

Ranger Power Master 1000 (PM1000F)

Single Phase Power Quality Recording Analyser with Flicker



Use the Right Tool for the Job

The PM1000F is a single phase, power quality troubleshooting tool with Flicker measurements to IEC61000-4-15, including Instantaneous Flicker Sensation.

Simply plug it in and play

The PM1000 will begin recording without requiring any user skill.

Wireless Communication

Bluetooth to phone, tablet or PC as well as remote data download, live results and remote control of your analyser via our PMGateway App.

Correct Data First Time

Our patented **Single Cycle Adaptive Store™** recording process provides single cycle measurements over long recording periods.

All the measurements you need first time out, without setting any thresholds!

Detail in your recordings where you need it

Record detail down to a single cycle whenever a disturbance occurs using our unique data storage technique Single Cycle Adaptive Store™. It's automatic, no need to set thresholds.

Straight forward communication

A virtual user interface on your PC or portable device allows you to set the PM1000F up and see real time data without it needing a display. Talk to your PM1000F via Bluetooth using a PDA or Windows compatible mobile phone and to your PC via an infra-red communication device.

Simple Analysis

Adaptive Store, combined with our comprehensive data analysis software, Pronto for Windows, enables you to analyse your data with speed and confidence, zooming in easily on the readings that matter.

What makes using the PM1000F so easy?

- Up to 16 channels of recorded information in the same session enables you to get all the information you want first time.
- Three flashing red/green LEDs give status information when the PM1000 is recording so you can check all is in order with no fuss.
- On screen 'Help' guides you through setting up so you can get it right first time.
- The PM1000 comes with 13 configurations for single phase hook ups already stored so you can get started with confidence.
- You can store up to 127 configurations or data files in the PM1000 so you only have to create each of your unique set ups once. The logger remembers them for your future use saving you much time and effort.
- Set ups can be programmed in on-site for your convenience.
- Compact and light, the PM1000 comes with a protective boot and specifically designed bag to make carrying it around easy.

Parameters Measured

- ∞ Voltage
- ∞ Current
- ∞ Stray voltage Hi Res <35V
- ∞ Real Power
- ∞ Reactive Power
- ∞ Power Factor
- ∞ Apparent Power
- ∞ Phase Angle
- ∞ Frequency
- ∞ Total Harmonic Value
- ∞ Total Harmonic Distortion
- ∞ Flicker
- ∞ Inrush Current (automatic)

Ranger PRODUCTS

designed and manufactured
in the UK by



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10/06/2015

Single Phase Power Quality Analyser with Flicker

Ranger PM1000F Kit

- PM1000 Power Quality Analyser with Flicker
- Infra Red Download Cable or Bluetooth option
- 24" 1000 Amp Flexible Rogowski Coil (max conductor size 8") Optional
- Mains Lead
- Protective Boot
- Customised Carrying Bag
- Pronto for Windows Analysis Software
- Customer CD with Operation Manual
- Android Tablet for Bluetooth Communication (Optional)



Single Cycle Adaptive Store™

“Starting from scratch we would have spent weeks zeroing in on something like this on a conventional recorder, but the PM logger caught it on the first try, with no special setup”

Pat Coleman, Southern Company, USA, 2010

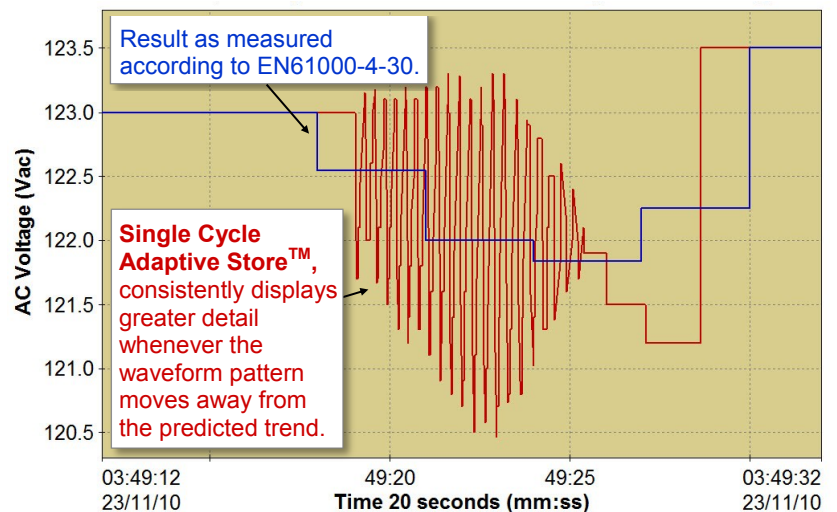
Adaptive Store is our patented compression technology available in all PM Series Analysers. It automatically records the chosen parameters in great detail and at high sampling rates when anomalies and deviations from the predicted trend occur.

