



Wireless Water Metering Solution

- **Introduction**
- Water Metering Products
- Wireless AMI Solution
- Data Center Platform
- Questions and Answers

...A Global Leader in Flow & Energy Management Solutions...



About Spire Metering



- Located just outside Boston near cutting edge technology companies.
- Leaders in design, development, and production of flowmeters, water meters, BTU meters, and AMR/AMI systems.
- Supplier to Siemens, Honeywell, JCI, NASA, GE, and more!

...A Global Leader in Flow & Energy Management Solutions...



ISO9001 Quality

- Spire Metering has complete ISO9001 certification.
- Our CMs (Contract Manufacturers) have complete ISO9001 certification.

Commitment to Overall Quality!





Proven Competence

NSF61 Certificate, OIML R49 Certificate, MID Certificate, HALT Test



Type Examination Certificate

n. IT-001-13-MI004-(B)

Issued in accordance with the Directive 2004/22/EC of the European Parliament and Council of March 31, 2004 on measuring instruments (MID) and with the Italian decree n. 22/2007 of February 22, 2007 which implements the Directive 2004/22/EC (MID).

Applicant:
Spire Metering Technology LLC
15 Craig Road
Acton, Massachusetts 01720
United States of America

Type of instrument:
Heat Meter
Type designation:
280T-SND 15-1.5
Test report:
*MI-004.153/2012
MI-004.103/2013*
Notified Body:
*Pa.L.Mer. Scarl.
EC-notified body n.2213*
Date of issue:
June 13, 2013
Certificate valid until:
June 13, 2023

The Head of Palmer
Mechanical Industries
David Parkin

Pa.L.Mer.
società consorziata a r.l.
Palmer S.p.A. e ThermoPalme di Lazio Consorzio
Cap. Soc. € 685.020,00 - C.F. e P.IVA 01585150598
info@parcopalmer.it - Pec: palmer@pecparcopalmer.it
www.parcopalmer.it

Sede Legale
Via Camere, 12/A – 04100 Latina (LT)
Tel. 0773.40.36.16 – Fax 0773.83.02.02
sede@parcopalmer.it

Sede Amministrativa
Via Cesario Neri, 24/B (km 68,200) – 03013 Ferentino
Tel. 0775.24.00.13 – Fax 0775.24.51.90
ferento@parcopalmer.it



OIML Certificate No.
R49/2013-CZ-15.01

OIML BASIC CERTIFICATE OF CONFORMITY

Issuing Authority

Name: Czech Metrology Institute
Address: Okružní 31,
638 00 Brno, CZ
Person responsible: Jan Kalanda

Applicant

Name: SPIRE METERING TECHNOLOGY
Address: 15 Craig Road Acton, MA 01720
USA

Manufacturer of the certified type:
Name: SPIRE METERING TECHNOLOGY
Address: 15 Craig Road Acton, MA 01720
USA

Identification of the certified type

Water meter
Type: 280W...

For further characteristics see page 2 to 4

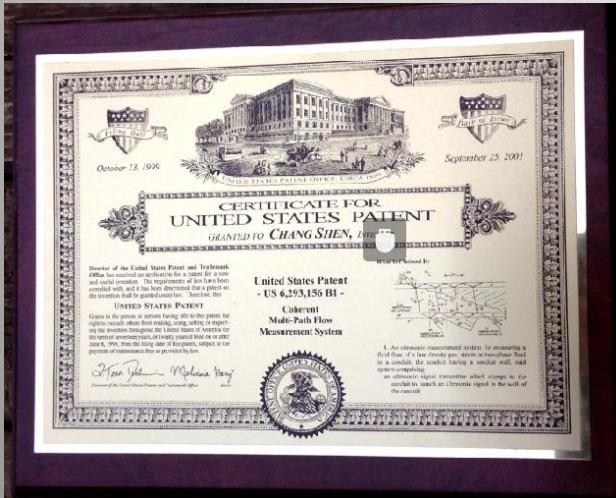
This certificate attests the conformity of above identified Type (represented by the sample(s) identified in the OIML Basic Type Evaluation Report) with the requirements of the following Recommendation of the International Organization of Legal Metrology (OIML):

R 49, edition 2013, for accuracy class 2



Proven Competence

Patents and Publications



(1) Inventor: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 242 days.

(21) Appl. No.: 13/374,768

(22) Filed: Jan. 12, 2012

(65) Prior Publication Data
US 2013/0108034 A1 Jul. 18, 2013

(51) Int. Cl. G01F 1/66 (2006.01)

(52) U.S. Cl. 73/861.25

USPC 73/861.25, 861.24, 861.28

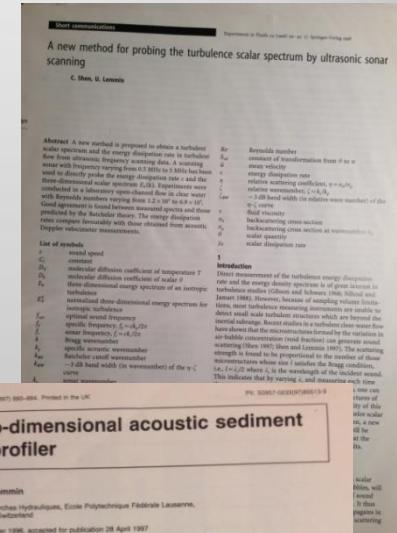
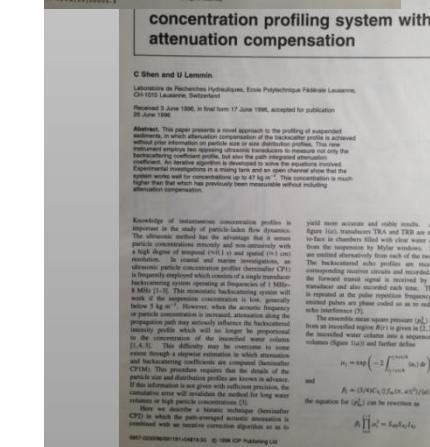
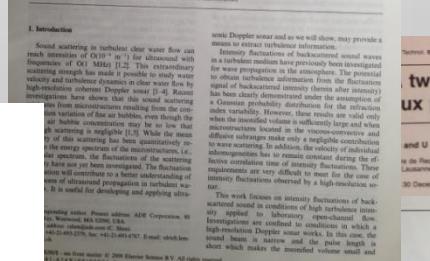
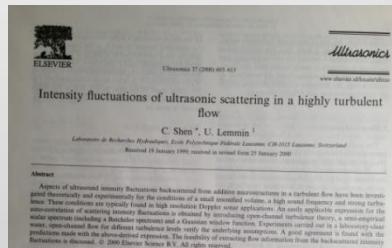
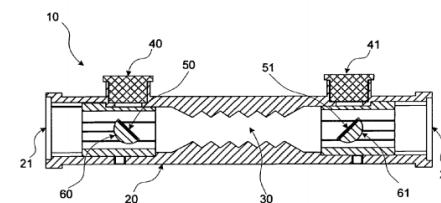
(38) Field of Classification Search
See application file for complete search history.

