

EMCheck[®] ISMZ I

User Manual



Diagnostic and service tools universal device

Revision overview

Date	Revision	Change(s)
05.08.2016	0	First version
05.09.2016	1	
05.03.2019	2	General improvements

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Contents

Revision overview.....	3
Contents	4
1 General information	5
1.1 Purpose of use.....	5
1.2 Technical data	5
1.3 Scope of supply	6
1.4 Safety information.....	6
2 Controls and display elements	7
3 Operation	8
3.1 Switching on/off	8
3.2 Standby mode.....	8
3.3 Menu control.....	8
4 Settings.....	9
4.1 Time and date.....	9
4.2 Display light	9
4.3 Display function	10
4.4 Sampling frequency.....	10
5 Viewing current values	11
5.1 Measuring the current effective value.....	11
5.2 Viewing the current course	11
5.3 Viewing the spectrum	11
5.4 Status memory, battery and recording	11
6 Carrying out recordings	12
6.1 Configure recordings	12
6.1.1 Permanent recording	12
6.1.2 Triggered recording	13
7 Control software EMCheck® View.....	15
7.1 Installation of the EMCheck® View software	15
7.2 Copying recordings to the PC.....	16
7.3 Data evaluation with EMCheck® View.....	17

1 General information

Please read this document thoroughly from start to finish before you begin using the device for the first time.

1.1 Purpose of use

The **Intelligent current clamp meter EmCheck® ISMZ I** is a mobile measuring device for conductor-bound interference currents. In standalone mode, the measuring clamp independently measures current values and continuously records the current course. Its integrated intelligence allows the user to make preliminary inspections and thus first estimations on the electromagnetic compatibility (EMC) of industrial systems.

The following measurements can be carried out:

- Current effective value (RMS)
- Current course
- Spectrum

To record the current values, an SD card is necessary, which is included in the scope of supply. All recorded data can be evaluated using a corresponding PC software.

1.2 Technical data

The **Intelligent current clamp meter EmCheck® ISMZ I** is suitable for recording conductor-bound electrical currents in the following ranges.

Measuring range: 10 mA to 30 A

Frequency range: Sampling frequency 10 kHz: 40 Hz to 5 KHz
Sampling frequency 20 kHz: 40 Hz to 10 KHz
Sampling frequency 40 kHz: 40 Hz to 20 KHz

Battery life: 336 h (14 days)

Changing the sampling frequency also changes the measurable frequency range. The sampling frequency should always feature at least the double value of the frequency to be measured.

The maximum monitoring time of 14 days is available when a sampling frequency of 10 kHz has been set. If the sampling frequency is increased, the monitoring time / battery life is reduced due to the increased current consumption.

Six LR6 (AA) batteries are needed to operate the ISMZ I. Please do not use any rechargeable batteries.

1.3 Scope of supply

The scope of supply comprises the following individual parts:

