Atom User's Manual

Power Monitors, Inc.



The Atom Environmental Sensor monitors Temperature, Humidity (%), Pressure (mbar) and Irradiance (W/m²) and can also detect movement and door closures.

The Atom sensor can be paired to an iOS device or paired to a PMI Tensor or Seeker recorder.

Data is viewed on the PQ Canvass website using standard web browsers. A PQ Canvass login is required.

Contents Introduction
<u>Getting Started with the Atom</u>
About the Atom
<u>Connecting the Atom to PQ Canvass</u>
Remove Associated Device
Connecting the Atom to the PMI Atom App
Devices Screen
Setting Alerts
Alert Thresholds
Alert Notifications
Atom LED Codes

Atom LED Codes	
Technical Specifications	
Additional Information	
Technical Support	
Appendix 1: Warranty Clause	
Equipment Return	29
Appendix 2: Regulatory Information	
FCC Warning	30

_____3 _____3 _____5 ____12 _____13

.....

_____22

20

©2024 Power Monitors, Inc. All Rights Reserved

In no event shall the copyright owner or contributors be liable for any direct, indirect, incidental, special, exemplary, or consequential damages (including but not limited to, procurement of substitute goods or services). In no event shall the copyright owner or contributors be liable for any business interruption or loss of use, data, or profits however caused. In no event shall the copyright owner or contributors be liable for any business interruption or loss of use, data, or profits on any theory of liability, whether in contract, strict liability, or tort (including negligence or otherwise) arising in anyway out of the use of this software, even if advised of the possibility of such damage. Contents are subject to change without notice. Screenshots used for illustrative purposes are the property of Power Monitors, Inc.

Help us improve our manual. Your comments and suggestions are important to us. Please contact us at the email <u>powerquality@powermonitors.com</u>

Introduction

Power Monitors Incorporated (PMI) was founded to provide state-of-the-art, easy-to-use, and affordable electronic test equipment to the power industry. PMI products have been developed by working directly with electric utilities to determine their specific needs. The Atom has also been developed by following these same principles.

If you have any questions about its operation, ideas for new features, or ideas for additional products please contact PMI. We want you to be happy with this product and would appreciate any input that could help us develop products to meet your future needs.

Getting Started with the Atom

The Atom, at time of purchase, will be added to your PQ Canvass account.

Your Atom can be associated to a PMI recorder. The data is sent through the recorder to the PMI PQ Canvass cloud for viewing using a web browser, or you can connect the Atom to an iOS device using the Atom application (app) and view live data as well as upload data to the PQ Canvass cloud.

You will need to be an administrative user in PQ Canvass to manage the Atom.

If you do not have administrative access, call the PMI Tech Support team at (800)296-4120.

Note: The Atom can only be associated with a single recorder, but a recorder can have multiple Atoms associated to it.

About the Atom



Connecting the Atom to PQ Canvass

Note: See the PQ Canvass User Guide for more information on viewing data Log into your PQ Canvass account <u>https://pgcanvass.powermonitors.com</u>

Select the Device icon at the bottom of the page 🔂. Verify your cellular or Wi-Fi Tensor or cellular Seeker is online in PQ Canvass. Also verify your Atom is listed.

All recorders and Atoms will be listed on the PQ Canvass Devices page 🗖. Unassociated Atoms are listed separately. Paired Atoms are listed under the associated recorder.



Place the Atom close to the Tensor or Seeker recorder that it will be paired to:

Press the Activation button and hold the button for 8 -12 seconds to 'wake up' the Atom. You will see the Atom's LED flash white 3 times. Press and release the Activation button 5 times. You will see 2 white flashes and then the LED will blink blue indicating it is searching for a Bluetooth[®] connection. This action is normally performed once when first receiving the Atom. The Bluetooth[®] will periodically turn on to sync to the paired device. Pressing the Activation button once will force the Bluetooth[®] on.

To add an Atom to a Tensor or a Seeker, in PQ Canvass, click on the Seeker or Tensor you want to pair the Atom to.

