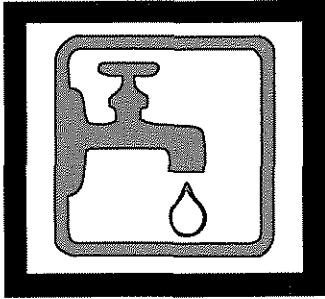


2008-00551



# NORTH MARSHALL WATER DISTRICT

56 Frankfort Rd • P.O. Box 850 • Benton, Kentucky 42025  
Telephone (270) 527-3208 • Fax (270) 527-3039 • 1-800-491-3209 (area code 270 only)

RECEIVED

JAN 27 2009

PUBLIC SERVICE  
COMMISSION

January 22, 2009

To Whom It May Concern:

Re: Radio Meters

By virtue of a unanimous vote of the North Marshall Water District Commissioners, on June 19, 2008, as reflected in the attached minutes of a regularly scheduled board meeting on said date, the Board elected to purchase Master Meter Radio Read Meter System, subject to approval by the Public Service Commission.

B.W. Darnell  
Chairman B.W. Darnell  
North Marshall Water District

Paula Boling  
Notary

9-1-2010  
My commissions expires

RECEIVED

JAN 27 2009

PUBLIC SERVICE  
COMMISSION

Marshall County Tribune-Courier • Benton, KY • Tuesday, July 1, 2008 **D3**

THE NORTH MARSHALL WATER DISTRICT WILL ACCEPT SEALED BIDS ON A RADIO READ METER SYSTEM. SPECS ARE AVAILABLE TO BE PICKED UP AT THE DISTRICT OFFICE. BIDS WILL BE ACCEPTED UNTIL 4:30 PM, MONDAY, JULY 7TH, 2008.

What's  
323  
Call Today  
527-3162  
in the

Marshall County Tribune-Courier • Benton, KY • Tuesday, July 1, 2008 **D3**

THE NORTH MARSHALL WATER DISTRICT WILL ACCEPT SEALED BIDS ON A RADIO READ METER SYSTEM. SPECS ARE AVAILABLE TO BE PICKED UP AT THE DISTRICT OFFICE. BIDS WILL BE ACCEPTED UNTIL 4:30 PM, MONDAY, JULY 7TH, 2008.

What's  
323  
Call Today  
527-3162  
in the



P.O. Box 910  
Benton, Kentucky 42025-0910  
Phone: 270.252.2265  
Fax: 270.252.3355  
www.1stkentuckyexpress.com

RECEIVED

JAN 27 2009

PUBLIC SERVICE  
COMMISSION

January 26, 2009

Brad Anderson, Superintendent  
North Marshall Water District  
Benton, KY 42025

RE: Loan Commitment

Dear Mr. Anderson:

Thank you very much for allowing us to look at your loan request for North Marshall Water District ("Borrower"). First Kentucky Bank ("Bank") is pleased to offer the following loan commitment:

Borrower: North Marshall Water District

Amount: \$800,000

Purpose: Purchase digital water meters

Payments: Repayment of this commitment will require monthly payments to the Bank comprising principal & interest monthly based upon an amortization schedule of 10 years.

Rate: Fixed for 10 years at a municipal tax-advantage rate of 4.34%.  
Approximate payment of \$8,253 /month.

Fee: \$300 origination fee.

Prepayment

Penalty: None

Collateral: As security for the loan, the Borrower will provide a blanket UCC lien on all business equipment.

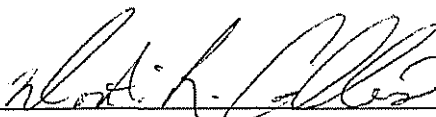
Other:

1. Borrower will remain active and in good standing with the Commonwealth of Kentucky.

2. Loan will be subject to and comply with the laws of the Commonwealth of Kentucky.
3. Borrower will comply with all governmental and environmental rules, regulations and laws that are applicable.
4. Borrower will provide on an annual basis to the Bank a fiscal year end audited return for North Marshall Water District within 90 days of the municipal's fiscal year end.
5. Borrower will pay for all costs and expenses associated with the Bank acquiring an acceptable, clear security interest in the previously described collateral. Such includes, but is not limited to, attorney's fees, filing fees and other preparatory fees.
6. The interest rate that has been presented is subject to certification by qualified Bond Counsel that the debt issue is "bank qualified tax exempt" as defined in the Internal Revenue Code.
7. The terms discussed in this letter should be deemed as a confidential discussion between the Bank, the Borrower, and the Kentucky Public Service Commission.

Should this commitment not be accepted as evidenced by signed and dated acceptance as shown below by February 26, 2009, this commitment shall be considered unacceptable to the Borrower and void.


This commitment is made on behalf of First Kentucky Bank this 26<sup>th</sup> day of January 2009 by its Vice-President, Monti R. Collins.

  
\_\_\_\_\_  
Monti R. Collins  
Vice-President

1/26/2009  
\_\_\_\_\_  
Date

Acceptance:

By signing below, I, Brad Anderson, acting as Superintendent of North Marshall Water District, do hereby accept the terms of this commitment.

  
\_\_\_\_\_  
Brad Anderson  
North Marshall Water District

1-26-09  
\_\_\_\_\_  
Date

RECEIVED

JAN 27 2009

PUBLIC SERVICE  
COMMISSION

# CONSTRUCTION SITE SERVICES

190 BANK CIRCLE DRIVE  
DUNDEE, KY 42347

---

BRANCH LOCATIONS:

3209 COOK STREET  
PADUCAH, KY 42003  
270-443-1759 (Phone)  
270-443-1789 (Fax)

[www.csspipe.com](http://www.csspipe.com)

D.O.T. Certified in KY, GA, OH, IL, TN, AL

552 SR 69  
HARTFORD, KY 42347  
270-298-4545 (Phone)  
270-298-4363 (Fax)

---

## Request for Information

### Water Utility Automatic Meter Reading (AMR) System

NORTH MARSHALL WATER DISTRICT  
BENTON, KENTUCKY

AUGUST 14, 2008

--

Prepared by:  
Construction Site Services  
Paducah – Hartford  
Kentucky

## **Table of Contents**

Section 1 – Introduction Letter

Section 2 – Technology Overview

Section 3 – Technical Support, Warranty & Service

Section 4 – Customer References

Section 5 – Delivery Schedule & Terms

Section 6 – Quotation

Section 7 – Submittals

# CONSTRUCTION SITE SERVICES

190 BANK CIRCLE DRIVE  
DUNDEE, KY 42347

---

BRANCH LOCATIONS:

3209 COOK STREET  
PADUCAH, KY 42003  
270-443-1759 (Phone)  
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552 SR 69  
HARTFORD, KY 42347  
270-298-4545 (Phone)  
270-298-4363 (Fax)

---

Subject: DRIVE-BY Radio-Read Automatic Meter Reading (AMR) System (For potable water)

Dear North Marshall Water District:

Thank you for the opportunity to provide for your community the MASTER METER, INC DIALOG 3-G (Third Generation) Connection free wireless RADIO READ AUTOMATED METER READING SYSTEM. We certainly appreciate your consideration.

Construction Site Services (CSS) has its home office in Dundee, KY with two branches to serve its utility customers in Paducah, Kentucky and Hartford, Kentucky. CSS was organized in 2002 and we currently have over 150 years of combined personnel experience in the fields of waterworks meter/ valve/ pipeline supply and sanitary sewer rehabilitation.

We are very pleased to offer you the only drive-by connection-free (no wires) radio-read 5/8x3/4 water meter on the market today. Master Meter, Inc's DIALOG 3-G AMR water meter is available in two models - the multi-jet and the positive displacement. Its unique "under the glass" radio antenna allows you to read from flooded pit settings that have several inches of water on top of the meter. The receiver and transmitter are manufactured by Master Meter, Inc. and with the wholly owned subsidiary of Greentree Applied Systems of Lexington, Kentucky the software shall mate to your existing billing software (satisfaction guaranteed).

DIALOG 3G is connection free. You just change out your existing water meter . It automatically turns on with the third sweep of the dial hand which would be the first 30 gallons of water. It will tell you when someone has turned the water meter backwards (or counter-clockwise movement) and will register the gallons. It will also tell you if someone has tampered with the meter, for instance should someone place a magnet on the meter. It has Leak Detection which lets you know when water has run continuous for 24 hours. *And*, it's ready for Fixed Base technology, still without any wires. And should the fixed-base go down (for instance with a tornado or earthquake) MMI is the only Fixed-Base AMR system that will allow you to revert back to a Drive-By system.

Please keep in mind and consider the fact that all components are owned by Master Meter, Inc. There is no finger-pointing between component manufacturers should there be a problem, Master Meter guarantees the whole system. Included with the DIALOG 3G products are data logging of customer history – all you do is drive near the customer's meter and read the information. You do not have to get back into the meter pit and interrogate the meter by disconnecting and reconnecting to the radio to retrieve data as do other manufacturers. Your data is collected from the safety of your vehicle. And Data-Collection is not an additional feature that you have to purchase separately. It's included with every Drive-By System -- It's what you would expect.

This is a *smart water meter*. 4,000 points of information are included with each meter. Usually, the owner sets these points as hours, which means you can go back on the hour up to 4,000 hours. That's 166 days. There are no additional hidden costs for the data-collection software, it's included with every Drive-By System. And all you do is change out the water meter. Your customers have no idea how smart it is because they see no wires.

We invite you to visit the Master Meter, Inc. website ([www.mastermeter.com](http://www.mastermeter.com)) which shows and offers you all the information needed to help make an informed decision regarding RF AMR water meters. The DIALOG 3-G RF water meter advertises the capability of transmitting from under 4-8 inches of water. Should your existing water meter setting have more than 8 inches of area between the register glass and the pit lid, we suggest a resetter to adjust the meter higher in the box/pit which will get you back to more easily view the meter. If you wish to keep the meter deep in the existing box, Master Meter offers their optional Active Wireless Antenna, featuring BlueTooth wireless technology (which is due out fall '08)

This wireless booster antenna fits through a 1-3/4" hole in the meter box lid and replaces the older version of our booster. Because this antenna is also Fixed-Base ready, you could migrate to this technology in the future if you so desire.

Please keep in mind that we have demonstrated this meter at depths beyond 8" and though we have proven it to work in extremely deep pit sets/situation, it is a situation where you must slow the vehicle or pull over and wait for the signal to migrate out. We really suggest that you consider a resetter device to go ahead and raise your meter to a depth that is workable and viewable for your employees. Or, again, you can consider the Active Wireless Antenna. If you have a meter pit setting that is prone to constant water flooding that goes *over* the pit lid, there is no way the radio wave can easily come through since there is no air space. This applies to all radio-meters. It is a time consuming venture to await the signals in these conditions.

---

### Manufacturer

Master Meter, Inc. is a privately held company that manufactures a complete line of water measurement products including Multi-Jet, Positive Displacement, Turbine, Compound, and Fire Service Compounds. In 1991 they introduced DIALOG®, their first automated meter reading system. Through the success of this system, Master Meter has gained recognition as an industry leader in wireless AMR systems. The system proposed for the Muhlenberg County Water District #3 has the latest, most advanced 3G (Third Generation) radio technology available today for drive-by utility applications. Master Meter, Inc. and its subsidiary, Greentree Applied Systems, offer over 50-years of manufacturing, software, training and service experience.

### System Introduction

The system proposed incorporates three key components: the water meter, RF transmitter, and the reading system (transceiver and laptop or handheld PC with route management software). The interface that we provide will bridge to your current billing interface for seamless connectivity of our route management software to your existing billing software. Route information may then be uploaded into the Panasonic laptop PC or Jett-CE Handheld device, whichever you chose.

The DIALOG 3G™ radio transmitter is integrated within the meter's register. **Let us reiterate – the antenna is underneath the register glass.** There is no wire connection to an antenna mount pole. There is no labor for the



preparation of the meter to the antenna mount pole and then the antenna onto the pole. Integrated (under the glass) 3G transceivers are completely wireless (connection-free) and preprogrammed from the factory. All 3G Transceivers, as well as the other components of the system, are FCC Part 15 compliant and license exempt. The units transmit one way every eleven seconds for normal collection of readings. However, the system employs true two-way communication capabilities for programming, data logging and troubleshooting. The register has customary odometer wheel readings which match to your radio read. Your water customers can look at their water meter and read the gallons if they want. LCD Registers are becoming available on the meters in the near future and we welcome your inquiry.

The DIALOG 3G D-MMR Transceiver receives the information, which is connected to our handheld Jett-CE device or optional vehicle-mounted Panasonic 5200 Tough Notebook laptop PC. Once the route management software stores the information, it is prepared for download back to the billing system where it is then processed in the same manner as is done currently. You may build reports through the included "Crystal Reports" and other reporting manners.


Master Meter is in the final stages of development and beta testing of their "Fixed Base" radio read system. All DIALOG 3G RF meters purchased for drive-by applications are guaranteed to be fully migratable to their "Fixed Base" system when available. Estimated date for release is fall 2008.

Keep in mind that Master Meter DIALOG 3G can often times convert your larger existing meters with our 3G radio register and allow you to DataLog the activities of these large volume mastering meters. This has been a major area of interest among our customers due to the high cost of larger water meters, it really is difficult to justify total replacement for radio-read. We can retro-fit the other manufacturers if they have the bayonet style body to register connection. The older meters that have the stem mounts on the bottom of the registers that go thru a hole in the body of the meter, we cannot retro-fit due to the compromised body.

No one offers the warranty that Master Meter, Inc. does. We have 25 years on the body housing, 20 years limited on the register and the antenna. The 20-limited year warranty is 10 years 100 percent and the second 10 years prorated. Manufacturers that use their touchread pad as an assistant connection into their radio do not cover the touchpad with their radio unit. This can and will be a future problem as to where the problem lies and which warranty rules.

As you decide to become pro-active with your water system's metering needs, we appreciate your serious consideration of MASTER METER, INC 3-G Connection-Free Wireless Radio-Read water meter. Just let us know when you would like a demonstration.

Respectfully,



Kathy Wemhoener  
Construction Site Services

cc: Daniel Wemhoener, CSS Meter Specialist  
John Johnson, Master Meter, Inc. Regional Rep.

# Technology Overview

## Master Meter Multi-Jet Meters

The water meters proposed are 5/8", 5/8"x3/4", 3/4", 1", 1 1/2" and 2" cold water multi-jet type. They meet and in many cases exceed the latest revision of AWWA Standard C708. Features and benefits include:

- 81% copper in body for longevity.
- At least 97% accurate on low flow for greater revenue and less unaccounted for water.
- Velocity design, one moving part in waterway, will pass small, entrained particles for longer accurate life
- Integrated DIALOG 3G-DS Radio Transmitter permanently sealed in Stainless steel/tempered glass, magnetic drive register for long-term, trouble free operation and ease of installation.
- Excellent warranty... 20 years on the housing, 20 years on the register head which includes the radio antenna, and limited 20 years on the battery with the first 10 years at 100% and prorated the second 10 years. See Attached Utility Product Warranty.

## Master Meter Dual Body Compound Water Meters

The water meters proposed are 2", 3", 4" and 6" dual body compound type. They meet and in many cases exceed the latest revision of AWWA Standard C702. Features and benefits include:

- All Master Meter Compound meters come equipped with DIALOG standard register for adaptation to DIALOG 3G external modules.
- Please see enclosed literature.

## Master Meter 3G Transmitter (integrated)

Features and benefits include:

- Digital Encoder
- Available in two models – Mechanical or LCD. LCD model displays both totalization and rate of flow
- No external connections – Completely wireless
- Environmentally sealed to withstand the harsh environment of pit set applications
- 20 year calculated battery life using two lithium thionyl chloride batteries
- FCC License exempt
- No need for pit mounting equipment. Transmits through existing pit lids
- Superior transmission range
- Fully programmed from the factory
- Leak, Backflow and Tamper Detection
- Data Logging of Customer History (up to 4,000 hours)
- Highly integrated reliable product

**Master Meter 3G Interpreter Register Kit (used on other manufacturer's bodies)**

Features and benefits include:

- Digital Encoder
- Available in two models – Mechanical or LCD. LCD model displays both totalization and rate of flow
- Compatible with most current 5/8"-2" positive displacement meter manufacturers models including: Sensus SR11, Sensus PMM, Badger Recordall, Neptune T10, AMCO C700, and Hersey 430
- No external connections – Completely wireless
- Environmentally sealed to withstand the harsh environment of pit set applications
- 20 year calculated battery life using two lithium thionyl chloride batteries
- FCC License exempt
- No need for pit mounting equipment. Transmits through existing pit lids
- Superior transmission range
- Fully programmed from the factory
- Leak, Backflow and Tamper Detection
- Data Logging capability
- Highly integrated reliable product

**Master Meter 3G Universal Transmitter (external)**

Features and benefits include:

- Available in six models – Single Switch, Dual Switch, Encoder, Fast Pulse, Generator & ARB-V
- Will interface to most popular brands of water meters with compatible output register including: Master Meter, AMCO, Badger, Neptune, Hersey, and Sensus models SR11 and PMM
- Highly integrated reliable product
- 20 year calculated battery life using two lithium thionyl chloride batteries
- FCC License exempt
- Superior transmission range
- Fully field programmable
- Environmentally sealed to withstand the harsh environment of pit set applications
- Provided complete with mounting bracket

**Master Meter DIALOG 3G E-MMR Transceiver**

The DIALOG 3G Transceivers may be utilized in both walk-by and drive-by AMR applications. They are housed in a lightweight aluminum case. The DIALOG Transceivers are designed to receive a frequency band ranging from 902-928MHz and is license exempt in the US under FCC Part 15 regulations.

The EMMR Transceiver works specifically with DIALOG 3G Direct Sequence Spread Spectrum radios. Features and benefits include:

- Operates in a temperature of -4 to +140F
- Single channel or frequency hopping
- RS232 COM Port interfacing or USB
- Vehicle unit with 12v cigarette lighter adapter
- Rapid data collection.
- FCC License exempt. Operates within 902-928 MHz ISM band
- No interrogation signal necessary.
- Compatible with Panasonic laptop PC's

**Panasonic Model 52 ToughBook Computer (latest model)**

- Please see attached literature.

**Jett-ce Hand Held Computer**

- Please see attached literature

**MasterLINK Data Collection System Route Management Software**

Greentree Applied Systems is a wholly owned subsidiary of Master Meter and provides the computer interface, training and support for all data collection and route management software to complete the proposed system. Greentree is based in Lexington, Kentucky and is a leading provider of route management and utility billing software.

