25 S4 4xPt1000 Sensor 981401

Use of the application program

Product family:	Phys. Sensors
Product type:	Temperature
Manufacturer:	Siemens
Name:	Temperature sensor N 258/02
	4x Pt1000
Order no.:	5WG1 258-1AB02

Functional description

Area of application

The temperature sensor N 258/02 is a device for DIN rail mounting, in N-system dimensions with a width of 4 module units, with 4 inputs for the direct connection of a Pt1000 temperature sensor each by an up to 50 m long two-core cable.

The device is supplied by mains voltage. It enables the recording and monitoring of up to 4 temperatures in the range -35...+145 °C.

Functions and objects

The temperature is measured cyclically per channel (with a fixed cyclic period of 1 s) and transmitted via the EIS5 object "Temperature, Channel x" as a 16 bit floating point value either cyclically and / or after a change by an adjustable differential value.

Each measured value can also be monitored either for one lower and upper limit value or for two lower and upper limit values. If only one lower and upper limit is monitored and the set upper limit value is exceeded, this is reported via the object "Upper alarm limit violation, Channel x". If the measured value reverts to the normal range after exceeding the upper limit value, this is also reported via this object. If the measured value falls below the set lower limit value, this is reported via the object "Lower alarm limit violation, Channel x". If the measured value reverts to the normal range after it has fallen below the lower limit value, this is also reported via this object.

If two lower and upper limits are monitored and the first (lower) of the set upper limit values is exceeded, this is reported via the object "Upper warning limit violation, Channel x". If the second (higher) of the set upper limit values is also exceeded, this is reported via the object "Upper alarm limit violation, Channel x". If the measured value falls below the lower limit values and if it reverts to the normal range, this is reported accordingly.

Parameter settings

Via the ETS (Engineering Tool Software) the measured value per channel can be aligned (i.e. calibrated) to a reference temperature value via an adjustable offset value if required. It can further be set per channel whether the measured value should be smoothed by mean-value generation (averaging) and whether it should be sent automatically after a change by an adjustable differential value. It is also possible to select whether the measured value should be monitored for one or two lower and upper limits and for which limit values. It is ensured via an adjustable <u>symmetric</u> hysteresis (this means that the hysteresis value is added to the limit value and subtracted from it) that a measured value that fluctuates by the limit value does not lead continuously to a coming and going violation of the limit value with corresponding messages.

In addition to the automatic sending of a modified measured value and of a coming or going limit value violation, it is possible to set whether the actual temperature value as well as the status of the limit value objects should be sent cyclically and with which cyclic period. It can also be configured separately per channel whether the current temperature value and / or the status of the limit value objects should be sent after a bus voltage or mains voltage recovery.

<u>Note:</u>
The application program 25 S4 4xPt1000 Sensor 981401 can be loaded with ETS2 version 1.3 and higher.

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Communication objects

Phys.Addr.	Program		Order number		Manufacturer					
no.	Object name		Function		Type		C	R	W	T	U
01.01.001	25 S4 4xPt1000 Sensor 981401		5WG1 258-1AB02		Siemens						
0	Temperature, Channel A		°C-value (EIS5)		2 Byte		✓	✓		✓	✓
1	Temperature, Channel B		°C-value (EIS5)		2 Byte		✓	✓		✓	✓
2	Temperature, Channel C		°C-value (EIS5)		2 Byte		✓	✓		✓	✓
3	Temperature, Channel D		°C-value (EIS5)		2 Byte		✓	✓		✓	✓
4	Lower alarm limit violation , Channel A		On / Off		1 Bit		✓	✓		✓	✓
5	Lower alarm limit violation , Channel B		On / Off		1 Bit		✓	✓		✓	✓
6	Lower alarm limit violation , Channel C		On / Off		1 Bit		✓	✓		✓	✓
7	Lower alarm limit violation , Channel D		On / Off		1 Bit		✓	✓		✓	✓
8	Upper alarm limit violation, Channel A		On / Off		1 Bit		✓	✓		✓	✓
9	Upper alarm limit violation, Channel B		On / Off		1 Bit		✓	✓		✓	✓
10	Upper alarm limit violation, Channel C		On / Off		1 Bit		✓	✓		✓	✓
11	Upper alarm limit violation, Channel D		On / Off		1 Bit		✓	✓		✓	✓
12	Lower warning limit violation , Channel A		On / Off		1 Bit		✓	✓		✓	✓
13	Lower warning limit violation , Channel B		On / Off		1 Bit		✓	✓		✓	✓
14	Lower warning limit violation , Channel C		On / Off		1 Bit		✓	✓		✓	✓
15	Lower warning limit violation , Channel D		On / Off		1 Bit		✓	✓		✓	✓
16	Upper warning limit violation , Channel A		On / Off		1 Bit		✓	✓		✓	✓
17	Upper warning limit violation , Channel B		On / Off		1 Bit		✓	✓		✓	✓
18	Upper warning limit violation , Channel C		On / Off		1 Bit		✓	✓		✓	✓
19	Upper warning limit violation , Channel D		On / Off		1 Bit		✓	✓		✓	✓

