

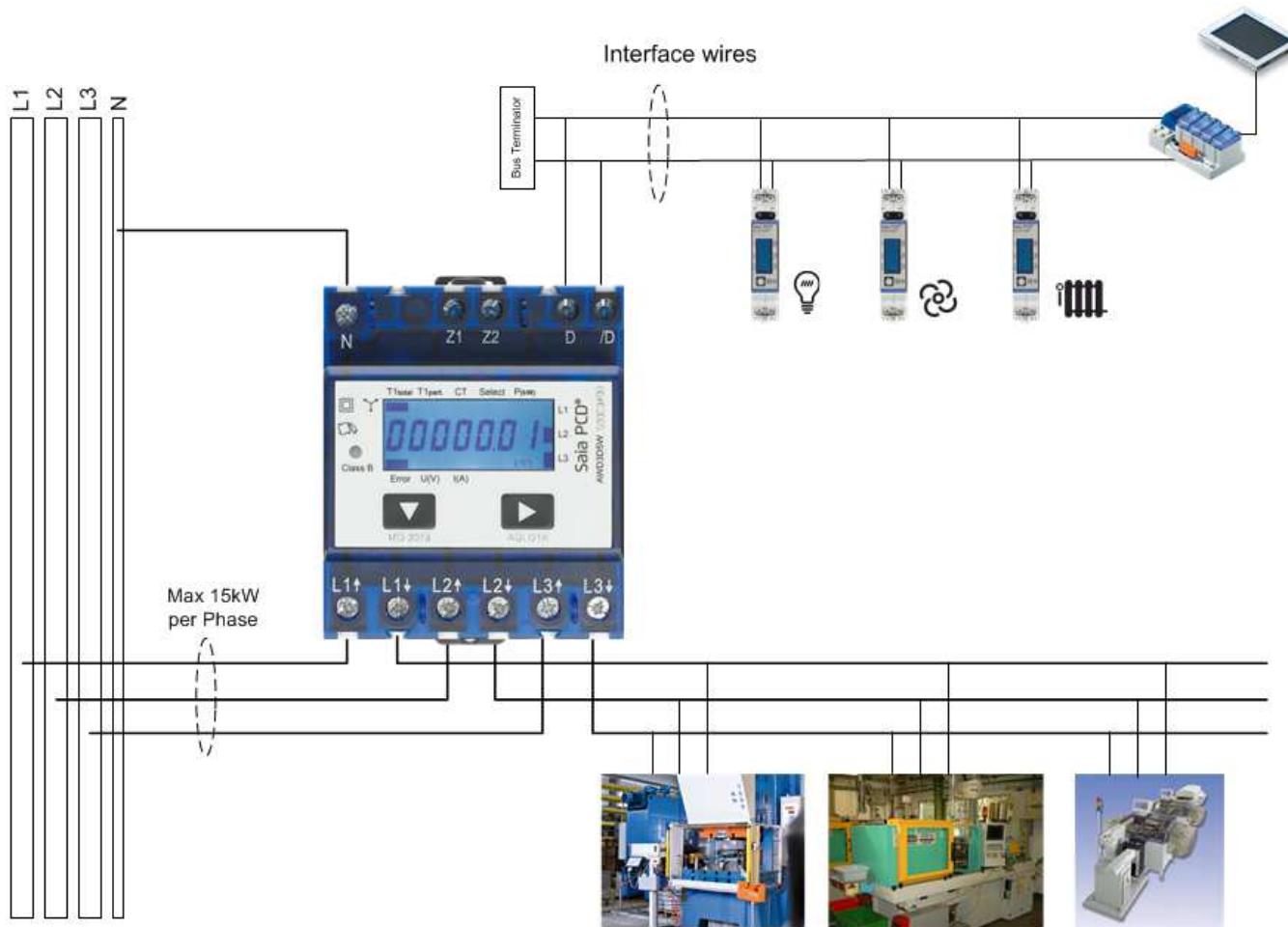


Application notes energy meters

Topic: mains disturbance

Pascal Hurni / December 2013

Application / Environment / Standardization



Mainpowerbar
3*230/400V
300kW

Communication

Data reading is possible with the following common protocols:

- M-Bus
- Modbus
- SBC S-Bus

Norm – Standards

The SBC energy meters are designed, tested and approved by the test agency according to the MID product norm EN50470.

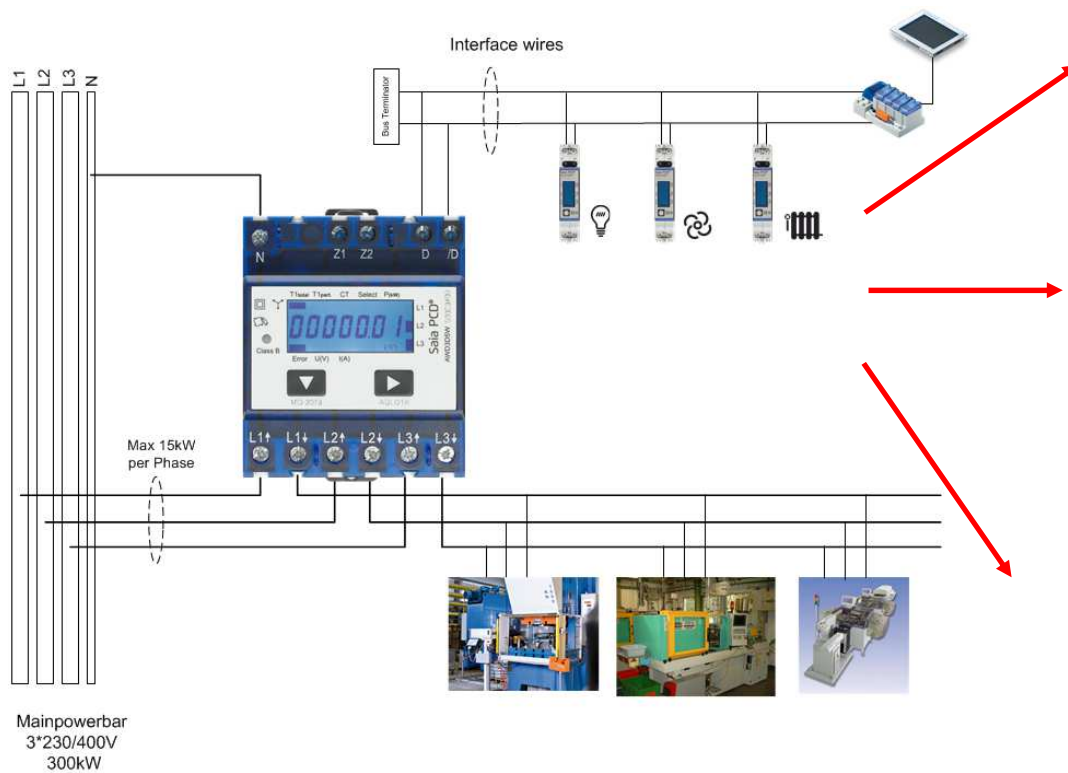
This norm specifies the electric (Burst, Surge, ESD, ...), mechanic and ambient (humidity, dust) characteristics that the meter need to meet.

