Infinity
INSIGHT MANAGEMENT
(PTY) LTD

L'AISON

The Most Widely Used Smart Water Meter Brand in Africa

TECHNICAL PROPOSAL

LAISON SMART WATER METER

LAISON GPRS Prepaid AMI Smart Water Meter

064 655 1330 admin@iimsa.co.za www.iimsa.co.za

GPRS Prepaid Smart Water Meter Solution

- Postpaid & Prepaid working mode switchable
- STS Compliance (IEC62055-41,51) for Prepaid Working Mode
- Integrated GPRS Module for Daily Automatic Meter Data upload
- Touchable Keypad for Flexible Meter Data Query

For Prepaid Working Mode

- Flexible Water Purchase Way at Vending Points, Vendor POS, Self-service Mobile Phone
- Convenient Payment via E-payment Channel (Mobile Money, Online Bank etc.)

Abstract

LAISON

This Proposal is prepared to introduce LAISON GPRS Smart Water Meter Solution with Postpaid / Prepaid Working Mode switchable, which aims to improve Water Revenue Collection, reduce Non-revenue Water (NRW), and also make end-customers' much more comfortable for water using and only pay for what they use.

The Proposal Consists of Two Parts:

01

GPRS Smart Water Meter working in Postpaid Mode, mainly for Remote Data Collection for Bill Generation, Data Analyzing, Report Generation etc. in HDMS (Hardware & Digital Billing Management System)

02

GPRS Smart Water Meter working in Prepaid Mode, which confirms to STS protocol IEC 62055-41,51, to realize Prepayment function. With Mobile Vending solution which integrates to local E-payment Platform (Mobile Money, Online Bank etc.) for easy water vending. The meter recharge could be done remotely via GPRS Com. Channel or through IR pad via Infrared Com., in the meantime, the meter could still upload the daily consumption data everyday for monitoring and analyzing.

For the purpose of servicing you better, we suggest to select the Working Mode (Prepaid or Postpaid) basing on project background and real situation.

For more details please kindly go though the proposal.

CONTENT

1.General

LAISON GPRS Smart Water Meter is a new generation of Smart Water Meter, equipped with GPRS Communication Module for bi-directional communication between Smart Water Meter and Hardware & Digital Billing Management system (HDMS), to realize Meter Remote Recharge, Automatic Data Collection etc. functions.