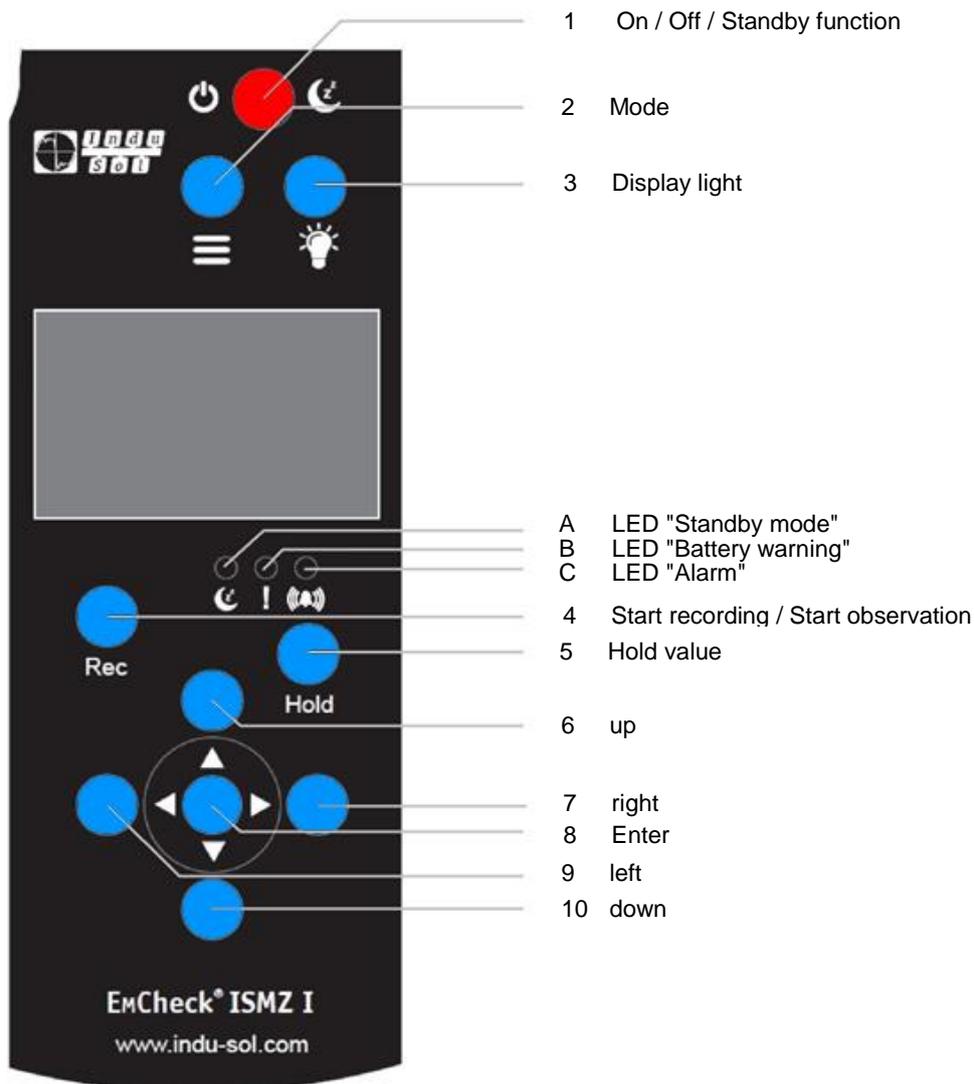
- Intelligent current clamp meter EMCheck® ISMZ I
- USB connection cable
- 32GB micro SD card with ISMZ I adapter
- 6 x 1.5V LR6 batteries
- CD with software for the report analysis and device manual
- Transport case

Please check that the contents are complete before using it the first time.

1.4 Safety information

- Never open the housing of the ISMZ I
- Opening the housing immediately voids any warranty.
- If you think the device is defective, send it back to the supplier.

2 Controls and display elements



	(A) Standby mode	Flashing green	Standby mode active
	(B) Battery warning	Flashing yellow	Battery charge low (less than 20 %)
	(C) Alarm	Flashing red	Trigger activated

Table 1: Overview LEDs

The **Intelligent current clamp meter EmCheck® ISMZ I** features an integrated illuminated LCD. All settings and measurements can be carried out by the controls and the display elements. To evaluate recordings, copy the measurement data from the SD card onto your PC and run the software **EmCheck® View**. Settings on the ISMZ I can also be carried out with an established USB connection via the PC Software **EmCheck® View**.

3 Operation

3.1 Switching on/off

Pressing the red Power button (1) switches the ISMZ I on. When the clamp is switched on, it can be set into standby mode by briefly pressing the red Power button (1). To switch off the ISMZ, the Power button (1) has to be pressed for a longer time.

3.2 Standby mode

The standby mode is a power-saving function. All measurements remain active and are not lost. You can also specify in the settings how long the period of inactivity should be before the clamp automatically switches into standby mode. The display is deactivated in standby mode. Standby mode is indicated by brief flashing of the standby LED.

3.3 Menu control

Press the Mode button (2) to leaf through the menu of the clamp to access the settings and functions.

The following menu pages are available:

CURRENT	-	Effective value measurement (main menu)
CURRENT COURSE	-	Course of the current over time
SPECTRUM	-	Display of frequency specter (0...20 kHz)
TEACH...	-	Automatic teaching of trigger thresholds
REC. CONFIG	-	Configure recordings and trigger
SETTINGS	-	Basic settings of the measuring clamp
STATUS	-	Memory and battery, status of the recordings

You can confirm entries by pressing the Enter button (8).

