

Method for testing a configuration of a safety device of an elevator system

The present invention relates to a method for testing a configuration of a safety device of an elevator system. The invention further relates to a data processing device, a computer
5 program and a computer-readable medium for carrying out the method, a safety device suitable for use in the method, and an elevator system.

An elevator system, such as used for transporting persons and/or objects in buildings, is usually equipped with a safety device that monitors one or more operating parameters,
10 such as a travel speed or a deceleration of the car at the end of the shaft, and automatically triggers one or more safety functions if an actual value of the respective operating parameter exceeds a certain trigger threshold. The elevator system is then usually brought into a safe state by interrupting the safety circuit. The trigger threshold usually lies above a maximum permissible value of the respective operating parameter.
15 For example, the trigger threshold may be 110% of the maximum permissible value.

It may be necessary to adjust certain settings relating to such a safety function on site, for example during commissioning. For this purpose, a technician can take certain maximum permissible values of safety-relevant operating parameters from the elevator controller
20 and use them to determine trigger thresholds adapted to the respective elevator system by adding a certain reserve to each of these maximum values. Mistakes can easily be made in this process. The safety device adapted in this way can then be tested by carrying out a test run in which the elevator system is operated differently from in normal operation, for example at an increased travel speed, in order to specifically trigger the safety function
25 and thus check whether the settings have been correctly adjusted. However, this can place a great deal of strain on the elevator system.

EP 1 510 492 A1 describes an example of a method for checking an elevator system.

30 There may therefore be a need for a method that makes it possible to prevent excessive strain on an elevator system when testing safety functions during a test run.

Furthermore, there may be a need for a corresponding data processing device, a corresponding safety device, a corresponding elevator system, a corresponding computer program and a corresponding computer-readable medium.

5 These needs can be met by the subject-matter of the independent claims. Advantageous embodiments are defined in the dependent claims, in the following description and in the accompanying drawings.

10 A first aspect of the invention relates to a method for testing a configuration of a safety device of an elevator system comprising a car that can be moved between several floors of a building. The safety device is configured to trigger a safety function when an actual value of a safety-relevant operating parameter of the elevator system exceeds a trigger threshold. The method comprises switching the safety device to a test mode for testing the configuration of the safety device. By switching the safety device to the test mode, the
15 safety device is configured to use a test threshold value which differs from the operating threshold value as the trigger threshold instead of an operating threshold value which the safety device uses as the trigger threshold during normal operation of the elevator system.

20 The method may be computer-implemented and carried out automatically by a processor, for example of the safety device or of a (higher-level) elevator controller.

The term "exceeding" can also be understood to mean falling below. In other words, the trigger threshold can be exceeded in different directions.

25 Preferably, the trigger threshold is lowered to the test threshold value by activating the test mode, so that the safety function is already triggered (for example by opening a switch in the safety circuit) when the elevator system is operated under normal operating conditions, for example at normal travel speed and/or normal deceleration. This avoids excessive strain on the elevator system when testing the configuration of the safety device
30 during a test run.

However, during a run with the test mode deactivated, the safety function should only be able to be triggered when operating conditions are not normal for any reason, for example

if the travel speed is significantly higher than under normal operating conditions, i.e. significantly above a maximum permissible travel speed.

5 The test threshold value can be fixed. For example, the test threshold value can be read from a read-only memory (see also below). This has the effect that a user will not be able to change the test threshold value or only with considerable effort and/or after having demonstrated authorization to do so. In addition, this eliminates the need for manual setting of the trigger threshold on site, which is usually much more complicated than simply switching the safety device to a test mode with a preconfigured trigger threshold
10 or preconfigured trigger thresholds.

The test threshold value may, for example, be an empirical value, have been determined in experiments, have been calculated from known parameters or have been determined by computer simulations or computer modeling.

15 Switching to the test mode preferably occurs in response to receipt of a corresponding command. The command can be input from a user. In other words, the test mode can be activated manually. However, it is also conceivable for the command to be generated automatically (and thus for the test mode to be activated automatically), for example as
20 part of a test program executed by a computer for testing the elevator system.

A second aspect of the invention relates to a data processing device having a processor that is configured to carry out the method described above and below. The data processing device may comprise hardware and/or software modules. In addition to the
25 processor, the data processing device may comprise a memory and a data communication interface for wireless and/or wired data communication with peripheral devices.

