# Standard report delivery method and report section overview

### **Rx Monitoring Services, Inc.**

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Rx Monitoring Services reports are delivered in a sophisticated pdf format by a encrypted link. This ensures that your report is only seen by the people that you want.

**Distribution lists:** 

RxMS makes the distribution of the reports easy as well, handling the list of people required to see the report once completed.

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See State Stat 11:43 AM

Other Actions 🔻

#### Customer Site Code: A0216A0147

То

Installation Notes: Pages of interest: See page 69 showing low voltage during monitoring. See pages 140-141 and 143-145 for voltage waveforms indicating a high impedance source. See pages 152-158 for sag events related to high impedance. See pages 125-129 to review temperature and humidity logs. Check the grounding of the transformer.

teres rootes: What appears to be very low during system operation. Source impedance though not measured appears to be high. Sags indicate that the source may undersized or incompatible with the load. Ground current was high. Immediate corrective action is required. Shed external loads from the feeder to increase source capacity or place the system on separate circuit. Visually inspect all ground connections and tighten as necessary. Be sure that there is a full size ground wire numing from the system directly to building steel. Consider visually inspecting the ground of the Delta/Wye transformer to make sure that there is a wire directly to building steel (not condit). The grounding has to improve in order to protect the system and reduce the system sources. Temperature and humidity were outside of specification; adjust the HVAC controls accordingly. If there are questions regarding the data in this report contact RAMS. Click on the following link to download the Rx Monitoring report: Tech Support Rx Monitoring Services, Inc. 22A Eastman Avenue Bedford, NH 03110-6701 (603) 666-6606 Ext. 2 http://www.rxms.com B If this message contains an Acrobat attachn nt (.pdf), the free Acrobat Reader Software must be installed on your system in order to open the file http://www.adobe.com/products/acrobat/re ep.html

#### **Encrypted download link:**

The link for the report makes the distribution easy. When the e-mail is sent users need only to click the link to download the report. This makes the distribution of the report simpler, without the worries of e-mail attachments and max limits.

### PDF layout: Bookmarks





### **Customer Information:**

customer and RxMS.

Clearly on first page so clients know where the report came from.

#### **Site Information:**

Makes it easy to manage multiple reports. This information includes where the meter was installed as well as any internal Client Code that you may have.



Comments can vary depend on type of test preformed.

### **Power Quality:**

A quick overview of stability and problems seen during survey.

### **Comments:**

Every report has comments explaining the problems if any exist and possible solutions.

D			Exec	utive	e Sum	mar	у		9/12
Site Certifie	ad ®		8/	28/2014	- 9/5/2014	4			
Customer In	formation				Site In	formati	on		
Bapart Baair					Client	Torritati	UNI .		
Recipient Co Recipient Ad	ompany Idress				Install	ation Na ation Ad	ime dress		
Dy Si	to #: 24306				Sito	Equipmo	ont:		
	le #. 24300					Equipine	ын. — · · ·		
Wonitor	S/N: 40310				Equi	pment A	ge: Existin	ig 🎷	
Client Site C	ode: A0216A0	147			Monito	or Locati	on: Wall F	ower	
	Chan	Chan	Chan	Chan	Rx	Meets			
Power Quality	y L1-L2	L3-L1	L2-L3	L1-G	Rating	Specs		Comments	
Power Failure		0	0	0	Good	Yes			
Sags	69	98	99	95	Minor	No	Due to loa	ad turn-on	
Surges	0	0	0	0	Good	Yes			
Transients	18	13	10	16	Moderate	No	Low Freq	uency = Wayes	shape Disto
Impedance m	10 N/A	N/A	N/A	N/A	Moderate	110	Not meas	ured - appears	to be high
impodditoo fi		1073	1073	10// (			Hot mode		to bo might
Data Loggi	Actual ing Low	Actual High	Low Spec	High Spec	Rx Rating	Meets Specs		Comment	s
Chan L1-L2	412	501	444	516	Moderate	No	Momenta	ry Sags	
Chan L3-L1	409	501	444	516	Moderate	No	Impedance	ce problem?	
Chan L2-L3	410	503	444	516	Moderate	No	Moderate	waveform dist	ortion
Chan L1-G	236	289	250	290	Moderate	No	Low volta	ge	
Frequency	59.9	60.1	59.0	61.0	Good	Yes	Within Sp	ec.	
Max V Imbala	ance N/A	0.3%	N/A	1.0%	Good	Yes	Within Sp	ec.	
Temperature	°F 76	89	62	82	Moderate	No	High Tem	perature	
Humidity	40	68	30	60	Moderate	No	High Hum	nidity	
L1 Current	N/A	146	N/A	N/A	N/A	N/A	L1 Currer	nt Peak RMS	
L2 Current	N/A	154	N/A	N/A	N/A	N/A	L2 Currer	nt Peak RMS	
L3 Current	N/A	154	N/A	N/A	N/A	N/A	L3 Currer	nt Peak RMS	
Neutral	N/A	3.5	N/A	N/A	N/A	N/A	Neutral C	urrent	
Ground	N/A	3.4	N/A	N/A	N/A	N/A	Excessive	e ground currer	nt
DC Volts - Ch	11								
DC Volts - Ch	12								
				Rx R	atings				
	Safety	Sev	/ere	Mod	erate	N	linor	Good	
N	IEC Violation or other Safety Hazard	Dama likely. Dis Highly	age is ruption is / likely	Dam pos Disruptic	age is sible. on is likely	Damag Disro po	e unlikely. uption is ssible	Within Manufacture Specification	r IS
Ple	ease email Sal	es@rxms for answ	s.com or vers to a	call <b>Rx</b>	Monitor tions rea	ing Ser arding	vices, Inc. this repor	. at (603) 666- rt.	-6606
		Bedf	ord, NH.	USA -	www	.RXMS	S.COM		
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**Data Logging:** This data shows a summary of all the trending data collected throughout the survey in a quick format that is easy to understand.

