Use of the application program

Product family: Sensors
Product type: Weather station interface
Manufacturer: WindowMaster A/S

Name: Weather Station WEI11M / WEI12M
Order no: WEI11M / WEI12M
Version 1.0

Contents

1. Functional description

The WindowMaster WEI12M is a weather station interface for measuring temperature, wind speed and rain. WEI11M additionally have a wind direction sensor (anemometer).

The WEI11M and WEI12M (hereafter mentioned as WEI1xM) can be programmed to send alarms depending on the following weather conditions:

- Outdoor temperature above or below programmed limit.
- Wind speed above or below programmed limits.
- Rain detected.

Besides the above mentioned alarm types the WEI1xM has three input for three external sensors. The sensor alarms can be programmed to trigger on input voltage between 0 - 10 V.

An external radio transmitted time/date signal (DCF77) can be added to the WEI1xM. If a valid date/time signal has been received the WEI1xM will transmit the date/time.

1.1. OutdoorTemperature (GO 0)

This object contains the actual outdoor temperature measured in Celsius. The temperature can be measured from -30 to 70 °C. The Outdoor temperature can also be used to trigger the Outdoor temperature alarm.

1.2. OutdoorTemperatureAlarm (GO 1)

The outdoor temperature is a flag that is set if the alarm is triggered. The alarm can be configured to be triggered if the temperature goes below or above limit. The alarm is transmitted automatically when triggered.

1.3. WindSpeed (GO 2)

This object contains the actual wind speed. The wind speed is measured from 0 to 25.5 [m/s]. The object is used to trigger the Wind speed alarm and used as input for the Rain and Wind alarm. The wind speed is a filtered RMS signal.

1.4. WindSpeedRaw (GO 3)

The Wind speed raw is the “unfiltered” (faster changing) RMS wind speed.

1.5. WindSpeedAlarm (GO 4)

The Wind speed alarm is activated if the measured wind speed is above or below the programmed limit. The alarm is transmitted automatically when triggered.

1.6. WindDirection (WEI11M only (GO 5))

This object contains the actual Wind direction. The direction is measured in degrees (0 - 360°).
NOTE: The object is only valid for WEI11M.

1.7. Raining (GO 6)

This object is a flag that is set to true if the sensor detects rain. Otherwise the Flag is set to False. The measured value is also used as input for the Rain and wind alarm. Rain detection "Turn off delay" can be set.

1.8. RainAndWindAlarm (GO 7)

The Rain and wind alarm is activated if rain is detected and the wind speed is above the programmed limit. The Rain and wind alarm is transmitted automatically when triggered. Status can be set to cyclical transmission.

1.9. Sensor2 (GO 8)

This object can be used for an external 0 - 10 V sensor. The input level can be used to trigger sensor alarm 2. The alarm is transmitted automatically when status is changes. Status can be set to cyclical transmission.

1.10. Sensor2Alarm (GO 9)

Sensor alarm 2 is triggered on the basis of Sensor 2 level.

1.11. Sensor3 (GO 10)

This object can be used for an external 0-10 V sensor. The input level can be used to trigger sensor alarm 3. The alarm is transmitted automatically when status is changes. Status can be set to cyclical transmission.

1.12. Sensor3Alarm (GO 11)

Sensor alarm 3 is triggered on the basis of Sensor 3 level.

1.13. Sensor4 (GO 12)

This object can be used for an external 0-10 V sensor. The input level can be used to trigger sensor alarm 4. The alarm is transmitted automatically when status is changes. Status can be set to cyclical transmission.

1.14. Sensor4Alarm (GO 13)

Sensor alarm 4 is triggered on the basis of Sensor 4 level.

1.15. Time (GO 14)

This object contains the latest valid time received via an external DCF77 antenna. If a valid date/time signal is received the time is transmitted.

1.16. Date (GO 15)

This object contains the latest valid Date received via an external DCF77 antenna. If a valid date/time signal is received the date is transmitted.

1.17. Date and Time (GO 16)

This object contains the latest valid date and time received via an external DCF77. If a valid date/time signal is received the Date and time is transmitted.