The data processing device may, for example, be a component of the safety device described above and below. However, the data processing device may also be a
30 component of a control device (also called the elevator controller) for controlling the elevator system.

It should be noted that features of the method described above and below may also be features of the data processing device (and vice versa).

A third aspect of the invention relates to a safety device for use in the method described above and below. The safety device is configured to trigger a safety function of an elevator system when an actual value of a safety-relevant operating parameter of the elevator system exceeds a trigger threshold. Furthermore, the safety device can be switched to a test mode for testing the configuration of the safety device, wherein the safety device is configured in the test mode to use a test threshold value which differs from the operating threshold value as the trigger threshold instead of an operating threshold value which the safety device uses as the trigger threshold during normal operation of the elevator system.

The safety device may additionally comprise one or more sensors for detecting the actual value. Such a sensor can be, for example, a position sensor, a displacement sensor, a speed sensor, an acceleration sensor, an incremental encoder, an absolute encoder or a combination of at least two of these examples.

The safety device can be configured to open one or more switches of a safety circuit of the elevator system when the safety function is triggered and thus to interrupt the power supply to a drive device of the elevator system. A braking device of the elevator system can be activated (automatically), whereby the car(s) of the elevator system are brought to a standstill and/or kept at a standstill.

The safety device can, for example, be designed as an (electronic) speed limiter.

It should be noted that features of the method described above and below may also be features of the safety device (and vice versa).

A fourth aspect of the invention relates to an elevator system. The elevator system comprises a shaft connecting several floors of a building, a car which is movable in the shaft between the floors, a drive device for driving the car, the data processing device described above and below and the safety device described above and below.

The drive device may, for example, comprise an electric and/or hydraulic drive. The drive device may also comprise a braking device for braking the car and/or for keeping the car at a standstill.

5 Further aspects of the invention relate to a computer program and a computer-readable medium on which the computer program is stored.

The computer program comprises commands which cause a processor to carry out the method described above and below when the computer program is executed by the processor.

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The computer-readable medium can be a volatile or non-volatile data memory. For example, the computer-readable medium may be a hard disk, a USB storage device (*universal serial bus*), a RAM (*random-access memory*), a ROM (*read-only memory*), a PROM (*programmable read-only memory*), an EPROM (*erasable programmable read-*
15 *only memory*), an EEPROM (*electrically erasable programmable read-only memory*), a flash memory or a combination of at least two of these examples. The computer-readable medium may also be a data communication network that allows program code to be downloaded (for example via the internet), or a cloud.

20 It should be noted that features of the method described above and below may also be features of the computer program and/or of the computer-readable medium (and vice versa).

Embodiments of the invention may be regarded as based on the concepts and findings described below. These embodiments are not to be understood as limiting the scope of the
25 invention.

According to one embodiment, the test threshold value may be lower than the operating threshold value. This is particularly useful if the operating parameter is a travel speed or an acceleration, in particular a deceleration, of the car. However, in certain cases it may
30 also be useful if the test threshold value is greater than the operating threshold value. The test threshold value may differ from the operating threshold value by, for example, at least 2%, at least 5%, at least 10% or at least 20%.

According to one embodiment, the trigger threshold value can be defined depending on a maximum permissible value of the safety-relevant operating parameter. The maximum permissible value can lie between the operating threshold value and the test threshold value. The maximum permissible value may differ from the operating threshold value and the test threshold value, for example by at least 2%, at least 5%, at least 10% or at least 20%. Preferably, the operating threshold value is greater than and the test threshold value is lower than the maximum permissible value.

The operating threshold value may exceed the maximum permissible value by a certain amount, which in some cases may be specified by a standard. For example, the operating threshold value for the travel speed of the car may be equal to 115% of a maximum permissible travel speed and the operating threshold value for the deceleration of the car during a braking operation bringing the car to a stop at one end of the shaft may be equal to 110% of a maximum permissible deceleration.

According to one embodiment, the test threshold value can be determined by multiplying the maximum permissible value by a predefined factor. The predefined factor can be positive or negative.

According to one embodiment, the predefined factor can be read from a read-only memory, for example of the safety device or of a (higher-level) elevator controller. For example, the test threshold value may have been programmed into the memory during manufacture. This prevents or makes it difficult to overwrite the predefined factor with other values and thus to manipulate the predefined factor without authorization. The memory may be, for example, a ROM, a PROM, an EPROM, an EEPROM, a flash memory, or a combination of at least two of these examples.

