

## Take control of your power quality



with a **RANGER PM3000HF**

- 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?

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

P T O

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



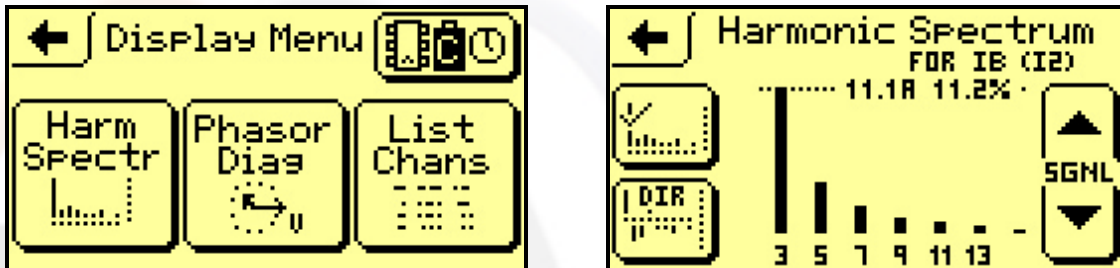
We are here to help you - email: [sales@shmcomms.co.uk](mailto:sales@shmcomms.co.uk) - tel no: +44 (0)1962 865142

## 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

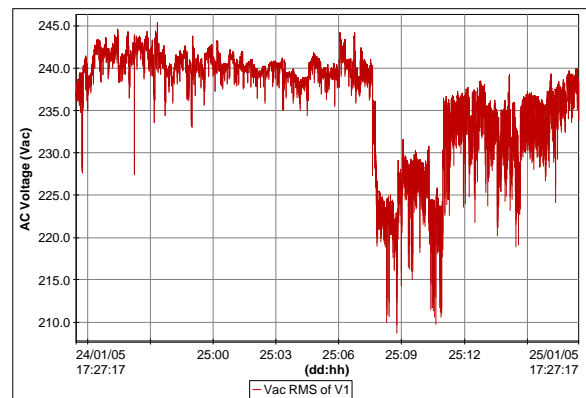
- **Pronto**, the best graphing software on the market.
- EN50160, averaging or exceedence report generation.
- Many useful power calculations.

### 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.



For further details, see the **Features and Specification sheet**.

## PM3000HF Features



- **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**
- **The Ranger 3000 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**

### 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**

We are here to help you  
Email: [sales@shmcomms.co.uk](mailto:sales@shmcomms.co.uk)  
Tel No: +44 (0)1962 865142



## PM3000HF Specification

**Input Voltage:** Three 0-480 Vac. Sensors: Inline shrouded 4mm banana plugs and fused crocodile clip G38, 600v Cat. IV

**Input Currents:** Three. Sensors: three 24" 1000 Amp Flexible Current Clamps supplied or can use with conventional 0-0.5 Vac 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 Vac and 0.1 Aac, 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, 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 SH

**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, 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

**Protocol:** MODBUS ASCII

**Computer Requirements for Pronto Software:** Windows 9x, ME, NT, XP: 486DX66 or higher; 250MB hard drive: 16MB RAM

**Display:** Backlit LCD graphic touch-screen display 100 x 35mm

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

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

## PM3000HF Kit



- PM3000 Power Quality & Harmonic Logger
- Three 24" 1000Amp Flexible Current Clamps (max conductor size 8")
- Four Voltage Input Cables with Fusing
- 9-Pin Serial Download Cable
- Two Neutral Common Leads
- Mains lead
- Pronto for Windows Analysis Software

For further information and help please contact:

**SHM Communications Ltd**

8 Chesil Street, Winchester

Hants SO23 0HU UK

Tel No +44-(0)-1962 865142

Fax No +44-(0)-1962 862451

e-mail sales@shmcomms.co.uk