

Wind display OMC-138/139



Version 1.10
Firmware v3.82

TDC 08-02-2011

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1. General

The Obsermet digital wind display OMC-138 is a combined display for wind speed and wind direction. The OMC-138 is provided with a digital LED indicator for speed, and a double ring of 36 LED's actual and average direction information.

A second three digit display located in the lower right corner provides gust information.

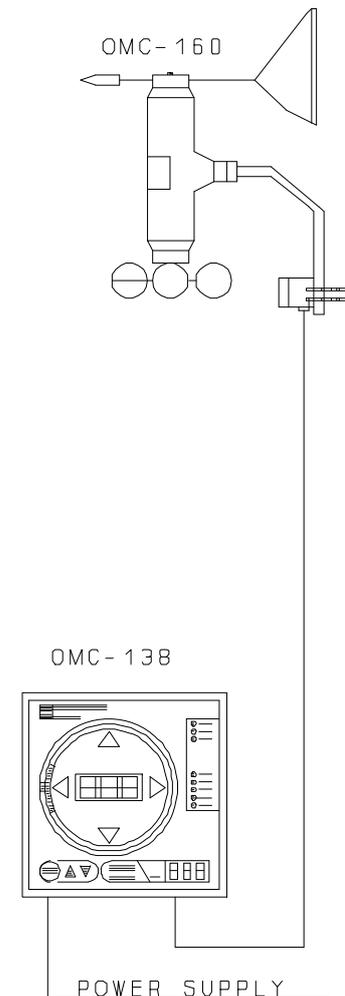
The front panel is provided with three buttons for adjusting the brightness of the LED's. Testing all the LED displays and entering a set menu for adjusting display settings.

The OMC-138 will accept the output-signals directly from the series OMC-160 and OMC-170 wind sensors, without the need of additional interfaces. It provides the power supply to the wind sensor, and "daisy-chain" connections are available for additional indicators. As an option, the OMC-138 can provide analogue output signals for speed and direction. Those can be 4...20 mA or 0...1 volt.

The display is housed in a 144x144 mm. DIN-size casing suitable for flush mounting in a console or display panel. Unit depth is 63mm.

The signal transmission of the daisy chain is: 20mA current loop, 300 Baud, ASCII-code.

The OMC-138 can display the wind speed in various scales i.e. Miles per hour (mph). Meters per second (m/s). Knots. kilometers per hour (km/h) and Beaufort. In addition the analogue output for wind speed and direction can be transmitted using a variety of averaging periods between 1 and 600 seconds.



Typical characteristics:

Power supply	: 220Vac. 115Vac and 24Vdc selectable via wire bridges
Power supply optional	: 12 Vdc
Speed display	: 3 digit 7 segment LED display 14.3 mm height
Gust display	: 3 digit 7 segment LED display 10.1 mm height
Direction display	: 36 LED's circular color RED
Direction average	: 36 LED's circular color AMBER
Input signal	: RS422 NMEA-0183 Currentloop with ASCII information
Input optional	: Pulse, Potentiometer and RS422
Output	: Daisy chain
Output (optional)	: 0...1 volt. 4...20 mA, RS232 and NMEA-0183
Dimensions	: 144x144x94 mm
Weight	: approx. 800 gr
Scale	: Knots, mph, m/s or km/h
Brightness control	: From the front panel (optional on distance)
Readout units	: m/s, Km/h, knots, Mph and Bft

2. Installation

2.1. Mechanical

Panel mounting of the OMC-138 display requires a panel cut-out of 137 mm square. Maximum panel thickness 5 mm. Rear access must be provided, for fixing of the tightening clamps and connecting the electric cabling. The depth of the unit is 63 mm and an additional clearance of 8 mm should be allowed for the cable connections.

