

Ranger Power Master 3000HF (PM3000HF)

Three Phase Power Quality Recording Analyser with Flicker and Harmonics



Take Control of your PQ Measurements Today

- Are your machines deteriorating due to poor power quality?
- Can you save money distributing your load?
- Are you wasting energy?
- Find out...and much more with the PM3000.

Now with optional



for remote communication. Hold your screen in your hand.

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!

The PM3000HF...is for everyday use

A 3 phase power quality analyser with a user-friendly, graphical touch screen provides you with all the information you need to get the answers to your power quality questions.

...gives detail in your recordings where you need it

Record detail down to a single cycle whenever a disturbance occurs, without setting any thresholds, with our unique data storage technique Single Cycle Adaptive Store™. Record this detail up to 2 months with our new Memory Extension to 64MB.

...records 16 Channels, from 100s of measurements

The PM3000 records and displays up to 16 detailed channels simultaneously. Choose from voltage, current, power, power factor, VAR's, phase angle, frequency, unbalance, THD, and much more. The PM3000 can measure 100s of individual parameters.

...is easy to set-up, you don't have to set thresholds

Setting up is easy. Simply use it as a meter or download recordings to your PC for further analysis.

Technical help: support@technical-sys.com
Sales enquiries: sales@technical-sys.com

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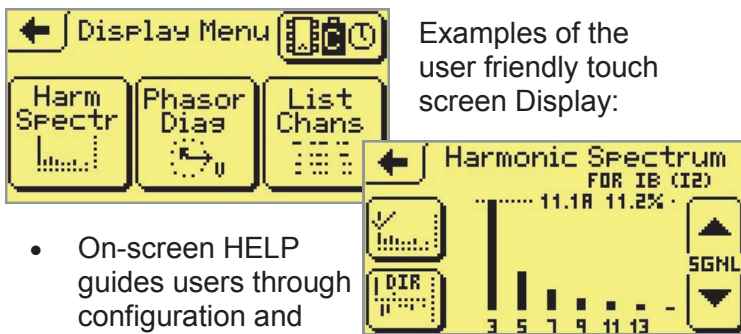
Ranger PRODUCTS

designed and manufactured in the UK by



PM3000HF with Harmonics and Flicker

- 23 pre-loaded configurations are set for 3, 2 and single phase hook ups with a variety of recording channels. These are selected for measuring voltage, current, power, power factor, harmonics, flicker, unbalance and more.
- Phasor Diagram Display is a graphical touch screen interface that ensures correct hook up, provides suggestions upon detecting errors and determines if current sensor is properly orientated.



- On-screen HELP guides users through configuration and hook up.
- Capable of storing up to 127 configuration or data files.
- The PM3000 measures both AC and DC Power (optional)
- 5 memory options available: 1MB, 8MB, 16MB, 32MB & 64MB

- Measures to the EN50160 Standard
- The PM3000 runs off the voltage being measured. For voltages below 50V use an AC/DC 12V charger.
- Battery back up provides 10 minutes resettable timed ride-through in case of power outage
- Fused voltage leads and internally fused voltage inputs protect valuable equipment
- Rugged, compact, portable case is lockable. Unit is lightweight, reliable and easy to use.
- Safety: 600V Cat III, pollution level 2 unit. Very small size, will fit in most panels and allow the door to be closed. Review screen remotely via Bluetooth.

- Field programmable software and firmware updates
- RS232, with MODBUS ASCII protocol or modem communications.
- Data analysis is easy with our and comprehensive software Pronto for Windows (included in your kit).



Great value 3 Phase Power Quality Analyser with Flicker and Individual Harmonics to the 15th

PM3000HF Kit

- PM3000HF Power Quality Analyser
- Three 24" 3000 Amp flexible current clamps (max. conductor size 8")
- Four voltage input cables with fusing
- 9-Pin RS232 Serial Download Cable
- Three Neutral Common Leads
- Mains Lead
- Customised Bag with Tool Roll
- Pronto For Windows Analysis Software
- Customer CD with Operation Manual
- Braid for personal cable management



- Optional Android Tablet/ Mobile Phone or Netbook for Bluetooth Communication

Exclusive! 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”

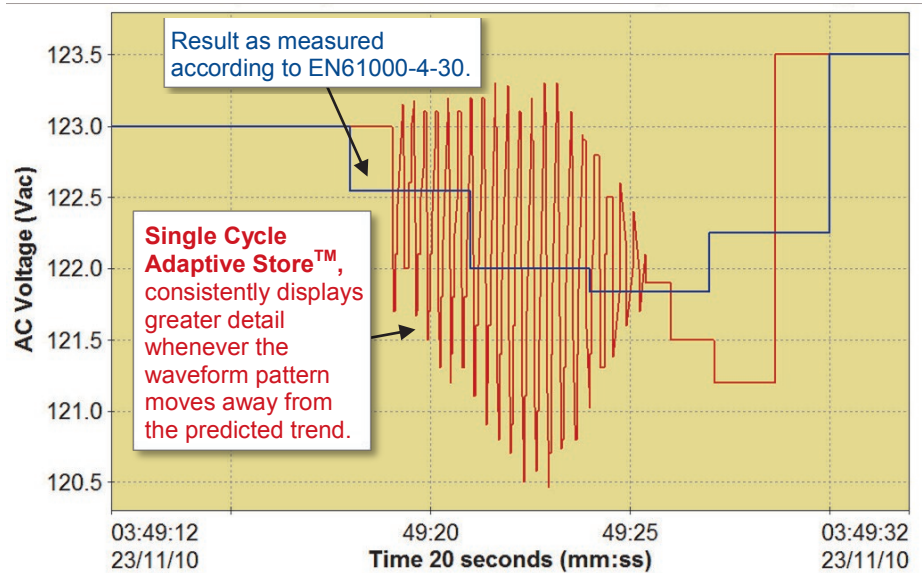
Pat Coleman, Southern Company, USA, 2010