Primary Examiner: Jewel V Thompson

(57) ABSTRACT

An ultrasonic flow sensor comprises a flow cell body with an inlet/outlet side wall having an inner flow conduit through which the liquid or aqueous media flows, an inner flow conduit with rough surface that not only decreases the flow transition point from turbulent regime to laminar regime but also suppresses the formation of multiple ultrasonic waves, one pair of ultrasonic transducers for emitting ultrasonic waves and receiving ultrasound signals, one pair of ultrasonic wave reflecting mirrors for guiding ultrasound waves from one transducer to the other, and two reflecting mirror support fixtures which set the position and orientation of the ultrasonic wave reflecting mirrors. The rough surface and distance to the flow inside the inner flow conduit is minimized while the ultrasonic signal strength is maintained.

25 Claims, 8 Drawing Sheets





Membership



American Water Works Association



International Society
of Automation



Small Business Association
– New England

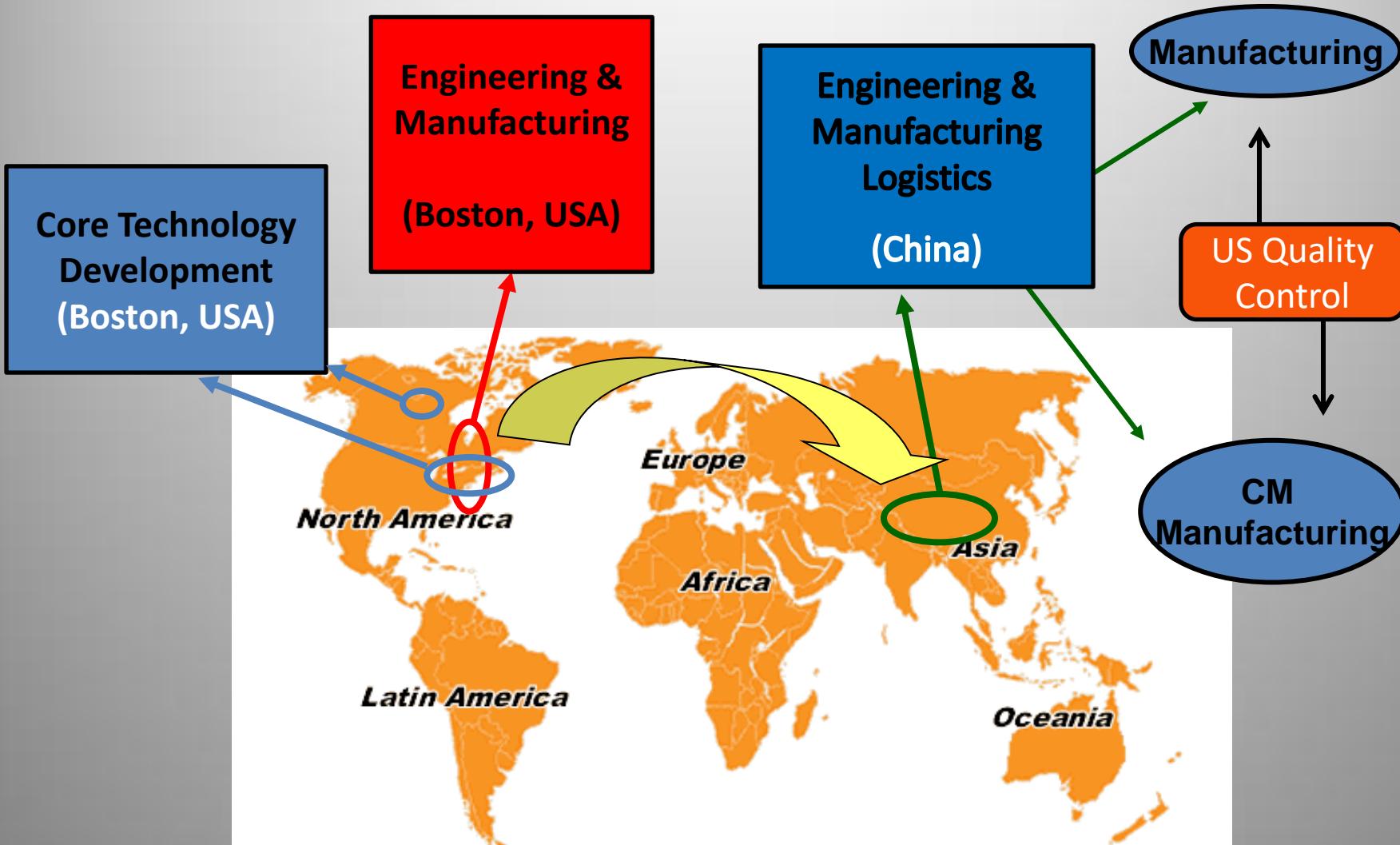


New England Water
Environment Association





High Performance, Low Cost



We are 100% behind our product quality!



We are proud to be the selected supplier for:

SIEMENS

مجموعة بن لادن السعودية
SAUDI BINLADIN GROUP
قطاعي العمارة وإنشاء المباني والمشاريع المستعجلة
ادارة الموارد البشرية

Honeywell

Carrier

ارامكو السعودية
Saudi Aramco

Schneider Electric



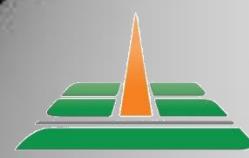
Johnson Controls



and more ...



LARSEN & TOUBRO
It's all about Imagineering



Domestic Distribution Channels



We are 100% behind our product quality!



International Distribution Channels





Quality Assurance

NIST Traceable Calibration Facility



Fully Automated Flowmeter Calibration Platform



Quality Assurance

Every Meter is Wet-calibrated





Quality Assurance

- Equipments for Endurance Tests



High-temperature Cycling



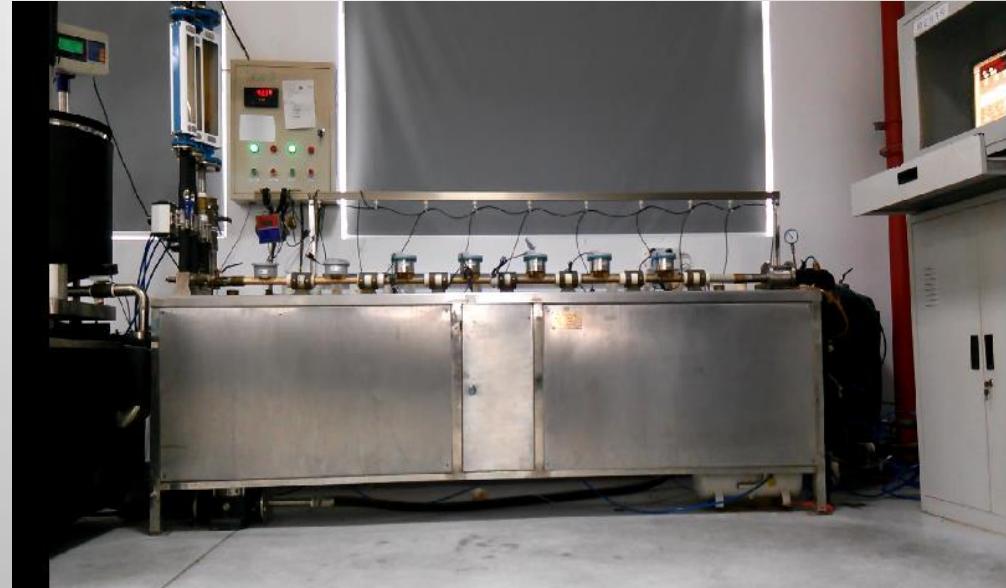
Temperature Bath



Pressure Testing



HALT Test



PASSED



Water Meters are in Oven under 85degC/85%RH for 1000 hours
Accuracy is still within range!



