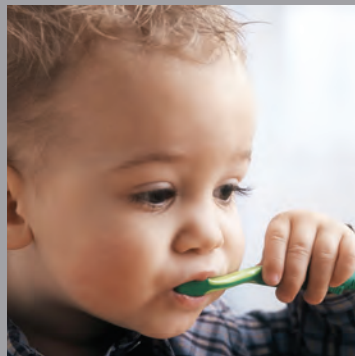# MASTER METER®

The Science of Precise Measurement™

MASTER METER

The Science of Precise Measurement.

At Master Meter we are enjoying the benefits of our relative youth and fresh corporate culture. Managed growth keeps us nimble as we pioneer new measurement and RF technology through applied science. Our engineering and manufacturing teams are unencumbered from decades of legacy products and old thinking. Sales and marketing groups are more focused than ever on the current and future needs of North America's utility marketplace.

Diverse management talent from both sides of the Atlantic represent more than a century of experience in the water utility space. We are excited to share with you the science of Master Meter through our technology portfolio highlighted in the following pages.

Our continued expansion of alliances and technology partnerships with companies such as a GE, Itron, Aclara, and Landis+Gyr, reflect Master Meter's firmly grounded position among other top-tier industry leaders. With an impressive track record of trend setting innovation and an array of technology patents, *Master Meter is Creating the Future of Water Management.*
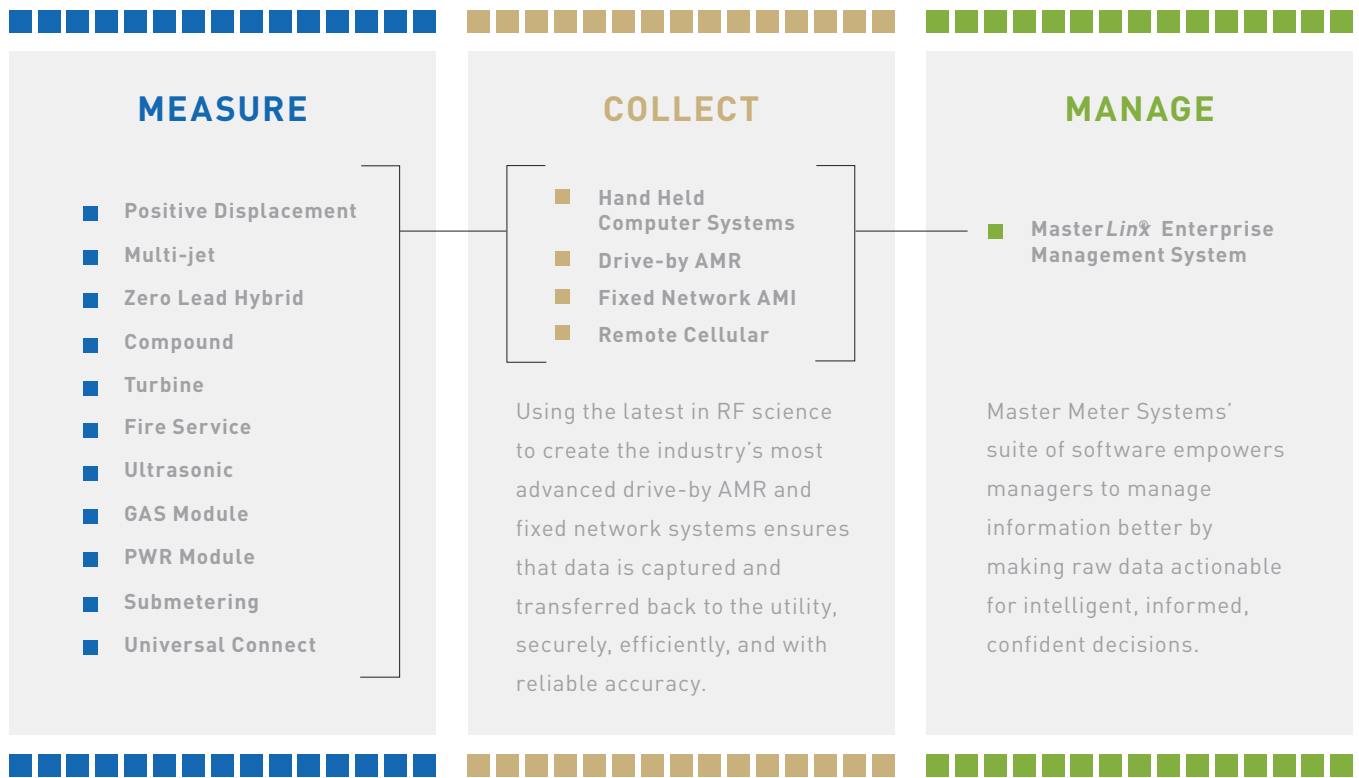
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Master Meter is doing its part to help the environment, both through optimizing our own business operations and in helping utilities, and their customers, improve their conservation efforts.

