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COMMISSION

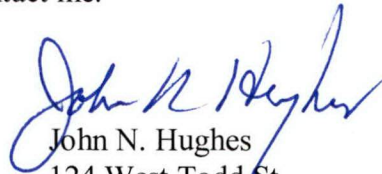
March 2, 2015

Jeff Derouen  
Executive Director  
Public Service Commission  
211 Sower Blvd.  
Frankfort, KY 40601

Re: Case No. 2014-00378

Dear Mr. Derouen:

In response to a telephone request by the Staff, East Casey County Water District submits the attached specifications for the Automated Meter Reading system. If additional information is needed, please contact me.



John N. Hughes  
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Attorney for East Casey County  
Water District

# 420 Series Bronze

420 Bronze PD Meter

Sizes 5/8" x 1/2" and 5/8" x 3/4"

**Mueller** SYSTEMS

## Features

**APPLICATIONS:** The Hersey® 420 bronze is a nutating disc style, positive displacement meter designed for residential and small commercial applications where water volumes are low and low flow sensitivity is important.

**CONFORMANCE TO STANDARDS:** All Hersey 420 bronze meters meet or exceed the latest revision of the AWWA C-700 Standard for positive displacement meters. Every 420 bronze no lead meter is compliant with the latest initiatives of NSF, ANSI and EPA standards.

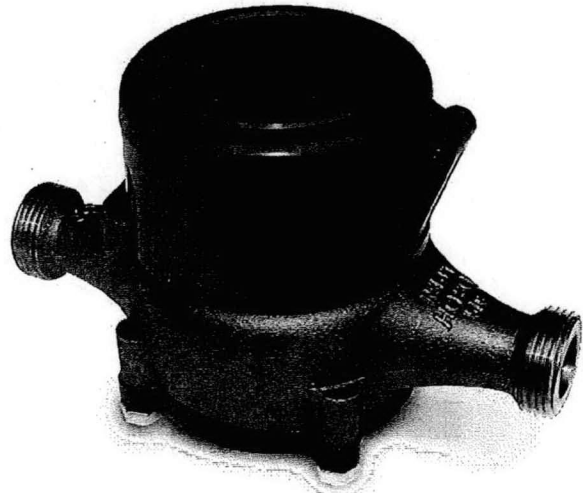
**CONSTRUCTION:** Hersey 420 water meters consist of three basic parts: maincase; measuring chamber; and permanently sealed register. The maincase is made of bronze for long life. Direction of flow arrows and model are cast into each maincase for ease of identification. The bottom cover is epoxy-coated cast iron with a molded plastic liner separating it from the waterway. Optional bronze and plastic bottom covers are available. The measuring chambers are designed for reduced wear during operation. The measuring chamber, integral strainer, nutating disc and thrust roller are thermoplastic, which is dimensionally stable and will not corrode. The register housing and lid are available in your choice of plastic or bronze for standard visual read registers. The meter is designed so that the register can be replaced easily without removing the meter from the service line.

**REGISTER:** The permanently sealed visual read register has a unique triple "L" seal and heat treated, glass lens to eliminate dirt, moisture infiltration and fogging. An integral tamper-proof locking feature is provided to resist tampering with the register. The totalizing register has a straight-reading odometer type display, a 360 test circle with center sweep hand and a low flow (leak) detector. Standard gearing is used, making registers interchangeable by size. The 420 bronze meter is available with all AMR and AMI options for increased reading efficiency.

**OPERATION:** Water flows through the meter's strainer where debris is screened out. The incoming water fills a known volume of the measuring chamber on one or the other side of a movable disc that separates the chamber into two sections. As water enters, it moves the disc (nutates), forcing a known volume of water out of the meter from the opposite side of the disc. The process repeats as the sections refill and empty in turn. The nutating action of the disc is coupled magnetically to the register to indicate the volume of water that passes through the meter.

**MAINTENANCE:** The Hersey 420 positive displacement meter is designed and manufactured to provide long service life with virtually no maintenance required. Repair components available include complete chamber assemblies and bottom plate gaskets. All components can be accessed without removing the meter body from the service line for simplified maintenance.