Features and benefits include:

- Import and export of route files in a format compatible with your current billing software
- Allows Multiple routes to be loaded on laptop or handheld at one time
- Displays incoming readings while constantly updating a display of unread meters
- Laptop version includes "Moving Maps" and GPS receiver
- Includes desktop route management software
- Routes can be moved between desktop PC by diskette or by direct network connection or USB data storage device or through handheld communication cradle
- Supports the EMMR receiver and processes all meter readings within radio range
- Includes CheckIT for DIALOG 3G, a signal strength and signal optimization program to aid installation
- Reports preview to screen and include Route Detail, Orphan Meters, Unread and Exception Report

# Technical Support, Warranty & Service

## Warranty

### Master Meter Products:

Master Meter Water Meters	(Note: See Attached Utility Products Warranty)
DIALOG 3G Transmitter	10-years with additional 10-year prorated warranty battery
E- MMR Transceiver	1-year (Note: See Attached DIALOG 3G-DS Component Warranty)

**Annual  
Maintenance  
After First Year**

## Warranty

### Other:

Panasonic ToughBook 52	3-years (Provided directly by Panasonic)	
Jett Hand Held Computer	1-year	
MasterLINK Data Collection System	1-year w/maintenance included	\$1,500.00

(THE LOWEST IN THE INDUSTRY )

### Maintenance Services

In the event questions or problems arise with the reading system, Greentree Applied Systems, Inc. is the primary support contact. Master Meter, Inc. and Construction Site Services are also available to provide assistance. In order to provide "One Stop Service", Greentree's support staff is available from 8:00 AM to 6:00 PM EST. After hours phone numbers are also available from 6:00 PM to 8:00 PM EST. Their support staff is fully trained to troubleshoot and provide complete assistance on all hardware and software. Greentree employs a staff of qualified people trained to support the hand-held and drive-by reading systems. Calls are answered by a receptionist, not a machine, and logged in a call database. Every effort is made to connect the customer with a tech support person at the time of the call.

### Service Contacts

Greentree Applied Systems Tech Support	Construction Site Services	Master Meter, Inc.
961 Beasley St., Suite 107	552 State Route 69 North	101 Regency Parkway
Lexington, KY 40509	Hartford, KY 42347	Mansfield, Texas 76063
Ph#: 800-928-6388	Ph# 270-298-4545	Ph# 800-765-6518
After Hours Ph # 859-421-5288	Fax# 270-298-4363	Fax# 817-842-8100
Fax: 859-263-9824	(Distributor)	(Manufacturer)

The vehicle reading system uses a Panasonic ToughBook computer, which includes overnight shipping and a 3-day turn around for repairs. Greentree offers unlimited, toll free phone support at no charge for the first year. Extended annual phone support agreements may be purchased for the cost stated above. This support includes free software updates (upon request) for users who remain under the phone support contract. If necessary, Greentree can route a technical support person to you within 14 days of notice for on-site assistance. The charge for this service or for additional training is \$875.00 per day plus expenses.



## **DIALOG™ 3G References**

### **City of Irvington, Kentucky**

Mr. Ricky Lucas  
270-547-3835  
600 (+) Units  
2007-08

### **City of Cloverport, Kentucky**

Mr. Chris Lucas  
270-788-6487  
485 Units  
2008

### **City of Harrodsburg, KY**

Ms. Debbie Norman  
859-748-5198  
3700 Units

2007-08 Change out of the entire city's system

### **City of Ledbetter**

Mr. Bill Downs  
270-898-3236  
Ledbetter, KY  
200 units  
2005

### **Gladeville Utility District**

Mr. Clifford Walker  
3826 Vesta Rd  
Lebanon, TN 37090  
615-449-0301

### **Spring Valley Utility Dept.**

French Lick, Indiana  
1800 units

### **Knox-Chapman Utility District**

Chapman, TN  
Gary Jones— Manager  
865-577-4497  
5000 units, Drive by & Radix  
Spring '03

**Bronston Water Association**

P.O. Box 243  
Bronston, Kentucky 42518  
Mr. J. C. New  
(Vicki or David)  
606-561-5209

**Town of St. John Municipality**

Bob Phararzyn  
St. John, Indiana  
219-365-4655

**We wish to show you the above references and stress how widely the water meter is accepted by giving you a diverse region of our area of the country. These DIALOG 3G above customers are considered large, medium, and small.**

**Terms & Implementation Schedule for Provision of AMR Equipment**

(Schedule based on date from Notice to Proceed)

**Terms:** Net 20 days.  
**Freight:** FOB Your water district location  
**Delivery:** Reading System: 45 to 60 days ARO.  
Water Meters and Transceivers: 3 to 4 weeks ARO or as negotiated to meet the utilities needs.  
**Prices Valid Until:** Reading Equipment– Water Meters and Transmitters:  
JANUARY 31, 2009.

**BUDGETARY PROPOSAL:**

**Unit Prices**

**3G Drive-by System**

As per attached quotation

**LATEST VERSION WILL BE 5200 ToughBook as of 01/2008**

MasterLINK Data Collection System provides Vehicle Meter reading  
With "Moving Maps" and desktop route management software.  
Panasonic ToughBook Model 52 features Intel Centrino Mobile  
Technology, Intel Pentium M Processors, Integrated 802.11b+g wireless,  
Combo drive (DVD-ROM/CD-RW), 15" Active Matrix Color LCD  
40GB (or larger) shock mounted removable hard drive,  
15" TFT Active Matrix Color Display, Integrated RJ-45 NIC  
RS-232 (DB9), USB Port and PCMCIA Slots, Internal Modem  
3 Year Warranty, 11.1v, 6600mAh Li-ion Battery Pack, Backup Battery

System includes Vehicle Power Supply, Carrying Case,  
Vehicle laptop computer stand, DIALOG 3G RF Transceiver with  
Cigarette DC Power Supply and Communication Cable,  
3G Technician programming software,  
2-day on-site installation & training, all travel expenses included in above,  
ASCII interface to existing utility billing software

<u>HandHeld Jett-ce --- See attachment</u>	w/radio capability	N/A
	Handheld unit only	N/A

One Additional Day of training is necessary if handheld is purchased with In conjunction with drive-by system quoted above.	N/A--	\$875.00
--	-------	----------

Optional: 8 Hour Follow-up Training Day (Should you desire, but usually not necessary)	\$1,675.00
--	------------

The optional training above is offered if you wish to have additional training above the included two-day training that automatically comes with the drive-by system or the handheld. Pricing is shown to let you know that if you feel it is necessary for additional training beyond what is included, then the prices are shown for you, or if you have a change of personnel and Greentree training is necessary, then this will let you know how to budget.



Quotation  
Page 2

**Mulit-Jet 5/8" x 3/4" Water Meters with Integrated 3G Transceivers**      Unit Price

Part #BL05-1MD-AAA-2      SEE QUOTATION ATTACHED  
5/8"x3/4" BLMJ Multi Jet Water Meter, US Gallons, Plastic Frost Proof Bottom, Stainless Steel Bolts, Plastic Top,  
Integrated 3G Transceivers (Antenna Under Glass)

Interpreter Connection-Free Retro-Fit Radio-Read Register, which can be retro-fitted to  
Badger, Sensus SR11, Precision (Sensus PMM), AMCO, Neptune, Hersey with the  
Master Meter patented body adapter ring      SEE QUOTATION ATTACHED

If, after demonstrating in the City of Campbellsville, Kentucky some of the flood-prone area meter pits are too flooded for  
the above to transmit, the Active Wireless Antenna (BlueTooth) booster unit is usually used when ... >8" of water is on top  
of the register. But, always consider raising the meter with a meter resetter (copper Ford resetting device) if at all possible  
just for better access to your meter.

Active Wireless Antenna (BlueTooth) Booster      (Available Spring 2009)

*KATHY WENHOWER*

Representatives (print/name)

*Kathy Wenhower*

Signature

**Bidder:**        ***CONSTRUCTION SITE SERVICES***

---

**Address:**     ***552 State Route 69, P. O. Box 83***

---

***HARTFORD, KY 42347***

---

**Phone#**        Paducah 270-443-1759    Hartford 270-298-4545

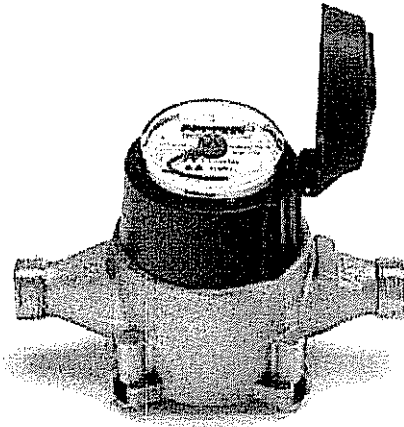
**Fax #**            Paducah 270-443-1789    Hartford 270-298-4363

**Date:**         ***August 14, 2008***

# All Master Meter AMR Dialog 3G Radio Product Submittals

# The Meter

Designed from scratch with 21st Century tools.



## Benefits & Features

- Meets or exceeds all AWWA Standards
- Second-generation Wireless RF Solution
- Ultra-low head loss at 6.5 PSI at 20 GPM
- Tested over 5 million gallons with new meter accuracy
- High durability; Quiet operation
- Improved capability to pass entrained solids

## DIALOG 3G-DS PD Water Meter

DIALOG 3G-DS PD is the first member of the Positive Displacement family of meters developed with 21st-century design tools like CFD and other software that allow design of accuracy, durability and quiet operation previously unattainable.

DIALOG 3G-DS takes wireless meter reading to a whole new level, with greater reading range and features proven Master Meter Technology that gives you the added edge in the pit, above ground and inside wet environments; huge-capacity, field programmable Data Logging capability of 4,000 reads; leak, tampering and backflow detection; no external wires or antennas; easy installation; and self activation with the first few gallons of flow.

## TECHNICAL SPECIFICATIONS

### AWWA Standard

Meets or exceeds all sections of Standard ANSI / AWWA C700, most recent revision for cold water displacement meters with bronze main cases.

### Design/Operation

Incoming water is continuously divided into crescent-shaped volumes by the action of the inlet ports, chamber interior and piston walls as controlled by the control roller assembly. This hydraulic action causes the center of the oscillating piston measuring element to make essentially continuous circular movements. A drive spindle formed integrally with the piston web moves the drive magnet. A follower magnet in the register assembly is directly connected to a gear system in the register that totalizes those movements into the desired billing units. The register assembly is removable under line pressure permitting upgrades in reading technology on this long life meter.

### Main Case

Choice of waterworks bronze case of 81% copper composition or a higher copper, unleaded bronze. All main cases incorporate externally threaded straight pipe threads to aid installation using industry standard tailpiece assemblies.

### Measuring Chamber

The measuring chamber housing and piston measuring element are constructed of smoothly-finished, water-lubricated engineering plastics. The removable chamber is sealed to the main case by a unique elastomeric chamber seal that resists the chances of back pressure seal blowouts and adverse effects on accuracy due to normal pipeline distortions.

Measuring chamber surfaces serving as bearing surfaces are generously dimensioned in water-lubricated polymers; these generous surfaces and unique mechanical control process allow more generous operating clearances but with outstanding low flow accuracy and long operating life. Key small wear components such as the division plate, control roller and drive dog are constructed from hydrolytically-stable, lubricated nylon minimizing localized wear.

### Magnetic Drive

A reliable, direct magnetic drive provides linkage between the measuring element and the register. No gearing is exposed to water.

### Register

Standard direct read, DIALOG® 2G, 3G, and 3G-DS AMR System registers are available. Six wheel odometers are standard.

### Register Sealing

Direct read and DIALOG registers are permanently sealed employing a scratch resistant glass lens, stainless steel cup base and a wrap-around elastomeric gasket to prevent intrusion of water, dirt or moisture.

### Register Units

Registration available in either U.S. gallons, cubic feet or cubic meters. Test Circle Large, center sweep hand with one hundred (100) clearly marked graduations on the outer periphery of the dial face.

*Low Flow/Leak Indicator* Center mounted indicator with high sensitivity resulting from direct one-to-one linkage to the measuring element.

### Data Logging

The DIALOG 3G Direct Sequence Spread Spectrum (DSSS) Wireless RF Radio has a large memory capacity for 7,000 individual reads that is programmable to meet any requirement. The default standard is to collect a read every 15 minutes for 72 days, 22 hours.

### Strainer

A rigid polymer strainer is provided with more than 4 times the open area of the pipe

*Frost Protection?*(option)In addition to standard bronze bottom plates, an optional bottom plate is available for frost protection made from reinforced engineering plastic

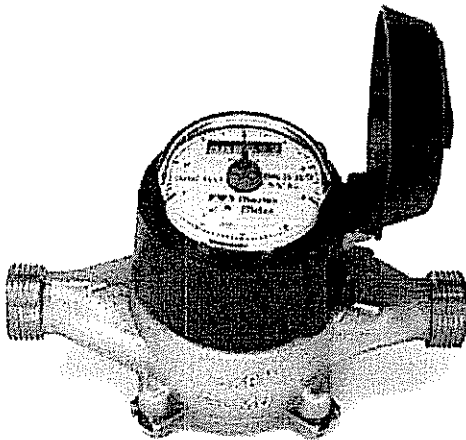
#### Tamper Detection

Register box screws are sealed as a tamper resistant feature and provide a visual indication of tampering attempts

=

## *The Dialog 3G Transmitter*

Our award-winning DIALOG 3G has changed the rules of the meter reading game.



#### Benefits & Features:

- Digital Encoder
- Superior moisture protection
- No external connections
- Detects tamper, leaks, backflow
- Easy Installation
- No Programming

#### DIALOG 3G -DS Wireless RF

*"Master Meter has quietly revolutionized the water segment of the AMR market with its third generation AMR product called Dialog 3G, a wireless system fully integrated into the register of the water meter. Utilities now have a welcome alternative mobile RF AMR system at very attractive prices that has been rated as excellent by the utilities" - Frost & Sullivan*

DIALOG 3G-DS is an innovative AMR solution offering several unique, patented advantages. The product features a wireless two way RF transceiver incorporated inside the meter register. The RF unit is enclosed within a permanently sealed register providing absolute protection against water intrusion and eliminating the need for external connections.

DIALOG 3G-DS is the solution for specific problems facing water utility and sub metering customers. A unique miniature transmitter/receiver utilizes the most recent technology to provide the meter reader with reliable, accurate readings as well as automatic detection of tampering, leaks, and backflow situations.

DIALOG 3G-DS is an absolute encoder by determining the actual position of the odometer wheels, so the electronic reading will always match the odometer reading.

Meters equipped with DIALOG 3G-DS are preprogrammed at the factory so they arrive ready for installation. Two way communication enables programming in the field, if desired.

*U.S. Patent No. 6,819,272. Others pending.*

#### TECHNICAL SPECIFICATIONS

##### Description

A two-way wireless radio that reads forward and backward flow of water through the meter. Provides leak and backflow detection.

##### Sealed Transmitter

RF Transceiver is integrated inside a permanently sealed register consisting of glass and stainless steel differentiating it from other AMR systems utilizing a plastic enclosure.

##### Battery Operated

Equipped with two 3.6 Volt Lithium-Thionyl Chloride batteries for long operational life (approx. 10 yrs.)

##### Frequencies

Operates within the licensed exempted ISM Band 902 - 928 MHz.

##### Environmental

Operating temperatures from 4° F to +140° F with an IP-68 water submersion rating.

##### Odometer Transmits

"Reads" position of all 6 odometer wheels and transmits "true meter reading"

**Easy Installation**

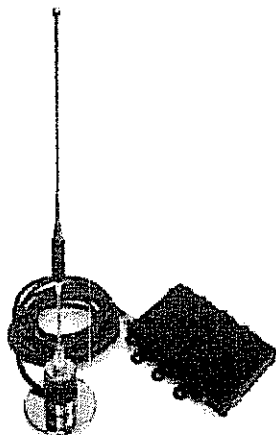
No external wires that can be cut or tampered

**FCC Regulatory Certification**

Certified to operate in the United States under FCC Part 15

## **The Dialog 3G-DS Transceiver**

### **The true two-way wireless, easy to install RF Transceiver.**



**Benefits & Features:**

- FCC Part 15 compliant
- ISM 902-928 MHZ Unlicensed (requires no license to operate)
- Single Channel and Frequency Hopping Receiver
- Vehicle unit with cigarette adapter
- Handheld unit comes with built in rechargeable batteries
- RS232 COM Port interface
- 3G Technician software

#### **DIALOG 3G E-MMR Transceiver**

DIALOG 3G represents an innovative approach to the time consuming and tedious process of gathering meter reads. The meter reading information is stored within the handheld or laptop computer for downloading to the utility billing system.

The DIALOG 3G E-MMR is an integrated component of the vehicle drive-by system and can also be configured as a handheld walk-by system for 3G meter installation and diagnostics. The transceiver that allows for receiving both single channel and frequency hopping transmissions and is designed for either vehicle power or battery operation.

#### **TECHNICAL SPECIFICATIONS**

**Description**

The DIALOG 3G E-MMR® is true two-way wireless RF Transceiver that is easily attached to most handhelds or PCs.

**Sealed Transmitter**

The DIALOG 3G RF Transceiver housed within an aluminum case designed to screen RF and minimize water intrusion.

**Size**

5" X 4" X 1" (height, width, depth)

**Battery Operated Or Vehicle Powered**

The DIALOG 3G E-MMR® is equipped with nickel metal hydride (NiMH) batteries for long recharge life. The vehicle system comes with its own cigarette lighter adapter.

**Frequencies**

Operates within the licensed exempted ISM Band 902 - 928 MHZ.

**Transmission**

Receives either single channel or frequency hopping transmissions.

**Data Format**

The DIALOG 3G E-MMR® receives fixed length, error checked (CRC and BCH), encoded data packets.

**Software**

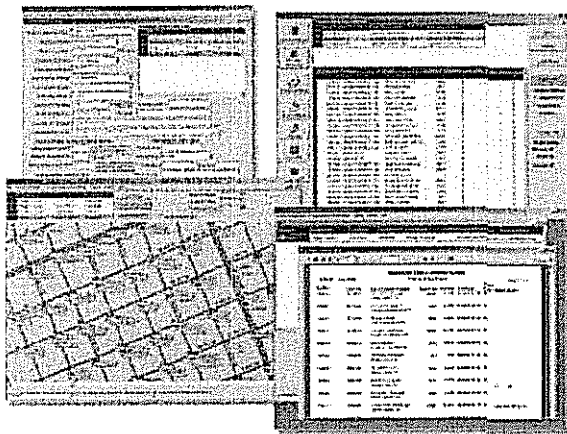
Software for diagnostics or troubleshooting 3G radios.

**FCC Regulatory Certification**

Certified to operate in the United States under FCC Part 15.

## The Software

Greentree helps you take the plunge into water system high technology.



Greentree Applied Systems and the DIALOG 3G-DS, a high-tech system that gives you real advantages:

- Reduced labor costs associated with meter reading
- Faster and more accurate billing cycles
- Leak, backflow and high-use detection
- Stopped or tampered meter alerts
- Free installation and training
- Free technical support

### DIALOG 3G-DS Wireless RF Software

Now one of the hottest high-tech products on the market—DIALOG 3G-DS from Master Meter—has the software solutions and system integration tools to make meter reading even more efficient and cost effective

Greentree Applied Systems, a subsidiary of Master Meter, produces custom programs to map and read 3G and 3G-DS meters using a standard laptop. Other Greentree products integrate the captured data to keep accurate and easy-to-access information that can be used for billing, billing/rate analysis, meter testing and more. Utilities can make use of Greentree's complete line of quality billing and accounting software or bridge to its existing system.

