Wind Indicator LED

Instruction for Use 4.3225.xx.x01

Contents

1. General Information

The airport version of the Wind Indicator LED is a state-of -the art indicator unit which displays both the wind direction and the wind speed parameters. It is extremely reliable, flexible and offers optimal display.

Thanks to its compact construction and a system of integrated self-test functions, the Wind Indicator unit is very reliable - an important quality. Moreover, its flexibility is guaranteed owing to the versatile connection possibilities available on it to transmit the wind parameters; different wind transmitters can be connected or the wind parameters can be transmitted over a serial interface.
The 2-minute mean values and the 10-minute mean values of the wind parameters are calculated and displayed. Calculation is carried out in line with the recommendations of the "International Civil Aviation Organisation" (**ICAO**, Annex 3 - *Meteorological Service for International Air Navigation*, 1/7/93, Chapter 4.5: *Observing and reporting of surface wind*). Moreover, the instantaneous value can also be displayed.
Three different units are available for wind speed:: m/s, kt, km/h.

You can control the brightness of the displays manually or automatically in a wide range.

1.1 Versions of the Indicator

The Wind Indicator LED was designed in different versions for different purposes with the following numbers:

4.3225.xx.0xx

In this version the Wind Indicator LED is equipped with no serial interface.

4.3225.xx.1xx

In this version the Wind Indicator LED is equipped with a serial interface RS232 to receive or send the wind speed and direction signals as a serial data telegram by selecting a DIP-switch on the back panel. (see chapter *3. Setting the Wind Indicator* LED on page 6 and option 1 in figure 2 on page 4)

4.3225.xx.2xx

In this version the Wind Indicator LED is equipped with a serial interface RS422 to receive or send the wind speed and direction signals as a serial data telegram by selecting a DIP-switch on the back panel. (see chapter *3. Setting the Wind Indicator* LED on page 6 and option 1 in figure 2 on page 4).

4.3225.x0.xxx

In this version of the Wind Indicator LED the power supply is 230 VAC 50/60 Hz as well as 115 VAC Hz, selectable by switch. Factory setting: 230 VAC 50/60 Hz.

4.3225.x4.xxx

In this version of the Wind Indicator LED the power supply is 115 VAC 50/60 Hz.

4.3225.1x.xxx

In this version the Wind Indicator LED is equipped with one terminal strip for wind transmitters (see figure 2 on page 4).

4.3225.2x.xxx

In this version the Wind Indicator LED is equipped with two terminal strips for wind transmitters and an additional Wind Indicator LED (Slave indicator, see chapter *3. Setting the Wind Indicator* LED on page 6 and option 2 in figure 2 on page 4).

1.2 Elements of the Indicator

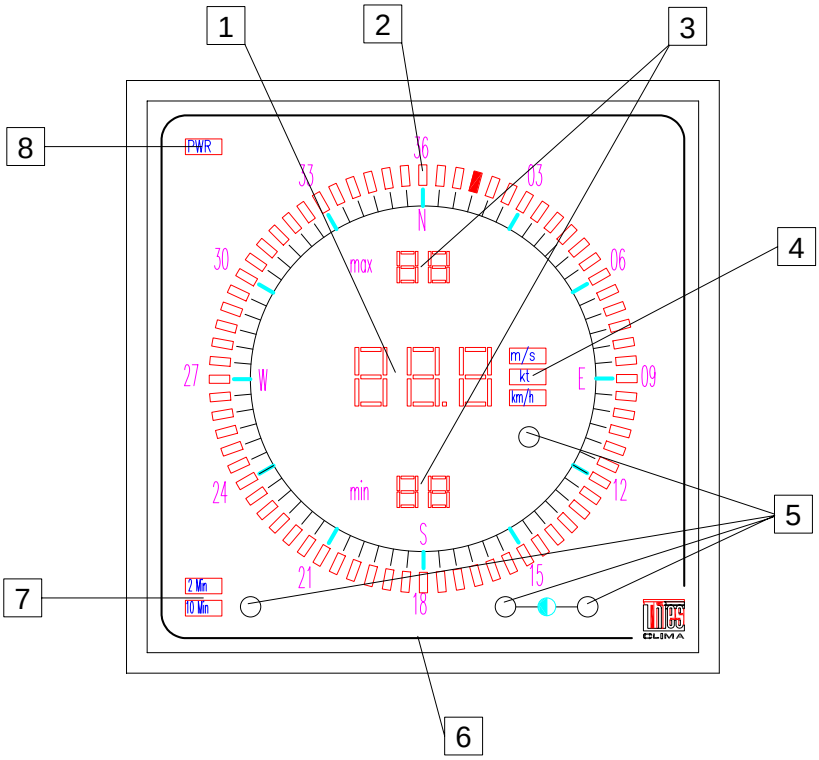


figure 1

The following numbers in brackets refer to the legends in the above figure 1:

