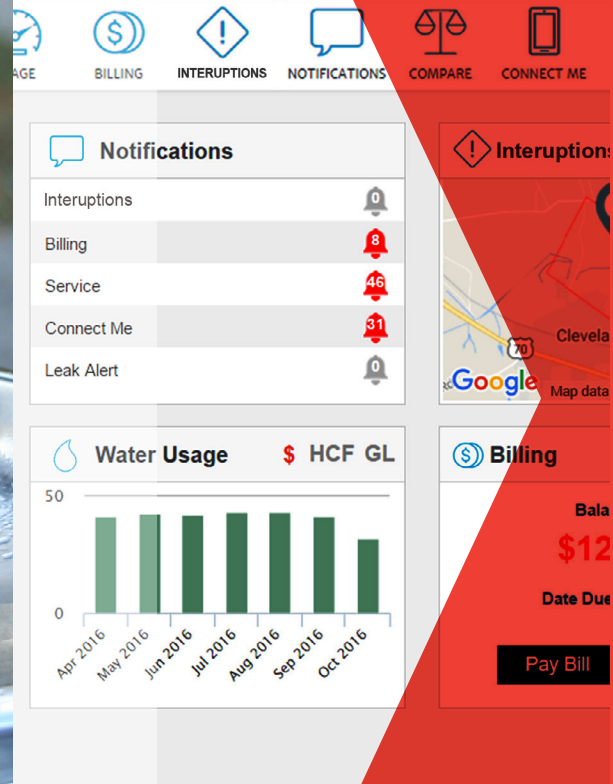


# MUELLER

## METROLOGY OVERVIEW

Advanced Metering Systems and Products to Manage the Delivery and Use of Water



# MI.NET®

a MUELLER brand





**MUELLER**

## **Utilities Need Innovative Solutions to Optimize the Delivery and Management of Water**

Continued population growth and increasing demand is putting added pressure on North America's aging water infrastructure, and utilities need experienced partners to help them manage their water resources. Mueller Systems' wide variety of metering systems and products provide utilities with the infrastructure and actionable data needed to optimize their water programs.

# WHERE INTELLIGENCE MEETS INFRASTRUCTURE®

Mueller Systems enables utilities to manage water and data more accurately and effectively. Our state-of-the-art solutions and products are designed to increase operational efficiencies, improve customer service and conserve our most vital natural resource. Mueller Systems offers a full line of residential, fire line and commercial/industrial meters; migratable Advanced Metering Infrastructure (AMI) systems; and related products for smart utility applications.

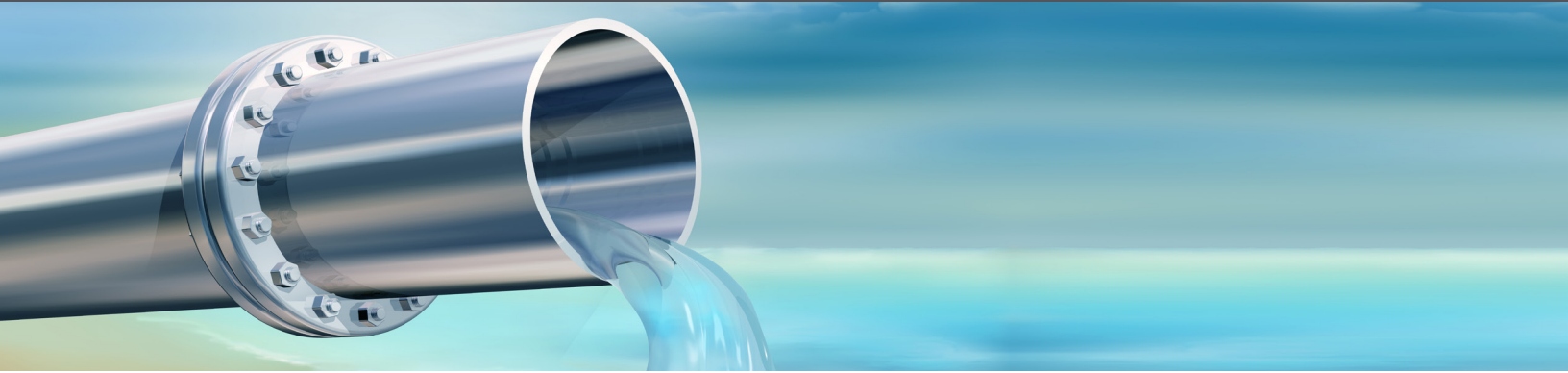
The effective management of a utility's resources requires accurate measurement of every drop of water throughout the distribution process. Mueller Systems' solutions help make that possible.



