



Production line: **Problems**

AGRI-FOOD INDUSTRY

A company specialized in plastic packaging was seeking to improve its productivity. At its industrial plant bottling dairy products in plastic recipients, this customer encountered intermittent production shutdowns.

A quick survey revealed slowdowns on one of the lines where the continuous supply of bottles was not operating correctly.

One of the conveyors on this line stopped randomly several times a week.

A rapid inspection showed no evidence of any mechanical problems.

In order to locate the problem, it was decided to monitor the electrical network. The main constraint involved keeping downtime to a minimum so that the site's productivity did not suffer. The measurements were therefore carried out with a Qualistar.

The Qualistar is ideal for this sort of context because everything can be monitored in a single operation, as all the measurements are simultaneous. In addition, it is particularly simple to configure the instrument and set the common monitoring period.

Maintenance

Productivity

Recording

Measurements

To record all the faults, however minor or brief, 3 monitoring modes are used : **trend mode, alarm mode and transient mode.**

In «**Trend**» mode, recording of all the parameters is programmed in seconds (1 s, 5 s, 20 s, 1 min, 2 min, 5 min, 10 min or 15 min). The Qualistar's recording capacity is more than sufficient to store all the results over a period of at least one month.

The operator selects the parameters that need to be monitored (fig.1: voltage, current, etc.) and then programs the recording.(fig.2).

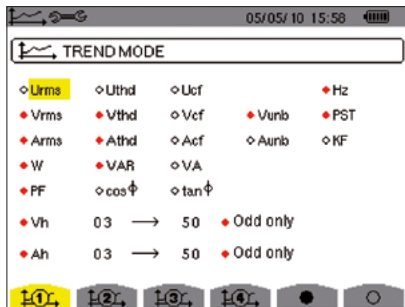


Fig.1

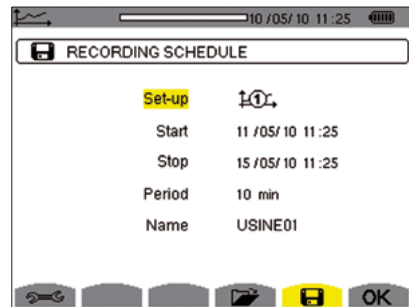


Fig.2

In «**Alarm**» mode, the operator selects all the main parameters and the mandatory parameters imposed by the standards (e.g. EN50160) in order to set the alarm thresholds (fig.3).

If one of the thresholds set is exceeded during the monitoring campaign (fig.4), the event is added to a list. All the time/date and alarm configuration data corresponding to the event are recorded. Thousands of events, some lasting less than half a period, can be captured in this way.

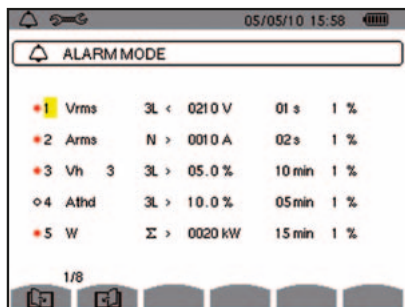


Fig.3

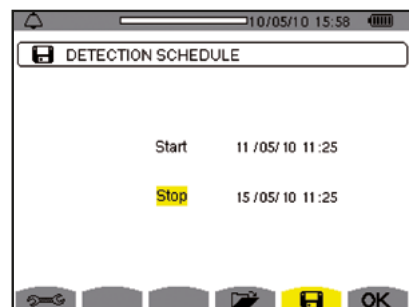


Fig.4

«**Transient**» mode is ideal for capturing very brief voltage and current events (lasting just tens of μs). The operator sets the thresholds (fig.5) to define the conditions in which the instrument will capture and record the signal. Once the recording start and end parameters have been indicated, recording can begin.

