20 S0 Combined fire alarm 900204
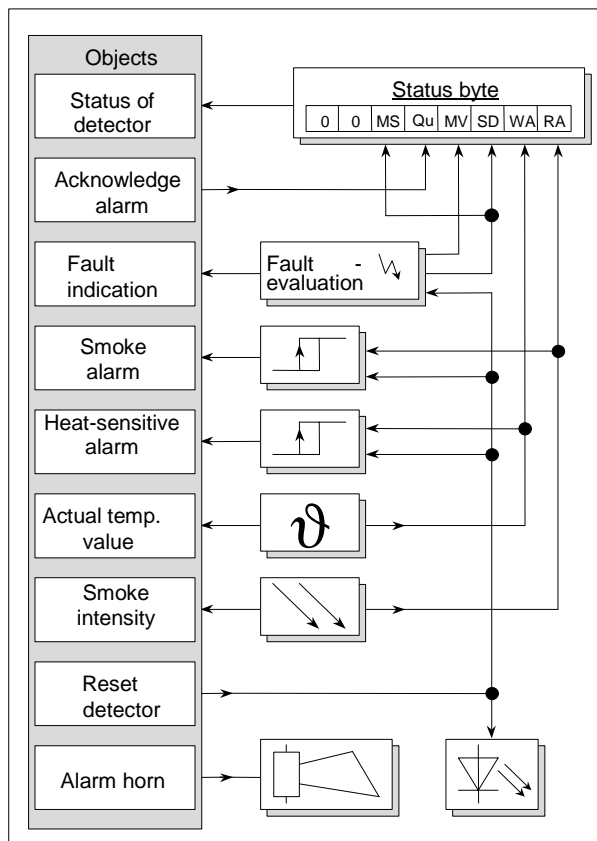
Use of the application program

Product family: Monitor, Report
Product type: Sensors
Manufacturer: Siemens

Name: Combined fire alarm AP 256
Order no.: 5WG1 256-3AB01

Functional description

With this application program, it is possible to use the combined fire alarm AP 256 for the early detection of fires. The alarm and fault signals together with the smoke intensity and actual temperature value are transmitted via five communication objects. Further objects are available for switching the alarm horn, querying the status of the detector and for acknowledging and resetting the detector.

Block diagram of the detector

Modifications compared to the application program 20 S0 Combined fire alarm 900203
- Send conditions of the alarm signals when the detector is reset
- Further communication objects
  – "Alarm horn with autom. stop"
  – "Smoke alarm generation"
  – "Response threshold"

Alarm generation is carried out via two communication objects which the detector uses to sound the appropriate alarm on detection of smoke or heat.
It can be selected via a parameter whether one or both alarm signals are used.
The response threshold for the heat-sensitive alarm is fixed at 57°C, while two thresholds can be set for the smoke alarm. The generation of the smoke alarm can also be enabled or disabled via a communication object.
The bus coupler sends a fault indication via a further communication object as soon as the sensor head is separated from the base or becomes dirty or defective.
The fault indication and the two alarm signals are sent cyclically on the bus when the parameter is enabled. The repeat interval can also be selected. The cyclical sending stops until the alarm signals are confirmed via the object "Acknowledge alarm".
When a smoke or heat-sensitive alarm is detected or there is a fault with the detector, the integrated LED in the sensor head flashes. The alarm LED only stops flashing when the detector is reset via the communication object "Reset combined fire alarm". It is only possible to reset the detector when the level has fallen below the response thresholds for smoke intensity or the heat-sensitive alarm and the alarm signals have been confirmed via a bus telegram at the object "Acknowledge alarm".
The signal horn of the detector is not coupled with the alarm signals of the sensor. It can be switched on or off via switching telegrams to the object "Alarm horn".
The horn emits a short signal tone when the detector is initialised e.g. after bus voltage recovery. The alarm LED also lights up temporarily.
There are also two communication objects available for the smoke intensity and temperature value.
The measured temperature can be sent cyclically or when it differs from the previous value. It is possible to set the differential for sending the temperature.
The detector does not automatically transmit the level of smoke intensity. It can be read out if required via the ETS program or with a visualisation terminal.