1.18. WEIAlarm (GO 17)

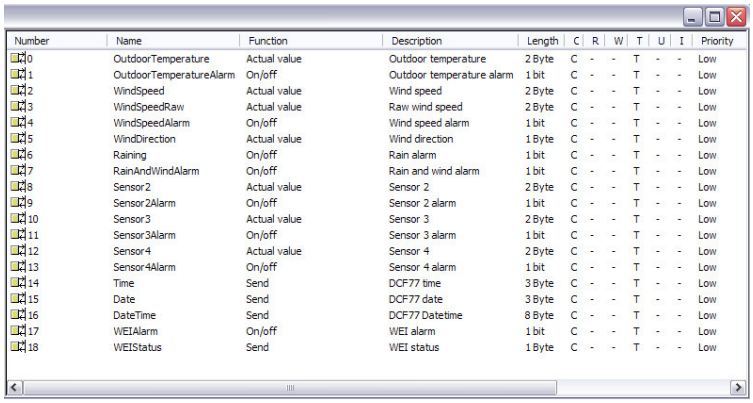
This object is used for internal errors on the weather station. If an internal alarm is detected the alarm is transmitted on the bus. A status byte indicating the actual error is connected to the alarm.

1.19. WEIStatus (GO 18)

This object contains the status of the sensors. If an error is detected the WEI alarm is transmitted.

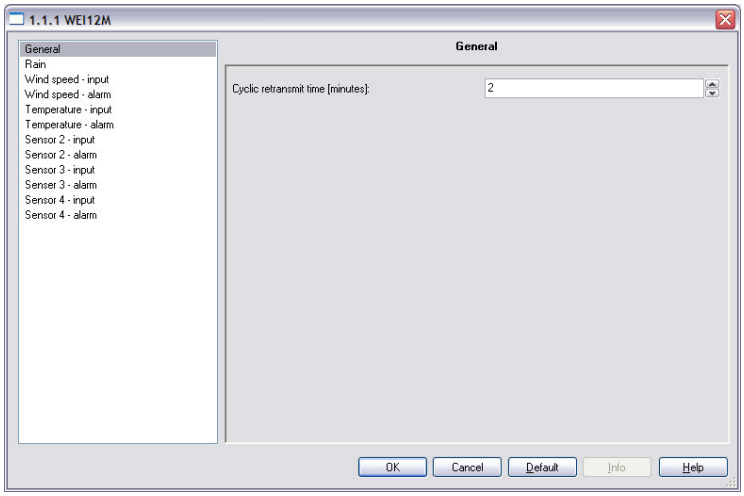
- Bit 0: ADC initialisation. Error condition on the analogue to digital converter
- Bit 1: Temperature sensor. Error condition on the Temperature sensor
- Bit 2: Sensor 2. Error condition on external sensor2
- Bit 3: Sensor 3. Error condition on external sensor3
- Bit 4: Sensor 4. Error condition on external sensor4
- Bit 5: Wind sensor. Error condition on wind direction equipment. (WEI11M only).
- Bit 6: Rain sensor. Error condition on rain sensor.
- Bit 7: Not used

2. Parameters and communication objects



Number	Name	Function	Description	Length	C	R	W	T	U	I	Priority
0	OutdoorTemperature	Actual value	Outdoor temperature	2 Byte	C	-	-	T	-	-	Low
1	OutdoorTemperatureAlarm	On/off	Outdoor temperature alarm	1 bit	C	-	-	T	-	-	Low
2	WindSpeed	Actual value	Wind speed	2 Byte	C	-	-	T	-	-	Low
3	WindSpeedRaw	Actual value	Raw wind speed	2 Byte	C	-	-	T	-	-	Low
4	WindSpeedAlarm	On/off	Wind speed alarm	1 bit	C	-	-	T	-	-	Low
5	WindDirection	Actual value	Wind direction	1 Byte	C	-	-	T	-	-	Low
6	Raining	On/off	Rain alarm	1 bit	C	-	-	T	-	-	Low
7	RainAndWindAlarm	On/off	Rain and wind alarm	1 bit	C	-	-	T	-	-	Low
8	Sensor2	Actual value	Sensor 2	2 Byte	C	-	-	T	-	-	Low
9	Sensor2Alarm	On/off	Sensor 2 alarm	1 bit	C	-	-	T	-	-	Low
10	Sensor3	Actual value	Sensor 3	2 Byte	C	-	-	T	-	-	Low
11	Sensor3Alarm	On/off	Sensor 3 alarm	1 bit	C	-	-	T	-	-	Low
12	Sensor4	Actual value	Sensor 4	2 Byte	C	-	-	T	-	-	Low
13	Sensor4Alarm	On/off	Sensor 4 alarm	1 bit	C	-	-	T	-	-	Low
14	Time	Send	DCF77 time	3 Byte	C	-	-	T	-	-	Low
15	Date	Send	DCF77 date	3 Byte	C	-	-	T	-	-	Low
16	DateTime	Send	DCF77 Datetime	8 Byte	C	-	-	T	-	-	Low
17	WEIAlarm	On/off	WEI alarm	1 bit	C	-	-	T	-	-	Low
18	WEIStatus	Send	WEI status	1 Byte	C	-	-	T	-	-	Low