For more information, scan this QR code with any smart phone or visit GreenisBlue.org

Confident decision making is important when choosing which technology path to follow and with which industry leader you entrust to lead the way forward. From each application-specific meter, to the underlying RF communication backbone, and our intuitive system software relied upon daily by utility managers — Master Meter has developed and owns the technology behind every piece of our fully integrated solution.

MEASURE

- Positive Displacement
- Multi-jet
- Zero Lead Hybrid
- Compound
- Turbine
- Fire Service
- Ultrasonic
- GAS Module
- PWR Module
- Submetering
- Universal Connect

COLLECT

- Hand Held Computer Systems
- Drive-by AMR
- Fixed Network AMI
- Remote Cellular

Using the latest in RF science to create the industry's most advanced drive-by AMR and fixed network systems ensures that data is captured and transferred back to the utility, securely, efficiently, and with reliable accuracy.

MANAGE

- MasterLink Enterprise Management System

Master Meter Systems' suite of software empowers managers to manage information better by making raw data actionable for intelligent, informed, confident decisions.

More Revenue
Creating More Revenue at Every Metered Point

Advanced AMR with integral 3G DataLogs™, 3G SyncReads™, and Revenue Impact Alerts™ help protect the bottom line and deliver:

• Meter right-sizing with granular minute-by-minute flow resolution;

• Comprehensive system balancing and leak management with District Metered Areas and Zones (DMA/DMZ)

• Proactive awareness of leaks, theft, tampering, and zero consumption.

Financial Benefit Analysis
Maximizing Return on Investment

Our comprehensive approach to water management ensures immediate ROI from improved results, as well as obsolescence protection from changes in technology.

• Turnkey solutions with financing options bring an immediate positive impact to the bottom line.

• Freedom to migrate on your timetable and with multiple concurrent collection technologies.

• Our precise measurement portfolio guarantees accurate water use accountability.

Unaccounted For Water
Closing The Water Loss Gap

The goal for any meter replacement program or AMR/ AMI deployment is to restore system accuracy, eliminate leaks, and assure that every drop of water is accurately accounted and paid for. Our expansive solutions portfolio helps water utilities achieve this end.

• Our precise measurement science is sensitive to every drop and accurately records all flows.

• Specialized leak detection technologies on both sides of the meter help address leaks concerning the ratepayers and those in the distribution system.

• Integral data logging is a powerful tool for both the utility and their customer by providing greater insight into how and when water is consumed so that awareness leads to behavioral change.

The Octave Water Management System

Using the Sound of Science™, the Octave® Ultrasonic Meter represents a new approach to comprehensive flow management and accountability based on a greatly improved version of the AWWA C750 standard. This highly advanced, all-digital technology achieves precise measurement without any moving parts to ensure optimum revenue without waning performance over time.

Performing brilliantly at low flows, this unique meter solution is capable of recording even the smallest of leaks and is an ideal replacement for any mechanical compound or turbine meter.

The 80/20 rule applies to large commercial and industrial (C&I) metering: commonly 20% of the utility installed meter base generates 80% of the utility's revenue. The Octave focuses advanced metering science where the real revenue exists — within the C&I meter assets.