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It is possible to query the current operational status of the combined fire alarm via the communication object "Status of detector". The various alarm and status signals are stored in this 1 byte object in bits 0 to 5.
The individual bits of the communication object "Status of detector" contain the following alarms and signals:

Bit 0:	Smoke alarm
logic "1":	Value exceeds response threshold
logic "0":	Value falls below response threshold

Bit 1:	Heat-sensitive alarm
logic "1":	Value exceeds trigger threshold
logic "0":	Value falls below trigger threshold

Bit 2:	Sensor is defective
logic "1":	Smoke or heat-sensitive detector is defective
logic "0":	Sensors function correctly

Bit 3:	Dirt
logic "1":	Smoke detector is dirty
logic "0":	Smoke evaluation functions correctly

Bit 4:	Alarm acknowledgement
logic "1":	Smoke alarm, heat-sensitive alarm or fault indication is not acknowledged
logic "0":	Alarm signals are acknowledged

Bit 5:	Detector is faulty
logic "1":	Detector is defective or separated from base
logic "0":	Detector functions correctly

Bit 6 :	Smoke alarm generation
logic "1":	Smoke alarm generation is carried out
logic "0":	Smoke alarm generation is disabled

Bit 7 :	Smoke detector category
logic "1":	Normal (3%)
logic "0":	Insensitive (5%)

Communication objects

Phys.Addr.		Program		
	no.	Object name	Function	Type
01.01.001		20 S0 Combined fire alarm 900204		
	0	Smoke alarm	Smoke alarm	1 Bit
	1	Heat-sensitive alarm	Heat-sensitive alarm	1 Bit
	2	Fault	Fault indication	1 Bit
	3	Status	Status of detector	1 Byte
	4	Smoke intensity	Smoke intensity	2 Byte
	5	Temperature	Actual temperature value	2 Byte
	6	Alarm horn	On / Off	1 Bit
	7	Alarm horn with autom. stop	On / Off	1 Bit
	8	Smoke alarm generation	On / Off	1 Bit
	9	Response threshold	normal / insensitive	1 Bit
	10	Acknowledge	Acknowledge alarm	1 Bit
	11	Reset	Reset combined fire alarm	1 Bit

Note

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

Obj	Object name	Function	Type	Flags
0	Smoke alarm	Smoke alarm	1 Bit	CRTU
When the response threshold of the smoke detector is exceeded, a "1" telegram for smoke alarm is sent via the group address in this object. When the parameter is enabled, the alarm is sent cyclically. This cyclical sending continues until the alarm receives a "1" via the object "Acknowledge alarm". It is only possible to reset the detector with the object "Reset combined fire alarm" if the alarm has first been acknowledged. All previously active alarm/fault indications send a "0" once to the bus. If alarm conditions are still exceeded, the sensor behaves as if a new alarm has been detected.			
1	Heat-sensitive alarm	Heat-sensitive alarm	1 Bit	CRTU
When the response threshold of the heat-sensitive detector is exceeded, a "1" telegram for heat-sensitive alarm is sent via the group address in this object. When the parameter is enabled, the alarm is sent cyclically. This cyclical sending continues until the alarm receives a "1" via the object "Acknowledge alarm". It is only possible to reset the detector with the object "Reset combined fire alarm" if the alarm has first been acknowledged. All previously active alarm/fault indications send a "0" once to the bus. If alarm conditions are still exceeded, the sensor behaves as if a new alarm has been detected			

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Obj	Object name	Function	Type	Flags
2	Fault	Fault indication	1 Bit	CRTU
When the detector becomes dirty, defective or is separated from the base, a "1" telegram is sent via the group address in this object to indicate a fault with the sensor. When the parameter is enabled, the alarm is sent cyclically. This cyclical sending continues until the fault receives a "1" via the object "Acknowledge alarm". It is only possible to reset the detector with the object "Reset combined fire alarm" if the alarm has first been acknowledged. All previously active alarm/fault indications send a "0" once to the bus. If alarm conditions are still exceeded, the sensor behaves as if a new alarm has been detected			
3	Status	Status of detector	1 Byte	CRTU
The current operational status of the combined fire alarm is stored in this object. Each bit designates a unique alarm or status signal. The object value is not sent automatically when there is a change in the status. The status of the detector can be read out and displayed if required via a visualisation terminal.			
4	Smoke intensity	Smoke intensity	2 Byte	CRTU
The smoke intensity recorded by the sensor is stored in this object. The numerical value lies between 0 and 150. This corresponds to a smoke density between 0 and 10% with a resolution of 0.066%. The object value is not automatically sent when there is a change in the smoke intensity. It can be read out and displayed if required via a visualisation terminal.			
5	Temperature	Actual temperature value	2 Byte	CRTU
The temperature recorded by the sensor is stored in this object. The accuracy of the temperature measurement is ± 1K with a resolution of 0.5K. It can be set via parameters whether the temperature value is sent cyclically on the bus or when it differs from the previous value.			
6	Alarm horn	On / Off	1 Bit	CRWTU
The alarm horn integrated in the sensor head is switched on or off via the group addresses in this object. A "1" telegram switches the alarm horn on while a "0" switches it off. The alarm horn is not coupled with the alarms of the detector. It can only be activated or deactivated via this communication object.			
7	Alarm horn with autom. stop	On / Off	1 Bit	CRWTU
The alarm horn integrated in the sensor head is switched on or off via the group addresses in this object. A "1" telegram switches the alarm horn on while a "0" switches it off. A "1" telegram to this communication object causes the alarm detector to be automatically disconnected once the set period has elapsed. The alarm horn is not coupled with the alarms of the detector. It can only be activated or deactivated via this communication object.			

