01 07 Presence Simulation 800D05

Use of the application program

Product family: Controller
Product type: Controller
Manufacturer: Siemens

Name: Presence simulation device N 345
Order no.:   5WG1 345-1AB01

Functional description

The presence simulation device N 345 can routinely record activities in a building that are visible externally and make it appear that the building is occupied during periods of absence by triggering the recorded activities of the last 1...4 weeks or special sample weeks in the same time sequence. The sequence of activities thereby appears to an observer as if they had actually taken place. The recording is carried out via a maximum of 32 channels and there are three different channel types available:

- Switching
- Dimming
- Shutter

Approx. 5000 actions can be recorded which equates to 32 channels with 5-6 switching operations each per day over a period of 4 weeks.

A prerequisite for using the presence simulation device is the presence of a time and date generator on the EIB (e.g. order no. 5WG1 391-3AR01) which sends the time and date at cyclic intervals. If the presence simulation device should take into account during the simulation whether the recorded day was a working day or a non-working day (e.g. Sunday or Bank Holiday), it must receive this information from another device (e.g. from event module N 341, order no. 5WG1 341 1AB01). This information is not absolutely necessary for the function of the presence simulation device.

The recording of telegrams takes place on a weekly cycle so that it jumps back by 1...4 weeks at the start of the presence simulation and then the sequence of recorded telegrams begins.
A maximum recording interval can be assigned. If the recording volume exceeds the set number of weeks, the number of weeks to be simulated is reduced. If less than a full week has been recorded, the best possible simulation day is calculated using the criteria of day type (non-working day/working day, if this information is available), day of the week (weekend / Monday – Friday), the oldest recorded day and the day that has not yet been simu-lated. If there is such an accumulation of telegrams that it is not possible to simulate a full day or if no recordings have been made over 24 hours, a warning signal is issued when the device switches to simulation mode.
The telegrams that have just been played are rewritten into the ring buffer store with an updated time sot that they can be used again once all the other recorded telegrams have been played.

Recording generally takes place continuously so that seasonal changes (e.g. switching on the light later when it gets dark later) can be taken into consideration during the simulation.
It is however also possible to make a one-off recording of 1...4 sample weeks which can be used for all future simulations. If the required sample weeks are stored, it is possible to interrupt the continuous recording via a special object. In this "idle mode", the oldest stored actions – in the same way as simulation mode – are copied into the ring buffer store again at the point when they would have been dealt with for the simulation. The same sample weeks are always retained but the simulation is started with a different week each time. A variance in the simulation is thereby achieved since it is not always exactly the same sequence that takes place. There is no distinction in this recording mode between a working day and a non-working day.
After switching to simulation mode, the replay of the actions begins on the earliest recorded day, limited by the parameterised number of weeks.

Variance:
It is possible to assign a variance period for the simulation. This parameter indicates how much earlier or later the telegrams should be triggered compared to the recording. The actual adjustment is determined by a random generator and is always symmetrical to the original time. However, the sequence of switching operations remains unchanged.

For operations involving the channels for shutter control, there is no variance for all the subsequent actions for a period of 30 seconds. The action is replayed at exactly the recorded time so that a shutter movement followed by a stop reaches roughly the same position as in the original action.
The telegrams recorded during the simulation are stored without this variance so that no unwanted adjustment of the originally recorded actions can occur.

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Behaviour at restart:

As soon as a valid time and date telegram has been received for the first time after the download of the application, the ring buffer store is initialised. This takes approx. 90 seconds. The presence simulation device cannot record or play telegrams during this period.

The control objects receive the following values:

Object "Workday"	= 0
Object "Simulation"	= 0
Object "Recording"	= 1

After the initialisation, the module immediately starts to record all the channels.

For further restarts, the object values of the above objects and the contents of the ring buffer store are maintained. A restart can normally only be triggered by a bus voltage failure.

In principle, a set period elapses when there is a restart (reset time) until recording or simulation can take place. First of all an attempt is made to read out the time and date generator. This requires the read flag to be set in the time and date generator.

The presence simulation device has an internal clock which is synchronised with the current time by following on or waiting. Once time and date telegrams have been received, all the actions that should have been processed since the bus voltage failure and prior to the assigned synch interval are executed internally in simulation mode at 38 times the speed. The synchronising of a full hour would therefore only require 1.5 minutes for example. Only the last valid object value per input/output is actually sent.

In the event of a bus voltage failure that is shorter than the synch interval or if this period is reached during the processing of any missed actions, all the telegrams that could not be sent during the voltage failure, follow at twice the speed.

In recording mode, the telegrams that are missed during the voltage failure cannot of course be taken into account.

