UNIVERSAL
METERING

SmartMeter Prepayment™

Water Metering System

SmartMeter Prepayment™

The **SmartMeter Prepayment™** water system is a revolutionary and complete 'water metering solution'. **SmartMeter Prepayment™** water metering provides many benefits to both water companies and end users, including guaranteed revenue and arrears collection, extensive management tools through detailed report functionality and the ability for customers to manage their budgets more easily.

A dynamic approach to Prepayment Water Metering

SmartMeter Prepayment™ is a straight forward and user friendly system to operate, as it uses a Smart Card to handle credit and monitor water use.

Customers purchase credit at vending points, providing an opportunity to download new tariff data. Simultaneously, data from the meter, stored on the Smart Card, is uploaded and sent to the utility headquarters.

Installed in a convenient place inside the home or business, the **SmartMeter Prepayment™** Internal Unit communicates with the external meter box, housing the meter and control valve, using wireless radio.

The **SmartMeter Prepayment™** Internal Unit is the customer's interface and requires the Smart Card to be inserted for it to work. It displays the credit status and gives useful information about the volume of water remaining, tariff status and potential leakage.

SmartMeter Prepayment™ guarantees payment prior to water distribution. SmartMeter Prepayment dramatically reduces operating overheads by removing the need for a billing department or meter readers.

The SmartMeter Prepayment™ water system provides the safest financial solution in water metering today.

INSERT SMART CARD

EXTERNAL METER BOX

INTERNAL UNIT & SMART CARD

HOUSE

VENDING POINT

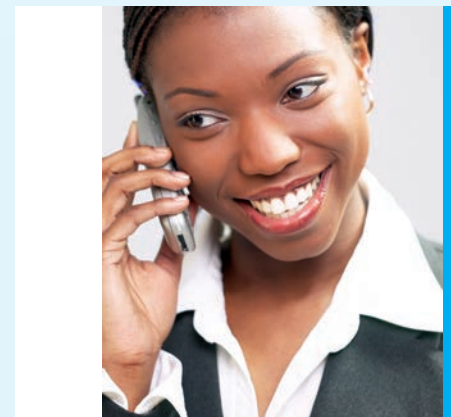METER MANAGEMENT SYSTEM
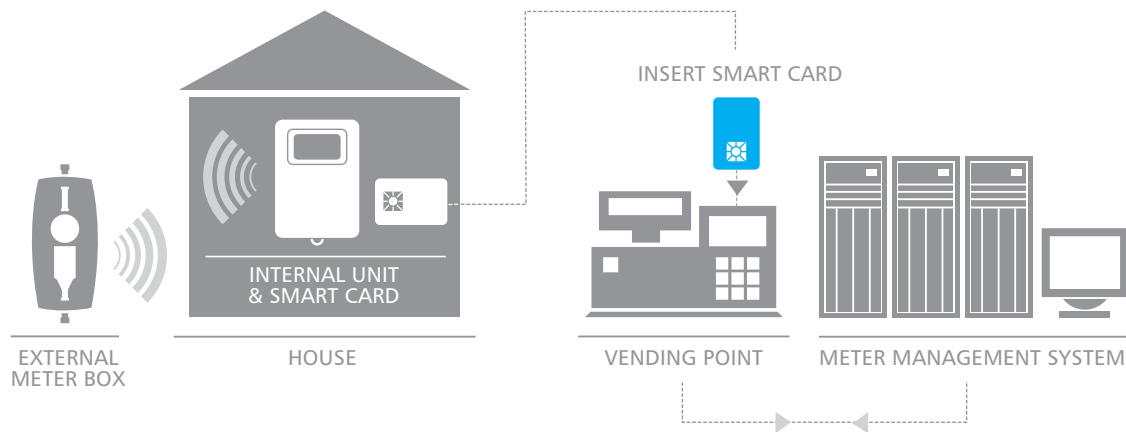
SmartMeter Prepayment™ Components
Internal Unit (IU)

- Power supply – 3.6v lithium battery. Expected battery life 8-10 years under normal operating conditions
- Conformal coated printed circuit board (PCB)
- Accommodates a Smart Card reader (the mechanism used for credit transfer). Can cut off the water supply on Smart Card removal
- Incorporates a tamper switch, which activates a water supply cut off

- Liquid crystal display (LCD), which shows the following customer information:
  - Prepayment credit
  - Remaining water available
  - Accumulated water consumption
  - Current tariff band status (8 levels)
  - Water supply valve – open / closed
  - Emergency water – on / off
  - Low battery warning
  - Any communication issues between the IU and EU
  - Tamper status

External Unit (EU)

- IU and EU communicate via radio frequency (RF), with a maximum distance of 200m – range is dependent upon installation topography
- System integrity IP68 protected
- Incorporates a tamper switch, which activates a water supply cut off
- Power supply – 3.6v lithium battery. Expected battery life 8-10 years under normal operating conditions

- The External Unit manages the following data and controls:
  - Prepayment credit
  - Remaining water available
  - Accumulated water consumption
  - Monthly water usage for the current month and previous 6 months
  - Minimum night time flow rate
  - Valve status
  - Battery status
  - Daily rateable value deductions
  - Programmed variable tariffs

Meter Management System

The Meter Management System (MMS) provides a friendly way for utilities to manage the SmartMeter Prepayment operation; run reports, find leaks, schedule battery changes, manage customers and prevents fraud.