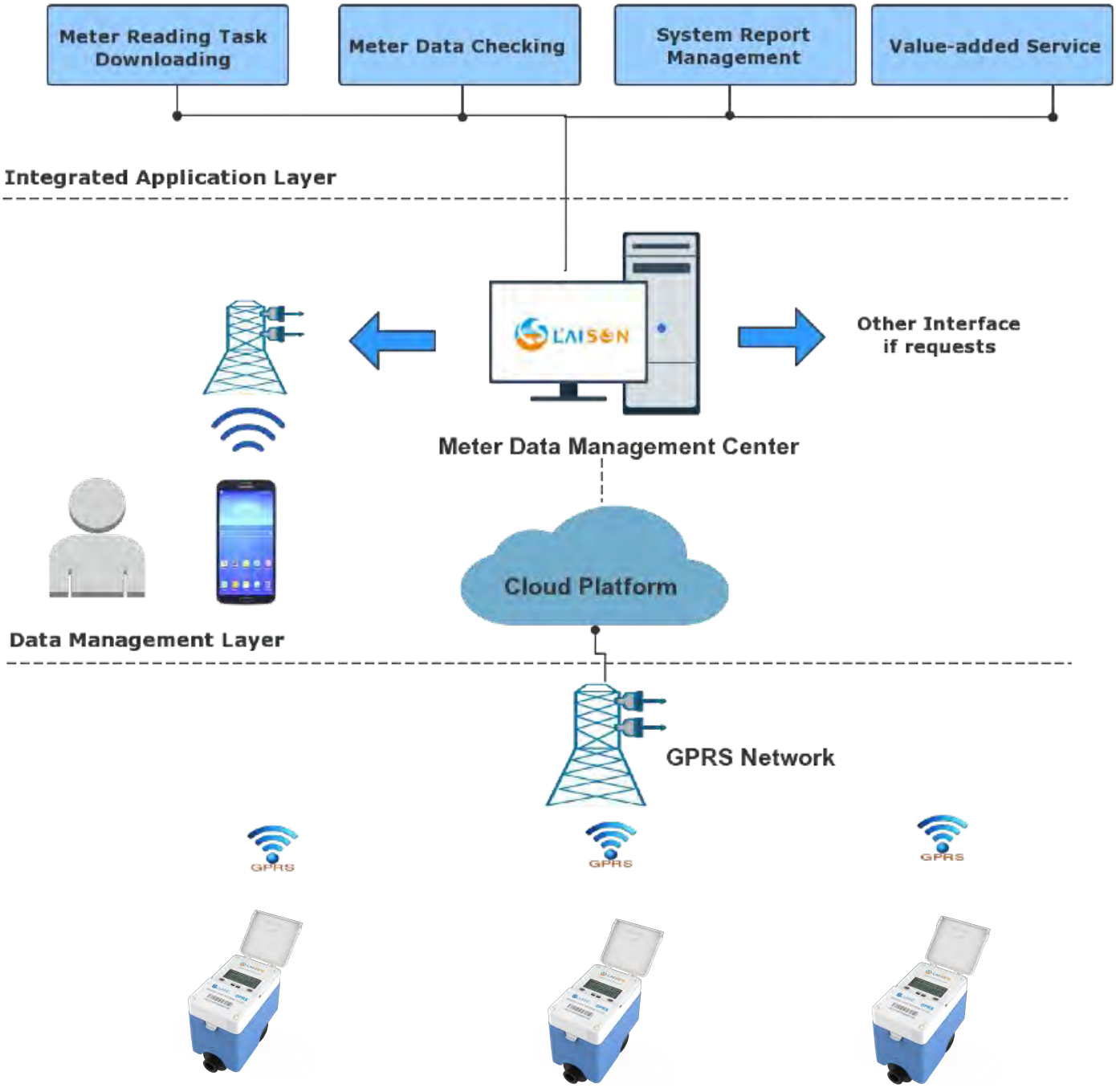
Moreover, it supports both Prepaid and Postpaid working mode, aims to meet the different requirements for different project background, reducing Non-revenue Water (NRW) and improve the working efficiency for Water Boards.

- Integrated Ball Valve, Prepaid & Postpaid Working Mode optional
- IoT Ready (GPRS) for Remote Meter Monitoring & Control
- Anti-UV Material shell and LCD protected cover to prolong the service life of meter
- Smart Module independent potting and nano-coating technology to ensure IP68 for outdoor installation
- Mechanical & Electronic Separation Structure for easily Maintenance, and better protection of Mechanical Dial
- Touchable Keypad on meter casing for convenient Data Query & Remote Data Upload
- Human-based design for easily SIM card insert and replacement
- Infrared Com. Reserved for Meter Recharge & Data Query
- Integrated Sensor for Meter Dismantle Detection & Alarm (Optional)
- 19,000mAh energy-based battery to guarantee 6+ years battery lifespan, replaceable

2.Basic Working Process

The GPRS Smart Water Meter can be connected to local GPRS network after inserting the SIM card, WITHOUT any requirement of extra Communication Station Establishment, for bi-directional data transfer between HDMS system and Smart Water Meter, to realize basic functions like:

- **Remote Meter Recharge for Prepaid Working Mode**
- **Remote Meter Data Checking via GPRS Com. Channel**
- **Daily Automatic Meter Data Upload**
- **Real Time Alarm Event Info.**



3. System Components Introduction

3.1 Smart Water Meter Part

LAISON PARISE GPRS Smart Water Meter solution is compatible with Plastic Body, Multi-jet Dry Dial and Wet Dial type mechanical water meter, at Water Authorities' Choice.
Here we propose Plastic Body, Multi-jet Wet Dial, WITH R (Q_3/Q_1) value 100/160