In addition, and for the same reason, the maximum permissible value or the operating threshold value, or both the maximum permissible value and the operating threshold value, may be stored in read-only memory.

According to one embodiment, the predefined factor can lie between 0.90 and 0.99, in particular between 0.96 and 0.98. Such values have proven in trials to be particularly suitable for practical use.

According to one embodiment, the safety device can be configured to determine the trigger threshold by using a vertical position of the car and an assignment rule which assigns different trigger thresholds to different vertical positions of the car. In this case, the safety device can be configured, by switching to test mode, to use a second assignment rule which differs from the first assignment rule and which assigns different test threshold values as the different trigger thresholds to the different vertical positions of the car in order to determine the trigger threshold, instead of a first assignment rule which assigns different operating threshold values as the different trigger thresholds to the different vertical positions of the car.

The safety device configured in this way makes it possible for the deceleration of the car to be monitored on the basis of the travel speed and the vertical position of the car, i.e. without the deceleration having to be measured directly. Such monitoring is typically required during a braking operation whereby the car is brought to a stop at one end of the shaft (i.e. at a top or bottom floor) in order to prevent the car from over-traveling. By switching the safety device to test mode, the relevant trigger thresholds can be adjusted easily and safely.

According to one embodiment, the method may further comprise: controlling a drive device for driving the car in order to carry out a test run for testing the configuration of the safety device, wherein the safety device is operated in the test mode during the test run. During the test run, the car can be moved vertically in a shaft. It is possible for the test run to be carried out in response to receiving another command, for example in response to another input from a user. The test run can be carried out automatically according to a defined procedure. When carrying out the test run, for example, a test result can be generated that indicates whether the test of the configuration of the safety device was successful or not. The test result can then, for example, be stored in a memory and/or made available to a user for evaluation via a user interface.

According to one embodiment, the drive device can be controlled during the test run so that the actual value approaches the maximum permissible value.

If the test threshold value lies below the maximum permissible value (as mentioned above) and the actual value is increased above the test threshold value during operation of the elevator system, this will have the effect of the safety function being triggered before the actual value reaches or exceeds the maximum permissible value. This prevents excessive strain on the elevator system during the test run.

According to one embodiment, the same maximum permissible value can be used for the test run as for a normal run. In other words, the test run can be carried out under the same operating conditions as a normal run. The term “normal run” can, for example, be understood to mean a run with passengers and/or objects after the (successful or certified) commissioning of the elevator system.

According to one embodiment, the safety-relevant operating parameter can be one of the following parameters: a travel speed of the car; an acceleration of the car, in particular a deceleration of the car during a braking operation in which the car is brought to a stop at one end of the shaft; a vertical position of the car; a distance traveled by the car.

It should be noted that the operating parameter can be defined, determined or measured with sensors, for example, with direct reference to the car. However, the operating parameter can also be derived indirectly, e.g. with reference to other elevator components. For example, a counterweight can be connected to the car via support means, so that a travel speed, an acceleration, a position or a path of the counterweight clearly correlates with corresponding properties of the car.

According to one embodiment, different test modes for different configurations of the elevator system can be stored in the safety device. The different test modes can differ in terms of their test threshold values. In this case, the method may further comprise: selecting the test mode to which the safety device is to be switched from the different test modes depending on a current configuration of the elevator system.

In other words, to test different configurations of the elevator system, different preconfigured trigger thresholds can be set by selecting an appropriate test mode. This means that the same safety device can be used for each elevator configuration. In other

words, the method can be carried out with different elevator systems without the need for complex changes to the hardware and/or software configuration of the safety device.

The test mode can be selected automatically and/or manually.

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For example, the method may further comprise receiving configuration data defining the current configuration of the elevator system. In this case, the test mode can be selected (automatically) from the different test modes by using the configuration data, for example with the aid of a lookup table. In this way, incorrect (manual) assignments can be avoided.

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Embodiments of the invention will be described below with reference to the accompanying drawings. Neither the description nor the drawings are to be understood as limiting the scope of the invention.

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Fig. 1 shows an elevator system according to one embodiment of the invention.

Fig. 2 illustrates possible values of a trigger threshold of a safety device according to one embodiment of the invention.

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The drawings are purely schematic and are not to scale. Where the same reference signs are used in different drawings, these reference signs denote identical or equivalent features.