For more information, scan this QR code with any smart phone or visit octavemeter.com

• Starting flow capabilities exceed the AWWA C702 low-flow specification by 50–90%.

• No mechanics: 100% digital electronics is a superior choice to moving parts and ongoing maintenance found in traditional C&I products.

• Available in stainless steel (2" - 8") or epoxy (2" - 10")

• Exceptional reporting and flexibility with proactive battery alarms, a wide array of available measurement units, rich communications for SCADA, and industry standard communication protocols for AMR and AMI compatibility.
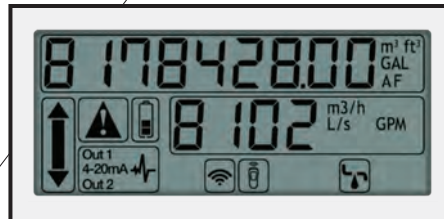
• Octave's revolutionary measurement science enables our 4" meter to initially record flow at a miniscule 1/16 USG.

• Lifetime Revenue: Zero wear is now possible with the elimination of mechanical parts.

• Go Anywhere Installation: No strainer required. Eliminates need for lengthy piping requirements.

• Octave's extremely wide turn-down ratio helps assure the meter is correctly sized. No moving parts reduces concern of premature accuracy loss caused by under-sizing at the top flows. Benchmark low flow capability addresses concern of over-sizing which might miss small flows.

On average,

10 gallons

per day of your water footprint (or 14% of your indoor use) is lost to leaks.

PD Technology

Using the latest in Computational Fluid Dynamic (CFD) design science, our engineers crushed existing performance benchmarks largely left untouched by other manufacturers for more than a century. We're in good company: the same software tools used in our Positive Displacement (PD) design also helped create Formula 1 race cars, military fighter craft, and the latest in aerospace propulsion. Master Meter's PD meter is nothing short of an engineering trifecta.

• New meter accuracy after 4,000,000 USG (35+ years) based on independent testing by the Utah Water Research Laboratory. Peak financial performance for the life of the meter.

• Whisper-quiet performance is achieved by shifting the point at which harmonics begin, to outside the meter's flow range. A chief complaint against PD meters is now eliminated.

• Our CFD-derived chamber design significantly reduces pressure drop between 7-19% versus our nearest competitors. More water flow to homeowners and less complaints at City Hall.

• Twenty-year (5/15) accuracy warranty assures more longer lasting revenue.

EcoMaster

Master Meter's latest innovation in the science of material design and construction is our EcoMaster™ Meter Main Case. This smart body design reduces product weight while shrinking its transportation-related carbon footprint. With no wetted metallic surface area, the EcoMaster complies with the latest rigorous environmental standards consistent with the 2014 Safe Drinking Water Act (SDWA).

• Strong marine grade aluminum exoskeleton reduces risk of cross threading and possible body damage caused by misaligned meter settings common with composite bodies.

• May be used with PD or MJ measure chamber technologies

• Each meter's more than 50% weight reduction helps eliminate harmful CO_2 from the atmosphere.

• Intelligent exoskeleton design preserves body rigidity and electrical connectivity without exposing water flow to metal.

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Multi-Jet

This bellwether technology is a worldwide standard in flow measurement suitable for all water conditions. In North America, Master Meter is the undisputed leader in multi-jet products.

• Get exceptional performance in passing entrained solids and operating in environments with high mineral content.

• Measures with only one moving part that is hydro-dynamically balanced on a sapphire bearing to preserve accuracy and promote a positive bottom line.

• Clean elegant measurement design is highly sensitive to leaks and low flow while limiting wear for excellent revenue protection.

C&I Meters

Our C&I product portfolio covers the entire spectrum of traditional, and now, not so traditional measurement technologies as found in the Octave Ultrasonic Meter. Regardless of the application or required flow measurement, our array of large meters including turbine, compact turbine, compound, and fire service types, deliver optimum reliable water accountability.

• A complete family of FM approved fire service measurement.

• Compound meters that cover the widest possible flows.

• A wide choice in turbine designs for any installation challenge.

For more information, scan this QR code with any smart phone.