Maximum number of group addresses: 114
Maximum number of associations: 162

Obj	Object name	Function	Type	Flags
0, 1, 2, 3	Temperature, Channel A, B, C, D	°C-Value (EIS5)	2 Byte	CRT
This object contains the current temperature value for the respective channel. The value is calculated from the resistance value measured by the connected sensor, under consideration of the configured mean-value generation and the correction value (offset). Depending on the parameter settings, the temperature value object is only updated, sent after a change by the set minimum difference value and / or sent cyclically. Additionally it can be read via the bus at any time.				
4, 5, 6, 7	Lower alarm limit violation, Channel A, B, C, D	On / Off	1 Bit	CRT
A telegram with the object value "1" reports that the measured value has fallen below the associated lower alarm limit value by at least the configured hysteresis. A telegram with the object value "0" reports that the measured value is no longer below the lower alarm limit value and that the current measured value lies above the lower alarm limit value by at least the configured hysteresis. <u>Note</u>: A short circuit in the cable to a sensor always leads to a violation of the lower alarm limit and the corresponding message!				

Obj	Object name	Function	Type	Flags
8, 9, 10, 11	Upper alarm limit violation, Channel A, B, C, D	On / Off	1 Bit	CRT
A telegram with the object value "1" reports that the upper alarm limit value has been exceeded by at least the configured hysteresis. A telegram with the object value "0" reports that the upper alarm limit value is no longer exceeded and that the current measured value lies below the upper alarm limit value by at least the configured hysteresis. <u>Note:</u> An interruption in the cable to a sensor always leads to a violation of the upper alarm limit and the corresponding message!				
12, 13, 14, 15	Lower warning limit violation, Channel A, B, C, D	On / Off	1 Bit	CRT
A telegram with the object value "1" reports that the measured value has fallen below the associated lower warning limit value by at least the configured hysteresis. A telegram with the object value "0" reports that the measured value is no longer below the lower warning limit value and that the current measured value lies above the lower warning limit value by at least the configured hysteresis.				
16, 17, 18, 19	Upper warning limit violation, Channel A, B, C, D	On / Off	1 Bit	CRT
A telegram with the object value "1" reports that the upper warning limit value has been exceeded by at least the configured hysteresis. A telegram with the object value "0" reports that the upper warning limit value is no longer exceeded and that the current measured value lies below the upper warning limit value by at least the configured hysteresis.				

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Parameters

Parameter window "General"

Parameters	Settings
Configuration	**identical for all channels** individual for each channel
This parameter is used to set whether only one parameter window for joint and identical configuration of the channels A...D appears or one parameter window per channel for individual configuration of each channel.	
Send temperature objects at bus voltage recovery or supply voltage recovery	enabled **disabled**
It can be set via this parameter whether the sending of the temperature is enabled or disabled after bus voltage recovery or mains voltage recovery.	
Send limit objects at bus voltage recovery or supply voltage recovery	enabled **disabled**
It can be set via this parameter whether the sending of the limit value status objects is enabled or disabled after bus voltage recovery or mains voltage recovery.	
Delay time at bus or supply voltage recovery	**2 seconds** 3 seconds 4 seconds 5 seconds 10 seconds 20 seconds 30 seconds
If the sending at bus or supply voltage recovery is enabled the current temperature values and limit status objects will be sent automatically via the bus. If several devices N 258/02 are installed a high bus load can be generated at voltage recovery. It can be set via this parameter how many seconds the automatic sending has to be delayed in order to reduce the bus load at bus or supply voltage recovery. If several devices N 258/02 are installed they should be set to different delay times.	