*For more than 150 years, the water infrastructure industry's most practical, respected and intuitive products have carried the Mueller brand.*



# SUSTAINABILITY, ACCURACY AND REVENUE GENERATION



Water is our most vital natural resource, as our physical and economic well-being relies on immediate access to safe, clean drinking water. As issues such as drought and an aging water infrastructure intensify, so too does the need for an active water management program. By providing the solutions utilities need to implement active water management programs, Mueller Systems demonstrates its commitment to sustainability and to ensuring that future generations have the same access to safe, clean drinking water that we enjoy today.

*Our commitment to sustainability is not limited to the products and services necessary for active water management programs; this commitment extends to the responsible way we manufacture our products, such as our composite positive displacement (PD) meter. The Mueller Systems 420 and 435 composite PD meters (see page 11) contain no lead and exceed NSF-61 and EPA requirements.*



## MUELLER SYSTEMS HELPS UTILITIES:

### Address Water Leakage

In some utilities, estimates of how much water is lost to infrastructure leakage are as high as 50%. Our metering systems and solutions are designed to provide accurate data collection and intelligent data analysis to help locate leaks, assess their severity, and allow for continuous leak monitoring. This ability to detect small leaks and repair high priority leaks allows you to decide how to manage your utility resources more effectively.

The Mi.Net® Mueller Infrastructure Network for Utilities, our industry-leading AMI system, addresses water leaks through state-of-the-art acoustic sensors, allowing complete system data analysis from the comfort of your desk. This level of detailed analysis allows utilities to perform preventive maintenance and avoid costly emergency repairs.

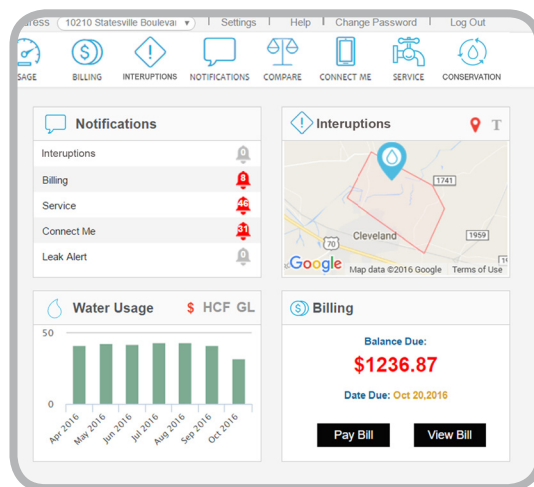
### Reduce Carbon Footprint

The Mi.Net System links meters, distribution infrastructure and control devices in a single, highly efficient data network that utilizes our Mi.Host meter data management (MDM) software. By enabling true two-way communication between your utility, ancillary devices and the meter, the Mi.Net System reduces your carbon footprint and encourages more efficient use of water.

### Account for Every Drop of Water

As demand for water increases and supply diminishes, there is a constantly increasing need for active water management programs. By helping account for every drop of water, Mueller Systems helps you conserve resources and address lost revenue opportunities. In turn, this allows you to recover more of the cost of treating and distributing water and enables investment in upgrades to your water infrastructure system.