Adaptive Store is designed to make the best use of available memory, whilst meeting two conflicting requirements:

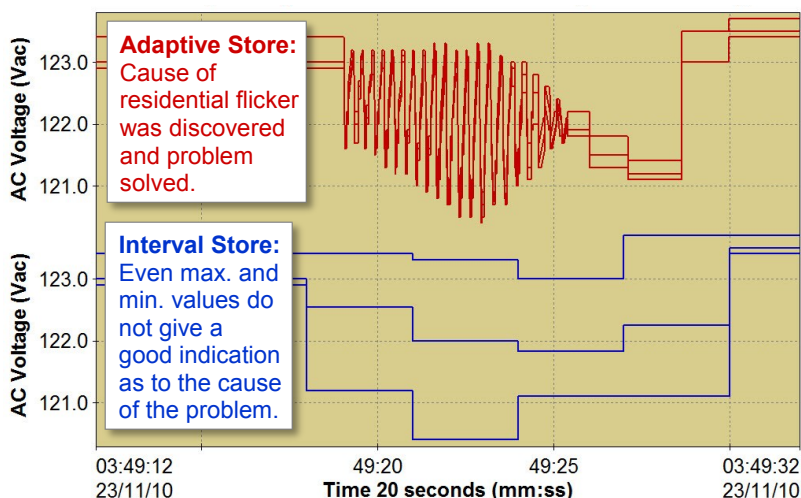
- to provide long-term trend data, observing the worst extremes of max and min values, and;
- to provide detail where new activity occurs, i.e., detecting and capturing sudden changes.

Adaptive Store assesses signal conditions in real time without having to set thresholds. The only required user parameter is the total time of the recording.

Outram's Adaptive Store vs. Interval Store (3 sec averages) of Van



Max, Min and Average of Van: Adaptive Store vs. Interval Store



Adaptive Store recognises the unpredictability of future signal activity

This unique method of *anticipating* the possible signal path has many advantages. For example:

- it allows for immediate reaction to transients capturing the entire duration of the disturbance, and;
- it works with extremely long recording periods.

By automatically adjusting the thresholds distinguishing the anomalies from the trend as signal dynamics change or the available memory becomes full, Adaptive Store ensures that less significant phenomena can be summarised and greater detail recorded for abnormal behaviour.

The Single Cycle Adaptive Store™ recording mode is the most powerful automatic data compression system available in any data logger on the market.

Exclusive Software, Pronto for Windows



How to make the most of all your recorded data:
Use our **Pronto for Windows Software**, the best graphing software on the market for use with all PM Analysers



UPSTREAM OR DOWNSTREAM?

Our Adaptive Store recording regime can deliver enough detail to indicate whether a disturbance is coming from upstream or downstream of where the measurement was taken. Work it out by looking at the relationship between the voltage and current data streams.

COMPARE LIKE WITH LIKE?

From your own recorded data in Pronto you can load the same configuration back into the analyser to record the same measurements again and again.

TECHNICAL SUPPORT

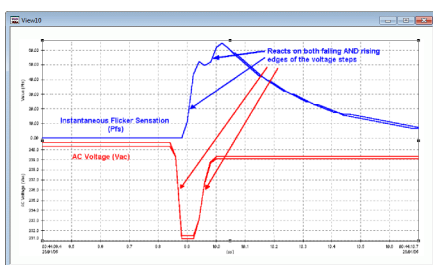
Technical support is available from those who either designed the unit or have over 20 yrs experience with the Ranger and PM series.

Who better to instruct you on how to make the most of your analyser?

STANDARD REPORTS

Generate graphs and tables suitable for EN50160 reports. (PM7000, PM7000FLM and PM7500 only)

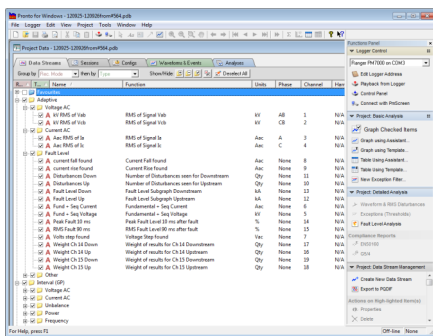
Pronto for Windows is a full-featured, Windows based program designed to extract data from the Power Master series and present it either graphically or in tables for straightforward analysis.



Analyse detailed data that Single Cycle Adaptive Store™ has captured automatically

Pronto for Windows is the only program you will need to communicate, analyse, report, and manage your data (as well as configure the analyser itself).

Through the use of easy to follow 'assistants' and pre-loaded templates create graphs and tables for emails and hard copy reports simply and quickly. Manage and save your favourites to create the same graphs recording after recording.

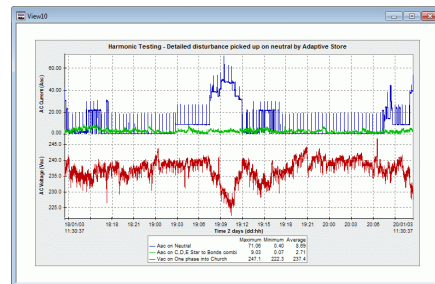


Pronto for Windows Project Browser

The selection of icons on the toolbar makes all commonly used instructions such as zooming, statistical analysis, annotation, downloading, and printing as easy as pointing and clicking the mouse.

Simply 'copy & paste' graphs into any word processing program and export tables straight to Excel or PQDIF for further analysis.

