



EMC-INspektor® V2

## EMC-INspektor® V2

With an increasing automation level of industrial productions the power density rises and thus the risk of disturbances by electromagnetic interferences. In this context interference currents occur along fieldbus cables, encoder lines, the routings of power supply and equipotential bonding systems.

**EMC-INspektor® V2** is a special measuring and analysing tool to record temporarily or permanently electromagnetic interferences. It allows connecting up to four current transformers, whose measured values were recorded, evaluated and compared separately. Depending on the line type different quality parameters can be configured.

Thereby it provides a specific evaluation and monitoring of each measuring channel in the interest of Condition Monitoring. The sector of industrial automation obtains a smart tool for comprehensive fieldbus analyses by the **EMC-INspektor® V2**.

### Measuring rudiments:

- EMC interferences along the bus cables
- EMC interferences via the V 24 VDC power supply
- EMC interferences via the 230/400 VAC low-voltage distribution system
- EMC interferences in the equipotential bonding system
- EMC interferences via the transmitter lines

### Highlights

- Measuring leakage, shielding and interference currents
- Parallel inspections of multiple potentially disturbed sections
- Permanent analysis and monitoring (Condition Monitoring)
- Data comparison of each input source
- Specific status evaluation and alerting
- Visual display of interferences via web interface
- Export of measurements on USB stick or via LAN interface
- Configuration of device software via web interface

### Application

The **EMC-INspektor® V2** provides an automated, contact- and interruption-free long-term inspection. Up to four channels can be connected, measured and analyzed.

On all four channels, the current course and the spectrum are captured. This makes it possible, for example, to detect if there is a link between PROFIBUS malfunctions and PE/PA currents. The additional frequency data from the spectrum provide clues regarding the possible cause of the fault. Frequency components in the lower kHz range point to pulse frequencies of frequency inverters.

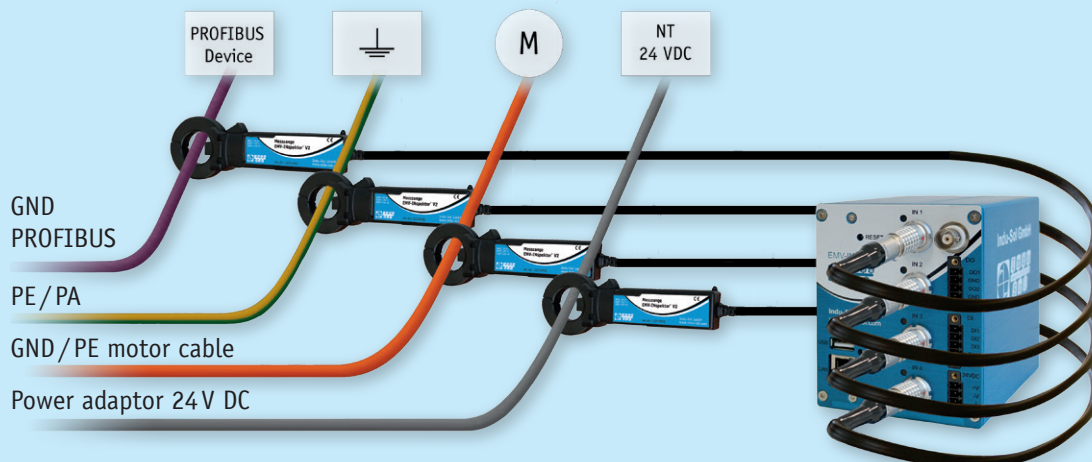


Fig. 22: Application example EMC-INspektor® V2



## Evaluation EmCheck® ISMZ I and EMC-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.

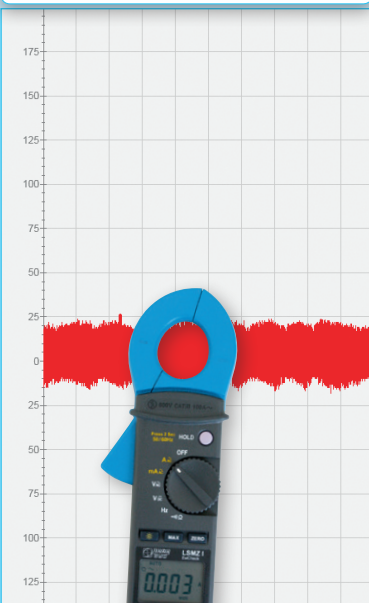
### Current course with amplitude

To analyse a current course, it is important to know the amplitudes of the current. With the **EmCheck® ISMZ I** and the **EMC-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