Fig. 1 shows an elevator system 1 for transporting persons and/or objects between floors 2 of a building 3. The elevator system 1 comprises a shaft 4 connecting the floors 2, a car 5 arranged in the shaft 4 so as to be movable between the floors 2, a drive device 6 for raising and lowering the car 5, for example an electric or hydraulic drive, and a control device 7 (hereinafter referred to as an elevator controller 7) for controlling components of the elevator system 1, in particular of the drive device 6. The drive device 6 may additionally comprise a braking device for braking the car 5 and/or for keeping the car 5 at a standstill.

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In addition, the elevator system 1 comprises a safety device 8 for triggering a safety function which brings the elevator system 1 into a safe state under certain operating

conditions, for example by opening a safety circuit of the elevator system 1 and/or by activating the braking device.

5 In this example, the elevator controller 7 and the safety device 8 each comprise a data processing device 9 with a processor 10 and a memory 11.

10 A computer program can be stored in the memory 11 of the safety device 8, wherein the processor 10 of the safety device 8 can be configured to receive, by executing the computer program, actual values of one or more operating parameters of the elevator system 1 (for example a position or travel speed of the car 5) during operation of the elevator system 1, to compare them with a corresponding trigger threshold A (see Fig. 2) and to trigger the safety function if one of the actual values exceeds the trigger threshold A.

15 The actual values can be determined using one or more sensors of the elevator system 1, for example using a position sensor, a displacement sensor, a speed sensor, an acceleration sensor, an incremental encoder, an absolute encoder or a combination of at least two of these examples. Such a sensor or such a sensor combination may also be part of the safety device 8.

20 Likewise, a computer program can be stored in the memory 11 of the elevator controller 7, wherein the processor 10 of the elevator controller 7 can be configured to receive the aforementioned actual values by executing the computer program and to control the elevator system 1, in particular the drive device 6, such that the respective operating parameter approaches a maximum permissible value S (see Fig. 2) in its actual value.

25 If the operating parameter is, for example, the travel speed of the car 5, the maximum permissible value S will correspond to a maximum permissible travel speed of the car 5. This can have a profile that depends on a vertical distance of the car 5 to the top and/or bottom of the floors 2. The profile can be stored in the memory 11 of the elevator control
30 7, for example, in the form of a lookup table and/or a mathematical function.

In addition, the processor 10 of the elevator controller 7 can be configured to switch the safety device 8 to a special test mode for testing the configuration of the safety device by executing the computer program, provided that the processor 10 receives a corresponding

command, for example as a result of an input from a user. For this purpose, the elevator controller 7 and the safety device 8 can be connected to one another by wire and/or wirelessly for data communication.

5 By switching the safety device 8 to the test mode, an operating threshold value 12, which the safety device 8 uses as the trigger threshold A during normal operation of the elevator system 1, is replaced by a predefined test threshold value 13 (see Fig. 2). The safety device 8 then uses the test threshold value 13 as the trigger threshold A.

10 As shown in Fig. 2, the maximum permissible value S may lie between the test threshold value 13 and the operating threshold value 12, wherein the test threshold value 13 may be lower and the operating threshold value 12 may be greater than the maximum permissible value S.

15 The operating threshold value 12 or the test threshold value 13 or the operating threshold value 12 and the test threshold value 13 may depend on the maximum permissible value S. For example, the test threshold value 13 for each operating parameter to be monitored can be determined by multiplying the respective maximum permissible value S (which is set here to 1.00 as an example) by a predefined first factor. In addition, the operating
20 threshold value 12 for each operating parameter to be monitored can be determined by multiplying the respective maximum permissible value S by a predefined second factor which differs from the first factor.

In the example shown in Fig. 2, the first factor is equal to 0.98 for both the travel speed
25 and the deceleration at the end of the shaft. In contrast, the second factor is equal to 1.15 for the travel speed and 1.10 for the deceleration at the end of the shaft. Depending on the configuration of the elevator system 1, other factors are also possible.

The factors for different operating parameters may (but do not have to) differ in their
30 magnitude and/or sign.

The operating threshold value 12, the test threshold value 13, the maximum permissible value S, the first factor or the second factor or a combination of at least two of these values can be read from a read-only memory portion of the memory 11 of the safety

device 8 and/or the elevator controller 7 (e.g. from a ROM, PROM, EPROM, EEPROM, flash memory or a combination of at least two of these examples). The memory section may additionally or alternatively be protected against changes by encryption, for example by using cryptographic key pairs consisting of a private key and a public key. Secure boot procedures are also possible.

