

**TITLE: Side casing for a gate for controlling access to a restricted area,
associated gate for controlling access to a restricted area and associated control
method**

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The present invention relates to a side casing for a gate for controlling access to a restricted area, said side casing comprising:

- a frame defining an access passage to the restricted area and having a floor plan,
- at least one obstacle that is movable between an obstructing position and an opening position, to obstruct or allow access selectively, and
- a motor assembly for driving said obstacle, comprising a motor,
- an output shaft coupled to said obstacle, designed so as to be driven in rotation about its axis by said motor assembly to hold the obstacle in an obstructing position or to move the obstacle so as to allow access, respectively, according to a respective current instruction to obstruct said passage or to allow access;
- an electronic control designed to make the motor obey on the basis of the current instruction.

Such automatic gates are typically intended to be used in control systems to access restricted areas such as pedestrian areas, building interiors, public transport networks, etc. They make it possible to filter users at the entrance and at the exit of these restricted areas, if necessary, so as to limit access to said restricted areas to authorized users only. For this purpose, the obstacles of these automatic gates are usually positioned in a first position, called the obstruction position, in which they extend across a passage to access the restricted area, and are moved by the motor assemblies of these automatic gates into a second position, called the opening position, away from the passage when an authorized user enters the access passage.

Fraudsters and vandals can try to force access by exerting strong pressure or even kicking the obstacles (with more than 300 joules of energy, in the case of "Karate Kicking").

In addition to the need for an automatic gate to resist illegitimate access attempts, there is also a need to be able to allow access when security requires it (for crowd movement, for example).

Existing solutions include mechanisms or electro-mechanisms that allow movement of the obstacles when the stress applied on them by the fraudster exceeds a predetermined level. They provide an unsatisfactory, passive and binary solution, consisting of resisting or yielding.

For this purpose, according to a first aspect, the invention has a side casing for a gate as its object, for controlling access to a restricted area of the aforementioned type characterized in that the motor assembly further comprises an angular position sensor designed to measure the angular position of the shaft, the electronic control unit is designed to collect the angular measurements made by the sensor, when the obstacle is held in an obstructing position according to a current instruction to obstruct access, to calculate temporal variations in angle on the basis of said collected measurements and to trigger an action, on the basis of said calculated angular variations, of:

- an increase, a reduction or a limitation of an instruction for the applied torque to hold the obstacle in an obstructing position; and
- an instruction to allow access.

The invention makes it possible to detect and classify a violent act exerted on the gate and to make an appropriate response.

In embodiments, the side casing for a gate for controlling access to a restricted area according to the invention further comprises one or more of the following features:

- the control unit is designed to determine the temporal variations in angle calculated by comparing each measurement collected with a determined reference position of the shaft; and the control unit is designed to compare said temporal variations in angle calculated with at least one standard profile, and to trigger said action depending on the comparison with said standard profile;
- when the obstacle is held in an obstructing position according to a current instruction to obstruct access, the electronic control unit is designed to select said action on the basis of a comparison of said temporal variations in angle with at least one standard profile;
- when the obstacle is held in an obstructing position according to a current instruction to obstruct access, the electronic control unit is designed to trigger an instruction for allowing said access as soon as said temporal variations in angle exceed a predetermined threshold S1 for at least a predetermined threshold time T0;
- when the obstacle is held in an obstructing position according to a current instruction to obstruct access, the electronic control unit is designed to trigger a torque modification instruction as soon as said temporal variations in angle continuously exceed a predetermined threshold S2 greater than the threshold S1 for at most a predetermined threshold time T, less than T0.

According to a second aspect, the invention also has as its object a gate for controlling access to a restricted area comprising at least one side casing according to the first aspect of the invention.