#### TECHNICAL SPECIFICATIONS

This portable AMR system is usually mounted in a truck and is used to capture individual meter radio transmissions for input into a billing system, either Greentree's system or virtually any billing system on the market. When used with the DIALOG 3G-DS, programming transmissions to the meter are also possible. It can simultaneously support RAMAR FastTrackIT and DIALOG 3G-DS transmissions. See red dots turn to green dots as readings are received.

The Greentree drive-by system provides three different choices for reading reception display:

- 1 Automatic scrolling text
- 2 Fixed maps, or
- 3 Maps that move with the vehicle position

The system is built around key components including the Panasonic ToughBook rugged notebook computer, Greentree software, Master Meter DIALOG 3G-DS receiver/transmitter, a full line of power sources, antennas and mobile mounting equipment completes the system. The JETT-CE or Radix FW300 handheld computer can replace the notebook computer in the drive-by system.

The drive-by system is designed to work with meters and billing systems from several different manufacturers. The utility provider is not locked into doing business with one source. This advanced "open architecture" system also enjoys a significant cost advantage compared to other closed, single vendor, systems on the market today.

The drive-by system reduces meter reading labor costs, improves customer service through fewer re-reads, provides greater meter reader safety, reduces read-to-bill time, and allows personnel to be assigned to other maintenance tasks.

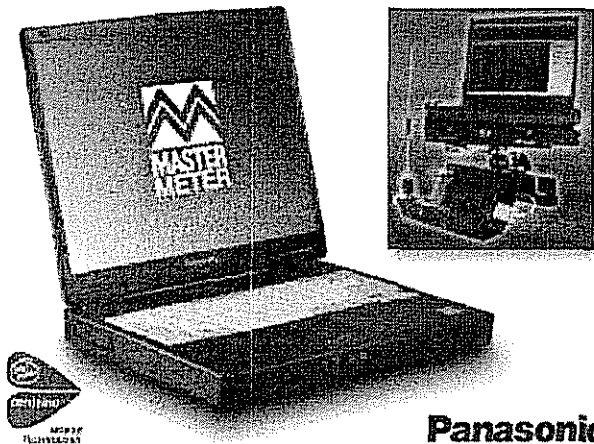
Our Bridge Builder software provides the link between the drive-by system and your current billing system. We use Bridge Builder to define the necessary import and export files. We also commit to integrating the drive-by system to both your billing and AMR reading system. Through our Route Master definition process you may merge or split routes which are defined in billing into different routes for use in the drive-by system.

Customer accounts are shown in a text listing or as points on a map depending on user preference. The yellow text list shows a list of problem reads such as high usage, etc. Several maintenance and error type reports are provided. Meter readings can be entered manually as well as being received through the AMR receiver. GIS coordinates can

be calculated from your service addresses. You do not need to spend many months gathering this data. Maps can display service addresses for an immediate definition of each customer point.

## The Drive by Computer

Full-featured, affordable, desktop alternative.



### Benefits & Features:

- Large 15" Display for Group Presentations
- Magnesium Alloy LCD Case
- Shock-mounted, Removable HDD
- Optional SmartCard Reader for Added Security
- Intel® Centrino™ Mobile Technology

### Panasonic ToughBook 51 Laptop PC

Full-featured desktop alternative, the ToughBook 51 has an Active Matrix Color display for group presentations, magnesium alloy LCD case, and optional SmartCard reader for added security. Durable and full-powered, it can handle your large programs and critical software applications with the reliability to help you get the job done right.

When sold with our system, each ToughBook laptop comes furnished with Gamber-Johnson Mobile Seat Pedestal.

### TECHNICAL SPECIFICATIONS

#### CPU

Intel® Pentium® M Processor 735.

- Processor speed 1.7GHz
- 2MB L2 cache
- 400MHz FSB Intel® Pentium® M Processor 725.
- Processor speed 1.6GHz
- 1MB L2 cache
- 400MHz FSB

#### STORAGE & MEMORY

With Intel® Pentium® M Processor 735.

- 512MB SDRAM standard, expandable to 1536MB; or 1GB SDRAM standard, expandable to 2 GB
- 60GB HDD (shock-mounted & easily removable) With Intel® Pentium® M Processor 725.
- 256MB SDRAM standard, expandable to 1280MB
- 40GB HDD (shock-mounted & easily removable)

#### DISPLAY

With Intel® Pentium® M Processor 735.

- 15" 1600 x 1200 (UXGA) TFT Active Matrix Color LCD
- ATI MOBILITY TMRADONTM9600, 64MB VRAM With Intel® Pentium® M Processor 725.
- 15" 1024 x 768 (XGA) TFT Active Matrix Color LCD
- ATI MOBILITY TMRADONTM9600, 64MB VRAM

#### AUDIO

- SigmaTel TMST9753A
- Integrated stereo speakers
- Convenient keyboard volume and mute controls

#### EXPANSION SLOTS

- PC Card Type II x 2 or Type III x 1

#### MULTIMEDIA POCKET

- 1.44MB FDD standard
- Combo Drive (DVD-ROM/CD-RW\*\*) standard



- Will accept optional DVD Multi Drive or second battery

#### KEYBOARD & INPUT

- 87-key with dedicated Windows® key
- Electrostatic touchpad with vertical scrolling support

#### WIRELESS LAN

- Intel PRO/Wireless 2200BG network connection 802.11b+g

#### INTERFACE

- External Keyboard/Mouse Mini-DIN 6 pin
- External Video D-sub 15 pin
- Headphones/Speaker Mini-jack Stereo
- IEEE 1394 (Firewire) 4 pin
- Microphone/Line In Mini-Jack
- Parallel D-sub 25 pin (bi-directional/ECP)
- Port Replicator Dedicated 100 pin
- Serial D-sub 9 pin (UART 16550 compatible)
- USB 2.0 (x2) 4 pin
- 10/100/1000 Ethernet RJ-45
- 56K Modem RJ-11

#### POWER SUPPLY

- Lithium Ion battery pack (11.1V, 6600mAh)
- Battery operation: 5 hours\*\*\*
- Battery charging time: approximately 3.8 hours/off, 6 hours/on\*\*\*
- AC Adapter: AC 100V-240V 50/60Hz, Auto Sensing/Switching worldwide power supply
- Pop-up on-screen battery status reporting

#### POWER MANAGEMENT

- Suspend/Resume Function, Hibernation, Standby, ACPI BIOS

#### SOFTWARE

- Microsoft® Windows® XP Professional
- Setup, Diagnostics, On-line Reference Manual, Adobe® Acrobat® Reader

#### SECURITY FEATURES

- Password Security, Supervisor, User, Hard-Disk Lock
- Kensington Lock Slot

#### WARRANTY

- 3-year limited warranty, parts & labor

#### DIMENSIONS & WEIGHT

- 11.9" (H) x 12.8" (W) x 1.0" (D)
- 6.7 lbs.

#### INTEGRATED OPTIONS\*\*\*\*

- SmartCard Reader

#### ACCESSORIES

- AC Adapter (3 pin) CF-AA1653M
- Battery Charger CF-VCBTB1U
- ComFolio Universal Carrying Case (large capacity, fits all Toughbooks) CF-COMUNIIV
- FieldMate Carrying Case CF-FM50
- FieldMate Carrying Case with User Harness CF-FM50HR
- Lithium Ion Battery Pack CF-VZSU27U
- 2nd Battery Pack CF-VZSU1473U
- Memory Cards
  - 256MB CF-WMBA40256F
  - 512MB CF-WMBA40512E
  - 1GB CF-WMBA401024B
- Mobile Data Wireless Display CF-VDW07HMS
- Mobile Data Wireless Display with Magnetic Stripe Reader and Fingerprint Scanner CF-VDW07RFHM
- Port Replicator CF-VEB511W

\*Decoder software is required for DVD movie play. (Included)

\*\*CD authoring software is required to write CD-R/RW (Included)

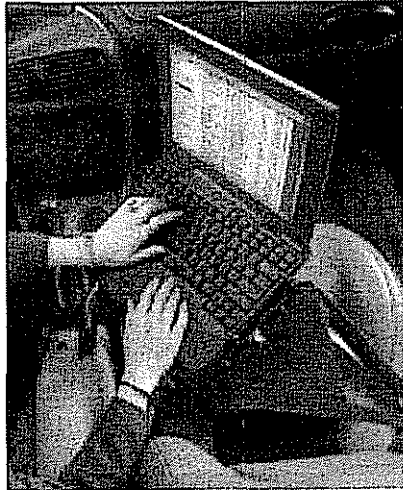
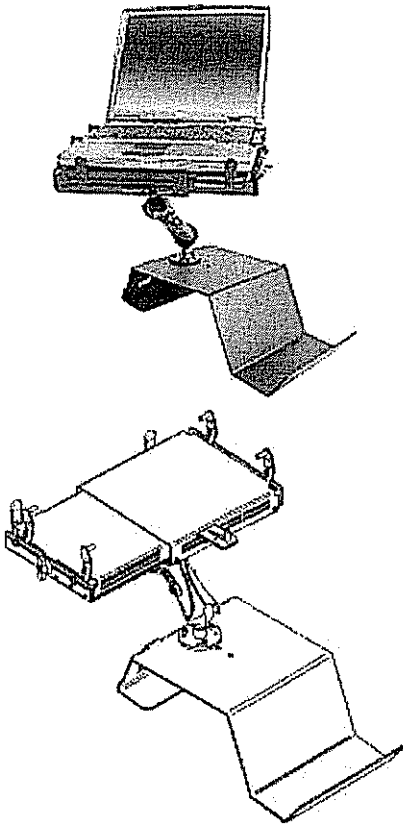
\*\*\*Battery performance features such as charge time and life span can vary according to the conditions under which the computer and battery are used. Battery operation and recharge times will vary based on many factors including screen brightness, applications, features, power management, battery conditioning and other customer preferences. Battery testing results from MobileMark 2002.

\*\*\*\*Integrated Options may vary depending on your notebook configuration.

Please consult your reseller or Panasonic representative before purchasing.

## NotePad™ IV Seat Mount Package

### NotePad™ IV Seat Mount Package



<b>Placement</b>	On passenger seat
<b>Drilling Required</b>	No
<b>Seat Configuration</b>	All
<b>Construction/Finish</b>	Seat mount - light-weight aluminum; NotePad™ IV - Steel/Black powdercoat
<b>Width adjustable</b>	Yes - adjusts to computer widths from 8 25" - 13 38"
<b>Thickness adjustable</b>	Yes - adjusts to computer thickness (measured with screen open) from 0 5" - 2 44"
<b>Depth adjustable</b>	Yes - adjusts to computer depths from 7" - 12 63"
<b>Holddown clips</b>	One-size-fits-all, curved hold-down clips
<b>Key lock</b>	Yes - Optional use - Keyed alike
<b>Rear support brackets</b>	Yes - easily adjusted to fit between ports
<b>Weight</b>	8 36 lbs
<b>Dimensions</b>	a = See <a href="#">NP-NOTEPAD4</a> b = See <a href="#">MO-1000</a>
<b>Misc.</b>	<ul style="list-style-type: none"> <li>- Uses safety belt to secure into passenger seat</li> <li>- Fits virtually any full-size notebook computer</li> <li>- New, curved hold-down clips: <ul style="list-style-type: none"> <li>--are "one-size-fits-all", work with most computers</li> <li>--feature easy height adjustment capability</li> <li>--are fastened on the interior do not hang below chassis</li> </ul> </li> <li>- Offset front retainer and rear support brackets for added forward/backward restraint</li> <li>- 90° wing turn closure latch: <ul style="list-style-type: none"> <li>--allows for fast initial size adjustment</li> <li>--allows for quick computer insertion and removal</li> <li>--has built-in key lock</li> </ul> </li> <li>- Can be used with <a href="#">power supply boxes</a>, <a href="#">USB hub</a> and/or other accessories to provide further capabilities in the field</li> </ul>

#### NOTES

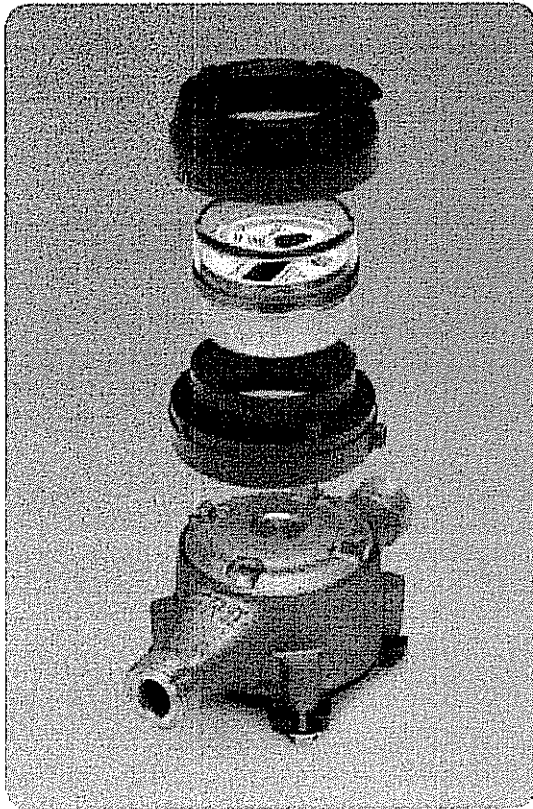
**IMPORTANT:** The NotePad™ IV holddown clips are primarily designed to securely hold the laptop in the mount. Along with the key lock, **the holddown clips also deter theft. Like all laptop mounts, they will not prevent theft.** Gamber-Johnson recommends taking your laptop out of the vehicle when not in use



# DIALOG INTERPRETER™ Register

## DIALOG Wireless RF AMR Retrofit Upgrade

Upgrade our competition's meter in a matter of moments with the AMR DIALOG INTERPRETER™.



Adapter Rings to fit a variety of competitive meters

Master Meter has invented a revolutionary AMR meter register that lets you upgrade many brands of water meters. So if the meter you have is still perfectly good, upgrade to Wireless RF by just replacing the register with the DIALOG INTERPRETER.

**The DIALOG INTERPRETER is designed to be a register that fits on competitors' water meters.**

**The INTERPRETER comes in 4 types:**

**DIALOG 3G-DS for drive by applications**

- With a digital LCD display
- With a mechanical odometer

**DIALOG 2G for read pad applications**

- With a digital LCD display
- With a mechanical odometer

**Advanced metering technology:**

**Programmable gear ratio** – enables assembling the unit on almost any current water meter.

**Total reliability** – absolute match between the transmitted data and the displayed one.

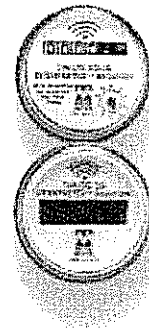
**The internal electronics:**

- Driven via 2 AA batteries
- Infra red LED transmitter and diodes
- 6-digit LCD or 6-digit mechanical odometer

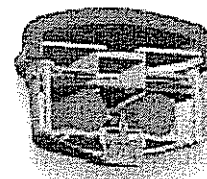
The structure of the INTERPRETER enables it to be programmed to any competitor's gear ratio. Compatible brands include: **Sensus, Neptune, Badger, AMICO, and Hersey.**

Adapter rings exist for competitive meters with tamper proof connection. Register and bonnet connect to the adapter ring.

The DIALOG INTERPRETER combines with the new Master Meter Positive Displacement meter and Multi-Jet family of DIALOG products, offering a dynamic new DIALOG 3G-DS Wireless RF Drive-By System.



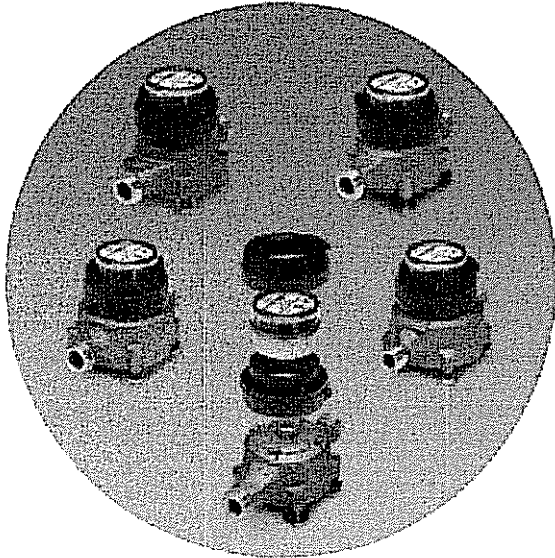
Analog and Digital Registers



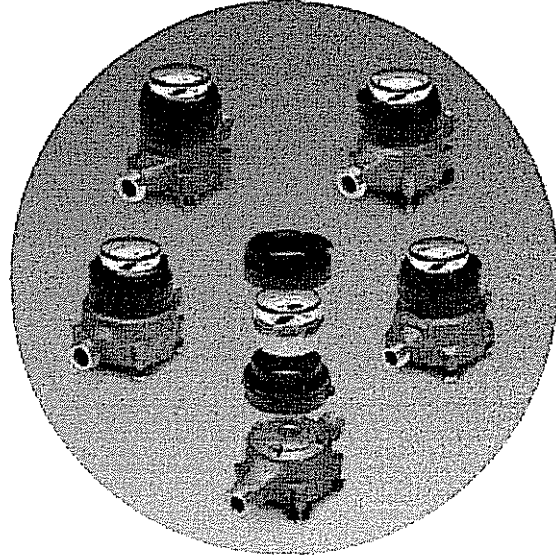
Internal Electronics

# DIALOG INTERPRETER™ Register

DIALOG Wireless RF AMR Retrofit Upgrade



Competitive Meters with  
INTERPRETER Analog Registers



Competitive Meters with  
INTERPRETER Digital Registers

*The DIALOG INTERPRETER is currently compatible with most meters of the following water meter brands:*

Sensus  
Neptune  
Badger  
AMCO  
Hersey

Distributed by:

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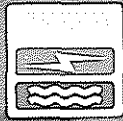
DIALOG INTERPRETER Rev 10/12/05



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Toll Free: 800-765-6518 • Main Line: 817-842-8000 • FAX: 817-842-8100

www.mastermeter.com  
info@mastermeter.com

**PRODUCT FAMILY OVERVIEW**



**CONSTRUCTION SITE SERVICES**  
P.O. BOX 83  
HARTFORD, KY 42347  
PH: (270) 298-4545  
FAX: (270) 298-4363



*Reading the Future™*

# WE'VE GOT EVERYBODY TALKING

Meter • Read • Manage • Act

Behold the latest measure of success for utilities - Master Meter's proven DIALOG 3G® ConnectionFree™ AMR Technology. Our completely integrated system brings uncompromising performance at every level—from the meter and register to our mobile read system and utility management software suite.

We are bringing utilities into the future, unburdened by the past. We refuse to accept convention, so you can trust that we rethink everything. We're not on a quest to reinvent the wheel. Innovation for the sake of innovation doesn't get the job done. Our secret—applying

innovation where it's needed most. We get our marching orders from the industry and hit back with solutions head on.