The safety device 8 may be configured to determine the trigger threshold A by using a vertical position of the car 5 and an assignment rule which assigns different trigger thresholds A to different vertical positions of the car 5. In this case, the safety device 8 is configured, by switching to the test mode, to use a second assignment rule which differs from the first assignment rule and which assigns different test threshold values 13 as the different trigger thresholds A to the different vertical positions of the car 5, in order to determine the trigger threshold A, instead of a first assignment rule which assigns different operating threshold values 12 as the different trigger thresholds A to the different vertical positions of the car 5. The operating threshold values 12 and the test threshold values 13 can, for example, be travel speed values. This makes it possible to monitor the deceleration of the car 5 during a braking operation in which the car 5 is brought to a stop at one end of the shaft (i.e. at the top or bottom floor 2) on the basis of the travel speed and the vertical position of the car 5, without the deceleration having to be measured directly. By switching the safety device 8 to the test mode, the relevant trigger thresholds A can be adjusted easily and safely.

The processor 10 of the elevator controller 7 can further be configured to carry out a test procedure by executing the computer program after switching the safety device 8 to the test mode, in which by an appropriate control of the drive device 6 the car 5 carries out a test run (or several test runs). During the test run, the safety device 8 is operated in the test mode, i.e. the trigger threshold A is set to the test threshold value 13 and the drive device 6 is controlled such that the actual value of at least one operating parameter approaches the maximum permissible value S. The trigger threshold A is exceeded here, which makes it possible to check the configuration of the safety device without the actual value having to be increased beyond the maximum permissible value S or the operating threshold value 12. This avoids excessive strain on the elevator system 1 during the test run, for example due to an excessively high travel speed and/or an excessively strong deceleration.

Optionally, the safety device 8 can be switched to different test modes that differ in terms of their test threshold values. The selection of a suitable test mode can be made automatically and/or manually depending on the configuration of an elevator system 1 to be tested.

5 For this purpose, for example, configuration data defining a current configuration of the elevator system 1 can be received in the elevator controller 7. The elevator controller 7 can then determine a suitable test mode and switch the safety device 8 to the suitable test mode using the configuration data and a list stored in the memory 11 which assigns one of the possible test modes to each possible configuration.

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In the case of an electronic safety device 8 whose monitoring limits can be parametrized, such a test mode, which can be activated (and deactivated) by the elevator controller 7, makes possible a simple check of the configuration of the safety device 8 without the elevator system 1 having to be operated in a manner deviating from the operating conditions intended for it.

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The test mode can be activated (and deactivated), for example, via a serial interface of the elevator controller.

20 For this purpose, the test mode is first activated and then a normal run is started. If the safety function is triggered here, this will confirm that the maximum permissible value S specified for the respective operating parameter (for example the travel speed) is correct, i.e. it is neither too high, as the safety device 8 would then not trigger the safety function, nor too low, since the run could then possibly not be carried out at all (i.e. the safety device 8 would trigger the safety function even at a very low travel speed).

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If the test mode is accidentally activated or accidentally not deactivated, this will not limit the safety of the elevator system 1 during normal operation, but at most the reliability. In contrast, the aforementioned factors (and the respective maximum permissible values S) are particularly relevant for safety and should therefore be stored in the safety device 8 and/or in the elevator controller 7 in a way that protects them from manipulation.

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In short, the method described above offers the following advantages:

- The configuration of the safety device 8 can be verified by using the normal travel parameters of the elevator system, so that each elevator system can be tested using the same method and within the safety limits.
- Acceptance tests can be automated by integrating the activation and/or deactivation of the test mode into the acceptance tests.
- The verification of the configuration of the safety device 8 is unambiguous (safety function is triggered or not triggered) and therefore safe.
- The simpler and safer acceptance test means that commissioning the elevator system takes less time overall.
- The elevator system does not have to be subjected to excessive strain in order to test the configuration of the safety device 8.

Finally, it should be noted that terms such as "having," "comprising," "including," "with," etc. do not exclude other elements or steps, and indefinite articles such as "a" or "an" do not exclude a plurality. Furthermore, it should be noted that features or steps that are described with reference to one of the above embodiments may also be used in combination with features or steps that are described with reference to other of the above embodiments. Reference signs in the claims are not to be understood as limiting the scope of the subject matter defined by the claims.

