Micro-Prepayment Vending Solution



Foreword

Utilities all around the world are getting more and more aware of importance of using prepayment system to reduce their bill collection losses. This system especially in developing countries plays an important role. Prepayment and Vending solution can solve different social and economical problems such as:

- Carrying cash for bill payment;
- Dealing with debt management;
- Customer consumption management;

One of problems of prepayment (vending) systems is that their implementation is not an easy job and needs reasonable amount of hardware and human resources especially in utilities covering big geographical area with significant number of villages and cities. From the other hand by emerging micro-grids, systems and solutions, which could fit in this new architecture, bring Hexing to the point to develop Micro-Vending system; a very lightweight and affordable but full function vending system.



Solution Overview

As a pioneer in metering industry, Hexing has developed flexible, reliable and extendable prepayment vending solution that complies with IEC, STS and CTS standards and can satisfy interoperability requirements of utilities around the world. This system is designed to manger small quantity of meters (consumers) meanwhile it is very efficient, robust, reliable and secure.

Hexing prepayment vending system has been implemented in different countries from Africa to South America for many years, which bring rich experiences to Hexing technical team.

Highlights:

Interoperability:

- Provide prepayment service for all STS meters from different manufacturers;
- Support web based services through XML standard;

Stability:

- Clustering and disaster recoverable architecture guarantee 24/7 continually service;
- Automatic data backup and routine maintenance to keep data safe and available in need;

High Performance:

Generation capacity of about 60 tokens per second;

Open Standard Interface:

- 3rd party vending interface which complies with XMLVend standard. (Integration with Mobile SMS vending, POS vending, E-bank vending, ATM vending, WEB vending);
- CIM based interface to 3rd party systems, such as CRM and Billing;

Security:

Using the hardware encryption module (STS standard) to generate vending token;

- The web-server checks data (i.e. Post, Get, and Cookie) committed by customer to prevent XSS, SQL Injection attack;
- Third-party using https service for security connection;
- CDU vending adopts the hardware-bound license for security;

Supported by Long Term Experience:

Experience of multiple successful projects implemented all over the world, like South Africa, Ghana, Nigeria, Dominica, Peru, etc.;

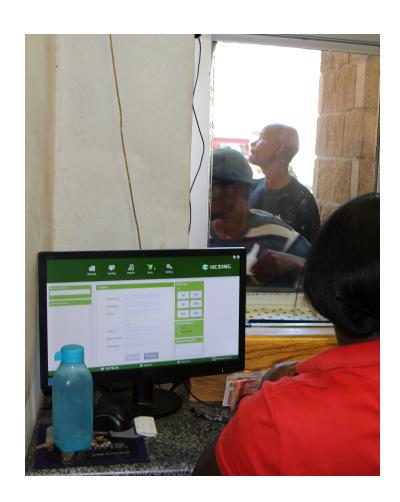


Highlights

Hexing Micro-Prepayment Vending solution is developed by using MySQL as an open source, fast, reliable, and small scale RDBMS that can operate on small PC-Server machines and bring full range of prepayment and vending advantage to small scales utilities or far villages and Micro-Girds.

Features

- Future Proof Technology:
 - Modular design which can ensure functional flexibility and fully meeting utility's current needs as well as future business changes;
 - Fully web-based User Interface with user-friendly and cross-browser compatibility;
- Support scaling up projects from pilot to small scale applications then to large scale projects;
- Integration with 3rd party systems via CIM based or custom designed interfaces;
- Security:
 - Multi-factor login authentication;
 - Access control;
 - Security audit;
 - SSL (Secure Sockets Layer) high security access;
 - AES/DES and RSA encryption;
 - Abnormal consumption analysis;
- Easy Maintenance:
 - This system is designed to work on lightweight PC-Servers, so its maintenance is also easy.





Functionalities

Vending Management

User Friendly and multi browser compatible user interface helps operator to easily login to this system and sell tokens (electricity) to consumers. This system is designed to be very simple, reliable and scalable to enable utility to use it in secure and convenient way.