(1) The large (h=15 mm) 3-digit red display of the wind speed can be read from a considerable distance. The wind speed can be displayed in several units depending on the version of the indicator. The display can be dimmed.

(2) The rectangular illuminated fields (size 2x5 mm) of 72 two colour (red, green and mixed) LEDs to display wind direction together with the illuminated scale contribute to optimal readability and orientation even in the most difficult circumstances. The display can be dimmed.

There are 4 different ways of displaying the wind direction selectable with a DIP-switch on the back panel of the instrument (see chapter *3. Setting the Wind Indicator* LED on page 6).

(3) Two 2-digit displays (8 mm high) for both the minimum value and the maximum value of the wind speed. The display can be dimmed.

(4) A display for the 3 units of wind speed. The display can be dimmed.

(5) 4 optical sensors (keys) to operate the display respectively to dim the display automatically (see chapter *4. Operating the Wind Indicator* LED on page 8).

(6) An illuminated scale for the wind direction ring shows the scale and its legend in the dark. This illumination cannot be dimmed.

(7) Display of the operating mode (mean value time period 2 minutes or 10 minutes.

(8) Display of the power supply status (PWR).

2. Installation

The electrical connections are located on the back panel of the display.

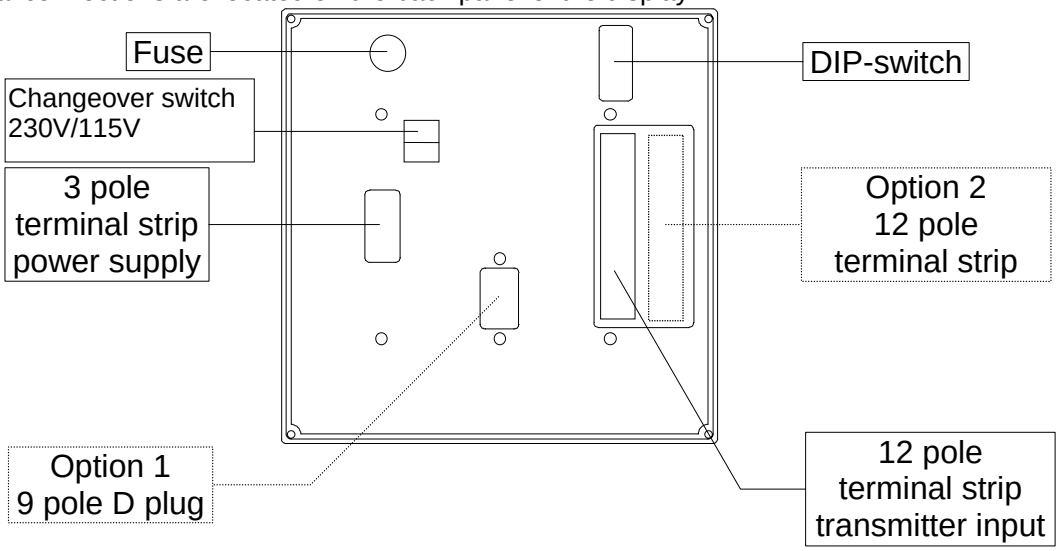


figure 2

- Remove the plug-in terminals from the terminal contacts,
- Set the DIP switch to the desired mode (see *3. Setting the Wind Indicator* LED on page 6),
- Place the instrument into the opening of the provided front panel and mount it with the enclosed holders,
- Switch off your power supply
- Connect the mains cable to the 3-pole plug terminal (see *2.1 Power* supply below),
- Connect the transmitter cable to the 12-pole plug terminal (see *2.2 Wind transmitter* input below),
- Optionally connect the serial interface cable to the 9-pole D-plug (see *2.3 Serial interface* (4.3225.xx.1xx or 4.3225.xx.2xx) below),
- Connect the plugs to their counterpart on the wind display unit,
- Switch on your power supply.