According to a third aspect, the invention has as its object a control method in a side casing for a gate for controlling access to a restricted area, said side casing comprising a frame defining a passage to access the restricted area and having a floor plan for at least one movable obstacle, one motor assembly comprising a motor and an output shaft coupled to said obstacle;

said method comprising the following steps:

- driving the output shaft in rotation about its axis by the motor assembly, according to a current instruction, in order to keep the obstacle in a respective obstructing position of the access passage or to move the obstacle to an opening position to allow access, either to obstruct or to allow said access passage, respectively;
- controlling the motor by means of an electronic control unit, based on the current instruction;

said method being characterized in that it comprises the following steps implemented by the electronic control unit:

- an angular position sensor measuring the angular position;
- when the obstacle is held in an obstructing position according to a current instruction to obstruct access:
 - collecting angular measurements made by the sensor and calculating temporal variations in angle based on said measurements collected and,
 - on the basis of said calculated variations in angle, to trigger an action of:
 - an increase, reduction or limitation of an instruction for the applied torque to hold the obstacle in an obstructing position; and
 - an instruction to allow access.

In embodiments, the control method according to the invention further comprises one or more of the following features:

- it comprises the following steps implemented by the electronic control unit:
 - determining the calculated temporal variations in angle by comparing each measurement collected with a determined shaft reference position;
 - comparing said calculated temporal variations in angle with at least one standard profile; and

- triggering said action on the basis of the comparison with said standard profile;
- when the obstacle is held in an obstructing position according to a current instruction to obstruct access, said action is selected on the basis of a comparison of said temporal variations in angle with at least one standard profile;
- when the obstacle is held in an obstructing position according to a current instruction to obstruct access, the method comprises a step of the electronic control unit triggering an instruction for allowing the said passage as soon as said temporal variations in angle exceed a predetermined threshold S1 for at least a predetermined threshold time T0.

Other features and advantages of the invention will become apparent from the following description, given solely by way of example and made with reference to the appended drawings, in which:

[Fig 1] Figure 1 shows a view of a gate for controlling access to a restricted area in one embodiment of the invention;

[Fig. 2] Figure 2 is a view of a motor assembly of the gate of Figure 1 in one embodiment of the invention;

[Fig. 3] Figure 3 is a schematic diagram illustrating the servo control of a motor of a motor assembly in one embodiment of the invention;

[Fig. 4] Figure 4 is a flow chart of steps implemented in one embodiment of the invention;

[Fig 5] Figure 5 is a timeline illustrating angular variations and instructions given in one embodiment of the invention.

The automatic gate 14 shown in Figure 1 comprises a side casing having a door 20 and at least one motor assembly 22.

The door 20 comprises a frame 24 defining an access passage 26 extending along a longitudinal circulation axis C-C'. The door 20 also comprises at least one obstacle 28 mounted for movement relative to the frame 24, between an obstructed position in which the obstacle 28 extends across the access passage 26, and an open position in which the obstacle 28 is clear of the access passage 26. Preferably, each door 20 comprises two obstacles 28, as shown in Figure 1.

Each obstacle 28 is composed of a leaf 34, i.e. a panel, movable relative to the frame 24. This leaf 34 is chosen from the following list: tilting leaf, side-clearing leaf, pivoting leaf.

In the particular case considered, each obstacle 28 is composed of a pivoting leaf, i.e. a leaf mounted so as to pivot relative to the frame 24 about a vertical rotation axis D-D'.

For this purpose, the leaf 34 is integral with a vertical shaft 60 mounted so as to be movable about its axis relative to the frame 24.

The door 20 of the gate 14 also comprises a control device (not shown) in a known manner, designed to send commands to the motor assembly 22 for opening or closing the access passage. Such a device typically comprises a pass reader designed to communicate with an access pass of a user 26 present at the entrance to the access passage, and a central calculator programmed to command the activation of the motor assembly 22 or not, depending in particular on the data read by the pass reader in the memory of the access pass.

Thus, for example, with the gate normally being closed, reading a valid pass gives rise to a command to open. Then, with a set of sensors sending signals to the control module that analyzes the access of the user, the control module triggers the closing as soon as it detects that the user has passed through the gate, on the basis of these signals.

Or again, in a normally open gate, for example, the detection of the beginning of access without a valid pass leads to the control module closing it, with the opening controlled by the absence of user's presence, detected at the entrance of the access passage, or presentation of a valid pass.

For example, the automatic gate 14 allows users with a transport pass in a contactless card to access public transport networks through the automatic gate 14.