Obj	Object name	Function	Type	Flags
8	Smoke alarm generation	On / Off	1 Bit	CRWTU
The smoke alarm generation can be enabled or disabled via this communication object. Via the parameter "Smoke alarm generation switchable with object: enabled/disabled", it is possible to specify whether the selected or previous setting is adopted after bus voltage recovery.			
9	Response threshold	normal / insensitive	1 Bit	CRWTU
With this communication object, it is possible to select the response threshold of the smoke detector externally. Via the parameter "Response threshold for smoke alarm switchable with object", it is possible to specify whether the selected or previous setting is adopted after bus voltage recovery.			
10	Acknowledge	Acknowledge alarm	1 Bit	CRWTU
The alarm signals or fault indications are acknowledged with a "1" via the group addresses in this object. A "0" telegram has no effect. In the parameter setting "Repeat alarm cyclically", the cyclical sending of alarms stops after the acknowledgement. The successful acknowledgement of the alarm signals is displayed in the object "Status of detector" in bit 4 "Alarm acknowledgement" with a logic "0".			
11	Reset	Reset combined fire alarm	1 Bit	CRWTU
Once an alarm has been triggered, the detector is reset with a "1" telegram via the group addresses in this object. A "0" telegram has no effect. It is only possible to reset the detector once the alarm signals have been acknowledged via the object "Acknowledge alarm". This can also be carried out together via the same group address in both communication objects. When the detector is reset, the alarm LED integrated in the sensor head also stops flashing.			

Maximum number of group addresses: 16
Maximum number of associations: 16

Parameters

General

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Parameters	Settings
Repeat alarm cyclically	**enabled** disabled
It is determined via this parameter whether the smoke alarm, the heat-sensitive alarm and the fault indication should be sent repeatedly on the bus according to the cyclic interval. "enabled": Once an alarm has been triggered, the alarm telegrams appear cyclically on the bus. The cyclical sending stops when the alarm signal is acknowledged via the object "Acknowledge alarm". "disabled": The alarm telegrams are only sent once when the alarm signals are triggered.	
Base for repeat interval of alarm	Time base 130 ms Time base 260 ms Time base 520 ms **Time base 1 sec** Time base 2.1 sec Time base 4.2 sec Time base 8.4 sec Time base 17 sec Time base 34 sec Time base 1.1 min Time base 2.2 min Time base 4.5 min Time base 9.0 min Time base 18 min Time base 35 min Time base 1.2 hr
Factor for repeat interval of alarm (5-127)	**30**
The cyclic interval for sending the alarm telegrams repeatedly on the bus is set here. The time is calculated by multiplying the selected base by the factor entered here. These two parameters are not available in the setting "Repeat alarm cyclically: disabled". Note: An attempt should always be made to set the required time with the smallest possible base as the base that is selected here also simultaneously specifies the maximum timing error,	

