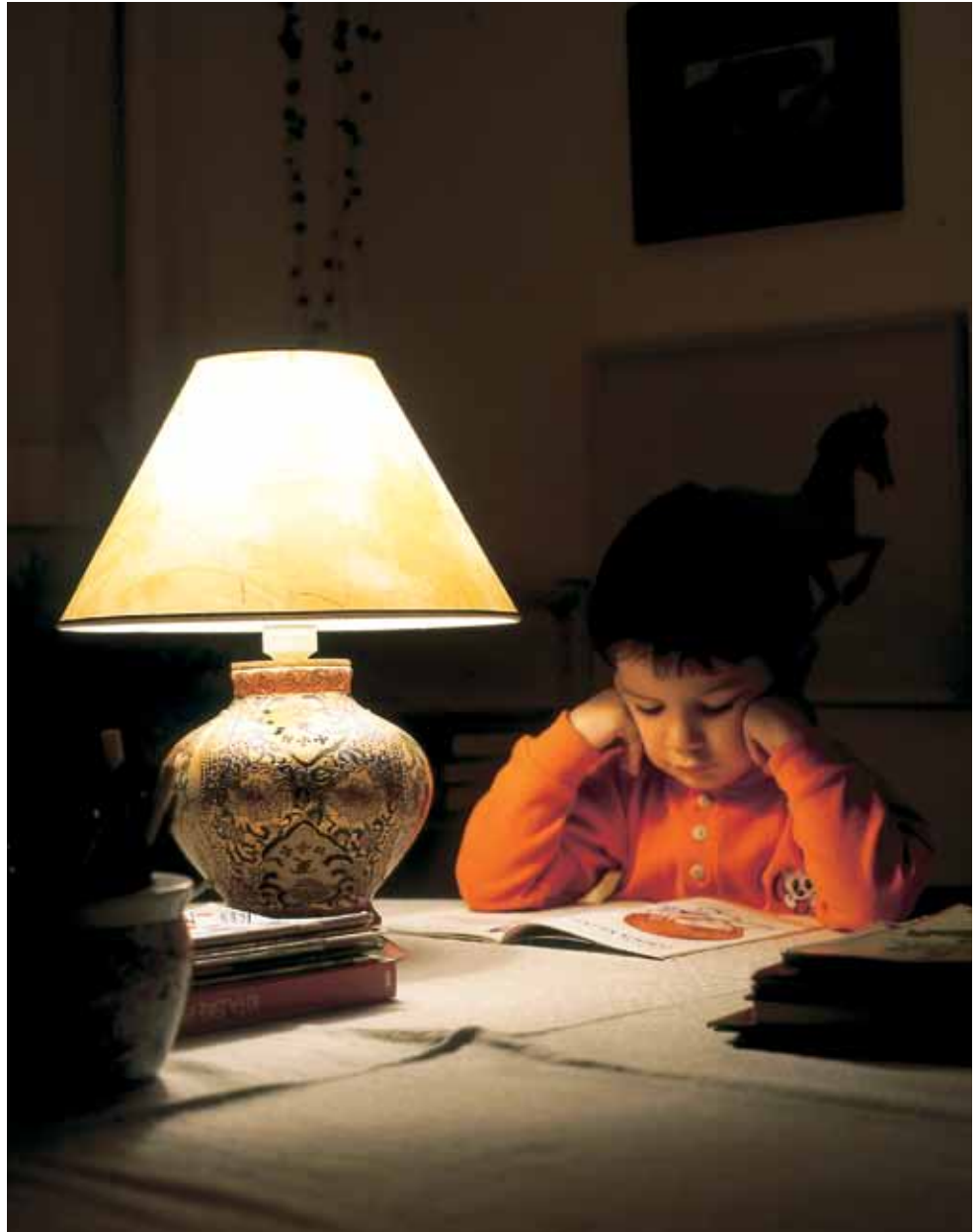


AMI

Advanced Metering Iskraemeco

Advanced Metering Iskraemeco AMI (Advanced Metering Infrastructure) system enables data collection, storage, device parameter setting, processing, validation and transmission of metering information. Data export and import to a higher level billing system are also possible. It enables processing of multi-utility information at the levels of production, transmission, distribution and consumption. Various types of reports are automatically generated and distributed in different formats. The system software records alarms about incidents and enables alarm processing and automatic notification. The modular design of the system enables the application of different metering and communication sets tailoring data transmission to different user's demands and requirements. Such approach keeps the AMI system adaptable and dynamic, for different geographic environments and various concentrations of metering points and distances between them. The system supports different communication paths (a direct connection via RS-232, RS-485 or CS, DLC, RF, PSTN, ISDN, GSM/GPRS modem connection, Ethernet, etc.), as well as different protocols (DLMS, IEC 62056-21, IEC 60870-5-102, FTP, NTP, SNMP, SOAP, etc.). Numerous experiences in the field of system solutions and user-friendly software enable simple collection, processing and data supervision, on-demand reading, parameter setting, alarming and metering point management (MPM).

