Application Notes

Electrocorder Range of data logging proudcts

- Data measurement - identify opportunities to save energy
- Ongoing Data Logging - identify issues with supply and equipment
- Calculate the monetary value of future energy savings
- Low cost investment for long term energy savings

The term Energy Audit is now common currency, with most understanding what it means but perhaps not knowing and how to perform one; the aim of this document is to explain an 'Electricity Energy Audit' using the Electrocorder range of data loggers. The ultimate aim of an Energy Audit should be to reduce usage.

Electricity (ignoring for now gas, water, oil, diesel, petrol)

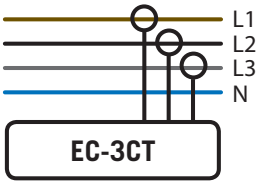
The first thing in any energy audit is to look at the information or data that you already have to hand, this usually takes the form of utility bills, invoices and meter readings, this can tell you an lot historically, what it will not tell you is where the energy went, which equipment, circuits, buildings or divisions consumed the energy and when. To answer these questions you have to recorder data over a period of time, you'll need an Electrocorder.

Circuit Diagrams

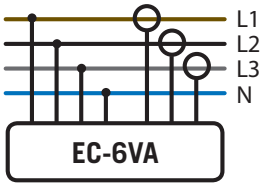
Before you log data you'll need to know the electrical layout of the system or premises to be audited, ask an electrician to explain the wiring diagram for the premises, if you don't have one, perhaps you'll need to create one. The diagram will show you the various circuits and connections of your system, in turn this may help you to determine the best logging points and where to get access for recording.

Pragmatist versus Purist

There is no need to be a purist; to correctly measure power and energy you need to measure voltage, current, power factor and time however for many situations measuring only current will do! The voltage you receive from your utility is not constant, generally you have no control over it, those variations will be fairly cyclic over the period of a day or even a week, so in essence voltage can be treated as a 'constant' there is therefore no need to record it. For the purposes of a comparative test or audit (before and after) you can robustly use only current. This makes life a lot easier for logging, no direct connection to voltage terminals, simply clip the CTs or Rogowski Coils around the conductors and press the start button to record.



Pragmatist

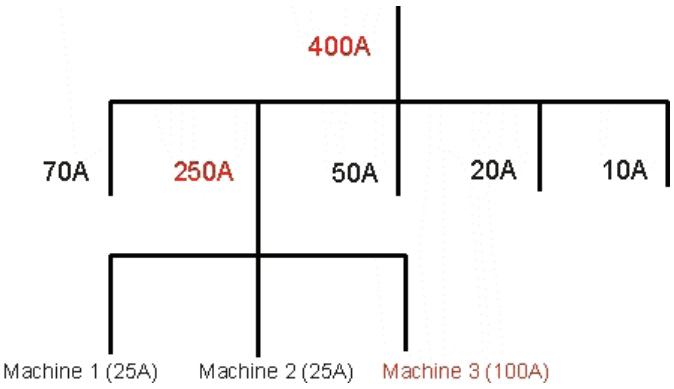


Purist

Our free Electrosoft software which is supplied with every logger allows you to input the systems voltage, for current only loggers, thus it will work out the power consumption over the logging period, assuming that constant voltage.

What to Record

There are two main approaches, one approach is to start at the top (where the power comes in) and record the total usage profile for a period of time, normally a minimum of a week is recommended, if you are happy that each day is going to be the same as every other day then you can log for one day on each of the nodes rather than a week. Start working your way down each of the major circuits, a bit like a family tree. Getting a feel for the profile, averages and peaks on each of the circuits.



You will need to allow time to perform this logging exercise, generally a day or more robustly a week for each leg (branch) that you want to log. For the small system above, it would take a minimum of 9 days, based on logging each of the nine labelled branches for 1 day.

The second approach, assumes that you have some knowledge of the demand and particularly where or what the big energy consumers are, in this case you go straight for those loads, in the diagram above, you may start logging items below the 150A branch, that is directly on machines 1 to 3, to see where the 150A is going, Machine 3 is taking four times as much current as machines 1 and 2.

Quick Double-Check

It is always wise to check your results, to make sure there are no fundamental mistakes, check your results against the bills. If you log for a period, say a week, Electrosoft will extrapolate the data and give you estimated power/energy figures for a month, quarter and year, it is always wise to check these figures against the bills.

It is always wise to document the audit, where you logged the data, as well as a brief summary which should include weather data and/or production or other business related data over the logging period, this will help you to correlate the information (in the future) and spot things which may have caused anomalies.

Current only recorders:-
EC-3A-TK (300A), -1K (1kA), -2K (2kA), -3K (3kA).
EC-3CT-30 (30A), -60 (60A), -300 (300A).

Voltage & Current recorders:-
EC-6VA-TK (300A), -1K (1kA), -2K (2kA), -3K (3kA).
EC-2VA (100A/300V).