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.

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



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.

Adaptive Store recognises the unpredictability of future signal activity

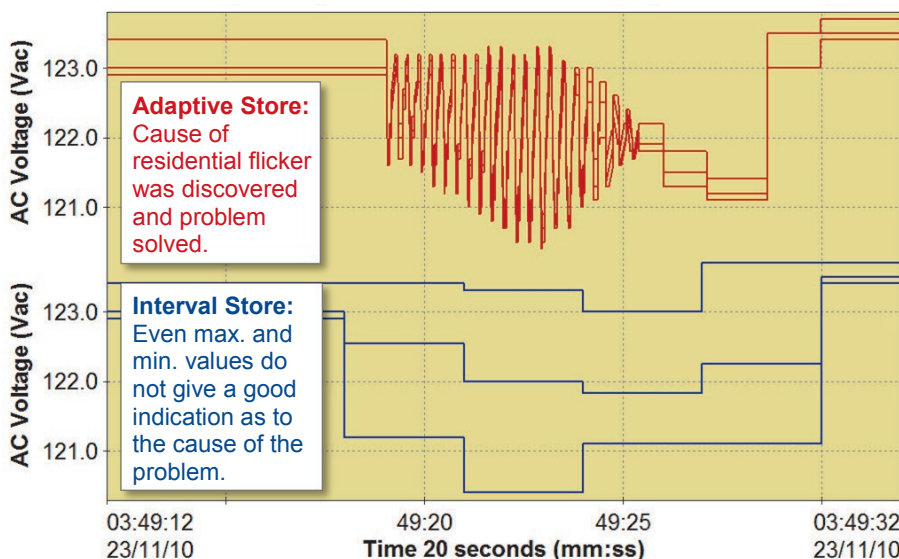
This unique method of *anticipating* the possible signal path has many advantages. For example:

- 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.

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





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



STANDARD REPORTS

Generate graphs and tables suitable for EN50160 reports.

UPSTREAM OR DOWNSTREAM?

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

COMPARE LIKE WITH LIKE?

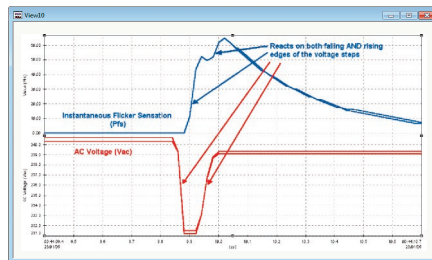
From your own recorded data in Pronto you can load the same configuration back into the analyser to record the same measurements again and again.

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 how to make the most of your analyser?

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.

Stream	Function	Type	Units	Phase	Channel Name	Config
A	RMS of Signal	Current	A	A	12.000	Summ...
B	RMS of Signal	Current	A	B	12.000	Summ...
C	RMS of Signal	Current	A	C	12.000	Summ...
N	RMS of Signal	Current	A	N	12.000	Summ...
V	RMS of Signal	Voltage	V	N	12.000	Summ...
Temp	Internal Temperature	Temp	°C	N	12.000	Summ...
Temp	Calculated RMS of line with respect to Vrms	Voltage	V	AC	7	N/A
Temp	Calculated RMS of line with respect to Vrms	Voltage	V	AC	8	N/A
Temp	Calculated RMS of line with respect to Vrms	Voltage	V	AC	9	N/A
Temp	Calculated RMS of line with respect to Vrms	Voltage	V	AC	10	N/A
Temp	Calculated RMS of line with respect to Vrms	Voltage	V	AC	11	N/A
Temp	Calculated RMS of line with respect to Vrms	Voltage	V	AC	12	N/A
Temp	Calculated RMS of line with respect to Vrms	Voltage	V	AC	13	N/A
Temp	Calculated RMS of line with respect to Vrms	Voltage	V	AC	14	N/A
Temp	Calculated RMS of line with respect to Vrms	Voltage	V	AC	15	N/A
Temp	Calculated RMS of line with respect to Vrms	Voltage	V	AC	16	N/A
Temp	Calculated RMS of line with respect to Vrms	Voltage	V	AC	17	N/A
Temp	Calculated RMS of line with respect to Vrms	Voltage	V	AC	18	N/A
Temp	Calculated RMS of line with respect to Vrms	Voltage	V	AC	19	N/A
Temp	Calculated RMS of line with respect to Vrms	Voltage	V	AC	20	N/A
Temp	Calculated RMS of line with respect to Vrms	Voltage	V	AC	21	N/A
Temp	Calculated RMS of line with respect to Vrms	Voltage	V	AC	22	N/A
Temp	Calculated RMS of line with respect to Vrms	Voltage	V	AC	23	N/A
Temp	Calculated RMS of line with respect to Vrms	Voltage	V	AC	24	N/A
Temp	Calculated RMS of line with respect to Vrms	Voltage	V	AC	25	N/A
Temp	Calculated RMS of line with respect to Vrms	Voltage	V	AC	26	N/A
Temp	Calculated RMS of line with respect to Vrms	Voltage	V	AC	27	N/A
Temp	Calculated RMS of line with respect to Vrms	Voltage	V	AC	28	N/A
Temp	Calculated RMS of line with respect to Vrms	Voltage	V	AC	29	N/A
Temp	Calculated RMS of line with respect to Vrms	Voltage	V	AC	30	N/A

