

Introduction to PSM1700 and PSM1735 Datalog Mode - January 2005

Version 1.20 firmware now includes a powerful new Datalog function that allows measurement functions from any of the PSM1700 measurement modes to be logged into non-volatile memory.

This function may be used in applications where results must be taken infrequently over a long period of time or very quickly with no gap between measurement windows. Example applications include:

1. Impedance measurement of materials over time when temperature is changing.
2. Testing the power profile of a product like a dish washer over an operation cycle.
3. Start up and dynamic testing of SMPS or Ballast with no break in measurement.

The following diagrams show the use of the datalog mode using the PSM1700 and the power adaptor option measuring the power input to a variable speed electric fan.

POWER METER		
	true	fundamental
watts	29.281W	29.149W
VA	32.918VA	32.429VA
pf	0.890	+0.899
CH1	240.08V	239.77V
CH2	137.11mA	135.25mA
frequency	49.916Hz	+025.989°
H3	15.867mW	0.054%

Up to four separate parameters can be logged and these are selected using the zoom function.

Here, the PSM1700 is configured in Power mode. Total Watts, VA, pf & Harmonic 3 Watts selected as zoom functions therefore the data from these functions will be logged.

ACQUISITION CONTROL	
mode	normal
speed	window
window	20.000ms
reference	ch1
filter	normal
filter dynamics	auto reset
low frequency	off
datalog	RAM
interval	1.0000 s

From 'ACQU' menu, speed option set to 'window' then window period set to 20mS.

Datalog option selected with results to RAM (non-volatile could also be selected)

Interval of 1 Sec selected.

0:00:15 POWER METER DATALOG (15)

(15)	watts	V/A	pf	H3
0:00:00	28.425 W	32.512 V/A	0.874	13.309m W
0:00:01	28.400 W	32.612 V/A	0.871	11.613m W
0:00:02	28.504 W	32.667 V/A	0.873	12.321m W
0:00:03	28.516 W	32.650 V/A	0.873	11.616m W
0:00:04	28.343 W	32.485 V/A	0.873	10.706m W
0:00:05	28.527 W	32.719 V/A	0.872	9.4880m W
0:00:06	28.349 W	32.507 V/A	0.872	9.7893m W
0:00:07	28.332 W	32.502 V/A	0.872	16.174m W
0:00:08	28.274 W	32.389 V/A	0.873	14.268m W
0:00:09	28.263 W	32.383 V/A	0.873	11.915m W
0:00:10	28.252 W	32.421 V/A	0.871	11.885m W
0:00:11	28.394 W	32.632 V/A	0.870	12.538m W
0:00:12	28.364 W	32.466 V/A	0.874	10.667m W
0:00:13	28.192 W	32.325 V/A	0.872	11.053m W
0:00:14	28.231 W	32.504 V/A	0.869	13.462m W

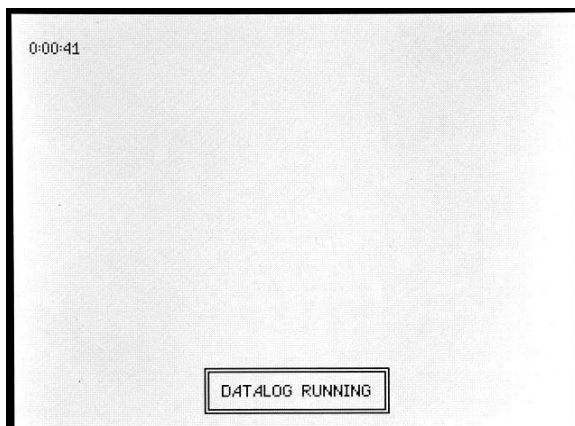
When the 'START' button is pressed, datalog begins and real time results, graph or table presentation can be chosen. The display will update 'live' at the selected interval period.

Note that the Datalog line number is shown and the cursor arrow shows the latest result.