**CONNECTIONS:** Supplied with external straight pipe threads (NPSM) per ANSI B1.20.1



5/8" x 3/4" 420 Bronze PD Meter

420 Bronze

## Materials and Specifications

|                          |  |
|--------------------------|--|
| MODEL                    | 420 Bronze Meter   |
| SIZES                    | 5/8" X 1/2", 5/8" X 3/4"   |
| STANDARDS SERVICE        | AWWA C-700, Most current NSF-61, ANSI, & EPA Initiatives<br>Measurement of flow in forward direction only  |
| INSTALLATION             | Horizontal or Vertical   |
| OPERATING FLOW RANGE     | See Charts on the following pages  |
| ACCURACY                 | See Charts on the following pages  |
| MAXIMUM WORKING PRESSURE | 150 PSI  |
| TEMPERATURE RANGE        | 33 F to 100 F water temperature  |
| MEASURING ELEMENT        | Nutating Disc PD Chamber   |
| REGISTER TYPE            | Straight reading, permanently sealed, magnetic drive with low flow indicator and remote reading capability   |
| METER CONNECTIONS        | External straight pipe threads (NPSM)  |
| MATERIALS                | Meter case - Bronze<br>Bolts - Stainless Steel<br>Measuring Element Chamber and Disc - Thermoplastic<br>Disc Pin - SST<br>Strainer - Thermoplastic |
| OPTIONS                  | AMR/AMI Reading Systems  |

## Meter Registration

| Meter Size | Initial Dial* | Capacity   | Initial Dial* | Capacity  |
|------------|---------------|------------|---------------|-----------|
| 5/8"       | 10 Gallons    | 10 Million | 1 Cubic Ft.   | 1 Million |

\*Registration equal to one full revolution of the sweep hand.

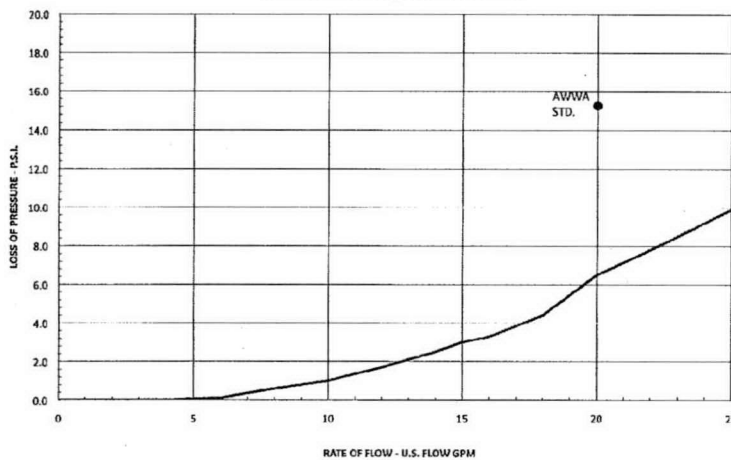
## Flow Characteristics

| Meter Size | Typical Low Flow (95% Minimum) | Typical Operating Range (100% ± 1.5%) | Maximum Continuous Operation |
|------------|--------------------------------|---------------------------------------|------------------------------|
| 5/8"       | 1/8 GPM                        | 1/2 to 20 GPM                         | 15 GPM                       |

## Performance

### Head loss

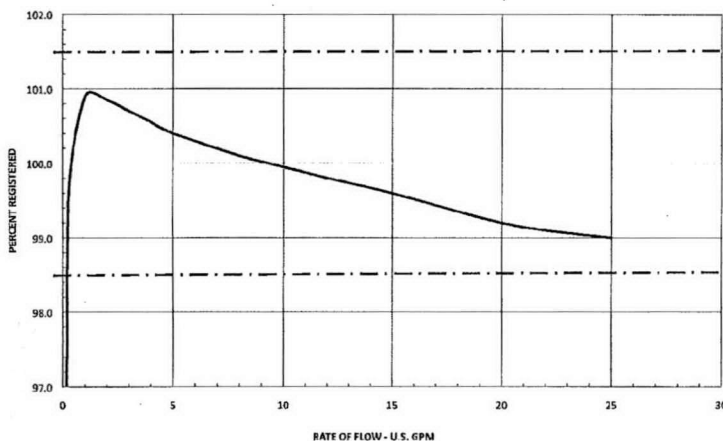
Head Loss on 5/8" 420 Bronze



NOTE: Performance curves are typical only and NOT a guarantee of performance.