CAUTION: ***Before removing the cover, disconnect the power supply!***

2.1 Power supply

Terminal Strip:

Pin	mark	Function
1	L1	phase
2	N	null
3	PE	not connected

The Wind Indicator LED 4.3225.x**0**.000 operates from a 230 V ac as well as 50 Hz or 60 Hz mains supply.The setting take place at a changeover switch. Factory setting: 230 VAC.

The Wind Indicator LED 4.3225.x**4**.000 operates from a 115 V ac 50 Hz or 60 Hz mains supply.

The max. required power is 20 VA.

2.2 Wind transmitter input

The wind transmitter input is a 12 pole terminal strip. This strip, depending on what wind data input has been set (see Chapter *3. Setting the Wind Indicator* LED on page 6) , has the following functions:

12 pole terminal strip

pin	pin	function parallel wind transmitter 8 Bit S7=ON, S8=ON	function parallel wind transmitter 6 Bit S7=ON, S8=OFF	function serial wind transmitter S7=OFF, S8=ON	function serial interface S7=OFF, S8=OFF
13	1	+15V	+15V	+5V	+5V
14	2	ground	ground	ground	ground
15	3	WS pulse	WS pulse	WS pulse	free
16	4	track A	V_{CC}	clock	free
17	5	track B	V_{CC}*	data (in)	free
18	6	track C	track C	free	free
19	7	track D	track D	free	free
20	8	track E	track E	dimmer (bright)	dimmer (bright)
21	9	track F	track F	dimmer (dark)	dimmer (dark)
22	10	track G	track G	dimension	dimension
23	11	track H	track H	free	free
24	12	Shield	Shield	Shield	Shield

R = 10 kΩ

As an option (4.3225.**2**x.xxx), the display can be equipped with a second 12 pole terminal strip (dashed in the above table). This terminal allows to connect up to 5 Wind Indicators LED parallel to one transmitter with 8 or 6 Bit wind direction code. The max. cable length over all is about 500 m. If the heating of the transmitter is supplied via the same cable, the max. cable length is about 50 m.

2.3 Serial interface (4.3225.xx.1xx or 4.3225.xx.2xx)

For the different versions of the Wind Indicator LED with a serial interface see chapter *1.1 Versions of the* Indicator on page 2.

The electrical connection for the serial interface is a 9-pole D-plug (male, see figure 2 on page 4):

Pin	Function
2	RX (RS232)
3	TX (RS232)
5	GND (RS232, RS422)
8	+ RX / TX (RS422)
9	- RX / TX (RS422)

The RS232 interface is suitable for distances up to 15 m.

The RS422 interface is suitable for longer distances, depending on the type of cable, the quality of the cable and the termination of the cable (possible up to 5000 m).
The function of the interface is determined by the DIP-switches S6, S7 and S8 (see chapter *3. Setting the Wind Indicator* LED on page 6).

Note for RS422:
Disturbances on long lines may influence or overvoltages may even damage the interface of the Wind Indicator LED. We recommend:

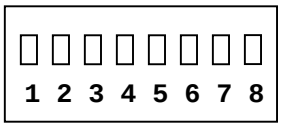
- use a shielded cable and connect the shield to a central earth potential,
- at least for cables longer than 100 m, use a twisted pair for the signals + RX and - RX or +TX and - TX,
- connect the GND pin of the Wind Indicator LED with the GND pin of the counterpart interface with an additional wire (pair) of the cable and connect it to a central earth potential,
- use an appropriate termination resistor for the cable (100 Ω to 600 Ω); place it to that indicator which is farthest away from the driver, if there is more than one indicator.

We cannot accept warranty claims for any damage caused by overvoltages!

3. Setting the Wind Indicator LED

The Wind Indicator LED has a number of different routine functions and different instrument versions which can be set on the back panel of the instrument by means of a DIP-switch.

DIP-switch:



switches S1 - S8

S1	Display mean or instantaneous value	operating mode	
ON	instantaneous display and extreme values	1/2	*
OFF	mean and extreme values	3/4	

* For the meaning of the operating mode see chapter **4.4 Changing the operating mode** on page 10.