The gate 14 comprises a motor assembly 22 for each obstacle 28. This motor assembly 22 is designed to move the obstacle 28 to which it is associated, between its obstruction and its opening positions, on the basis of corresponding commands received from the device (not shown) for controlling user access authorizations, and also on the basis of instructions determined by the motor assembly 22, as described below in one embodiment of the invention.

For this purpose, as shown in Figures 1 and 2, the motor assembly 22 comprises an output shaft 62 and a motor 64 for driving the output shaft 62 in rotation about its axis, the output shaft 62 being kinematically linked to the obstacle 28 so that rotation of the output shaft 62 about its axis causes the obstacle 28 to move between its obstructing and opening positions.

The motor 64 is of the "brushless" type, for example.

The motor assembly 22 comprises a reducer 66 that ensures a reduction of rotation speed and an increase in torque between the rotor of the motor 64 and the output shaft 62.

The motor assembly 22 also comprises a drive unit 68 for driving the motor 64, with said reducer 66 and drive unit 68 forming a geared motor 67 with the motor 64 and the shaft 62.

In one embodiment, the motor assembly 22 further comprises an angular position sensor 15, such as a Hall effect sensor, designed to determine the angular position of the output shaft 62 as it rotates about the axis DD' relative to a reference position corresponding to the obstacle 28 in the obstructed position. In the example under consideration, the motor assembly 22 is assembled to the door 20 in such a way as to minimize the intermediate mechanisms between the motor assembly 22 and the obstacle 28.

For this purpose, the motor assembly 22 is coupled directly to the obstacle 28, i.e. it drives the shaft 60 to which the obstacle 28 is integral without conversion of movement between the movement of the output shaft 62 and the movement of said shaft 60. Thus, in the particular embodiment under consideration, the output shaft 62 of the motor assembly 22 is coaxial and integral with the shaft 60.

The motor assembly 22 thus comprises a mechanical device driven by servo-controlled electric motorization (servomotor and reducer).

In one embodiment, the control unit 68 comprises a memory and a processor (not shown). The control unit 68 is further designed to implement the steps incumbent on it as described below. For example, the memory comprises software instructions that result in the driver unit 68 performing those steps when executed on the processor.

In one embodiment, the memory stores modifiable parameter values typically comprising speeds, torques, directions of rotation and/or servo constants at one or more positions of the motor rotor 64.

The drive unit 68 is further designed to collect the current angular position of the shaft 62 measured by the angular position sensor 15 at every time period T (with T being in the [50 ms; 200 ms] range, for example).

The control unit 68 is designed to make the motor 64 obey on the basis of commands to open or close access received by the control unit 68 from the central gate computer, which elaborates these commands on the basis of data transmitted by the pass reader, on the one hand, and by the sensors that detect the user's access. on the other hand (and translated by the control unit 68 into instructions corresponding to keeping the obstruction position, moving to the open position, angular position values of the of the shaft 62, angular speed values, torque values on the shaft 62), and also on the basis of instructions determined by the motor assembly 22, as described below in one embodiment of the invention.

Figure 3 illustrates the principle of the servo-control function of the brushless motor 64 implemented by the control unit 68: it comprises two servo-control loops, depending on the said instructions "P": a loop 18 for controlling the torque on the shaft 62 and a loop 17 for controlling the rotation speed and angular position of the shaft 62. The measurements of the sensor 15 are used to implement these loops.

According to the invention, in a general manner, when the obstacle is held in an obstructing position according to a current instruction to obstruct access, the control unit 68 is designed to collect the angular measurements made by the sensor 15, to calculate temporal variations in angle on the basis of said collected measurements and, on the basis of said angular variations calculated, to trigger an action of:

- an increase, a reduction or a limitation of the torque applied on the shaft 62 by the motor 64 to keep the obstacle in an obstructed position, or
- a command to open said access.

Let us considering an embodiment of the invention now described with reference to the set of steps 100 shown in Figure 4, for example, while the obstacle 28 is held in the obstructing position by the control unit 68 of the motor assembly associated with this obstacle 28, with no access authorization deduced from reading a transportation pass.