Use the arrow buttons (6), (7), (9) and (10) to scroll through the menu and also to change input values and zoom stages.

With pressing the Rec button (4) the time of recording or time of observation (trigger mode) can be started or stopped.

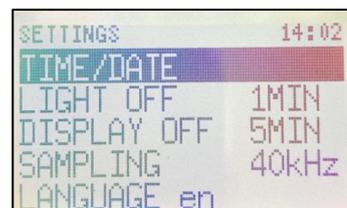
Switch the display light on and off by pressing the button Display light (3).

4 Settings

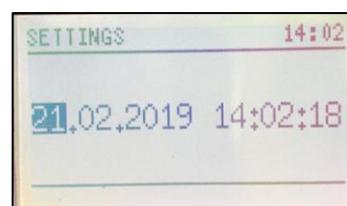
Switch into the SETTINGS menu with the Mode button (2).

4.1 Time and date

- Use the arrow buttons (6) and (10) to select TIME/DATE.
- Press the Enter button (8) on TIME/DATE to make settings for the time and date.



- Use the arrow buttons (7) and (9) to move the cursor.
- Use the arrow buttons (6) and (10) to change the numerical value at the cursor position.
- Enter the date first and then the time. Confirm the date and time by pressing the Enter button (8).



4.2 Display light

The display light is switched on or off by pressing button Display light (3).

- Use the arrow buttons (6) and (10) to select LIGHT OFF.
- Use the arrow buttons (7) and (9) to select the time for switching the light off automatically. The following values are possible:
 - Always on
 - 10 seconds
 - 30 seconds
 - 1 minute
 - 3 minutes
 - 5 minutes
 - 7 minutes
 - 10 minutes



4.3 Display function

- Use the arrow buttons (6) and (10) to select DISPLAY OFF.
- Use the arrow buttons (7) and (9) to select the time for switching the display off automatically. The following values are possible:
 - Always on
 - 1 minute
 - 3 minutes
 - 5 minutes
 - 7 minutes
 - 10 minutes
 - 20 minutes
 - 25 minutes
 - 30 minutes



While recording or observing a current, the clamp will switch into standby mode after the set time.

4.4 Sampling frequency

- Use the arrow buttons (6) and (10) to select SAMPLING
- Use the arrow buttons (7) and (9) to change the sampling frequency. The following values are possible:
 - 10 kHz
 - 20 kHz
 - 40 kHz



Changing the sampling frequency also changes the measurable frequency range. The sampling frequency should always feature at least the double value of the frequency to be measured. The higher the sampling frequency, the shorter the battery life.

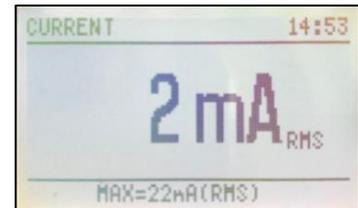
5 Viewing current values

Once you have switched on the ISMZ I with the red Power button (1), you are in the CURRENT menu. The current effective value (RMS) is displayed.

5.1 Measuring the current effective value

Switch into the CURRENT menu with the Mode button (2).

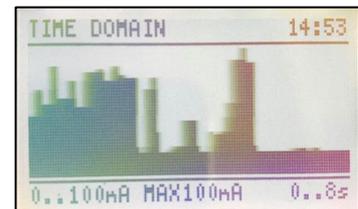
- Pressing Hold (5) displays or hides the maximum value.



5.2 Viewing the current course

Switch into the TIME DOMAIN menu with the Mode button (2).

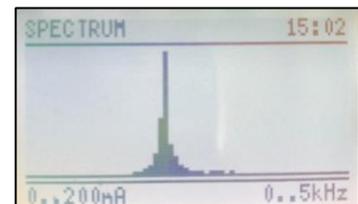
- Use the arrow buttons (6) and (10) to change the zoom stage of the current (Y-axis).
- Use the arrow buttons (7) and (9) to change the zoom stage of the time (X-axis).
- Press Enter (8) to stop the display and to start it again.
- Pressing Hold (5) displays or hides the maximum value.



