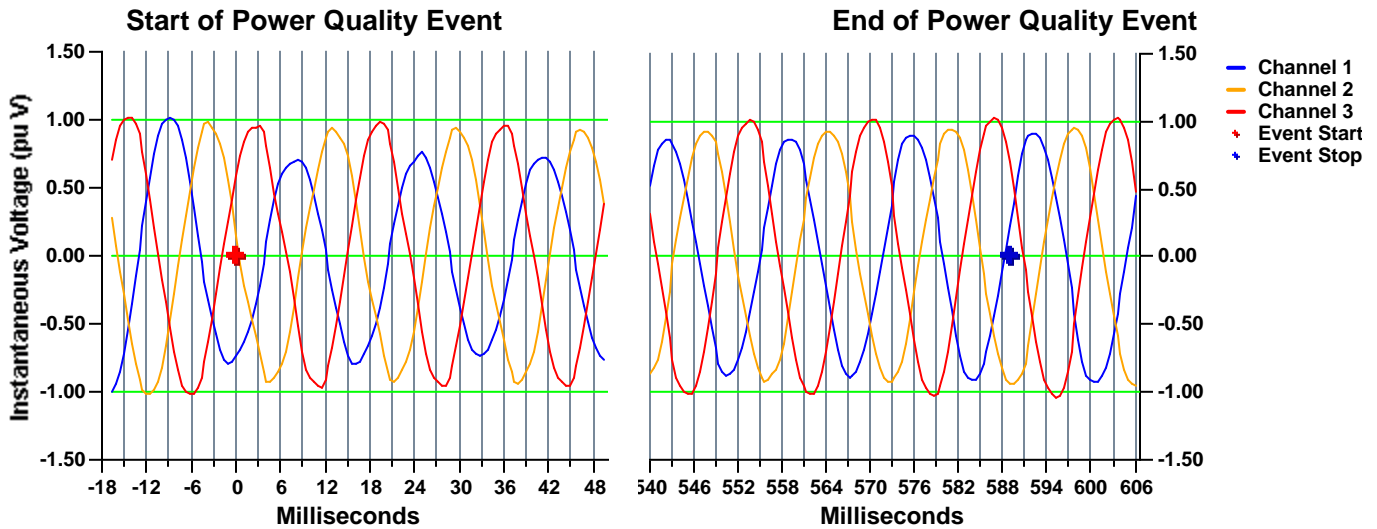
Duration: 589ms (35.34 cycles)