2.2. Electrical

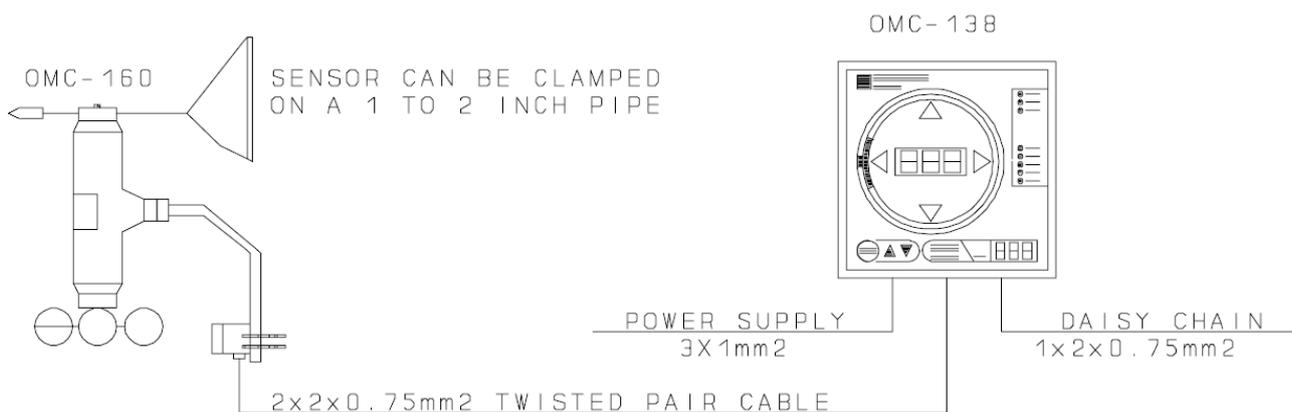
All Obsermet displays utilize a common terminal strip for the connections to the wind sensors and the ancillary displays and/or recorders. The signal cable between sensor and display is a 4-core cable with 2 cores for power to the sensor and 2 cores for signal transmission. To reduce interference the cable must have a common screen. This screen should be grounded to earth in the junction box of the wind sensor. In this way the cable may run distances up to 1 kilometer.

Recommended cable: 2 (or 3) twisted pairs with common screen, core size 0.75 mm².

In the case that the wind sensor is provided with a heater. 2 extra cores are required for power supply to the heater. The size of the heater cable depends on the cable length. (For more details see manual wind sensor)

The OMC-138 display unit provides the 15 Volts DC. power supply to the microprocessor transmitter in the wind sensor. The power consumption of the sensor transmitter electronics is approx. 65 mA. This power supply should not be used for the optional heaters in the sensor. These sensor-heaters must be powered independently from the display unit.

2.2.1 Cable lay-out without heater



2.2.2 Power supply settings

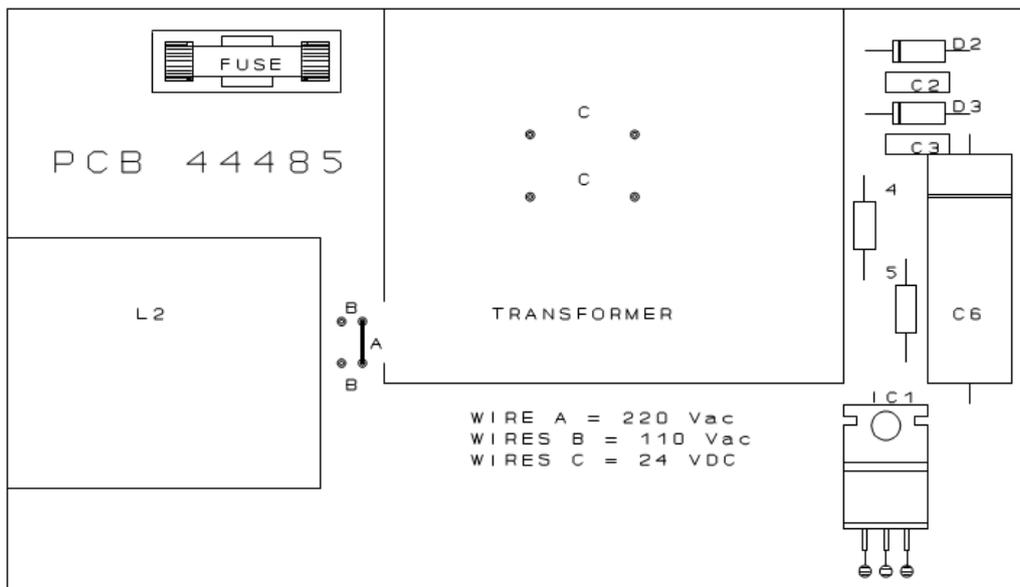
The OMC-138 will be delivered with the power supply set as required by the customer. If no power supply is mentioned in the official ordering papers the OMC-138 power supply will be set for 230 Vac.

