Management Tool for Decentralized Utilities

MicroPowerManager (MPM) is a decentralized utility and customer management tool. Manage customers, revenues and assets with this all-in one Open Source platform. Documentation: https://micropowermanager.io/

Steamaco meter integration for MicroPowerManager.
https://github.com/inensus/Steama-Meter-Package

Spark meter integration for MicroPowerManager. https://github.com/inensus/Spark-Meter-Package

This application is used to register customers and meters to MPManager
https://github.com/inensus/Customer-Meter-Registration

Calin Smart meter integration for MicroPowerManager.
https://github.com/inensus/Calin-Smart-Meter-Package

Stron meter integration for MicroPowerManager. https://github.com/inensus/Stron-Meter-Package

https://github.com/inensus/MicroStar-Meter-Package

https://github.com/inensus/SunKin-Meter-Package

https://enaccess.org/

Hardware and Software

MicroPowerManager (MPM)

This is an open source software solution for mini-grid customer and asset management, originally developed by INENSUS and first launched in 2020. This software provides a robust set of features, including a customer relation management (CRM) tool, a comprehensive ticketing system and maintenance, etc

OpenPAYGO Pass

Introducing OpenPAYGO™ Pass: Enhanced Paygo Activation in Areas without Mobile Money, the latest open-source innovation created by SolarisLab in conjunction with EnAccess

Open Smart Meter

The Open Source GSM Smart meter enables adoption of affordable solar energy solutions in Nigeria through energy as a service business model.

Battery Management System

A battery management system (BMS) is the core electronic circuit of every modern Li-ion based energy storage system. It enables energy access companies to develop customised solutions including second life applications of used electric vehicle batteries, suitable for productive use appliances, mini grids, etc.

AirLink

AirLink uses financed phones as relay-extensions of the internet in remote areas, to extend productive asset data coverage in even the most rural communities. By introducing open-standards communications, AirLink allows customers' phones and PAYGo assets to communicate between themselves and each other using widely available, standard low-energy Bluetooth connectivity.

OpenPAYGO Token

The OpenPAYGO Token is an open source token system to enable PAYGO functionality in new products. This system can be used by product manufacturers creating new devices and can be integrated with any PAYGO software platform.

Cicada

Many Pay-As-You-Go (PAYG/PAYGO) systems are based on 2G/GPRS communications. But as 2G towers get replaced by 3G and 4G infrastructure, energy access organizations around the world will need to update their hardware. Okra's communications solution, Cicada, is an open source module with 2G, 3G, 4G, and WiFi capabilities.

Previous generation DS1000 Single Phase Prepayment Meter

Configuration
DS1000 DS1000 measures reactive energy in addition to active energy and is ideally suited for utilities who wish to bill or monitor energy consumption based on Kilovolt-reactive-hour (kVArh) measurement. The meter offers additional instrumentation values and maximum demand as well.

- Accuracy Class 1.0 to IEC 62053-21
- Standard IEC 62055-31 for STS prepayment
- Contactor Disconnect
- Basic Feature Extensive security data
- High security, compact design

- DIN double insulated, glass filled polycarbonate case
- Rate select for two rate meters, switch to neutral
- IP54 in accordance with IEC 60529:1989
- 15 years service life
- Unidirectional or bi-directional measurement
- Metering Security
- STS/CTS Compliance
- Communication

- Mechanical Meter are compliant to IEC 62055-31, having an ingress protection of IP54 to IEC 60529 and comply with EMC standard IEC 50081-1.
- Security DS1000 offers high security with various useful security features. The meter stores all registration and configuration data to nonvolatile memory. All data is retained for the life of the meter. Recordable security features are provided.
- Advanced Feature IEC 62056-21 optical communications and serial communications
- Maximum demand, Voltage and current instrumentation values registration
- Display DS1000 can be configured by the customer to display English characters or OBIS identification codes.
- An optional battery can support the display during power outages.

DS1600 Single Phase Smart Prepayment Meter

DS1600 meter from DONSUN Technology provides an effective and reliable solution for smart prepayment metering for domestic consumers. It offers modular communications as PLC, 3G/GPRS, RF Mesh to interface directly to the utility via WAN or LAN and to connect to a consumer's Home Automation Network (HAN).

