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# Energy Spy Dry Contact Requirements

## Overview

The Energy Spy interfaces to pulsed output utility meters (aka your electric meter). These meters with dry contacts provide a “pulse output” for kW·h or kVar·h, depending on the meter type. kW·h pulse meters have a scale factor that produces a pulse after a fixed amount of kW·h have been consumed (the scale will be in kW·h/pulse). For our example we will use 0.60 kW·h/pulse. kVar·h pulse meters have a scale factor that produces a pulse after a fixed amount of kVar·h have been consumed (the scale will be in kVar·h/pulse). For our example we will use 0.60 kVar·h /pulse.

The Energy Spy counts the raw pulses over a user specified time period and calculates the following parameters (using the fixed meter scale described above): Power Factor, Killowatt, KVAR, KVA and KWH (accumulating) displays them and optionally sends them to a PC.

## Requirements for Your Electric Meter

“Dry contacts” are required to interface your utility meter to the Energy Spy, these contacts can either be mechanical or solid state relays.

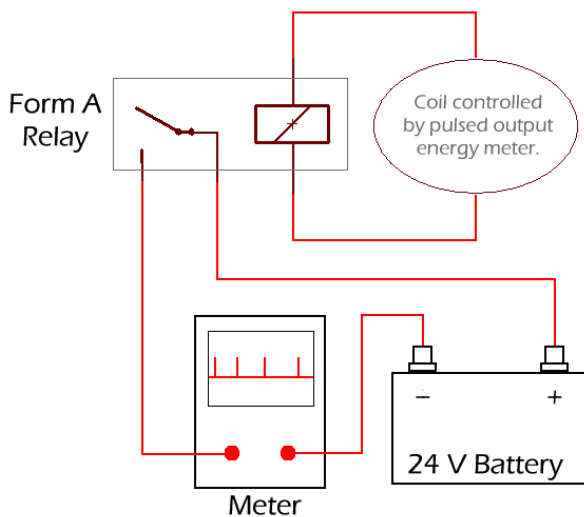
Contact your power company to determine the following:

- 1) “Does my utility meter provide pulsed outputs for kW·h and kVar·h or can pulse outputs be added?”
- 2) “Are ‘dry contact’ closures available for my utility meter?”
- 3) “Are the ‘dry contact’ closures ‘Form A’ or ‘Form C’ ?”

Note: Most utility meters are designed to provide pulsed outputs. If your meter does not provide pulsed outputs, please contact your power company to see if your current utility meter can be replaced with one that does. Contact Cincinnati Process Technologies for further details.

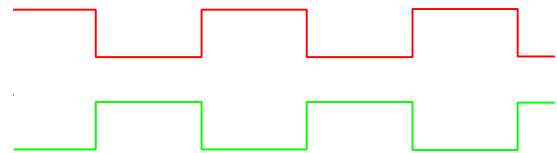
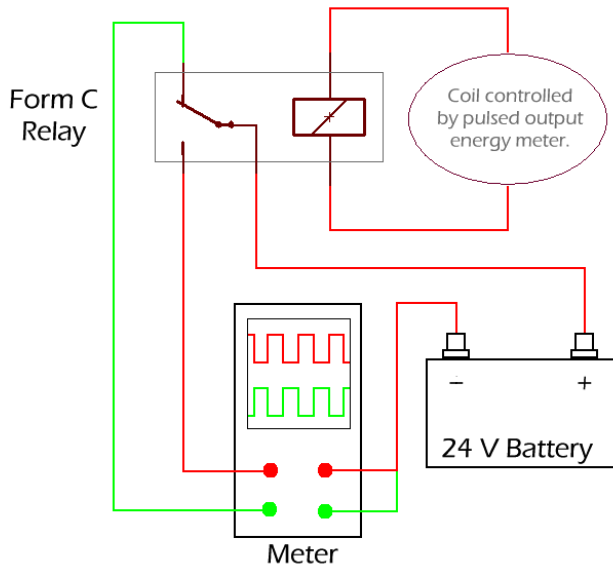
There are two relay form factors that work with the Energy Spy; Form C and Form A, these are described below.