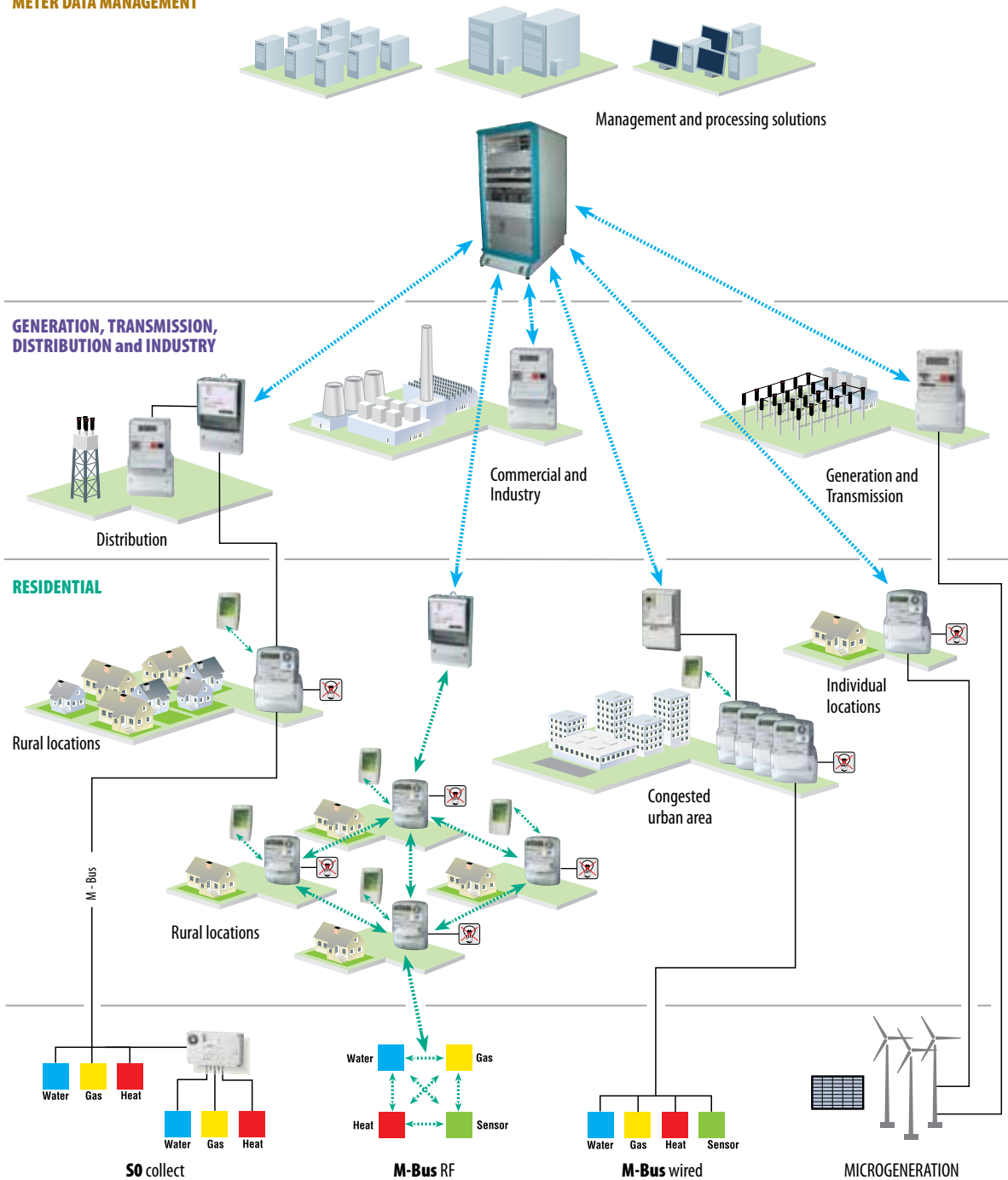


We make efficient energy use easy

AMI system for residential metering

The structure of the AMI system is a three-level pyramid with measuring (lower), communication (middle) and data collection and processing (higher) layer. Submetering is also included in the lower level since the system architecture design allows a smart meter to obtain data from the devices measuring the consumption of other types of energy (water, gas, heat, temperature). Data can be obtained from these devices either via a wired or wireless mode (e.g. wireless M-Bus). Different converters are also available (wired or wireless) which convert the impulses from older devices to a form convenient for processing via an M-Bus interface of the smart meter. An important factor in building AMI systems is interoperability with system devices from other providers of AMI solutions. In Iskraemeco, this is assured by applying open international standards and protocols of data transmission (IEC 61334-5-1, HDLC, DLMS/COSEM, TCP/IP, FTP, SNMP). Different communication paths are supported in the system (DLC, RF, GSM/GPRS, RS-485, M-Bus, Ethernet, etc.) in order to keep user adaptability and dynamics. Advanced solutions (strength and signal quality measurement, the adaptable reception-transmission system, Install and Manage (IaM), etc.) are built in the system components that orchestrate devices and therefore additional settings are not required anymore. All these enable simple installation, startup and maintenance of the complete AMI system. User-friendly software supports monitoring of the complete network, normal data readout, data readout on request, alarming in case of emergency events, limitation of consumption, remote switching of the meter circuit breaker, in a word, complete management of a metering point.

METER DATA MANAGEMENT



MULTI-UTILITY, SUBMETERING and MICROGENERATION

AMI system components

Mx3zy (Mx37y, Mx38y) meter family

Single-phase or three-phase multifunction meters are intended for measuring active (A+/A- and optionally reactive (R+/R-) or apparent (S+/S-) energy and power. DLC, RF, GSM/GPRS or RS-485 communication interfaces can be built in regarding different customers requirements. They enable limitation of consumption of the metering point (active, apparent power or current) and also a complete user switch-off. Submetering is enabled by a built-in M-Bus (micro master) interface for the connection of max. four additional (metering) devices and an In-House Display, HD 100.