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Water & Other Utility Metering Products



Ultrasonic Water Meter

280W-D Domestic Water Meter

280W -CI Com/Ind Water Meter

280W General Purpose Water Meter

RH40 On-site Calibration Kit

Ultrasonic BTU Meter

280T BTU Meter

RH40 On-site Calibration Kit

Other Utility Meter

101E Single-phase Electricity Meter

103E Three-phase Electricity Meter

280G Gas Meter

280V Utility Valve

AMR/AMI & Billing Solutions

SpireCapture AMI System

SpireCapture Billing System

SpirePulsar Mobile AMR System



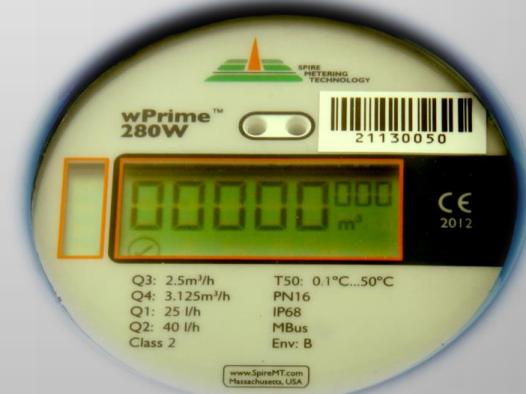
Residential Ultrasonic Water Meters



**No moving parts. No maintenance
Accuracy does not degrade over time
Robust brass body
Battery powered for 10 years
Ideal for residential metering**



ULTRASONIC COLD WATER METER



- Low starting flow rate.

Counts each drop

- Detects leakage
- Detects empty pipe
- Detects pipe burst

- Not impacted by water impurity due to proprietary sensor design.



How to Detect Leakage In Residential Properties?

Over 24 hours, if there is at least 1 hour that the flow stays at 0 or below a preset threshold, then, there is no leakage.

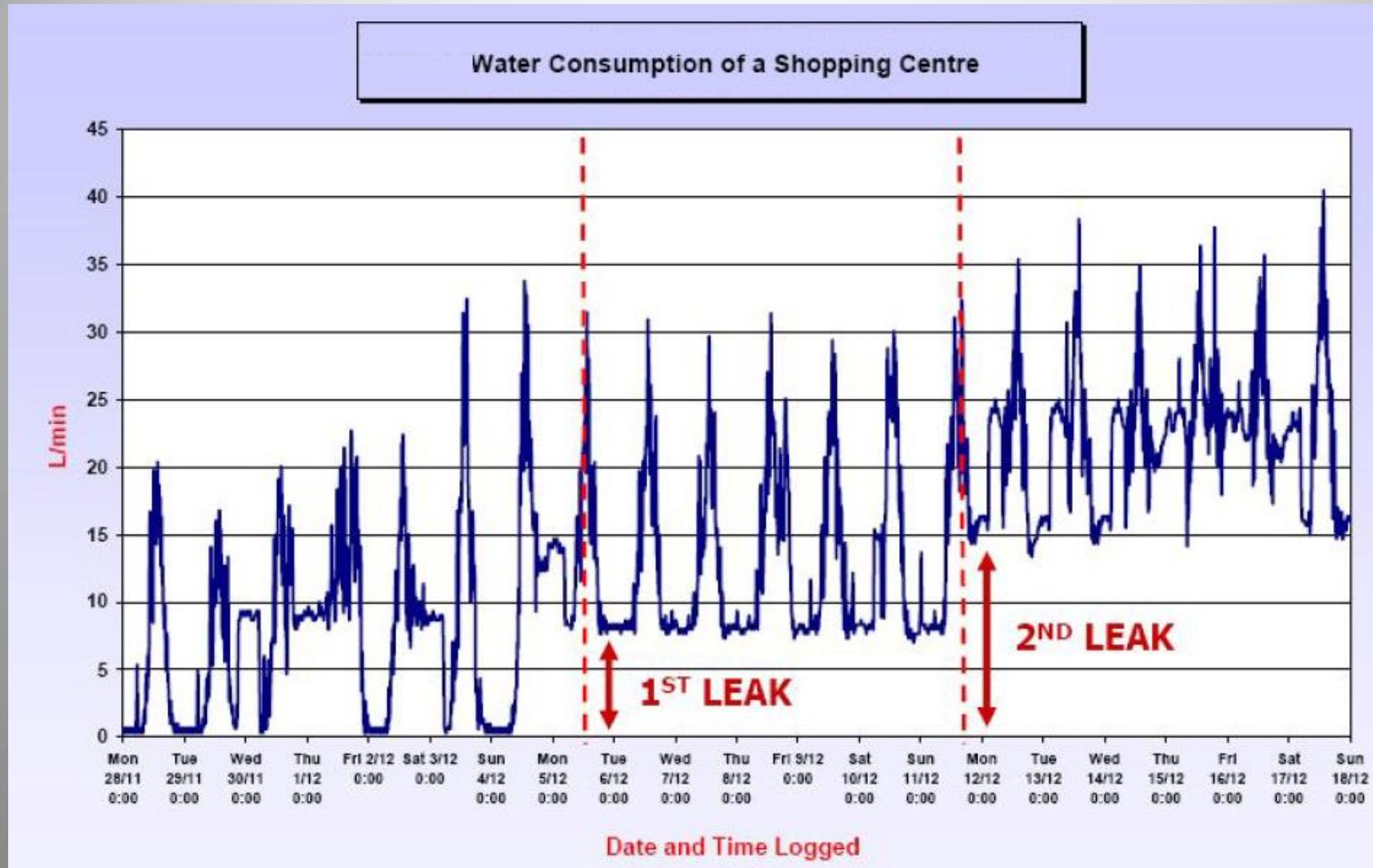
Otherwise, there is a potential leakage. The alarm status will set. An alarm symbol will be displayed.

If the next day the leak is gone/repaired, the alarm status will be reset and alarm symbol will be cleared.





