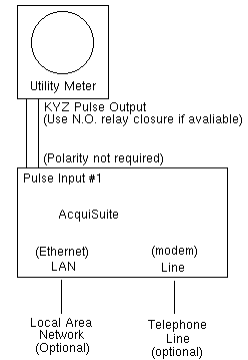


Technote 01 - Pulse Output Energy Meters

Pulse Meter Inputs

Many utility meters provide kWh consumption by way of a pulse output (dry contact relay closure). To log kWh from such a meter, you can simply hook the pulse output to one of the pulse inputs on the AcquiSuite. The AcquiSuite will take the raw pulse count and multiply by the user specified multiplier to allow reporting of kWh.

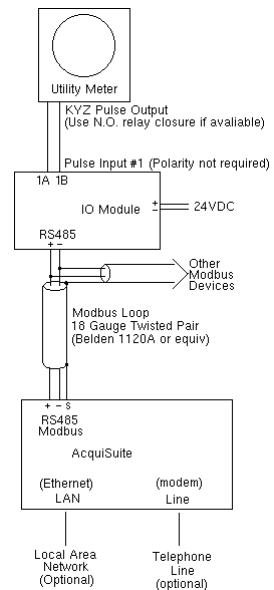
Locate the pulse output terminals on the utility meter. Attach the AcquiSuite pulse input to the meter's pulse output terminals. On Form C devices(KYZ), this is the K and Z terminals. (K-Y is normally closed)



Additional Pulse Meters

If more pulse inputs are required, use a Flex I/O module, which provides additional pulse inputs and additional analog inputs. A typical deployment is shown in the second diagram.

The meter should be attached in the same manner as with the AcquiSuite pulse inputs. Use the Flex I/O pulse input and attach both terminals to the meter's pulse output terminals. On Form C devices(KYZ), this is the K and Z terminals. (K-Y is normally closed)

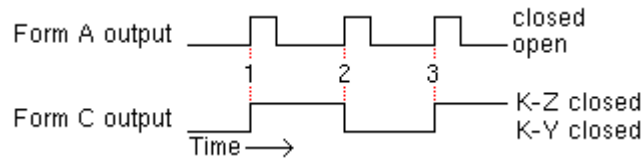


Form A -vs- Form C

A power meter that is listed as Form A indicates that the meter has a pulse output providing a pulse with a two-terminal dry contact. This can be either a mechanical relay or a solid state device. These devices close the contact every time a unit of power has been measured by the meter. The contact is then opened at some interval of time thereafter. (100ms). A form A device is essentially a SPST switch that opens and closes to indicate power consumption.

Form C devices are a little different. A form C device has 3 terminals, often labeled K, Y, and Z. The device will act like a SPDT switch, where K is the common terminal, Z is the Normally Open position, and Y is the normally closed position. When a unit of power has been measured by the meter, the meter *changes* the status of the output relay. If the relay was closed, it is opened, or vice-versa. The meter does not close and re-open the relay automatically.

In the following chart, both Form A and C are shown. Three pulses are shown, labeled 1, 2, and 3. Notice how the form A output closes and opens for each pulse, where the form C output simply changes state.



If you have a Form C device (3 terminals, KYZ), you may need to double the multiplier. The AcquiSuite and Flex I/O Module only count one half of a 3 terminal device because they only count the contact closures for the K and Z terminals. K and Y pulses from the meter will not be counted by the pulse inputs on the AcquiSuite or Flex I/O. Doubling the multiplier will correct this problem.

AcquiSuite Setup: Configuring the Multiplier

Configure the AcquiSuite according to the AcquiSuite install instructions. Use a computer with a web browser to configure the AcquiSuite. Select the Modbus/Device List option from the menu on the left side of the screen. A list of devices will be displayed in the right side of the screen. Select the IO module that the pulse meter is attached to. If you are using the AcquiSuite's internal pulse or analog inputs, the device will be #250. A new screen will show a list of the pulse and analog inputs. Click on the "configure" button on the bottom of the screen. Scroll down and locate the pulse input number corresponding to the inputs that you attached to the meter. The default name for each pulse input is "pulse input #1", #2, etc.

Once you have located the correct input, click the button to the right of "Pulse Input #1" to configure this input. Specify the input name, and set the multiplier. This multiplier tells the AcquiSuite how many kWh per pulse the meter reports. For example, if the meter reports 1/10 kWh per pulse, set the pulse input multiplier to 0.1 and the engineering units field to kWh as shown in the following example.

The screenshot shows the configuration interface for an Obvius A8332 Flex I/O device. On the left is a navigation tree with categories like Accounts, Modbus, Wireless, Log File Data, Networking, and System. The main content area is titled 'Obvius A8332 Flex I/O' and displays the following information:

- Device Address: 2
- Device Type: Obvius, A8332-8F2D, IO Module, 8-Flex, 2-DO (id=48)
- Status: Ok (cached)

The 'Unconfigured' section contains the following fields:

- Current Reading: invalid
- Sensor Name: Input 8
- Input Mode: Pulse
- Sensor Make and Model: (custom)
- Sensor Minimum range: 0.000
- Sensor Maximum range: 100.000
- Pulse Multiplier: 0.1
- Curve scaling: (Not Used)
- Engineering units: kW
- Rate: KW Per Hour

At the bottom of the configuration area are 'Save Profile' and 'Cancel' buttons. The footer includes the Obvius logo, address (3300 NW 211th Terrace, Hillsboro, OR 97124), phone and fax numbers, copyright information (© 2001-2010 Obvius), and the current time (Wednesday, September 15 2010 15:03:44 PDT).

The AcquiSuite will use the multiplier to convert the meter pulse count to engineering unit data and store it in the log files. If the raw pulse count is desired, use a multiplier of 1, and the AcquiSuite will store the basic pulse count in the log file.

The AcquiSuite is able to accept a number of different pulse input types. You can specify engineering units for MWh, Gallons (flow meters) or any other pulse output meter type you may have. Because the input pulse count is converted to engineering unit values, you can specify alarm values based on easy to read engineering unit numbers. ie, 100KW.

After setting the multiplier, review the device status page. The input name, reading value, and engineering units for the pulse input should be updated to reflect the new configuration.

Consumption and Rate of consumption (Demand)

Pulse output meters are consumption monitoring devices. A pulse output power meter will indicate the number of kWh used by the system load. The AcquiSuite has the ability to provide an additional data point showing the rate of consumption. This is calculated by measuring the total consumption at the beginning and end of the data logging period, and evaluating the difference with respect to the interval. For power meters, the rate of consumption, or demand, is displayed in kW.

In the device configuration page, a "configure point" button is shown to the right of the pulse rate. This will allow you to configure the rate field engineering units to either units per minute, or units per hour. For power meters, the engineering units are automatically set to kW or MW depending on the pulse input engineering units that are configured.