If during installation is found that the supply setting is wrong two things can be done, the unit can be returned to the factory for modification or the user will modify the unit himself.

To modify the display unit for a different power supply proceed as follows,

On the power supply board, the PCB with the terminal connection on the rear side, there is installed a transformer. The transformer offers the possibility of 115 or 230 Vac. The supply depends on the jumper settings between the filter transformer and the supply transformer. (see PCB layout) If the wired marked "B" are installed the unit is set for 115 Vac, If the wire "A" is installed the unit is set for 230 Vac.

For 24 Vdc power supply the transformer TR1 has to be removed from the printed circuit board. When the transformer has been removed two wire connection can be made (marked with "C")



As an option the OMC-138/139 can be delivered for 12 Vdc, If the unit has to be modified to work with 12 Vdc the transformer has to be removed. With the transformer removed it becomes possible to install a DC/DC converter on the location of the transformer. The DC/DC converter converts the 12 Volt supply voltage up to 24 Vdc.

2.2.3. Connections

All connections to the OMC-138 display are made to the rear of the display as shown on the drawing on the right.

If the Obsermet wind sensor is used, only the terminals 1, 2, 3 and 4 are used.

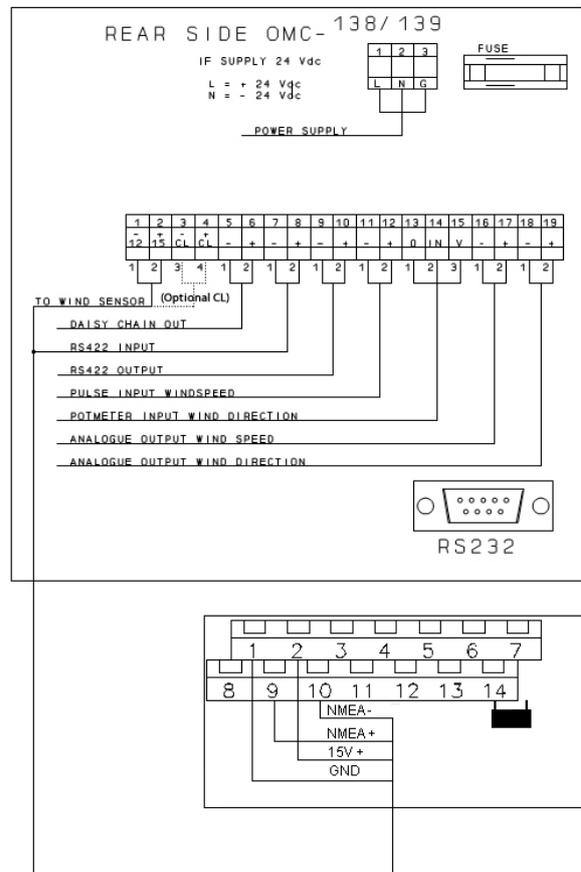
Daisy chaining to the next instrument is done on the terminals 5 and 6.

If a sensor is used providing a pulse signal for wind speed connections must be made to terminals 1 and 2.

If for wind direction a sensor is used with a potentiometer connections must be made to the terminals 13, 14 and 15.

