

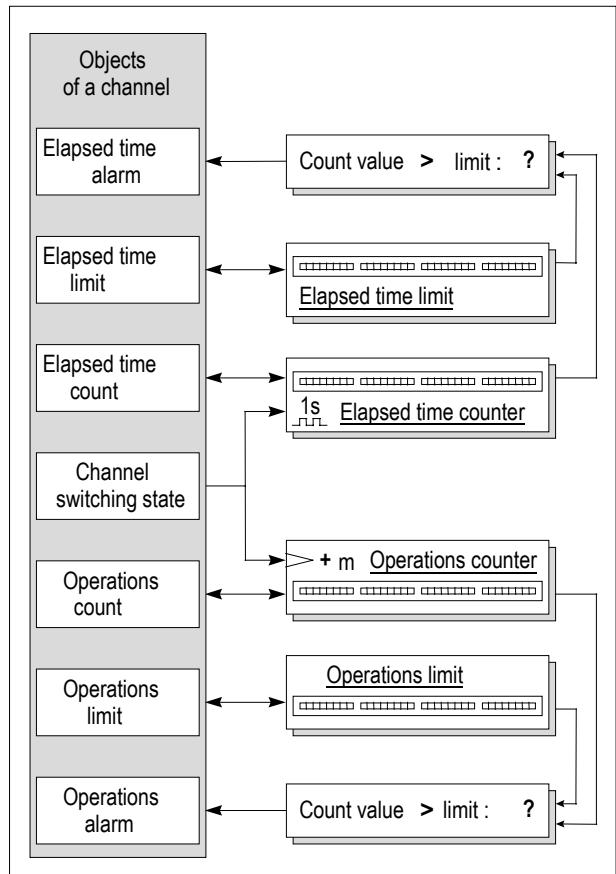
07 CO Elapsed time counter 800B01**Use of the application program**

Product family: Controller
Product type: Controller
Manufacturer: Siemens

Name: Elapsed time counter N 343
Order no.: 5WG1 343-1AB01

Functional description

Using the elapsed time counter N 343, it is possible to count the operations of switch actuators as well as record the operating time of the loads that are connected to it with a resolution of 1 second. There are 36 independent channels available, each with seven communication objects. This enables operating data from up to 36 load circuits to be collected.

Block diagram of a channel

The operating data of each channel is derived from the status of the 1 bit object "Channel - switching status" and stored in the two counter objects "Elapsed time count" and "Operations count".

It is also possible to define a limiting value for each of these count values via two further objects. If this limit is exceeded when the parameter is enabled, an alarm signal is generated.

The count and limiting value objects have a data size of 4 bytes (EIS 11) which can be scanned while the system is running or set at any value. The limiting values can also be set via parameters.

The 4 byte object type can in theory collect a maximum of 4,294,967,295 seconds (136 hours) in operating hours and as many operations (4.3 billion).

The elapsed time counter N 343 listens to the switching telegrams for all the channels and is also able to scan over a set cyclic interval the actuator channels that are to be recorded.

Each change in status from logic "0" to "1" in the "Channel - switching status" object increases the current value of the operations counter by one. Provided that the switching status "On" is available, the elapsed time count value is then counted up second by second. The transition of the object value from "1" to "0" causes the elapsed time counter to stop. This status change has no effect on the operations counter.

During the initialisation of the counter module (e.g. after bus voltage recovery), the switching status of the actuators that are to be monitored are read out after a set delay and the "Channel - switching status" objects are thereby updated. The delay between the scans of the individual channels can also be parameterised.

On bus voltage failure, all the count and limiting values are saved in the EEPROM and restored once the bus voltage has recovered. If limiting values are exceeded, the elapsed time counter sends the corresponding alarm signals to the bus when the parameters are enabled.

So as not to reduce the service life of the device due to the guaranteed number of write cycles of the EEPROM, each limiting or count value should not be modified externally more than three times a day.