All of the thresholds are taken from equipment specifications provided by the customer to ensure accuracy.

# Executive Summary: Rx Rating

"Rx Ratings" & "Meets Specs" are clearly defined for ease of understanding during customer engagement. The ratings are based off equipment specifications and NEC/ IEEE codes. They are throughout the survey so problem sites can be identified easily and addressed accordingly.



Power Quality	Chan L1-L2	Chan L3-L1	Chan L2-L3	Chan L1-G	Rx Rating	Meets Specs	Comments
Power Failures	0	0	0	0	Good	Yes	
Sags	69	98	99	95	Minor	No	Due to load turn-on
Surges	0	0	0	0	Good	Yes	
Transients	18	13	10	16	Moderate	No	Low Frequency = Waveshape Distortion
Impedance m $\Omega$	N/A	N/A	N/A	N/A			Not measured - appears to be high

Data Logging	Actual Low	Actual High	Low Spec	⊦ S	ligh Grec		Rx Rating	Meets Specs	Comments
Chan L1-L2	412	501	444	ļ	16	1	Moderate	No	Momentary Sags
Chan L3-L1	409	501	444		16		Moderate	No	Impedance problem?
Chan L2-L3	410	503	444		516		Moderate	No	Moderate waveform distortion
Chan L1-G	236	289	250		290		Moderate	No	Low voltage
Frequency	59.9	60.1	59.0	e	61.0		Good	Yes	Within Spec.
Max V Imbalance	N/A	0.3%	N/A	1	.0%		Good	Yes	Within Spec.
Temperature °F	76	89	62		82		Moderate	No	High Temperature
Humidity	40	68	30		6)		Moderate	No	High Humidity
L1 Current	N/A	146	N/A		ΝA		N/A	N/A	L1 Current Peak RMS
L2 Current	N/A	154	N/A		N/A		N/A	N/A	L2 Current Peak RMS
L3 Current	N/A	154	N/A		J/A		N/A	N/A	L3 Current Peak RMS

			Rx Ratings			
	Safety	Severe	Moderate	Minor	Good	
$\langle$	NEC Violation or other Safety Hazard	Damage is likely. Disruption is Highly likely	Damage is possible. Disruption is likely	Damage unlikely. Disruption is possible	Within Manufacturer Specifications	)

### Detailed Event Log:

All events have a time based stamp so correlation to system issues can be obtained. The event log also shows the Rx Ratings system to highlight problem areas during monitoring period.

### **Rx Rating:**

Make it simple to find worst events.