### Accuracy

Accuracy on 5/8" 420 Bronze



NOTE: Performance curves are typical only and NOT a guarantee of performance.

# 420 Series Bronze

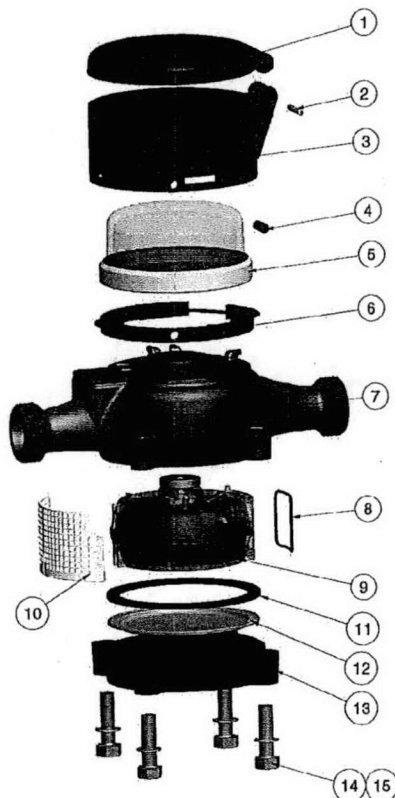
420 Bronze PD Meter

Sizes 5/8" x 1/2" and 5/8" x 3/4"

**Mueller** SYSTEMS

420 Bronze

| MODEL 420 BRONZE METER ASSEMBLY COMPONENTS |           |  |     |
|--|-----------|--|-----|
| ITEM                                       | PART #    | DESCRIPTION                                | QTY |
| 1  | C5768     | PLASTIC REGISTER COVER                     | 1   |
|  | C5774     | BRONZE REGISTER COVER                      |     |
| 2  | C5769     | PLASTIC REGISTER HOUSING BASE              | 1   |
|  | C5772     | BRONZE REGISTER HOUSING BASE               |     |
| 3  | AS41122   | PLASTIC LID SPIROL PIN                     | 1   |
|  | AS41123   | BRONZE LID SPIROL PIN                      |     |
| 4  | AS12658   | BLUE COLOR REGISTER LOCKING PIN            | 1   |
|  | AS126581  | BRONZE COLOR REGISTER LOCKING PIN          |     |
| 5  | D36981    | MODEL 420 VISUAL REGISTER SG               | 1   |
|  | D36982    | MODEL 420 VISUAL REGISTER CF               |     |
|  | D36983    | MODEL 420 VISUAL REGISTER CM               |     |
|  | D36991XX  | MODEL 420 TRANSLATOR REGISTER SG           |     |
|  | D36992XX  | MODEL 420 TRANSLATOR REGISTER CF           |     |
| 6  | D36993XX  | MODEL 420 TRANSLATOR REGISTER CM           | 1   |
|  | C5770     | REGISTER HOUSING INSERT                    |     |
| 7  | D3680SI   | 5/8" X 3/4" MODEL 420 MAIN CASE            | 1   |
|  | D3681-1SI | 5/8" X 1/2" MODEL 420 MAIN CASE            |     |
| 8  | A13120    | MODEL 420 CHAMBER O-RING                   | 1   |
| 9  | D3635PO   | MODEL 420 CHAMBER ASSEMBLY                 | 1   |
| 10   | C6681     | MODEL 420 BRONZE STRAINER RETAINER         | 1   |
| 11   | B8664     | MODEL 420 BRONZE GASKET                    | 1   |
| 12   | B8665     | MODEL 420 LINER (IRON/BRZ ONLY)            | 1   |
|  | B8663     | MODEL 420 IRON BOTTOM PLATE                |     |
|  | B8662     | MODEL 420 BRONZE BOTTOM PLATE              |     |
|  | C6682     | MODEL 420 PLASTIC BOTTOM PLATE             |     |
| 14   | 90026     | 5/16-18 X 7/8" HEX BOLT SS (IRON/BRZ BTM)  | 4   |
|  | 90010     | 5/16-18 X 1-1/8" HEX BOLT SS (PLASTIC BTM) |     |
| 15   | 90018     | 5/16 FLAT WASHER SS (PLASTIC BTM)          | 4   |