ACQUISITION CONTROL

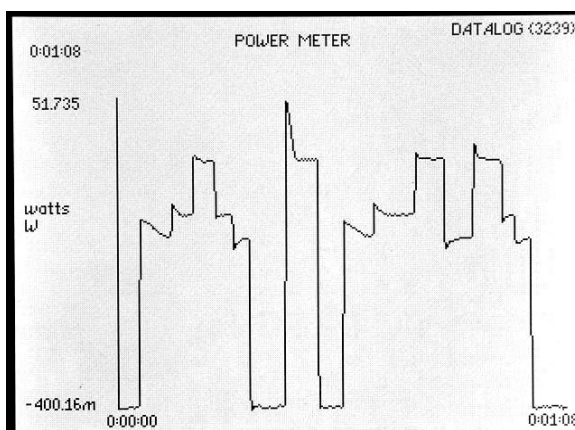
mode	normal
speed	window
window	20.000ms
reference	ch1
filter	normal
filter dynamics	auto reset
low frequency	off
datalog	RAM
interval	000.00ms

Here the interval is set to 0 seconds so no time interval will be added between measurements and results will be taken every window period (in this case a 50Hz power cycle) with no gap.



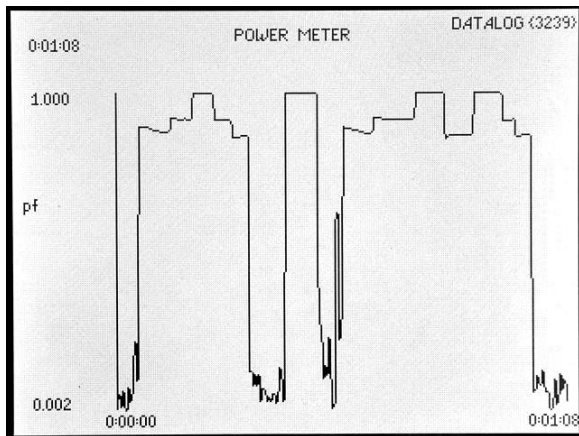
With interval periods down to 100mS, real time, table or graphs display will still show results updated live. The graph shows 250 points and will 'scroll' like an oscilloscope screen with the last 250 measurements when more than 250 lines are logged.

With less than 100mS interval, a screen with flashing 'Datalog Running' and the elapsed time will show.



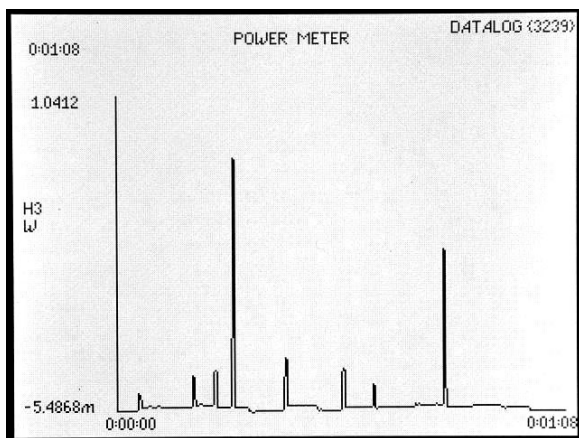
When the datalog memory is full (up to 8096 lines for single measurement function or 3239 lines for four measurement functions) or datalog is stopped, the complete datalog record is shown.

Here, Total watts over the measurement period is shown.

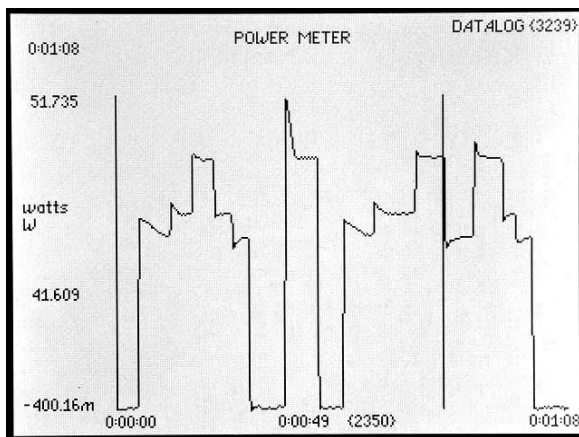


Each measurement function can be shown as a graph over the complete datalog period.

E.g. here, the pf for a datalog of every cycle over one minute is selected.