Example



This family has two leaks occurred one after another. Each leak is about 8 l/min



C&I Ultrasonic Water Meter



Quad-path technology ensures high accuracy
Low starting flowrate allows for DMA leakage detection
Idea for commercial & industrial applications



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Long Range Wireless Endpoint

470MHz wireless, free band

2.5km distance in open space



Meter with RF Transmitter
(Integral type)



RF Transmitter
(remote type)

2-way communication

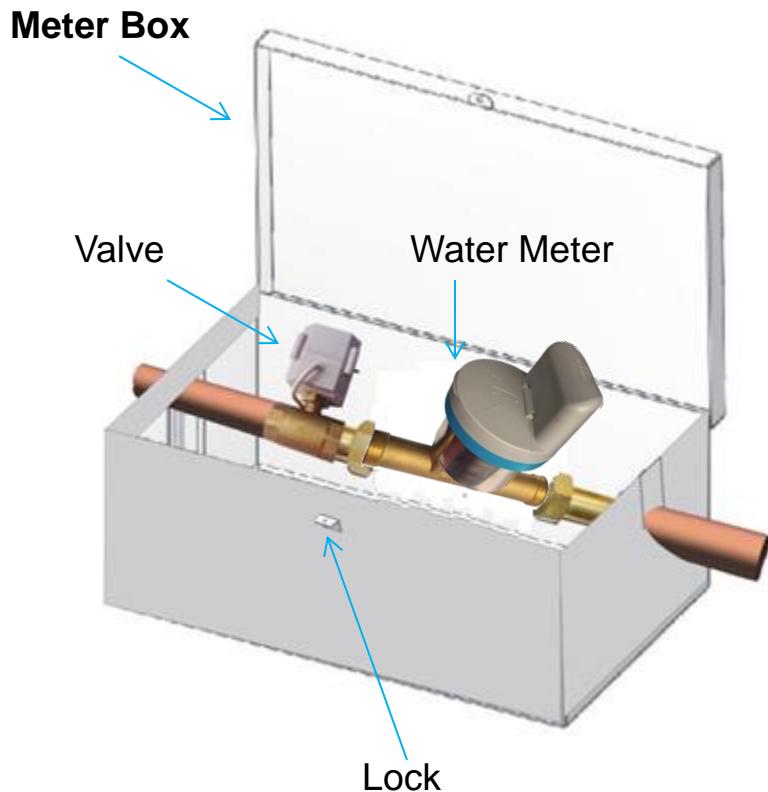
Battery powered for 10 years

IP68 water-proof

Cutting edge technology for increased sensitivity and robustness



Meter Box (Optional) for Water Meter and Valve

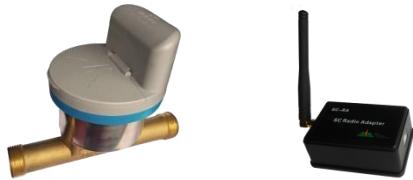


- Housing box with lock
- IP54
- Provides protection for water meter and shut-off valve tampering, vandalism, UV and dust



Network Components

Wireless Endpoint



- RF470 MHz wireless transmitter
- Integral type (built-in) or remote type (transmitter separated from the meter)
- Long range, >2.5 km
- Battery powered for 10 years

Wireless Concentrator - AC powered



- Downlink: RF 470MHz, >2.5km
- Two-way wireless M-Bus communication
- Uplink: GPRS cellular or Ethernet
- Large storage
- Support 1000 meters
- AC power supply, IP54

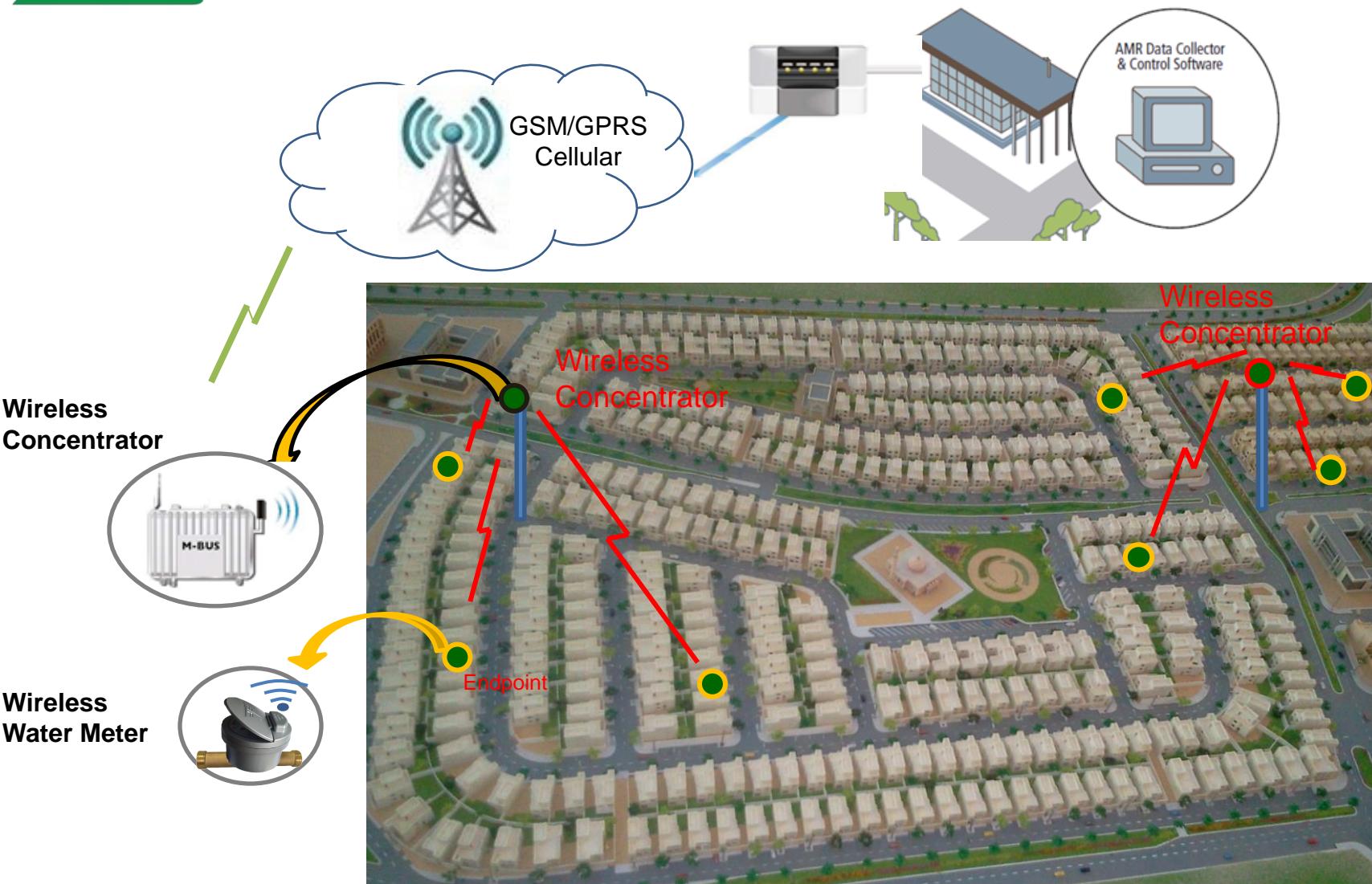
Wireless Concentrator - Solar powered



- Downlink: RF 470MHz, >2.5km
- Two-way wireless M-Bus communication
- Uplink: GSM/GPRS cellular or Ethernet
- Large storage
- Support more than 1000 meters
- Solar power supply, IP65



