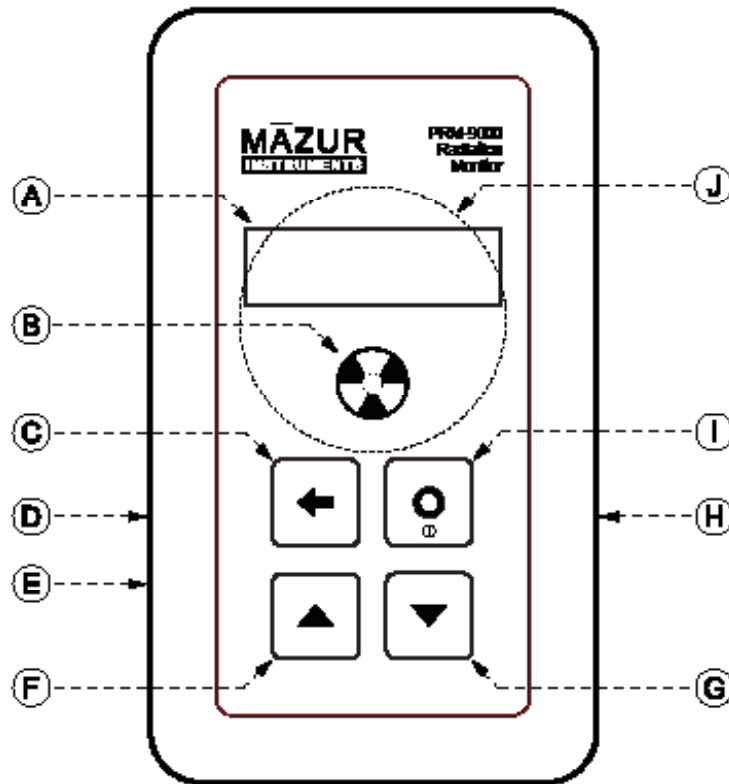


# PRM-9000 Nuclear Radiation Monitor

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Quick Start Guide






### Controls, Indicators and Connections

A	2 Line by 14 Character Backlit LCD
B	Radioactive Event LED Indicator
C	Back Key
D	External Audio and Data Jack
E	External DC Power Input Jack
F	Up Key
G	Down Key
H	Sound Port
I	Select/Power On Key
J	Geiger-Müller Tube Window

### Powering On the PRM-9000

Press and hold down  until the start up message is displayed on the LCD.





## “Always-On” Monitoring Power Management Settings

Power Setting (Set in Preferences)	Time of Inactivity Until:	
	LCD Off	Backlight Off
<b>Lowest</b>	60 Seconds	15 Seconds
<b>Medium</b>	10 Minutes	45 Seconds
<b>High</b>	Always On	Always On



Low Battery Condition	30 Seconds	2 Seconds
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**NOTE:** If LCD is turned off, the PRM-9000 will continue to monitor and measure radiation including current, average, maximum, minimum and total-count values. Pressing any key will “wake-up” the display and operations will continue normally until the inactivity threshold of the selected Power Setting is exceeded.

## Home Screen Operation






	Toggle Backlight On and Off
 or 	Move up and down through the eight screens: <ol style="list-style-type: none"> <li>1. Current Measurement</li> <li>2. Average Measurement</li> <li>3. Maximum Measurement</li> <li>4. Minimum Measurement</li> <li>5. Total Count Measured</li> <li>6. Time/Date of Maximum Measurement</li> <li>7. Current Time and Date</li> <li>8. Elapsed Time Since Power Up, or Reset</li> </ol>
	Select Main Menu


## Powering Off the PRM-9000

The PRM-9000 is intended to always be on. Power consumption is kept to a minimum using the power settings. To power down the unit press and hold down  while at the Home Screen until you are prompted to confirm that you want to power down the device. Press  to confirm. Alternately, the unit can be powered down from the Utilities sub-menu.

The clock will continue to keep time while the unit is powered down and all settings will be preserved. However, when the unit is powered back on, all counters (Average, Minimum, Maximum, Total and Elapsed Time) will be reset.

## Navigating the Menu System

	Select Main Menu
 or 	<p>Move up and down through the sub-menus:</p> <ol style="list-style-type: none"> <li>1. Timed Measure This function allows users to take measurements over a defined amount of time. This is useful for detecting small amounts of contamination.</li> <li>2. Set Units Users can select either <math>\mu\text{R/hr}</math>, <math>\text{mR/hr}</math>, <math>\mu\text{Sv/hr}</math>, CPS or CPM measurement units.</li> <li>3. Settings This sub-menu allows the user to customize the behavior of the PRM-9000. Settings include those associated with the beeper, LED, dose-rate alarm, time/date, power settings as well as the control over the averaging performed at low dose rates.</li> <li>4. Utilities This sub-menu includes functions to reset the measurement counters (Average, Minimum, Maximum, Total and Elapsed Time), perform a hardware reset, power down the device, load the factory calibration values, display the voltage of the battery and perform the calibration procedure.</li> <li>5. Ext Audio/Data This sub-menu is used to control the behavior of the audio/data jack. The jack can output audio at three selectable volume levels, provide a pulse output compatible with third party software or output a serial data stream (optional cable required) on the minute for data collection using a PC.</li> <li>6. Data Logging This sub-menu provides functions to control data logging to the internal logging memory in the PRM-9000.</li> <li>7. Language This allows the user to set the language to either English or Japanese</li> </ol>
	Select the desired sub-menu. Repeat the process for navigating through the sub-menus
	Return to previous menu