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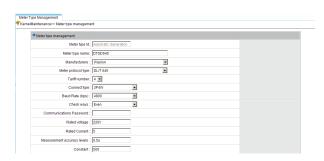


Easy vending process

Meter Information Management

Meter management is used to manage meter information like serial number, rated current and tariff program. Operator can check, add, import, modify and cancel meter information. All activities of operator are recoded and logged.

To import new meters information to system in bulk, importing data through several popular file formats like Excel and CVS is supported.



Customer Information Management

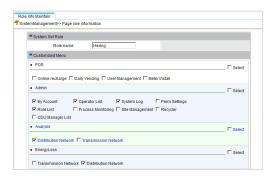
manages customers bν adding/removing/updating them and their information.

Like meter information management section, also customers information can be imported to system in bulk popular file formats like Excel and CVS.



Customer Management

System also can exchange all of information with external systems through standard interfaces.



Transaction Management

- Token issue and reissue
- Transaction inquiry
- Order cancellation management
- TOKEN Management
 - Energy (normal) token
 - Test tokens
 - Event clear
 - Credit clear
 - Configuration tokens (like set maximum load)
 - Update security key token



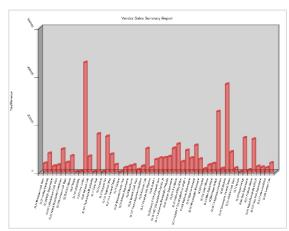
Tariff Management

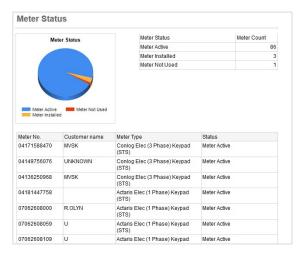
- Single Tariff
- Step Tariff
- TOU Tariff
- Tariff archive

Report

- Management level reports
- Financial & monetary reports
- Engineering & technical reports
- Audit reports

SL10 Inspan Garage	1067	411	105,136.60	125,204.40	17,528.62	0.00	0.00	142,733.02	98.53	133.77
SL60 Hola Supermarket	112	103	9,944.20	8,833.34	1,236.67	0.00	0.00	10.070.00	88.79	89.91
SL01 Falckvlei Motors	1428	1275	130,450.40	120,061.43	16,808.61	0.00	0.00	136,870.04	91.35	95.85
SL03 Naledi Municipality VSRUS	878	316	22,237.70	21,938.61	3,071.40	0.00	0.00	25,010.01	25.33	28.49
SL113 Vista Park Supermarket	259	225	22,131.10	19.679.83	2,755.18	0.00	0.00	22,435.01	85.45	86.62
SL12 Protea Handelaar	129	90	15,858.30	17,184.21	2,405.79	0.00	0.00	19,590.00	122.93	151.86
SL106 Loopys Cafe	472	405	36,866.90	34,289.48	4,800.53	0.00	0.00	39,090.01	78.11	82.82
Total	52558	34590	3,265,884,40	3.163.655.19	442,911,75	0.00	0.00	3.606.566.94	62.14	68.62





Experience and References

Hexing after more than two decades of working in metering business has developed rich set of required software and hardware system to offer Smart Prepayment Vending solution. Hexing software systems are mature and under protection in different countries and are enhanced to be one of the world's best and most user-friendly prepayment systems. Hexing meters and terminals are designed in such a way to satisfy all existing standards and utility requirements. Hexing Systems now are under operation in South Africa, Ghana, Nigeria, Senegal, Iran, Pakistan, Jordan, Tajikistan, Dominican, Panama, Argentina, Ecuador and too many other countries.



Figure 1, Started in 2012, Hexing and Centlec implemented Hexing prepayment and vending system in Centlec region.

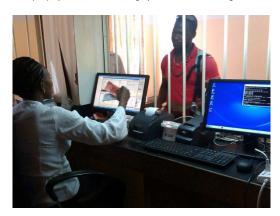


Figure 2, Started in 2013 Hexing and NEDCo deployed Hexing prepayment vending system and now all north of Ghana work with this system



Dominican Republic Smart Prepayment Cluster Metering System, in 2014



Tajikistan Smart Metering project since 2013