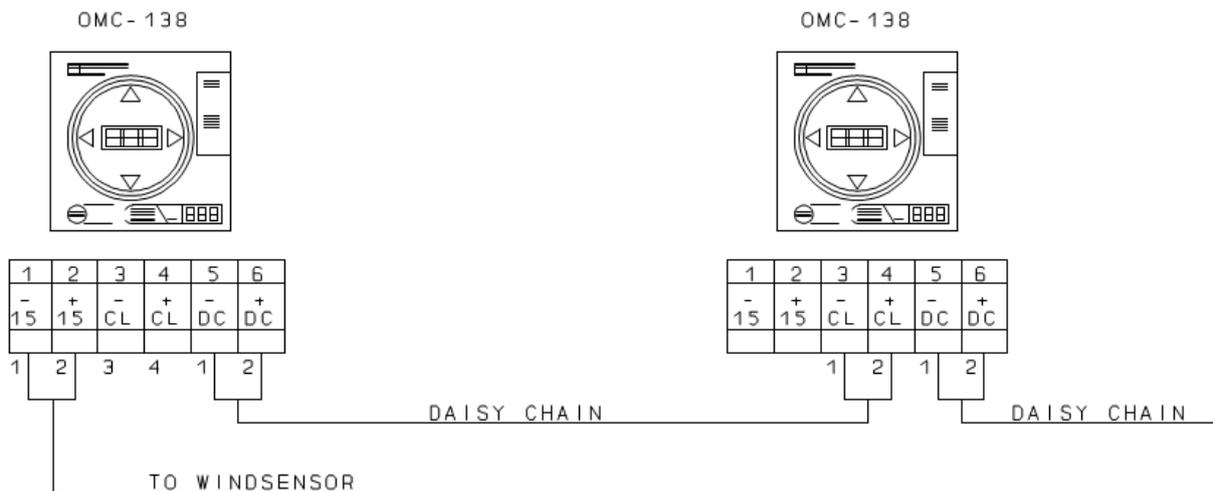
- 1 = -15 Vdc sensor supply
- 2 = +15 Vdc sensor supply
- 3 = - serial currentloop input
- 4 = + serial currentloop input
- 5 = - daisy chain output
- 6 = + daisychain output
- 7 = - RS422 input
- 8 = + RS422input
- 9 = - RS422 output
- 10 = + RS422 output
- 11 = - pulse input (wind speed) (*)
- 12 = + pulse input (wind speed) (*)
- 13 = 0 Volt reference supply potentiometer (wind direction)
- 14 = input signal potentiometer
- 15 = + reference signal potentiometer 2500 mV
- 16 = - analogue speed output 4..20 or 0..1 Volt
- 17 = + analogue speed output 4..20 or 0..1 Volt
- 18 = - analogue direction output 4..20 mA or 0..1 Volt
- 19 = + analogue direction output 4..20 mA or 0..1 Volt

*) it is possible to use the pulse input for wind speed to adjust the brightness of the display from a remote location. This is optional and must be ask for when the instrument is ordered.



2.2.4. Daisy chaining

The daisy-chain output is used to transfer the wind sensor information to a second wind display. The cable length depends on the type of cable used. Depending on the total capacity of the cable a distance up to 1000 meter is possible. The cable should be screened, and the screen should be grounded at 1 point only.



Recommended cable: 1 twisted pair with common screen, core size 0.75 mm².

3. Commissioning

Before switching ON the mains, check that the power supply is correct as indicated on the identification label on the rear of the equipment.

With no signal cable connected, switch on the display and observe the front panel LEDs. The system will perform a led test all led are switched on and off one by one. When the test is finished the display shows on the led circle no information and on both speed displays only "----" is shown. This is because no sensor information is received by the display.

Check the voltage at terminals [1] and [21 on the rear panel this should be 15 Volts DC. With all cabling correctly connected, the display will show the wind speed and wind direction directly as transmitted by the OMC-160 wind sensor.

Adjustment cannot be made as the sensor-signal is digitally transmitted.

When there is no serial information received from the wind sensor the watchdog circuit in the display unit starts to switch the 15 Volt supply voltage to the sensor ON and OFF. The supply voltage is 10 seconds ON and if none information is received from the wind sensor the supply voltage is switched OFF for 5 seconds. If this is happening during the commissioning check the wiring to the wind sensor.

When the display is fully operational and the and the sensor information is not received for more than 5 seconds the display starts flashing indicating that the sensor information is not longer received by the display unit.

The OMC-138 is also available as OMC-139. The OMC-139 is made to be used on board of ships. The front panel of the OMC-139 is different, the degree scale is made from 0...180 degrees on both sides of the scale.

If from the speed display inside the led circle the decimal point between the hundred and the ten displays is ON the Eeprom has been damaged. Settings for proper operation are most probably lost. The display must be returned to the factory.