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Communication objects

Phys.Addr.		Program	
no.	Function	Object name	Type
---	---	07 CO Elapsed time counter 800B01	
0	Channel - switching state	Channel 1 - switching state	1 Bit
1	Channel - switching state	Channel 2 - switching state	1 Bit
2	Channel - switching state	Channel 3 - switching state	1 Bit
---	---	---	---
34	Channel - switching state	Channel 35 - switching state	1 Bit
35	Channel - switching state	Channel 36 - switching state	1 Bit
36	Elapsed time count	Channel 1 - elapsed time count	4 Byte
37	Elapsed time count	Channel 2 - elapsed time count	4 Byte
---	---	---	---
70	Elapsed time count	Channel 35 - elapsed time co...	4 Byte
71	Elapsed time count	Channel 36 - elapsed time co...	4 Byte
72	Elapsed time limit	Channel 1 - elapsed time limit	4 Byte
73	Elapsed time limit	Channel 2 - elapsed time limit	4 Byte
---	---	---	---
106	Elapsed time limit	Channel 35 - elapsed time limit	4 Byte
107	Elapsed time limit	Channel 36 - elapsed time limit	4 Byte
108	Elapsed time alarm	Channel 1 - elapsed time alarm	1 Bit
109	Elapsed time alarm	Channel 2 - elapsed time alarm	1 Bit
---	---	---	---
142	Elapsed time alarm	Channel 35 - elapsed time alarm	1 Bit
143	Elapsed time alarm	Channel 36 - elapsed time alarm	1 Bit
144	Operations count	Channel 1 - operations count	4 Byte
145	Operations count	Channel 2 - operations count	4 Byte
---	---	---	---
178	Operations count	Channel 35 - operations count	4 Byte
179	Operations count	Channel 36 - operations count	4 Byte
180	Operations limit	Channel 1 - operations limit	4 Byte
181	Operations limit	Channel 2 - operations limit	4 Byte
---	---	---	---
214	Operations limit	Channel 35 - operations limit	4 Byte
215	Operations limit	Channel 36 - operations limit	4 Byte
216	Operations alarm	Channel 1 - operations alarm	1 Bit
217	Operations alarm	Channel 2 - operations alarm	1 Bit
---	---	---	---
250	Operations alarm	Channel 35 - operations alarm	1 Bit
251	Operations alarm	Channel 36 - operations alarm	1 Bit

Note

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

Obj	Function	Object name	Type	Flag
0 to 35	Channel - switching status	Channel 1-36 - switching status	1 Bit	CWTU

The switching status of the 36 load circuits are received via the group addresses of objects 0 to 35. All the addresses are entered that are in the corresponding actuator. In addition the elapsed time counter reads out the corresponding actuators of each channel cyclically via the 'sending' group address when the parameter setting is enabled. The read flag must therefore be set in the communication objects of the actuators that are to be scanned. It is also possible to parameterise the cyclic interval for updating the object status. Likewise the switching status of the actuators are read out on initialisation of the counter module (e.g. after bus voltage recovery). It is therefore possible to assign a delay until the start of the scanning process as well as a delay between the individual scans. Each change in status from logic "0" to "1" in one of the objects increases the value of the associated operations counter by one. Provided that the switching status "ON" is available, the corresponding elapsed time count is then counted up second by second. The transition of the object value from "1" to "0" causes the elapsed time counter to stop.

36	Elapsed time count	Channel 1-36 - elapsed time count	4 Byte	CRWT
71				

The elapsed time count values of the 36 channels are stored in objects 36 to 71. Provided that the switching status are logic "1" in the "Channel - switching status" objects, the relevant elapsed time count values are counted up in seconds. The transition of the switching status objects from logic "1" to "0" causes the relevant counter to stop. The current status of the counters are saved in the EEPROM and restored once the voltage has recovered. It is possible to read out the elapsed time count values via a visualisation terminal or the tools provided and to set lower range values as required. In theory, it is possible to record operating times up to 4,294,967,295 seconds (136 years) with the 4 byte object type (EIS 11).

72	Elapsed time limit	Channel 1-36 - elapsed time limit	4 Byte	CRWT
107				

The elapsed time limiting values are stored in objects 72 to 107. If a limiting value is exceeded by an associated count value when the parameter is enabled, an alarm signal is sent via the corresponding "Elapsed time alarm" object. The limiting values can be set via parameters. It is also possible to read out the elapsed time limits via a visualisation terminal or the tools provided and to set lower range limits as required. The limiting values are saved in the EEPROM and restored once the bus voltage has recovered after a failure.