2.1. General: Parameters

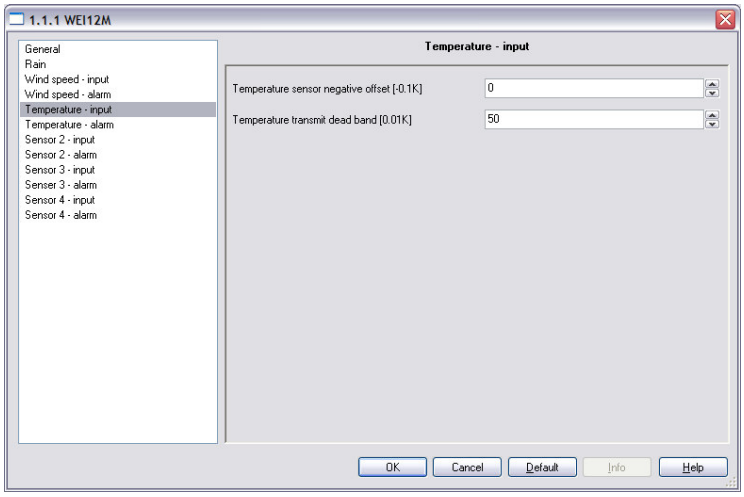


Parameters	Settings
Cyclic retransmit time	1, **2** .. 29, 30 [minutes]
	Cyclical transmit time in minutes

2.2. Outdoor temperature: Communication objects

GO	Object name	Data point type	Type	Flags
0	OutdoorTemperature	9.001 DPT_Value_Temp	2 Byte	CT
	Actual outdoor temperature in degrees Celsius (-30 to 70 °C).			

2.2.1. Outdoor temperature: Parameters

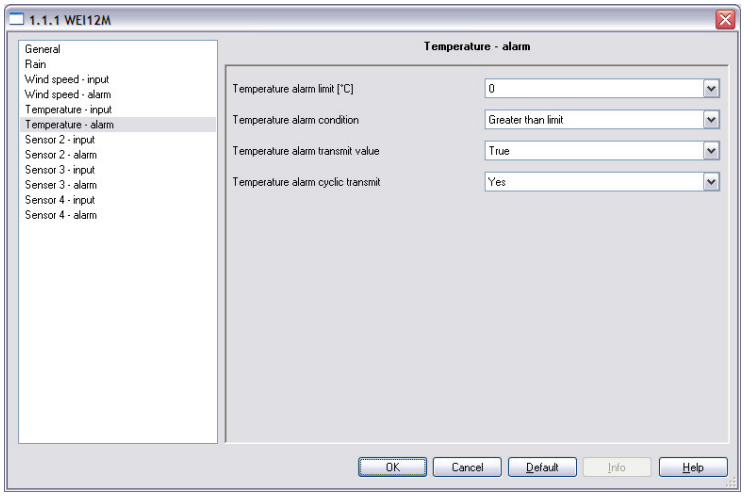


Parameters	Settings
Temperature sensor negative offset	-128 .. **0** .. 127 [-0.1 K]
	Sensor negative offset value. (Output = sensor input + offset) If the parameter is set to 10 the output will be: Output = input + 10 [-0.1K] = input - 1K
Temperature transmit dead band	0, 1 .. **50** .. 255 [0.01 K]
	Temperature transmit dead band indicates the level which the temperature can change before it is transmitted.

2.3. Outdoor temperature alarm: Communication objects

GO	Object name	Data point type	Type	Flags
1	OutdoorTemperatureAlarm	1.005 DPT_Alarm	1 Bit	CT
	The Outdoor temperature alarm will be triggered if the measured temperature is below/above the temperature limit depending on the parameter configuration.			