In a step 101, the control unit 68 successively collects the angular position measurements made by the angular position sensor 15 and gives instructions to the motor to keep an obstruction position in standby mode (the instruction on position controlled via the servo-control of the motor 64 is the reference position for closing the shaft 62, and the instruction on torque controlled via the servo-control of the motor 64 is of a minimum value sufficient to keep the obstacle closed, for example).

Then, in a step 102, on the basis of these measurements collected, the angular deviation is determined, based of the time between the obstruction position commanded and the actual position. If none of these deviations exceeds a determined threshold, in absolute value, over the observation time window, for example, step 101 is repeated. If at least one exceeds the observation time window, a step 103 is then implemented, of comparing the profile of the successive angular deviations determined with a set of N standard profile(s), each corresponding to an aggression type of event on the gate.

N is greater than or equal to 1, equal to 2 or 4, for example.

The object of step 103 is to classify the aggression.

For example, rapid and repeated variations with high angle deviation values will indicate aggression associated with vandalism, whereas a smaller but continued angular deviation will indicate forcing, which may be associated with crowd movement or fraud.

For example, by referring to the graph in Figure 5 showing the evolution of the temporal deviations in angle ANG, expressed in 10^{th} s of degrees expressed in ms, the control unit 68 determines that the forcing type of aggression is occurring because the angular deviation remains greater than a threshold value S1 for a period T1 greater than a threshold duration T0 (typical profile 1) (equal to s seconds, for example, with s greater than 1).

Subsequently, the control unit 68 detects that the vandalism type of aggression (profile no. 4) is occurring by detecting significant angular deviations, greater than a threshold value S2, itself greater than S1, over short impact durations (less than a threshold duration of T ms, with T less than 900 ms, for example, or 700 ms, or 500 ms), which corresponds to attacks of the violent, rapid type and possibly repeated kicking.

In the case of N = 4, the two other profiles (profiles 2 and 3) take deviation threshold values and intermediate threshold periods into account, for example.

If the comparison does not make it possible to classify within the set of standard profiles, then step 101 is repeated; otherwise, once the aggression type has been determined on the basis of the comparison step 103, the step 104 of the control unit 68 triggering action(s) on the basis of the determined aggression type is implemented: one or more current instructions are then modified by the control unit 68, via the corresponding servo-control of the motor 64, on the basis of the aggression type detected, for example (with these instructions being able to be modified in the course of time); these instruction modifications comprising:

- increasing the torque to oppose resistance (in the event of aggression of the anti-fraud type); and/or
- reducing or limiting the torque to preserve the gate (if protection of the gate itself is desired); and/or
- ordering the automatic opening position (protection of people).

Depending on the type of profiles present in the set of standard profiles, the servo-motor 64 follows a torque profile that favors protection over the risk of damage (minimum torque) or, on the contrary, that favors resistance over the attempt to open (maximum torque). Between these extreme settings, there may be intermediate standard profiles (2, for example) that offer compromises other than self-protection and resistance.

A mode of action is thus associated with each type of aggression profile.

In a step 105, following step 104 or concomitantly, the servo-motor 68 generates information and/or reactions such as alarms indicating the type of aggression, via its I/O outputs, intended for the outside, such as:

- local audible alarm (dissuasion); and/or
- light signals (location of the gate among others in a row); and/or
- transmission of an alert to the station's central office or to an agent; and/or
- transmission of a time marker to a video surveillance device, etc.

5 The output of the modes of action corresponding to the respective types of aggression such as forcible entry or vandalism is carried out automatically as soon as the angular deviation returns to "usual" values (below S1, for example) for a predetermined time.

10 In one embodiment, N is equal to 1 and the only aggression profile type is the one corresponding to vandalism, for example, with aggression of the forcing type considered as treated without any particular provisions by the law of servo-control torque that tends to bring the obstacles to the instruction position.

15 More sophisticated variants can be developed by multiplying the modes, the torque evolution (and position commands) in these modes as well as the alerts and alarms. For example, in the case of violent shock repeated at regular intervals and in a sophisticated version of the system, the opening of the obstacle 28 is controlled by the control unit 68 at the moment the aggressor is going to strike again (possibly with the help of the access sensors), in order to destabilize the latter.