List of reference signs

	1	Elevator system
	2	Floor
5	3	Building
	4	Shaft
	5	Car
	6	Drive device
	7	Control unit / elevator controller
10	8	Safety device
	9	Data processing device
	10	Processor
	11	Memory
	12	Operating threshold value
15	13	Test threshold value
	A	Trigger threshold
	S	Maximum permissible value

Claims

1. Method for testing a configuration of a safety device (8) of an elevator system (1), wherein the elevator system (1) comprises a car (5) which can be moved between several floors (2) of a building (3), wherein the safety device (8) is configured to trigger a safety function when an actual value of a safety-relevant operating parameter of the elevator system (1) exceeds a trigger threshold (A), wherein the method comprises: switching the safety device (8) to a test mode for testing the configuration of the safety device, wherein the safety device (8) is configured, by switching to the test mode, to use a test threshold value (13) which differs from the operating threshold value (12) as the trigger threshold (A) instead of an operating threshold value (12) which the safety device (8) uses as the trigger threshold (A) during normal operation of the elevator system (1).
2. Method according to claim 1, wherein the test threshold value (13) is lower than the operating threshold value (12).
3. Method according to any of the preceding claims, wherein the trigger threshold (A) is defined as a function of a maximum permissible value (S) of the safety-relevant operating parameter; wherein the maximum permissible value (S) lies between the operating threshold value (12) and the test threshold value (13).
4. Method according to claim 3, wherein the test threshold value (13) is determined by multiplying the maximum permissible value (S) by a predefined factor.
5. Method according to claim 4, wherein the predefined factor is read from a read-only memory (11); and/or wherein the predefined factor lies between 0.90 and 0.99, in particular between 0.96 and 0.98.
6. Method according to any of the preceding claims,

wherein the safety device (8) is configured to determine the trigger threshold (A) by using a vertical position of the car (5) and an assignment rule which assigns different trigger thresholds (A) to different vertical positions of the car (5);

wherein the safety device (8) is configured, by switching to the test mode, to use a second assignment rule which differs from the first assignment rule and which assigns to the different vertical positions of the car (5) different test threshold values (13) as the different trigger thresholds (A), in order to determine the trigger threshold (A), instead of a first assignment rule which assigns to the different vertical positions of the car (5) different operating threshold values (12) as the different trigger thresholds (A).

7. Method according to any of the preceding claims, further comprising:
controlling a drive device (6) for driving the car (5) in order to carry out a test run for testing the configuration of the safety device, wherein the safety device (8) is operated in the test mode during the test run.

8. Method according to claim 7, as dependent upon claim 3,
wherein the drive device (6) is controlled during the test run such that the actual value approaches the maximum permissible value (S); and/or
wherein the same maximum permissible value (S) is used for the test run as for a normal run.

9. Method according to any of the preceding claims,
wherein the safety-relevant operating parameter is one of the following parameters: a travel speed of the car (5); an acceleration of the car (5), in particular a deceleration of the car (5) during a braking operation in which the car (5) is brought to a stop at an end of the shaft; a vertical position of the car (5); a distance traveled by the car (5).

10. Method according to any of the preceding claims,
wherein different test modes for different configurations of the elevator system (1) are stored in the safety device (8) and the different test modes differ in terms of their test threshold values (13),
wherein the method further comprises:
selecting the test mode to which the safety device (8) is to be switched from the different test modes depending on the current configuration of the elevator system (1).

11. Data processing device (9) comprising a processor (10) configured to carry out the method according to any of the preceding claims.

12. Safety device (8) for use in the method according to any of claims 1 to 10,
5 wherein the safety device (8) is configured to trigger a safety function of an elevator system (1) when an actual value of a safety-relevant operating parameter of the elevator system (1) exceeds a trigger threshold (A), and can be switched to a test mode for testing the configuration of the safety device,
wherein the safety device (8) is configured in the test mode to use a test threshold value
10 (13) which differs from the operating threshold value (12) as the trigger threshold (A) instead of an operating threshold value (12) which the safety device (8) uses as the trigger threshold (A) during normal operation of the elevator system (1).

13. Elevator system (1), comprising:
15 a shaft (4) connecting several floors (2) of a building (3);
a car (5) which is movable in a shaft (4) between the floors (2);
a drive device (6) for driving the car (5);
the data processing device (9) according to claim 11;
the safety device (8) according to claim 12.

14. Computer program comprising commands which cause a processor (10) to carry out the method according to any of claims 1 to 10 when the computer program is executed by the processor (10).

15. Computer-readable medium on which the computer program according to claim 14 is stored.