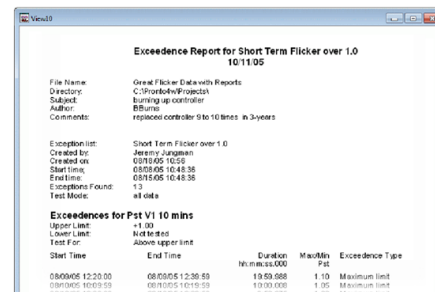
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Sample Graphical Data of Voltage & Current

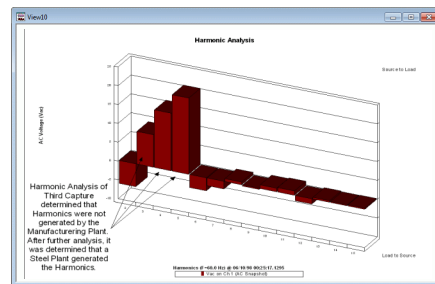
More Pronto Features:

- Analyser configuration is saved with data for retrieval any time
- Easy file management tools
- Watch our New video tutorials on-line
- Reporting Tools:
Exceedence reports
Summary statistics
Tabular Listings
Custom Reports saved as templates



Exceedence Report - Multiple reports generated after recording is concluded

- Unlimited traces on a screen
- Arrange traces on any axis, full freedom of editing on all aspects of a graph
- A comprehensive, context-sensitive help system



Harmonic Analysis of Waveform Events (PM7000, PM7000FLM, PM7500 series and PM4000 only)

Ranger PM1000F Product Specification

Input Voltage: 2 channels, 0-270 Vac, Live to Neutral and Neutral to Earth.

Input Current: 1 channel, ranges 0-1000 A RMS and 0-50 A RMS. Sensing using a flexible Rogowski Coil. Also works with standard CT's.

Channels: 16.

Accuracy: Volts and wide range current < 0.25% True RMS +/-2 LSB's excluding sensors. Narrow range current < 1% True RMS excluding sensors.

Resolution: Programmable to 0.1 Vac and 0.1 Aac or 0.01V and 0.01A high resolution mode.

Maths Channels:

AC 1 Phase: RMS, Stray Voltage RMS Hi Res < 35V, Real power W, Reactive Power VARS (fund), Apparent Power VA, Power Factor PF, Phase Angle, Frequency, Instantaneous Flicker Sensation, Short Term & Long Term Perceptibility, Flicker Flag.

Harmonics: Total Harmonic Value, % Total Harmonic Distortion.

Other Maths Option: Channel X * Constant, Channel X / Channel Y, Filtered Channel X, Internal Temperature, On Charge, Battery Volts.

Sampling: Continuous sampling at 64 samples per cycle.

Recording: Single cycle True RMS response time; 16 bit simultaneously sampling all signals.

Recording Mode and Rate:

Adaptive Store: Unique storage management enables extended recording & single cycle resolution on significant signal changes.

Point Store: Selectable from single cycle rate to once every 12 hours.

Memory: 1 MB RAM Standard compressed.

Data Retention: Back-up battery provides 1 month's retention @ 25°C (77°F) from a full charge.

Power: Runs and charges via an input to 'Voltage Input Channel 1' of 100-270 Vac.

Battery: 4 AA NiMH battery pack & 1 Lithium button cell.

Battery ride through: 10 minutes at a time. Operation from fully charged battery with no ac mains power present > 5 hrs at 25°C.

Safety & Standards: IEC 61010 (300V Cat III, Pollution level 2), CE, IEC 61326 (EMC), IEC 61000-4-15.

Internal fusing: PSU, Battery stack, fused voltage leads.

Communications:

User Interface: 3 status LEDs (Power on, Voltage in spec, Recording /Memory).

Serial Port: Serial infra red port, (up to 115.2K baud); isolation >2.5 kV.

Bluetooth (optional): Wireless interface (isolated) reception up to 10m.

PMGateway App.: Enables Android mobile phone to act as a Gateway. Send data files to your inbox, start and stop recordings.

Protocol: MODBUS ASCII.

Computer Requirements for Pronto Software: Windows 2000, XP, Vista, 7; 250MB hard drive space.

Case: Rectangular box enclosed in a protective boot.

Dimensions: 215 mm x 116 mm x 45 mm including boot.

Weight: 900 gm including boot.

Operating Temp: -10°C (14°F) to 60°C (140°F).

DELVING INTO THE DETAIL

Single Cycle Adaptive Store™ takes more detailed recordings when the measurement deviates from the predicted trend.

This PM series EXCLUSIVE storage technique means only the necessary information is captured in detail making the most of the unit memory and reducing analysis time.

FIND THE SOLUTION

Could you find the answer to your power quality complaints faster?

Do not leave it to chance.

Find out with a **PM1000F**.



sales@outtramresearch.co.uk

TESTIMONIAL

In short, we are very happy with the [Outram Analyser], and glad we found each other. Really because it does things and finds things which other kit doesn't touch! The "detailed recording" channels, and the ability to relate different channels, makes it ideal for answering questions like "what happened and why?"

R. Ball, National Grid UK, 2011.