When maintenance concerns slowed the adaptation of AMR we hit back—eliminating the #1 maintenance related issue: external wires. We were the first to incorporate all vital AMR components—battery, antenna, encoder register, and transmitter—safely under the register glass. The industry started talking.

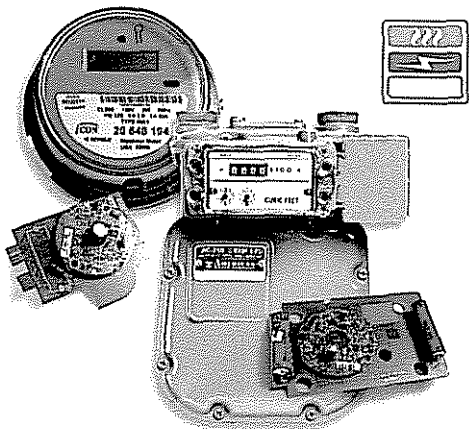
When legacy meters and existing hardware investments limited utilities' choices in AMR we hit back. Our Universal 3G Interpreter™



## INTERPRETER™ & 3G UNIVERSAL XTR™

Meet the universal voice of reason. The Interpreter and 3G Universal XTR bring 3G performance to most any brand meter in virtually any installation. Interpreter is a universal 3G register that replaces a utility's existing meter registers without sacrificing the meter. It's perfect for utilities with newer meters that seek 3G technology. Universal XTR takes advantage of already-installed electronic, absolute encoder and pulse output registers, but replaces their problem-plagued AMR systems with 3G reliability.

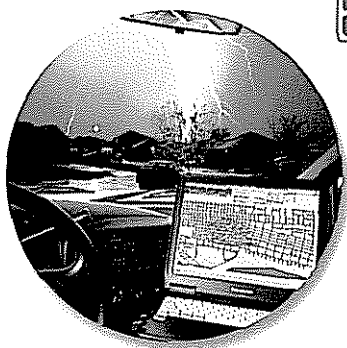
- Utilize existing infrastructure
- Hassle-free upgrade, Worry-free maintenance
- Install in minutes without service interruption
- Compatible with virtually any existing meter
- Assured compatibility with future Master Meter AMR Technology



## MULTI-UTILITY AMR

3G AMR has expanded beyond the water industry to include gas and electric solutions! Our 3G Universal Gas Register retrofits most every gas meter used in the United States today. And 3G is now fully integrated inside the Sensus® iCon™ residential electric meter, with more brands on the way, including polyphase.

- 3G integrated in Sensus iCon™ electric meters
- Clean retrofit for most existing gas meters
- Award-winning suite of Revenue Impact Alerts™
- Data management solutions across water, gas and electric platforms



## MOBILE & FIXED NETWORK

Our completely integrated 3G ConnectionFree AMR solution offers broad compatibility and reliable, hassle-free performance. So whether you drive by to collect meter data or migrate to an effortless fixed network, you get renowned 3G performance with universal applicability and assured migration. Innovative engineering has delivered the optimal balance of system performance, battery life and functionality, providing lifetime operational cost savings. Fixed network available in first quarter of 2008.

- Award-winning design
- No external wires
- Low-maintenance, High-performance
- Broad compatibility
- MasterLink™ Utility Management Software

1970	1980	1991	1997	2001	2002
Texas Company Formed As Aqua Utilities	Name Changed To Master Meter	DIALOG® Encoder Developed For On-Site & Telephone AMR	MasterLink™, T-LINK™, LAN-LINK™ & Fixed Network RF-LINK™ Introduced To Submeter Market	Greentree Applied Systems™ Acquired For Integrated Utility Software Solution Offering	Dialog 3G® Register with 100% Integral AMR Solution is Born

# BOTTOM LOAD MULTI-JET METERS

5/8," 3/4," 1"



## TOUGH, DEPENDABLE AND EXTREMELY CAPABLE

Master Meter Bottom Load Multi-Jets get the job done. Featuring the latest in measurement technology, they bring sustained accuracy with tough performance that stands up to particulates that would choke other meters. These bold meters have sensitive measurement capabilities that account for every drop of potential revenue — reading flow as low as 1/8 gallon per minute. Nothing sneaks by our meters. If you demand tough-as-nails performance, with a keen eye on your bottom line, you can count on Master Meter Bottom Load Multi-Jets.

## LIVE LONG WITH A BRIGHT FUTURE

The Bottom Load Multi-Jet is an updated smart design to the classic "top load" multi-jet meter. These meters are designed with the future in mind for use in mobile and fixed network AMR/AMI data management systems. Choose an optional DIALOG 3G<sup>®</sup> Integrated AMR Register and put our ConnectionFree™ AMR Technology to work for you. 3G delivers powerful results with 4,000 read data logging and vigilant Revenue Impact Alerts™ monitoring for leaks, theft (backflow), tamper, and zero consumption. Our award-winning register design houses all vital components — encoder, RF transmitter, battery and antenna — safely within the register's sealed stainless steel and tempered glass enclosure. We eliminated external wires, components and connections—the #1 cause of warranty related issues on competitive designs.

## FEATURES:

- \* Rugged Basket Strainer Built From Advanced Polymer Materials for Superior Wear Mitigation
- \* Proprietary Design Produces Smooth, Laminar Flow Profile for Improved Accuracy
- \* Accuracy Meets or exceeds the AWWA C-708 Standard. Optional NSF Certification Available.
- \* Optional 3G Integrated Register Delivers:
  - Revenue Impact Alerts - Leak, Tamper, Theft (backflow), and Zero Consumption
  - Rich 4,000 Read Data Logging Capabilities
  - Deploy District Management Areas/Zones (DMA/DMZ) Advanced Infrastructure Leak Management Programs

## SIZES AVAILABLE: 5/8," 3/4," 1"

## REGISTER OPTIONS:

- \* DIALOG 3G Integrated AMR Register
- \* DIALOG 3G LCD Interpreter™
- \* DIALOG 2G<sup>®</sup> Pit
- \* DIALOG 2G Indoor
- \* Direct Read

## READ:

- \* Direct Read/Manual
- \* Proximity/Touch - 2G
- \* Mobile Drive-By AMR - 3G
- \* Fixed Network AMI Solution - 3G (FN migratable using existing Mobile AMR infrastructure)

Tough | Sustained Accuracy | Dependable | AMR/AMI Migratable with 3G



Reading the Future™

## TECHNICAL SPECIFICATIONS:

AWWA Standard - Meets or exceeds all sections of AWWA Standard C-708, most recent revision;

NSF/ANSI Standard 61 - Optional Standard 61 certified no-lead main case available

Register Sealing - Direct read and DIALOG® registers are permanently sealed with a scratch resistant glass lens, stainless steel base and wrap-around gasket to prevent intrusion of dirt or moisture

Design/Operation - Velocity-type flow measurement. Water that is evenly distributed by multiple converging inlet ports flows past an impeller in the measuring chamber, creating an impeller velocity directly proportional to water flow rate. The meter's register integrates that velocity into totalized flow. An inherent advantage for this design is unparalleled wear mitigation leading to sustained revenues. The register assembly is removable under line pressure permitting seamless, simplified upgrades in reading technology

Register Unit - Registration available in U S gallons, cubic feet or cubic meters

Test Circle - Large center sweep hand with one hundred (100) clearly marked gradations on the periphery of the dial face

Low Flow/Leak Indicator - Center mounted indicator with high sensitivity resulting from direct one to one linkage to measuring element

Main Case - Choice of waterworks bronze case of 81% copper composition, or, 87% copper, no lead bronze. All main cases incorporate externally threaded ends to aid installation

Measuring Chamber - The measuring chamber housing and measurement element are built with an advanced synthetic polymer. This tough, non-hydrolyzing material ensures durable wear. The chamber design optimizes water flow, eliminating harsh turbulence for smooth, easy operation that minimizes bearing wear

Measurement surfaces are not wear surfaces, providing sustained accuracy despite the presence of entrained solids in the water. A long-life, synthetic sapphire bearing serves as a wear surface. The chamber housing is constructed in two parts to allow access to the impeller

Strainer - A rugged, 360-degree advance polymer basket strainer protects the critical measuring element from damage. The unique strainer design smoothes the flow of water entering into the meter creating a laminar flow that is gentle on the meter's internal components. Tough materials operating in a smooth, balanced environment enable the meters to perform more accurately over

time. Utilities' investments last longer while capturing more revenue

Optional Bottom Plates - Bronze, Cast Iron (CI), or Engineered Plastic

Magnetic Drive - A reliable, direct magnetic drive provides linkage between measurement element and register. No intermediate gearing is required; no gearing is exposed to water.

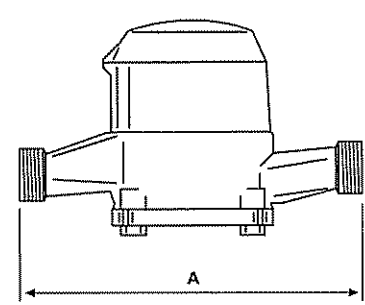
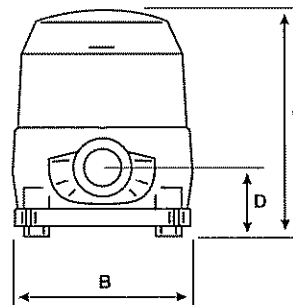
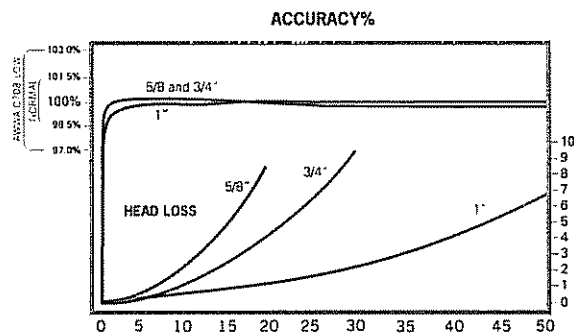
Adjusting Port - Sealed after factory calibration. Port is accessible for utility recalibration to compensate for inaccuracy in older meters without parts replacement

Register - Standard Direct Read, DIALOG 2G and DIALOG 3G AMR System registers are available. Six wheel odometers are standard. Together, an integrated and migratable technology environment is attained; direct, proximity (touch), mobile AMR, and Fixed Network AMI

Tamper Detection - The Master Meter Multi-jet adjusting port and register are concealed to prevent tampering and removal of the register. This design also provides a visual indication of tampering attempts

METER OPERATING CHARACTERISTIC/DIMENSION	5/8"	3/4" x 7/16"	3/4" x 9"	3/4" x 9" x 1"	1"
Flow Rating (gpm)	20	30	30	30	50
Continuous Flow (gpm)	15	20	20	20	30
Normal Flow Range (gpm)	1-20	2-30	2-30	2-30	3-50
Low Flow (gpm)	1/4	1/2	1/2	1/2	3/4
Maximum Working Pressure (psi)	150	150	150	150	150
Maximum Working Temperature (F)	120	120	120	120	120
Length (A below)	7-1/2"	7-1/2"	9"	9"	10-3/4"
Width (B below)	3-5/8"	3-5/8"	3-5/8"	3-5/8"	4"
Height, standard register with lid (C below)	5"	5"	5"	5"	5-1/4"
Height, bottom to center line (D below)	1-1/2"	1-1/2"	1-1/2"	1-1/2"	1-3/4"
Weight (lbs)	3.95	4.0	4.1	4.6	5.25
Packed To Carton	6	6	6	4	4
Carton Weight (lbs)	25.1	25.4	26	19.8	22.4

## ACCURACY AND HEAD LOSS CHART



### Master Meter, Inc.

101 Regency Parkway, Mansfield, TX 76063

Toll Free: 800-765-6518 • Main Line: 817-842-8000 • FAX: 817-842-8100

www.mastermeter.com

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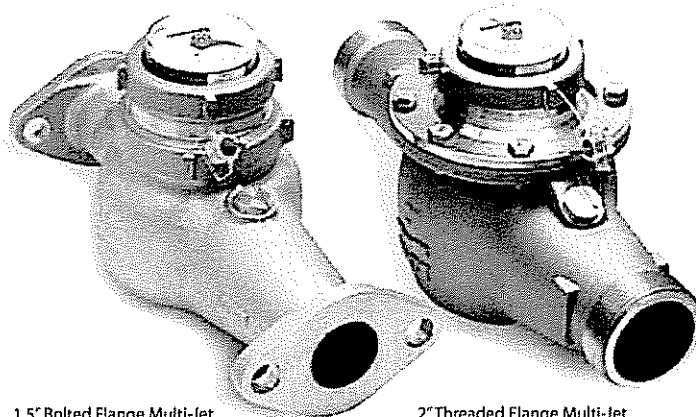


Reading the Future™



# INTERMEDIATE MULTI-JET

1-1/2" AND 2"



1.5" Bolted Flange Multi-Jet

2" Threaded Flange Multi-Jet

## SMALL COMMERCIAL MEANS BIG BUSINESS

Maximize your revenue stream across a wide range of small commercial applications with our Intermediate Multi-jets. Capture accurate low flow readings where turbine meters fall short, with an easy to install meter that is tough enough to handle higher flows like a small turbine.

Choose a bolted oval flange or threaded design to meet your install needs and enjoy lifelong performance from a meter built to last while adapting to the future. Our unique, modular register design allows for hassle-free upgrades in new reading technologies. You can swap the brains of these meters long before their bodies need replacement. Smart design enables smart technology.

## INFORMED BUSINESS DECISIONS — GOOD FOR YOU AND YOUR CUSTOMERS.

Choose the optional DIALOG 3G™ Integrated AMR Register and put our ConnectionFree™ AMR Technology to work for you and your business customers. 3G delivers powerful results with 4,000 read data logging that can define consumption profiles, pinpoint peaks and valleys in water usage and, when shared with your customers, can help them make informed decisions on water use that can impact conservation initiatives, and reduce customer billing complaints. In turn, 3G looks out for your utility's bottom line with vigilant Revenue Impact Alerts™ monitoring for leaks, theft (*backflow*), tamper, and zero consumption. Our award-winning register design houses all vital components — encoder, RF transmitter, battery and antenna — safely within the register's sealed stainless steel and tempered glass enclosure. We eliminated external wires, components and connections — the #1 cause of maintenance related issues on competitive designs. Master Meter Intermediate Multi-jet meters are designed with the future in mind for use in mobile and fixed network AMR/AMI data management systems.

## FEATURES & BENEFITS:

- \* High Accuracy on Low Flow (1.5 GPM on 1-1/2" MJ)
- \* Modular Register Design Allows for Easy Upgrades to Future Read Technologies
- \* Meets All Applicable AWWA Standards; Optional NSF Certification
- \* Tamper Detection and Prevention
- \* Precision Engineered Flow Components For Smooth Operation and Sustained Accuracy Under Tough Conditions
- \* With Optional 3G Integrated Register:
  - + Better Serve Business Customers Who Demand Accountability with Rich 4,000 Read Data Logging Capabilities (scalable / customer defined resolution)
  - + Protect Your Utility's Bottom Line:
    - Revenue Impact Alerts - Leak, Tamper, Theft (*backflow*) and Zero Consumption
    - Deploy District Metering Areas or Zones (DMA/DMZ) Advanced Infrastructure Leak Management Programs

## REGISTER OPTIONS:

- \* DIALOG 3G Integrated AMR Register
- \* DIALOG 3G LCD Interpreter™
- \* DIALOG 2G™ Pit
- \* DIALOG 2G Indoor
- \* Electrical Output Register
- \* Direct Read

## READ:

- \* Direct Read/Manual
- \* Proximity/Wand Read - 2G
- \* Mobile Drive-By AMR - 3G
- \* Fixed Network AMI Solution - Utilizes the 3G technology backbone with simultaneous Mobile AMR and Fixed Network AMI data collection capabilities

SIZES AVAILABLE:  
1.5" & 2"

Compact Size | Enhanced Low Flow Sensitivity | Easily Upgradeable | AMR/AMI Migratable with 3G



Reading the Future™

## TECHNICAL SPECIFICATIONS:

AWWA Standard - Meets or exceeds all sections of Standard ANSI / AWWA C708, most recent revision for cold water multi-jet meters with AWWA bronze main cases

NSF/ANSI Standard 61 -Optional EnviroBrass unleaded main case available

**Design/Operation - Velocity - type flow measurement.** Water that is evenly distributed by multiple converging inlet ports flows past an impeller in the measuring chamber, creating an impeller velocity directly proportional to water flow rate. The meter's register integrates that velocity into totalized flow. An inherent advantage for this design is exceptionally low head loss for improved infrastructure efficiencies and unparalleled wear mitigation. The register assembly is removable under line pressure permitting seamless, simplified upgrades in reading technology.

**Main Case - Choice of waterworks bronze case of 81% copper composition or EnviroBrass® II, 86% copper, unleaded bronze.** Main case incorporates either compact externally threaded ends or bolted flanged connections.

**Measuring Chamber - The measuring chamber housing and measurement element are built with an advanced synthetic polymer.** This tough, non-hydrolyzing material ensures durable wear. The chamber design optimizes water flow, eliminating harsh turbulence for smooth, easy, operation that minimizes bearing wear.

**Measurement surfaces are not wear surfaces, providing sustained accuracy despite the presence of entrained solids in the water.** A long-life, synthetic sapphire bearing serves as a wear surface. The chamber housing is constructed in two parts to allow access to the impeller.

**Magnetic Drive - A reliable, direct magnetic drive provides linkage between measurement element and register.** No intermediate gearing is required; no gearing is exposed to water.

**Register - Standard Direct Read, DIALOG 2G and DIALOG 3G AMR System registers are available.** Six wheel odometers are standard. Together, an integrated and migratable

technology environment is attained; direct, proximity (wand), mobile AMR, and Fixed Network AMI.

**Register Sealing - All Direct read and DIALOG® registers are IP-68 rated,** permanently sealed with a scratch resistant glass lens, stainless steel base and wrap-around gasket to prevent intrusion of dirt or moisture.

**Register Units - Registration available in either U.S. gallons, cubic feet or cubic meters.**

**Test Circle - Large center sweep hand with one hundred (100) clearly marked gradations on the periphery of the dial face.**

**Magnetic Drive - A reliable, direct magnetic drive provides linkage between measuring element and register so that no gearing is exposed to water.**

**Test Circle - Large center sweep hand with one hundred (100) clearly marked gradations near the periphery of the dial face.**

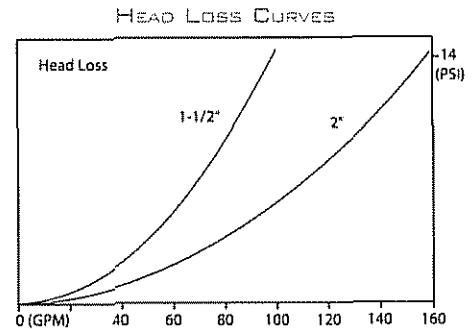
**Low Flow/Leak Indicator - Clearly visible leak indicator with high sensitivity resulting from direct one-to-one linkage to the measuring element.**

**Strainer - A rugged, 360-degree polymer basket strainer protects the critical measuring element from damage.**

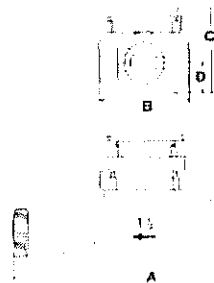
**Adjusting Port Detection - The Master Meter Multi-jet adjusting port is sealed after factory calibration to prevent tampering and provides a visual indication of tampering attempts.** Port is accessible for utility recalibration to compensate for inaccuracy in older meters without parts replacement.