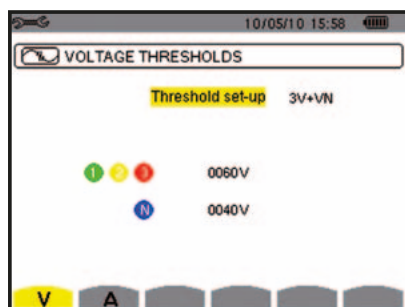


Fig.5

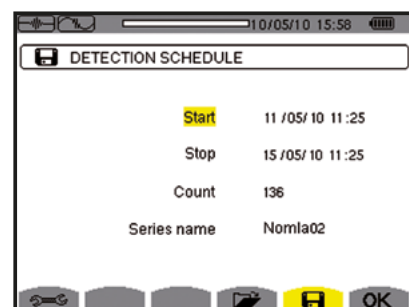


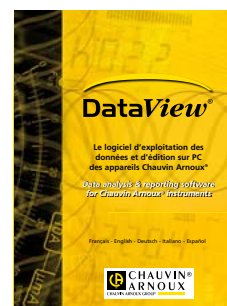
Fig.6

DataView® software

Whatever the mode used, all the parameter settings and recordings mentioned above can be carried out directly from a PC equipped with the DataView® software. This processing software can be used to configure, transfer and process the measurement results.

It displays the waveforms and measurements captured by the analyser «online» on any PC in real time.

It is also possible to generate predefined or customized reports automatically.



Implementation



The Qualistar is particularly simple to set up. Connection of the instrument is easy thanks to the colour-coded terminals and cables (coloured ring at each end of the cable). When it is switched on, the Qualistar automatically recognizes all the current sensors connected, whatever their type (fig.7).

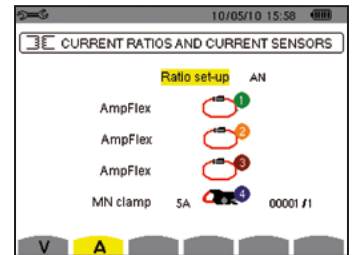


Fig.7

To guarantee reliable measurements, it is a good idea to check that the connections are correct.

If you press the waveform button  on the front panel of the Qualistar and then press F6 (fig.8),

the Qualistar gives you access to the phasor diagram (fig.9).

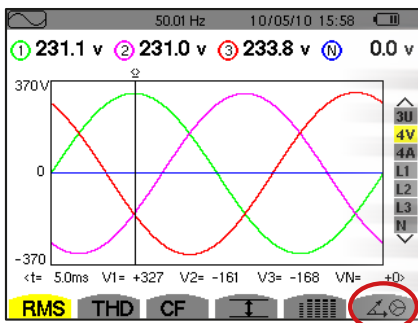


Fig.8

F6 key

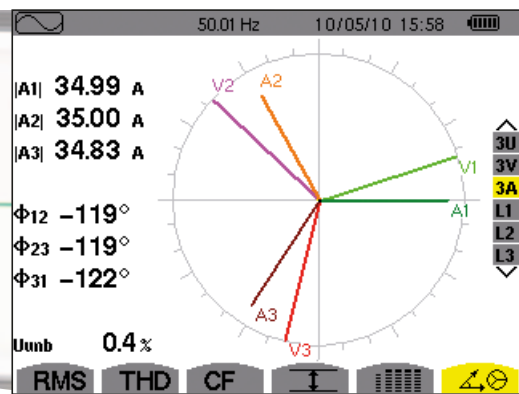


Fig.9

(see Case Study on «Phasor diagrams»).

Analysis of the measurements...

On the third day, an interruption occurred on the production line. This meant that measurements with the C.A 8335 could begin. The motor driving the production line continued to operate. The process, meanwhile, had restarted automatically without operator intervention. The voltages and currents (fig.10 et fig.11) are those usually present for this application.