Our AMI solutions offer interval consumption data, as well as leak detection and other alert features, to successfully manage water usage and resolve customer disputes. This empowers you to improve customer service while also more efficiently managing your resources.



*Your utility consumers can monitor their water consumption through the Mi.Net system's web-based portal.*

# REVOLUTION IN RESIDENTIAL METERING

Utilities are looking for ways to improve customer service while simultaneously increasing operational efficiencies.

Mueller Systems offers scalable AMI solutions that provide on-site hourly consumption data to effectively manage water usage and resolve customer disputes. Our systems are flexible and migratable, allowing utilities to upgrade as needs and budgets permit.

Meter readers can access monthly, daily or hourly usage data in the field using Mueller Systems' Mi.Net solution.



§

EZReader

Task Setup

Troubleshooting & RDM Right Sizing

Search

Name	Meter ID	Address	Set Config	Get Data	Reset
MUELLER SYSTEMS	0000097393	LEONA DR:19	Set	Get	
FITGERALD: MARK	0010411148	ASH ST:10	Set	Get	
FORESTER: JAMES	1500074027	PLEASANT ST:110	Set	Get	
MORRISON: SAM	1500001448	PLEASANT ST:125	Set	Get	
BOBS HARDWARE	0017125929	BEDFORD ST:90	Set	Get	
EDWARDS: MARIA	0017125908	BEDFORD ST:80	Set	Get	
BURGER KING	0017125914	BEDFORD ST:70	Set	Get	
MCDONALDS	0017225862	BEDFORD ST:60	Set	Get	
SUBWAY	0017225866	BEDFORD ST:75	Set	Get	
JOHNSON: MARY	1600030288	OLD CENTER ST:105	Set	Get	
HARRYS FURNITURE	0014609699	BEDFORD ST:120	Set	Get	
HOMETOWN MINI M...	0015230895	BEDFORD ST:130	Set	Get	
HARRISON: JAMES	1700053389	W GROVE ST:545	Set	Get	
MURRY: WILLIAM	1700053398	W GROVE ST:535	Set	Get	

Delete All Tasks Revert to Last Save Save

*Your mobile reading system can transition to an AMI system with the addition of the appropriate hardware, software and hosting.*





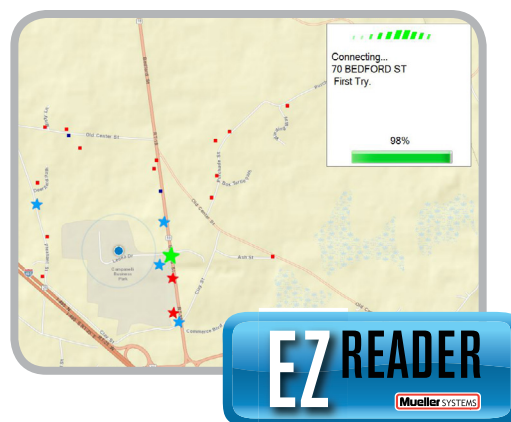
## HIGH-PERFORMANCE AMR

Mueller Systems' advanced Mi.Net system is designed to outperform every other competitor. In mobile AMR mode, the Mi.Net migratable endpoint transmits data every six seconds utilizing LoRa® long range technology. The lightweight and agile mobile transceiver works in tandem with Mueller Systems software to provide data that reliably interfaces with your billing system.

Even more impressive, the open architecture of all Mi.Net components means they can work seamlessly with many other brands of encoded meters that you may have already installed.

The Mi.Net migratable system also includes a comprehensive and powerful data logging feature called Consumption Profiling. This capability permits forty days' of hourly usage analysis to be retrieved from the meter, with alarms that are graphically displayed to enable utilities to quickly respond to customer questions and proactively approach customers about possible leaks or tampering.

Mueller Systems makes it easy to get up and running. All Mi.Net migratable endpoints have a variety of mounting options to optimize your system performance.