Select the Actions icon

Then select the Atom Discovery icon

Atom

Discovery



\$\$P						Atom Discovery RTC Wifi Tensor (100	
At	om Dis	covery					
)						
	Label ‡	S\N \$	Updated ‡	RSSI (dBm) ‡	TX Power (dBm) 🕽	Associated 1	
- Sgr	Unlabeled Device	700455	1/8/2024, 4:10:42 PM	-66 🗢	0		Pair

The serial number of the Atoms available to pair are listed

Find the correct Atom and select 'Pair'

Note: The Seeker or Tensor must be online to associate with an Atom

The associated recorder will be listed



Select the X in the upper right corner to close

Once paired, the Atom is nested directly below the parent Seeker or Tensor

Select the arrow to expand >

2					Devices			?	D 🏓	×
3Ø	Multibu	rst							ø	q
-	#	S/N	Label 🔓	æ,	Status	V 1	V2	V3	kW	< >
	5	200649	Demo 200649 © 🛜		Offline	0.8	0.8	0.1	0.0	^
v		100639	RTC Wifi Tensor		Online	119.5	0.0		0.0	
•	\$	700455	Unlabeled Device Image: Optimized state		Online					

Select the Atom to see the 'Quick Access View' page



To view data, select the Overview button.

See the PQ Canvass User Manual for complete description of the listed icons



The Graphs button on the 'Quick Access View' page, displays additional graph options



Use the Reports button on the 'Quick Access View' page to view and save Interval reports



Use the Alert Thresholds button on the 'Quick Access View' page to view or change alert settings.

Alerts are sent to the user's email, see setting Alerts later in this manual.

Reed Switch and Accelerometer configurations are set here with additional settings on the Quick Access View Settings page (see below).

/ Pressure			Unlabeled Device (70045	5)		❹
		Low-Low	Low	High	High-High	
			Holdoff Time	Hysteresis		
Humidity						
		Low-Low		High	High-High	
			Holdoff Time	Hysteresis		
Temperature						
		Low-Low	Low	High	High-High	
			Holdoff Time	Hysteresis		
Irradiance						
		Low-Low	Low	High	High-High	
			Holdoff Time	Hysteresis		
Reed Switch	h					
Alert: Or	n State (Change			•	
Accelerome	eter					
Alert: Or	n Orient	ation Change			-	
Alert: Or						
Alert: Or						
Alert: Or		all				
			Set Thresh	holds		
			2	0	🖇 🗘 р	qcanvass

The Info button on the 'Quick Access View' page displays the Atom's information

	í	Device Info (700455)	?	Ð	۶	×
	Informatior	۱				
	GENERAL INFO					
	Label			/		
1	Serial Number	700455				
-	Platform	Atom				
	Customers	0		/		
	Location	38.3571, 78.9409 오		I		
	Firmware	v1.11				
	STATUS					
	Updated	1/09/2024 09:54:07				
-	Status	Online				
	NETWORK					
	RSSI					
	Battery Voltage	3.55 (v)				

The Settings button on the 'Quick Access View' page can be used to view or edit select settings. The accelerometer setting determines how the Magnetic Reed switch responds to the Alert settings. If using this setting also set the Alert Thresholds

°°		De	evice Info (700455	5)		?	Ð	۶	×
Setting	5								
	Accelerometer Profile			Power Profile					
Orientation	Only		Default						
Power Mode	Low Power		This is the defa	ult profile.					
Single Tap	Off								
Double Tap	Off								
Orientation	On								
Free Fall	Off								
Submit									

Accelerometer Profile	
Single-Tap Only	~
Ofi	
Single-Tap + Movement	
Double-Tap + Movement	
Single-Tap Only	
Double-Tap Only	
Movement Only	
Orientation Only	
Free-Fall Only	

Remove Associated Device

To remove the Atom from the associated Seeker or Tensor, click the - 🕈 👻 shown on the right of the Atom and press OK to remove. The Atom can now be associated to another recorder or paired to an iOS device such as an iPhone or iPad.

V I	•	100639	RTC Wifi Tensor	Online
•	<i>§</i> ?	700455	Unlabeled Device	Online
•				

You can also disassociate an Atom by selecting the Actions button on the Tensor or Seeker Quick Access View page, then select the Associated Devices button and select the X listed to the right of the Atom

តំង			Associate RTC Wifi Ten:	
Associated	Devices			
•		700455	Atom	×
Select the blue diskette i	con 🔲 to confi	rm removal		
តង				ed Devices nsor (100639)
Associated	Devices	Ð		
No Children Associa	ted			

Connecting the Atom to the PMI Atom App

The PMI Atom app is used to access Atom data using an iOS Apple product such as the iPad or iPhone

Verify you have Bluetooth® enabled on your Apple product.

The PMI Atom app can be <u>downloaded from the Apple store</u>.

Use your PMI PQ Canvass account login to enter the Atom app.



Select the icon for the Atom App

Sign in using your PQ Canvass login

Email		
Email		
Password		
Password		o
	Need help? Contact us	
	Log In	

Once logged in, you can select items from the bottom of the page.