Communication objects

Phys.Addr.	Program		
no.	**Function**	**Object name**	**Type**
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0	Timemaster	Date	3 Byte
1	Timemaster	Time	3 Byte
2	Day type	Workday	1 Bit
3	Mode	Simulation	1 Bit
5	Information	Warning	1 Bit
6	Information	Number of Days	2 Byte
7	Reset	Reset	1 Bit
8	Information	Function Control	1 Bit
9	Internal Clock	Date	3 Byte
10	Internal Clock	Time	3 Byte
11	Number	Elements in Buffer	2 Byte
12	1. Channel On / Off	Switching	1 Bit
16	2. Channel On / Off	Dimming On / Off	1 Bit
17	2. Channel Brighter / Darker	Dimming	4 Bit
18	2. Channel 8-bit Value	Value	1 Byte
19	2. Channel 8-bit Value	Status	1 Byte
20	3. Channel Open / Closed	Louvres	1 Bit
21	3. Channel Up / Down	Shutter	4 Bit
...	...	...	...

Note

The view of the objects can be arranged individually i.e. this view can vary.

Obj	Function	Object name	Type	Flag
0	Timemaster	Date	3 Byte	CWTU
	The date telegram from the time and date generator is received via this object. The presence simulation device has an internal clock which can be synchronised with the current time if necessary by following on or waiting.			
1	Timemaster	Time	3 Byte	CWTU
	The time telegram from the time and date generator is received via this object. The presence simulation device has an internal clock which can be synchronised with the current time if necessary by following on or waiting.			

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Obj	Function	Object name	Type	Flag
2	Day type	Workday	1 Bit	CWTU

The application program stores this information during the recording (0=working day, 1=non-working day). During the simulation, a search is made in the memory for the optimum day with the same day type. If one is available, it is used for the simulation. This means that if a Bank Holiday falls on a week-day, the same day is not used for the simulation. A non-working day (e.g. a Sunday) is used instead. The value of this object is read out at 23:00 to define the day that has just been recorded and at 0:00 the day type of the next day to be simulated is defined using this object. It is therefore advisable to always update the day type for the subsequent day via this object.

This object is only available for continuous recording to prevent sample weeks from being changed.

Obj	Function	Object name	Type	Flag
3	Mode	Simulation	1 Bit	CWTU

With this object, the presence simulation device can be switched either to recording or idle mode (object value = 0) or to simulation mode (object value = 1).

Obj	Function	Object name	Type	Flag
4	Mode	Recording	1 Bit	CWTU

It is possible to interrupt the recording via this object (object value = 0). It is therefore possible for example to record a specific week that is then always used for simulation. This object is only available when using sample weeks.

Obj	Function	Object name	Type	Flag
5	Information	Warning	1 Bit	CT

If a recording has not yet been made over 24 hours when switching to simulation mode, a warning signal is sent via this object.
If 24 hours have not been recorded, gaps can occur during the simulation at the missing times which can be detected by an observer.
A check is carried out on bus voltage recovery, after a change in the date and when switching from recording to simulation mode to see whether a full day is available. The results of the check are sent each time.

Obj	Function	Object name	Type	Flag
6	Information	Number of Days	2 Byte	CWT

This object contains the number of full days that are recorded in the memory. The object is updated on bus voltage recovery, after a change in the date and when switching from recording to simulation mode.

Obj	Function	Object name	Type	Flag
7	Reset	Reset	1 Bit	CWTU

It is possible to reset the internal clock and to delete stored telegrams via this object.
The following actions are carried out depending on the object value:
Object value = 0, internal clock is reset
Object value = 1, internal clock is reset and stored telegrams are deleted.
CAUTION: By resetting the internal clock to the current time, there is a relative adjustment of all the recorded elements by the time which elapsed between the last recorded action and the current time. As a result, all the actions may be replayed at absurd times or on the wrong days. A reset with simultaneous deletion of the ring buffer store is therefore a safer option.
This object is only required for maintenance and should not be linked with group addresses that are used for normal operation.

Obj	Function	Object name	Type	Flag
8	Information	Function Control	1 Bit	CWT

As soon as the presence simulation device has received a valid date and time telegram for the first time, it starts to carry out its function. This is shown by the object value = 1. The correct function of the module can therefore be read out via this object.
This object is only required for maintenance purposes.

Obj	Function	Object name	Type	Flag
9	Internal Clock	Date	3 Byte	CWT

The date of the internal clock can be read out via this object in order to check that it matches the current date.

Obj	Function	Object name	Type	Flag
10	Internal Clock	Time	3 Byte	CWT

The time of the internal clock can be read out via this object in order to check that it matches the current time.