**Mi.Net Mobile Transceiver**

# THE SMART MOVE FOR RESIDENTIAL METERING

## MI.NET<sup>®</sup>

a **MUELLER** brand

### INTELLIGENCE THAT DRIVES THE NETWORK.

When you are ready for a two-way smart utility system, the Mi.Net<sup>®</sup> Mueller Infrastructure Network for Utilities is your ideal solution. The Mi.Net System is an AMI communications network that fully automates the meter reading-to-billing process, linking meters, distribution sites and control devices in a single, highly efficient data network. The Mi.Net System is flexible and scalable, enabling utilities to deploy newer technology in stages as their needs and budgets allow.

The Mi.Net System uses Mi.Net endpoints on metering devices to gather and pass data to area collectors through LoRa<sup>®</sup> long-range unlicensed technology. These collectors collect and upload data to either the utility's server or to our hosted server with Mi.Host MDM software, using cellular or other data backhaul options. The many benefits of the Mi.Net System include "On Demand" meter readings, email alerts and alarms based on near real-time information, and the ability to effectively manage your water resources through ongoing access to custom data and information.

To meet evolving technology standards and customer needs, Mueller Systems continues to develop valuable, visionary solutions that offer easier implementation, improved functionality and a faster return on investment. Leveraging the LoRa platform, Mueller Systems can provide a future-proof network that will provide customers with a path to open standards, maximizing the value of their investment. Take a look at some of the innovative products that work seamlessly within the Mi.Net System.



- Improve customer service
- Reduce truck rolls
- Increase employee safety
- Improve cash flow



*The Mi.Net system employs LoRa technology. LoRa, short for "low power, long range," is an RF modulation technique that offers high-power transmissions and increased range when compared with traditional systems with lower battery usage.*





*Mueller Systems Mi.Host consumer dashboard's intuitive user interface helps consumers easily monitor their monthly usage and estimate costs, ensuring that they're never surprised by their monthly bill.*

## Communication from the Office to the Curb – and All Points in Between.

The **Mi.Host consumer dashboard** from Mueller Systems enables municipalities to strengthen relationships with consumers by providing a consolidated view of their water consumption online, helping them to better understand and manage usage behavior and enhance communication with their municipality.

The **420 Remote Disconnect Meter\* (RDM)** from Mueller Systems enables utilities to remotely manage water services from the office. This capability helps municipalities to improve customer service, as consumers no longer have to wait for a field crew to arrive to turn on their water. The 420 RDM also helps municipalities—especially those that experience high account turnover—to improve employee safety, reduce labor and operational costs and reduce their carbon footprint, as field crews and service vehicles do not have to be dispatched to connect or disconnect water services.

The **EchoShore®-DX** leak detection platform incorporates the latest generation of acoustic sensors to transform your existing field assets into a smart water network. A proven leak detection technology, the EchoShore-DX platform utilizes Mueller's Mi.Net system or cellular network for communications. The acoustic technology is built into a standard fire hydrant pumper nozzle cap, maintaining a stealth appearance. EchoShore-DX technology allows you to find leaks sooner, monitor leak progression, assign field crews based on actual leak urgency, and become proactive with your pipe repair program.



*Our 420 Remote Disconnect Meter enables utilities to manage service from the office, not the curb.*



# RESIDENTIAL METERING

## Positive Displacement (PD) Meters

Mueller Systems is an industry leader in offering high-quality, technologically advanced water measurement products. These products serve as an integral part in helping utilities account for every drop of water their customers use – minute by minute, month after month. The accuracy, durability and adaptability of our positive displacement meters are unsurpassed in the industry.

Rugged NSF-61 compliant bronze cases in 5/8" through 2" sizes deliver years of unwavering, unsurpassed service. The Mueller Systems PD meter offers exceptional tamper protection with a standard visual-read register, an ME-8 eight-digit mechanical encoder register, or a solid state encoder register (SSR). A wide selection of AMR/AMI options gives you the flexibility to create a system best suited to your performance needs and revenue targets.