The meters are certified with the GOST approval for Russia and the CTA approval for China.

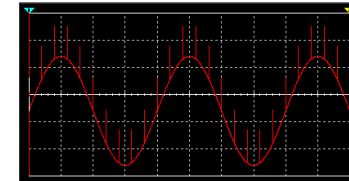
Signals in the application

Disturbances in the real application!

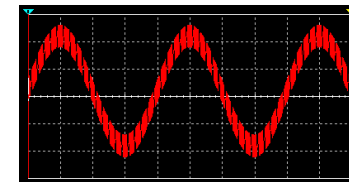
Disturbances can have different sources!



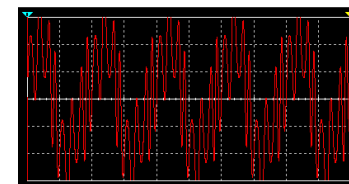
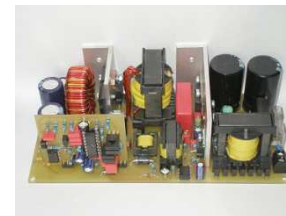
The mains can carry voltage spikes.



Perturbations can be coupled through wiring.



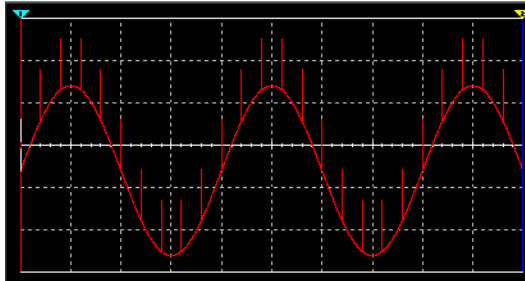
The application can generate harmonics.



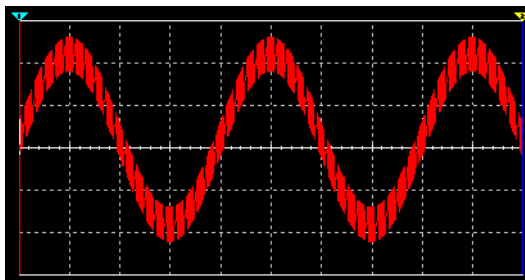
Different disturbances

Effects of disturbed mains

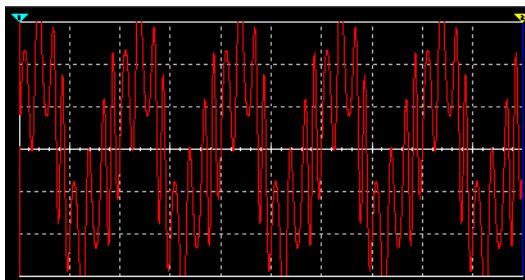
Voltage spikes on the mains



PLC signal on the mains



Harmonics on the mains



Disturbances distort the measurement!

In order to obtain precise measurements, the signal distortion needs to be within certain limits (see EN50470). Outside these limits the measurement accuracy is not guaranteed anymore.

Improvement possibilities

- Improve the installation and cabling/wiring
- Dejam the loads
- Dejam the mains

Example of an installation problem:
Very high current cables next to the energy meters.



Important basic statements for the application

Basic statements for SBC energy meters:

Our meters are made for precise and reliable registration of electric energy and parameters like voltage, current and phase angle also in rude industrial environment. No other device on the market with the same functionalities and the same dimensions has a longer life cycle and a better immunity to interferences.

Basic statements for the mains:

If the mains are disturbed in such a way that according to the European measurement directive (MID) a reliable measure is no more possible, it's possible to have unprecise measurements with the SBC energy meters.

With abnormal overvoltage a discharge between the input circuits is possible. This can not be eliminated with capacitors in the input circuits because of the overall size and the direct measuring system.

Basic statements in the case of bad mains :

For most cases, save your time and don't search the fault in the device. Our devices are MID approved and are according to this thoroughly tested in production.

We gladly help you to check the shielding of your cables and to improve the electrical grounding of the connected devices, because this is 99% of the time the reason of communication problems.

In the cases where the problem with the bad mains can not be solved, there is only the solution to keep the disturbance away from the energy meter. For this purpose a choke should be used. This is the safest way and the fastest solution; but it needs space and costs money.

Tip if you have suspicion of bad mains:

The use of a power quality analyzer can help you find the source of the interference.