Form A: This is a single, normally open, two terminal, “dry contact” that closes for approximately 100 milliseconds and then opens again. These devices close the contact every time a unit (0.60 kW·h, in our example) has been measured by the meter. When attached as shown below, the output appears as a pulse train with the pulse frequency depending on the usage.



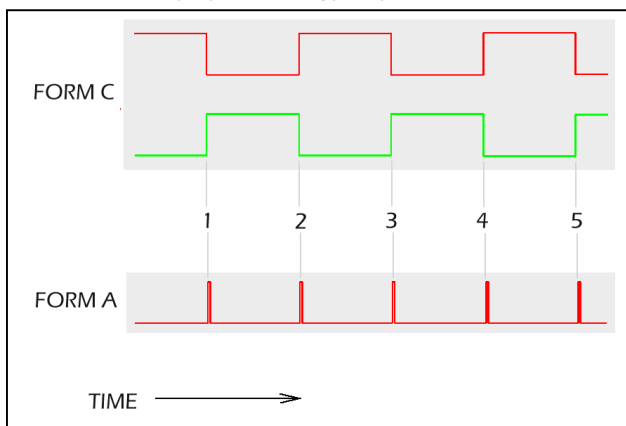
Form A pulse output showing 5 units (0.60 kW·h in our example) consumed.

Form C: This type has one normally open contact, one normally closed contact and a common pin. This type usually has three terminals, but may have only two of the three available for wiring. These type of contacts switch the contacts every time a unit (0.60 kW-h, in our example) has been measured by the meter. When attached as shown below, the two outputs are opposite of each other and remain in their current state until another unit (0.60 kW-h, in our example) is consumed at which time it inverts. Every change from “low to high” or “high to low” on each line denotes one unit (0.60 kW-h, in our example) has been consumed. The rate at which the output state changes varies depending upon usage. This type of pulsed output from energy meters is also known as KYZ pulsed output, where K is the common position, Y is the normally closed position and Z is the normally open position.



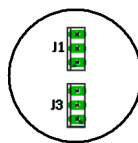
Form C pulse outputs showing 5 units (0.60 kW-h in our example) consumed.

As shown below in a side by side comparison, both types of contacts provide the same information but need to be read differently by the Energy Spy.



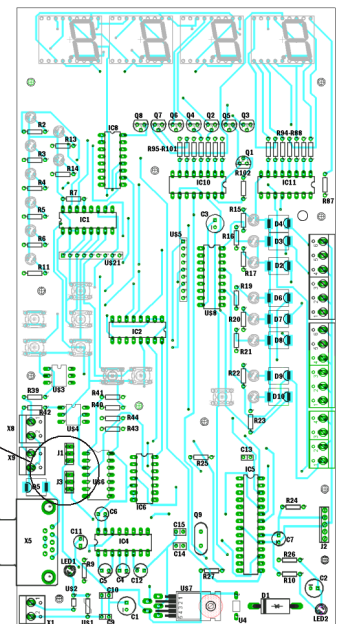
Jumper Center to Top for Form A Contacts

Jumper Center to Bottom for Form C Contacts



Jumper 'J1' is used to set kVar-h.

Jumper 'J3' is used to set kW-h.



Jumpers must be set in the Energy Spy to match each individual dry contacts type. As shown above right, J1 is used to set the kVar-h form factor type. If J1 is jumpered center to the top, the kVar-h is a Form A contact, conversely if J1 is jumpered center to the bottom, the kVar-h is a Form C contact.

As shown above right, J3 is used to set the kW-h form factor type. If J3 is jumpered center to the top, the kW-h is a Form A contact, conversely if J3 is jumpered center to the bottom, the kW-h is a Form C contact.