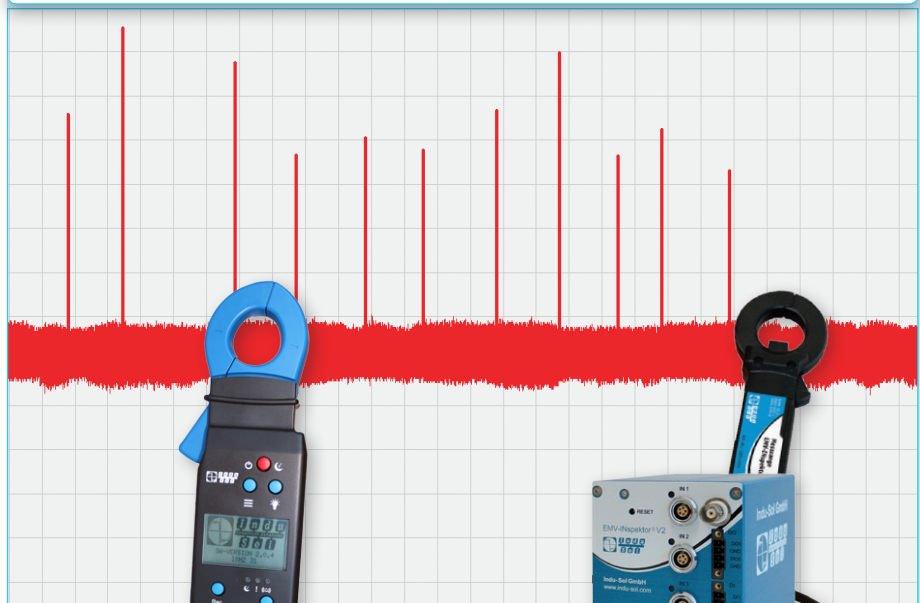


21 mA  
RMS



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



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



EmCheck® ISMZ I    EMC-INspektor® V2

### Important characteristics compared

	EmCheck® ISMZ I (mobile)	EMC-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 EMC-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.

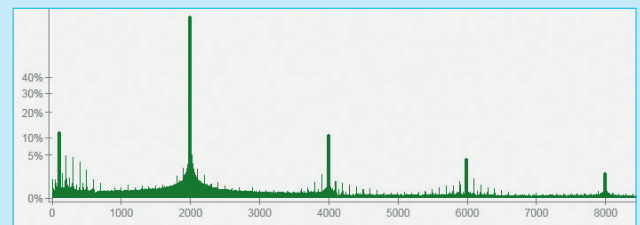


Fig. 23: Display of spectrum with 50 Hz and superimposed 2 kHz

### 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.

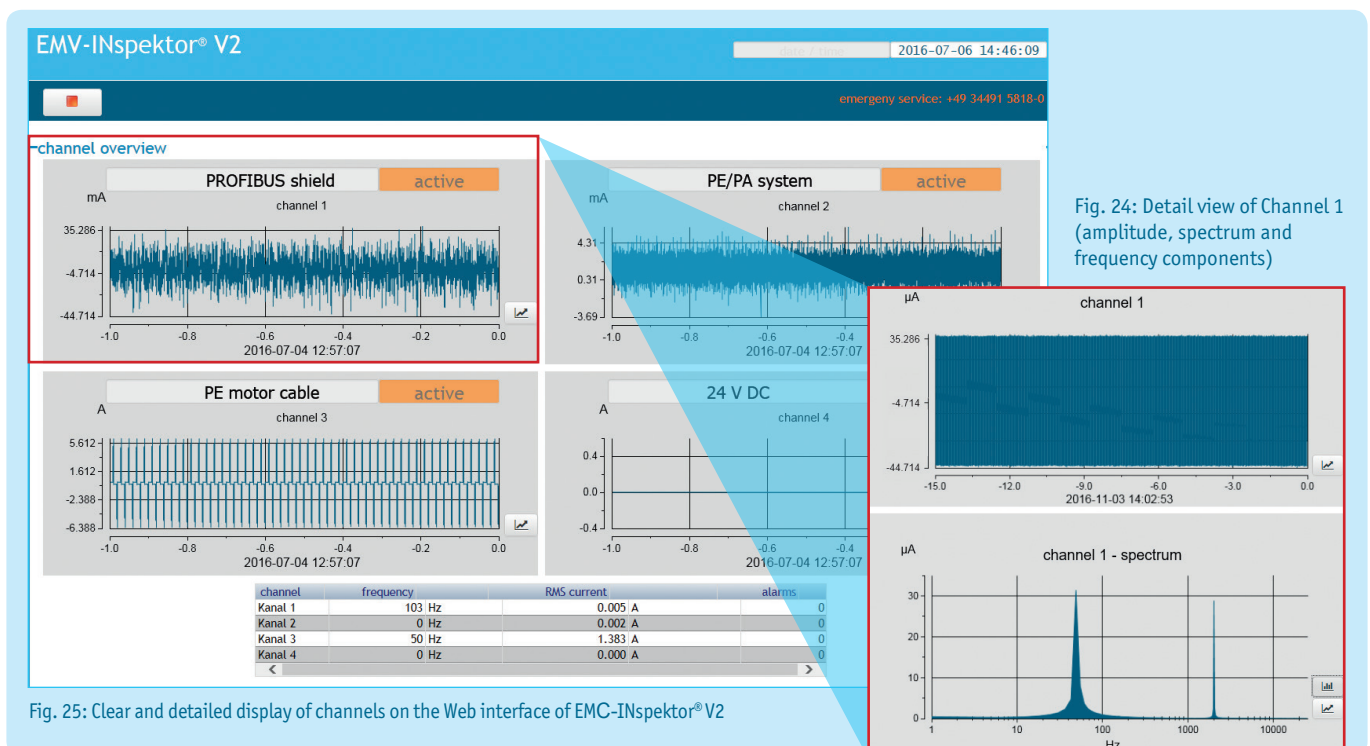


Fig. 25: Clear and detailed display of channels on the Web interface of EMC-INspektor® V2

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