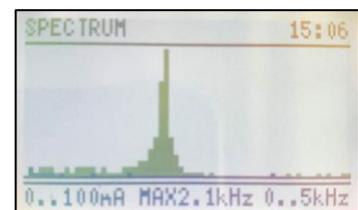
5.3 Viewing the spectrum

Switch into the SPECTRUM menu with the Mode button (2).

- Use the arrow buttons (6) and (10) to change the zoom stage of the current (Y-axis).
- Press Enter (8) to stop the display.



- Pressing Hold (5) displays/hides the frequency range with the highest components.



5.4 Status memory, battery and recording

Switch into the STATUS menu with the Mode button (2).

You will receive information on available memory and the battery status in %. Once a recording is active, you receive information on the recording duration as well as maximum values or trigger exceedances.



6 Carrying out recordings

The ISMZ I is capable of recording current values continuously and to save these on the SD card. The recordings are either saved without interruption during a permanent recording or only during specified trigger events. Before starting a recording, choose between permanent or triggered recording by configuring the recording options.

6.1 Configure recordings

Switch into the RECORD MENU with the **Mode button (2)**.

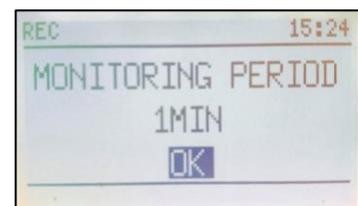
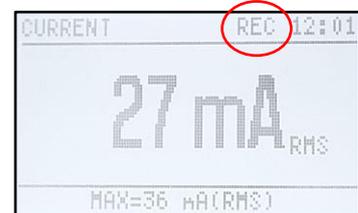
- Use the arrow buttons (6) and (10) to select RECORDING.
- Use the arrow buttons (7) and (9) to choose between PERMANENT and TRIGGERED.
 - PERMANENT – permanent recording
 - TRIGGERED – triggered recording



6.1.1 Permanent recording

All current values are recorded without interruption during a permanent recording and saved on the SD card. No trigger thresholds are therefore necessary.

- The recording is started by button **REC (4)** and selection of a time with arrow buttons (7), (9), and the button **Enter (8)**. The following values are possible:
 - 1 minute
 - 3 minutes
 - 5 minutes
 - 10 minutes
 - 15 minutes
 - 30 minutes
 - 1 hour
 - 4 hours
 - 8 hours
 - 15 hours
 - 1 day
 - 2 days
 - 3 days
 - ∞ (permanent recording)
- The recording is stopped by button **REC (4)**.



Once the recording is being actively conducted, the abbreviation REC appears in the display. The ISMZ I saves all recordings on a micro SD card in "*.EMC" format. The directories are saved temporally in the format YYYY-MM-DD and the files in the format hh:mm:ss. Recordings can be evaluated with the included software **EMCheck® View**.

6.1.2 Triggered recording

During a triggered recording, current values are only registered if the set trigger thresholds are exceeded. You can specify the trigger threshold automatically by a teach-in process or configure them manually. Once you have chosen the triggered recording in the RECORD MENU, the set trigger thresholds for the current level and the current inclination appear in the display.

6.1.2.1 Specifying the trigger thresholds manually

- Use the arrow buttons (7) or (9) to switch to RECORD MODE TRIG.
- Select the LEVEL with the arrow buttons (6) and (10).
- After pressing Enter (8) on LEVEL, the current value can be set by the arrow buttons (6), (7), (9) and (10) that should actuate the trigger if exceeded. Confirm by pressing Enter (8).
- Select the SLOPE with the arrow buttons (6) and (10).
- After pressing Enter (8) on SLOPE, the current change in A/ms can be set by the arrow buttons (6), (7), (9) and (10) that should actuate the trigger if exceeded. Confirm by pressing Enter (8).
- The monitoring is started and stopped as described in 6.1.1 *Permanent recording*.