S2	S3	Basic Setting of the Wind Speed Dimension
ON	ON	m/s
OFF	ON	kt
ON	OFF	km/h
OFF	OFF	----------

The setting is only valid after the instrument is switched on (hard-reset) or after the LED test (soft reset).

S4	Dimming mode (Display brightness control)
ON	automatic dimming via the brightness sensors
OFF	manual dimming via the sensor keys

S5	Basic setting of the mean value period	operating mode
ON	2 minutes	1/3
OFF	10 minutes	2/4

The setting is only valid when the instrument has been switched on (hard reset) or after the LED test (soft reset).

For the meaning of the operating mode see chapter **4.4 Changing the operating mode** on page 10.

S6	Master / slave modus
ON	Slave (2 - 5 indicators connected to 1 parallel transmitter) serial output is OFF
OFF	Master (1 indicator connected to 1 parallel transmitter) serial output is ON

In consequence on switch S6=ON note the following:

- The output of the instantaneous wind data on the serial interface (RS232 or RS422) is switched off.
- The test for the supply current of the wind transmitter (error „E06“) is switched off (see chapter *6.* Troubleshooting on page 15). This is necessary if you connect 2 to 5 indicators to one parallel wind direction transmitter to prevent an error message.

In consequence on switch S6=OFF note the following:

- The output of the instantaneous wind data on the serial interface (RS232 or RS422) is switched on.
- The test for the supply current of the wind transmitter (error „E06“) is switched on (see chapter *6.* Troubleshooting on page 15). Only one indicator should be connected in this case to one parallel wind direction transmitter to allow a correct error message, if the supply current of that wind direction transmitter fails.

S7	S8	Wind data input selection	V_{cc}	
ON	ON	Wind direction: 8 bit parallel wind transmitter	15 V	
OFF	ON	Wind direction: serial wind transmitter	5V	
ON	OFF	Wind direction: 6 bit parallel wind transmitter	15 V	*
OFF	OFF	Serial interface (RS232, RS422)	---	

* If you select a 6 bit parallel wind direction transmitter, there is no test for the life-zero signal of the wind speed transmitter. In consequence, there will be no error message „E04“ or „E05“ (see chapter *6.* Troubleshooting on page 15).

4. Operating the Wind Indicator LED

The Wind Indicator LED is operated from the front with optical sensor keys. These keys are located behind the front pane. This pane of glass protects the instrument from dust.

The sensor keys respond to the contrast between the reflected and the direct radiation resulting when the surface of the sensor is touched. For this reason, care must be taken that when the sensor surface is touched, no direct sunlight falls onto the wind display (otherwise the sensor will not work). One way to protect the instrument from direct sunlight is for the user to simply cast his shadow onto the wind display instrument. Also, it is very important to make sure that the sensor surfaces are not dirty.