# 420 Series Bronze

420 Bronze PD Meter  
 Sizes 5/8" x 1/2" and 5/8" x 3/4"

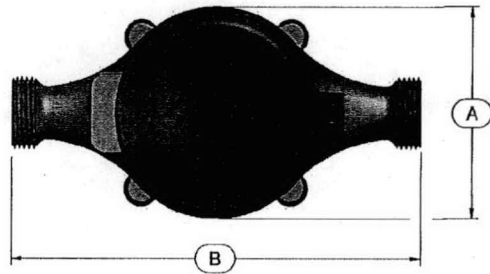
420 Bronze

## Dimensions, Weights and Parts

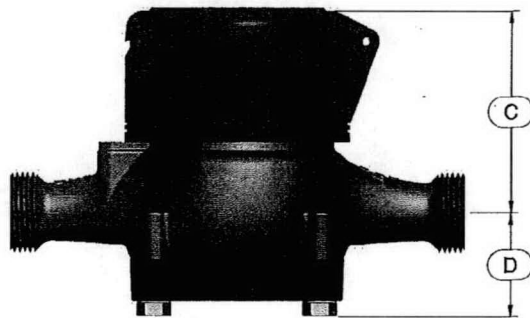
420 Bronze Meter

| Meter Size | 5/8"                         |                                |
|------------|------------------------------|--------------------------------|
| Model      | 420 Bronze Standard Register | 420 Bronze Translator Register |
| Dimension  |                              |                                |
| A          | 3.8125"                      | 3.8125"                        |
| B          | 7.5"                         | 7.5"                           |
| C          | 3.3125                       | 4.25                           |
| D          | 1.375"                       | 1.375"                         |
| Weight     | 3.7                          | 3.7                            |

Weights are in pounds and are approximate.  
 Inlet and outlet 1/2" or 3/4"



420 Bronze Meter



**Mueller** SYSTEMS

WHERE INTELLIGENCE MEETS INFRASTRUCTURE®

# The Smart Move for Advanced Automated Meter Reading (AMR)

Increased Meter Reading Efficiency  
Through High Performance AMR.



**Smart Move®**



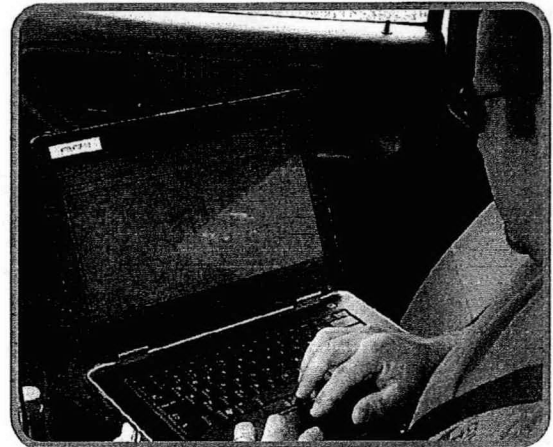
## Hot Rod™ AMR System from Mueller Systems

Mueller Systems' high performance automated meter reading (AMR) system—**Hot Rod**—outpaces every other contender by providing utilities with an advanced mobile AMR system that stores consumption data for 170 days and enables them to increase their ability to capture drive-by meter readings by up to 400%.

The components of the **Hot Rod** AMR system, which include the **Hot Rod** Radio Transmitter Unit, **Street Machine™** Mobile Data Collector, and **EZ Reader™** Software, work together to transmit monthly consumption reads, along with leak and backflow alerts, while internally storing hourly consumption data for up to 170 days (six months) for retrieval.

Additionally, by enabling consumption profiling, the **Hot Rod** AMR system allows meter readers to provide graphical displays of consumer usage and alarms while they are in the field, which helps them to proactively approach customers about possible leaks or other service related issues.