Note: If you have multiple PQ Canvass accounts, a screen will show which will allow you to choose a specific account.

The account detail page contains some settings and access to the User Guide. Selecting PQ Canvass will open a browser with the PQ Canvass website.

Location brings up a map with the Devices location if set (the default location is longitude 0 , latitude 0)

Account Details – expanded

Act	ount Details	
1	User name	
I	Power Monitors Inc	
	© Settings	
	Automatically Upload Data	
	Remeber Device Filter	3
	Support	
	User Guide	
	PowerMonitors.com	
	24/7 Tech Support 1 (800)296-4120	
	Terms & Conditions	
	Contact PMI	
LO	τυο τ	
	Devices 🛇 Location 🛱 PQ Canvass 📶 Saved Data 名 🔺	ccount

Devices Screen

When the Atom App connects to the Atom, the serial number and RSSI (signal strength) will be displayed

Specific filters can be selected.

Click on the serial number listed



Note: If the Atom has not connected recently, push the Activation button on the Atom one time to 'wake up' the Bluetooth® connection. Once the Bluetooth® connection is established the Fetching Data Screen will show for a few seconds.

Note: An Atom that is not connected will list only the General Info tab and the Thresholds tab.



Selecting the Start Scanning button, will retrieve data from the Atom and send it to PQ Canvass (If the iOS device is not connected to the Internet, the data is placed under the 'Saved Data' tab on the iOS device to manually send later).

Open the link to PQ Canvass to view the data

11-36 AM Wed Jan 10	 ✓ all ♥ 445 ■ 	<		\odot
<	\circ			
Uploading Atom dat				
	77%	700455		
700455 700455	E	700455		
Start scanning	АТОЙ	Start scanning		
General Info		General Info		
Thresholds				
Sensor Readings		Thresholds		
Alerts		Sensor Readings		
		Alerts	Data was successfully uploaded. You can now view it on PQ Canvass	
			ОК	
☆ UPLOADING.			NOTHING TO UPLOAD	

Select Sensor Readings tab to view the latest data.

:	3:19 1 ? 🕬					
	Atom Sensor Readings					
	Last Read	3:18 PM				
	RSSI	-44				
	Firmware Version	1.09				
	Battery	3.531 V				
	Humidity	29.17 %				
	Pressure	969.8 mbar				
	Temperature	77.74 °F				
	Irradiance	6553.5 W/m^2				
	Reed Switch					
	Reed Switch Activation (Count 0				
	Orientation	Left				
	# of Orientation Change	s 0				
	# of Free Falls					
	# of Double Taps					
	-					

General Information tab can be used to associate the Atom to a PMI recorder and disassociate the Atom from the PMI recorder and change the location of the Atom on the PQ Canvass map.

<	General Information	3:21PM Tue Jan 9	•••	1 🖬 🕈 83% 🛄)
		<	General Information	
Label	700455			
Serial Number	700455	Label		700455
Platform	Atom	Serial Number		700455
Last Seen	3:20 PM			
Last Uploaded	3:20 PM	Platform		Atom
Location	38.3571 , 78.9409 >	Last Seen		3:20 PM
ASSOCIATE		Last Uploaded		3:20 PM
		Location		38.3571 , 78.9409 >
RTC Wifi Tensor		Parent Device		RTC Wifi Tensor
Demo 200649				
		DISASSOCIATE		

Thresholds tab

Settings are similar for Pressure, Humidity, Temperature (shown) and Irradiance.



Alerts Tab

Displays Atom status based on the Threshold settings

3:22 PM Tue Jan 9	• • •	1 III 🗢 82% 🔲
<	Alerts	
700455 700455 [©] Normal [®] Normal [®] Normal [•] ∕r Normal		SOLAR CELL SOLAR CELL
③ Pressure:		Normal
💩 Humidity:		Normal
∬[‡] Temperature :		Normal
-☆́- Irradiance:		Normal
	Thresholds >	

Setting Alerts

There are two areas that are used to configure alerts; one is the Threshold settings in PQ Canvass or in the iOS Atom app, the other are the Notification settings in PQ Canvass.

Alerts are sent to the PQ Canvass users' email, or to a PQ Canvass account created with an SMS address. Check with your cellular provider (ex: <10-digit-number>@txt.att.net, <10-digit-number>@sprintpaging.com, <10-digit-number>@myvzw.com).

Alerts sent to an email address include the graph of the alert, but PMI Tech Support can set this to Text Only if needed.

Alert Thresholds

Select Alert Thresholds from the Quick access View page in PQ Canvass



Then select the specific settings you want to monitor. You can select just one of the settings, or the full range of the settings. The Reed Switch and Accelerometer will generate Event notices which do not contain graphs.