Wireless AMI System



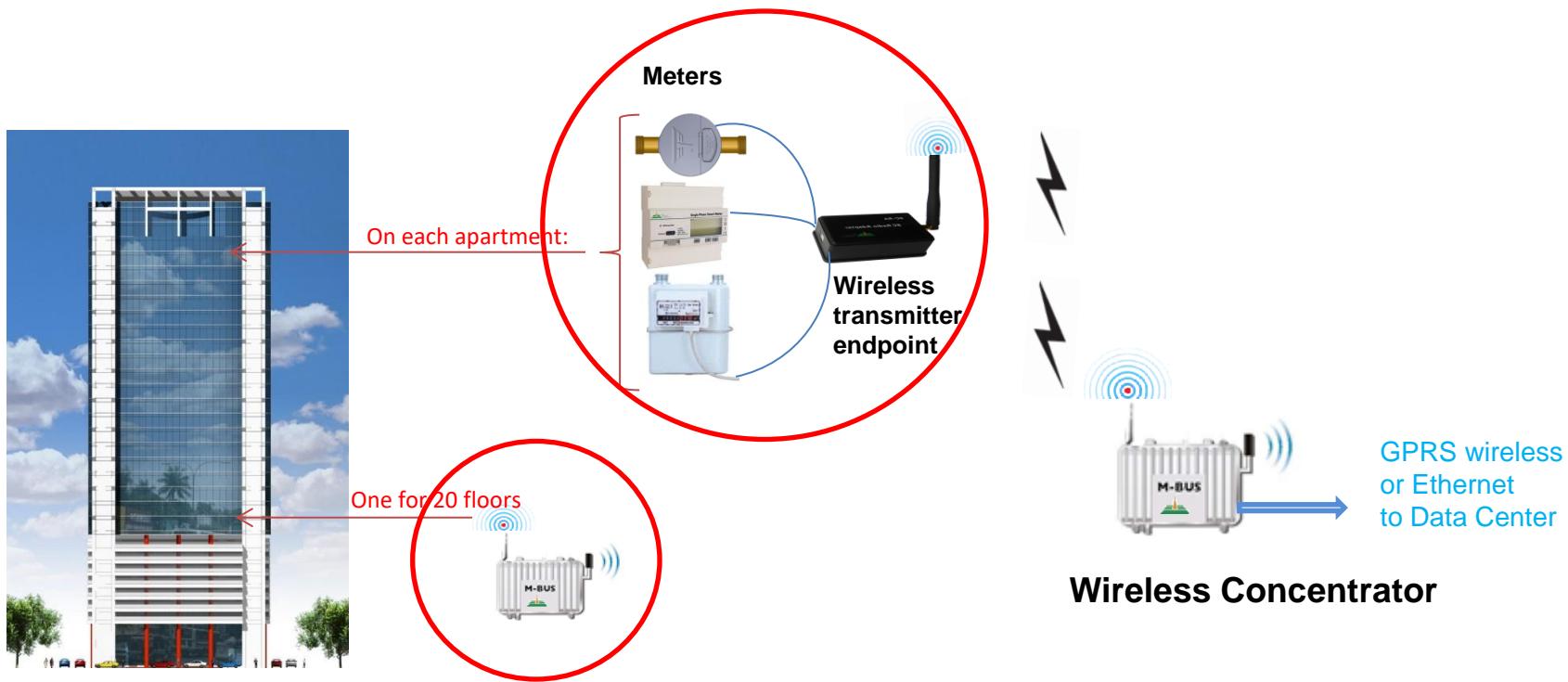
For a cluster of houses, one concentrator can be used.

From concentrator to data center, GPRS wireless or Ethernet connection can be used.

No need for repeater since the endpoint has a long operation distance



Wireless AMI System (cont.)



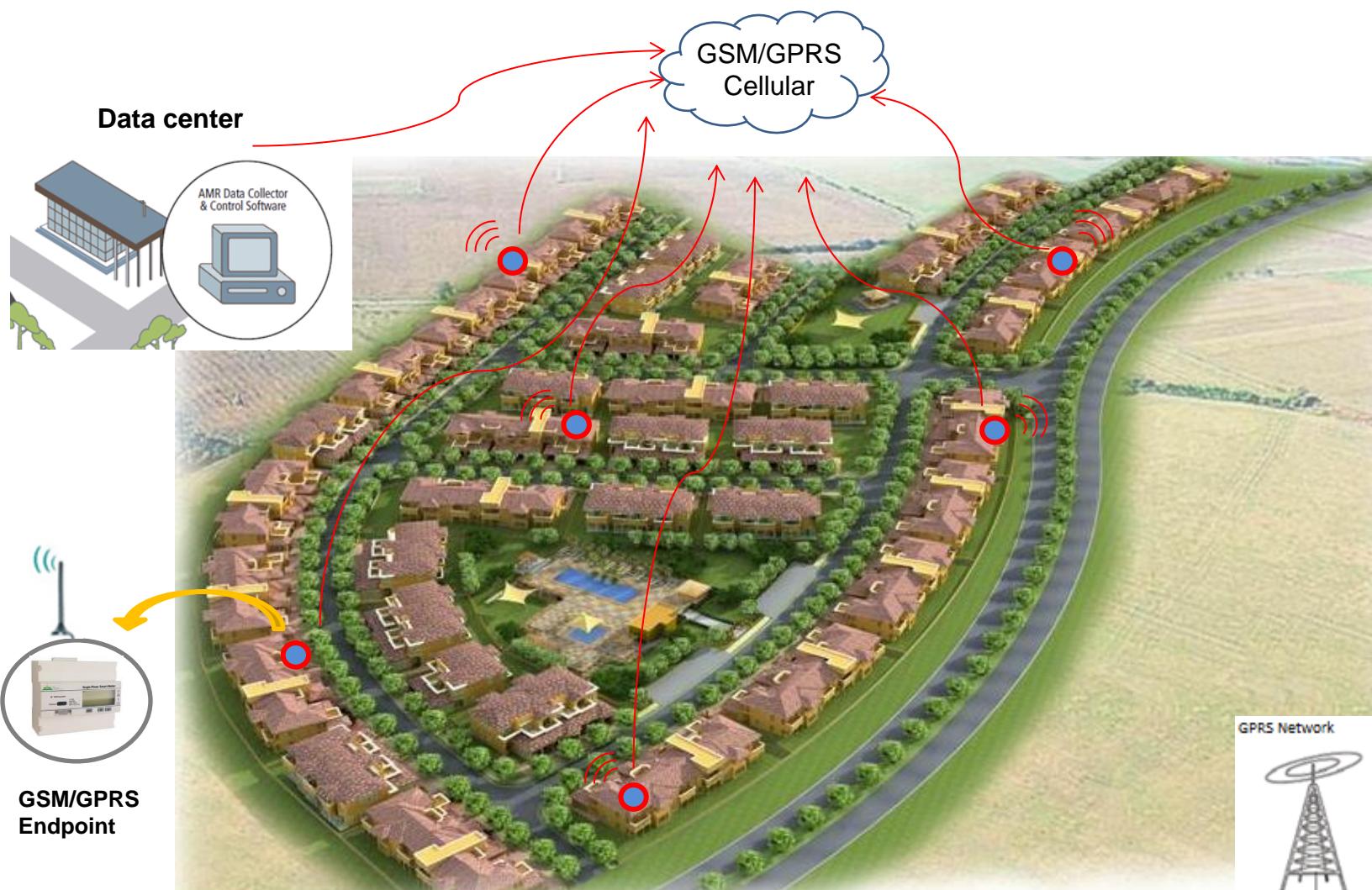
One apartment or house may have several meters, such as one water, one BTU, one Electricity and one gas meter.

