Info Paper

04/2015

MeasuringSystem 2020 *(Basic Meter — Smart Meter Gateway)*
Metrology and Data Communication

Specialist for data communication EMSYCON and producer of test equipment ZERA have created a sustainable test environment for intelligent measuring systems. This solution serves for the technical specifications of the FNN* project in any way. Hard- and software which are required for data communication are integrated into a metrological system — e.g. a single or multi-position Meter Test System. This allows metrological testing as well as guarantee of interoperability of MS2020 Basic Meters.

Implementation of MS 2020

Implementation of MS 2020 on the German market is planned for 2017. Technical requirements have already been in place. Because of the energy revolution and decentralized energy supply by renewable energies it is important to record more data than just the current energy consumption. Besides metrological testing also the interoperability has to be guaranteed in the future. Therefore MS 2020 Basic Meters as well as interconnected Gateways are used for the intelligent measuring system. The interconnected Gateways serves for the required communication between meter and network operator.
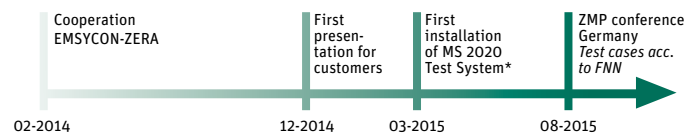
Principle of Realisation

ZERA, experienced in producing meter test equipment, supplies all required components for metrological testing of MS2020 Basic Meters. The test system consists of a source for generating the required test values, a test bench including all suspensions, contacting elements, error calculators etc. as well as control- and test software *WinSAM*.

EMSYCON, specialist for data communication has developed the RS485 interface 1MBit (CR2020). The CR2020 is integrated into the existing ZERA Test System. The *KoaLa*-test-case-driver is implemented into the *WinSAM*-surface for simulation of the test cases defined by FNN.

Time Schedule

Cooperation EMSYCON-ZERA	First presentation for customers	First installation of MS 2020 Test System*	ZMP conference Germany *Test cases acc. to FNN*
02-2014	12-2014	03-2015	08-2015

* limited scope of function

Designs

Generally there are two types of connecting designs:

1. Design for *3-point-technology.* This type of meter is connected with the test system via electrical interface RS485 (LMN IN/OUT).
2. Design for *plug-in-technology* (known as eHZ). This type of meter is connected with the test system via optical interface (LMN) via OKK adapter.

FNN = Forum network technology/ network operation

Designs of Meter Test Systems

Meter Test System for MS 2020 Basic Meter at a German test laboratory


Interface for data transfer (MP2020) between Basic Meter and CR2020

EMSYCON - Data communication

EMSYCON develops *embedded systems* for hard- and software. The founders of the engineering office started in the field of meter data communication 20 years ago. They have supported and created specifications for electricity meters (e.g. specifications for VDEW load profile meter, for VDN plug-in meter „eHZ", for FNN-EDL-meter).

For realisations of interoperability EMSYCON provides the *KoaLa*-test-case-driver as well as the CR2020. The software provides execution of the test cases (acc. to FNN) within the *WinSAM* surface. The CR2020 is integrated into the ZERA test bench and provides the realisation of data communication (RS485, HDLC, TLS, SML, COSEM), all electrical connections, recording and logging of serial data stream, supply of LMN-members and burden measurement of LMN low voltage sources.
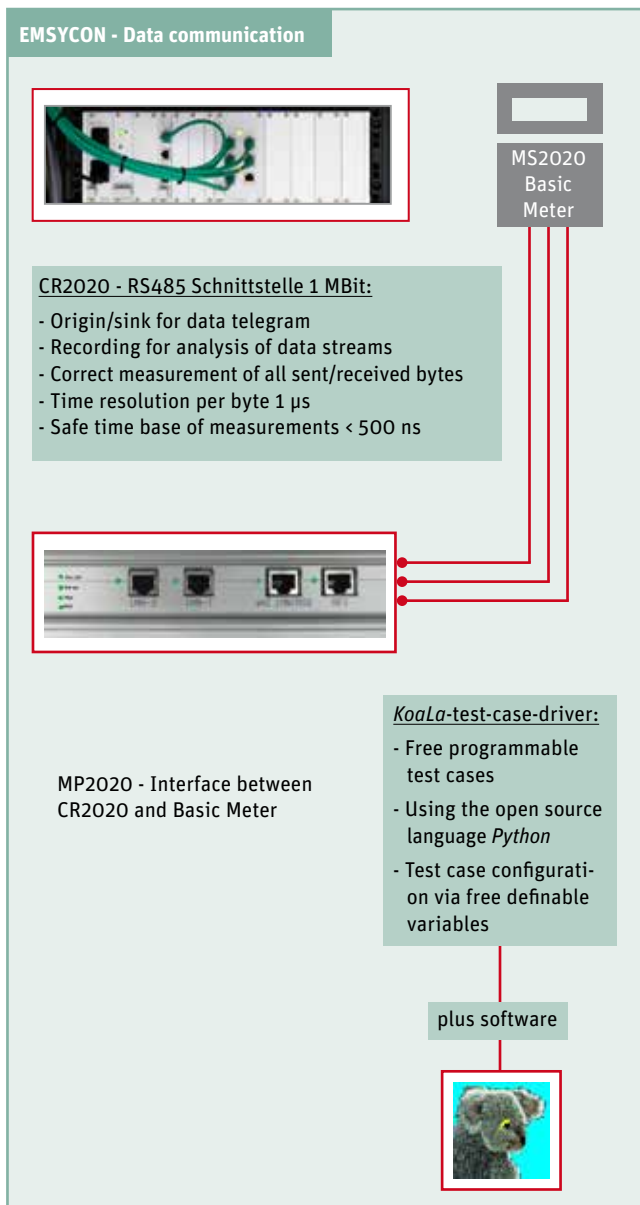
ZERA - Metrology

ZERA is developer and producer of systems and equipment for test procedures of electricity meters and supplies customized test systems for metrological institutes, test laboratories of power utilities and meter manufacturers.

The classical line of Meter Test Systems - the MTS series - consists of a source system for generating the test values, a test bench including error calculators, control unit, isolated current transformers*, scanning heads, the corresponding connectors and a control PC with control and test software *WinSAM*.

* option

EMSYCON - Data communication

MS2020 Basic Meter

CR2020 - RS485 Schnittstelle 1 MBit:
- Origin/sink for data telegram
- Recording for analysis of data streams
- Correct measurement of all sent/received bytes
- Time resolution per byte 1 μs
- Safe time base of measurements < 500 ns

MP2020 - Interface between CR2020 and Basic Meter

KoaLa-test-case-driver:
- Free programmable test cases
- Using the open source language *Python*
- Test case configuration via free definable variables

plus software

ZERA - Meter Test System

Power Source for generating the metrological test values (current and voltage) consisting of:
- Function generator
- Electronic Reference Meter
- Voltage amplifier
- Current amplifiers

Test bench:
- E.g. equipped with 5 test positions
- Incl. error calculator, interfaces LMN (In/Out)
- Isolated current transformers ICT123
- Photoelectric scanning head TK325

plus software

WinSAM