The MMS is centrally located and collects customer and consumption data coming from the vending points. The MMS also sends data back to the vending point and Smart Card network. It is possible to add, shut off or remove customers and alter tariffs.

Each unique Smart Card will only operate in a single customer's Internal Unit (IU). The Smart Card further provides a two way communication highway back to the MMS and delivers the following data:

- Accumulated water consumption
- Monthly usage for the current month and previous 6 months. Facilitates accurate zoned water balances and trend analysis
- Minimum night flow. Highlights potential leaks within the customer's premises
- Battery status is reported 6 months prior to failure, allowing time to schedule a maintenance visit
- Tamper status and mode is highlighted to initiate an evaluation visit to assess the mode and potential fraudulent/vandal activity
- Collection of arrears. Accommodates a field for customer arrears within the database. It can be deducted on a fixed amount or a fixed percentage of each transaction
- Limit water consumption to a maximum daily water allowance in times of water restrictions
- Collect rateable value community charges (up to 8 different rates)

Report Generation

SmartMeter Prepayment™ includes a powerful suite of reports, giving utilities full diagnostics and revenue control and the reports include:

- Battery status exception
- Minimum night flow exception
- Tamper status exception
- No purchase since installation
- No purchase in the last 31 – 60 days
- No purchase in the last 61 – 90 days
- No purchase in over 90 days
- Customer sales history
- Transactions per customer per day
- Vending points sales data
- Transactions per vending point per day
- Water usage report

Additional reports can be generated on request.
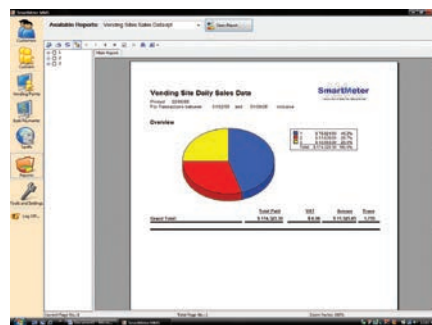
The Metering Technology

Unaffected by particulates and with no moving parts to wear, the meter is 100% accurate for its lifetime. Guaranteed not to record air, customers know that they are only every billed for the water they use.

Due to constant maintenance, cumulative inaccuracies caused by wear and the fact that they record and bill for air (up to 7 times as much), Mechanical Meters are a thing of the past, and should not be used in Prepayment systems.

Therefore, **SmartMeter Prepayment™** is the only Prepayment system in the world to offer accuracy, performance and reliability.

The advantages

- Unaffected by grit and particulates
- Does no measure air
- Retains accuracy throughout its entire lifetime
- Prevents losses in billing revenue

Vending Points

Vending points can be provided at fixed locations or as mobile hand held vending units. These options provide full flexibility for urban and rural areas.

Customers bring their Smart Card to a vending point to load new credit. When new credit is loaded to the card, customer and consumption data is uploaded.

To operate the vending point, a Cashier Card and a 4-digit PIN is required. This ensures only authorised cashiers can operate a vending point and a full transaction audit trail is available.

Vending points regularly upload all transactions. In the event that communications are not possible, a manual transfer system is available. The vending points link to the MMS, which offers a full SQL server database, through a communication network using secure FTP protocols. The MMS can handle in excess of 5 million customer records through a Smart Card protected operator interface.

Application development allows operation under 32-bit or 64-bit editions of Microsoft Windows XP Pro, Windows 7 Pro or Windows 8 Pro, and Server 2003, 2008 & 2008 R2 editions.

Typical example of a customer vending point

SmartMeter Prepayment™ Benefits

For the water company:

- ■ Flexible tariffing
- ■ Different shut-off levels overcome traditional hurdles to Prepayment
- ■ Automatic and remotely controlled - no customer visits required after installation
- ■ Two-way communication between customers and the utility. Provides many of the benefits of Automatic Meter Reading systems
- ■ Protected long-term revenues with guaranteed accuracy

For the customer:

- ■ Customers are in control of their own budgets
- ■ Water supply is not cut off unexpectedly
- ■ Less administration helps to keep prices more affordable
- ■ No visits to the customer's property required to read meters

