

## Take control of your power quality measurements



### with a *Ranger* PM3000HF

Now with optional wireless Bluetooth communication. Talk to your *Ranger* remotely and stay safe.

- Are my machines wearing out prematurely? Is it due to the presence of harmonics?
- Am I wasting energy? Is my power factor good enough?
- Why do parts of my process fail? Is my mains voltage dipping? How often? How much?

**The PM3000 will help answer these questions and many more...**

*Ranger* PRODUCTS  
designed and manufactured in the UK by  
OUTRAM RESEARCH LTD

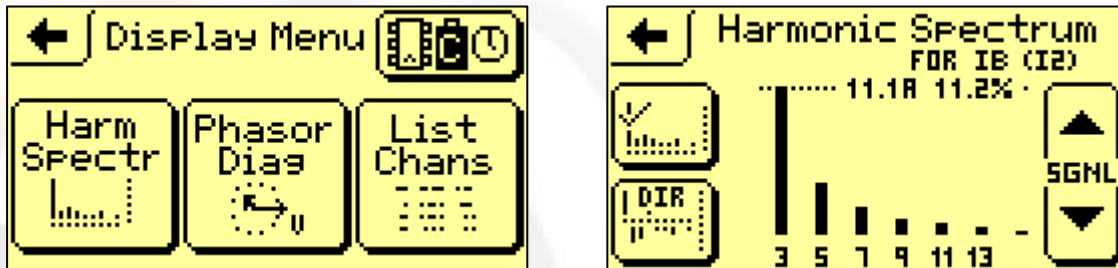


## Here's how!

The **PM3000** records voltage and current on your 3-Phase electricity supply. It has...

### OPERATION

- Easy touch-screen operation:



### RECORDING

- Unique single cycle **Adaptive Store** data storage, ensuring no significant recording detail is missed over long time periods.
- Flexible recording options that allow you to measure accurately all the aspects of power quality you may need.

### RESULTS

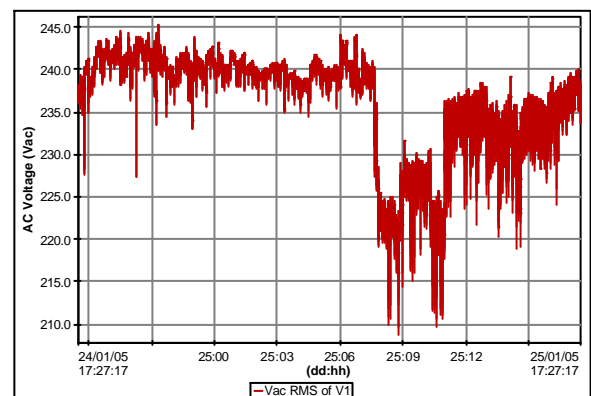
- **Pronto**, the most comprehensive graphing software .
- EN50160, averaging or exceedence report generation.
- Many useful power calculations.

### EXAMPLE

**PROBLEM:** During the morning, a machine is failing in my factory. Why? Are there additional hidden dangers?

**ANALYSIS:** This **Pronto** graph of a 24 hour recording shows that the voltage supply to the failing machine was dropping by almost 10% between 7.30 am and 11.00 am.

**CONCLUSION:** The **PM3000** analysis also confirmed that the voltage of the supply entering the factory was OK. Therefore there was a significant, potentially dangerous problem with the factory's wiring (a lot of heat was being dissipated at the fault) which could then be pinpointed and fixed.



## Ranger PM3000HF



- **Patented Single Cycle Adaptive Storage** recording process provides extremely high resolution and Proper Time waveforms down to single cycle **over long recording periods**
  - Records and displays up to 16 channels of voltage, current, power, power factor, VAR's, phase angle, frequency, THD, and much more but especially **Flicker and Harmonics**. Over 50 individual measurements
  - Graphical **touch-screen** interface provides straightforward, user-friendly operation on logger and PC.
- 
- **Authoritative Flicker measurements to IEC61000-4-15**
  - **It includes Instantaneous Flicker Sensation**
  - **Individual Harmonics including direction to the 15th**
- 
- 14 pre-stored configurations are set for 3 phase, 2 phase, and single phase hook ups with several channels pre-configured for power harmonic and flicker measurements
  - Phasor Diagram Display 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**
  - **Additional internal flash memory for field programmable upgrades**
  - **RS232, with MODBUS ASCII protocol or modem communications**
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- **The Ranger PM3000 runs off the voltage being measured**
  - **Powered independently by AC measurement circuits or DC power supply for voltages below 50 volts**
  - **Battery back up provides 10 minutes resettable timed ride-through if power outages**
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- Safety Benefits
- **Fused voltage leads and internally fused voltage inputs protect equipment**
  - **Its robust, compact, portable case is lockable**
  - **With its small size it will fit in most panels and allow the door to be closed**
- 
- **Measures to the EN50160 standard**
- 
- **Easy to use**
  - **Reliable**
  - **Automatically measures**

