

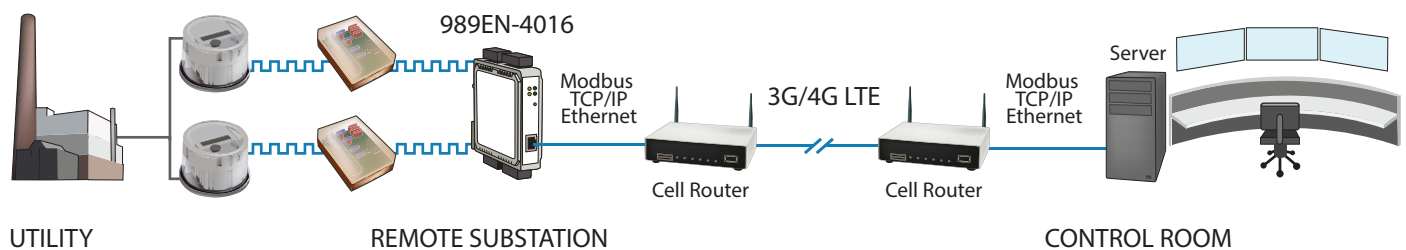
# Application Note: Cellular Telemetry For Remote Power Metering

## Defining the Problem:

At a large military complex, current reporting of electrical usage is transmitted from Substations directly to the Electric Utility only. The Public Works division onsite would like to establish a data collection system of the power usage for energy auditing and optimizing operations. Due to obstructions and installation restrictions, the telemetry system would operate over a 3G/4G LTE cellular network using Digi WR21 Cell Routers.

## System Requirements:

At the substations, the Electric Power Meters' pulse outputs to the Utility are re-transmitted to the data collection system via Electrical Isolation Relays. A relay output, 1 pulse = 1 kWh, is connected to an input channel on the [989EN-4016](#). The current totalized count is converted to Modbus TCP/IP and connected to the Ethernet port on the Cell Router.



## Implementing the Solution:

1. Set up a Private APN with a Cell Carrier to reserve internally customer supplied IP Addresses.
2. Configure the Cell Router IP Address using a reserved IP Address. For example, 10.0.0.20 .
3. In the Cell Router, configure the Ethernet Port Forward with the IP Address of the device connected to its Ethernet port, either the 989EN-4016 in the field or the Server IP Address in the Control Room. The Server software would send a Modbus TCP/IP message to the IP Address of the Cell Router that would forward it to the 989EN-4016.
4. For multiple field locations, the Cell Router at each site can have a unique IP Address (10.0.0.21, 10.0.0.22, etc), but every Acromag 989EN-4016 connected to it can have the same IP Address (192.168.1.1). This standardizes the set up and allows each Acromag unit to be configured the same way.
5. For the data collection, the Server can request the totalized count from the 989EN-4016 at whatever time interval is desired from hours to days. To do this, program the Server application software to Open and Close a Modbus socket with each message exchange.

## Featured Products:

[989EN-4016](#), 16 DIO / up to 8 Counters

## Notes:

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## Why Acromag:

This military site has standardized on Acromag Ethernet Remote I/O as previous installations have been very reliable, easy to implement and highly cost effective.