Alarm generation

Parameters	Settings
Alarm generation	**Heat- sensitive and smoke alarm** Only heat sensitive alarm Only smoke alarm
This parameter determines which sensors are used for the alarm generation. "Heat-sensitive and smoke alarm": The alarm can be generated via the heat-sensitive sensor and the smoke detector. "Only heat-sensitive alarm": The alarm can only be generated via the heat-sensitive sensor. The communication object for the smoke detector is not available. "Only smoke alarm": The alarm can only be generated via the smoke detector. The communication object for the heat-sensitive sensor is not available.	
Smoke alarm generation switchable with object	**enabled** disabled
This parameter determines whether the selected setting can be modified via an object. "disabled": Only the parameter setting is valid; the communication object "Smoke alarm: On/Off" is not available. "enabled": The smoke alarm generation can only be modified by the communication object "Smoke alarm: On/Off". The object value always corresponds to the current setting.	
Smoke alarm generation on bus voltage recovery	**as adjusted** as before bus voltage failure
This parameter is only displayed if the response threshold can be adjusted via an object. "as adjusted": The parameter setting is adopted again after bus voltage failure. "as before bus voltage failure": The current value prior to the bus voltage failure is adopted on bus voltage recovery.	
Response threshold for smoke alarm	**normal (3%)** insensitive (5%)
Two sensitivity levels can be set for the smoke alarm. "normal (3%)": The smoke alarm is only triggered if the value of the smoke intensity exceeds 3%. "insensitive (5%)": The smoke alarm is only triggered if the value of the smoke intensity exceeds 5%.	
Response threshold for smoke alarm switchable with object	**enabled** disabled
This parameter specifies whether the selected parameter settings can be modified via an object. "disabled": Only the parameter setting is valid; the communication object "Response threshold" is not available. "enabled": The response threshold can be modified via the communication object "Response threshold". The object value always corresponds to the current setting.	

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Parameters	Settings
Response threshold for smoke alarm on bus voltage recovery	**as adjusted** as before bus voltage failure
This parameter is only displayed if the response threshold can be switched via an object. "as adjusted": After bus voltage failure, the parameter setting is adopted again. "as before bus voltage failure": On bus voltage recovery, the current setting prior to the bus voltage failure is adopted.	

Temperature

Parameters	Settings
Cyclical sending of the temperature value	**enabled** disabled
This parameter determines whether the temperature value that is measured by the sensor is sent repeatedly on the bus according to the cyclic time. "enabled": The current temperature value appears cyclically on the bus. "disabled": The temperature value is not sent cyclically.	
Base for cyclical sending	Time base 130 ms Time base 260 ms Time base 520 ms **Time base 1 sec** Time base 2.1 sec Time base 4.2 sec Time base 8.4 sec Time base 17 sec Time base 34 sec Time base 1.1 min Time base 2.2 min Time base 4.5 min Time base 9.0 min Time base 18 min Time base 35 min Time base 1.2 hr

Parameters	Settings
Factor for cyclical sending (2-127)	**60**
The cyclic time is set here for sending the current temperature value at repeat intervals on the bus. The time is calculated from the selected base multiplied by the factor entered here. If the setting "Cyclical sending of the temperature value: disabled" is selected, both these parameters are not available. Note: An attempt should always be made to set the required time with the smallest possible base as the base that is selected here also simultaneously specifies the maximum timing error.	
Differential for automatic sending of the temperature on modification	**inactive** 0.5 °C 1.0 °C 1.5 °C 2.0 °C 2.5 °C 3.0 °C 3.5 °C 4.0 °C 4.5 °C 5.0 °C
This parameter determines whether the temperature value that is measured by the sensor is sent on the bus when it differs from the previous value. "inactive": The temperature value is not sent automatically after a change. "0.5 °C": The temperature value is sent if it differs from the previous value by at least 0.5 °C. . . . "5.0 °C": The temperature value is sent if it differs from the previous value by at least 5.0 °C.	

Alarm horn with autom. stop

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Parameters	Settings
Alarm horn with autom. stop	**enabled** disabled
This parameter determines whether the signalling device is used with an automatic disconnection. Depending on the setting, the associated object 7 is visible.	
Base for alarm horn activity	Time base 130 ms Time base 260 ms Time base 520 ms **Time base 1 sec** Time base 2.1 sec Time base 4.2 sec Time base 8.4 sec Time base 17 sec Time base 34 sec Time base 1.1 min Time base 2.2 min Time base 4.5 min Time base 9 min Time base 18 min Time base 35 min Time base 1.2 hr
Factor for alarm horn activity (5-127)	**10**
The base and factor determine the period which must elapse before the signalling device is automatically disconnected. The time is calculated by multiplying the selected base by the factor entered here. These two parameters are not available in the setting "Alarm horn with autom. stop". Note: An attempt should always be made to set the required time with the smallest possible base as the base that is selected here also simultaneously specifies the maximum timing error,	