20 An example of logic with two types of aggression profiles is detailed below, thus corresponding to two aggression modes implemented by the control unit 68 in one embodiment. This example is described with reference to the chronograms of the time-based angle deviation ANG and the time-based torque command CC, in Figure 5.

"Standby" mode (corresponding to the mode described above for state 101)

25 A0: initial state: the motor assembly 22 is in "standby" mode: the gates are closed (Position Command = 0 (i.e. angle deviation as commanded relative to the reference position is equal to 0 i.e. the obstruction position is commanded); Torque Command = CC1, low i.e. the minimum to keep the obstacle 28 closed); the actual obstruction position angle is continuously measured in a software loop;

30 if α exceeds the predetermined threshold S2 => go to step V1 of the "presumption of vandalism" mode

 if α does not exceed the threshold S2 but exceeds the predetermined threshold S1, lower than S2 => go to step F1 of the "presumption of forcing" mode

 if a command is received (e.g. to open) => exit "standby" mode and execute the command

35 if not, loop this step A0.

“Presumption of Vandalism” mode (upon detection of α exceeding the threshold S2)

V1. Position Command = 0 (obstruction position); Torque Command = CCmax => go to step V2.

5 V2. For duration = dv1 (typically 300 ms):

if α remains above S3 (= S2 or possibly lower than S2, S1) until the end of the duration dv1, (i.e. it is not a blow, but very strong pressure) then Position Command: opening position; Torque Command = 0 or low: i.e. leave this mode (return to the "active" mode with command to open)

10 if α returns below S3 (i.e. it was in fact a first blow, intentional or not): go to step V3.

V3. For duration = dv2 (typically 1500 ms):

if it remains below S2 until the end of the duration dv2 (i.e. it was an isolated blow): Position Command = 0 (obstruction position); Torque Command = CC1, i.e. low torque, leave this process (return to "standby" mode)

15 if α exceeds the threshold S2 (again): go to step V4;

V4. For duration = dv1 (typically 300 ms):

if α remains above S3 until the end of the duration dv1 (i.e. it is not a blow, but very strong pressure): Position Command = opening position; Torque Command = 0 or low, leave this process (return to the "active" mode with command to open)

20 if α returns below S3 (i.e. it is a 2nd blow, intentional or not) => trigger reaction A (such as a single strong audible alarm) and go to step V5;

V5. For duration = dv2 (typically 1500 ms):

if α remains below S2 until the end of the duration dv2 (i.e. it was two blows without continuation) => Position Command = 0 (obstruction position); Torque Command = CC1, low, leave this process (return to the "standby" mode)

25 if α exceeds the threshold S2 (again) => go to step V6;

V6. During duration = dv1 (typically 300 ms):

if α remains above S3 until the end of the duration dv1 (i.e. it is not a blow, but very strong pressure): => Position Command = opening position; Torque Command = 0 or CC1, weak, leave this process (return to the "active" mode with command to open);

30 if α returns below S3 (i.e. it is a 3rd blow, probably intentional) => trigger reaction B (e.g. loud audible alarm + alert to the central unit + dating and video-surveillance recording command) and go to step V7;

V7. For duration = dv3 (typically 1 minute):

Position Command = open position; Torque Command = 0 or low CC1 (= passive preservation sub-mode)

then at the end of the duration dv3 => Position Command = 0 (obstruction position); Torque Command = CC1 low, leave this process (return to the "standby" mode).