Obj	Function	Object name	Type	Flag
11	Number	Elements in Buffer	2 Byte	CWT

The number of telegrams that have been recorded since the last bus voltage recovery can be read out via this object. When you exit the recording mode, the value of this object is sent automatically.

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Obj	Function	Object name	Type	Flag
12 ... **139**	1. Channel ... 32. Channel	Switching Dimming On/Off Dimming Value Status Shutter Louvres	1 Bit 1 Bit 4 Bit 1 Byte 1 Byte 1 Bit 1 Bit	CWTU

The telegrams that are to be recorded are received via the group addresses of these objects in recording mode and the simulated actions are sent in simulation mode.

There are always 4 objects linked to one channel. Only the required objects and corresponding object types for each channel are displayed according to the selected channel type (switching, dimming or shutter).

The following functions are available depending on the channel type:

Switching: Switching (object type: 1 Bit)
Via this object, switching telegrams can be received for recording or sent for simulation.

Dimming: Dimming on/off (object type: 1 Bit)
Switching telegrams from the switch/dim actuator are received for recording or sent for simulation via this object.

Dimming (object type: 4 Bit)
Dimming telegrams (brighter/darker) are received or sent via this object.

Value (object type: 8 Bit)
A brightness value is sent or received via this object.

Status (object type: 8 Bit)
This object serves as a receiving or sending object for the current status (brightness value) of the switch/dim actuator.

Shutter: Shutter (object type: 1 Bit)
This object is used as a receiving or sending object for shutter control telegrams.

Louvres (object type: 1 Bit)
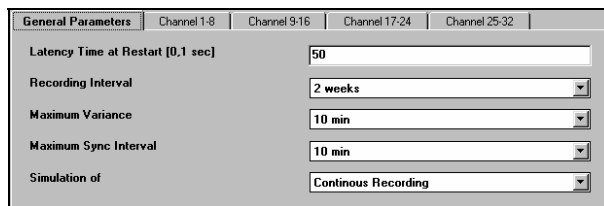This object serves as a receiving or sending object for telegrams or for louvre adjustment.

The process for storing a dimming action is as follows: if the application program determines that a new object value has been received at the "Dim brighter/darker" object, a timer of 5 seconds is applied which is triggered in the event of an update (also when there is a stop telegram). Once the timer has elapsed, the status (8-bit object) is requested. If the status is then received, it is stored. During the simulation, the required dimming value is then issued directly. The dimming action is recorded with an offset of 5 seconds by this process. For the dimming type "Dimming with cyclical sending" for the dimming sensor combined with the setting "Dim up" for the dimming actuator, the dimming level must be achieved after 5 seconds.

When recording channels used for shutter control, there is no variance for all the actions for 30 seconds.

Maximum number of group addresses: 150

Maximum number of associations: 170

General parameters

Parameters	Settings
Latency Time at Restart [0.1 sec]	0 - 65635 **50 (5 sec)**
This parameter is used to distribute the bus load in the event of a restart e.g. after bus voltage failure. The module only sends and receives telegrams once this period has elapsed. The entry is carried out in tenths of a second.	
Recording Interval	1 week **2 weeks** 3 weeks 4 weeks
This defines which timeframe should be recorded by the presence simulation device and thus how far in the past the module should start the simulation.	
Maximum Variance	none 1 min 2 min 5 min **10 min** 17 min 30 min
This parameter indicates how much earlier or later the telegrams should be triggered compared to the recording. The actual adjustment is determined by a random generator. However, the sequence of switching operations always remains unchanged.	

Parameters	Settings

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Maximum Sync. Interval	1 min 2 min 5 min **10 min** 17 min 30 min

On bus voltage recovery, all the telegrams follow at twice the speed in simulation mode within the reset period until the current time is reached. All actions outside the reset time are collated and only the last action is sent.

Example: the bus voltage failed at 11:00 and recovered at 11:50. All the actions therefore that were to be simulated between 11:00 and 11:40 are collated and the last value is then sent per channel (duration: approx. 1 minute). Actions that would be dealt with between 11:40 and 12:02 are carried out at twice the speed (it takes 11 minutes to catch up 11 minutes at twice the speed as the time is of course moving forwards).

If it is necessary to synchronise during recording mode, the received channels are stored with the internal time that was valid at the time of receipt. Chronological deviations will inevitably occur during later simulations compared to the true operating state both at the time of the simulation and in the interval between two telegrams. This must primarily be noted in the case of shutter control actions as e.g. a shutter process of 1 second becomes a movement that lasts approx. 38 seconds.

| Simulation of	Continuous Recording Sample Week(s)

The type of recording can be selected here.