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Obj	Function	Object name	Type	Flag
108 to 143	Elapsed time alarm	Channel 1-36 - elapsed time alarm	1 Bit	CRT

The elapsed time alarm signals are sent via the group addresses of objects 108 to 143 when the parameter setting is enabled. If a count value exceeds the relevant limiting value (count value is larger than the limiting value) or a limiting value falls below the relevant count value (limiting value is smaller than the count value), an "Alarm ON" telegram is produced. If a count value falls below or is equal to the relevant limiting value (count value is smaller than or equal to the limiting value) or a limiting value exceeds or is equal to the relevant count value (limiting value is larger than or equal to the count value), an "Alarm OFF" telegram is produced. The alarm signals are also sent if the corresponding comparisons occur by changing the elapsed time count values or limiting values externally. An active alarm is thus removed by resetting the relevant elapsed time counter or by increasing the elapsed time limiting values. When the counter module is initialised (e.g. after bus voltage recovery), all the enabled alarm signals that have the status "Alarm ON" due to the comparison between the restored limiting values and count values, are sent to the bus.

144 to 179	Operations count	Channel 1-36 - operations count	4 Byte	CRWT
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The operations count values of the 36 channels are stored in objects 144 to 179. Each change in status from logic "0" to "1" in the "Channel - switching status" objects, increases the current value of the relevant operations counter by one. A transition of the switching status objects from logic "1" to "0" has no effect on the operations counter. Only the starting operations are thus recorded and counted. The current status of the counters are saved in the EEPROM on bus voltage failure and restored once the voltage has recovered. It is possible to read out the operations count values via a visualisation terminal or the tools provided and to set lower limiting ranges as required. In theory, it is possible to record up to 4,294,967,295 (4.3 billion) operations with the 4 bit object type (EIS 11).

180 to 215	Operations limit	Channel 1-36 - operations limit	4 Byte	CRWT
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The operations limiting values of the 36 channels are stored in objects 180 to 215. If the limiting value is exceeded by the relevant count value via the corresponding "Operations alarm" object, an alarm signal is sent. The limiting values can be set via parameters. It is also possible to read out the operations limiting values via a visualisation terminal or the tools provided and to set lower limiting ranges as required. The limiting values are saved in the EEPROM and restored once the bus voltage has recovered after a voltage failure.

Obj	Function	Object name	Type	Flag
216 to 251	Operations alarm	Channel 1-36 - operations alarm	1 Bit	CRT

The operations alarm signals are sent via the group addresses of objects 216 to 251 when the parameter setting is enabled. If a count value exceeds the relevant limiting value (count value is larger than the limiting value) or a limiting value falls below the relevant count value (limiting value is smaller than the count value), an "Alarm ON" telegram is produced. If a count value falls below or is equal to the relevant limiting value (count value is smaller than or equal to the limiting value) or a limiting value exceeds or is equal to the relevant count value (limiting value is larger than or equal to the count value), an "Alarm OFF" telegram is produced. The alarm signals are also sent if the corresponding comparisons occur by changing the operations count values or limiting values externally. An active alarm is thus removed by resetting the relevant operations counter or by increasing the operations limiting values. When the counter module is initialised (e.g. after bus voltage recovery), all the enabled alarm signals that have the status "Alarm ON" due to the comparison between the restored limiting values and count values, are sent to the bus.

Maximum number of group addresses: 254
Maximum number of associations: 255

Parameters

General

General	Channel parameters
Time until start of scanning cycle after restart (0-1800) * 1 sec	10
Time delay between scans after restart (1-600) * 100msec	3
Cyclic time for updating each channel to be scanned (1-720) * 1 min	1

Parameters	Settings
Time until start of scanning cycle after restart (0-1800) * 1 sec	10

When the counter module is initialised (e.g. after bus voltage recovery), the switching status of the actuators are scanned via the objects "Channel - switching status". By setting a delay until the start of the scanning process, the actuators can also be given enough time to start up. When several counter modules are used, the busload needs to be minimised when resetting the system by cascading the scanning cycles. The delay should be entered in a range between 0 and 1,800 seconds (0-30 minutes). The default value is 10 seconds.