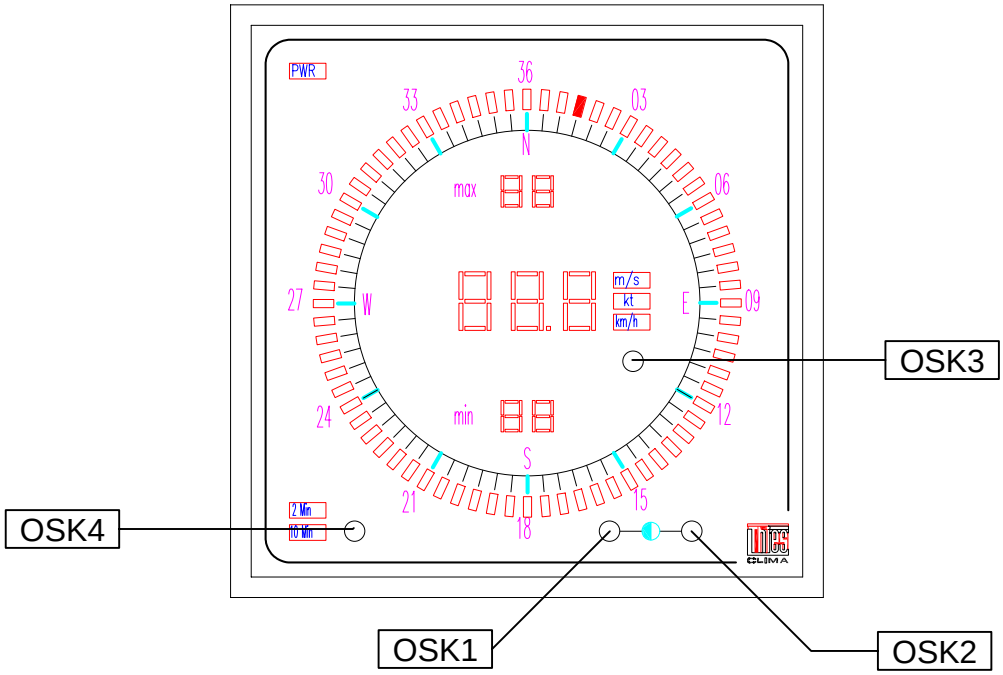


figure 3

Optical **S**ensor **K**ey	Function
OSK1 ("bright“)	brightness +
OSK2 ("dark")	brightness -
OSK1 + OSK2	LED test
OSK3	no operation
OSK4	no operation

4.1 Selecting the units

The units can be changed by setting the programming switch (DIP-switch) (see chapter *3. Setting the Wind Indicator* LED on page 6, switch S2 and S3)

4.2 Controlling the brightness

The brightness of the displays, with the exception of the PWR display and the scale illumination, can be modified in fine gradations with the "bright" (OSK1) and "dark" (OSK2) optical sensor keys (see *figure* 3 on page 8). To do so, activate the indicator with one of the two keys to switch it to the dimming mode in about 14 seconds. In the dimming mode, the left half of the wind direction ring (180°...355°), proceeding from 180°, displays in yellow the brightness which has been set on the display.

Please note:
As long as the dimming mode is switched on, no measurements or calculations will be carried out!

If the dimmer of the indicator is set to automatic, (see chapter *3. Setting the Wind Indicator* LED on page 6, switch S4), then the "bright" and "dark" sensor keys serve as brightness sensors.
The brightness of the displays adapts automatically to the brightness of the surroundings.

4.3 Testing the LEDs (Soft reset)

The LED test is a test function which can be activated at any time. It triggers a complete initialisation of the indicator. This soft reset does the same as the hard reset by switching on the power supply.
The LED test is switched on by activating the sensor keys of the dimmer function "bright" (OSK1) and "dark" (OSK2, see figure3 on page 8) simultaneously for approximately 14 seconds.
This switches on all the illumination elements on the displays.
The wind direction ring first lights up red and, a few seconds later, switches to green. Then a complete self-test is carried out and recognised errors are displayed by means of an error code in the wind speed display (see chapter 5 on page 14).
Finally the software version used is output in the 3-digit display. Sub-versions are displayed in the minimum display and in the maximum display.

4.4 Changing the operating mode

There are four operating modes available to display the wind speed and direction.

1. Instantaneous values and 2 minute extreme values.
2. Instantaneous values and 10 minute extreme values.
3. 2 minute mean and extreme values.
4. I0 minute mean and extreme values.

When the instrument is switched on (hard reset) or after the LED test (soft reset), the operating mode set with the DIP switch is set. (see chapter *3. Setting the Wind Indicator* LED**,** Switch S1 and S5, on page 6).

Display of Operating Mode
Two text fields with yellow background light are used to display the period (2 or 10 minutes, see *figure 1* on page 3).
Either only one text field lights up, or neither light up.

When the text field flashes once a second, this means that the mean value period is not yet completed.
This is the case for 2 minute settings during the first 2 minutes of operation (hard reset) or during the LED test (soft reset). When the 10 min setting has been selected, the display flashes during the first 10 minutes of operation as well as for at least 8 minutes when a "discontinuity" occurs (see chapter *5.3* Discontinuity on page 15).

When the operating mode 1 or 2 is set, 1 of the 3 unit fields flashes once a second. Otherwise the unit field lights up permanent (operating mode 3 or 4).