Shown: 8" Fire Service Compound

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Every time you shave minutes off your use of hot water, you also

SAVE
ENERGY
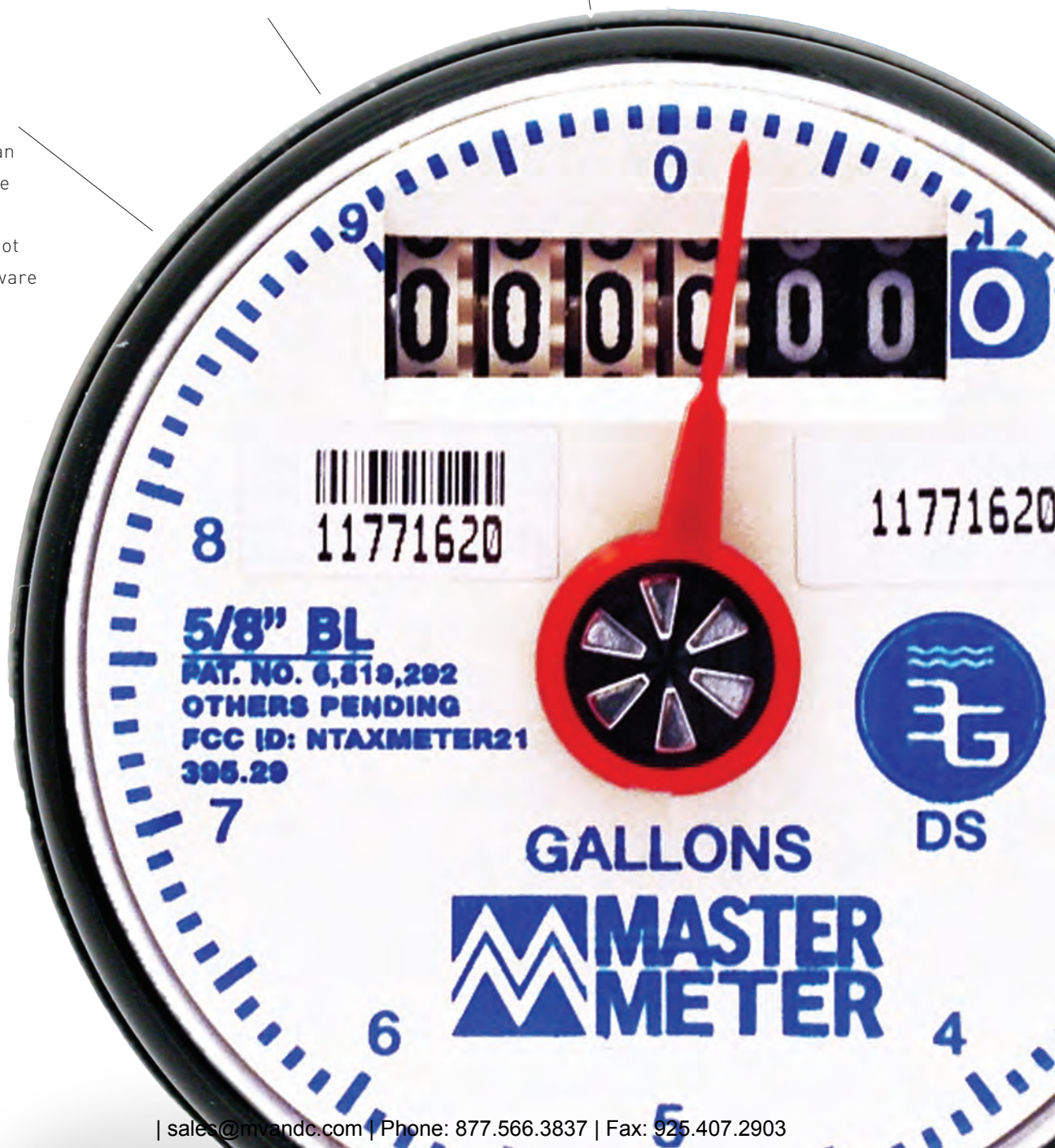
and keep dollars in your pocket.