Plastic Body, Multi-jet, Wet Dial Type, R100/R160			
Items		**Parameters**	
Nominal Diameter DN	**mm**	15	20
Q_3	**m^3/h**	2.5	4.0
R (Q_3/Q_1)		100/160	
Working Temperature		T30/T50	
Nominal Working Pressure	**MPa**	1.0	
Pulse Equivalent	**m^3**	0.1/0.01 optional	
Class of Upstream Flow Field Sensitivity		U10	
Class of Downstream Flow Field Sensitivity		D5	
Protective Level		IP68	
Permissible Error		$Q_2 \leq Q < Q_4$	2%
		$Q_1 \leq Q < Q_2$	5%
Communication Method		GPRS Comm. Reserved Infrared Comm.	
Communication Distance		Depends on local GPRS Comm. Station coverage ≦2m by Infrared Comm. without obstacle	
Protection Level		IP68	
Power Supply		Lithium battery DC3.6V， replaceable 1pcs ER35615+HPC1520 (19000mAh)	
Battery Lifespan		≥ 8 years	

3.2 LAISON Hardware & Digital Billing Management System (HDMS)

LAISON Hardware & Digital Billing Management System (HDMS), aims to realize Water Vending, Revenue Collection, Meter Monitoring, Data Management & Statistic for both Prepaid Smart Water Meters and traditional Mechanical Water Meters, targets to improve the working efficiency for Water Authority by Digitialization and Reduce Non-Revenue Water (NRW) by Meter Monitoring and Leakage Control.
It has functional modules as follows but not limited to:

4.3.1 Basic Functional Module

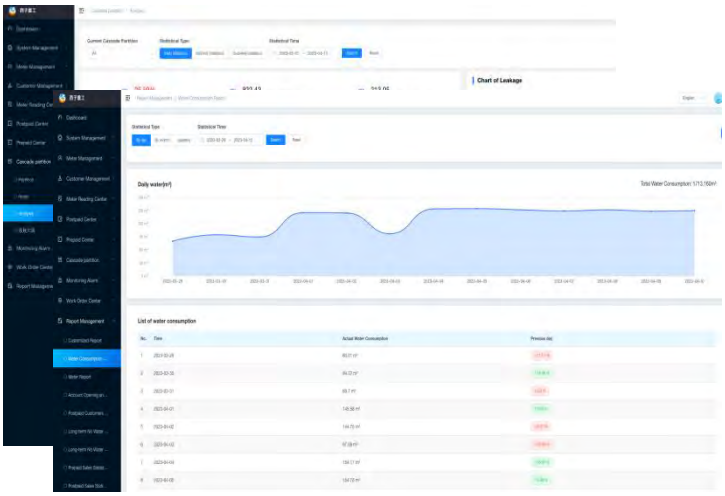
It aims to manage the basic configuration like Water Tariff, Customer Info. thus to realize the digital billing for both Prepaid Vending and Postpaid Revenue Collection. Also system & data security is taken priority consideration by self-defined Authority Scheme for different level of operators

4.3.2 Extra Revenue Collection

LAISON HDMS supports extra additional fee/ historical debt automatic collection to dramatically increase the revenue income for Water Authority, No historical Debt anymore

4.3.3 Remote Meter Control & Data Collection

LAISON HMDS provides Regular Remote Meter Data Collection basing on different communication ways like LoRa, GPRS, NB-IoT, LoRaWAN etc. integrated in meter. Moreover, it supports 24*7 Remote meter monitoring in case any abnormal event happens like Water Leakage, Magnetic Interference, Illegal Meter Dismantle etc.



4.3.4 Data Statistics

LAISON HMDS provides various data statistics report on Water Vending, Consumption etc., in various mode like Dashboard, CEO Carbinet etc., make full use of the meters' data, assist for decision-making for water utility

4.3.5 Data API for integration

LAISON provides various API for future integration with different 3rd party systems includes but not limited to Billing System like SAP/Oracle etc., IoT Platform like Live Objects (Orange), SIEMENS Energy, Municipal Management/Smart City System, E-payment Channel like M-Pesa, Airtel etc.

Integration with SAP/Oracle etc. SaaS Billing System

Integration with IoT Platform

Live Objects

SIEMENS energy

Integration with SAP/Oracle etc. SaaS Billing System

Integration with E-payment (Mobile Payment/Digital Bank）

M-PESA

airtel

Standard Chartered

citibank

3.3 LAISON Customer Self-help App

LAISON HDMS provides Customer self-service APP for Online Business, Self-service Water Purchase by E-payment, Self-service Water Consumption Data Query and Instant Alarm of abnormal event, at customers' convenience.

