

Turn Your Keysight Handheld Meter into a Data Logger

Case Study

Petros Electric Uses
Keysight Handheld Meters
as Data Loggers

Introduction

Peter Argyropoulos, owner and sole employee of Petros Electric, is a professional electrician open to trying new tools to improve his service. Peter groups his work into two categories: service calls and contracting jobs. Contracting jobs are typically installations that have a well-defined scope. In contrast, the majority of service calls are from homeowners unable to resolve electrical issues on their own. These problems typically involve performing diagnostics and troubleshooting, and require test and measurement tools to identify the root cause. Recently Peter tried the Keysight Technologies wireless remote connectivity solution, which allowed him to use his Keysight handheld meters together as a data logger system.

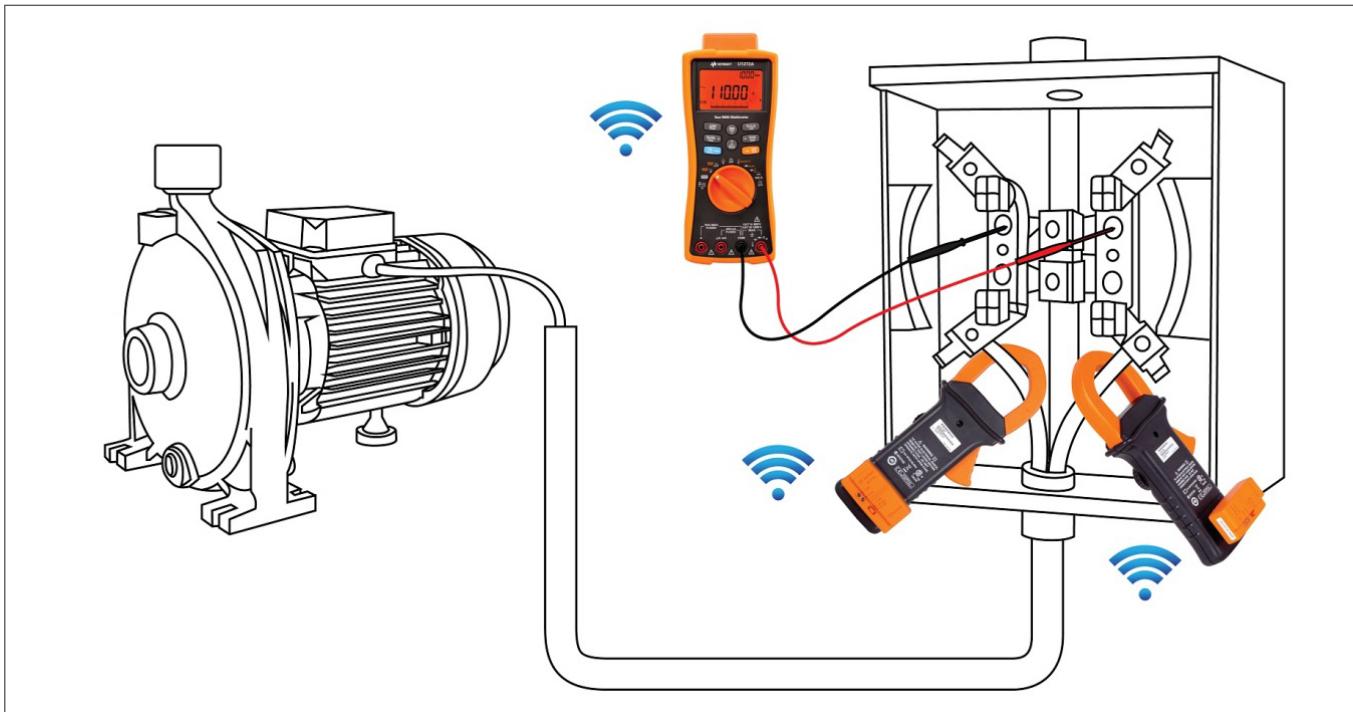


Figure 1. Application configuration

Problem

One of Petros Electric's customers owns a small farm. This customer was concerned about his extremely high electricity bill, which covered a 30-day billing period during the winter months. Even though his usage habits had not changed over that duration, he was charged for significantly higher usage. Like many small farms, his was not an energy intensive operation. Most of the electricity was used in the main house and a small bungalow for typical loads, like lighting, cooking, HVAC, and hot water. Without any idea why power consumption had changed so drastically, he called Petros to isolate the problem.