Dialog® 3G Register System

Whether considering drive-by AMR or fixed network, the 3G Register System is the technology foundation that our solutions portfolio is built upon. Its elegant 100% integral design features no external wires or connections. Its innocuous appearance belies the deep technology within while discouraging tamper and minimizing public curiosity common with other designs.

3G remains the benchmark by which all others aspire.

• SyncRead RTC technology makes possible district metered areas and zones (DMA/DMZ) to significantly enhance leak management and conservation programs.

• 3G offers the lowest long-term ownership cost when considering our generous warranty protections, speed of installation and deployment, and the actionable intel that positively impacts the bottom line.

• 3G SyncRead™ real-time clock (RTC) technology provides an accurate discrete time stamped read at the register endpoint — not in the collection software and without latency.

- 3G DataLogs™ provide 4,000 points of discrete data to address high billing disputes, verify key alarms, and help right-size large C&I meters. These personal consumption profiles provide useful insight for homeowners to better manage thier water use. Data is conveniently gathered either by fixed network or safely from within the utility vehicle.

- Real world reliability with over 2 million units installed from the frozen tundra of Canada to the challenging wet pit settings of America's South, to the harsh deserts of the Middle East.

- 3G's "plug-and-play" design provides robust two-way communication from a register that automatically activates after installation and immediately begins transmitting data.

- Vigilant active sensor technology monitors 24/7 for small leaks, meter tamper, water theft, and zero consumption from disabled or removed meters.

- 3G Register System

For more information about Dialog® 3G Register System, scan this QR code with any smart phone.

Smart RF technology that assures freedom of choice in meter procurement

Master Meter's holistically designed 3G AMR/AMI system does not limit a utility to only Master Meter's measurement solutions. From our universal connection products, a utility may safeguard their investment in existing infrastructure and connect to most any meter asset currently installed or in inventory.

XTR

This flexible two-way 3G transceiver provides comprehensive data communication across most every installed meter asset in a utility's system.

• Ideal for providing communications between magnetic acoustic leak sensor technology, the XTR™ and the water utility.

• Interconnect diverse metered assets into Master Meter's 3G network including magnetic, propeller, differential pressure, ultrasonic, commercial gas products, and other manufacturer's encoder equipped meters.

• 3G DataLogs, 3G SyncReads, and active Revenue Impact Alerts are standard with the XTR.

Interpreter

This revolutionary universal AMR register with integral 3G technology will retrofit most any installed meter using a bayonet mount meter body. Simply remove the original register and attach the brand-specific adapter ring, Interpreter™ register and its protective shroud. In just minutes, silent meters without a voice are easily enabled to communicate clearly about leaks, tamper, theft, offer detailed consumption profiles, bring insight into correct or incorrect application sizing, and more.

• Accurately mimics a meter's original register using precise high-resolution encoder technology. Available on most all Master Meter measurement products (a standard configuration in Canada).

• 3G DataLogs, 3G SyncReads, and Revenue Impact Alerts are included, just like with our standard 3G register.

• LCD Interpreter provides nine digit display resolution and the added benefit of instantaneous rate-of-flow information.

3G Gas

• This simple Connection*Free*™ retrofit unites over 95% of installed US residential gas meters with 3G AMR technology.

• Ruggedized IP65 rated enclosure with uniformly coated electronics deliver reliable environmental performance in the most challenging environments.

• A simple intuitive retrofit procedure with auto-activation speeds installation and helps eliminate error.

3G PWR

• Master Meter's technology agreements with leading electric meter manufacturers assure 3G integration at most residential meter connections.