Extension (optional)

The display can provide information of wind speed and direction in the NMEA-183 format.

The display can be used with a Gill wind sensor

The display can be used with an Irdam wind sensor

The display can be used with Vector wind sensors (12 Vdc supply possible)

Adjusting brightness on remote location. (not when Vector sensors are used)

The display can provide 0...1 Volt or 4...20 mA output signals

3.1 Internal hardware settings

3.1.1 Analogue output

The OMC-138/139 provides an analogue output signal for wind speed and wind direction. This is optional and not as standard available.

On the processor board (middle board) there are some jumper settings to select a current or an voltage output signal. There are three jumpers that have to be set in the correct position. In the drawing the selection for a voltage output is set. In jumper field J3 de position 2-3 is selected and in jumper field J4 the jumper settings 1-3 and 2-4 are selected.

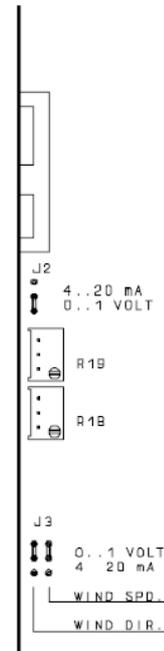
To get a 4...20 mA output the jumpers must be set as follows, Jumper field J3

set 1-2

Jumper field J4 set 3-5 and 4-6

The Potentiometers R18 and R19 are used to set the range of the analogue output signals.

For analogue output the following IC's must be placed in the sockets, IC16, IC17, IC18 and IC20.



3.1.2 Serial in/output

The OMC-138 has two different serial in/output ports. Port 1 is used to receive information from the wind sensor on the input and to transmit information on the currentloop and RS422 output. Port 2 is used to communicate via the RS232 port on the rear of the instrument.

Receive information port 1

The OMC-138/139 has the possibility to receive information on different levels, the possibilities are RS422, RS485 and Currentloop. A selection is made with the jumper field J1 in the following way.

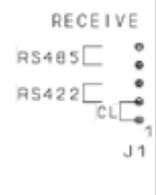
- Jumper field J1 RS485 set jumper 4-5
- Jumper field J1 RS422 set jumper 2-3 (Default)
- Jumper field J1 Currentloop set jumper 1-2

Transmit information Port 1

The OMC-138/139 provides the possibility to transmit information on different signal levels. Those levels are RS422 and Currentloop.

Transmit and receive Port 2

Port 2 is the 9-pin D-connector at the rear of the instrument. This port can be used for setting up the instrument or to output the wind information (optional). The baud rate for this port is default set to 9600 baud. Via the menu options this can be changed.



Currentloop output OMC-160 message format

The currentloop output is normally used to transport the collected data from the currentloop input. Using the system in this way it is not necessary anymore to output the data as analogue signals which upgrade the performance and the accuracy. The data is transmitted with the same speed as data is received from the wind sensor. 300 baud 8N1.

If the currentloop output signal from the OMC-160 is repeated by the OMC-138 the message looks as follows,

<LF>D125<sp>V234<sp>cscs<CR>

In the above message the transmitted wind direction is the number shown after the indent "D" 125 degrees. the wind speed in the message is shown after the indent "V" 234 is 23.4 m/s. The wind speed is transmitted without decimal point and therefore must be divided by 10 to get the correct wind speed.

The checksum is all information in the string added, the least significant byte is divided into high and low nibble and both nibbles are incremented by hexadecimal 30. This information is sent out as a checksum.

OMC-2900 message format

Sometimes the data is transmitted in the OMC-2900 format. This format is used when more parameters are transmitted.

The wind data transported in the OMC-2900 format looks as following,

**<STX> <LF>V21.2<SP>CSCS< CR>
<LF>D156<SP>CSCS<CR> <EOT>**

Every message starts with a start of text character after this the messages are transmitted. All messages start with a line feed followed with the identifier for the data, then the data and then a checksum for protection reasons, the message end with a carriage return.

All input channels can be transmitted in this way every second to any receiving station.