4.3.1 Water Purchase

Customer can purchase water through self-service via AquaCyber App by E-payment

4.3.2 Meter Recharge

After successful water purchase on AquaCyber App,customer will get a 20 digits token and the token will be recharged at pre-defined time(normally at midnight)

4.3.3 Data Query

After Entering into Aqua Cyber's home page, enter into my Meter Menu, then click Read Meter Button. Different meter data will be displayed.(Including Meter Parameters, Water Consumption, and Meter Status.)

4.3.4 Historic Usage Data Query

After entering into Historical Usage page, customer can click Month Button at Top to view daily water consumption in a certain Month. Click on the date at the top of the page to switch months.

Customer can click Year Button at Top to view monthly water consumption in a certain year. Click on the date at the top to switch years.

4. Functional Introduction - Postpaid Working Mode

4.1 Basic Functions

- **Real Time Clock**

  Adopting internal crystal oscillator Timing in meter to ensure the high accuracy of RTC (Real Time Clock), which is the guarantee of basic functions like Frozen Data, Event Record etc.

- **Remote Meter Data Checking via GPRS Com. Channel**

  Meters' data could be queried remotely via GPRS Com. Channel on HDMS System when necessary

- **Daily Automatic Meter's Parameter Upload**

  LAISON GPRS Smart Water Meter will upload the corresponding data to Center System HDMS automatically everyday.
  Each meter is allocated by an Automatic Data Upload Time by center system, at which time, the meter will automatically wake up and upload the data to center system and then back to sleep mode after 30 seconds non operation period.

- **The data uploaded from Meter to Center Management System includes:**

  1)Meter No.
  2)Meter's Firmware Version No.
  3) Battery Voltage
  4)Real Time Clock (RTC) in Meter
  5)Hourly Consumption Data Record (24 data per day)

- **Alarm Event Record & Upload**

  LAISON GPRS Smart Water Meter shall upload the corresponding Event Record to Center System in real time when it occurs.

  Following Event Record will be recorded and uploaded Automatically:

  1)Meter Reset (Battery Replacement)
  2)External Magnetic Interference
  3)Valve Open/Close Failed
  4)Low Batter Voltage
  5) Water Leakage
  6) Illegal Meter Dismantle (optional)

4.2 Battery Management

- **TWO (2) levels of low battery warning**

1st level of low battery warning: when battery voltage reaches the 1st level of alarm value, the valve should be closed once to remind the customers to replace the battery in time. At this time, the valve could still be opened for continuous water usage.
2nd level of low battery warning: when battery voltage reaches the 2nd level of alarm value, the valve should be closed and can not be opened anymore until it is replaced.

Data Auto-save when power off

All the data in meter will be stored safely in non-erased memory and valve will be closed when power off.

4.3 Secure Management

Anti-Magnetic Interference

If external magnetic interference happens, the meter shall record this event with exact time and Valve is optional to be closed as configured

Leakage Detection

When the meter is with a certain flow in constant for over 24 hours period, a visual alarm of Water Leakage will be triggered

Meter Dismantle Detection (Optional)

By integrated specific Sensor in meter, it could detect possible illegal meter dismantle and corresponding alarm info. will be recorded and transferred to HDMS

4.4 Data & Event Record

Monthly Consumption Data Record

10 years' Monthly Consumption Data Record can be stored and queried.

Hourly Consumption Data Record

Hourly Consumption Data Record can be stored and queried for Trend Analysis and Customer Monitor

PART TWO

STS Prepaid Part for Prepayment Function

1.General

LAISON GPRS Smart Water Meter could work in Prepaid mode when necessary
It complies to STS Protocol (Standard Transfer Specification), which is an Open Architecture initially introduced in South Africa in 1993, for the transfer of electricity prepayment tokens. Subsequently published by the IEC (International Electrotechnical Commission) as an International standard IEC62055-41,51
Now it also becomes popular for Water & Gas Meters with following advantages:

A Compatibility

Inter-operability between system components from different manufacturers of prepayment systems

B Easy Data (Water Volume / Credit) Transfer

No External Data Transfer Media (Token-less). LAISON joined STSA (http://www.sts.org.za/) in 2014 and get both LAISON STS Prepaid Smart Meter & STS Vending System certified in 2015.