Technical Specification

System Hardware - Prepayment Domestic Water Meter System

ITEM	SMARTMETER PREPAYMENT™ SPECIFICATION
FEATURES	
Lifeline	✔
Emergency water	✔
Daily limit	✔
Pre debit	✔
Tamper detect	✔
Sealed	✔
Customer profile	✔
Low battery warning	✔
Field configurable	✔
Communication	Radio frequency 433 MHz up to 200m line of sight (other frequencies possible on request)
MEASUREMENT	
Specification	Full electronic water meter (does not measure air and is unaffected by sand or grit)
Flow	Min 15 l/h, Max 7 m³/h
TARIFFS	
Type of tariffs	Multi
Tariff Groups	8
Type	Fixed, inclining, declining & free issue
CLOCK	
Type	Hardware real time clock
Control type	Latching valve
METER TOKEN	
Type	Smart Card
Function	Credit transfer, configuration, test, tariff, tamper reset and data feedback
Display type	Liquid crystal

ITEM	SMARTMETER PREPAYMENT™ SPECIFICATION
VENDING	
Online	✔
Offline	✔
MOUNTING	
Vertical	✔
Horizontal	✔
Inclined	✔
Below ground	✔
POWER SOURCE	
Type	Lithium battery (3.6v dc)
Life span	8 to 10 years
HOUSING	
Internal and External Units	Grivory
Meter box	ABS (impact and UV resistant)
IP (Housing)	IP54
IP (Electronics)	IP68
Components	Meter, valve and electronic control modules manufactured to ISO:90001standards
Connections	½" BSP (15 mm) female at both inlet and outlet (SF150 & SF200) ¾" BSP (20mm) female at both inlet and outlet (SF250)
TESTED TO	
ISO 4064	✔
OIML R49-1	✔
Operating pressure	From 0.1 to 12 bar
Maintenance	Minimum maintenance procedures
Literature	Comprehensive user manuals
Guarantee	36 months manufacturers guarantee

SmartMeter™ Bulk Prepayment System

"Pareto's Principle" or the "80-20 rule" states that 20% of the population controls 80% of the wealth, which is as true with bulk metering. Even though the number of industrial applications are considerably less than domestic, they provide significant revenue, due to their considerably higher annual consumptions.

SmartMeter™ Bulk Prepayment can satisfy pipe sizes from 2" (50mm) up to 12" (300mm) and flow rates of 85 m³/hr up to 3054 m³/hr respectively.

Operating in exactly the same manner as the domestic **SmartMeter Prepayment™** system, **SmartMeter™** Bulk Prepayment offers the most reliable method of water delivery to the industrial and commercial sector.

Other components and software are as per the domestic **SmartMeter Prepayment™** system.

Guaranteed monies prior to supply, especially from these large customers can dramatically assist in development of other areas of the water network, reducing overall network leakage and reducing both technical and real revenue loses.

Typical Bulk Meter used in an installation

Typical Bulk SmartMeter Preypayment Installation

METER

SHUT OFF VALVE

PLINTH

BELOW GROUND

WATER FLOW
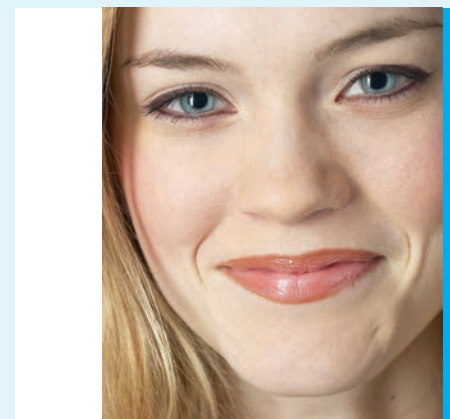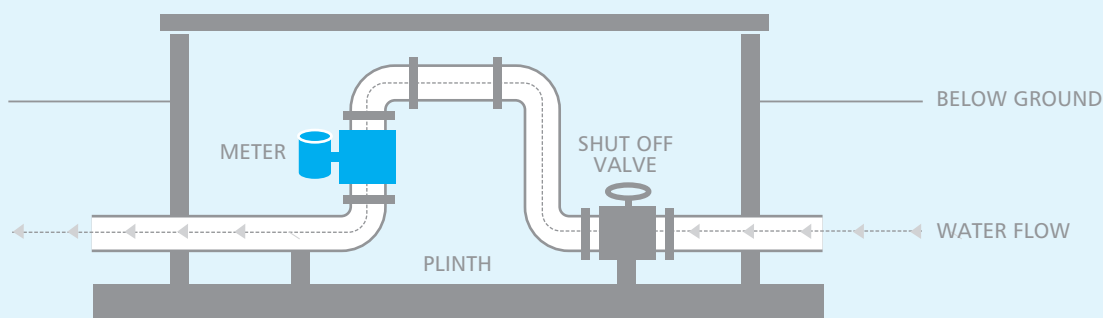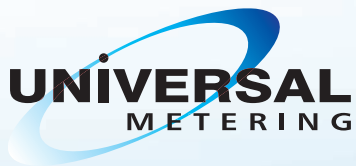
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