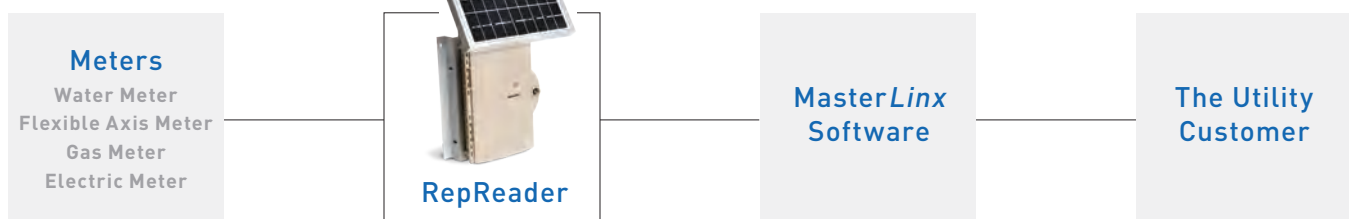• A perfect solution for water utilities that also provide power service to their customers.

Submetering

Master Meter's submetering system is based on a light architecture that promotes a quick startup and simplified implementation. The flexible design fits virtually any property and provides full reporting for water, gas and electric connections. Online data and billing management simplifies information flow and helps property owners keep focused on the big picture.

• Reliable wireless reporting at any property is simple with Master Meter's IP Remote Reader and 3G RepReader submeter communication architecture.

• Invest with confidence without limitations — our submetering solution is designed for maximum flexibility, ease of adaption, and universal freedom of choice in meter and billing service technology.

• An integrated solution for what matters most; water theft notifications, leak notifications, early or unannounced move-outs, unauthorized move-ins, and controlled data access by the RBC from anywhere in the world.

Meters
Water Meter
Flexible Axis Meter
Gas Meter
Electric Meter

RepReader

Master*Linx* Software

The Utility Customer

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Dialog® 3G Cellular

Dialog® 3G Cellular unit provides remote data collection and advanced meter functionality for isolated locations. A single unit can monitor a variety of reading devices — meters, flow meters, valves, level sensors and other equipment. Its ruggedized enclosure is built to survive nature's most challenging conditions.

• Innovative, distant two-way communication tool designed for data collection and sensor monitoring, such as line pressure and residual chlorine levels at remote pump stations.

• Advanced I/O architecture supports multiple meter connections including 3G, 4-20 mA, and digital contact output designs.

Accu*Linx* High Resolution Encoder

Provides Freedom of Choice in meter selection for third-party drive-by and fixed network platforms.

• Utilizes an industry-wide universal communication protocol for integration with nearly every installed AMR/AMI system.

• Precise 8-wheel design delivers detailed granular measurement data.

• Exclusive positional sensing technology gives precise reporting of measurement data for a confident remote read.

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Nearly

60[%]

60%

of a person's
household water
footprint can
go toward lawn
and garden
maintenance.

Mobile Terminal Field Computers

Even if fully deployed with fixed network or drive-by AMR, there is always a need for an intelligent and highly functional handheld computer system. Our Mobile Terminal™ is sophisticated, ruggedized and packed with communication features that make it the perfect meter installation tool in addition to meter data collection.

- Integral camera, flash light, and GPS help geocode meter locations and digitally record every facet of the installation site.

- The integrated barcode scanner is a powerful installation tool and helps eliminate human error.

- Bluetooth and WIFI provide comprehensive communications and, when linked to a cell phone, real-time data transfer to the utility is a snap.

3G Mobile AMR

- Most every meter, most every make – water or gas, and a growing list of solid state electric meters — can be read by the 3G AMR drive-by system.

- Consumption data and alarms are transmitted in real time back to the utility from the field using a cell phone or integral cellular card on the mobile unit.

- Two of the world's largest AMR deployments representing 1,000,000+ connections — in Mumbai, India, and Southern Water in the United Kingdom — use 3G Mobile AMR technology.

- True two-way RF communication keeps data flow simple and convenient just as common with fixed network systems.

- This mobile solution delivers nearly every benefit associated with fixed network without the infrastructure. 3G Mobile's precise data logging, leak management zones, system-wide synchronized meter reads, water balancing capabilities, and a broad suite of revenue impact alerts keep pace with the best of AMI technology.

Fixed*Linx*™ AMI

This powerful fixed network AMI system frees utilities from operational inefficiencies and empowers them with the time and information to do more — to better service customers, better manage revenue and responsibly protect precious resources. Our stable technology has created a simplified migration path that utilities of any size, and current technology level, can easily adapt — at their own pace.