RS232/RS422 in/output channel

The OMC-2900 and the OMC-160 format on the RS232/RS422 output looks the same as the format used in the currentloop output described paragraph 3.2.2.2

There are two possibilities to transmit data in the NMEA output, wind speed can be transmitted in m/s or in knots, both messages are shown below.

\$IIMWV,123,R,5.8,N,A*24 Wind speed in knots

\$IIMWV,123,R,5.8,M,A*27 Wind speed in meters per seconds

The transmission speed is the same as the communication speed of the wind sensor used, if this is the OMC-160 it will be 300 bps 8N1.

If the currentloop input is not used the speed can be set from 300 to 9600 bps.

3.2 Settings via front panel

On the front panel of the display there are three pushbuttons. The buttons are marked "MENU", arrow up and arrow down. Under normal conditions the buttons marked arrow up and down are used to adjust the brightness of the display.

3.2.1 Units and averaging settings

When the menu button is pressed the led in the average time window starts flashing indicating that the select option is on. It becomes possible now to make a selection using the arrow up and down button. If the menu button is pressed again the led in the unit's window starts flashing indicating that the select option is on. With the arrow up and down button it is possible now to select different units for the wind speed.

When the buttons are not touched for 5 seconds the display will return to the normal operation mode.

3.2.2 Lamp test

With both arrow buttons pressed all the displays and led's start flashing (lamp test). When the interval time for gust is set to 0 seconds the Gust must be reset manually. This has to be done by pressing the menu and the arrow down button at the same time.

3.2.3 Deviation setting

The display provides the possibility to add an offset to the wind direction. This is very useful for winds systems installed on oilrigs and for airports if they want to use the magnetic North instead of the true North.

An offset is added in the following way, Press the arrow-up button and the Menu button, the Gust display starts flashing and is showing the offset. As long as the display is flashing the offset can be changed using the arrow-up or arrow-down buttons. The set value is added to the actual wind information from the sensor.

3.2.4 Alarm setting (optional OMC-123 alarm module)

This is only available when the optional alarm module OMC-123 is installed.
Press [MENU] until the led's are blinking.

Set Pre-Alarm (output 1, terminal 16 & 17)

- Use the menu button to select the 'min' led in the Gust display, the pre-alarm value in m/s will be displayed in the gust display.
- Edit the value with the arrow buttons if required.

Set Alarm (Output 2, terminal 18 & 19)

- Use the menu button to select the 'max' led in the Gust display, the alarm value in m/s will be displayed in the gust display.
- Edit the value with the arrow buttons if required.

The settings are automatically stored, when no buttons are used for approx 10 s, the display will exit the settings mode.

3.3 Settings possible via the RS232 port.

- 1 Users interval time, 3 different times can be set, direction, speed and gust. When for gust a time of 0 is selected the gust can be reset by pushing the menu button and the arrow down button at the same time.
- 2 Scaling analogue outputs. For the analogue outputs it is possible to set the span of the signal. 4...20 mA can be 0...40 m/s or 50 m/s. For the direction a choice can be made between 360 or 540 or 720 degrees.
- 3 Average time for analogue output signals, For the 2 available analogue outputs it is possible to set a average time. This is done to prevent analogue recorder to paint the paper.
- 4 Selection of sensor type, a selection can be made between the following inputs.
 - a. Obsermet sensors OMC-160. OMC-170 and OMC-165 (standard)
 - b. Gill sensors RS422 (optional)
 - c. Irdam sensor RS422 (optional)
 - d. Vector puls/potentiometer (optional)
- 5 When pulse/potentiometer is selected it is possible to set the scaling factors for the input signals.
- 6 RS232 output on/off and baud rate setting
- 7 RS422 output on/off and baud rate setting
- 8 Repeat the sensor message on the RS232/422 or select NMEA-183 output signal.

4. Maintenance

The Obsermet OMC-138/139 digital display unit has no moving parts, and requires no routine maintenance. If required, the perspex display front can be cleaned with a cloth, slightly moistened with a soft detergent. Care must be taken that no liquid enters the display unit. Solvents should not be used, and scratches should be avoided.