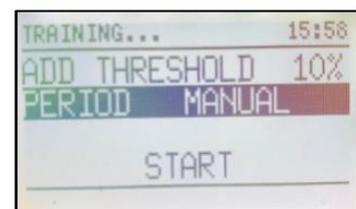


6.1.2.2 Teaching of trigger thresholds

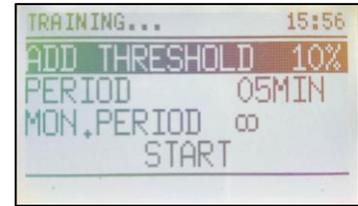
When trigger threshold are taught, the ISMZ I registers all current levels and current changes during the process. Before the teaching process, specify by which amount the trigger thresholds should be higher than the registered values (e.g. by 20 % higher). Furthermore you set a specific teaching time or start and stop the teaching manually.

Switch into the TRAINING... menu with the Mode button (2).

- Select ADD THRESHOLD with the arrow buttons (6) and (10).
- Use the arrow buttons (7) and (9) to set by how much the operationally prevailing current needs to be exceeded so that a start trigger is actuated (e.g. 20 %). Values between 0 % and 95% are possible.
- Select PERIOD with the arrow buttons (6) and (10).
- If the function MANUAL is used, the training time can be started with selecting start with arrow buttons (6) and (10) and confirming this with button (8).
- From now the ISMZ will measure the LEVEL and SLOPE of the current. The measured values will be shown in the display.
- If the TRAINING time should be stopped, the button (8) has to be pressed.
- After stopping the TRAINING time the window RECORD MENU will be shown and the monitoring can be started as described in 6.1.1 *Permanent recording*.



- Select PERIOD with the arrow buttons (6) and (10).
- Switch from MANUAL to a time (5 min, 10 min, 15 min, 20 min, 25 min or 30 min) to observe the current and set the trigger threshold by using the arrow buttons (7) and (9).
- After choosing a PERIOD to add the trigger threshold the MON.PERIOD (time of monitoring) should be chosen with the arrow buttons (7) and (10), as described in 6.1.1 *Permanent recording*.
- Select START with the arrow buttons (6) and (10) and confirm to start the measurement with button (8).
- The clamp will now learn the trigger thresholds and start monitoring afterwards.



7 Control software EMCheck® View

The ISMZ I saves all recordings on a micro SD card in "*.EMC" format. The directories are saved temporarily in the format YYYY-MM-DD and the files in the format hh:mm:ss. Recordings can be evaluated with the included EMCheck® View software.

7.1 Installation of the EMCheck® View software

Insert the supplied CD in your drive and run Setup.exe by double-clicking it. Select "Language", "Install to", "create desktop Icon" and "register fileextension emc and raw". Click on "Install" to execute the installation. Confirm the completion of the installation at the end.

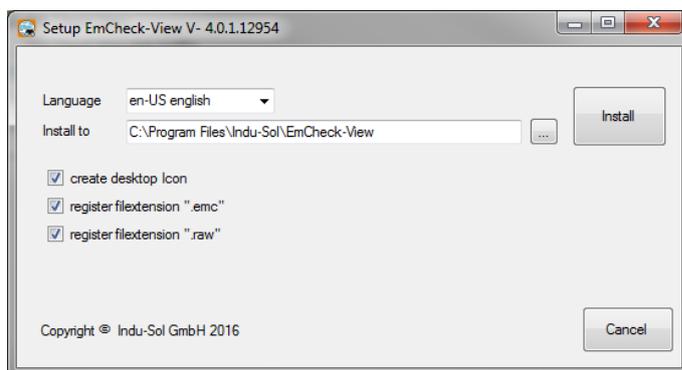


Figure 1: Selecting the installation folder

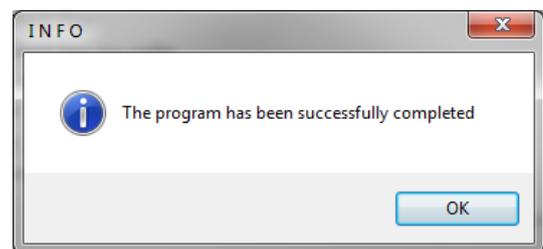


Figure 2: Completing the installation

In addition, run the installation of the USB driver and click on Extract.

