Owl Energy Technologies, Inc.
Motor Control Division

Intelligent AC Motor Control: Available Now!	Owl Energy Technologies

Application Brief

Introducing "Intelligent Motor Control"

For Commercial and Industrial
Alternating Current (AC)
Fixed Speed Motor Applications

Paul J. Landis
Owl Energy Technologies, Inc.
50 Columbus Avenue Suite F21
Tuckahoe, NY 10707
Phone: 914-771-9114
pjlandis@earthlink.net
Info@owlmotorcontrol.com
Fax: 914-206-4318
www.owlmotorcontrol.com

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Overview:

The purpose of this Application Brief is to introduce the availability and capabilities of “Intelligent Motor Control” For Commercial and Industrial Alternating Current (AC) Fixed Speed Motor Applications.

The graph on page 3 shows results of data recorded with a live application in the USA at 60Hz,

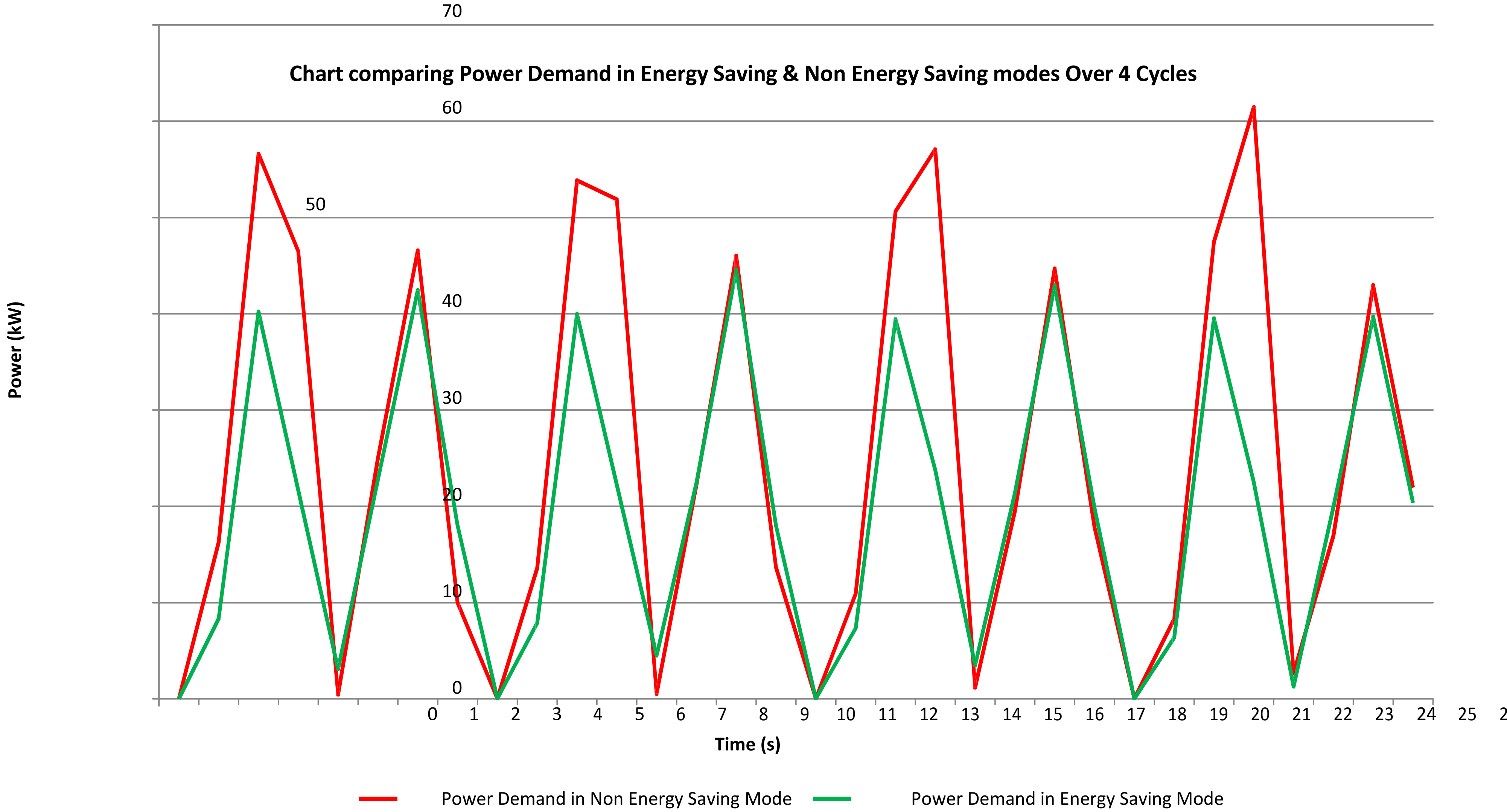
Please note:
The motor controller is installed between the power source and the motor running the application device.