MT831

The electronic three-phase modular designed meter is used for whole current, CT or CT/VT connection. It measures active, reactive and apparent energy/power and demand and can analyze the quality of the supplied energy. The meter is used as a reference meter (a sum of the total household consumption) and is usually installed in a transformer station.



P2CC

The communicator is used for connection and data transmission between Mx3zy meters with a built-in RS485 interface and the AMI system data layer.



P2LPC

This data concentrator is used for data reading from Mx3z1 meters in the DLC AMI system via a low-voltage network. On request, the stored data are transferred to the AMI data centre. There are two communication possibilities, i.e. a GSM/GPRS interface or Ethernet. The data concentrator is provided with advanced functions of automatic detection, reading and control with the meters (IaM). Built-in Web services are used for the connection with the data centre.



HD100

The in-house display enables a simple remote monitoring of consumption of electric and other types of energy. The price for a kilowatt hour (kWh) and a daily, weekly and monthly consumption is displayed. In accordance with the preset consumption values the emoticon can be happy, neutral or sad. If it is sad, the release of carbon dioxide is exceeded.

Data transmission between the in-house display and the electronic meter is remote.



P2M

It is a basic system element and is used as an extension of the smart meter in relation to submetering. P2M collects and stores impulses from older meters (gas, water, heat) with impulse outputs. Impulses are stored and transformed in a form which is »understandable« for the connection with the M-Bus (micro master) interface of the smart meter. Impulses are counted also in case of power failure because the converter is independent on the electricity meter and has its own battery. When supply is restored (after power failure), the values are transferred to the electronic meter.