2.3.1. Outdoor temperature alarm: Parameters

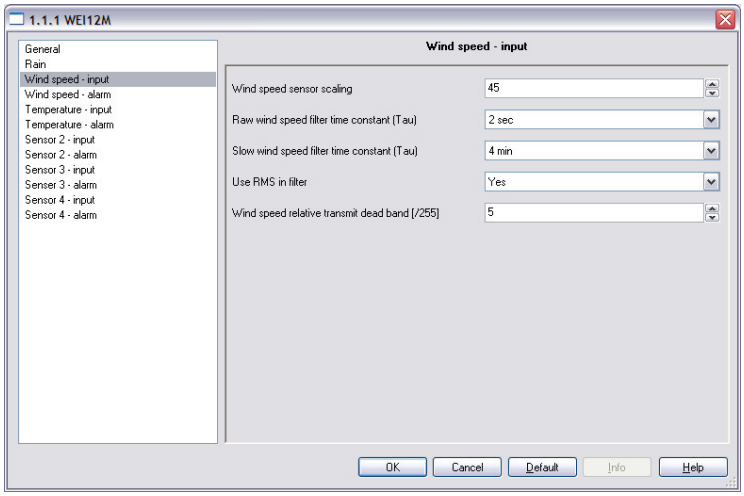


Parameters	Settings
Temperature alarm limit	-20 .. **0** .. 1000 [°C]
	Alarm temperature limit
Temperature alarm condition	**Greater than limit**/Lower than limit
	Temperature alarm condition indicates whether the alarm should be triggered if the temperature is less than or greater than the temperature alarm limit.
Temperature alarm transmit value	**True**/False
	Temperature alarm transmit value indicates which value to send in case of an alarm.
Temperature alarm cyclic transmit	**Yes**/No
	Temperature alarm cyclic transmit indicates whether the alarm should be cyclical transmitted or not.

2.4. Wind speed: Communication objects

GO	Object name	Data point type	Type	Flags
2	WindSpeed	9.005 DPT_Value_Wsp	2 Byte	CT
	This object contains the actual filtered wind speed in m/s.			

2.4.1. Wind speed: Parameters



Parameters	Settings
Wind speed sensor scaling	0, 1 .. **45** .. 255
	Wind speed scaling. This also applies to Wind speed raw.
Slow wind speed filter time constant (Tau)	0, 1 .. **2** .. 15 [minutes]
	Slow Speed Filter tau
Use RMS in filter	**Yes**/No
	Use RMS Indicates whether to use RMS or not. This also applies to WindSpeedRaw.
Wind speed relative transmit dead band	0, 1 .. **15** .. 255 [/255]
	Wind speed transmit dead band indicates the fraction which the wind speed can change before it is transmitted. This also applies to Wind speed raw.

2.5. Wind speed raw: Communication objects

GO	Object name	Data point type	Type	Flags
3	WindSpeedRaw	9.005 DPT_Value_Wsp	2 Byte	CT
	Actual “unfiltered” (faster changing) wind speed in m/s.			

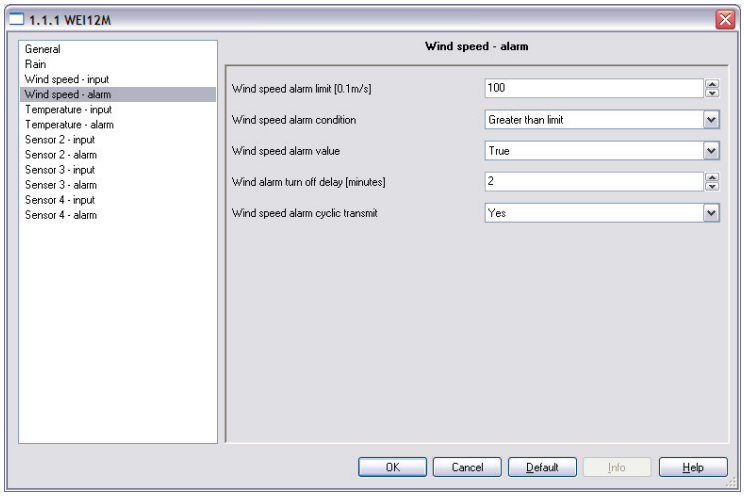
2.5.1. Wind speed raw: Parameters

Parameters	Settings
Raw wind speed filter time constant (Tau)	0, 1 .. **2** .. 15 [s]
	Fast speed filter tau

2.6. Wind speed alarm: Communication objects

GO	Object name	Data point type	Type	Flags
4	WindSpeedAlarm	1.005 DPT_Alarm	1 Bit	CT
	The Wind speed alarm will be triggered if the measured wind speed is above the Wind speed limit.			