In the setting "Continuous Recording", recording takes place continuously and the oldest recorded actions are overwritten automatically. When switching to simulation mode, the replay of the actions beings on the earliest recorded day, limited by the number of weeks set in the parameter "Recording Interval".

In the setting "Sample Week", the recording can be interrupted at the end of the required period so that these sample weeks can always be used in the simulation from now on.

The object "Workday" is not displayed in the "Sample Week(s)" recording mode and can therefore not be used. For continuous recording, the object "Recording" is not displayed.

Parameters for channels 1 – 8
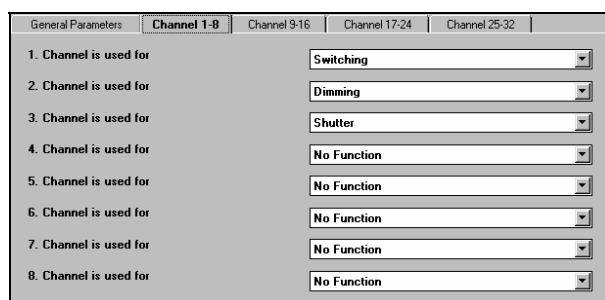
The function and the parameters of channels 1 – 32 are identical.

Parameters	Settings
x. Channel is used for	**no function** Switching Dimming Shutter

The channel type for the respective channel can be defined with this parameter.

The channel can be deactivated by selecting "no function".

The setting "Switching" enables switching operations of switch actuators to be recorded. During the simulation, the recorded switch actions are sent via the "Switching" object of the parameterised channel.

The "Dimming" option makes it possible to record dimming actions. Switching and dimming telegrams, the brightness value and brightness status is thus recorded. If a new object value is received at the "Dim brighter/darker" object (4 bit) during the recording, a timer of 5 seconds is applied which is triggered in the event of an update (also when there is a stop telegram). Once the timer has elapsed, the status (8-bit object) is requested and stored. The dimming action is recorded with an offset of at least 5 seconds. During the simulation, the required dimming value is sent directly via the corresponding object of the assigned channel.

The "Shutter" setting allows shutter control and louvre adjustment telegrams to be recorded. During the simulation, the recorded actions are sent via the objects of the parameterised channel.

The channel type must be defined before the objects are linked with group addresses. When the channel type is selected, the required objects are automatically displayed in the object list.

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Notes for carrying out a functional test

If you wish to test the function of the presence simulation device N 345 after parameterisation, the following process is recommended:

- Remove any existing time and date generators from the EIB.
- Load the application program into the module.
- Send the current date and time to the corresponding time and date generator objects of the module using the ETS program. The internal clock of the N 345 is immediately synchronised to the received time. You can check this by reading out the "Time" and "Date" objects of the internal clock.
- Wait for at least 2 minutes until the ring buffer store is prepared and the N 345 can record telegrams. As soon as the module is ready, the value of the object "Functional test" is set to "1". You can check this by reading out the object.
- Trigger several telegrams that need to be recorded. After each telegram, the value of the object "Elements in the buffer" increases by 1. You can check this by reading out the object.
- Switch the module to simulation mode by sending a "1" to the "Simulation" object. As a result, a "1" is issued via the "Warning" object as less than 24 hours has been recorded.
- Now send the N 345 a day in the future by sending a date telegram for the next day and a time which is approx. 1 hour before the start of the simulation i.e. the time when you triggered the first test actions.
  The hour is necessary so that the N 345 has sufficient time to synchronise the internal clock to the time that has now become current. By reading out the objects of the internal clock, you can monitor the progress of the synchronisation. Note that the N 345 only works at double speed shortly before reaching the current time (depending on the parameterisation). Any time differences caused by temporary voltage failures would thus be balanced out almost imperceptibly.
- Once the hour has elapsed, the presence simulation device will start to replay the previously recorded actions. Note that the actions will possibly not be repeated at exactly the times they were triggered on the previous day due to a parameterised variance. The sequence is however the same in all cases.

- Once the test has finished, you can reconnect the time and date generator to the EIB.
  Wait until a date and time telegram has been sent to the N 345 for the first time or send the current time and date yourself with the help of the ETS program.
  So that the module does not have to wait a day until it synchronises its internal clock with the current time again and in order to remove the test telegrams from the buffer, carry out a reset of the module. Then send a "1" telegram to the "Reset" object. The module immediately synchronises its internal clock with the received time and deletes the ring buffer store in the same way as when the application had just been loaded. The N 345 is ready for operation again after approx. 2 minutes.
  Do not forget to set the presence simulation module to recording mode by sending a "0" to the "Simulation" object.

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