Sub-Menu Selection:DEFAULT	Description	Values - Press  to change/select
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
### Timed Measure


<b>Start</b>	Starts a timed measurement. The display will show the running average during the timed measurement and a count down of the minutes. The display will hold the final value until dismissed by the user.	
<b>Length: 10min</b>	Defines the length of the timed measurement in minutes.	1min, 5min, 10min, 20min, 30min, 60min, 90min

### Set Units

<b>mR/hr</b>	Sets desired dose rate measurement units	$\mu$ R/hr, mR/hr, $\mu$ Sv/hr, CPS, and CPM
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### Settings

<b>Beeper: Medium</b>	Sets beeper volume control	OFF, Low, Medium, High
<b>LED: ON</b>	Sets LED indicator on or off	ON, OFF
<b>Alarm: OFF</b>	Sets dose rate alarm on or off	ON, OFF
<b>mR/hr Alarm</b>	Sets the dose rate measurement in mR/hr that will result in audible alarm	 to select digit  to set digit value  save setting and exit  exit without change
<b>uSv/hr Alarm</b>	Sets the dose rate measurement in uSv/hr that will result in audible alarm	
<b>Set Time/Date</b>	Set time and date in 24 hour format HH:MM:SS, MM:DD:YY	
<b>Bt-Pwr: Lowest</b>	Sets battery Power Setting	Lowest, Medium, High
<b>Ex-Pwr: High</b>	Sets external Power Setting	Lowest, Medium, High
<b>Low AvWin: 20s</b>	Low range measurements are averaged over the number of seconds chosen in this setting.	20s, 10s, 5s

Sub-Menu Selection:DEFAULT	Description	Values - Press  to change/select
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### Utilities

<b>Reset Counters</b>	Resets Current, Minimum, Maximum, Average, Total Count and Elapsed Time registers	
<b>Hardware Reset</b>	Resets device and clears all registers including Time and Date	
<b>Power Down</b>	Turns power off and shuts down all radiation monitoring functions	
<b>Load Defaults</b>	Loads factory calibration	<b>NOTE: This function will erase existing calibration data. Use with care.</b>
<b>Display Bat/DC</b>	Displays battery and external DC input voltages	
<b>Calibrate</b>	Enters the calibration routine. Two calibrated dose rates are required - 20mR/hr and 200mR/hr	<b>NOTE: Calibration should be performed by a certified lab with a certified Cs137 source.</b>

### Ext Audio/Data

<b>Off</b>	Provisions the external audio and data jack for use with either headphones or the optional USB interface cable. The Pulse Out setting can be used to interface the PRM-9000 to radiation graphing software or to other electronic equipment.	Off, Data, Audio:Low, Audio: Medium, Audio: High, and Pulse Out
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### Data Logging

<b>Every: Minute</b>	Sets how often a measurement is stored in the data log memory	Minute or Hour
<b>Start or Stop</b>	Starts Logging, or Stops Logging	
<b>Status</b>	Shows the number of Records and Memory remaining during logging and after logging has been stopped.	
<b>Send Data</b>	Transmits log data in comma separated value format at 57,600 baud (requires data cable)	<b>NOTE: This command is visible only when logging is stopped.</b>

### Language ゲンゴ

<b>English</b>	Used to select either English or Japanese	English, Japanese
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## Using the Reset Switch of the PRM-9000

In the unlikely event that the PRM-9000 becomes unresponsive, the device can be reset using a paper clip. A small hole is located just to the right of the power jack. Insert a paper clip into the hole to push the reset switch. The start up message will be displayed and all factory default settings will be in place.

Alternatively, to reset the device, remove the battery, wait 30 seconds and replace the battery. This will reset the device.

Please note that if the unit has been calibrated and calibration data is found on the device, at reset, the calibration data will be used.

## Replacing the Internal Battery

1. Disconnect any external connections to the power connector and Audio/Data connector of the PRM-9000.
2. Using a Phillips Head screwdriver carefully remove the four screws located around the keypad while being careful not to scratch the case or keypad.



**High Voltage is present inside the PRM-9000. Avoid any contact with areas underneath or past the LCD towards the front of the device.**

3. Remove the top part of the case and gently place it on its face being careful not to over extend the ribbon cable connecting the keypad to the main board of the PRM-9000.
4. Using a finger from each hand disconnect the 9-Volt battery by pushing the top part of the 9-Volt battery away from the battery contacts.
5. Wait 30 seconds for the system to completely de-energize.
6. From the terminal side of the battery lift the battery out over the bracket that is securing the battery in place.
7. Properly discard the used battery.
8. Orient the new battery so that it is positioned to mate properly with the positive and negative terminals and use the side of the new battery to spread apart the bracket so that the battery is secured in place.
9. Push the battery up and be certain that both terminals snap into place.
10. The PRM-9000 should display the startup message and serial number.
11. Be sure to fold the shield into place and gently secure the cover back into position.
12. Reinstall the four Phillips Head screws to complete the procedure being careful not to over tighten the screws.



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