2.6.1. Wind speed alarm: Parameters



Parameters	Settings
Wind speed alarm limit	1, 2 .. **100** .. 255 [0.1 m/s]
	Wind speed alarm limit. If the wind speed exceeds the wind speed alarm limit the wind speed alarm is triggered.
Wind speed alarm condition	**Greater than limit**/Lower than limit
	Speed alarm condition. This flag indicates whether the alarm should be transmitted if the wind speed is less than or greater than the limit.
Wind speed alarm value	**True**/False
	Wind speed alarm transmit value. This flag indicate which value to transmit in case of an alarm.
Wind alarm turn off delay	0, 1 .. **2** .. 30 [minutes]
	Defines the minimum duration of the wind alarm.
Wind speed alarm cyclic transmit	**Yes**/No
	Wind speed alarm cyclic transmit. This flag indicates whether the alarm should be cyclical transmitted or not.

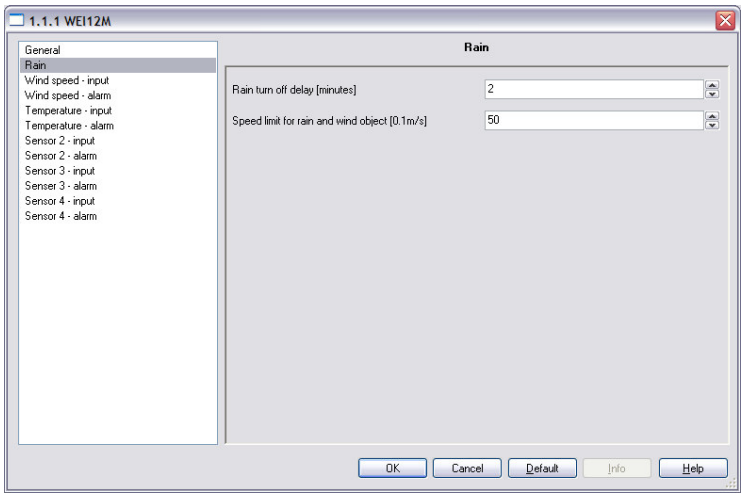
2.7. Wind direction (WEI11M only): Communication objects

GO	Object name	Data point type	Type	Flags
5	WindDirection	5.003 DPT_Angle	8 Bit	CT
	This object contains the wind direction measured in degrees (0 - 360 °).			

2.8. Raining: Communication objects

GO	Object name	Data point type	Type	Flags
6	Raining	1.002 DPT_Bool	1 Bit	CT
	This object is set to True if the rain sensor is activated. Otherwise it is False.			

2.8.1. Rain: Parameters



Parameters	Settings
Rain turn off delay	1 .. **2** .. 30 [minutes]
	Defines the minimum duration of the raining alarm.

2.9. Rain and wind alarm: Communication objects

GO	Object name	Data point type	Type	Flags
7	RainAndWindAlarm	1.005 DPT_Alarm	1-Bit	CT
	The Rain and wind alarm is triggered if rain is detected and the Wind speed for Rain alarm is exceeded.			

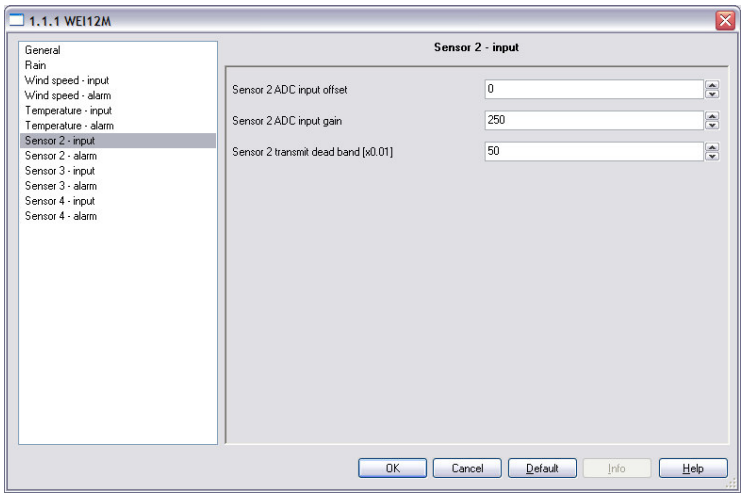
2.9.1. Rain and wind alarm: Parameters

Parameters	Settings
Speed limit for rain and wind object	1, 2 .. **50** .. 255 [0.1 m/s]
	Wind speed limit for the RainAndWindAlarm object