THE STS ASSOCIATION

CERTIFICATE OF CONFORMANCE

This is to certify that the

LAISON STS PREPAYMENT WATER METER LXSZ V 3.0.0

Of

HANGZHOU LAISON TECHNOLOGY CO., LTD

has been assessed and found to satisfy the requirements of the Standard Transfer Specification

Tested for Compliance with: IEC 62055-41, IEC62055-51
In accordance with the STS531
Compliance Test Specifications Entities: D-STS531-4; E-STS531-5-6; F-STS531-6-1-07
Testing Reference Number: HZLAI-LXSZ

DISCLAIMER
This certificate certifies that the certified product has been tested for the compliance with the version of the Standard Transfer Specification (STS) current as at the date (as detailed above) of testing and that the certified product has been found to be STS Compliant to the extent tested, as required by the STS Association. The certificate does not certify or imply STS compliance of Every actual or potential feature of the certified product nor that the certified product is or will be interoperable with STS compliant products other than the certified product. In this regard, the STS Association does not and will not indemnify any person against claims of any nature that may arise out of the testing, certification, use, sale or distribution of the product and the STS Association is hereby indemnified against all liability from any claim by any party arising from any defect or other Characteristic of the certified product.

For the STS Association

16 October 2015
Date

Certificate No. STS-556

THE STS ASSOCIATION

CERTIFICATE OF CONFORMANCE

This is to certify that the

LAISON VENDING SYSTEM VER 1.2.0.0

Of

HANGZHOU LAISON TECHNOLOGY CO., LTD

has been assessed and found to satisfy the requirements of the Standard Transfer Specification

Tested for Compliance with: IEC 62055-41, IEC62055-51
In accordance with the STS531
Compliance Test Specifications Entities: STS531-1-0-02 Ed1.3
Testing Reference Number: laisont.2-0015

DISCLAIMER
This certificate certifies that the certified product has been tested for the compliance with the version of the Standard Transfer Specification (STS) current as at the date (as detailed above) of testing and that the certified product has been found to be STS Compliant to the extent tested, as required by the STS Association. The certificate does not certify or imply STS compliance of Every actual or potential feature of the certified product nor that the certified product is or will be interoperable with STS compliant products other than the certified product. In this regard, the STS Association does not and will not indemnify any person against claims of any nature that may arise out of the testing, certification, use, sale or distribution of the product and the STS Association is hereby indemnified against all liability from any claim by any party arising from any defect or other Characteristic of the certified product.

For the STS Association

14 September 2015
Date

Certificate No. STS-547

2. System Component

LAISON GPRS Smart Water Meter, in Prepaid Working Mode, consists of

01

Smart Water Meter

GPRS Smart Water Meter, in Prepaid Working Mode Comply with STS standard IEC62055-41,51

02

IR Pad

IR Pad reserved for Meter Recharge & Data Query via Infrared Com.

03

Point of Sale (POS)

Point of Sale (POS) for Remote Water Vending, for Appointed Agency

04

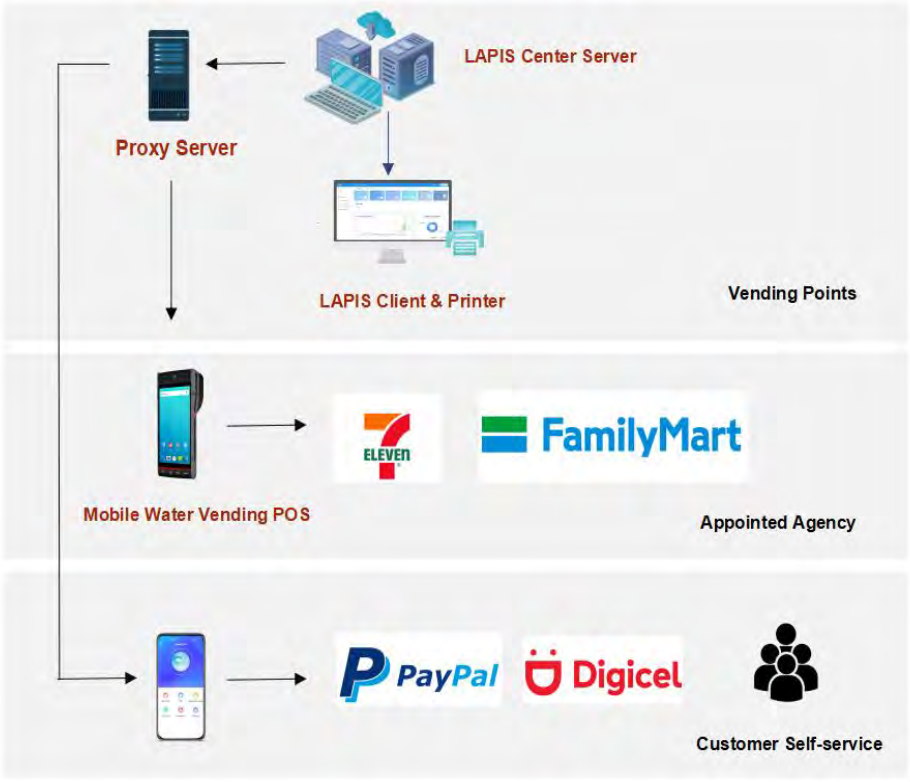
Hardware & Digital Billing Management System (HDMS)