The following table shows the different features of the displays in the different modes. The number of the displays in the first column refer to *figure 1* on page 3

operating mode:		2 min value	10 min value	instantaneous value
display	text field: / parameter:	2 min	10 min	neither
1	wind speed	3-digit, 7-segment, red	3-digit, 7-segment, red	3-digit, 7-segment, red
		2 min gliding mean value	10 min gliding mean value note "discontinuity"	instantaneous value
	missing telegram			"EEE"
2	wind direction	one of the 72 red LEDs on the ring	one of the 72 red LEDs on the ring	one of the 72 red LEDs on the ring
		2 min gliding mean value	10 min gliding mean value note "discontinuity"	instantaneous value
	missing value	4 red LEDs flashing once a second: E/90, S/180, W/270, N/360		
2	variation of wind direction	one sector of the 72 green LEDs on the ring	one sector of the 72 green LEDs on the ring	none
		extreme values of the last 2 minutes	extreme values of the last 10 minutes note "discontinuity"	none
3	extreme values of wind speed	2-digit, 7-segment, red min and max	2-digit, 7-segment, red min and max	none
		extreme values of the last 2 minutes	extreme values of the last 10 minutes note "discontinuity"	none
	value > 99	"EE"	"EE"	none
	missing value	"- -"	"- -"	none

If no wind direction value is available, the four red LEDs of the four main directions flash once a second (E/90°, S/180°, W/270°, N/360°).

When the output value is too large for the respective display (for example maximum > 99 km/h), "EE" appears on the display. If no calculated value is available, "- -" appears.

In SLAVE operation (see chapter *3. Setting the Wind Indicator* LED on page 6) and for setting the operating mode to instantaneous values, if no telegram has been received., "EEE" will appear in the 3-digit display.

Rounding of the Extreme Values

The minimum values of the wind parameters are rounded off:

– wind speed: rounded off to integral values

(example: minimum value 1.8 ktdisplay 1 kt)

– wind direction: rounded off to 10° steps

(example: minimum value 146° display 140°)

The maximum values of the wind parameters are rounded off;

– wind speed: rounded off to integral values

(example: maximum value 9.1 kt display 10 kt)

– wind direction: rounded off to 10° steps

(example: maximum value 241° display 250°)

4.5 Remote control

The Wind Indicator LED can be operated from an external point. The precondition for this is that no 8 bit or 6 bit parallel wind transmitter is connected (see chapter *3. Setting the Wind Indicator* LED on page 6). The following pins on the terminal strip can be used for the operation:

Terminal Strip	Function
Pin 1	+ V_{cc}
Pin 8	Dimmer (bright)
Pin 9	Dimmer (dark)
Pin 10	Units switch

To activate a function the corresponding pin must be connected with pin 1 on the terminal strip. This can be done with a push button.

Example: Units switch Pin 1

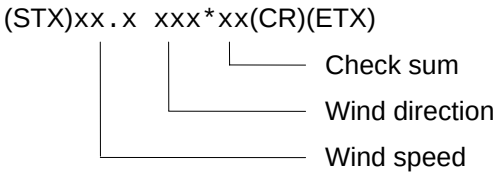
Pin 10

4.6 Serial protocol (4.3225.xx.1xx or 4.3225.xx.2xx)

The interfaces are set as follows:

Baud rate	1200 (optional 300 - 4800)
Data bits	7
Parity	even
Stop bit	1

The incoming data telegram must have the following format:



character No.	Function
1	STX (HEX 02)
2	10^1 wind speed
3	10^0 wind speed
4	"." decimal point
5	10^{-1} wind speed
6	space (HEX 20)
7	10^2 wind direction
8	10^1 wind direction
9	10^0 wind direction
10	"*" check sum identifier
11	check sum (hex high nibble)
12	check sum (hex low nibble)
13	CR (Hex 0D)
14	ETX (Hex 03)

The check sum is formed by the XOR function of characters 2...9 (beginning with Hex 00). Then the 8 bit checksum is divided into two ASCII characters (high and low nibble) with a value ranging from 0...F (Hex).

Example: wind speed: 5.2 m/s
wind direction: 125°
telegram: "(STX) 5.2 125*1F(CR)(ETX)"

5. Calculating the values

5.1 Calculating the mean values

Gliding mean values for both wind parameters are calculated once a second.

The time period is either over 2 minutes or over 10 minutes (taking discontinuity into consideration, see chapter *5.3* Discontinuity on page 15). The values of both these time periods are continuously calculated and can be displayed immediately by changing the operating mode (see chapter *4.4 Changing the operating* mode on page 10).