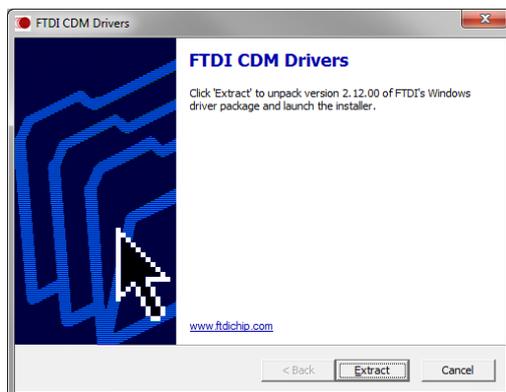


Figure 3: USB driver installation



Figure 4: EMCheck® View

After a successful installation, you can start the EMCheck® View software.

7.2 Copying recordings to the PC

There are two methods for copying the recordings from the ISMZ I onto your PC.

- 1) Remove the micro SD card from the clamp and take it from the adapter board. You can now read the micro SD card using a removable medium reader with an adapter to USB or standard SD.
- 2) Connect the ISMZ I with the integrated memory card via USB to your PC. A USB cable is included in the scope of supply.
 - Open the EMCheck® View software.
 - Select "Adjust clamp" (on top, on the right side)
 - Follow the instructions of the software – it's recommended to use "Wizard"
 - Once the connection has been established, you can make settings on the clamp and use it as a removable medium reader to access the micro SD card.
 - Once you end the "Set clamp" field, the function as removable medium is interrupted.

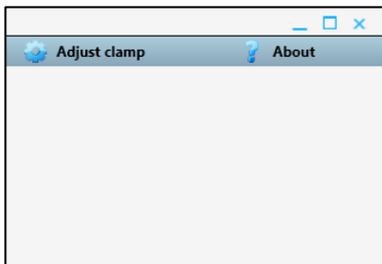


Figure 5: Select "Adjust clamp"

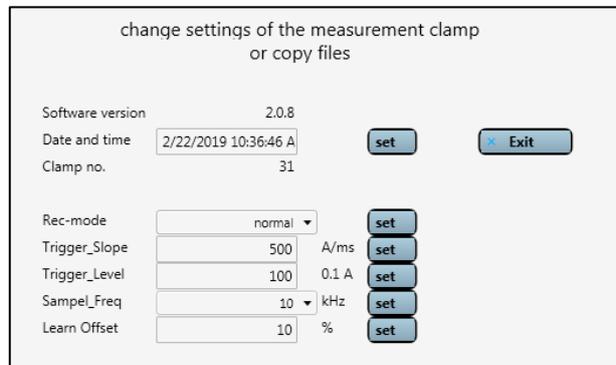


Figure 6: USB connection active

7.3 Data evaluation with EMCheck® View

Import of up to four EMC-files is possible by clicking the button “Add measurement data” in the top left corner.