2.10. Sensor 2: Communication objects

GO	Object name	Data point type	Type	Flags
8	Sensor2	9.000 DPT_Value	2 Byte	CT
	This object contains the value for Sensor 2			

2.10.1. Sensor 2: Parameters

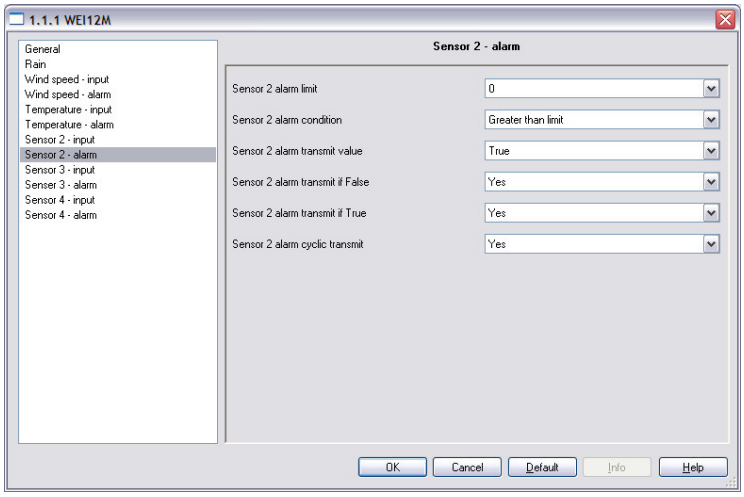


Parameters	Settings
Sensor 2 ADC input offset	-32768, -32767 .. **0** .. 32767
	ADC input offset for Sensor 2
Sensor 2 ADC input gain	-32768, -32767 .. **250** .. 32767
	ADC input scaling for Sensor 2
Sensor 2 transmit dead band	0, 1 .. **50** .. 255 [0.01]
	The Transmit dead band indicates the amount which the level on Sensor 2 can change before it is transmitted.

2.11. Sensor 2 alarm: Communication objects

GO	Object name	Data point type	Type	Flags
9	Sensor2Alarm	1.005 DPT_Alarm	1 Bit	CT
	The Sensor 2 alarm is triggered if the measured Sensor 2 value is Greater than limit/Lower than the sensor 2 limit depending on the parameter configuration.			

2.11.1. Sensor 2 alarm: Parameters

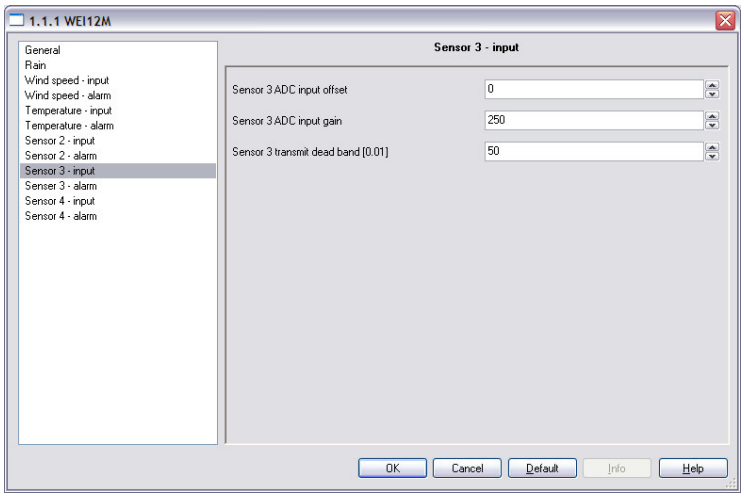


Parameters	**Settings**
Sensor 2 alarm limit	-20 .. **0** .. 1000
	Sensor 2 alarm limit
Sensor 2 alarm condition	**Greater than limit**/Lower than limit
	Sensor 2 alarm condition
Sensor 2 alarm transmit value	**True**/False
	Sensor 2 alarm transmit value
Sensor 2 alarm transmit if False	**Yes**/No
	Sensor 2 alarm transmit if False
Sensor 2 alarm transmit if True	**Yes**/No
	Sensor 2 alarm transmit if True
Sensor 2 alarm cyclic transmit	**Yes**/No
	Sensor 2 alarm cyclic transmit