To save cost, all those meters can be connected to a wireless transmitter endpoint through wire.



GSM/GPRS Wireless solution

Recommend only for remote locations



GSM/GPRS cellular network is used to send data to server (data center). Each smart meter will have an external GSM/GPRS modem unit.



Advantages:

- Cutting edge RF wireless technology
- Long range reliable wireless communication
- Two-way system for advanced features
- Accurate meter reading on hourly basis
- Improved meter reading safety and less turnover
- Increased customer satisfaction with historical consumption graphs (daily or monthly)
- Capability of leakage alarm, tamper detection, pipe burst alarm, empty alarm and more



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SpireCapture™ AMR Platform



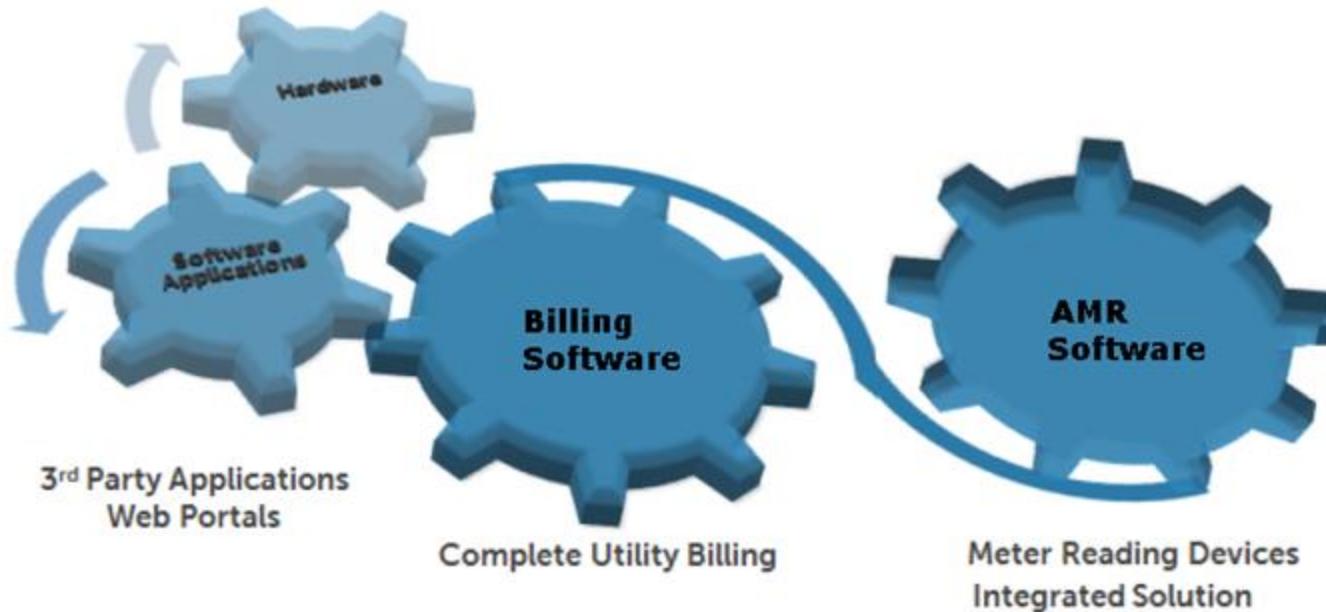
Complete utility management at your finger tips.

- 1. Fixed M-Bus AMR/AMI System**
- 2. Fixed Wireless AMR/AMI System**
- 3. Hybrid AMR System**



COMPLETE SOFTWARE SOLUTION

Open, Flexible, Scalable, Reliable

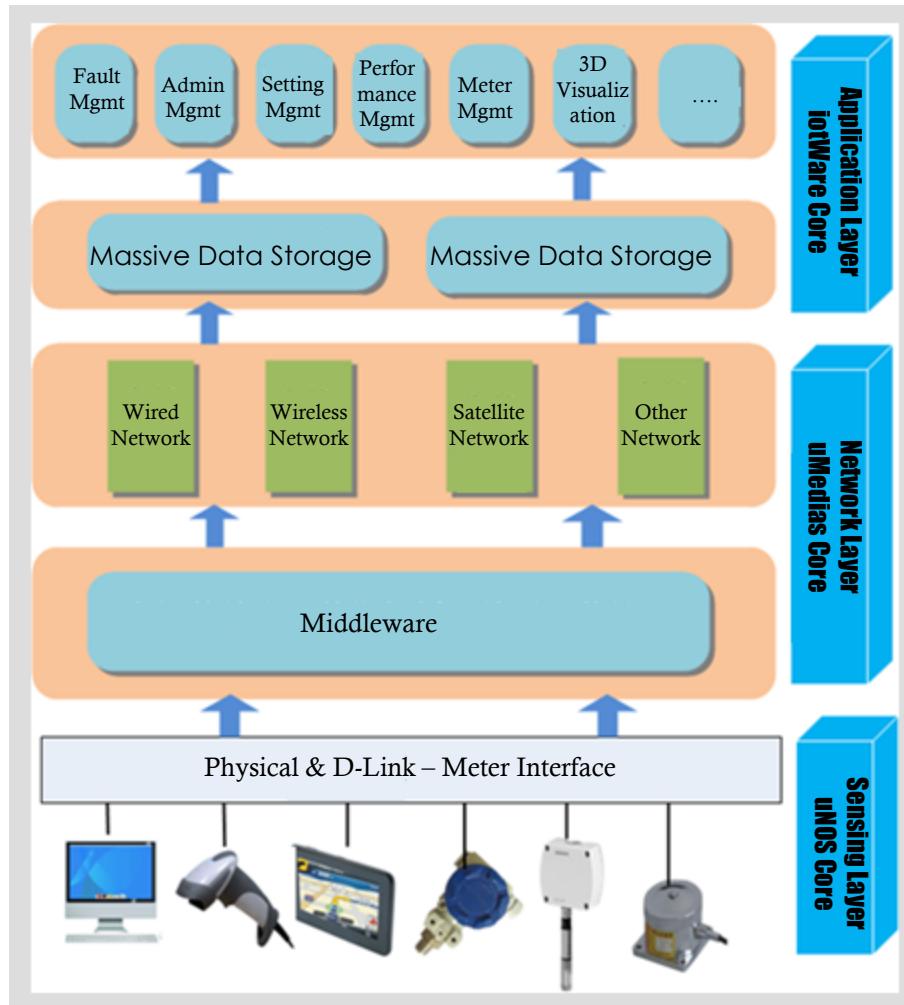


Provide a complete, integrated environment, combining
the best AMR software and billing software