## MULTI-JET WATER METER (1-1/2" AND 2")

METER OPERATING CHARACTERISTIC / DIMENSION	1-1/2" Threaded	1-1/2" Flanged	2" Threaded	2" Flanged
Flow Rating (gpm)	100	100	160	160
Continuous Flow (gpm)	75	75	120	120
Normal Flow Range (gpm)	5-100	5-100	8-160	8-160
Low Flow (gpm)	1-1/2	1-1/2	2	2
Maximum Working Pressure (psi)	150	150	150	150
Maximum Working Temperature (°F)	110	110	110	110
Length (A below)	12-5/8"	13"	15-1/4"	17"
Width (B below)	5-3/8"	5-3/8"	5-3/4"	5-3/4"
Height, standard register with lid (C below)	6-3/4"	6-3/4"	7-5/8"	7-5/8"
Height with DIALOG register	7-1/2"	7-1/2"	8-3/8"	8-3/8"
Height, bottom to center line (D below)	1-3/4"	1-3/4"	2-3/4"	2-3/4"
Meter Casing Spuds, Nominal Threadsize* (E below)	2"	N/A	2-1/2"	N/A
Weight (lbs)	11	12	20	24
Packed to Carton	1	1	1	1
Carton Weight (lbs)	12	14	22	26



1-1/2" Threaded-End Multi-Jet



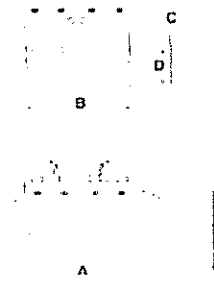
1-1/2" Flanged-End Multi-Jet



2" Threaded-End Multi-Jet



2" Flanged-End Multi-Jet



### Master Meter, Inc.

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www.mastermeter.com

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Reading the Future™

# 5/8" - 2" Master Meter MMMJ

Accuracy Guarantee & Product Warranty

## Multi-jet Water Meter Products

### Scope of Warranty

This warranty applies exclusively to Master Meter Multi-jet (MMMJ) 5/8", 3/4", 1", 1.5" and 2" meters purchased on or after January 1, 2006 when used for cold potable water (120° F) and installed in accordance with Master Meter published installation instructions in effect as of the Master Meter shipment date of the original product. This warranty applies exclusively to the original utility purchaser when product is purchased from either Master Meter or an authorized Master Meter distributor. Coverage in both terms of time and registered usage is from date of shipment by Master Meter.

### Materials and Workmanship

If used and installed as described above, Master Meter warrants all MMMJ (5/8", 3/4", 1", 1.5", and 2") to be free from defects in material and workmanship for a period of 2 years (24 months) from date of shipment.

### Case Integrity

If used and installed as described above, Master Meter, Inc. warrants that the standard and/or low lead bronze cases of the 5/8", 3/4", 1", 1.5", and 2" MMMJ Meters will retain their structural integrity for a period of 25 years from the date of Master Meter shipment.

### Claims

Any meter or register covered by this warranty that fails to meet the terms of the stated warranty will be repaired or replaced, at the option of Master Meter, Inc. The customer is responsible for removing the meter and/or register from service, returning it to the factory service center designated by Master Meter, Inc., providing all required paperwork per the Return Material Authorization at the time of the returned product and for freight costs to the service center. The customer is also responsible for reinstalling repaired or replaced product.

*Master Meter's MMMJ & BLMJ Multi-jets meet or exceed AWWA's most recent revision of C708 Standards for Accuracy.*

	5/8" x 3/4"	3/4"	1"	1.5"	2"
<b>Extended LOW FLOW Accuracy</b>	97% @ ¼ GPM 5 Years or 750,000 USG	97% @ ½ GPM 5 Years or 750,000 USG	97% @ ¾ GPM 5 Years or 1,100,000 USG	97% @ 1.5 GPM 5 Years or 1,440,000 USG	97% @ 2 GPM 5 Years or 1,890,000 USG
<b>NEW Meter Accuracy</b>	5 Years or 750,000 USG	5 Years or 750,000 USG	5 Years or 1,100,000 USG	5 Years or 1,600,000 USG	5 Years or 2,100,000 USG
<b>REPAIRED Meter Accuracy</b>	15 Years or 2,500,000 USG	15 Years or 2,500,000 USG	15 Years or 3,250,000 USG	15 Years or 5,600,000 USG	15 Years or 10,400,000 USG

NEW – 5 years      REPAIRED – 15 years  
= 20 Year Total Accuracy Guarantee



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[www.mastermeter.com](http://www.mastermeter.com)

# 5/8" - 2" Master Meter MMMJ

*Accuracy Guarantee & Product Warranty*

## Multi-jet Water Meter Products

### Limits of Liability

This warranty does not apply to meters or registers damaged by aggressive water conditions, foreign matter in water, vandalism, negligence, installation not in accordance with Master Meter, Inc. installation instructions, misapplication or other use not as described on this document, acts of God or other conditions beyond the control of Master Meter, Inc. This warranty is null and void if a meter is altered by the addition of any register not manufactured by or on behalf of Master Meter, Inc. for its specific model and size. If a meter is claimed to breach the accuracy guarantees as stated herein, the customer shall submit a certified copy of the test results at the time the meter is returned to Master Meter, Inc. The accuracy warranty shall be void if an examination of the customer's water system shows an unusually adverse effect on metering equipment.

Any description of product, whether in writing or made orally by Master Meter, Inc or its agents, specifications, samples, literature, models, bulletins, drawings, diagrams, data sheets or similar materials used in connection with any customer's order are for the sole purpose of identifying product and shall not be construed as an express or implied warranty. Any suggestions by Master Meter, Inc. or its agents regarding use, application or suitability of product shall not be construed as an express or implied warranty unless confirmed to be such in writing by Master Meter, Inc.

The laws of the State of Texas, excluding its conflicts of law rules shall exclusively govern this warranty. If any provision hereof, partly or completely, shall be held invalid or unenforceable, such invalidity or unenforceability shall not affect any other provision or portion hereof and these terms shall be construed as if such invalid or unenforceable provision or portion thereof had never existed.

**THE FOREGOING EXPRESS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES OR GUARANTEES WHATSOEVER, WHETHER EXPRESSED OR IMPLIED (EXCEPT FOR WARRANTY OF TITLE) INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**

**CUSTOMER'S EXCLUSIVE REMEDY AND MASTER METER, INC. AND ITS BUSINESS PARTNERS' SOLE LIABILITY ON ANY CLAIM, WHETHER IN BIAS (INCLUDING STRICT LIABILITY), NEGLIGENCE, CONTRACT, WARRANTY OR OTHERWISE, FOR ANY METER OR REGISTER WHICH FAILS TO MEET THE TERMS OF THE WARRANTY STATED IN THIS DOCUMENT, SHALL BE LIMITED TO REPAIR OR REPLACEMENT AS DESCRIBED ABOVE. IN NO EVENT SHALL MASTER METER, INC. AND/OR ITS BUSINESS PARTNERS BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND, INCLUDING BUT NOT LIMITED TO LOSS OF PROFITS OR REVENUE, LOSS OF USE, COST OF CAPITAL, COST OF SUBSTITUTE EQUIPMENT, FACILITIES OR SERVICE, DOWNTIME COSTS, DELAYS AND CLAIMS OF CUSTOMERS FOR THE CUSTOMER OR OTHER THIRD PARTIES.**



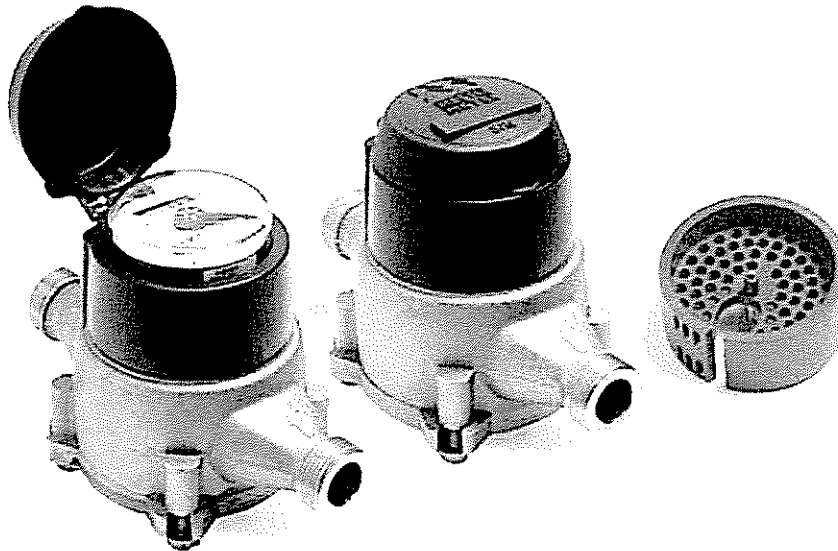
*Reading the Future*

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Page 2

# POSITIVE DISPLACEMENT METERS

5/8"- 1"



## POSITIVE REINFORCEMENT FOR YOUR FRONTLINE METER RANKS

Master Meter's Positive Displacement Meter is leading the PD charge into the 21st century. Utilities preferring PD meters can now choose our advanced meter technology with 3G performance previously available only with Master Meter Multi-Jets. The basic PD meter has served on the frontlines for water utilities, virtually unchanged, for the past century. We salute its legacy, but our engineers felt this decades old design could use some improvement. Our latest PD meters are an engineer's dream — completely redesigned using the same Computational Fluid Dynamics (CFD) type software used by NASA to build advanced aerospace equipment. These meters feature optimized flow dynamics for quiet, precise operation and unmatched sustained accuracy. Whether you are replacing old meters or addressing growth, choose the latest in meter technology and put Master Meter Positive Displacement meters to work on your frontline.

## TECHNOLOGY FOR ADVANCING YOUR UTILITY

Master Meter Positive Displacement meters are designed with the future in mind for use in mobile and fixed network AMR/AMI data management systems. Choose the optional DIALOG 3G<sup>®</sup> Integrated AMR Register and put our ConnectionFree™ AMR Technology to work for you. 3G delivers powerful results with 4,000 read data logging and vigilant Revenue Impact Alerts™ monitoring for leaks, theft (backflow), tamper, and zero consumption. Our award-winning register design houses all vital components — encoder, RF transmitter, battery and antenna — safely within the register's sealed stainless steel and tempered glass enclosure. We eliminated external wires, components and connections — the #1 cause of warranty related issues on competitive designs.

## FEATURES:

- \* Oscillating piston technology delivers maximum flow with minimal pressure drop
- \* Measuring chamber housing and piston measuring element built with advanced, non-hydrolyzing engineered polymer materials
- \* Meets or exceeds all AWWA Standards
- \* Ultra-low head loss at 6.5 PSI at 20 GPM
- \* 35 + Years Verified Sustained Accuracy (4,000,000 million USG) in independent tests on the 5/8" size meter by the Utah Water Research Laboratory
- \* Improved capability to pass entrained solids
- \* Superior low flow capability records every leak
- \* With Optional 3G Integrated Register:
  - Revenue Impact Alerts - Leak, Tamper (Theft), Backflow, and Zero Consumption
  - Rich 4,000 Read Data Logging Capabilities (scalable / customer defined resolution)
  - Deploy DMA/DMZ Advanced Infrastructure Leak Management Programs

## REGISTER OPTIONS:

- \* DIALOG 3G Integrated AMR Register
- \* DIALOG 3G LCD Interpreter™
- \* DIALOG 2G<sup>®</sup> Pit
- \* DIALOG 2G Indoor
- \* Direct Read

## READ:

- \* Direct Read/Manual
- \* Proximity/Wand Read - 2G
- \* Mobile Drive-By AMR - 3G
- \* Fixed Network AMI Solution - 3G (100% migratable using existing Mobile AMR infrastructure)

## SIZES AVAILABLE:

5/8" (3/4" and 1" Available in 2008)

Precision Engineered | Sustained Accuracy | Quiet Operation | AMR/AMI Migratable with 3G



Reading the Future™

## TECHNICAL SPECIFICATIONS:

AWWA Standard - Meets or exceeds all sections of Standard ANSI / AWWA C700, most recent revision for cold water displacement meters with AWWA bronze main cases

NSF/ANSI Standard 61 - Optional Standard 61 certified no-lead main case available

**Design/Operation** - Incoming water is continuously divided into crescent-shaped volumes by the action of the inlet ports, chamber interior and piston walls as controlled by the division plate and controller assembly. This hydraulic action causes the center of the oscillating piston measuring element to make continuous circular movements. A drive spindle formed integrally with the piston web moves the drive magnet. A magnetically-coupled follower magnet in the register assembly is directly connected to a gear system in the register that totalizes those movements into the desired billing units. The register assembly is removable under line pressure permitting seamless, simplified upgrades in AMR reading technology

**Measuring Chamber** - The measuring chamber housing and piston measuring element are constructed of smoothly-finished, non-hydrolyzing engineered polymer materials. The removable chamber is sealed to the main case by a unique elastomeric chamber seal that resists the chances of back pressure seal blowouts or fouling of the sealing surfaces and adverse effects on accuracy due to normal pipeline distortions

**Register** - Standard Direct Read, DIALOG 2G and DIALOG 3G AMR System registers are available. Six wheel odometers are standard. Together, an integrated and migratable technology environment is attained; direct, proximity (wand), mobile AMR, and Fixed Network AMI

**Register Sealing** - All Direct read and DIALOG® registers are IP-68 rated, permanently sealed with a scratch resistant glass lens, stainless steel base and wrap-around gasket to prevent intrusion of dirt or moisture

**Register Units** - Registration available in either U S gallons, cubic feet or cubic meters

**Magnetic Drive** - A reliable, direct magnetic drive provides linkage between measuring element and register so that no gearing is exposed to water

**Test Circle** - Large center sweep hand with one hundred (100) clearly marked gradations near the periphery of the dial face

**Low Flow/Leak Indicator** - Clearly visible leak indicator with high sensitivity resulting from direct one-to-one linkage to the measuring element

**Main Case** - Choice of waterworks bronze case of 81% copper composition, or, 86% copper, no lead bronze All

main cases incorporate externally threaded ends to aid installation. Measuring chamber surfaces that serve as bearing areas are generously dimensioned out of continual water-lubricated, non-hydrolyzing polymer material. These broad surface areas act to disperse any potential wear over a greater area. Advanced chamber design combined with a unique mechanical control process, provide greater operating clearances yet deliver outstanding low flow accuracy and sustained overall accuracy over a long operating life. Key small wear components such as the division plate, control roller and drive dog are constructed from hydrolytically-stable, lubricated nylon that minimizes localized wear

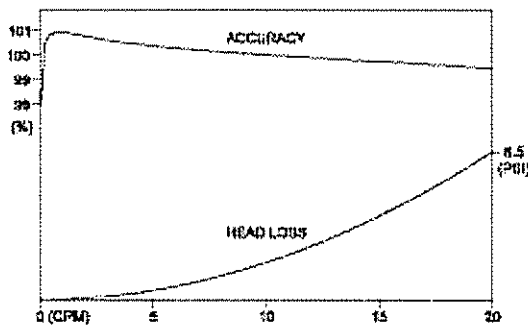
**Optional Bottom Plates** - Bronze, Cast Iron (CI), or Engineered Plastic

**Strainer** - A rigid, advanced polymer strainer is provided with more than 4 times the open area of the pipe. The unique strainer design smooths the flow of water entering into the meter creating a flow profile that is gentle on the meter's internal components. Tough materials operating in a smooth, balanced environment enable the meters to perform more accurately over time

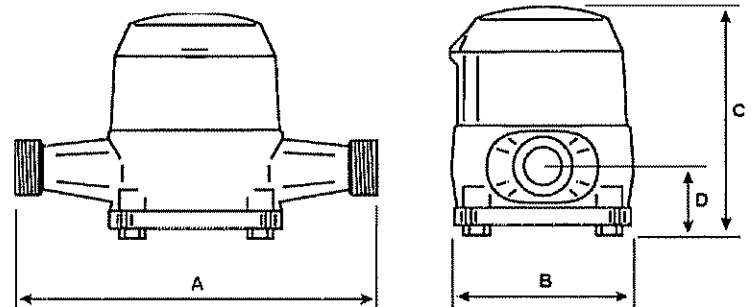
**Tamper Detection** - Design inhibits unauthorized register tampering and removal of the register. This design also provides a visual indication of tampering attempts

METER OPERATING CHARACTERISTIC/DIMENSION	5/8" x 1/2"	5/8" x 3/4"
Flow Rating (gpm)	20	20
Continuous Flow (gpm)	10	10
Normal Flow Range (gpm)	1-20	1-20
Low Flow (gpm @ > 97%)	1/4	1/4
Extended Low Flow (gpm @ > 95%)	1/8	1/8
Maximum Working Pressure (psi)	150	150
Maximum Working Temperature (°F)	105	105
Specific Displacement (revs/gallon)	56.4	56.4
Headloss at Maximum Flow Rate (psi)	6.5	6.5
Length (A below)	7-1/2"	7-1/2"
Width (B below)	3-13/16"	3-13/16"
Height, standard register with lid (C below)	5-3/8"	5-3/8"
Height, bottom to center line (D below)	1-5/8"	1-5/8"
Weight (lbs)	4.25	4.25
Packed To Carton	6	6
Carton Weight (lbs)	30	30

### ACCURACY AND HEAD LOSS CHART



### Standard PD Water Meter



### Master Meter, Inc.

101 Regency Parkway, Mansfield, TX 76063

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Reading the Future™

# 5/8" - 1" Master Meter MMPD

Accuracy Guarantee & Product Warranty

## Positive Displacement Water Meter Products

### Scope of Warranty

This warranty applies exclusively to Master Meter Positive Displacement (MMPD) 5/8", 3/4", 1" meters purchased on or after January 1, 2006 when used for cold potable water (120° F) and installed in accordance with Master Meter published installation instructions in effect as of the Master Meter shipment date of the original product. This warranty applies exclusively to the original utility purchaser when product is purchased from either Master Meter or an authorized Master Meter distributor. Coverage in both terms of time and registered usage is from date of shipment by Master Meter.

### Materials and Workmanship

If used and installed as described above, Master Meter warrants all MMPD (5/8", 3/4", 1") to be free from defects in material and workmanship for a period of 2 years (24 months) from date of shipment.

### Case Integrity

If used and installed as described above, Master Meter, Inc. warrants that the standard and/or low lead bronze cases of the 5/8", 3/4" and 1" MMPD Meters will retain their structural integrity for a period of 25 years from the date of Master Meter shipment.