Frequency: 60.0 Hz

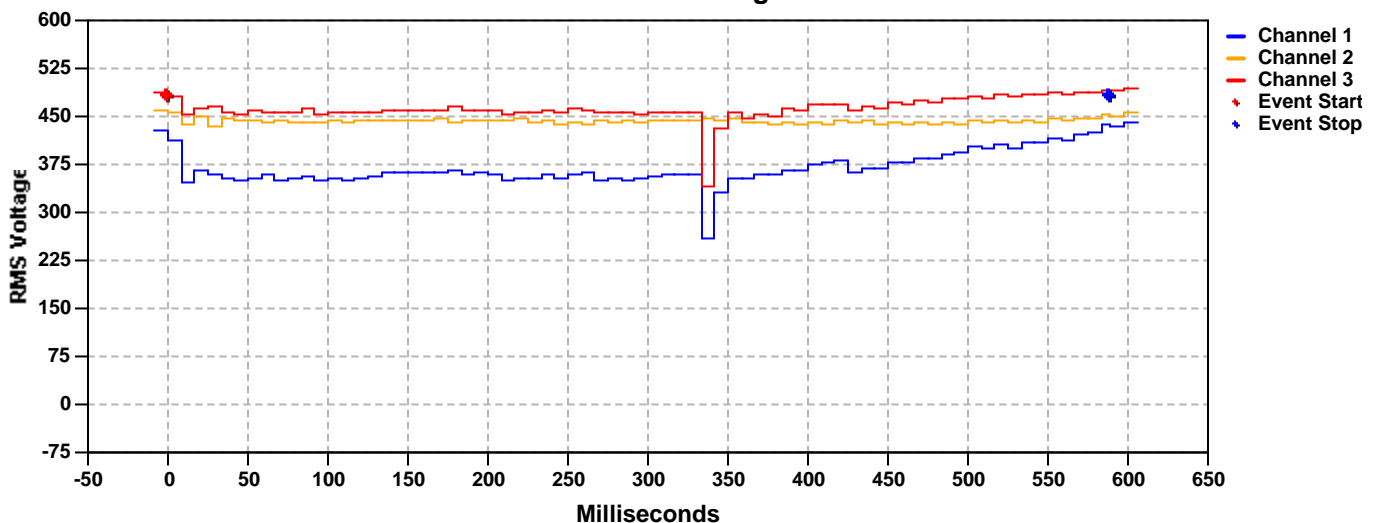
Nominal RMS: 480.0 Volts

**RMS Summary**

Channel	1	2	3
Min	250.0	423.1	333.4
Max	436.1	463.9	492.5
Worst Case RMS as % of Nominal	52.1%	88.1%	69.5%



**RMS Voltage**



**Figure 6: Waveform & RMS Voltage Profiles (continued)**

Monitor: 0073-1490-0896

Event: 10424 (Instantaneous Sag)

Time: Tuesday Apr 12 2016 09:00:55.069 AM CDT

Duration: 37ms (2.28 cycles)