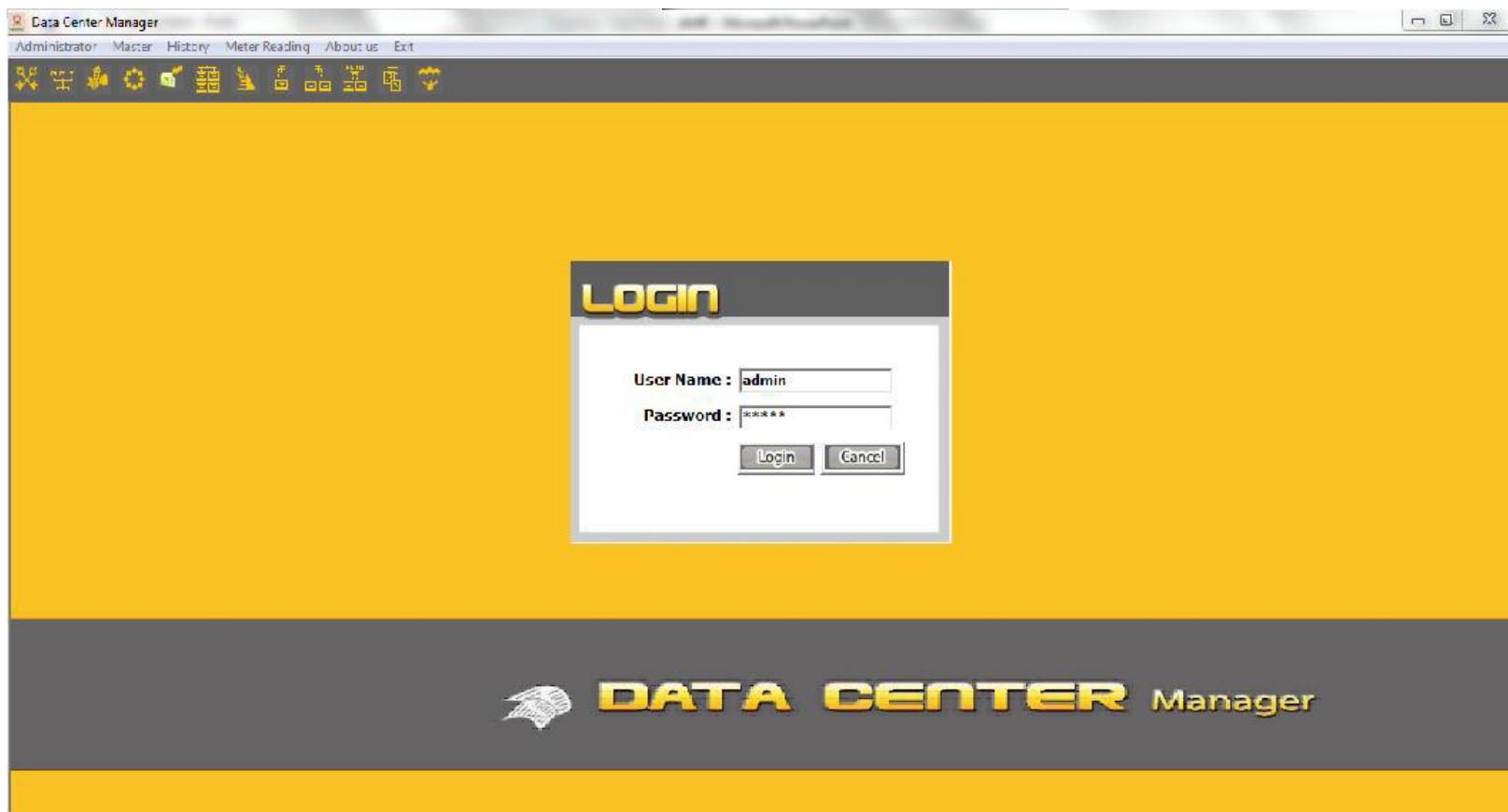
AMR SOFTWARE ARCHITECTURE

Open, Flexible, Scalable, Reliable

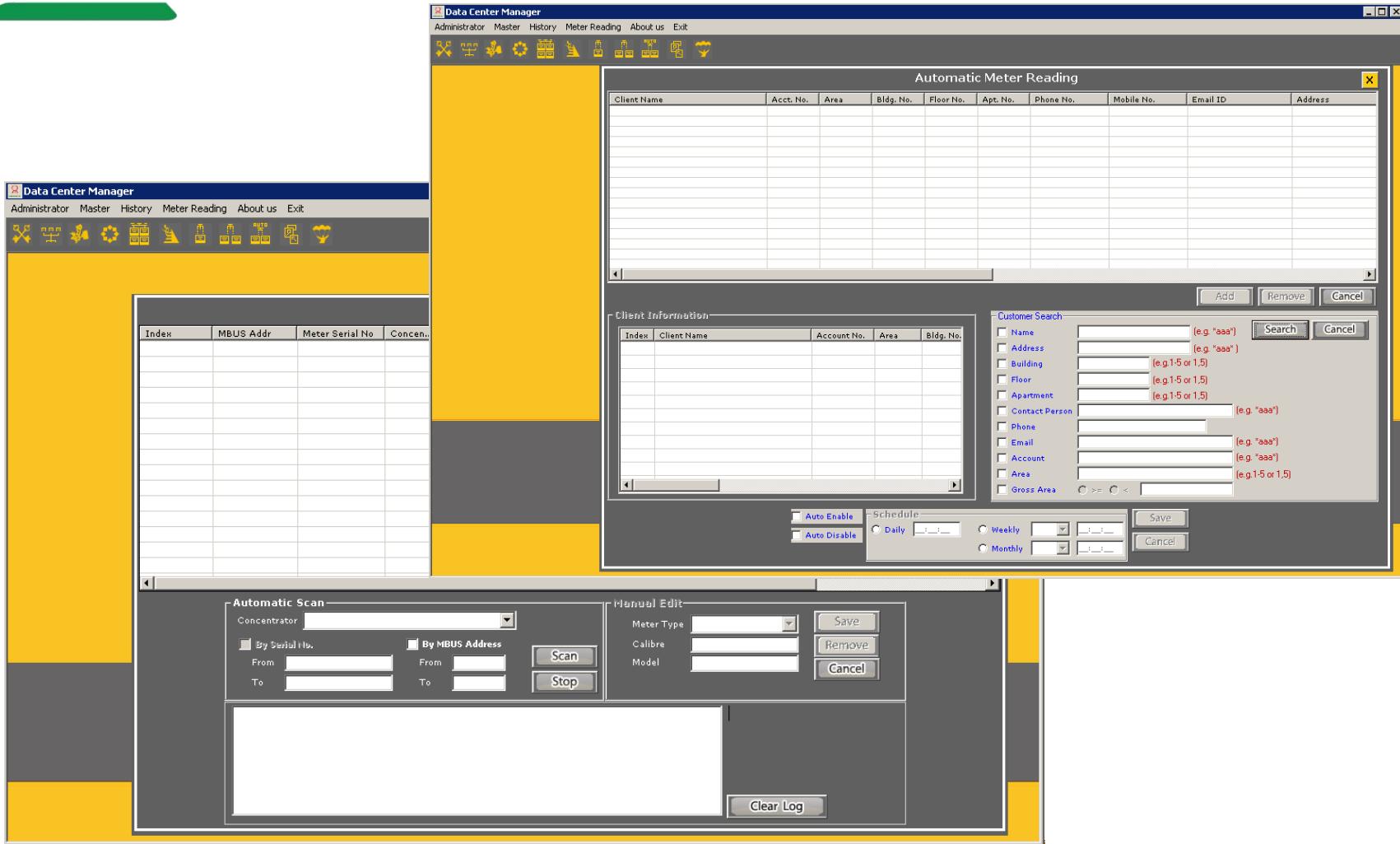




Standalone AMR Software



- **Standalone. Need only one computer**
- **Economical**
- **Good for small to median system**
- **Client-meter association**



- Client profile management
- Meter profile management
- Automatic meter discovery
- Client-meter association

- Scheduled meter reading
- SQL database
- Auto-link to Billing software
- Reports



Network-based AMR Software

English

Advanced SpireMT MMS

Based on iotWare®

Best Solutions For You

Watermeters

Log in

admin

.....

remember me

Login

You don't have an account yet? Register here

Forgot your password?