5 **"Presumption of Forcing" mode (upon detection of α exceeding the threshold S1)**

F1. Position Command = 0 (obstruction position); Torque Command = CC1 => go to step F2

F2. During duration = df1 (typically 500 ms):

10 if α exceeds threshold S2 => go to step V1 of the "presumption of Vandalism" mode;
if α passes below S1 (it was a blow or a short pressure without continuation) => Position Command = 0; Torque Command = CC1, leave this process (return to "standby" mode);

15 if α remains between S1 and S2 until the end of the duration df1 (it is continued pressure) => Position Command = 0; Torque Command = CC2, and go to step F3;

F3. During duration = df2 (typically 500 ms) same as previous step with torque increase:

if α exceeds threshold S2 => go to step V1 of the "presumption of Vandalism" mode;
if α passes below S1 (it was a blow or a short pressure without continuation) =>

20 Position Command = 0; Torque Command = CC2, leave this process (return to "standby" mode);

if α remains between S1 and S2 until the end of the duration df2, it is continued pressure => Position Command = 0; Torque Command = CCmax, and go to step F4;

25 F4. During duration = df3 (typically 1000 ms) same as previous step with torque vibrations:

during this step, the commanded torque varies between CCmax and a lower value, at a low frequency (typically 10 Hz) and, in parallel:

if α exceeds threshold S2 => go to step V1 of the "presumption of Vandalism" mode;
if α passes below S1, it is a blow or a short pressure without continuation, => Position

30 Command = 0; Torque Command = CC2, leave this process (return to "standby" mode);

if α remains between S1 and S2 until the end of the duration df3 (it is continued pressure (over 2 seconds, in the case of the numerical examples of the durations dfx above) which can signify the necessity of an emergency evacuation) => Position Command = open position; Torque Command = low, and go to step F5;

35 F5. During duration = df4 (typically 500 ms):

during this step, it is kept open under the assumption that it might be an emergency evacuation, and thus with alarm => trigger reaction C (such as a low audible alarm + alarm transmission to the central unit + dating and video-surveillance recording command) and go to the next step

5 then, at the end of the duration df4 => Position Command = 0; Torque Command = low, leave this process (return to "standby" mode or to the "active" mode with the obstruction position command)

10 The reactions mentioned above, in the embodiment considered, (involving the reactions commanded outside the control system, with "internal" reactions such as successive position and torque commands forming part of the modes and stages described above) correspond to:

 reaction A: loud audible alarm (may also be lighting, to signal the gate attacked)

 reaction B: strong audible alarm (and lighting, if necessary) + alert transmission to the central + dating and video-surveillance recording command

15 reaction C: weak audible alarm (and lighting, if necessary) + alarm transmission to the control room + dating and video-surveillance recording command).

20 The invention thus proposes an automatic gate that can resist illegitimate access attempts and/or allow access when security requires it (such as for crowd movement), and/or return to a normal operating state, without damage, when the act of forcing or vandalism has ceased.

 The invention makes it possible to detect and classify a violent act, and to react according to a relevant compromise between:

25 prohibiting the access of unauthorized users,
 allowing access when security requires it,
 preserving the material against damage,
 graduated and relevant alerting.

30 The invention thus proposes a modular and scalable solution that optimizes the response by exploiting the aggression chronology and classifying the aggression, making it possible in one embodiment to differentiate between vandalism (aimed at damaging) and forcing (aimed at obtaining fraudulent access), for example, and to implement reaction instructions specific to each case.

35 The invention has been described above in relation to an automatic gate with a swing type obstacle. It is, of course, applicable to other types of gate leaves, such as retractable panels, or sectors opening like a fan, called "flaps", etc.

CLAIMS

- 5 1. A side casing (20, 22) for a gate (14) for controlling access to a restricted area, said side casing comprising:
- a frame (24) defining an access passage (26) to the restricted area and having a floor plan,
 - at least one obstacle (28), movable between an obstructing position and an opening position, to selectively obstruct or allow access,
 - a motor assembly (22) for driving said obstacle, comprising a motor (64);
 - an output shaft (62) coupled to said obstacle and designed to be driven in rotation around its axis by said motor assembly to hold the obstacle (28) in an obstructing position or to move the obstacle so as to allow access according to a respective current instruction
- 10 to obstruct or allow said access;
- an electronic control unit (68) designed to make the motor obey on the basis of the current instruction;
- said side casing being characterized in that, with the motor assembly (22) further
- 20 comprising an angular position sensor (15) designed to measure the angular position of the shaft, the electronic control unit (68) is designed to calculate temporal variations in angle, when the obstacle is held in an obstructing position according to a current instruction to obstruct access so as to collect the angular measurements made by the sensor, on a basis of said collected measurements and to trigger an action, on the basis of said calculated
- 25 angular variations compared to a plurality of standard profiles, of:
- an increase, a reduction or a limitation of a torque instruction applied to hold the obstacle in an obstructed position; and
 - an instruction to allow said access;
- 30 wherein the electronic control unit (68) is designed, when the obstacle is held in the obstructing position according to a current instruction to obstruct access, so as to:
- trigger an instruction to allow said access as soon as said temporal variations in angle calculated exceed a predetermined threshold S1 for at least a predetermined threshold time T0 and/or