Application program description

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Parameters	Settings
Time delay between scans after restart (1-600) * 100 msec	3
When the counter module is initialised (e.g. after bus voltage recovery), the switching status of the actuators are scanned after a set time delay via the objects "Channel - switching status". A time delay can be assigned between the individual read requests while the switching status are read out. The period is calculated from the value entered multiplied by 100 milliseconds. The default delay time is thus 0.3 seconds.	

Parameters	Settings
Cycle time for updating each channel to be scanned (1-720) * 1 min	1
The switching status of the actuators can be scanned cyclically via the objects "Channel - switching status". This is necessary if the status changes of the actuators do not always have to be reported via the bus. Using additional parameters, it is possible to enable or disable the cyclical scanning of each channel individually. The cyclic time affects all the channels. The shorter the setting for the scanning cycle, the smaller the error that occurs until a modified switching status is detected. The cyclic time should be entered in a range between 1-720 minutes (1 min - 12 hours). The default scanning time is one minute.	

Note: A shorter cyclic interval with a large number of enabled channels leads to a correspondingly high busload.

Parameters	Settings
Scanning of switching status of channel	disabled enabled
The cyclical scanning of the switching status via the corresponding object "Channel - switching status" is enabled or disabled for the selected channel via this parameter. The cyclic time which is used for sending the read requests to the individual actuators is set for all the channels via a further parameter.	
"Disabled": The switching status of the selected channel are not cyclically scanned. All the status changes of the actuator must be listened to by the elapsed time counter via the switching telegrams.	
"Enabled": The switching status of the selected channel are scanned cyclically according to the set cyclic time. This is necessary if the status changes of the actuators are not reported via the bus.	
Elapsed time limit (0-2147483647) * 1 sec	0
The elapsed time limit of the selected channel is set via this parameter. The value can be set in a range between 0 and 2,147,483,647 seconds (0-68 years). The limiting values can in addition be set at any value while the system is in operation via a visualisation terminal or the tools provided.	
Signal on change in status of elapsed time monitoring	disabled enabled
This parameter allows you to enable or disable the sending of an alarm signal via the relevant "Elapsed time alarm" object when the value exceeds or falls below the elapsed time limit.	
"Disabled": No alarm telegram is sent when the value exceeds or falls below the limiting value.	
"Enabled": When the value exceeds or falls below the limiting value an alarm telegram is sent according to the results of the comparison.	
See description of the "Elapsed time alarm" object.	
Operations limit (0-2147483647)	0
The operations limit of the selected channel is set via this parameter. The value can be set in a range between 0 and 2,147,483,647. The limiting values can in addition be set at any value while the system is in operation via a visualisation terminal or the tools provided.	
Signal on change in status of operations monitoring	disabled enabled
This parameter allows you to enable or disable the sending of an alarm signal via the relevant "Operations alarm" object when the value exceeds or falls below the operations limit.	
"Disabled": No alarm telegram is sent when the value exceeds or falls below the limiting value.	
"Enabled": When the value exceeds or falls below the limiting value an alarm telegram is sent according to the results of the comparison.	
See description of the "Operations alarm" object.	

Channel parameters

General	Channel parameters
Number of channel to be parameterized	Channel 1
Scanning of switching state of channel	disabled
Elapsed time limit (0-2147483647) * 1 sec	0
Signal on change in status of elapsed time monitoring	disabled
Operations limit (0-2147483647)	0
Signal on change in status of operations monitoring	disabled

The function and the parameters for the 36 channels are identical.

Parameters	Settings
Number of channel to be parameterised	Channel 1 Channel 2 : Channel 36
The selection determines which channel the following parameters affect. The 36 available channels can be parameterised one after the other according to this setting.	

"Channel 1": The following parameters affect channel 1.
 "Channel 2": The following parameters affect channel 2.
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 "Channel 36": The following parameters affect channel 36.