Calculating the gliding mean value:

Wind speed (WS)

The gliding mean values for wind speed are formed from the number of measured values (1 second instantaneous values) in a memory which subtracts the oldest value from a gliding sum and adds the new value. Then the value is divided by the number of values corresponding to the total memory period:

$$WS_{avg} = \frac{1}{n} \cdot \left(\sum_{i=1}^{n} WS_i - WS_{old} + WS_{new} \right)$$

n = 120 (2 min)
or
n=600 (10 min)

Wind direction WD)

It is not quite as easy to calculate the gliding mean value of wind direction as it is to calculate the gliding mean values of wind speed. The mean value of wind direction is calculated vectorially by splitting it into x components and y components as the wind direction values are relative to a circle (0 to 359°) and the so-called "north jump" (the jump from 359° to 0° and vice versa) has to be considered.

The following method is used to determine the gliding vectorial wind direction mean value:

The one-second instantaneous wind direction values are transformed from polar co-ordinates (vector with uniform length 1) into Cartesian co-ordinates X and Y:

$$X_i = \sin(WD_i)$$
$$Y_i = \cos(WD_i)$$

The gliding mean values of both co-ordinates are formed from the number of measured values (1 second instantaneous values), each formed in its own memory, by subtracting the oldest value from a gliding sum and adding the new value. Then the value is divided by the number of values corresponding to the entire memory period.

$$X_{avg} = \frac{1}{n} \cdot \left(\sum_{i=1}^{n} X_i - X_{old} + X_{new} \right)$$
$$Y_{avg} = \frac{1}{n} \cdot \left(\sum_{i=1}^{n} Y_i - Y_{old} + Y_{new} \right)$$

n = 120 (2 min)
or
n=600 (10 min)

The gliding mean value of wind direction is obtained by retransforming the values back into polar co-ordinates.

$$WD_{avg} = \arctan\left(\frac{X_{avg}}{Y_{avg}}\right)$$

5.2 Calculating Extreme Values

Gliding extreme values are calculated once a second for both wind parameters. The extreme values are the smallest and the greatest instantaneous values within a period of measurement. The measurement period is either 2 minutes or 10 minutes (allowing for discontinuity, see chapter *5.3* Discontinuity on page 15). The values from both measuring periods are continuously calculated and can be displayed immediately after changing the operating mode (see chapter *4.4 Changing the operating* mode on page 10).

5.3 Discontinuity

The so-called discontinuity is taken into consideration for the 10 minute mean values and 10 minute extreme values. The determination is based on the recommendations of the "International Civil Aviation Organisation" (**ICAO**, Annex 3 - *Meteorological Service for International Air Navigation*, 1/7/93, Chapter 4.5: *Observing and reporting of surface wind*).

The 2-minute mean values of the wind parameters and the 10 minute mean values are compared. There are two ways to determine the discontinuity:

- The difference between the 2 minute mean values and 10 minute mean values of the wind direction is greater than 30° and when at least one of the two mean values (2 minute value or 10 minute value) of wind speed is greater than 5.5 m/s (≈20 km/h).

- The difference between both mean values (2 minute value and 10 minute value) of wind speed is greater than 5.5 m/s (≈20 km/h).

If a discontinuity is determined, then the 10 minute mean values and 10 minute extreme values from the timpoint of the discontinuity will be calculated anew. The 10 minute values first correspond to the 2 minute values, until after 8 minutes the 10 minute values can again be calculated over the entire period of time.

6. Troubleshooting

The Wind Indicator LED has a number of error control routines which are automatically carried out during the switch on phase of the instrument i.e. while the instrument is in operation. If an error occurs, this is indicated on the wind speed display in the form of an error code. If several errors occur simultaneously, the error with the highest priority is displayed.

Table of the error codes sorted according to priority:

(E51 low priority E99 highest priority)