Parameter window "Channel A-D" or "Channel x"

Parameters	Settings
Temperature offset	+10K; +8.0K; +7.0K; +6.5K; +6.0K; +5.5K; +5.0K; +4.5K; +4.0K; +3.5K; +3.0K; +2.5K +2.0K; +1.5K; +1.2K; +1.0K; +0.8K; +0.6K; +0.5K; +0.4K; +0.3K; +0.2K; +0.1K; **no offset** -0.1K; -0.2K; -0.3K; -0.4K; -0.5K; -0.6K; -0.8K; -1.0K; -1.2K; -1.5K; -2.0K; -2.5K; -3.0K; -3.5K; -4.0K; -4.5K; -5.0K; -6.0K; -6.5; -7.0K; -8.0K −10K;
The measured temperature value can be calibrated or aligned to environmental influences (e.g. cable length) via the temperature offset.	
Number of values for averaging	**1**; 2; 3; 4; 5; 10; 15; 30; 60
It is set via this parameter how many measured values should be used for the calculation of the average value in order to diminish considerable fluctuations in the measured value.	
Deviation for automatic sending of the current temperature value	0.1K; **0.2K**; 0.3K; 0.4K; 0.5K; 0.6K; 0.7K; 0.8K; 0.9K; 1.0K; 1.2K; 1.5K; 1.8K; 2.0K; 2.5K; 3.0K; 3.5K; 4.0K; 4.5K; 5.0K; no action
It can be set here by how much the temperature value must change in order to be sent automatically again.	
Cycle time for automatic sending of temperature values and limits status	5; 6; 7; 8; 9; 10; 12; 15; 17; 20; 25; 30; 40; 50; 60; 90; 120 minutes; **disabled**
The time interval is set here in which the temperature and status objects of the alarm / warning limit values should be sent in addition to the automatic sending after a change.	

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Parameters	Settings
Monitoring of temperatures for	**one lower and one upper limit value**
	two lower and two upper limit values
It can be set via this parameter whether the sending of the temperature is enabled or disabled after bus voltage recovery or mains voltage recovery.	
Lower alarm limit (°C)	**- 35 .... +145**
The lower alarm limit value is defined via this parameter. If the temperature value falls below the lower alarm limit value minus the hysteresis value, the object "Lower alarm limit violation" is sent with the value "1". If the temperature rises again to a value which lies above the lower alarm limit value by at least the value of the hysteresis, the object "Lower alarm limit violation" is sent with the value "0". <u>Note</u>: With two lower limit values it has to be considered that the lower alarm limit value lies below the lower warning limit value.	
Lower warning limit (°C)	**- 35 .... +145**
The lower warning limit value is defined via this parameter. If the temperature value falls below the lower warning limit value minus the hysteresis value, the object "Lower warning limit violation" is sent with the value "1". If the temperature rises again to a value which lies above the lower warning limit value by at least the value of the hysteresis, the object "Lower warning limit violation" is sent with the value "0". <u>Note</u>: With two lower limit values it has to be considered that the lower warning limit value lies above the lower alarm limit value.	
Upper warning limit (°C)	**- 35 ... +145**
The upper warning limit value is defined via this parameter. If it is exceeded by the value of the hysteresis, the object "Upper warning limit violation" is sent with the value "1". If the temperature falls again to a value which lies below the upper warning limit value by at least the value of the hysteresis, the object "Upper warning limit violation" is sent with the value "0". <u>Note</u>: With two upper limit values it has to be considered that the upper warning limit value lies below the upper alarm limit value.	
Upper alarm limit (°C)	**- 35 ... +145**
The upper alarm limit value is defined via this parameter. If it is exceeded by the value of the hysteresis, the object "Upper alarm limit violation" is sent with the value "1". If the temperature falls again to a value which lies below the upper alarm limit value by at least the value of the hysteresis, the object "Upper alarm limit violation" is sent with the value "0". <u>Note</u>: With two upper limit values it has to be considered that the upper alarm limit value lies above the upper warning limit value.	

Parameters	Settings
Hysteresis for limit values	0.2K; 0.3K; 0.4K; **0.5K**; 0.6K; 0.7K; 0.8K; 0.9K; 1.0K; 1.5K; 2.0K; 2.5K; 3.0K; 3.5K; 4.0K; 4.5K; 5.0K
The value of the hysteresis is as well added to a limit value as subtracted from it. So the hysteresis defines when a limit value violation should be reported as coming and when as going.	

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