Best support for Google Chrome sponsored by IBM

- Reliable server-based data center
- Web presentation for remote data access
- Customized 3D visualization available
- Good for median to large system



Automatic meter reading at scheduled time and frequency

16:24:20
Mar 29/2013 Fri

admin1
Logout

Administrator 150
Master 348
History 152
Meter Reading 20
Read Single Meter 19
Automatic Meter Reading 96
Valve 222
Database 2
Virtual(3D) 127
Other 147

Concentrator
choose a concentrator ▾

Customer

index	ClientName	AccNo	BldgNo	Room	PhoneNo	MobileNo
1	abrhams	6115100723355896435			010-6523456	13652647892
2	Alice	5231656489380315254			010-6524529	13652647246
3	anne	5871299557808013920			027-246437530	13920101573
4	Betty	6220066233558287014			027-61233983	13910059861
5	Bob	6885100723355894568			0756-6556456	18052634892
6	Bruce	622584622394222			010-58946238	13911996222
7	Carmen	52234800111203250823			027-27558403	15920230065
8	Chris	8023651658947865432			010-54687923	15642398715
9	Christina	6221651658947865432			010-54687923	15642398745

Showing 1 to 20 of 30 entries

First Previous 1 2 Next Last

Auto Enable Auto Disable

Schedule ⓘ

After 00:MM:00 mins

Daily HH:MM:SS

Weekly weekly HH:MM:SS

Monthly monthly month



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The customer information can be added, edited, searched, removed in the tables

16:33:46
Mar/29/2013 Fr

admin1
Logout

index	ClientName	AccNo	Country	City	District	Street	Bldg	FloorNo	Room
1	abrhams	6115100723355896435	China	Beijing	Haidian	Zhongguancun	0	3	3-1-2
2	Alice	5231656489380315254	China	Beijing	Fangshan	Dadongcun	0	2	2-1-1
3	anne	5871299557808013920	China	Wuhan	Wuchang	Luoyulu	0	20	20-3-2
4	Betty	6220066233558287014	China	Shanghai	Wuchang	Luxiang	0	13	13-1-3
5	Bob	6885100723355894568	China	Zhuhai	Xiangzhou	Gangwan	0	5	5-2-1
6	Bruce	622584622394222	England				0	0	
7	Carmen	52234800111203250823	China	Wuhan	Wuchang	Zhongnan	0	11	11-3-6
8	Chris	8023651658947865432	China	Beijing	Chaoyang	Zhongchuang	0	15	15-4-6
9	Christine	6221651658947865432	China	Beijing	Yizhuang	Rongchang	0	12	12-3-7

Showing 1 to 20 of 30 entries

First Previous 1 2 Next Last

Administrator 150
Master 349
Concentrator Master 17
Customer Master 8
Meter Master 7
Meter View 8
Import-Export Meter Master 6
Meter Allocation 7
ON-OFF Status 7
History 153
Meter Reading 20
Valve 222
Database 2
Virtual(3D) 127
Other 147

Full name: anne
Floor no: 20
P.O.box:
District: Wuchang
Street no:
Street name: Luoyulu
City: Wuhan
Province: province
Country: China
Postal code:
Gross Area:
Reset

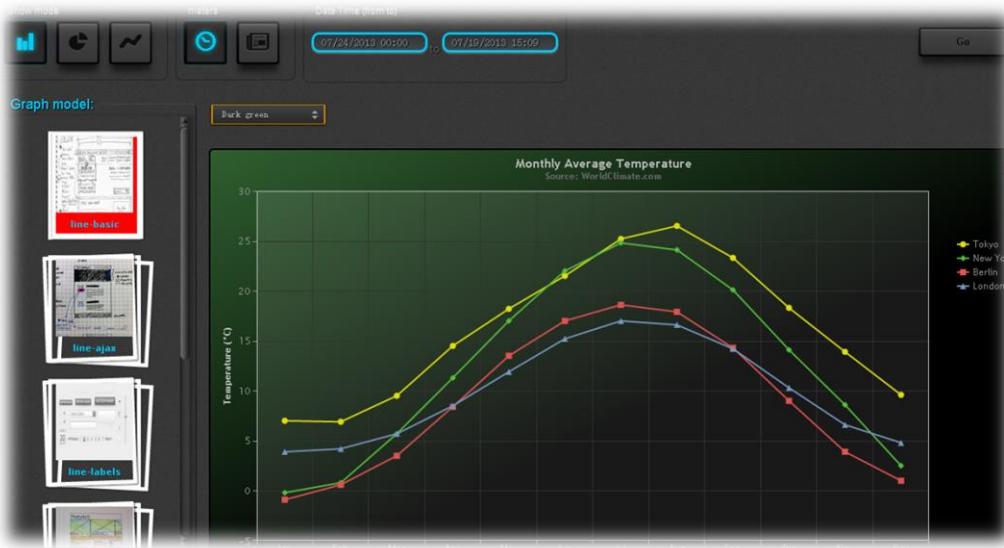
In Date: Check in date
Building no: 0
Account no: 58712995578080139
Telephone no: 027-246437530
Cell phone: 13920101573
Alt telephone no: alternate telephone n
Fax no:
E-mail: anne520@163.com
Contact person: contact person
Create: Submit
Reset

Sex: man woman
chose a photo
IPrint™ 280T
Ultrasonic Heat Meter
• Power: 7.5W~9W • PT 1000
• IP: 55 • 3.5 m/s • Temp Delta: -3~95°C
• Spots: 0.07 m²/s • Temp Range: +4~95°C
• Water Class: 2 • Accuracy: ±0.5%
• Resolution: 0.01°C
Model 280T DIN 131
CE
RoHS
WEEE
FCC
IC
ISO 9001
ISO 14001
ISO 13485
ISO 27001
ISO 45001
ISO 50001
ISO 9001
ISO 14001
ISO 13485
ISO 27001
ISO 45001
ISO 50001

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Data mining function provides utility company an effective way to manage water resources and discover potential loss

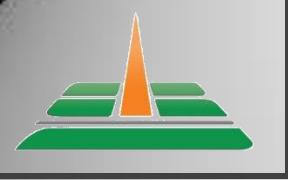




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References



NASA – USA



Monroe South Bend Canal Association – Utah, USA



Bin Laden Group – Saudi Arabia



Army National Guard – New Hampshire, USA



7th Word Trade Center
New York, USA



BHP Billiton - Australia



India Institute of Technology – Bombay, India



GE Global Research

United States - India - China - Germany



الراجحي والسعودية
Saudi Aramco