### Claims

Any meter or register covered by this warranty that fails to meet the terms of the stated warranty will be repaired or replaced, at the option of Master Meter, Inc. The customer is responsible for removing the meter and/or register from service, returning it to the factory service center designated by Master Meter, Inc., providing all required paperwork per the Return Material Authorization at the time of the returned product and for freight costs to the service center. The customer is also responsible for reinstalling repaired or replaced product.

Master Meter's MMMJ & BLMJ Multi-jets meet or exceed AWWA's most recent revision of C701 Standards for Accuracy.

	5/8" x 3/4"	3/4"	1"
<b>Extended LOW FLOW Accuracy</b>	95% @ ¼ GPM 5 Years or 750,000 USG	95% @ ½ GPM 5 Years or 750,000 USG	95% @ ¾ GPM 5 Years or 1,100,000 USG
<b>NEW Meter Accuracy</b>	5 Years or 750,000 USG	5 Years or 750,000 USG	5 Years or 1,100,000 USG
<b>REPAIRED Meter Accuracy</b>	15 Years or 2,500,000 USG	15 Years or 2,500,000 USG	15 Years or 3,250,000 USG

NEW – 5 years      REPAIRED – 15 years      ○  
 = 20 Year Total Accuracy Guarantee      ○



Master Meter, Inc.  
 101 Regency Parkway  
 Mansfield, TX 76063  
 T: 817-842-8000  
 F: 817-842-8100  
[info@mastermeter.com](mailto:info@mastermeter.com)  
[www.mastermeter.com](http://www.mastermeter.com)

# 5/8" - 1" Master Meter MMPD

*Accuracy Guarantee & Product Warranty*

## Positive Displacement Water Meter Products

### Limits of Liability

This warranty does not apply to meters or registers damaged by aggressive water conditions, foreign matter in water, vandalism, negligence, installation not in accordance with Master Meter, Inc. installation instructions, misapplication or other use not as described on this document, acts of God or other conditions beyond the control of Master Meter, Inc. This warranty is null and void if a meter is altered by the addition of any register not manufactured by or on behalf of Master Meter, Inc. for its specific model and size. If a meter is claimed to breach the accuracy guarantees as stated herein, the customer shall submit a certified copy of the test results at the time the meter is returned to Master Meter, Inc. The accuracy warranty shall be void if an examination of the customer's water system shows an unusually adverse effect on metering equipment.

Any description of product, whether in writing or made orally by Master Meter, Inc or its agents, specifications, samples, literature, models, bulletins, drawings, diagrams, data sheets or similar materials used in connection with any customer's order are for the sole purpose of identifying product and shall not be construed as an express or implied warranty. Any suggestions by Master Meter, Inc. or its agents regarding use, application or suitability of product shall not be construed as an express or implied warranty unless confirmed to be such in writing by Master Meter, Inc.

The laws of the State of Texas, excluding its conflicts of law rules shall exclusively govern this warranty. If any provision hereof, partly or completely, shall be held invalid or unenforceable, such invalidity or unenforceability shall not affect any other provision or portion hereof and these terms shall be construed as if such invalid or unenforceable provision or portion thereof had never existed.

**THE FOREGOING EXPRESS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES OR GUARANTEES WHATSOEVER, WHETHER EXPRESSED OR IMPLIED (EXCEPT FOR WARRANTY OF TITLE) INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**

**CUSTOMER'S EXCLUSIVE REMEDY AND MASTER METER, INC. AND ITS BUSINESS PARTNERS' SOLE LIABILITY ON ANY CLAIM, WHETHER IN BIAS (INCLUDING STRICT LIABILITY), NEGLIGENCE, CONTRACT, WARRANTY OR OTHERWISE, FOR ANY METER OR REGISTER WHICH FAILS TO MEET THE TERMS OF THE WARRANTY STATED IN THIS DOCUMENT, SHALL BE LIMITED TO REPAIR OR REPLACEMENT AS DESCRIBED ABOVE. IN NO EVENT SHALL MASTER METER, INC. AND/OR ITS BUSINESS PARTNERS BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND, INCLUDING BUT NOT LIMITED TO LOSS OF PROFITS OR REVENUE, LOSS OF USE, COST OF CAPITAL, COST OF SUBSTITUTE EQUIPMENT, FACILITIES OR SERVICE, DOWNTIME COSTS, DELAYS AND CLAIMS OF CUSTOMERS FOR THE CUSTOMER OR OTHER THIRD PARTIES.**



*Reading the Future*

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Page 2



# DIALOG 3G<sup>®</sup> AMR TECHNOLOGY



## FULLY INTEGRATED AMR SOLUTIONS

Master Meter's proven 3G ConnectionFree™ AMR Technologies provide improved utility management. Our completely integrated AMR solution incorporates leading-edge technology at every critical point—from the meter and register to our fixed network migratable

mobile read system and utility management software. 3G enabled water, electric, and gas meters provide functionality for AMI applications on the horizon. Get pioneering AMR performance at every level with our master-planned system.

### FEATURES:

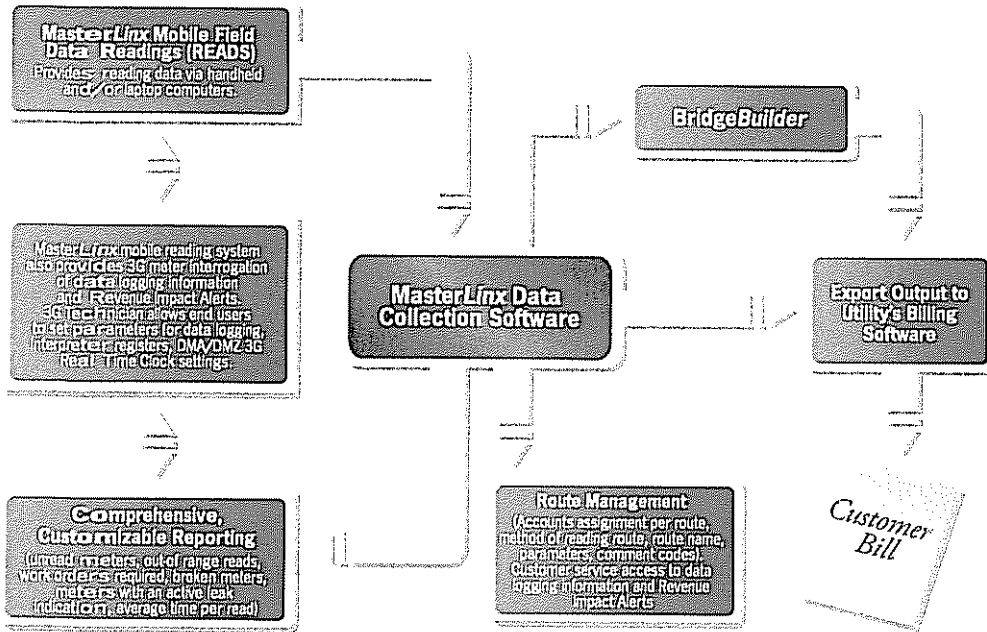
Water, Gas & Electric Applications



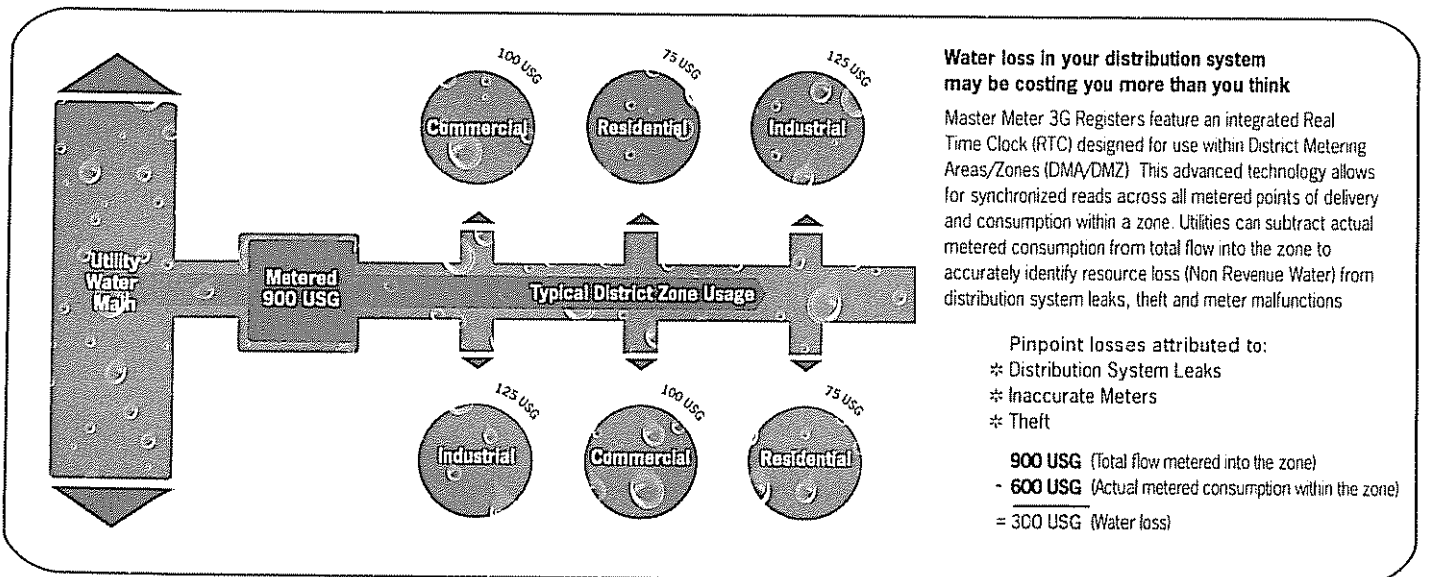
- \* Integrated Single-Source AMR System:  
Measure > Read > Manage > Act
- \* 3G Mobile, Fixed Network Migratable
- \* ConnectionFree - No Wires, No Programming
- \* Revenue Impact Alerts™  
Leak, Tamper, Theft (backflow) & Zero Consumption
- \* 4,000 Read Data Logging Provides Pinpoint Usage Detail for Informed Customer Service, and Conservation Program Management
- \* DMA & DMZ Ready for Advanced Infrastructure Leak Management (see side bar on back page for details)
- \* MasterLinx™ Software Suite - Integrated Utility Management and Billing Interface
- \* Comprehensive Cross Departmental System Training, Unlimited Annual Phone Support
- \* Superior IP- 68 Internationally Recognized Environmental Rating
- \* FCC Part 15 Compliant Unlicensed ISM 902 - 928 Mhz
- \* Flexible Dual RF Modulation: Direct Sequence Spread Spectrum (DSSS) and Wide-Band for highest assured read completion.
- \* Optional User-Defined Programmability for Improved Control
- \* Auto Activation Ensures Fast "Drop & Go" Installation



Reading the Future™



## WATER LOSS BEFORE THE METER... WHO'S FOOTING THE BILL?



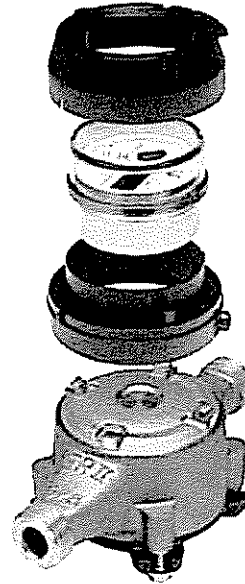
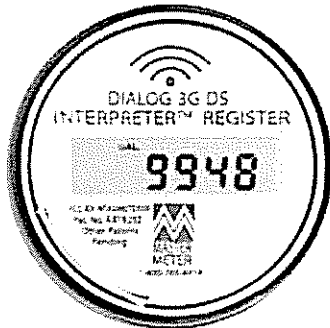
**Master Meter, Inc.**  
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 Toll Free: 800-765-6518 • Main Line: 817-842-8000 • FAX: 817-842-8100  
[www.mastermeter.com](http://www.mastermeter.com)

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*Reading the Future*

# DIALOG 3G® INTERPRETER™ REGISTER



## UPGRADE VIRTUALLY ANY EXISTING METER TO WIRELESS AMR IN MINUTES.

Take advantage of the life left in your existing hardware and migrate into the future with the DIALOG 3G Interpreter Register.

Our universal AMR upgrade replaces the existing register on most any brand meter in minutes—without service interruption. The Interpreter activates automatically upon installation. Registers that are pre-programmed at the factory require no additional programming in the field.

Hassle-free installs give way to worry-free maintenance. The Interpreter's ConnectionFree™ design houses all vital AMR components—encoder, RF transmitter, battery and antenna—safely within the register's sealed stainless steel and tempered glass enclosure. We eliminated external wires, components and connections—the #1 cause of warranty related issues on competitive designs.

The DIALOG 3G Interpreter Register system design is fully-migratable to fixed network. On the backs of your existing meters the Interpreter will lead you well into the future.

### FEATURES:

- \* Direct replacement of most any current bayonet style register: AMCO, Hersey, Badger, Neptune, and Sensus SR II or Master Meter
- \* Installs in Minutes without Service Interruption
- \* 3G Mobile, Fixed Network Migratable
- \* Revenue Impact Alerts™ :  
Leak, Tamper, Theft (backflow) & Zero Consumption
- \* 4,000 Read Data Logging
- \* ConnectionFree — No wires No Programming
- \* Available in LCD or Classic Odometer
- \* LCD Register Special Features: Measure and display rate of flow. Additional program features include: Utility operator resettable index, Test Mode (ability to test in 1/10 units), programmable fixed zeros, and ability to reprogram without losing reading
- \* DMA & DMZ Ready: integral Real Time Clock is ideal for use in advanced infrastructure leak management programs



*Reading the Future™*

# INTERPRETER REGISTER TECHNICAL SPECIFICATIONS

## Award-Winning Design \* Unmatched Compatibility

### \* Hassle-Free Install & Maintenance

The 3G Interpreter Register is available with:

#### \* Digital LCD display

\* **Analog classic odometer:** Interpreter registers can be preprogrammed at the factory to work with the specific meter brand they will be installed on. This simple process sets the Interpreter's gear ratio to precisely match that of the meter it will be paired with. The registers can also be programmed/reprogrammed in the field—at anytime—with Master Meter's 3G technician software. The reprogramming capability allows the Interpreter to be reassigned to a different brand meter providing the new meter matches either the 2-pole or 4-pole magnet configuration the Interpreter was initially set to.

**UTILIZE EXISTING METERS:** Retrofit virtually any current competitor meter; AMCO, Hersey, Badger, Neptune, and Sensus SR II.

#### REVENUE IMPACT ALERTS:

- \* **Leak Detection:** Proactive leak notification saves costs and bolsters conservation efforts.
- \* **Tamper & Theft:** Stop theft and be notified of reverse metering attempts, backflow events, or improper meter installation.
- \* **Zero Consumption:** Alerts utility to a potential "stuck meter" or vacated water service.
- \* **DMA & DMZ Ready:** The 3G Real Time Clock inside combined with District Metering Areas / Zones provides control over Distribution System Leaks, in either MOBILE or FIXED NETWORK AMR. DMA and DMZ provide proactive control over distribution system leaks and help isolate where the revenue holes are in your system. Through synchronized readings of meters at the inlet into a zone and the sum of all the metered points within the zone, a utility can now, more definitively, isolate trouble areas that result in unaccounted-for-water. Interpreter's RTC (Real Time Clock) makes this possible.

**CONNECTIONFREE:** Smart design features all vital components—encoder, RF transmitter, battery and antenna—permanently sealed in a stainless steel and tempered glass enclosure to ensure years of maintenance free service. No external wires or connections—the #1 cause for warranty related issues with competing product designs. Initial AMR installation and lifetime project costs are greatly reduced.

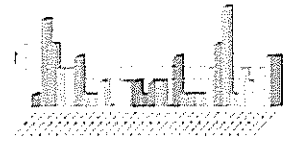
**NO PROGRAMMING:** Install like any standard direct read meter and walk away; no wires, no drilling and no programming. The 3G transmitter activates automatically giving you dramatic installation time and cost savings.

Complete Kits	LCD	Analog
Sensus	199 006 02	100 007 02
Neptune	199 006 04	199 007 04
Badger	199 006 05	199 007 05
AMCO / ABB	199 006 01	199 007 01
Hersey	199 066 03	199 007 03
Master Meter	199 006 06	199 006 06

Kit comes complete with register, register housing and brand-specific bayonet mounting adapter. Interpreter registers can be programmed at time of order per utility defined criteria (make, model, size, registration), or be programmed / reprogrammed at any time by utility personnel using our 3G Technician software.

#### 4,000 READ DATA LOGGING:

Delivers uncompromising customer service benefits and detailed records to resolve billing disputes. Data logging is completely customizable with utility-defined TBR (Time Between Reads). The utility and their customers can determine the desired resolution of their data logging.

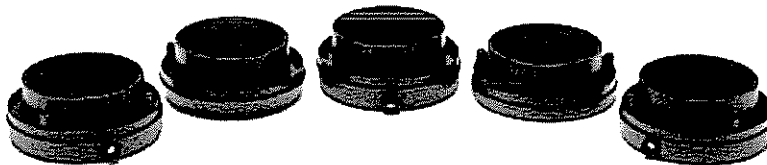


**FIXED NETWORK MIGRATION:** Technology investments are protected through our fully migratable system design. Migration does not mean limitation. Master Meter's scalable and modular architecture allows for a 100% conversion to fixed network or hybrid technology where a combination of these technologies can coexist seamlessly for superior flexibility and control. Master Meter's system design gives the added advantage to always have the Mobile as a backup to Fixed Network in case of natural disaster or other potential outages.

Manual Read (Touch Style) → Mobile → Fixed Network

**20-YEAR INVESTMENT PROTECTION:** Master Meter's electronics warranty protects against battery or transmitter failure for 10 full years and then a generous 10 year prorated schedule.

**TAMPER RESISTANT DESIGN:** Tamper resistant plugs are used to secure the register to the body and provide visual indication of tamper attempts.



Adapter Rings to fit a variety of competitive meters: AMCO, Hersey, Badger, Neptune, and Sensus SR II

## Master Meter, Inc. Reading the Future™

101 Regency Parkway, Mansfield, TX 76063

Toll Free: 800-765-6518 • Main Line: 817-842-8000 • FAX: 817-842-8100

www.mastermeter.com

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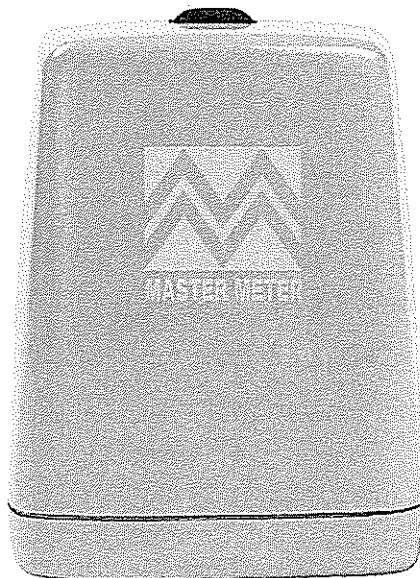


Reading the Future™



# DIALOG 3G External Transceiver

The patented AMR solution offering unmatched advantages.