Select 'Set Thresholds' to save the settings.

The Hold-off Time can limit the number of alerts sent. An alert will not be sent until the event reaches the specified number of minutes. No alert is sent if the alarm condition returns to normal before the Hold-off value is reached.

Hysteresis is used as a pad value that defines a narrow band above and below each threshold. A measurement must exceed the programmed threshold plus (or minus) the hysteresis value for that measurement to be used for alert triggering.

Pressure					
		Low-Low	Low	High	High-High
					disabled
			Holdoff Time	Hysteresis	
Humidity					
		Low-Low	Low	High	High-High
			Holdoff Time	Hysteresis	
Temperature					
		Low-Low	Low	High	High-High
			65	70	disabled
			Holdoff Time	Hysteresis	
Irradiance					
		Low-Low	Low	High	High-High
			Holdoff Time	Hysteresis	
Reed Switch					
Alert: On Stat	te Change				-
Accelerometer					
Alert: On Orie	entation Ch	ange			
Alert: On 1 Ta					•
Alert: On 2 Ta Alert: On Free			Set Thresholds		

In the iOS Atom app, select Thresholds from the device screen and select one of the settings, or the full range of the settings.

3:21PM Tue Jan 9

🖊 🚛 🗢 82% 📖

	<	Threshold Settings		
3:19PM Tue Jan 9 +++				
< ∞	Pressure			
700455 700455	Humidity			
ATOM	Temperature			
Start scenning	Degrees Fahrenheit			
General Info				
Thresholds				
Sensor Readings				
Alerts			1	+
Saved Data	Hold Off Time			
	Hysteresis			+
	Irradiance			
NOTHING TO UPLOAD				
	Reed Switch			
	Accelerometer			

Alert Notifications

To set the Notification, in PQ Canvass select the Tools icon 🔯 at the bottom of the screen. Then

select the Notification settings icon were setted. If you do not see the Notification icon, contact PMI Tech Support to make you and administrative user.



Select the + to add a Notification List

۶		No	tifications	0 D 🕈	×
()	+				q
۶	N Add Notification List	ggregate	Holdoff		
			No items in list		^

A notification list can be one person getting alerts from one recorder or multiple users getting the same alerts from multiple recorders. Aggregate is the number of minutes to collect all the alerts before the email is sent.

Holdoff is the number of minutes to wait before sending the alert email. Both are used to prevent numerous emails over a short period of time. Both can be adjusted at a later date.

Sel	ect the Save icon 🕒 . or t		In D		0	-0 •	, x	¢
s	+				, in the second s		С	2
۶	Notification List	Aggregate	Holdoff				T	^
۶		0	0	🖹 X				^
۵		1	Notifications		3	-0 📢		ĸ
\$ 5	+						¢	2
۶	Notification List	Aggregate	Holdoff				Î	< >
								*

Now that a Notification list is create, set the Devices, Users, Alerts and Events.

Devices will show all the recorders for your account. Click the + to select one, multiple, or all devices.

Users will show every user for your account. Click the + to select one, multiple, or all users.

		Atom alerts	Ð	۶	×
Devices	>	/ (700455)			+
Users	>	ret Demo 200649 (200649)			+
Alerts	>	🛋 RTC Wifi Tensor (100639)			+
Events	>				

Alerts will have many selections; many are not for the Atom sensor. Click the + to select one or many alerts.

Select 'Update' to save settings.

Note: Your selections must match to the Thresholds set earlier.

٦ ۶ 🛕 Temperature, No Alarm 🛕 Humidity, Low Low Device: A Temperature, Low 🛕 Humidity, High A Temperature, Low Low A Humidity, High High Alerts Alerts 🛕 Temperature, High 🛕 Irradiance, No Alarm 🛕 Temperature, High High 🛕 Irradiance, Low A Pressure, No Alarm 🛕 Irradiance, Low Low A Pressure, Low 🛕 Irradiance, High Update A Pressure, Low Low 🛕 Irradiance, High High A Pressure, High A Pressure, High High 🛕 Humidity, No Alarm 🛕 Humidity, Low ÷

Atom Alerts:

There are also Event selections that are not used for an Atom sensor. Select the events and then the Update button to save. Events also need to match the Thresholds selections.