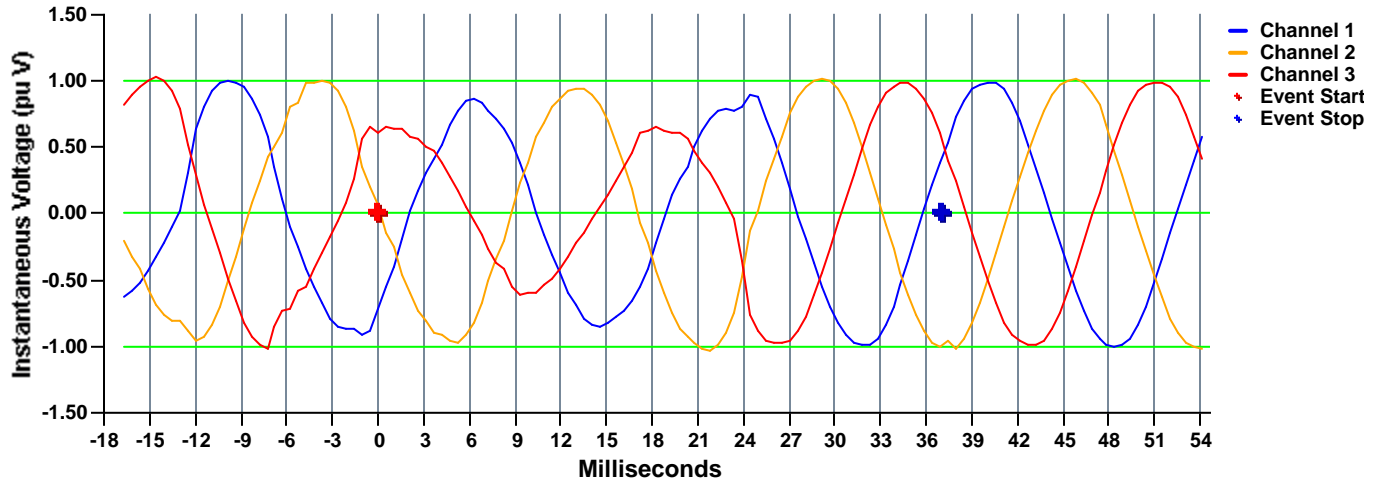
Frequency: 60.0 Hz

Nominal RMS: 480.0 Volts

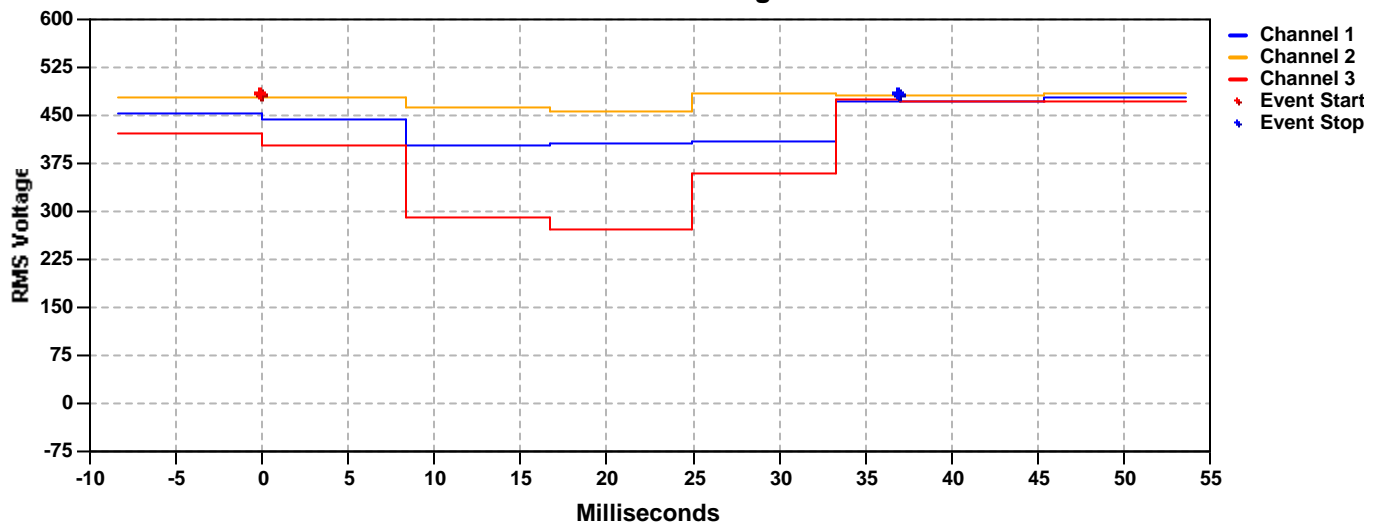
**RMS Summary**

Channel	1	2	3
Min	384.6	452.9	270.7
Max	475.0	517.6	474.0
Worst Case RMS as % of Nominal	80.1%	107.8%	56.4%

**Voltage Waveforms**



**RMS Voltage**



**Figure 6: Waveform & RMS Voltage Profiles (continued)**

Monitor: 0073-1490-0896

Event: 9213 (Instantaneous Sag)