The motor controller dynamically determines the motor load and the ‘needed load’, and continually makes the needed power, volts and amps, adjustments resulting in this graph.

Any and all of your fixed speed AC motor application are opportunities for electricity savings as: Compressors, Presses, Pulverizers, Conveyors and more.

The common denominator here is that the ‘load’ varies.

This graph and related materials on page 4 were produced during a test conducted by Fairford Electronics in the USA using a 60 HZ, 50 HP Baldor Motor.



The Chart above shows the power consumed by the motor with the energy saving feature turned off (Red) and then with the energy saving feature turned on (Green).

Results

A reading was taken every second and the following information was collected:
Average Demand in kW, Average Power Factor, Average Potential in Volts (all three phases) and Average Current in Amps (all three phases).

The first results taken were comparing individual cycles; four cycles were taken from the start of the 30 minute non-energy saving period and compared against subsequent cycles in the energy saving period.

- The average power demand of the motor over the four cycles when the energy saving feature was turned off was 25.20 kW.
- The average power demand when the energy saving feature was turned on was 19.50 kW.
- This yielded a kW saving of 5.7 kW. This equates to an energy saving of 22.63%.

Taking the above information as a basis, the next set of results to be compared was the average energy consumption over the entire 30 minutes.

- The average power demand of the motor over the non-energy saving 30 minute interval was 23.99 kW.
- The average power demand of the motor over the energy saving 30 minute interval was 19.85 kW.
- This yielded and energy saving of 4.14 kWh or 17.27%.

What does this mean in real terms?

From the information above the energy saved per hour is 4.14kWh.
Based on a unit electricity cost of $0.1/kWh, $.414 would be saved per hour.

Hours	**Savings per KW hour**	**Annual Savings**
40hrs/week x 50 wks/year or 2000 hours annually	$.414	**$828.00**
60hrs/week x 50 weeks per year or 3000 hours annually	$.414	**$1,242.00**
14hrs/day x 6 days per week x 50 weeks or 4200 hours annually, etc.	$.414	**$1,438.80**

Conclusions

This Pump-Jack application has shown that by utilizing the Boxer Pump Jack Controller with the Fairford Intelligent Motor Controller and their iER, Energy Optimizing, System, the energy consumption of pump jacks can be reduced by, on average, 17%.

In addition, utilizing the soft start feature of the motor controller will also help to: reduce the peak in- rush current, reduce the strain on the mechanical components, reduce unscheduled down time, reduce motor temperature which will increase the motor life which all plays a part in reducing your carbon foot print along with reducing pump jack related expenditures.

However, the Intelligent Motor Controller shown here is designed to provide electricity usage reductions for all fixed speed alternating current (AC) motors. Examples include Compressors, Presses, Pulverizers, Conveyors and more.

The motor controller is not directly connected to the pump jack, but is installed between the motor and the power supply. The Fairford iERS, energy optimizing, system, dynamically detects the motor load with the ‘needed; motor load, and adjusts the power available as needed. This is what the graph on page 3 shows.

The intelligent Energy Recovery System (iERS), standard on all Fairford motor controllers, reduces the iron losses on fixed speed AC induction motors which in turn reduces the amount of energy consumed when the motor is lightly loaded. The iER system achieves this by monitoring the running power factor of the motor.

When the power factor drops (which indicates the motor is lightly loaded), the iER system detects this and reduces the voltage and current to the motor to only supply the exact amount of energy required to maintain full speed, causing a reduction in power demanded by the motor (kW) and an improved fractional load power factor.

The iER System is a tried and tested technology which has been extensively used with AC motors in over 80 countries worldwide with great success. It is a simple product to install and maintain as no regular input from the user is required to manage this technology in its normal operation.

About Fairford Electronics

In the 1970’s Frank Nola, of NASA, developed an algorithm for reducing the iron losses in single phase motors. This was used to reduce the energy consumption of single phase motors on the Apollo rockets.

In 1982 Fairford Electronics was the first company in the world to design and produce a three phase digital energy saving soft starter. This product has continually been modified and improved by Fairford and the most recent products launched are the most advanced motor controllers for fixed speed motors ever conceived.

Contact Information: Cover Page