Solution

To initiate troubleshooting Peter needed to monitor the farm's power loads over a period of time. Without a data logger, this troubleshooting task would be difficult however he used Keysight's newly-introduced wireless remote connectivity solution. The configuration used one Keysight U1272A handheld multimeter and two U1212A clamp meters, each equipped with Keysight U1177A Bluetooth® adapters. The solution also included an android tablet or phone loaded with a free Keysight Mobile Logger application.

Using the two clamp meters, he was able to monitor the current on the two "hot" wires of the service as shown in Figure 1. The Keysight U1272A multimeter was used to measure the voltage between the two "hot" wires.

After monitoring the main service feeders for about 1.5 hours, Peter was able to spot a large, intermittent load. The graph (similar to the one shown in Figure 2) showed that something was running approximately 1 minute and 20 seconds every four minutes. It was now possible to narrow the problem down to the water pump, which lead to the discovery of a broken underground water pipe in an outbuilding. Under normal conditions, the pump would only run when someone was using the water. The constantly running water pump had played the major role in the farm owner's high electricity bill along with a number of other small loads like a space heater used that winter and a water bed heater, both of which showed up on graph as constant, low level loads.

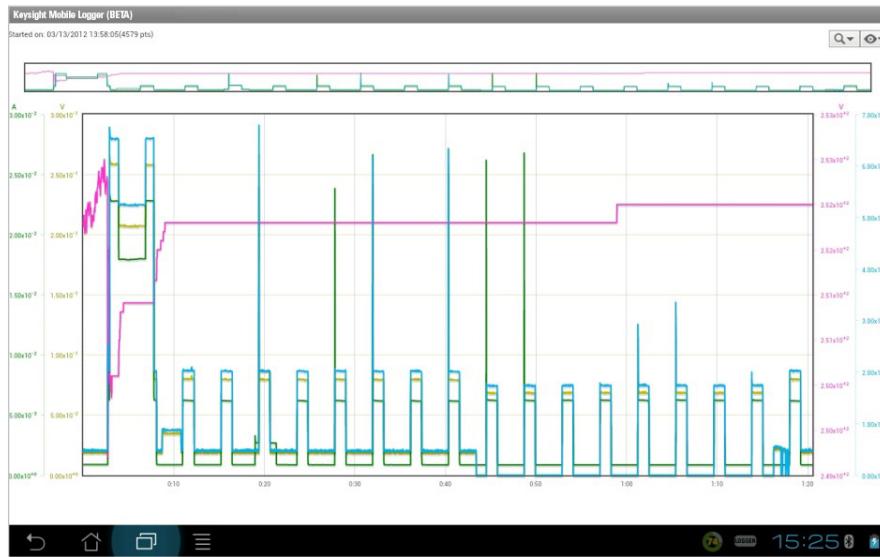


Figure 2. Voltage, current, and power trend logging with Keysight Mobile Logger app



Summary

Investigating faults that trigger high electricity bills can be a very challenging and time-consuming task. With a simple tool like the Keysight U1177A *Bluetooth* adapter, you can now turn your Keysight handheld multimeter into a trend logging device to gather important data for troubleshooting. This information allows you to analyze usage and determine if the loads in an electrical system are performing normally. Upon activation, the Keysight Mobile Logger can be deployed and left unattended to measure and record information for monitoring a specified time period. This allows a graph to be created that provides a comprehensive, accurate picture of the load conditions being monitored, at down to one second intervals which provides a much better illustration of what is going on in comparison to multiple, single measurements taken at unrelated points in time. The Keysight wireless remote connectivity solution frees you from needless repetitive testing and allows you to achieve higher productivity.

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