Time: Friday Mar 18 2016 09:14:39.056 PM CDT

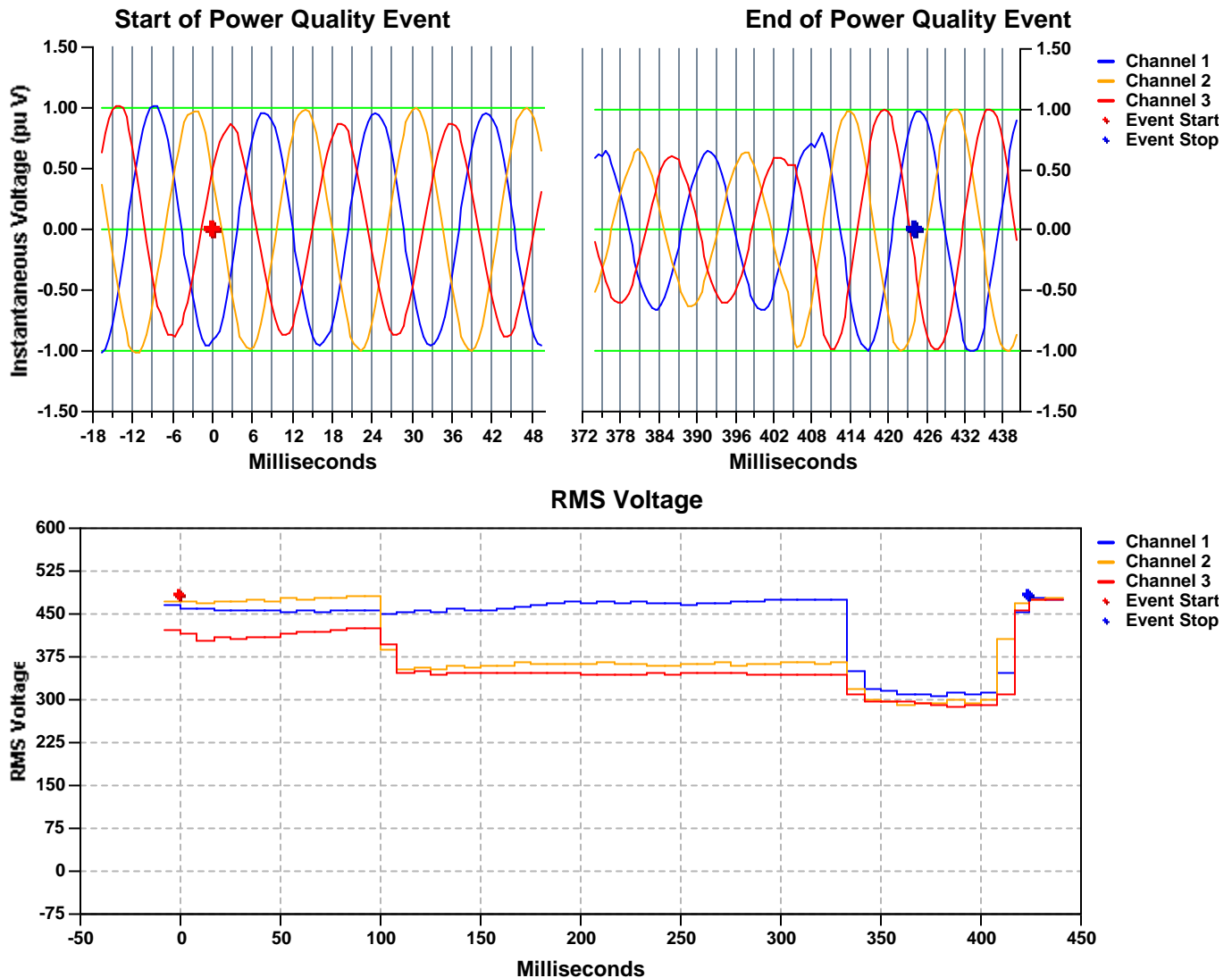
Duration: 424ms (25.44 cycles)

Frequency: 60.0 Hz

Nominal RMS: 480.0 Volts

**RMS Summary**

Channel	1	2	3
Min	306.6	289.9	287.7
Max	475.8	481.6	478.8
Worst Case RMS as % of Nominal	63.9%	60.4%	59.9%



**Figure 7: Event Log (transient events excluded)**

Events are listed in ascending order by event time. The Event IDs for aggregate events are denoted with an asterisk (\*). The power quality events are correlated to the severe weather conditions. The "Weather" column of the table below describes the type of severe weather conditions, if any, at the time of the power quality event.