Pronto for Windows Project Browser

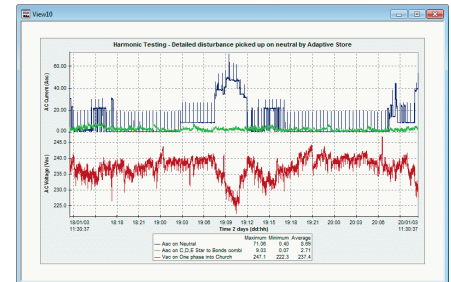
The selection of icons on the toolbar makes all commonly used instructions such as zooming, statistical analysis, annotation, downloading, and printing as easy as pointing and clicking the mouse.

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

Sales enquiries: sales@technical-sys.com

Toll Free: 866-327-8731

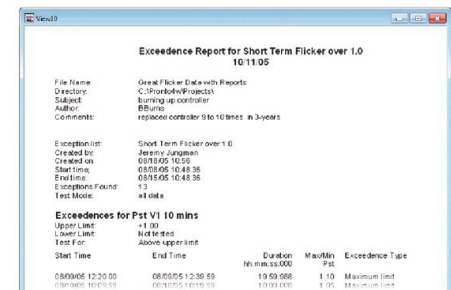
Technical help: support@technical-sys.com



Sample Graphical Data of Voltage & Current

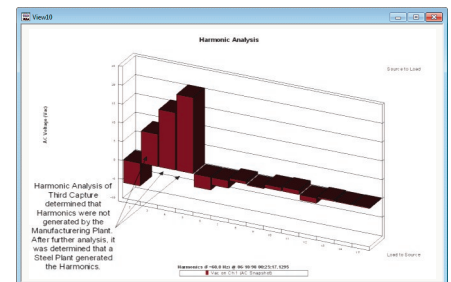
More Pronto Features:

- 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 only)

Ranger PM3000 Product Specification

Input Voltage: 3 channels 0-480 Vac. Sensors: In-line shrouded 4mm banana plugs and fused crocodile clips

Input Current: 3 channels. Sensors: Three 24" 3000 Amp Flexible Current Clamps supplied (Ranges 0-3000A, 0 - 400.0A, 0 - 50.00A) or can use with conventional 0 - 0.5 V ac voltage output current clamps.

DC measurement with suitable sensors optional

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. Zeroing function for DC

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

Maths Channels:

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

AC 2 Phase: Real Power, VARS (fund), Apparent Power, Power Factor

AC 3 Phase: Real Power, Reactive Power VARS (fund), Apparent Power, Power Factor, Voltage Unbalance, (Conventional & Sequential Components) Current Unbalance

Harmonics: Odds, Evens, Triplens, Individual Harmonics and Harmonic Direction to the 15th, K Factor, % Total Harmonic Distortion to the 25th, Harmonic Value

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

Sampling: Continuous sampling at 64 times per cycle

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

Memory: 5 options available: 1MB, 8MB, 16MB, 32MB & 64MB RAM

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

Data Retention: Back-up battery provides 2 month's retention @ 25°C (77°F)

Power: Requires 50-480 Vac from Phase A voltage measurement or separate power supply

Battery: 4 AA NiMH battery pack & 1 Lithium battery

Safety & Standards: IEC 61010, 600V Cat. III, Pollution level 2, CE, IEC 61326(EMC), IEC 61000-4-15

Internal fusing: PSU, Battery stack, fused voltage leads

Communications:

Serial Ports: RS232, (up to 230.4K baud); isolation>2.5kV. Bluetooth (wireless) (optional)

Protocol: MODBUS ASCII touch-screen display 100 x 35 mm

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

Display: Backlit LCD graphic touchscreen display 2.5" x 1.35"

Case: Pelican 1120 Guard Box: Dimensions 8" x 6.5"x 3.5"

Weight: 2.5lbs (1.1kg) without leads and clamps

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

DELVING INTO THE DETAIL

Single Cycle Adaptive Store™ records more detail 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 there be fire risks in your warehouse or problems with your power network?

Do not leave it to chance.

Find out with a **PM3000HF**.

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sales@technical-sys.com

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.