DIALOG 3G features a wireless two-way RF transceiver. The RF unit is housed within a high density ABS enclosure and further sealed with an electrostatic gel that eliminates moisture intrusion. DIALOG 3G is the solution for specific problems facing water utility and submetering customers.

A unique miniature transmitter/receiver utilizes the most recent technology to provide the meter reader with reliable, accurate readings. Two-way communication enables programming in the field. DIALOG 3G can be attached to most water meters that are AMR ready.

U.S. Patent No. 6,819,292. Patent No. 6,954,178. Others pending.

## FEATURES & BENEFITS

- Easy installation
- Superior moisture protection
- Field-programmable
- Easily retrofits many competitive brands of water meters
- Available in 6 models: Fast Pulse, ARB V, Generator, Single-pulse, Dual-pulse, and Encoder

## TECHNICAL SPECIFICATIONS:

<b>Description</b>	DIALOG 3G External Transceiver is a true two-way RF Transceiver. Each unit may be attached to a maximum of four single switch inputs, two dual switch inputs, or one encoder input. Compatible with: • Sensus ECR II and ICE Encoders • Badger RTR • Hersey ER2 Switch Output or Translator Encoder • AMCO Pulsar or Scancode • other compatible single- or dual-switch outputs
<b>Size</b>	5" x 3" x 1-1/2" (height, width, depth)
<b>Sealed Transmitter</b>	DIALOG 3G RF Transceiver housed within a high density ABS enclosure and further sealed with an electrostatic gel that eliminates moisture intrusion.

<b>Battery Operated</b>	Equipped with two 3.6 Volts Lithium-Thionyl Chloride batteries (approx 10 yr operational life).
<b>Frequencies</b>	Operates within the licensed exempted ISM Band 902 - 928 MHZ
<b>Environmental</b>	Operating temperatures from -40° F to +140° F with an IP-68 water submersion rating.
<b>Easy Installation</b>	Field programmable. Comes with its own wall mounting bracket
<b>FCC Regulatory Certification</b>	Certified to operate in the United States under FCC Part 15

# DIALOG 3G External Transceiver

## RELATED INFO:

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Frost & Sullivan reports: "Although Master Meter prefers to follow a low-key approach to marketing, the water utilities are anything but quiet about the new system. It is being discussed at water utility association meetings as the elite system without an elite price."

### DIALOG 3G Walk-By/Drive-By Handheld System

#### SYSTEM COMPONENTS

- Radix FW300, Radix FW500, or JETT<sup>™</sup>ce Handheld Computer
- DIALOG 3G Transceivers -Types: Integrated, External, 3G-WR (Wireless Retrofit)
- Master Meter MMR Receiver
- Charging and Communication Cradles
- Radix Utility Management Software (UMS) or MasterLink Data Collection System (GPS Receiver and MAPS included)
- Installation & Training
- Service & Support

### DIALOG 3G Wireless RF Drive-By System

#### SYSTEM COMPONENTS

- Panasonic ToughBook PC
- Gamber-Johnson Mobile Pedestal
- Master Meter MMR Receiver
- DIALOG 3G Transceivers -Types: Integrated External, 3G-WR (Wireless Retrofit)
- Greentree MasterLink Data Collection System (GPS Receiver and MAPS included)
- Master Meter 3G Technician Software
- Greentree 3G CheckIt Software
- Installation & Training
- Service & Support

Distributed by:

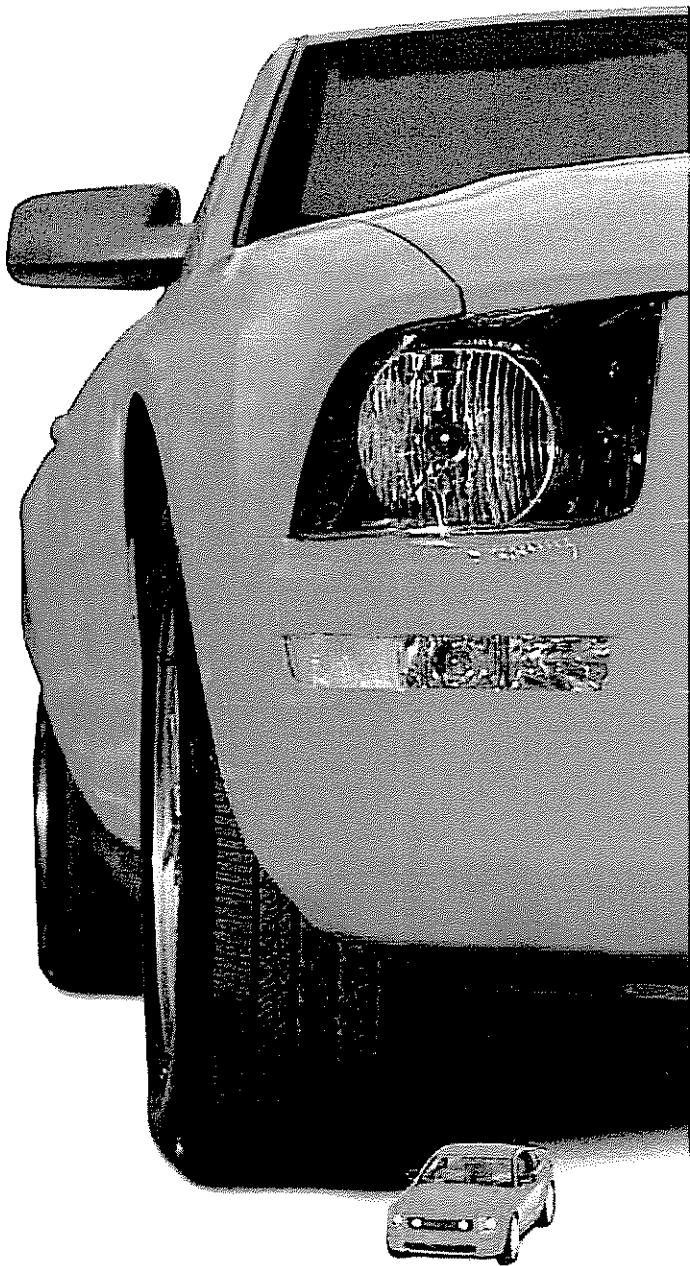
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MNDS 03GET Rev1/23/06



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[info@mastermeter.com](mailto:info@mastermeter.com)



**YOU CAN KEEP  
TELLING YOURSELF  
“IT’S JUST LIKE  
A TOUGHBOOK,”  
OR YOU CAN GO FOR  
THE REAL THING.**

**Panasonic ideas for life**

**The new Panasonic Toughbook 52.**

The only full-power desktop replacement laptop PC with Toughbook durability, reliability and performance. With a 15.4" widescreen LCD for group presentations and advanced technology to run multiple applications without a hitch. And embedded mobile broadband (WWAN) lets you work seamlessly pretty much anywhere.



**TOUGHBOOK**

**THE RUGGED ORIGINAL.**

# The NEW Panasonic Toughbook 52.

Reliable, Semi-rugged Desktop Alternative

Panasonic recommends Windows Vista® Business.

## SOFTWARE

- Genuine Windows® XP Professional SP2 or Genuine Windows Vista® Business
- Setup, Diagnostics, DMI Viewer, Online Reference Manual, Adobe® Reader
- Hard Disk Data Erase Utility, Recovery DVD, WinDVD 8, B's Recorder
- GOLD8 BASIC, B's CLIP6

## CPU

- Intel® Core™ 2 Duo Processor T7300
  - 4MB L2 cache
  - Processor speed 2.0GHz
  - 800MHz FSB
- Intel® Core™ 2 Duo Processor T7100
  - 2MB L2 cache
  - Processor speed 1.8GHz
  - 800MHz FSB

## STORAGE & MEMORY

- Intel® Core™ 2 Duo Processor T7300
  - 1GB SDRAM (DDR2) standard, expandable to 4GB\*
  - 120GB hard drive (shock-mounted & user-removable)
- Intel® Core™ 2 Duo Processor T7100
  - 1GB SDRAM (DDR2) standard, expandable to 4GB\*
  - 80GB hard drive (shock-mounted & user-removable)

## DISPLAY

- Intel® Core™ 2 Duo Processor T7300
  - 15.4" widescreen 1320 x 1200 (WUXGA) TFT active matrix color LCD
  - AMD x 2300 max. 512MB VRAM
- Intel® Core™ 2 Duo Processor T7100
  - 15.4" widescreen 1280 x 800 (WXGA) TFT active matrix color LCD
  - Intel® GMA x3100 graphic controller max. 384MB (DVMT) VRAM
- Anti-glare, anti-reflective coating

## AUDIO

- Intel® high-definition audio compliant
- Integrated stereo speakers
- Convenient keyboard volume and mute controls

## EXPANSION SLOTS

- PC card type II x 1
- Secure Digital (SD) card x 1
- ExpressCard/54 x 1

## MULTIMEDIA POCKET

- DVD Super MULTI Drive with Dual Layer Support

## KEYBOARD & INPUT

- 87-key with dedicated Windows® key
- Electrostatic touchpad with scrolling support

## INTERFACE

- External video: D-sub 15-pin
- Headphones/speaker: Mini-jack stereo
- Microphone/line in: Mini-jack stereo
- Port replicator: Dedicated 100-pin
- Serial: D-sub 9-pin
- USB 2.0 (x 4): 4-pin
- IEEE 1394a (Firewire): 4-pin
- 10/100/1000 Ethernet: RJ-45
- 56Kbps Modem: RJ-11

## WIRELESS

- Optional integrated mobile broadband (WWAN)
- Intel® Wireless WiFi Link 4965AG 802.11a/b/g
- Bluetooth® v2.0 + EDR (option on model with T7100 CPU)
- Security
  - Authentication: LEAP, WPA, 802.1x, EAP-TLS, EAP-FAST, PEAP
  - Encryption: CKIP, TKIP, 128-bit and 64-bit WEP, Hardware AES
- Sleep on/off switch

## POWER SUPPLY

- Lithium ion battery pack (11.1V, 7650mAh)
- Battery operation: approximately 3.5–9.5 hours\*\*
- Battery charging time: approximately 4 hours\*\*
- AC Adapter: AC 100V–240V 50/60Hz, auto sensing/switching worldwide power supply
- Pop-up on-screen battery status reporting

## POWER MANAGEMENT

- Suspend/Resume Function, Hibernation, Standby, ACPI BIOS

## SECURITY FEATURES

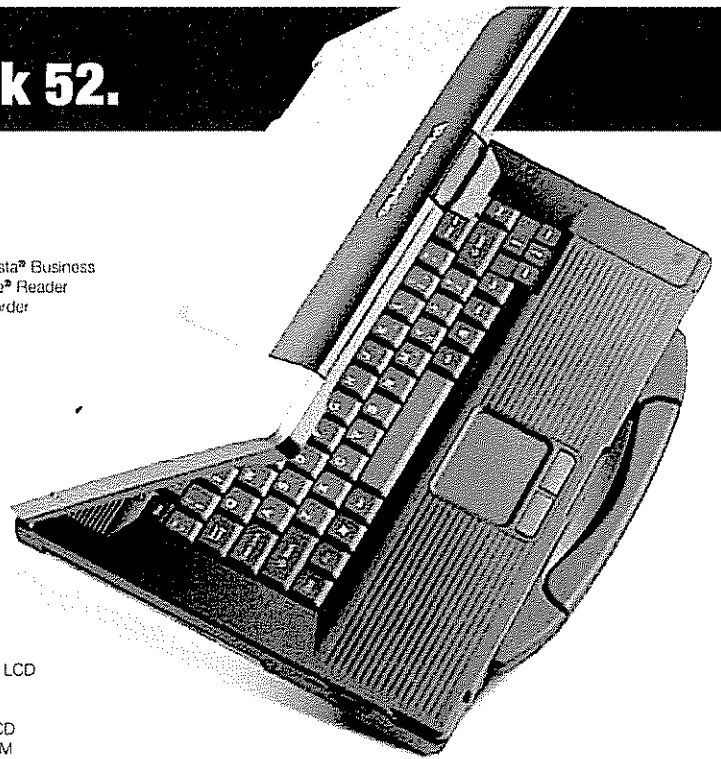
- Password Security: Supervisor, User, Hard Disk Lock
- Cable lock slot
- Trusted platform module (TPM) security chip v 1.2
- Computrace® theft protection agent\*\*\*
- Fingerprint scanner (option)
- SmartCard reader (option)

## WARRANTY

- 3-year limited warranty, parts and labor

## DIMENSIONS & WEIGHT

- 2.0" (H) x 14.0" (W) x 11.3" (D)
- 7.4 lbs. (with handle)



- 15.4" Widescreen Display
- Full Magnesium Alloy Case with Handle
- Shock-mounted, Removable Hard Drive
- Drop- and Spill-resistant
- Mobile Broadband-ready Design

## INTEGRATED OPTIONS\*\*\*\*

- Mobile Broadband Solutions
  - EV-DO Rev. A
  - HSDPA
- SmartCard reader
- Fingerprint scanner

## ACCESSORIES\*\*\*\*\*

- AC Adapter (3-pin) CF-AA1683AM
- Battery Charger CF-VCBTB1W
- ToughMate ComUniversal Carrying Case (large capacity) COMUNIV-P
- ToughMate Always-on 52 Case TM52-P
- Desktop Port Replicator CF-VEBS21M
- Lithium Ion Battery Pack CF-VZSU29AU
- Memory Cards
  - 1GB CF-WMBA601G
  - 2GB CF-WMBA602G
- Large Venue DLP Projector PT-DW5100U
- Mobile LCD Projector PT-LB6CU

\* Total usable memory will be less depending upon actual system configuration.

\*\* Battery performance features such as charge time and life span can vary according to the conditions under which the computer and battery are used. Battery operation and recharge times will vary based on many factors including screen brightness, applications features, power management, battery conditioning and other customer preferences.

\*\*\* Requires software and activation to enable theft protection.

\*\*\*\* Accessories and Integrated Options may vary depending on your notebook configuration.

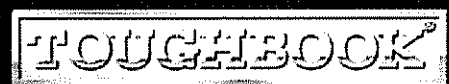
Please consult your reseller or Panasonic representative before purchasing.

For more information call 1.800.662.3537 or visit us on the Web at [panasonic.com/toughbook](http://panasonic.com/toughbook).

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Panasonic ideas for life

ss52 12/07



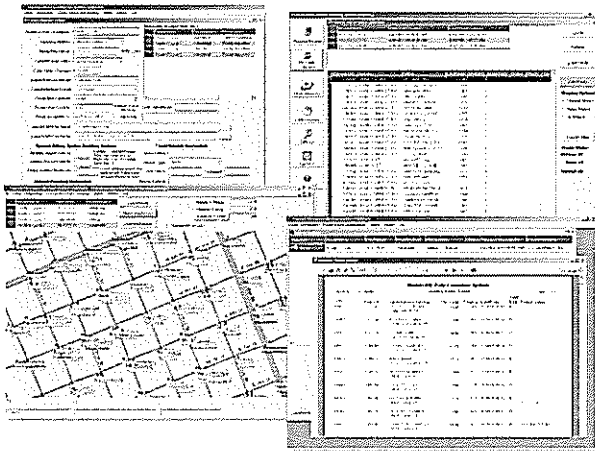
THE RUGGED ORIGINAL.





## DIALOG 3G-DS Wireless RF Software

Greentree helps you take the plunge into water system high technology.



Now one of the hottest high-tech products on the market--DIALOG 3G-DS from Master Meter--has the software solutions and system integration tools to make meter reading even more efficient and cost effective.

Greentree Applied Systems, a subsidiary of Master Meter, produces custom programs to map and read 3G and 3G-DS meters using a standard laptop. Other Greentree products integrate the captured data to keep accurate and easy-to-access information that can be used for billing, billing/rate analysis, meter testing and more. Utilities can make use of Greentree's complete line of quality billing and accounting software or bridge to its existing system.



### Greentree Applied Systems, Inc.

961 Beasley, Suite 107 Lexington, KY 40509

1-800-928-6388

Greentree Applied Systems and DIALOG 3G-DS, a high-tech system that gives you real advantages:

- Reduced labor costs associated with meter reading
- Faster and more accurate billing cycles
- Leak, backflow and high-use detection
- Stopped or tampered meter alerts

#### TECHNICAL SPECIFICATIONS:

This portable AMR system is usually mounted in a truck and is used to capture individual meter radio transmissions for input into a billing system, either Greentree's system or virtually any billing system on the market. When used with the DIALOG 3G, programming transmissions to the meter are also possible. It can simultaneously support RAMAR FastTrackIT and DIALOG 3G and 3G-DS transmissions. See red dots turn to green dots as readings are received.

The Greentree drive-by system provides three different choices for reading reception display:

- 1 Automatic scrolling text
- 2 Fixed maps, or
- 3 Maps that move with the vehicle position

The system is built around key components including the Panasonic Toughbook rugged notebook computer, Greentree software, Master Meter DIALOG 3G receiver/transmitter, and the Ramar receiver. A full line of power sources, antennas and mobile mounting equipment completes the system. The JETT•ce or Radix FW300 hand held computer can replace the notebook computer in the drive-by system.

The drive-by system is designed to work with meters and billing systems from several different manufacturers. The utility provider is not locked into doing business with one source. This advanced "open architecture" system also enjoys a significant cost advantage compared to other closed, single vendor, systems on the market today.

The drive-by system reduces meter reading labor costs, improves customer service through fewer re-reads, provides greater meter reader safety, reduces read-to-bill time, and allows personnel to be assigned to other maintenance tasks.

Our Bridge Builder software provides the link between the drive-by system and your current billing system. We use Bridge Builder to define the necessary import and export files. We also commit to integrating the drive-by system to both your billing and AMR reading system. Through our Route Master definition process you may merge or split routes which are defined in billing into different routes for use in the drive-by system.

Customer accounts are shown in a text listing or as points on a map depending on user preference. The yellow text list shows a list of problem reads such as high usage, etc. Several maintenance and error type reports are provided. Meter readings can be entered manually as well as being received through the AMR receiver. GIS coordinates can be calculated from your service addresses. You do not need to spend many months gathering this data. Maps can display service addresses for an immediate definition of each customer point.

# DIALOG 3G-DS Wireless RF Software

## RMSWIN ROUTE SOFTWARE

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The Dialog 3G-DS route software for vehicle systems is a simple to use Windows program that interfaces easily with most billing systems software.

<b>Billing System Bridge Creator</b>	It has a built in interface creator for generating the right output files needed by the billing program being used.	<b>10,000 Accounts per Route</b>	The account listing per route is large enough to cover most route applications. Multiple route files can be uploaded to expand the numbers beyond the 10,000 limit.
<b>Street Map Interface</b>	The route can also be placed on a local street map making the process of reading the route simple and trouble free	<b>Handles duo COM Port Interfaces</b>	RMSWIN can handle two RS232 inputs or USB (as COM ports) which allows for duo receiver input into the software program.
<b>Multiple Report Generation</b>	The program generates multiple reports based on the need of the utility. With the report generator, missed reads, orphans and alerts can be readily accessed for follow up	<b>DIALOG 3G Technician Software</b>	Diagnostics software for programming or troubleshooting the water meter radio.