Start Time (CST)	IEEE 1159 STD Classification	RMS%	Duration (seconds)	Outside ITIC?	Weather	Grid Event?
11/17/2015 12:52:59	Instantaneous Sag	67%	0.09	Yes	Windy	
11/18/2015 02:26:21	Momentary Sag	62%	1.98	Yes	Light Rain	
11/18/2015 02:49:17	Instantaneous Sag	80%	0.02		Rain	
11/19/2015 02:07:40	Instantaneous Sag	72%	0.09			
11/21/2015 19:40:27	Momentary Sag	61%	2.29	Yes		
11/21/2015 20:28:33	Instantaneous Sag	61%	0.36	Yes		
11/21/2015 20:44:40	Momentary Sag	61%	2.13	Yes		
11/21/2015 21:18:37	Instantaneous Sag	80%	0.03			
11/28/2015 11:57:28	Instantaneous Sag	71%	0.3			
12/08/2015 15:32:00	Instantaneous Sag	74%	0.02			
02/05/2016 17:11:22	Instantaneous Sag	81%	0.02			
02/06/2016 20:38:16	Instantaneous Sag	78%	0.06			
02/08/2016 14:43:27	Instantaneous Sag	87%	0.01			
02/19/2016 05:41:27	Instantaneous Sag	86%	0.01			
02/19/2016 07:59:13	Instantaneous Sag	82%	0.01			
02/19/2016 08:56:10	Instantaneous Sag	84%	0.02			
02/20/2016 21:49:10	Instantaneous Interruption	8%	0.4	Yes		
02/23/2016 23:06:39	Momentary Sag	52%	0.59	Yes	Windy	
02/24/2016 00:32:45	Instantaneous Sag	82%	0.02			
02/26/2016 18:32:22	Momentary Sag	84%	0.71			
03/09/2016 11:00:47	Instantaneous Sag	71%	0.06		Windy	
03/10/2016 15:16:34	Momentary Sag	72%	2.12	Yes	Rain	
03/11/2016 04:59:59	Sustained Interruption	0%	10,142.13	Yes	Light Thunderstorms and Rain	Yes
03/13/2016 17:52:28	Instantaneous Sag	84%	0.01			
03/14/2016 21:11:38	Instantaneous Sag	81%	0.02			
03/14/2016 23:51:06	Instantaneous Sag	83%	0.02			
03/15/2016 00:36:26	Instantaneous Sag	84%	0.01			
03/18/2016 12:08:35	Momentary Sag	71%	1.87	Yes	Heavy Thunderstorms and Rain	
03/18/2016 21:14:39	Instantaneous Sag	60%	0.42	Yes	Thunderstorms and Rain	
04/12/2016 09:00:55	Instantaneous Sag	56%	0.04	Yes	N/A	
04/20/2016 13:48:12	Instantaneous Sag	86%	0.01		N/A	
04/21/2016 20:51:34	Instantaneous Sag	83%	0.03		N/A	
04/22/2016 16:54:37	Sustained Interruption	0%	3,954.26	Yes	N/A	
04/23/2016 18:09:07	Instantaneous Sag	84%	0.01		N/A	
04/27/2016 21:47:38	Instantaneous Sag	85%	0.01		N/A	
05/04/2016 20:35:18	Instantaneous Sag	86%	0.04		N/A	
10/13/2016 08:40:37	Instantaneous Sag	79%	0.03		N/A	
10/13/2016 09:00:24	Instantaneous Sag	79%	0.03		N/A	



## Appendix A: Explanatory Appendix

**Event Aggregation:** If enabled, events are aggregated using a 2 minute time period. Individual events occurring within 2 minutes of each other are treated as a single aggregate event throughout the report. The aggregate event's remaining RMS voltage and event duration are derived from the *worst event*; the individual event with the lowest remaining RMS voltage.

**Transient Events:** A transient event is defined as any event with a duration less than .5 cycles, or an event with duration between .5 and 1 cycle and magnitude between 90% and 110% of nominal.

**ITI/CBEMA Curve:** The ITI/CBEMA curve describes an input voltage envelope that typically can be tolerated by most information technology equipment. Events between the ITI/CBEMA lines on the chart typically do not create problems with a system. Events that are shown outside the ITI/CBEMA curves have a high probability of disrupting the operation of a system.

**Semi F47 Curve:** The Semi F47 curve describes voltage sag ride-through capability required for equipment used by the semiconductor industry. Events above the F47 line on the chart typically do not cause problems with semiconductor equipment. Events below the F47 line have a high probability of disrupting the operation of semiconductor equipment.

**Grid Event:** An event is defined as a "Grid Event" if another monitor within a 200 mile radius recorded a similar event inside of a two minute window.

**Event Classification:** The i-Grid system classifies the severity of a power quality event according to the IEEE 1159 specification,

"IEEE Recommended Practice on Monitoring Electrical Power Quality",  
IEEE Standard Number 1159-1995, ISBN 1-5593-7549-3,  
available from the IEEE Standards Association,  
as extended by IEEE draft proposal 1159.1, and further extended by Rockwell  
Automation/SoftSwitching in order to fill gaps in the proposed standard.