## Composite Positive Displacement Meters

Composite meters represent the latest advancement in positive displacement meter technology. Composite meters from Mueller Systems incorporate lead-free, renewable resources into all components that come in contact with water, giving utilities and their customers a metering option that is environmentally friendly, sustainable, and compliant with all current regulations. With no possibility for corrosion or lead contamination, and with the ability to encourage conservation when utilized with the Mi.Net System, composite meters from Mueller Systems are the premier green metering choice for the future.

Our composite meters help customers accurately and reliably measure potable water over time for residential and small commercial applications, especially where water volumes are low and low flow sensitivity is critical. The permanently sealed register has a unique seal and heat-treated glass to eliminate dirt, moisture infiltration and lens fogging. To resist tampering with the register, an integral tamper-proof locking feature is provided.



**420 Bronze PD Meter**

Sizes	Model	Operating Range
5/8"x1/2"	420	1/8 to 20 GPM
5/8"x3/4"	420	1/8 to 20 GPM
3/4"	435	1/4 to 30 GPM
1"	452	3/4 to 50 GPM
1-1/2"	562	1-1/2 to 100 GPM
2"	572	2 to 160 GPM



**420 Composite Meter**

Sizes	Model	Operating Range
5/8"x1/2"	420	1/8 to 20 GPM
5/8"x3/4"	420	1/8 to 20 GPM
3/4"	435	1/4 to 30 GPM

## Solid State Registers (SSR)

Combining time-tested engineering and leading-edge solid state technologies, Mueller Systems' Solid State Registers (SSR) are the industry's most advanced composite register technology for positive displacement water meters. With friction-free operation and up to 10 digits of visual resolution, SSR registers are fully compatible with Mueller Systems' automated meter reading (AMR) system and its advanced metering infrastructure (AMI). SSR's exceptional accuracy and readability enhance utilities' ability to increase operating efficiencies and revenues while mitigating losses and non-revenue water.

Unlike electro-mechanical water meter registers, Mueller Systems' SSR utilizes sensors to detect magnet rotations associated with the meter-measuring element. With no moving parts, the solid-state design eliminates the possibility of wear or friction from wheels, spindles and pinions and other parts found in electro-mechanical registers that can contribute to meter inaccuracy.

The SSR's market-leading composite enclosure houses processor electronics, battery, liquid crystal display and magnetic sensors under a heat-treated, tempered glass lens. With a low profile, installation in small meter boxes is easier, and SSR housing provides multiple options for integrated AMR/AMI device mounting.

## Solid State Meters (SSM)

Solid State Meters (SSM) utilize ultrasonic flow technology capable of measuring accurately across the entire flow range of the meter. The meter provides extreme low flow capabilities to capture minimal usage and leaks, and it offers a residential and small commercial meter option for forward-thinking utilities that determine an SSM best suits their requirements and needs now and in the future.

The 20-year warranty associated with the meter ensures long-term revenue returns. The integral design of the display and meter prevents tampering while maintaining the opportunity to install the meter in any environment.



*With no moving parts, the solid-state design eliminates the possibility of wear or friction from wheels, spindles and pinions.*



Sizes	Model	Operating Range
5/8"x3/4"	SSM	0.05 – 20 GPM
3/4"	SSM	0.05 – 30 GPM
1"	SSM	0.25 – 55 GPM
1-1/2"	SSM	0.5 – 100 GPM
2"	SSM	0.55 – 160 GPM

# FURNISHING FLOW TO THE FIRE AND PROTECTING POTABLE



## The Standard for Fire Lines

The Mueller System FM3 fire service meter with bypass is designed for combined fire service and domestic water, where a single supply line supports both fire and domestic or process needs. The meter may be utilized in automatic sprinkler systems and fire service, as a master meter for an entire water system, as a master meter for zoned systems, and for domestic or processed water where accuracy across a broad range of flows is critical. The FM3 meter eliminates the need for secondary service lines, saving time and reducing installation expenses. Mueller Systems' FM3 meter is compliant with all UL®, FM®, NSF-61 fire service meter standards.