**Greentree Applied Systems, Inc.**

961 Beasley Suite 107 Lexington, KY 40509

1-800-928-6388

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MINDS 31GWRP1 Rev11/10/05



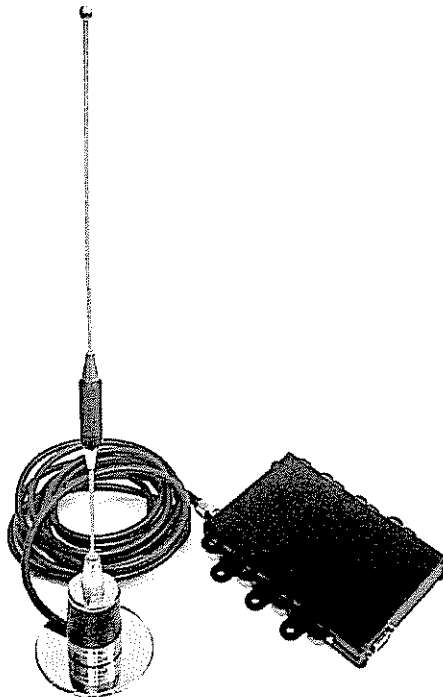
**Master Meter, Inc.** • 101 Regency Parkway, Mansfield, TX 76063  
Toll Free: 800-765-6518 • Main Line: 817-842-8000 • FAX: 817-842-8100

[www.mastermeter.com](http://www.mastermeter.com)  
[info@mastermeter.com](mailto:info@mastermeter.com)



# DIALOG 3G E-MMR Transceiver

The true two-way wireless,  
easy to install RF Transceiver.



DIALOG 3G represents an innovative approach to the time consuming and tedious process of gathering meter reads. The meter reading information is stored within the handheld or laptop computer for downloading to the utility billing system.

The DIALOG 3G E-MMR Transceiver is an integrated component of the vehicle drive-by system and can also be configured as a handheld walk-by system for 3G meter installation and diagnostics. The transceiver allows for receiving Direct Sequence Spread Spectrum transmissions and is designed for either vehicle power or battery operation.

## FEATURES & BENEFITS

- FCC Part 15 compliant
- ISM 902-928 MHZ Unlicensed (requires no license to operate)
- Programmable Direct Sequence Spread Spectrum Transceiver
- Vehicle unit with cigarette adapter
- Handheld unit comes with built in rechargeable batteries
- RS232 COM Port interface
- 3G Technician software

## TECHNICAL SPECIFICATIONS:

<p><b>Description</b> The DIALOG 3G E-MMR® is true two-way wireless RF Transceiver that is easily attached to most handhelds or PCs</p> <p><b>Sealed Transmitter</b> The DIALOG 3G-DS RF Transceiver housed within an aluminum case designed to screen RF and minimize water intrusion.</p> <p><b>Size</b> 5" x 4" x 1" (height, width, depth)</p> <p><b>Frequencies</b> Operates within the licensed exempted ISM Band 902 – 928 MHZ.</p> <p><b>Battery Operated Or Vehicle Powered</b> The DIALOG 3G E-MMR® is equipped with nickel metal hydride (NiMH) batteries for long recharge life. The vehicle system comes with its own cigarette lighter adapter</p>	<p><b>Transmission</b> Receives either single channel or frequency hopping transmissions.</p> <p><b>Data Format</b> The DIALOG 3G E-MMR® receives fixed length, error checked (CRC and BCH), encoded data packets</p> <p><b>Software</b> Software for diagnostics or troubleshooting 3G-DS radios</p> <p><b>FCC Regulatory Certification</b> Certified to operate in the United States under FCC Part 15</p>
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# DIALOG 3G E-MMR Transceiver

## RELATED INFO:

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Frost & Sullivan reports: "Although Master Meter prefers to follow a low-key approach to marketing, the water utilities are anything but quiet about the new system. It is being discussed at water utility association meetings as the elite system without an elite price."

### DIALOG 3G-DS Walk-By/Drive-By Handheld System

#### SYSTEM COMPONENTS

- Radix FW300, Radix FW500, or JETT<sup>™</sup>ce Handheld Computer
- DIALOG 3G-DS Transceivers-Types: Integrated, External, 3G-DS-WR (Wireless Retrofit)
- Master Meter E-MMR Receiver
- Charging and Communication Cradles
- Radix Utility Management Software (UMS) or MasterLink Data Collection System (GPS Receiver and MAPS included)
- Installation & Training
- Service & Support

### DIALOG 3G-DS Wireless RF Drive-By System

#### SYSTEM COMPONENTS

- Panasonic ToughBook PC
- Gamber-Johnson Mobile Pedestal
- Master Meter E-MMR Receiver
- DIALOG 3G-DS Transceivers-Types: Integrated, External, 3G-DS-WR (Wireless Retrofit)
- Greentree MasterLink Data Collection System (GPS Receiver and MAPS included)
- Master Meter 3G Technician Software
- Greentree 3G CheckIt Software
- Installation & Training
- Service & Support

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NINDS D1GENJMR7 Rev 1/2/06



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Toll Free: 800-765-6518 • Main Line: 817-842-8000 • FAX: 817-842-8100

www.mastermeter.com  
info@mastermeter.com

### DIALOG® 3G-DS Component Warranty

DIALOG 3G-DS registers and external transmitters (herein know as "product") are warranted to be free from defects in materials and workmanship for Ten (10) years from date of shipment by Master Meter and at a prorated replacement cost of list price during the following Ten (10) years based on the discounted rate value listing below.

All other 3G-DS System components are warranted to be free from defects in materials and workmanship for One (1) year from date of shipment by Master Meter.

If a product fails to perform as warranted, Master Meter will repair or replace the product, at Master Meter's sole option, at no charge to the customer, subject to the terms of the warranty. This warranty shall not be applicable to products that have been damaged by willful misconduct, negligence, vandalism, act of God, exposure to adverse service conditions or improper installation, use or repair.

Master Meter's liability under this warranty is expressly limited to repair or replacement of the product, at Master Meter's option. The repaired or replacement product will maintain the original meter's warranty based on the original purchase date. The customer must pay for freight cost of the returned product or products to the factory or service center designated by Master Meter. The product replaced becomes the property of Master Meter.

Master Meter further warrants that any 3G register or external transmitter installed shall be free from battery defects in manufacturing and design for a period of ten (10) years from the date of shipment in the relevant DIALOG 3G-DS product (such period is defined as the "Battery Warranty Period"). Master Meter will repair or replace a product that is non-performing due to battery failure free of charge for the first Ten (10) years and at a prorated replacement cost based on the current list price during the remaining Ten (10) years as follows:

Year of Failure	Replacement Cost
1-10	Full Replacement
11	30%
12	35%
13	40%
14	45%
15	50%
16	55%
17	60%
18	65%
19	70%
20	75%



DISCOUNT PERCENTAGES WILL BE APPLIED AGAINST PUBLISHED LIST PRICES IN EFFECT AT THE TIME THE PRODUCT IS ACCEPTED BY MASTER METER UNDER WARRANTY CONDITIONS. THE WARRANTIES CONTAINED ABOVE HEREOF ARE THE ONLY WARRANTIES WITH RESPECT TO THE LISTED PRODUCTS, AND ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, BETWEEN THE PARTIES OR ARISING BY LAW. IN PARTICULAR, MASTER METER DISCLAIMS ANY AND ALL WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. THESE WARRANTIES SHALL BE VOID IN THE EVENT THAT THE FAILURE OR DEFECT IN THE LISTED PRODUCT HAS ARISEN AS A RESULT OF THE PRODUCT BEING USED FOR ANY PURPOSE OTHER THAN THAT WHICH WAS INTENDED AND APPROPRIATE AT THE TIME OF MANUFACTURE INCLUDING USE IN A CONFIGURATION OTHER THAN AS RECOMMENDED BY MASTER METER OR AS A RESULT OF IMPROPER INSTALLATION OR MAINTENANCE. MASTER METER'S LIABILITY SHALL IN NO EVENT EXCEED THE PURCHASE PRICE. MASTER METER SHALL NOT BE SUBJECT TO AND DISCLAIMS THE FOLLOWING: (1) ANY OTHER OBLIGATIONS OR LIABILITIES ARISING OUT OF BREACH OF CONTRACT OR OF WARRANTY (2) ANY OBLIGATIONS WHATSOEVER ARISING FROM TORT CLAIMS (INCLUDING NEGLIGENCE AND STRICT LIABILITY) OR ARISING UNDER OTHER THEORIES OF LAW WITH RESPECT TO PRODUCTS SOLD OR SERVICES RENDERED BY MASTER METER, OR ANY UNDERTAKINGS, ACT OR OMISSIONS RELATING THERETO, AND (3) ALL CONSEQUENTIAL, INCIDENTAL, SPECIAL, MULTIPLE, EXEMPLARY, AND PUNITIVE DAMAGES WHATSOEVER.

FORM MM1008 06/20/2005



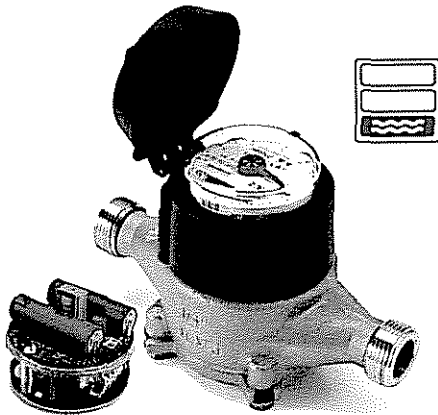
now brings the latest in AMR to the backs of most any existing meter in service—in minutes. We're giving these meters a voice and we've got old brass talking.

Positive displacement meters and multi-jets have been around practically since the stone age. Time proven, yes. Up-to-date, no. We engineered our multi-jets to set new record standards in endurance while standing up stronger against entrained solids. We completely re-invented the positive displacement meter using 21st century design tools. The result, we shattered benchmarks for sustained accuracy

in simulated tests representing 35 years of wear. Accuracy equals revenue. Bottom line: Our meters are more accurate over time, which means more revenue for your utility.

"Although Master Meter prefers to follow a low-key approach to marketing, the water utilities are anything but quiet about the new system. It is being discussed at water utility association meetings as the elite system without an elite price." - Frost & Sullivan

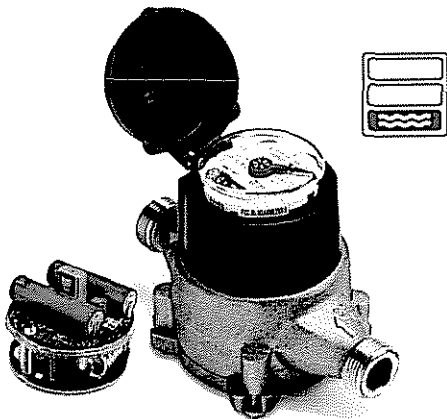
We're ready to talk when you are.



### MULTI-JETS

Master Meter Multi-Jets get the job done. Our BLMJ (Bottom Load Multi-Jet) sets records for independently verified accuracy endurance. Translation: You get more revenue through accurate measurement over time. Master Meter Multi-Jets are the right choice, whether you face suspended particulate matter, entrained solids, high mineral content, or simply want superior, long lasting flow accuracy.

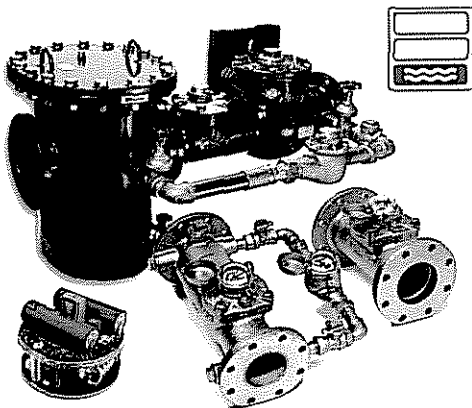
- Verified record setting accuracy
- Tough against minerals, entrained solids and particulate matter
- Optional NSF61<sup>®</sup> certification
- Flexible Axis Meter available to install at any angle
- 5/8" - 2"
- 3G options available
- Assured compatibility with future Master Meter AMR Technology



### POSITIVE DISPLACEMENT

Master Meter reinvented the PD with its MMPD. Using the latest in materials and cutting-edge Computational Fluid Dynamics (CFD) design software, our 21st century PD is 3G capable, and is tested to 4 million USG for 5/8" and 6 million USG for 3/4". Our PD meters provide decades of lasting performance. Master Meter's oscillating piston technology delivers maximum flow at minimized pressure drop and reduces the overall wear profile. Translation: It's accurate longer, so your revenue stream lasts longer.

- New state-of-the-art design
- Greater accuracy, longer
- Assured compatibility with future Master Meter AMR Technology
- 5/8" & 3/4"
- 3G option available



### COMMERCIAL & INDUSTRIAL

Maximize your revenue! Your C&I meters are important - often accounting for up to 80 percent of revenue. That's why our Turbine, Compound, Fire Service and Fire Hydrant meters are built strong and our patent protected designs deliver best-in-class performance. Our application assessment tools deliver the correct solution for your specific utility application.

- Meet or exceed AWWA specifications
- Optimized flow range
- Minimal pressure loss
- Accuracy across all flow ranges
- Optimized crossover accuracy
- Proprietary fire service design for full-flow performance
- Optional NSF61<sup>®</sup> certification on brass turbine meters
- Right-sized meter solution assurance

2002

3G ConnectionFree<sup>™</sup> AMR Solution is Born

2003

Frost & Sullivan Technology Award For 3G AMR

2006

Interpreter<sup>™</sup> Universal AMR Register Heralded As An Industry First

2006

21st Century Computational Fluid Dynamics (CFD) Designed PD Meter Unveiled

2006

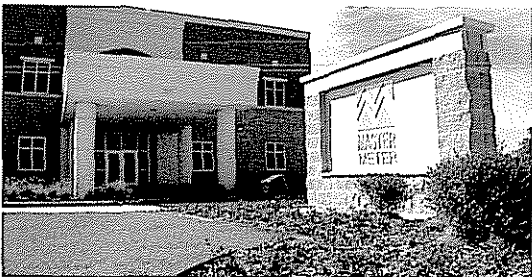
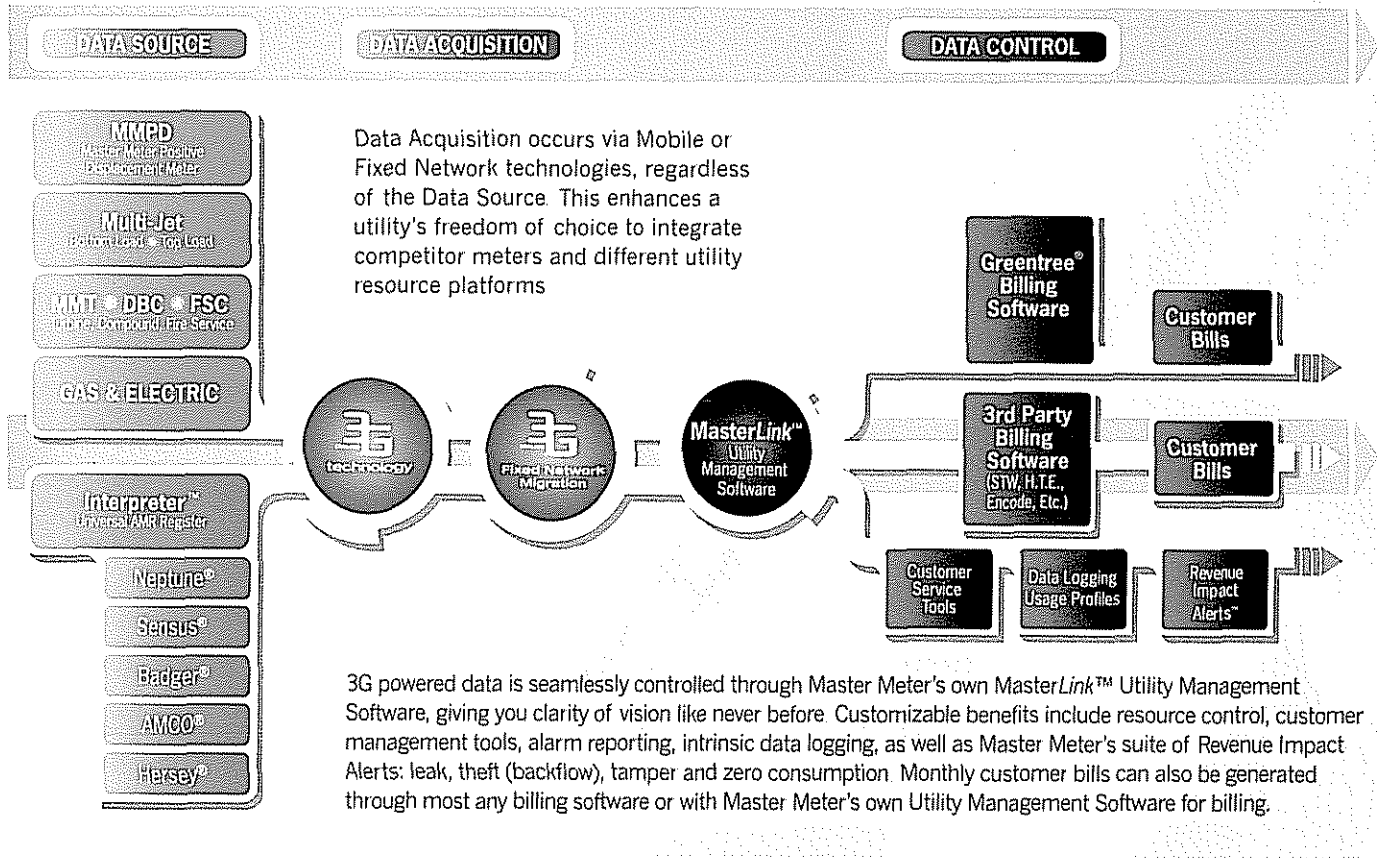
1,000,000th 3G Deployed  
3G AMR Integrates with Sensus<sup>™</sup> iCon<sup>™</sup> Residential Electric Meter

2008

Widespread 3G Fixed Network Implementation

# OUR COMPLETELY INTEGRATED AMR ARCHITECTURE

Our sophisticated 3G technology ties together the broadest elements in today's utility environment: water, gas and electric metered points from a variety of different manufacturers.



## Integrating technology to drive solutions for today's evolving utility markets

Master Meter intellectual property registered with U.S. patent office:

**Measurement**  
5,698,781 • D468,222 • 6,178,816 • 6,386,029  
Foreign Patents and Patents Pending

**AMR Technologies**  
6,819,292 • 6,954,178 • 7,126,551 • 5,111,407 • 7,135,986 • D503,643  
With many more active

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*Reading the Future™*