20	_		_	_			9/12/2	2014
			Detaile	ed E	vent Log			
			5	Site:	24306			
Filter Good Events			8/28/2	2014 -	9/5/2014			
Date/Time	Event ID	Event T	ype (	Chan	P 1	P 2	P3	Severity
g 29, 14 07:40:27.843	3 197	RMS Sag	L	L3-L1	429	33	476	Minor
29, 14 07:40:27.843	3 200	RMS Sag	L	L1-0	428	33	477	Minor
g 29, 14 07:40:27.844	178	Transient	l	L3-L1	-84	3060	104	Good
g 29, 14 07:40:27.845	5 181	Transient	1	L1-G	-49	2604	272	Good
29, 14 07:40:27.847 29, 14 07:40:27 849	177	Transient	L	L1-L2	-75	2995	279	Good
g 29, 14 07:42:57.125	5 203	Transient	l	L3-L1	-83	2214	285	Good
g 29, 14 07:42:57.126	3 205	Transient		L1-G	-48	2344	97	Good
g 29, 14 07:42:57.127	213	RMS Sag	l	L1-L2	428	33	475	Minor
ig 29, 14 07:42:57.127 ig 29, 14 07:42:57.127	212	RMS Sag		L3-L'I L1-G	428	33	476	Minor
ıg 29, 14 07:42:57.127	216	RMS Sag	L	- L2-L3	427	33	477	Minor
g 29, 14 07:42:57.128	3 202	Transient	l	L1-L2	-75	3060	98	Good
g 29, 14 07:42:57.130	206	Transient	L	L2-L3	-81	3125	277	Good
ig 29, 14 07:45:46.043	3 236	RMS Sag	l	L3-L1	423	33	475	Minor
ig 29, 14 07:45:46.043	3 229	RMS Sag		L1-G	246	33	274	Minor
ig 29, 14 07:45:46.043	3 230	RMS Sag	L	L2-L3	431	33	477	Minor
g 29, 14 07:45:46.045 a 29-14 07:45:46.045	5 221 5 223	Transient	l	L3-L1	-83	2279	98 250	Good
g 29, 14 07:45:46.049	224	Transient	L	L1-L2	-77	2995	303	Good
g 29, 14 07:45:46.050	) 225	Transient	l	L2-L3	-76	3125	96	Good
g 29, 14 07:48:25.493	3 247	RMS Sag	L	L1-L2	434	25	479	Minor
g 29, 14 07:48:25:493 g 29, 14 07:48:25:493	3 248	RMS Sag	L	L3-L1 L1-G	425	33	480 276	Minor
g 29, 14 07:48:25.493	3 249	RMS Sag	L	L2-L3	433	33	481	Minor
g 29, 14 07:48:25.494	243	Transient	l	L2-L3	-76	1563	276	Good
g 29, 14 07:48:25.495	5 240	Transient	l	L3-L1	-83	3320	69	Good
g 29, 14 07:50:16.417	242	Transient	l	L3-L1	-40	1497	106	Good
g 29, 14 07:51:08.710	) 272	RMS Sag	L	L3-L1	427	33	475	Minor
g 29, 14 07:51:08.710	266	RMS Sag		L1-G	249	33	274	Good
g 29, 14 07:51:08.710 a 29, 14 07:51:08.712	267	KMS Sag		L2-L3	428	33 1693	476	Good
g 29, 14 07:51:08.716	257	Transient	1	L3-L1	-84	3320	257	Good
29, 14 07:51:08.717	261	Transient		L1-G	-49	1693	72	Good
			Para	meter	rs			
RMS Nominal	RMS Re-N	ominal HF	Transient	Н	F Sensitivity	RMS Sag/Surge	Line Imped	ance
P1 = Nominal Volts	P1 = Prev No P2 = Now No	om Volts P1 = F	Peak Voltage	P1 =	Sens Val	P1 = Peak Voltage P2 = Duration mSe	P1 = Impedan	ce m Ω s
	1 Z - New No	P3 = F	Phase Angle			P3 = Nom Voltage		
omments:			-	•		0	•	
g 29, 14 07:48:25.495 g 29, 14 07:48:25.495 g 29, 14 07:50:16.417 g 29, 14 07:51:08.710 g 29, 14 07:51:08.710 g 29, 14 07:51:08.710 g 29, 14 07:51:08.710 g 29, 14 07:51:08.716 g 29, 14 07:51:08.716 g 29, 14 07:51:08.717 <b>RMS Nominal</b> P1 = Nominal Volts <b>Comments:</b> Most significant ev.	5         240           7         242           7         254           0         272           0         266           0         267           4         263           5         257           7         261           RMS Re-Ni           P1 = Prev Ni           P2 = New Ni           ents related 1	Transient           Transient           Transient           RMS Sag           RMS Sag           Transient           Transient           Transient           Transient           Transient           Transient           Transient           Transient           Opminal         HF           PM Volts         P1 = F           PM Volts         P2 = E           P3 = F         P           oo load changees         page dotted changees	Para FTransient Para Para Sand the imple s and the imple	L3-L1 L1-G L3-L1 L3-L1 L1-G L2-L3 L2-L3 L3-L1 L1-G <b>Meter</b> <b>P</b> 1 =	-83 -48 -72 427 428 428 -75 -84 -49 <b>'S</b> <b>F Sensitivity</b> Sens Val	3320 1497 130 33 33 33 1693 3320 1693 885 893 893 893 91 = Peak Voltage P2 = Duration mSe P3 = Nom Voltage	69 251 106 475 274 476 101 257 72 Line Impeda P1 = Impedan P2 = Nom Vol ags, swells, and	Good           Good           Good           Minor           Good           Minor           Good           Good