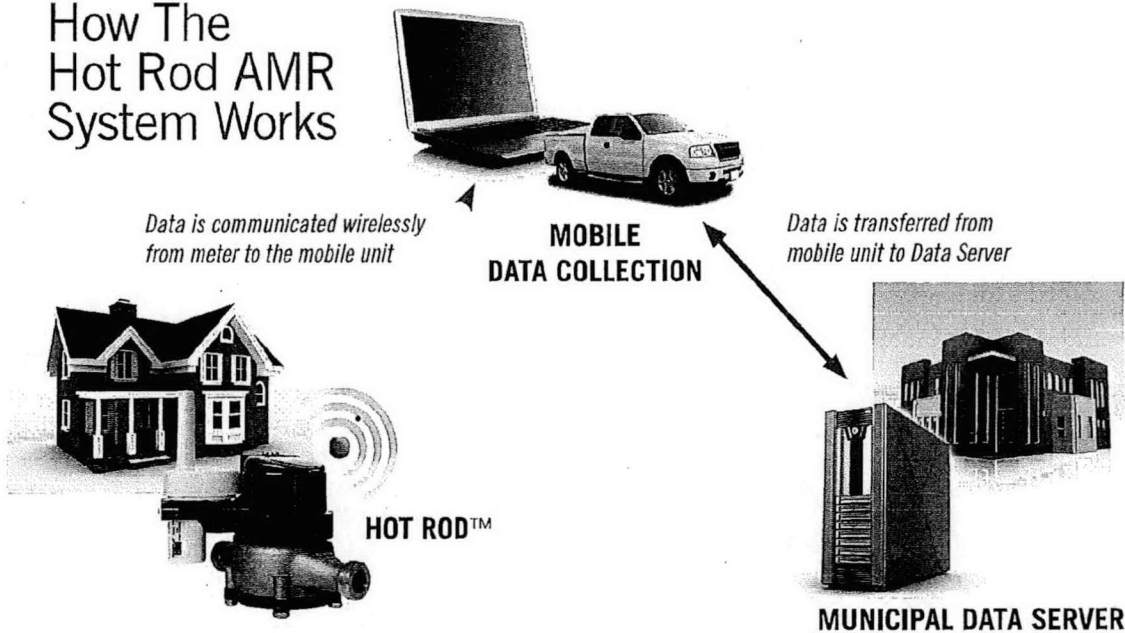
As a result of such advanced functionality, utilities can leverage the **Hot Rod** system to reduce the amount of time it takes to manually collect meter reads, effectively manage water usage, and improve customer service. Plus, the ability to collect meter reads from a vehicle means improved employee safety.



*"It used to take us at least three weeks to manually collect meter readings. With the Hot Rod AMR system, it takes us 16 hours or less to collect monthly readings from each of our 3200 service connections—using only one meter reader. Mobile data collection has dramatically improved the accuracy of our readings, and it has reduced our labor costs by approximately \$40,000."*

Moody Barrick  
Public Works Director  
The City of Clayton, Georgia

## How The Hot Rod AMR System Works



*"The system's data logging capabilities are worth their weight in gold. We use the leak report everyday; in fact, our customer service representatives keep it with them at the window at all times, and would be lost without it."*

Steve Natoli  
Water and Sewer Collection Supervisor  
Anson County Water Department

### **Benefits:**

- Improved customer service
- Improved water conservation
- Improved employee safety
- Increased operational efficiency
- Stores consumption data for 170 days
- Accurate meter reading collection
- Reduced meter reading times
- Leak, tamper, and reverse flow alarms
- Hourly, daily and/or monthly consumption data available to utilities and customers



## Hot Rod™ AMR Technology Hot Rod Radio Transmitter Unit

The Mueller Systems' **Hot Rod** Radio Transmitter Unit is a high performance module that provides the basis for high speed, high performance meter reading.

