



EmCheck® ISMZ I

## Intelligent current measuring clamp EmCheck® ISMZ I

Often, there are undesirable interactions between power supply and control technology in complex industrial systems that might cause errors in control engineering. These interferences often arise from communication failures between components. Since the failure causes are usually hard to find, a mobile detection system in the form of a current clamp for line-based parasitic currents achieves significant savings of installation expenses and in service department. The Intelligent current measuring clamp **EmCheck® ISMZ I** is a mobile tool for detecting line-based parasitic currents in industrial plants. It detects values by its own, evaluates and records data.

The integrated intelligence is innovative. It allows first surveys and hence first estimations of EMC susceptibility of plants without drawing on special tools.

Furthermore, the intelligent current measuring clamp **EmCheck® ISMZ I** is applicable in an environment with heavy interferences.

### Highlights

- Measuring leakage, shielding and interference currents
- Data recorded on internal memory for a period of up to 14 days
- Compact, portable, battery-operated current clamp
- Easy and intuitive operation
- Independent capture, evaluation and recording of data
- Easy display and menu functions to assess existing current levels for a line
- Data evaluation by dedicated software on a standard PC

A large variety of malfunctions can be adequately analysed by the captured measuring data. Therefore, the need to use more sophisticated devices, and to call in a qualified expert can be reduced to a small number of incidents.

### EmCheck® View

**EmCheck® View** is the free operating software for the **Intelligent Current Measuring Clamp (ISMZ I)**. It lets you display the measurement data on screen for convenient evaluation.

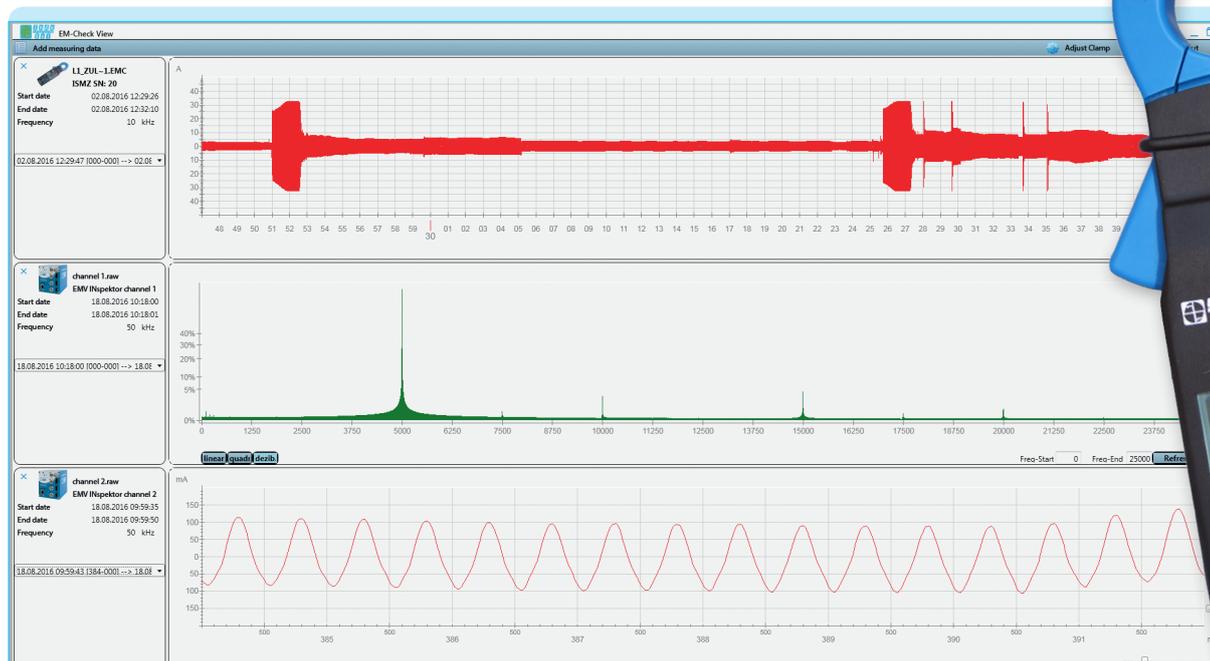


Fig. 21: Display of ISMZ measurement data by EmCheck® View



## Evaluation EmCheck® ISMZ I and EMV-INspektor® V2

In modern industrial facilities switching power supplies, drive solutions and similar equipment influence the quality of the network. Due to these electric interdependencies measuring devices that only capture currents at a specific moment often provide inaccurate results. Therefore, precise current measurement is not as trivial as it might appear at first glance.