For more information, scan this QR code with any smart phone or visit fixedlinx.com

MEASURE

COLLECT

MANAGE

• Utilities can personalize the degree of consumption detail sent through the system. More information equates to greater insight and better decision-making by utility managers and their end customers.

• Continual AMI improvements are aimed at reducing infrastructure requirements and help shrink the utility's carbon footprint. Future system features include expanded 2-way communication across the entire data path, geared at providing even greater functionality and efficiency.

• This powerful Meter Data Management (MDM) software takes continually streaming information and makes it presentable in an intuitive and user-friendly format. The Software as a Service (SaaS) model when chosen greatly reduces the utility's IP infrastructure requirements and maintenance hassles.
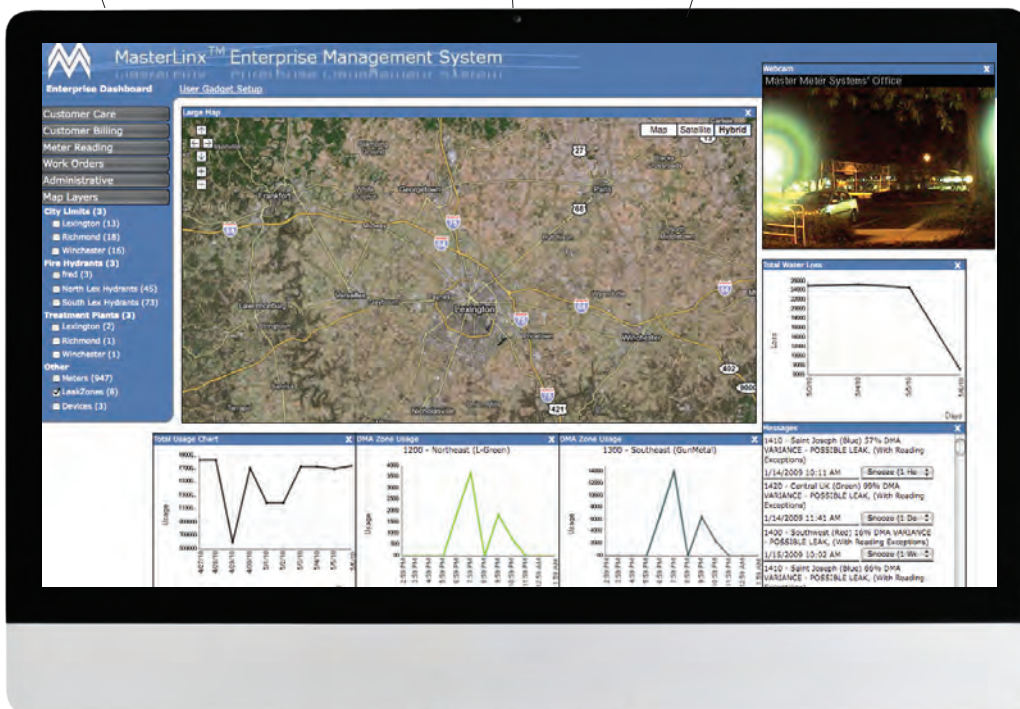
Fixed*Linx* AMI

15

Master*Linx*™ Enterprise Management Software

Raw data from handheld field computers, drive-by AMR, fixed network, or 3G Cellular is easily made actionable under a single data management system umbrella: Master*Linx* created by Master Meter Systems.

Designed with input from utilities of all sizes, Master*Linx* is highly intuitive and developed for immediate implementation and mastery by utility personnel.

• Master*Linx* Panels is a dashboard display that provides a quick litmus test of the health of the entire water system. Utility management can efficiently ascertain which areas require attention and where to prioritize resources for the day.

• Utilities may easily share data with homeowners and empower them to make informed decisions about their own consumption while promoting better conservation. Leak notifications are easily communicated through e-mail or SMS text messaging so that prompt action can be taken.

• Master*Linx*'s optional billing software module can provide a true end-to-end data management and revenue solution. Master*Linx* is proven to integrate seamlessly with whichever billing software a utility may choose.

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