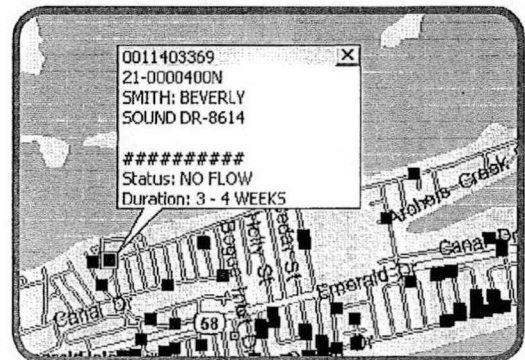
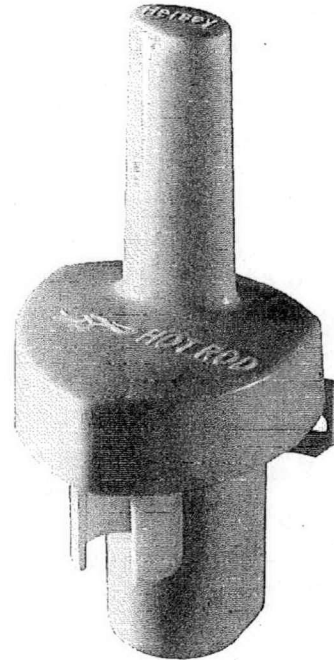
Every three seconds the **Hot Rod** module transmits encoded serial numbers, water meter readings, data logging alarms and meter status data via 902MHz to 928MHz radio frequency. **Hot Rod** is compatible with all current Hersey™ meters utilizing the Translator® Positional Encoder Register and other manufacturers' encoder registers outputting a similar protocol.

### **Benefits:**

- Instant data logging alarms
- Improved meter reading efficiency with 3-second transmissions
- Stores up to 170 days of hourly consumption data
- Potential service issue alarms
- Quick and easy installation
- Compatible with other manufacturers' encoder registers

### **Instant Data Logging Alarms**

**Hot Rod** modules transmit alarms that indicate potential service issues, such as leaks, tamper and reverse flow to meter readers as they travel along a route. This enables meter readers to take immediate action in the field—such as leaving a door hanger to inform the customer of a potential problem or downloading the account's historical data for further investigation.



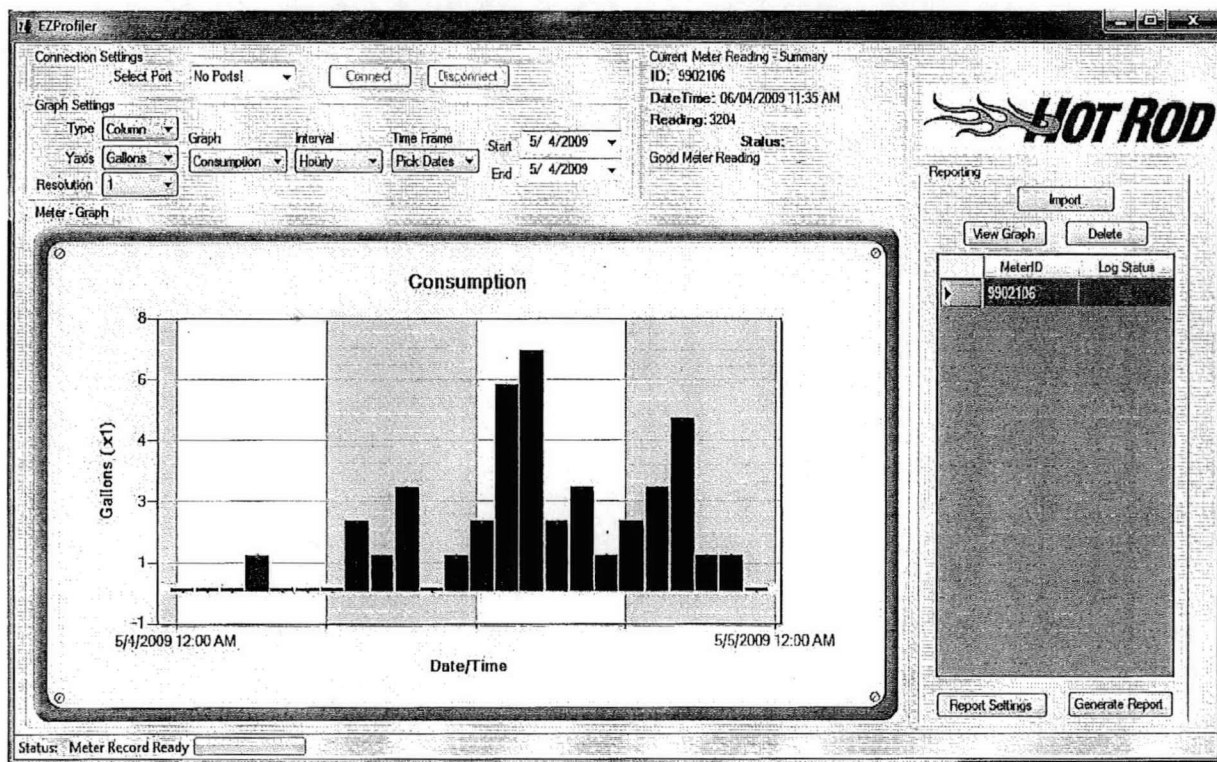
The instant data provided by **Hot Rod** can empower utilities with information needed to make proactive calls to customers about potential problems, such as leaking toilets or line breaks, before they lead to billing disputes. All of this can be done without leaving the office or scheduling additional field investigations that can be costly and increase a utility's carbon footprint.