2.12. Sensor 3: Communication objects

GO	Object name	Data point type	Type	Flags
10	Sensor3	9.000 DPT_Value	2 Byte	CT
	This object contains the value for Sensor 3			

2.12.1. Sensor 3: Parameters

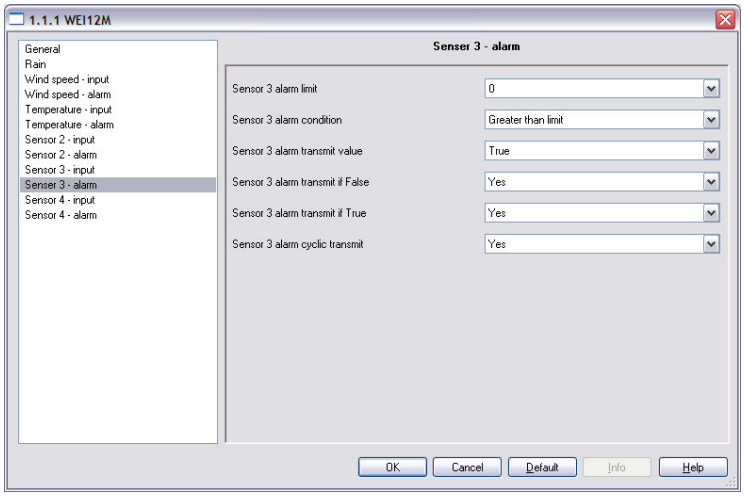


Parameters	Settings
Sensor 3 ADC input offset	-32768, -32767 .. **0** .. 32767
	ADC input offset for Sensor 3
Sensor 3 ADC input gain	-32768, -32767 .. **250** .. 32767
	ADC input scaling for Sensor 3
Sensor 3 transmit dead band	0, 1 .. **50** .. 255 [0.01]
	The Transmit dead band indicates the amount which the level on Sensor 3 can change before it is transmitted.

2.13. Sensor 3 alarm: Communication objects

GO	Object name	Data point type	Type	Flags
11	Sensor3Alarm	1.005 DPT_Alarm	1 Bit	CT
	The Sensor 3 alarm is triggered if the measured Sensor 3 value is Greater than limit/Lower than the sensor 3 limit depending on the parameter configuration.			

2.13.1. Sensor 3 alarm: Parameters

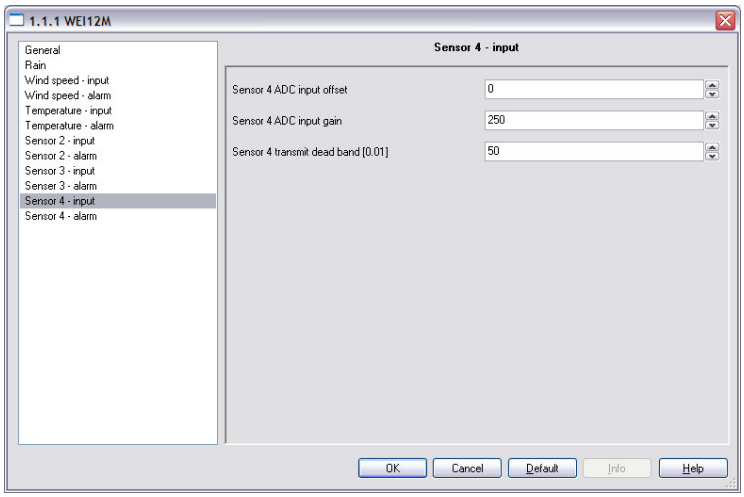


Parameters	Settings
Sensor 3 alarm limit	-20 .. **0** .. 1000
	Sensor 3 alarm limit
Sensor 3 alarm condition	**Greater than limit**/Lower than limit
	Sensor 3 alarm condition
Sensor 3 alarm transmit value	**True**/False
	Sensor 3 alarm transmit value
Sensor 3 alarm transmit if False	**Yes**/No
	Sensor 3 alarm transmit if False
Sensor 3 alarm transmit if True	**Yes**/No
	Sensor 3 alarm transmit if True
Sensor 3 alarm cyclic transmit	**Yes**/No
	Sensor 3 alarm cyclic transmit

2.14. Sensor 4: Communication objects

GO	Object name	Data point type	Type	Flags
12	Sensor4	9.000 DPT_Value	2 Byte	CT
	This object contains the value for Sensor 4			