### Effective value – RMS (Root Mean Square)

For the measurement of alternating current, the root mean square of the alternating value is normally used, which is the effective value. The effective value of an alternating current is equivalent to the energy that a direct current would present at a resistive load. However, this measurement is only accurate in case of a pure sinus current. Many of today's consumers, however, deviate from an ideal sinus shape.

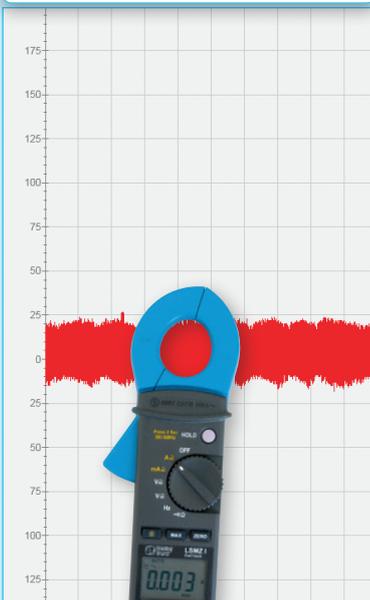
### Current course with amplitude

To analyse a current course, it is important to know the amplitudes of the current. With the **EmCheck® ISMZ I** and the **EMV-INspektor® V2**, currents can be scanned at 40 kHz or 50 kHz. For each scan point, you also obtain the amplitude in order to realise a meaningful analysis.

The current data recorded in the devices can be easily accessed with the free **EmCheck® View** software.

Interference pulses caused by switching operations at the contactor cannot be detected by conventional current measurements. They are too brief, and also deviate significantly from sinus shape.

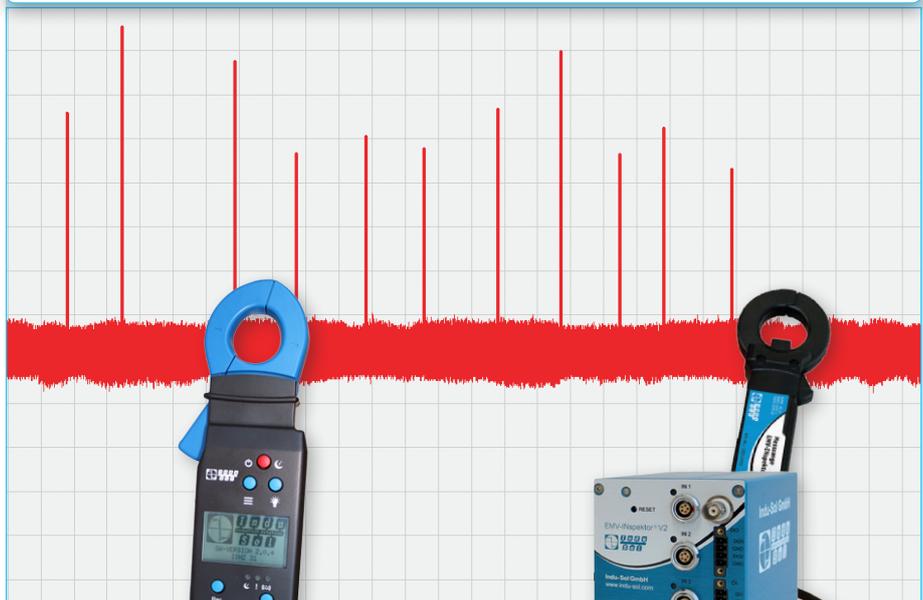
### Conventional measurement



21 mA  
RMS

Conventional effective-value measurement is very inaccurate for this signal shape.

### Intelligent capture of sporadic interference peaks



536 mA  
21 mA  
RMS

The EmCheck® ISMZ I displays amplitude in addition to effective value.

536 mA  
21 mA  
RMS

EMV-INspektor® V2 displays effective values and amplitudes for up to 4 clamps.