- trigger a torque modification instruction as soon as said temporal variations in angle calculated continuously exceed a predetermined threshold S2 greater than the threshold S1 for at most a predetermined threshold time T less than T0.

5 **2.** The side casing (20, 22) for a gate (14) for controlling access to a restricted area according to claim 1, wherein the control unit (68) is designed to determine the temporal variations in angle by comparing each collected measurement with a determined reference position of the shaft; and the control unit (68) is designed to compare said temporal variations in angle with at least one standard profile, and to initiate said action on
10 the basis of the comparison with said standard profile.

3. The side casing (20, 22) for a gate (14) for controlling access to a restricted area according to one of the preceding claims, wherein the electronic control unit (68) is designed, when the obstacle (28) is held in an obstructing position according to a current
15 instruction to obstruct access, so as to select said action on the basis of a comparison of said temporal variations in angle with the plurality of standard profiles.

4. An automatic gate (14) for controlling access to a restricted area comprising a side casing according to the preceding claims.

20 **5.** A method for controlling in a side casing (20, 22) for a gate (14) for controlling access to a restricted area, said side casing comprising a frame (24) defining an access passage (26) to the restricted area and having a floor plane, at least one movable obstacle (28), a motor assembly (22) comprising a motor (64) and an output shaft (62) coupled to
25 said obstacle;

 said method comprising the following steps:

- driving the output shaft in rotation about its axis by the motor assembly, according to a current instruction, in order to keep the obstacle (28) in a respective obstructing position of the access passage or to move the obstacle to
30 an opening position to allow access, either to obstruct or to allow said access passage, respectively;
- controlling the motor by means of an electronic control unit (68), based on the current instruction;

 said method being characterized in that it comprises the following steps
35 implemented by the electronic control unit (68):

- an angular position sensor (15) measuring the angular position;
- when the obstacle is held in an obstructing position according to a current instruction to obstruct access:
 - collecting angular measurements made by the sensor and calculating temporal variations in angle based on said collected measurements; and
 - on the basis of said calculated variations in angle, to trigger an action of:
 - an increase, reduction or limitation of an instruction for the applied torque to hold the obstacle in an obstructing position; and
 - an instruction to allow access;

said method comprising, when the obstacle is held in the obstructing position according to a current instruction to obstruct access:

- a step of the electronic control unit (68) triggering a command to allow access as soon as said temporal variations in angle exceed a predetermined threshold S1 for at least a predetermined threshold time T0; and/or
- a step of the electronic control unit (68) triggering a command to torque modification instruction as soon as said temporal variations in angle continuously exceed a predetermined threshold S2 greater than the threshold S1 for at most a predetermined threshold time T less than T0.

6. The control method according to claim 5, comprising the following steps implemented by the electronic control unit (68):

- determining the calculated temporal variations in angle by comparing each collected measurement with a determined reference position of the shaft;
- comparing said calculated temporal variations in angle with at least one standard profile; and
- triggering said action on the basis of the comparison with said standard profile.

7. The control method according to claim 5 or 6, wherein when the obstacle (28) is held in an obstructing position according to a current instruction to obstruct access, said action is selected on the basis of a comparison of said temporal variations in angle with the plurality of profile-types.

8. The control method according to one of claims 5 to 7, comprising, when the obstacle is held in an obstructing position according to a current instruction to obstruct the

passage, a step of the electronic control unit (68) triggering an instruction to release said access as soon as the said temporal variations in angle exceed a predetermined threshold S1 for at least a predetermined threshold time T0.