### **Time Based Events:**

Snapshots are time based events, usually occurring at the start of the monitoring cycle and everyday at 10AM.



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These events are used to get a "baseline" of the incoming power conditions without a trigger to properly diagnose and issues.

### Harmonics:



Calculated the 63rd harmonic.

# High Frequency Plots:



# High Frequency Impulses:

### High frequency sampled at 2 million samples / second per channel captures all events that may be missed by other power monitors.



#### Comments:

Impulse associated with equipment turn-on to standby mode.

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## Voltage Sag /Surge:

### **RMS Voltage % deviation versus time:**

These black marks show voltage sags or surges, based on the RMS voltage level.



### **Voltage Ratings:**

Plot colors are based off of equipment specifications so it is clear when RMS deviations could cause system issues.

### Waveform Capture:

#### **Trigger based events:**

Waveform captures are based on triggers, these can be from RMS deviation from the voltage or current changes.

![](_page_12_Figure_3.jpeg)

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These graphs reinforce and properly diagnose the Sag / Surge plot, showing how the voltage or current changes during a RMS deviation.

![](_page_13_Picture_0.jpeg)

![](_page_13_Figure_1.jpeg)

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## Current Logs:

	2	9/10/2014 Site: 24306
	160 -	Wadnesday, September 03, 2014 L1 Current Max Avg
	140 - 120 -	without Minute Mi
S Current	100 · 80 ·	
RM	60 · 40 ·	
	20 · 0 ·	
	0,0	ర్ క్ క్ స్ ఫ్ ఫ్ ఫ్ ఫ్ ఫ్ Time
	160 -	Thursday, September 04, 2014 L1 Current Max -Avg
	140 -	WWWWWWWWWWW
Current	100 -	
RMS 0	60 -	
	40 · 20 ·	
	0. 0	ν <sup>Φ</sup> κ <sup>Φ</sup> κ <sup>Φ</sup> κ <sup>Φ</sup> χ <sup>Φ</sup> κ <sup>Φ</sup> κ <sup>Φ</sup> κ <sup>Φ</sup> κ <sup>Φ</sup> κ <sup>Φ</sup> γ <sup>Φ</sup> Time

Current logs can be shown in two formats, 1) RMS (128 Sample/cycle) 2) Peak (Single sample)

![](_page_14_Picture_3.jpeg)

L1 Current

MMMMMMMMMMM

### **Peak Current Logs**:

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Give an estimation of the maximum current draw from the system.

But if load profile is needed for a piece of equipment Rx Monitoring Services recommends using Waveform Capture events.

![](_page_14_Figure_7.jpeg)

Wednesday, September 03, 2014

25

200

![](_page_15_Picture_0.jpeg)

All power monitors can obtain Temperature and humidity data, either wireless or though a connected sensor.

![](_page_15_Picture_2.jpeg)

### Temp/Humidity Logs

9/10/2014

Site: 24306

8/28/2014 - 9/5/2014

![](_page_15_Figure_7.jpeg)

![](_page_15_Figure_8.jpeg)

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