**FM<sup>3</sup> with Bypass**

Sizes	Operating Range
3"	1/2 to 750 GPM
4"	3/4 to 1250 GPM
6"	2 to 2600 GPM
8"	2 to 4400 GPM
10"	2 to 7000 GPM

## Keeping Leaks in Check

Theft and leaks compromise the integrity of a fire system. Mueller Systems' detector checks are spring-loaded devices that check for flow irregularities, so you can always tell if water is "slipping by."

Rugged and reliable, these detector checks are designed to reduce pressure loss, simplify maintenance and enable unobstructed flow through the main line. Bypasses are available as a separate option with Mueller Systems' positive displacement or vertical turbine meters.



**EDC-IV**

Sizes
3"
4"
6"
8"
10"



# WATER SUPPLY

## The Ultimate Litmus Test: A UL® Stamp

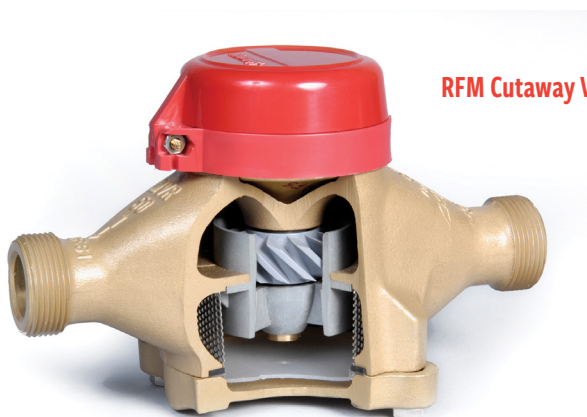
From single-family homes to massive manufacturing structures, sprinkler systems rely on the full-rated capacity of water meters in order to do their job. For more than 100 years, Mueller Systems has been the proven leader in fire line meter design.

Mueller Systems' RFM meter was the first residential fire meter on the market to carry the prestigious Underwriter's Laboratory (UL®) listing, widely accepted as the assurance of system component reliability. UL subjected the RFM meter to tests of accelerated aging, heat extremes, leaks, pressure loss, burst pressure and long-term durability to verify full flow reliability and long-term accuracy. Designed for use in residences with fire protection systems or for combination domestic plumbing/fire service, RFM meters are available in sizes from 3/4" to 2".



**RFM Meter**

Sizes	Operating Range
3/4"	1/2 to 35 GPM
1"	3/4 to 55 GPM
1-1/2"	1-1/2 to 110 GPM
2"	2 to 175 GPM



**RFM Cutaway View**



*The Mueller Systems RFM meter was the first residential meter on the market to carry the prestigious Underwriter's Laboratory (UL) listing.*

# TIME-TESTED PERFORMANCE-PROVEN



## HORIZONTAL TURBINE METERS

When your business depends on measuring potable water with a moderate-to-high flow rate, Mueller Systems' horizontal turbine meters offer key advantages. Built for accuracy over extended periods of time with low head loss, these horizontal turbine meters handle some of the widest flow ranges in the industry, with up to 175 PSI working pressure and within temperature ranges of 33°F to 100°F. Our exclusive D.I.M.E. (Drop-In Measuring Element) feature provides additional value by streamlining maintenance.

The Mueller Systems' FM3 fire service meter with no bypass is also designed for combined fire service and domestic water, where a single supply line supports both fire and domestic or process needs and usage is consistently moderate to high. The meter may be utilized in automatic sprinkler systems and fire service, as a master meter for an entire water system, as a master meter for zoned systems, and for domestic or processed water where accuracy across a broad range of flows is critical. The FM3 meter eliminates the need for secondary service lines, saving time and reducing installation expenses. Mueller Systems' FM3 meter is compliant with all UL®, FM® and NSF-61 meter standards.