*Hot Rod can empower utilities with the information needed to make proactive calls to customers about potential problems, such as leaking toilets or line breaks, before they lead to billing disputes.*

### Hourly Consumption Data

Hot Rod transmitters can log and store up to 170 days of hourly consumption data, which can be downloaded by meter readers in the field and displayed in bar graphs that show monthly, daily or hourly consumption profiling data. Not only can consumption data aid in the investigation of potential service issues, it can be referenced when answering billing-related inquiries or disputes.



### Quick and Easy Installation

All Hot Rod transmitters are pre-programmed and ready for installation in metal or plastic meter boxes using integral mounting brackets (no assembly required). Installation of Hot Rod transmitters does not require holes to be drilled through meter box lids, which enables them to be easily mounted beneath meter box lids, installed on PVC pipe or installed above ground.

## Hot Rod AMR Data Management Tools EZ Reader™ Software

The components of **EZ Reader** Software, which include **EZ Mobile™** and **EZ Profiler™**, work in tandem with the **Street Machine™** Mobile Data Collector to provide meter reading data that reliably interfaces with utilities' billing systems on any laptop that runs on Microsoft® Windows® 7 and Windows® 8. This provides easy access to information about routes, customers, meters and previous readings by remotely downloading data from the utility's host billing system (in standard ASCII format) and presenting it to meter readers through their PCs while they are in the field.

### **Street Machine™ Mobile Data Collector**

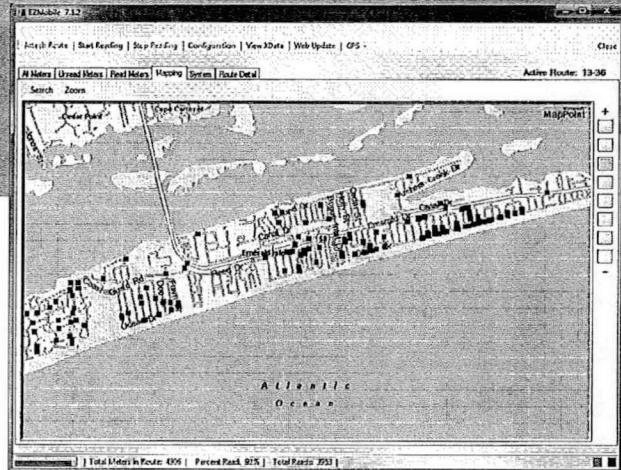
The **Street Machine** Mobile Data Collector is a high performance, vehicle-based receiver that is part of the **Hot Rod** AMR system. Consisting of a radio receiver, data collection software, an antenna and cable connections, the **Street Machine** works with **EZ Mobile** meter reading software to enable field workers to easily collect readings that are transmitted by **Hot Rod** modules as they drive along a selected route at posted speed limits.