MDM Software Solution

SEP2W System

SEP2W System software solution is the top-level data layer of the AMI-pyramid structure. It is used for transmission, collection and processing of data obtained from the metering points. The information can be stored, processed and distributed in standard formats.

SEP2W System enables configuration of the metering points and updating of metering points software. It consists of many modules that are complementary and support individual system functions.

Main **functional units (modules)** of the system software are:

Database, Core, Manager, Meter Access, Meter Reading, Scheduler, Report, Alarm, Validation, Aggregation, Web Service, Import/Export, Web Portal, MeterView and Pin Point.

SEP2 Database serves as data repository and stores all data. Deployment on Microsoft SQL, ORACLE and DB2 RDBMS is supported.

SEP2 Core Service ensures core functionalities. The main purpose is the license policy supervision and definition of user rights regarding access to different functionalities.

SEP2 Manager is a plug-in based user interface and is intended for system administration and performance overview. Different plug-in units support individual functionalities (Database Plug-in, Management Plug-in, Reading Plug-in, Scheduler Plug-in, Validation Plug-in, Import/Export Plug-in, Web Plug-in, etc.).

SEP2 Meter Access Service is used for accessing the smart meters, concentrators, communicators and other devices. It supports different types of communication paths and protocols.

SEP2 Meter Reading Service is used for reading and configuration of the smart meters, concentrators, communicators and other devices.

SEP2 Scheduler Service is used for supporting automation. It enables automatic implementation of tasks such as reading and configuration of devices, generating reports, data import and export from the database, etc. It ensures the implementation of the work flow and conditions where different operations are performed sequentially.

SEP2 Report Service supports generation of different reports in relation to administration, control and performance of a metering point. The reports can be distributed via different mechanisms in various formats.

SEP2 Alarm Service and SEP2 Listener Service are used for receiving alarm messages from smart meters, concentrators and communicators as well as further data processing (Alarm module). They enable informing of the various statuses with issue of alarms in different ways. For this purpose special agents (SMS, SNMP, e-mail, etc.) are used.

SEP2 Validation Service checks data received from the metering point by means of proven high-quality testing methods.

SEP2 Aggregation Service aggregates consumption from different measurement points into a single, virtual measurement point.

SEP2 Web Service is the system interface and is used for data exchange and system integration.

SEP2 Import/Export Service ensures automatic data imports and exports from the database.

SEP2 Web Portal enables publishing of consumption data on the internet.

SEP2 MeterView enables a detailed survey and parameter setting of an individual meter or device.

SEP2 Pin Point is a simple GUI which displays metering point information and consumption and enables disconnection and reconnection of the customers power supply, along with definition of maximum load allowed.

Products of system software

SEP2W System Base Edition

The Base Edition software as a product includes one database (**Database**), core functionalities (**Core**), management (**Manager**), automated or manual remote access to the metering point (**Meter Access**), remote meter reading (**Meter reading**), automatic implementation of tasks (**Scheduler**), and report generation and distribution (**Report**).

Add-on modules are available.

SEP2W System Professional Edition

The Professional Edition incorporates more functionalities than the Base Edition as reception and processing of alarm messages from the devices (**Alarm**), aggregation of multiple consumptions (**Aggregation**) and verification of the metering point data (**Validation**) are already included.

Add-on modules are available.

SEP2W System Enterprise Edition

The Enterprise Edition is the most advanced Edition available and it incorporates all available modules or functional units. It already includes integration to other business applications (**Web Service**), transfer of data files in and out of the system (**Import/Export**), internet access to consumption information for consumers (**Web Portal**), detailed survey and setting of individual meters (**MeterView**) and user-friendly survey of data of metering points (**Pin Point**).

The products can be supplemented with additionally purchased add-on modules, which provide additional functionality and can be optimized and integrated in the system solution on customer's request.

For detailed consultation please contact us and refer to the SEP2W System brochure.

Owing to periodical improvements of our products the supplied products may differ in some details from the data stated in the prospectus material.

Iskraemeco, Energy Measurement and Management
4000 Kranj, Savska loka 4, Slovenia
Telephone: (+386 4) 206 40 00, Telefax: (+386 4) 206 43 76,
<http://www.iskraemeco.si>, e-mail: info@iskraemeco.si
Published by Iskraemeco. Data subject to alteration without notice.