Communication DS1600 DS1600 provides modular communication platforms, including GSM/GPRS, PLC and Low Power Radio for WAN/LAN communications. Options for HAN communications can be included each as M-Bus or ZigBee.

All methods of communication allow the meter registers and security data to be read electronically from a laptop, hand-held device or by HES remotely, greatly reducing the possibility of manual meter reading errors. The same data is available via the meter auxiliary terminals and the exchangeable communication module.

- Accuracy Class 1.0 to IEC 62053-21
- Configuration
- Contactor Disconnect
- Basic Feature Metering Security
- Unidirectional or bi-directional measurement
- Active and reactive energy measurement
- Large digit multilingual display with OBIS information indication on backlite LCD
- High security, compact design
- Exchangeable communication module
- STS/CTS Compliance
- Extensive security data
- Communication
- IP54 Mechanical Protection

Additional Feature Configurable TOU measurement

IEC 62056-21 optical communications and serial communications
Exchangeable modules configured for:
- PLC/RF Mesh
- GPRS/3G/NB-IoT

- Maximum demand, Voltage and current instrumentation values registration
- Security The internal contactor can be disconnected locally or remotely by the Utility. It can be driven directly or driven by the meter at load limiting thresholds, credit expiry or defined events occurrence.
- STS/CTS Compliance DS1600 adopts the latest STS/CTS standards for prepayment. It offers high-security features including main and terminal cover removal detection and magnetic field manipulation detection protect the meter and module from fraud or tampering.
- DS1600 can be configured by the customer to display English characters or OBIS identification codes.
- An optional battery can support the display during power outages.

Data Concentrator Unit DSC100

The DSC100 is a DLMS and DL/T 698 compliant data concentrator whose primary function is to communicate between the Head End System (HES), and data streams collected from a variety of energy meters with different communication modules. The system is intended to provide reliable and secure data management for Advanced MeteringInfrastructure (AMI) and Post Event Analysis.

The DSC100 system collects, processes, and reports data in compliance to DLMS, DL/T 698 from smart energy meter and system monitoring applications. Smart metering data from a variety of meters are time-aligned, structured, and transmitted to upstream devices, which can be similar DCU to smart meter, Super PDCs, visualization devices, external historians, or external applications. The DSC100 can be installed at the Transformer Level, or at a Regional Control Center. DONSUN’s data concentrator, DSC100, acquires metering data from various Energy Measurement Units (EMUs), such as the single-phase RF meter, PLC meter and three phase RF and PLC meter,and from other EMU devices with different reporting rates. The DSC100 can accommodate RF and PLC communication module for downlink to meters and GPRS/3G/4G modules for uplink to HES. All EMU data sent to the DSC100 must comply with DLMS or DL/T 698. The DSC100 system is a DLMS and DL/T 698 complaint DCU. This DSC100system can communicate with DLMS or DL/T 698 standard compliant EMU/DC devices. The primary functions of the DSC100 are to: • communicate with EMUs and other DCs (eg: super-DC) • acquire meter data from up to meters at different sites • time-scheduled data from various meters • filter and process the received data as required, if configured by the user • structure/aggregate output datasets from the available input data • archive and visualize the EMU data if it is ordered with the optional device and visualization tool for various real-time energy visualization applications. The DSC100 is a multi-processor computing platform comprising multiple single board computers: Processor Single Board Computer and one other Single Board Computer are housed in composite plastic case. To alleviate maintenance concerns, the DSC100’s design has eliminated the need for any moving parts, and it is cooled entirely by natural convection (for mounting requirements for cooling, see the Mechanical Installation > Mounting section below). In addition to its processor cards, the DSC100 device supports 2, 128 MB solid-state drives connected to the processor, should it be ordered, to serve as its archive location. Finally, though the base model of the DSC100 has 1 power supply (DC or Universal), it can be equipped with a fully redundant, current sharing mate. The DSC100 can be ordered with either a low voltage DC power supply or a high

voltage universal AC/ DC power supply. Additionally, the device may be ordered with a fully redundant power supply. The DSC100’s power supply and its mate (if installed) are located adjacent to the input power board. A LED indicator has been provided to show the status of the supply. The input power requirements are also clearly indicated on the front of each supply.