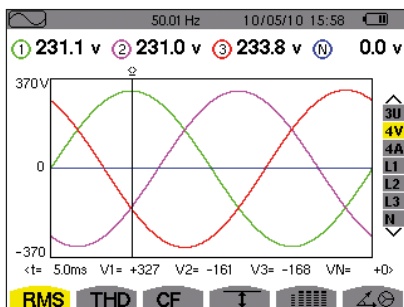


Fig.10

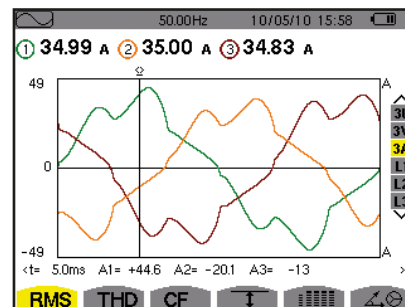
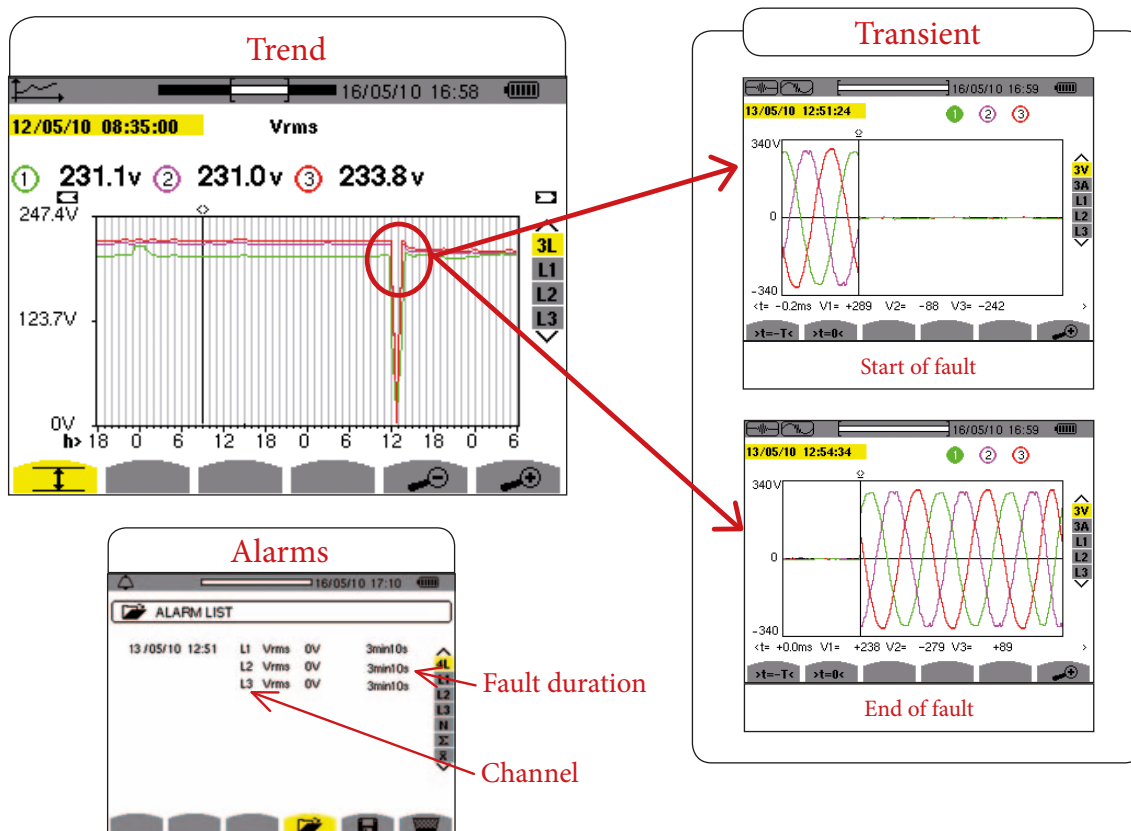


Fig.11

...Analysis of the measurements



Now all they had to do was define the cause of this power outage. The motor was stopped by the absence of any voltage on one channel. As soon as the voltage returned to normal, the motor restarted automatically. The delay in the process was the only consequence of the fault.

The recording made of the transients clearly shows an outage. For more detailed information on these anomalies, all you need to do is check them in the list of alarms. This shows the duration, channel, etc., at a glance.

The transients captured in this way represent the exact form of the signal at the time of the fault and until the end of acquisition, so until the end of the fault.

This detailed analysis of the electrical network proved that all the network's parameters were correct.

Conclusion

This first series of measurements showed that the network was not the cause of the dysfunction.

Further troubleshooting was then necessary downstream from the network, at the level of the motor. A second series of measurements provided a clearer diagnosis of the various parts of the motor. Analysis of the electronic command-control part subsequently revealed a faulty capacitor on the motor's power supply.