For Water Vending, Meter Monitoring, Data Management & Statistic etc.Local deployment/Cloud Deployment optional

3.Basic Working Process

3.1 Flexible Water Purchase Way

LAISON Smart Water Meter Solution provides flexible water purchase way, make it much more convenient and easier.



01
At Vending Points via HDMS, by Cash

02
At appointed Agency via POS, by Cash

03
Customer self-service via Mobile phone, either through APP or USSD, by E-payment

3.2 Flexible Water Recharge Way

By integrating GPRS Com. Module and infrared Sensor in ONE (1) in Meter Part, it supports GPRS as main communication way and Infrared as backup for Meter Recharge & Data Query.

4.POS for Remote Water Sale by Appointed Agency

LAISON POS (Point of Sales) is an intelligent device which is used for Remote Water Purchase (Mobile Vending) of LAISON STS Prepayment Water Meter System.

It is designed for the appointed Agency / Vendor of Water Company, who firstly purchase bulk water from Water Authority, get the corresponding sales quota and then re-sell to end-users until the sales quota is used up. The Vendor could get more sales quota by self recharge operation, the payment could be done via PayPal / Credit etc.

It adopts ANDROID 5.1 OS and support WIFI, GPRS, Bluetooth etc., by integrating Barcode scanning, IC Card/Contactless Card Reading, Thermal Printer, GPS etc. functional modules, it provides a flexible, comprehensive solution to Water Authorities, for convenient water re-sell, avoid heavy investment in establishment of Vending Points.

5. STS Prepaid Water Meter Function

5.1 Basic Functions

Meter Recharge

By 20 digits recharge token, which comply with STS Standard IEC62055-41,51

Overdraft Function

Emergency Water, customers could still consume water even if the balance credit in meter is used up if Overdraft Function is activated.

Recharge Limitation

Anti-water storage, if remaining water + current recharged water > Recharge Limitation, it shall reject the recharge operation, to prevent water storage.

Insufficient Water Warning

Low Credit Alarm, if remaining water in meter reaches the alarm value, the buzzer should beep and the LCD shall give indication to remind the customers that the water is about to used up.

5.2 Flexible Meter Recharge Ways

Remote Recharge via GPRS Com.

After purchase of water credit at Vending Office, it could be remotely recharged via GPRS Com. Channel at HDMS

Via IR pad

Customer could use IR Pad to input the 20 digits recharge token for meter recharge, through Infrared Com.

5.3 Human-based functions

Friendly Time Period

Friendly Time Period which consists of Off-duty Time, Weekend, Holiday can be set according to requirement of Water Authority
During Friendly Period, customers could continuous use water even if the balance credit in meter is used up, the water consumed during this period should be accumulated and deducted in next recharge.

- **Social Amount**

  According to some countries' policy, getting access to water is the basic human right, thus we designed the Monthly free consumption management function, which means, during each month, X cubic meters could be provided to customers for free.

- **Emergency Water**

  Can be accessed via the CIU using 2-digit codes. With a configurable allocation which is free issue, for some emergency case, such as fire.

Recommend: Video in Youtube

Split STS Prepayment Water Meter:

https://www.youtube.com/watch?v=Yg36zvDzmg4

Walk-by AMR Solution for semi-automatic Meter Data Collection

https://www.youtube.com/watch?v=8EWS60tnokA

064 655 1330 admin@iimsa.co.za www.iimsa.co.za