EMCheck® ISMZ I    EMV-INspektor® V2

### Important characteristics compared

	EMCheck® ISMZ I (mobile)	EMV-INspektor® V2 (stationary)
Measured points	1	4
Function	autonomous measurement, assessing and recording of electromagnetic disturbances	measurement, assessing and recording of electromagnetic disturbances
Sampling rate	choice of 10 kHz, 20 kHz or 40 kHz	50 kHz
Permanent measurement	14 days	permanent
Storage medium	Integrated, removeable storage medium (32GB)	Integrated storage medium (16GB, extensible via USB port)

### Parallel current measurement with EMV-INspektor® V2

EMV-INspektor® V2 allows the simultaneous evaluation of up to four clamps. For each channel, it displays effective values, amplitudes and frequency components. The amplitudes and the spectrum are visualised over time in a diagram.

If a defined threshold value is exceeded, the integrated alarm management can, for example, trigger a switch contact or send an email.

### Frequency analysis / spectrum

In addition to the current course, the **EMCheck® View** software calculates the current spectrum. This informs you of the frequency components in the current.

Currents in the kHz range call for different measures to improve the bonding system than at 50/60 Hz. Once you know the pulse frequencies, you can draw conclusions as to potential causes of the disturbance.

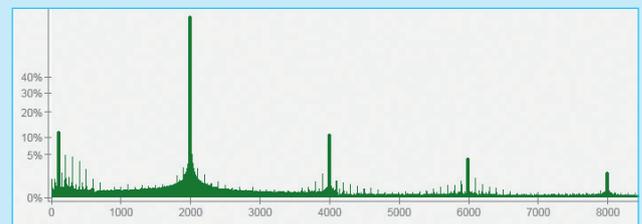


Fig. 23: Display of spectrum with 50 Hz and superimposed 2 kHz

### RECOMMENDATION

By smart long-term monitoring we tap your system for EMC. Our system solution is capable of detecting and localizing conducted interferences. A detailed protocol makes it easy for you to understand the results and indicates specific measures to reduce interferences.

### EMV-INspektor® V2

2016-07-06 14:46:09

emergency service: +49 34491 5818-0

#### channel overview

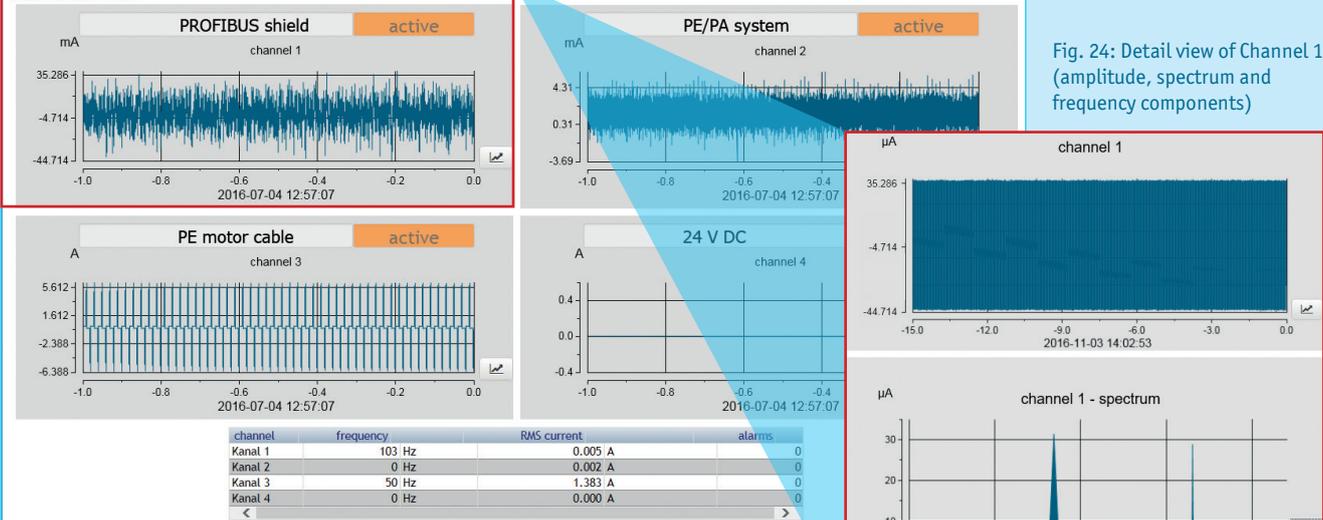


Fig. 24: Detail view of Channel 1 (amplitude, spectrum and frequency components)

Fig. 25: Clear and detailed display of channels on the Web interface of EMV-INspektor® V2