2.14.1. Sensor 4: Parameters

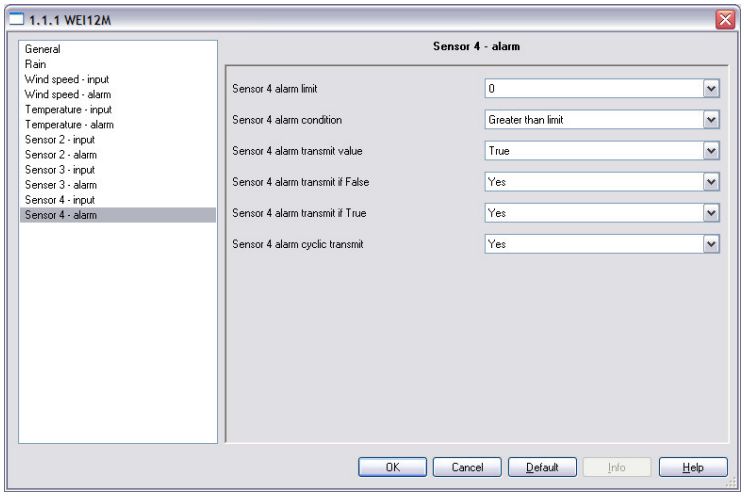


Parameters	Settings
Sensor 4 ADC input offset	-32768, -32767 .. **0** .. 32767
	ADC input offset for Sensor 4
Sensor 4 ADC input gain	-32768, -32767 .. **250** .. 32767
	ADC input scaling for Sensor 4
Sensor 4 transmit dead band	0, 1 .. **50** .. 255 [0.01]
	The Transmit dead band indicates the amount which the level on Sensor 4 can change before it is transmitted.

2.15. Sensor 4 alarm: Communication objects

GO	Object name	Type	Type	Flags
13	Sensor4Alarm	1.005 DPT_Alarm	1 Bit	CT
	The Sensor 4 alarm is triggered if the measured Sensor 4 value is Greater than limit/Lower than limit than the sensor 4 limit depending on the parameter configuration.			

2.15.1. Sensor 4 alarm: Parameters



Parameters	Settings
Sensor 4 alarm limit	-20 .. **0** .. 1000
	Sensor 4 alarm limit
Sensor 4 alarm condition	**Greater than limit**/Lower than limit
	Sensor 4 alarm condition
Sensor 4 alarm transmit value	**True**/False
	Sensor 4 alarm transmit value
Sensor 4 alarm transmit if False	**Yes**/No
	Sensor 4 alarm transmit if False
Sensor 4 alarm transmit if True	**Yes**/No
	Sensor 4 alarm transmit if True
Sensor 4 alarm cyclic transmit	**Yes**/No
	Sensor 4 alarm cyclic transmit

2.16. Time: Communication objects

GO	Object name	Data point type	Type	Flags
14	Time	10.001 DPT_TimeOfDay	3 Byte	CT
	This object contains the TimeOfDay if available through DCF77 signal. The Time will be transmitted if available at minute change.			

2.17. Date: Communication objects

GO	Object name	Data point type	Type	Flags
15	Date	11.001 DPT_Time	3 Byte	CT
	This object contains the Date if available through DCF77 signal The Date will be transmitted if available at minute change.			

2.18. Date and Time: Communication objects

GO	Object name	Data point type	Type	Flags
16	DateTime	19.001 DPT_DateTime	8 Byte	CT
	This object contains the Date and Time if available through DCF77 signal The Date and Time will be transmitted if available at minute change.			

2.19. WEI Alarm: Communication objects

GO	Object name	Data point type	Type	Flags
17	WEIAlarm	1.005 DPT_Alarm	1 Bit	CT
	The WEI alarm is triggered if the one of the bits in Object 18 is indicating an error.			

2.20. WEI Status: Communication objects

GO	Object name	Data point type	Type	Flags
18	WEIStatus	wei_status_byte	8 bit	CT
	This object contains error condition on sensors and ADC.			
	•Bit 0: ADC initialisation. Error condition on the analogue to digital converter •Bit 1: Temperature sensor. Error condition on the Temperature sensor •Bit 2: Sensor 2. Error condition on external sensor 2 •Bit 3: Sensor 3. Error condition on external sensor 3 •Bit 4: Sensor 4. Error condition on external sensor 4 •Bit 5: Wind sensor. Error condition on wind direction equipment. (WEI11M only). •Bit 6: Rain sensor. Error condition on rain sensor. •Bit 7: Not used			