۵		Atom alerts	Ð	۶
Devices		Accelerometer, Vibration		+
Users		Ø Alarm Status Changed		+
Alerts		🖉 Auto Shutdown		+
Events	>	Reed-Switch, State Change U	pdate	+

Irradiance Alert example:

Start Time	01-12-2024 18:29:38 UTC
End Time	01-12-2024 18:38:29 UTC
Device Label	
Device Serial Number	700455
Measure	Irradiance
Distribution List	Atom tost
DISTINUTION LIST	Atom test
Distribution List	Atom test

Event orientation message example:

Start Time	01-12-2024 16:22:25 UTC
End Time	01-12-2024 16:29:46 UTC
Orientation	Face Down
Orientation Change Event Count	1
Single-Tap Event Count	0
Double-Tap Event Count	0
Free-fall Event Count	0
Туре	Vibration or Orientation Changed

Temperature alert and graph example:



Atom LED Codes

Green Blink - Unit is collecting data

Blue Blink - Bluetooth radio turned on, looking for a device to send data to.

Blue Blink (twice) – Tensor/Seeker connected to Atom. Data is being transferred.

Aqua - A Tensor/Seeker has connected recently (within 6 minutes) to the Atom but has not connected since.

Data is waiting to be sent to the Seeker/Tensor

Yellow - Waiting for NTP server to be set (Occurs when the Atom is first turned on and has not yet connected to a Seeker, Tensor or the Atom app)

Technical Specifications

Temperature: -20C to 60C Pressure: 500 - 1100 hPa Humidity: 10-95% RH Solar Flux: 100 - 100,000 lux Acceleration drop and vibration detection Magnetic Reed Switch: door closure detection Environmental Rating: IP68 Communication: Wireless BLE 5.0 Radio Sensor data read every minute On-board Memory: 1 Year Battery Life: 10 years Weight: 2 ounces

Additional Information

Network Time Protocol (NTP) is synced with the Tensor or Seeker each time the Atom connects

The Atom's battery is currently expected to last 5 to 10 years.

Irradiance is used instead of Solar Flux. Think sunshine instead of a light bulb.

The Atom can only connect to a single recorder, it must then be dissociated and associated to another recorder if needed.

The Atom holds data for up to a year until it can connect to a device to send that data.

Refer to the PQ Canvass User manual for more information on using PQ Canvass

Technical Support

Help is always available if one needs additional assistance. The technical support team at PMI is widely considered to be the best in the industry. Use one of the following methods to obtain technical support:

E-mail Support

Send e-mail to: techsupport@powermonitors.com

Web Support

Submit a support request via the web at https://www.powermonitors.com/support

Telephone Support

Contact us 24 hours a day, 7 days a week for live tech support by calling: (540) 434-4120

Faxes should be sent to: (540) 432-9430

Postal Mail Support

All correspondence by post should be addressed to: Power Monitors, Inc. 800 North Main Street Mt. Crawford, VA 22841USA

Appendix 1: Warranty Clause

Power Monitors Inc. (PMI) warrants each new product manufactured and sold to be free from defects in material, workmanship, and construction, and that when used in accordance with this manual will perform to applicable specifications for a period of one year after shipment.

If examination by PMI discloses that the product has been defective, then our obligation is limited to repair or replacement, at our option, of the defective unit or its components. PMI is not responsible for products that have been subject to misuse, alteration, accident, or for repairs not performed by PMI.

The foregoing warranty constitutes PMI's sole liability and is in lieu of any other warranty of merchantability or fitness. PMI shall not be responsible for any incidental or consequential damages arising from any breach of warranty.

Equipment Return

If any PMI product requires repair or is defective, call PMI at (800) 296-4120 before shipping the unit to PMI. If the problem cannot be resolved over the phone, PMI will issue a return authorization number. For prompt service, all shipments to PMI must include:

- 1. The billing and shipping address for return of equipment
- 2. The name and telephone number of whom to contact for further information
- 3. A description of the problem or the work required
- 4. A list of the enclosed items and serial numbers
- 5. A return authorization number
- 6. If possible, a copy of the original invoice

Equipment returned to PMI must be shipped with freight charges prepaid. After repair, PMI will return equipment F.O.B. factory. If equipment is repaired under warranty obligation, freight charges (excluding airfreight or premium services) will be refunded or credited to the customer's account.

Return equipment to:

Power Monitors Inc. 800 North Main Street Mount Crawford, VA 22841 USA Attention: Repair Department

Appendix 2: Regulatory Information U.S. FCC Part 15 and Industry Canada RSS 210 Statements

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- **1.** This device may not cause harmful interference and
- **2.** This device must accept any interference received, including interference that may cause undesired operation.

FCC Warning

Changes or modifications to this product not expressly approved by Power Monitors, Inc. could void the user's authority to operate this equipment.