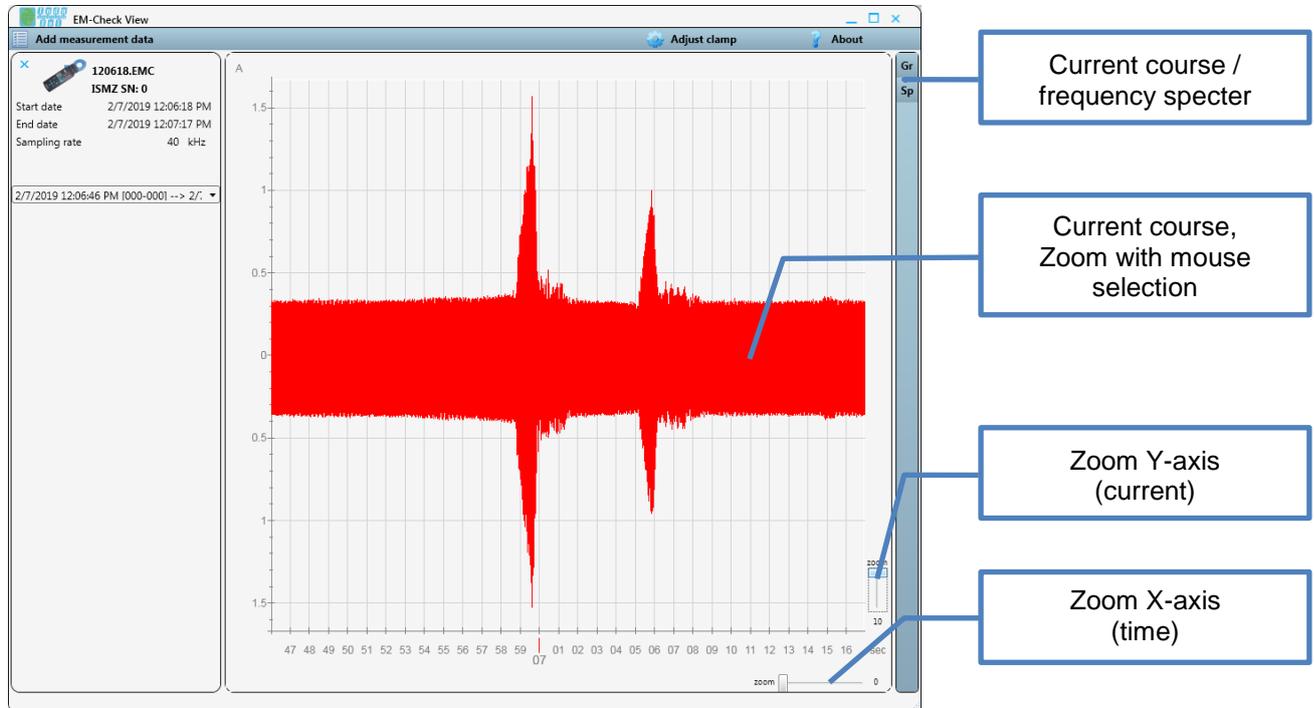


Figure 7: EMCheck® View data evaluation

You can change the displayed time frame for the display by drawing a frame with the mouse over the current course.

Using the arrow buttons next to the displayed time range, you can switch to previously set time ranges. All time ranges created till now are expanded by clicking on the time range.

By clicking on the button “Sp”, you can switch from “Current course” to the “frequency specter” of the shown graph.

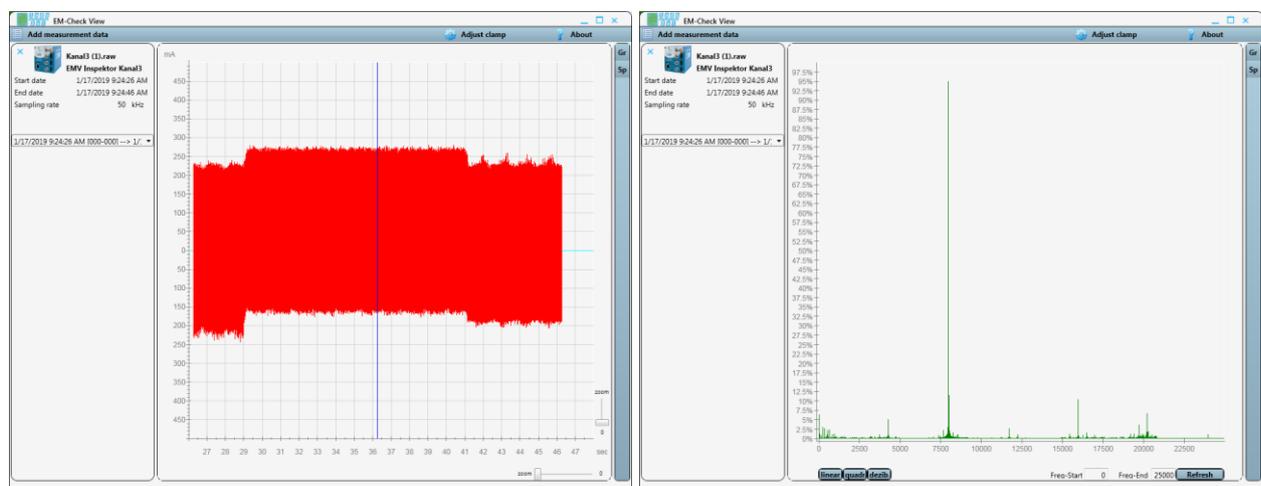


Figure 8: EMCheck® View data evaluation, Current course and frequency specter

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