

Event Recording with PowerMonic

The PowerMonic 45 not only profiles/logs steady state issues such as voltage and harmonic levels, but it also records one-off power quality events. The memory allocated for events is independent of profiling memory to ensure that profiling is not disrupted should a significant numbers of events occur.

Events are divided into the following classes:

- Sag/Swell detection
- RMS capture
- Transient capture (dV/dt).

Sag/Swell Detection

On the PowerMonic, sag/swell detection is used to provide a list of sag and swell events in a table format, or for plotting events on a curve, such as the ITI(CBEMA) curve. Table data includes the time, duration and the maximum or minimum event voltage. GridSense PowerView software can automatically graph events on the ITI(CBEMA) curve. The data can be further manipulated or plotted to other curves through export to Microsoft Excel.

RMS Capture

PowerMonic's RMS capture is ideal for capturing temporary, momentary or instantaneous sag, swell and/or interruption events. It is excellent for locating motor start problems, and for setting the changeover timer for motor starters. RMS capture can be set with either voltage or current. Since interruptions are clearly visible, it's easy to determine if network protection equipment is operating properly. RMS capture also allows comparison with customer logs to determine the cause of equipment malfunctions or plant failures. PowerMonic captures up to 30 seconds of 10 ms data points for 50 Hz supplies.

Waveform capture can also be selected to allow direct correlation with an RMS event captured at the same time. This can help identify what happened at the onset of the RMS event in more detail. PowerMonic captures 400ms of data points at 98 micro-second intervals.



A PowerMonic 45 is installed at a plastics plant to determine cause of random shutdowns.

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Transient Waveform Capture

Transient waveform capture allows the logging of low frequency oscillatory waveforms that occur as a result of the energization of a capacitor bank and notching, caused by the commutation of electronic devices such as Silicon Controlled Rectifiers.

Required Standard (Australia)

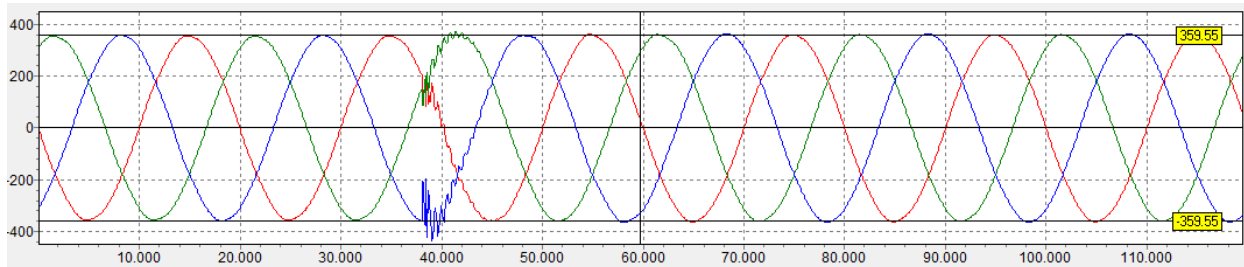
The following provides a summary of the standards that apply to events captured by the PowerMonic 45:

- Sags – No standard applies at this stage
- Swells – The National Electricity Rules Figure S5.1a.1
- RMS voltage capture – Voltage fluctuations are managed by AS/NZS61000.3.3, AS/NZS61000.3.5 and AS/NZS61000.3.7
- RMS current capture – Large swings in current cause voltage fluctuations; therefore current capture is generally managed through voltage fluctuations, though distributors may have local requirements
- Transient waveform capture – Compatibility limits have not been applied for transients and notching at this stage; obsolescent standard AS2270.2 provides guidance on the management of notching, and oscillatory transients should be managed to industry best practices.

Case in Point

A plastics factory was experience random shutdowns of its variable speed drive (VSD) equipment. Unblocking of equipment was time consuming and the resulting delays were damaging client relationships.

A PowerMonic 45 was installed at the main switchboard and set to log transient waveform capture, as well as RMS capture, voltage, and harmonics. Fig. 1 shows a low frequency oscillatory transient that caused a major shutdown of the plant.



The plant contacted the power company to see if capacitors had been switched as the oscillatory transient occurred. The power company admitted that a capacitor bank had been switched at the local zone substation at that time, and admitted that the bank did not have transient mitigation equipment. The power company agreed to stop switching the capacitors when the plant was operating and to introduce transient mitigation equipment to the capacitor bank as soon as possible.