The **Street Machine's** components can be temporarily or permanently mounted in vehicles. The system receives power through the vehicle's AC adapter, and a magnetic antenna on the vehicle's roof receives all radio frequency transmissions from **Hot Rod** modules. At the end of the day, the collected data is uploaded to the utility's existing billing system with a few clicks of a mouse.

### **Benefits:**

- Instant data logging alarms
- Improved meter reading efficiency with 3-second transmissions
- Compatible with other manufacturers' encoder units
- Potential service issue alarms
- Stores up to 170 days of hourly consumption data
- Quick and easy installation





### EZ Mobile Software

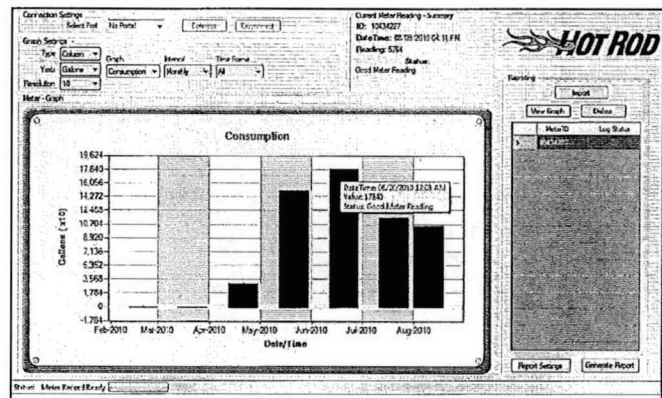
**EZ Mobile** Software collects meter reads and instant data logging alarms along a selected route, while providing meter readers with various tabs including progress screens and route maps, which display collected readings and remaining meters that still need to have their data collected.

Meter locations are graphically represented on the route map by blue icons that disappear as soon as readings are collected. If a leak, reverse flow, no flow or tamper alarm is received, the corresponding icon will turn red, immediately prompting the meter reader to take action.

Information about individual meters, such as route sequence numbers, high/low reading parameters and messages about the account, are displayed as icons that can be selected by the meter reader. Additional functions allow users to quickly find a particular meter and record notes on a specific account that can be referenced in the future or relayed back to the billing department.

### EZ Profiler Software

170 days worth of hourly consumption data stored by **Hot Rod** modules can be easily retrieved by **Street Machine** via **EZ Profiler** software. **EZ Profiler** enables detailed information to be viewed in the field or in the office to resolve customer billing disputes or to monitor and enforce water bans/restrictions.



Hourly consumption data can be viewed in various ways to help utility personnel better address customer concerns. Graphical displays provide historical data views in hourly, daily, weekly or monthly intervals. Simply rolling a cursor over the graph will display an individual hourly meter reading and users can view subsets of data as well.

Hourly consumption data can also be easily exported into report formats of the utility's choice (i.e. Excel, PDF). Report information includes the serial number of the meter's register, hourly readings, hourly usage and any Instant Data Logging alarms received from each meter. Historical profiles can be built for troublesome accounts to provide billing and customer service representatives the chronological data they need to resolve billing disputes.



## About Mueller Systems.

Where Intelligence Meets Infrastructure®

Mueller Systems offers a full line of residential, fire line and commercial meters, AMR/AMI systems and related products. Mueller Systems provides Smart Metering solutions to optimize the delivery and use of water and energy. Municipalities that supply water and electricity need innovative ways to increase efficiencies, reduce costs, conserve water and energy, and improve customer service. Mueller Systems portfolio of metering systems meets that need.

Mueller Systems develops meters and metering systems that are a Smart Move® for the most demanding applications including residential, commercial and fire-line meters, advanced metering infrastructure (AMI)/automated meter reading (AMR) systems and related products.

We provide utilities with infrastructure technology that enables them to access the intelligent, actionable data needed to increase efficiencies, reduce costs, conserve water and energy, and improve customer service.

Mueller Systems is part of Mueller Water Products, Inc., a leading manufacturer and marketer of products and services used in the transmission, distribution and measurement of water.

**Find out how Mueller Systems can help you increase efficiencies, reduce costs, conserve water and energy, and improve customer service by calling us today at 800-323-8584 or visiting [www.muellersystems.com](http://www.muellersystems.com).**

**Mueller Water Products**

**Smart Move®**