Error code	Error	Cause / Remedy	Remark
Optical sensor keys:			
E51	optical sensor OSK1 defect	surface may be dirty	1
E52	optical sensor OSK2 defect	surface may be dirty	1
E53	optical sensor OSK3 defect	surface may be dirty	1
E54	optical sensor OSK4 defect	surface may be dirty	1
Wind speed or direction transmitter:			
E01	WS > cut-off frequency (1300 Hz)	check input signal	
E02	WD transmission error	check serial WD-transmitter	
E03	WD U-level error (life-zero)	perhaps a „break in cable“	
E04	WS U-level error (life-zero)	perhaps a „break in cable“	2
E05	E03 and E04	perhaps a „break in cable“	2
E06	I_{CC} error (transmitter supply current)	perhaps wind transmitter not connected	3
Serial interfaces:			
E10	time out serial interface	no signal (not connected)	4
E11	check sum error serial interface	check route to sender	
E12	parity error	check route to sender	
E13	WD error (FFF)	transmitted WD error	5
E14	WS error (FF.F)	transmitted WS error	5
E15	E13 and E14	transmitted error	5
Internal hardware:			
E60	WS input error	internal error (return instrument)	
E61	WD-CLK error	internal error (return instrument)	
E7x	track A,B,C,D (x=1,2,4,8)	internal error (return instrument)	
E8x	track E,F,G,H (x=1,2,4,8)	internal error (return instrument)	
E90	V_{CC} (wind transmitter) error	internal error (return instrument)	
E91	U_{ref} error	internal error (return instrument)	
E99	watch-dog error	internal error (return instrument)	6

WD = Wind direction
WS = Wind speed
Remarks:

1. Definitions for the optical sensor keys OSK1 to OSK3 see chapter *4. Operating the Wind Indicator* LED on page 8
2. If you select a 6 bit parallel wind direction transmitter, there is no test for the life-zero signal of the wind speed transmitter. In consequence, there will be no error message „E04“ or „E05“.
3. Only possible if the DIP-switch is set to S6=OFF (see *3. Setting the Wind Indicator* LED on page 6)
4. If no telegram was received since more than 10 s
5. Check the transmitter connected to the sender of the telegram
6. Watch-dog errors occur after system break down by external or internal troubles. This error occurs regularly only after a hard or soft reset.

7 Technical Data

Display:

- two colour LEDs (red, green) for the wind direction

size of LED 2 x 5 mm

- 3-digit 7-segment display for the wind speed

height of digits 15 mm

- two 2-digit 7-segment displays for the extreme values of wind speed

height of digits 8 mm

- text field for the units (m/s, kt, km/h)
- text field for the display of the operating mode (mean value period) (2 minutes, 10 minutes)
- text field to display the status of the supply voltage (power LED, PWR)

Brightness

- dimming manually or automatically

Resolution

- wind direction: 10 degrees
- wind speed
- 1 m/s

Operating mode

- 2-minute gliding mean value and extreme value
- 10-minute gliding mean value and extreme value allowing for so-called "discontinuity" (see chapter *5.3* Discontinuity on page 15)
- instantaneous value and 2-minute gliding extreme value.
- instantaneous value and 10-minute gliding extreme value.

Scanning rate

the wind parameters are measured, processed and displayed once a second

Wind transmitter input:

Wind speed

- Pulse input
- Amplitude 5...15V
- Error message at low level < 0.7V (with appropriate wind speed transmitter)
- Input frequency range 0...1300 Hz

Wind direction

- 8 bit or 6 bit parallel wind direction transmitter
- serial wind direction transmitter
- Error message at low level < 0.7V (only parallel wind direction transmitter)

Power supply

- power from the display unit
- +15V (parallel wind direction transmitter)
- + 5V (serial wind direction transmitter)

Serial interface (4.3225.xx.1xx or 4.3225.xx.2xx):

Type

- RS232 (V.24) bi-directional, max. distance 15 m (4.3225.xx.**1**xx)
- RS422 (V.11) unidirectional, max. distance up to 5 km (4.3225.xx.**2**xx)

Format

- Baud rate 1200 Bd
- 7 data bits
- 1 stop bit
- even parity

Power supply:

- 230V AC/ 50 Hz (4.3225.x**0**.xxx)
- 115V AC/ 50 Hz (4.3225.x**4**.xxx)
- max. 20 VA

Environmental:

- 0 ... 45°C

Test functions:

- measurement of the supply current of the wind transmitters, identification of a break in the supply line.
- identification of a break in the line ("life-zero“) in parallel wind direction transmitters
- identification of a break in the line in synchronous-serial wind direction transmitters via software
- serial communication (wind data telegrams) with check sum text and parity test.
- watch-dog for self-testing the program run of the instrument and for re-start when an error is identified.
- instrument self-testing after switch on or by a "LED-test".

ADOLF THIES GmbH & Co. KG
Hauptstraße 76 37083 Göttingen Germany
P.O. Box 3536 + 3541 37025 Göttingen
Phone ++551 79001-0 Fax ++551 79001-65
www.thiesclima.com info@thiesclima.com