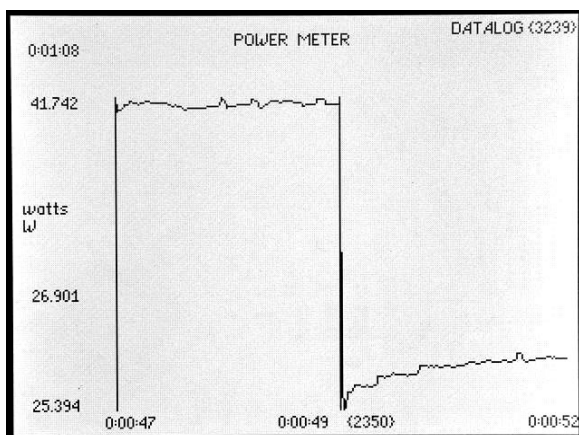


Here, a graph of harmonic 3 power is shown over the same measurement period.

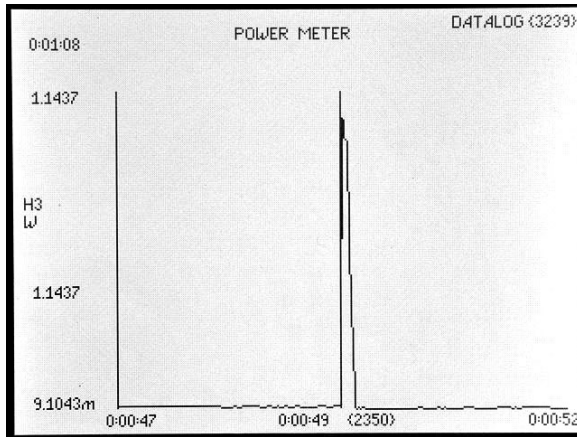


Here, the cursor is taken to a point where the electric fan has been switched from full power to medium power.

This occurs at cycle number 2350



Here, the ZOOM button is pressed showing detail at cycle number 2350 with results for every cycle showing over a 5 second zoom window.



Here, the GRAPH button is pressed again to show the Harmonic 3 power also in zoom on the same cycle.

	watts	V/A	pf	H3
0:00:49	41.335 W	41.335 V/A	1.000	17.683m W
0:00:49	41.418 W	41.418 V/A	1.000	17.075m W
0:00:49	41.379 W	41.379 V/A	1.000	17.655m W
0:00:49	41.356 W	41.356 V/A	1.000	17.863m W
0:00:49	41.738 W	41.739 V/A	1.000	20.030m W
0:00:49	41.677 W	41.685 V/A	1.000	20.357m W
0:00:49	41.617 W	41.625 V/A	1.000	20.172m W
0:00:49	41.607 W	41.618 V/A	1.000	20.231m W
0:00:49	41.609 W	41.621 V/A	1.000	20.579m W
0:00:49	41.350 W	41.350 V/A	1.000	16.774m W
0:00:49	41.352 W	41.360 V/A	1.000	17.434m W
0:00:49	41.362 W	41.367 V/A	1.000	16.773m W
0:00:49	41.328 W	41.338 V/A	1.000	18.447m W
0:00:49	41.347 W	41.359 V/A	1.000	18.742m W
0:00:49	41.371 W	41.385 V/A	1.000	19.900m W
0:00:49	41.358 W	41.371 V/A	1.000	19.586m W
0:00:49	41.366 W	41.373 V/A	1.000	19.538m W
0:00:49	26.901 W	30.605 V/A	0.879	1.1437 W

Here, the TABLE button is pressed showing all measured functions for every cycle with the selected cycle number 2350 automatically positioned at the bottom of the table.

	true	fundamental
watts	30.233W	30.095W
V/A	33.988V/A	33.394V/A
pf	0.890	+0.901
CH1	241.96V	241.95V
CH2	140.47mA	138.02mA
frequency	49.910Hz	+025.682°
H3	11.558mW	0.038%
watts	478.45mWh	430.74mWh
V/A	523.11mVAh	463.21mVAh
pf	0.915	0.930
rms	2.1139mA	2.0269mA

Here, the REAL TIME button is pressed the screen shows all power function in real time measurement mode again but also shows the integrated values obtained at the end of the datalog period.

true watts	30.233	W
true V/A	33.988	V/A
true pf	0.890	
watts H3	11.558m	W

Here, the ZOOM button is pressed to see the selected functions in full size.