**FM3 Meter without Bypass**

Sizes	Operating Range
3"	3 to 750 GPM
4"	4 to 1250 GPM
6"	9 to 2600 GPM
8"	18 to 4400 GPM
10"	30 to 7000 GPM

## VERTICAL TURBINE METERS

If sensitivity to low flow is a consideration for your commercial, industrial or residential application, Mueller Systems' MVR meters are the answer. The most sensitive vertical turbine meters available, they can be installed vertically or horizontally and are the perfect replacement for compound meters. These MVR meters are ideal for installation in tight spaces, and their built-in strainer eliminates the need for a separate external strainer. This is the most versatile meter in the industry and can be used in place of normal PD, turbine and compound applications.



**MVR 350**

Sizes	Operating Range
3/4"	1/2 to 35 GPM
1"	3/4 to 55 GPM
1-1/2"	1- 1/2 to 110 GPM
2"	2 to 175 GPM
3"	2-1/2 to 390 GPM
4"	3-1/2 to 715 GPM
6"	5 to 1430 GPM

## HbMAG METER



HbMAG is a magnetic flow meter that offers easy installation, superior measurement and improved operational efficiency for potable water systems. The meter provides municipal water service providers with a viable replacement for applications that previously utilized a compound or horizontal turbine meter.

HbMAG features a sensor that accurately measures consumption with minimal pressure loss, allowing you to accurately account for every drop of water your customers use while conserving energy and significantly reducing pumping costs. HbMAG's compact and highly durable design does not contain any moving parts—which means virtually no wear and tear or maintenance costs—and it can be installed vertically or horizontally for ultimate flexibility in system retrofits and designs.



**HbMAG Meter**

Sizes	Operating Range
3"	1/2 to 550 GPM
4"	3/4 to 880 GPM
6"	1- 1/2 to 2200 GPM
8"	2 to 3465 GPM
10"	8-3/4 to 5500 GPM
12"	15 to 8800 GPM

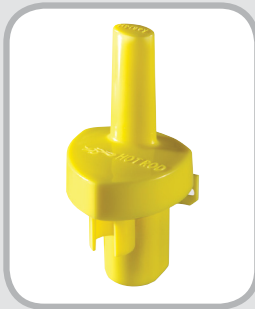
## COMPLEMENTARY PRODUCTS

Mueller Systems offers additional high quality, technologically advanced products which enhance our customers' ability to communicate and collect data. These products blend seamlessly with our equipment and enable your utility to lower costs, improve operations, and easily and proactively respond to customer needs.



### SSR Register

Combining time-tested engineering and leading-edge solid state technologies, Mueller Systems' Solid State Registers (SSR) are the industry's most advanced composite register technology for positive displacement water meters. With friction-free operation, up to 10 digits of visual resolution and 9 digits of electronic resolution, SSR registers are fully compatible with Mueller Systems' Mi.Net AMI and migratable endpoints.



### Hot Rod®

The Mueller Systems Hot Rod is a high-performance, low-cost transmitter used with the Street Machine Mobile Receiver and EZ Reader Software to provide accurate, high-speed meter reading.



### ME-8 Register

Given the rise of automation and the exponential growth in the significance of data in industries throughout the world, it is no surprise that an innovation in data transmission has come to mechanical register technology. The new Mueller® Encoder 8 (ME-8) electromechanical register from Mueller Systems is now available for all positive displacement meters. The register combines reliable mechanical components with an innovative new automated data acquisition system, providing a solution to water utilities that improves meter accuracy and functionality.



### FLO® Unit and Pulser Systems

The Pulser System and the FLO Unit with Frequency Transmitters allow meter flow rates to be electronically transmitted to information management systems for data collection and analysis.

# MUELLER

**For more information about Mi.Net® or to view our full line of water products, please visit [muellerwp.com](http://muellerwp.com) or call 1.866.324.6564.**

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