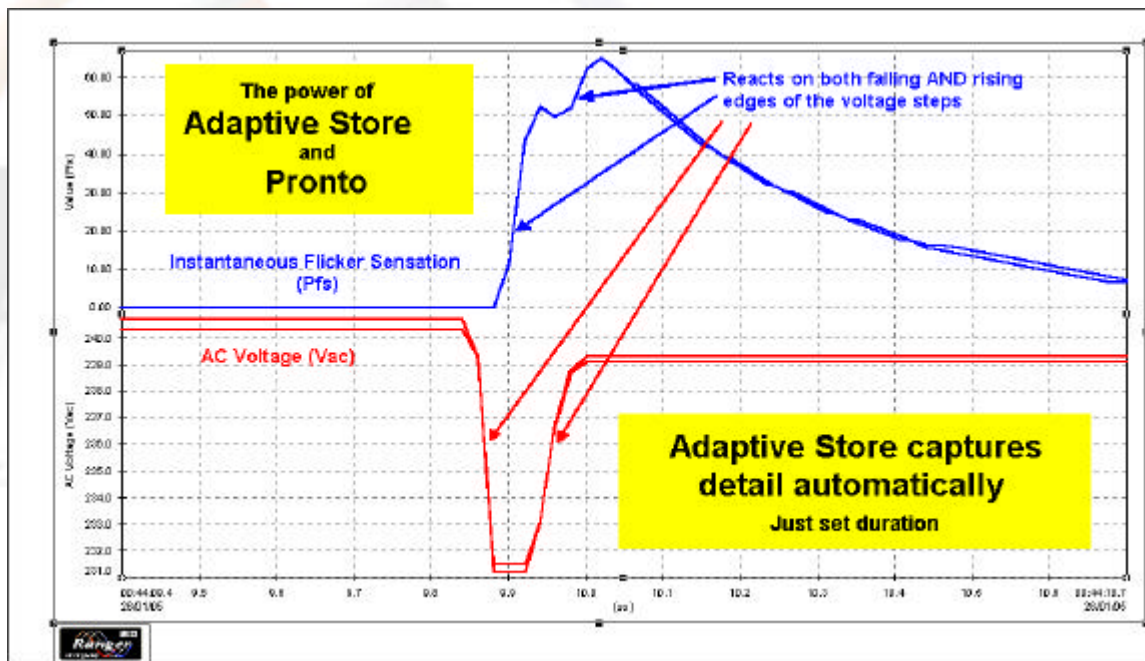


# Power Quality Analyser with Flicker and Harmonics

The PM3000 gives you detail over long recording periods thanks to ORL's intelligent, effective, data handling technique, **Adaptive Store**.

This unique capability is combined with the comprehensive scope of the Ranger data analysis software, **Pronto for Windows**, to produce graphs and reports.

Example graph



Use the graphing wizard to help you in a few clicks get your graph or be an adventurous user and design your own graph and report layouts, then create a template which Pronto will remember for future use.

All the **Ranger** Power Master series of power quality analysers use the same software, **Pronto for Windows**, and have a similar user interface. Therefore once you have used one of them you can feel comfortable whichever PM you use.

For further information and help please contact:

## Facilities in Pronto

- Annotations
- Exception reports
- Templates
- Listings
- Zooming and panning

## Outram Research Ltd

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## Ranger PM3000HF Specification



**Input Voltage:** Three 0-480 V ac. Sensors: Inline shrouded 4 mm banana plugs. Fused dolphin clip

**Input Currents:** Three. 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 current clamps, voltage output.

**Channels:** 16

**Accuracy:** Volts and wide range current < 0.25% True RMS

Narrow range current < 1% True RMS (excluding sensors)

**Resolution:** Programmable to 0.1 V ac and 0.1 A ac, 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, Displacement Power Factor, Phase Angle, Frequency, Instantaneous Flicker Sensation, Short Term & Long Term Perceptibility, Flicker Flag

**AC 2 Phase:** Real Power, Reactive 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

**Sampling:** Continuous sampling at 64 times per cycle

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

**Memory:** 1MB Ram

**Recording Mode and Rate:**

**Adaptive Store:** Unique store 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 1 month's retention @ 25°C (77°F)

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

Battery: 4 AA Ni-Cad 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 >2.5 kV. Bluetooth (wireless), (optional)

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

**Case:** Pelican 1120 Guard Box: Dimensions. 210 x 165 x 90mm

**Weight:** 1.1 kg. without leads and clamps

**Computer Requirements for Pronto Software:** Windows 9x, ME, N4T, XP, 2000, Pentium class processor or higher; 250MB hard drive: 32 MB RAM

**Display:** Backlit LCD graphic clamps

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## Ranger PM3000HF



### Kit List



- PM3000 Power Quality & Harmonic Logger
- Three 24" 3000Amp Flexible Current Clamps (max conductor size 8") or  
Three bootlace Flexible Current Clamps
- Four Voltage Input Cables with Fusing
- 9-Pin Serial Download Cable
- Three Neutral Common Leads
- Mains lead
- Pronto for Windows Analysis Software
- Customer CD with Manual
- Customised carrying case

For further information and help please contact :

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