Fuses: Glass fuses 5x20 mm,

40 mA for 230 Vac.
80 mA for 115 Vac
250 mA for 24 Vdc

The fuse can be reached as follows,

Switch of the main supply and disconnect all the wiring on the rear of the display.
Remove the four 2.5 mm screws on the rear of the display.
Remove the front window, pull on a corner with both hands.
With holding the front down, the whole case can be removed now.

The fuse can be reached now. The fuse is placed on the PCB where all the wires are connected to.

5. Setting up procedure

During final testing in the factory the OMC-138/139 is setup for the system it is manufactured for.

If at a later stage the settings have to be changed then this can be done by the user in the following way.

Connect a cable to the RS232 connector at the rear of the instrument. Connect the other end of the cable to a PC.

Start on the PC a terminal program like "Terminal" under Windows or "Hyper terminal" under windows XP.

Select the proper transmission speed, the speed is as a standard set to 9600 bps. This setting might be set differently, if no response from the instrument when pressing the ENTER button on the keyboard try a different transmission speed.

If contact is established with the display the above shown menu will appear on your computer screen.

```

OMC-138/139 Obsermet wind display unit
Software version 3.82

Serial nr. 00000000

1 - Select input device

2 - Select output device

3 - Set averaging of channels

4 - Set options

5 - Show all settings

6 - Test Instrument

7 - Exit menu

```

5.1 Input device

With the given options the OMC-138 can be set to customers needs.

If "Select input device" is selected the menu on the right will appear on the screen. The menu shows the actual setting (star in front of the option) and it shows the options that are not available because they were not ordered. That option is followed by the word disabled.

In the menu shown on the right the vector sensors are selected as input.

```

OMC-138/139 Obsermet wind display unit
Software version 3.82

Serial nr. 00000000

Instrument input device

0 - menu back
1 - Obsermet equipment [disabled]
2 - Vector wind sensor [disabled]
3 - Gill wind sensor [disabled].
4 - Irdam wind sensor [disabled].
5 - NMEA input message [disabled].
6 * Young / NMEA message with power output
7 - Obsermet OMC2900 format.

8 - Change baud rate CL/RS422[4800]

9 - WMO compatible 3 second average

[on] Select option:

```

5.2 Vector range settings

If the vector sensor is selected a new window will open. This window is shown on the right.

In this window the scaling values for the vector instruments can be set.

Due to the fact that the vector wind-direction sensor is using a potentiometer the start and end value can be set. For wind-speed the vector sensor is using pulse signal. With option 3 the value for every pulse can be set.

OMC-138/139 Obsermet wind display unit
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Serial nr. 00000000

Vector range settings

0 - menu back

1 - Wind direction min. value [1.875]

2 - Wind direction max. value [358.125]

3 - Wind speed m/s / pulse [1.25]

Select option :

5.3 Instrument output device

The OMC-138 has several output possibilities. All those possibilities need to be set to customers needs.

The output possibilities are. The analogue outputs, the RS232 output and the CL/RS422 output.

For the analogue output the range can be set as well for speed as for direction.

For the serial outputs (RS232 and CL/RS422) the format of the output message and the transmission speed can be set.

OMC-138/139 Obsermet wind display unit
Software version 3.82

Serial nr. 00000000

Instrument output device

0 - menu back

1 - Analog output

2 - RS232 output

3 - CL/RS422 output

Select option:

5.4 Analogue output range settings

The OMC-138 provides two analogue output. These outputs are optional. There are two outputs one for the wind speed and one for wind direction. With jumper settings on the middle PCB it is possible to select current or voltage. See paragraph 3.2.1

The scaling can be set with the menu shown on the right. The actual settings are set to 0...360 degrees and 0...40 m/s over the full output swing of the current or voltage signal. The user can change this to meet his requirements.

OMC-138/139 Obsermet wind display unit
Software version 3.82

Serial nr. 00000000

Analog output range settings

0 - menu back

1 - Range wind direction [360 deg]

2 - Range wind speed [40 m/s]

Select option:

5.5 RS232 output settings

The 9-pin connector on the rear of the instrument but can also be used to output messages. (optional) With the menu shown on the right it is possible to select the format of the message.

Option 1 will output the message as received from the wind sensor.

With option 1 it is possible to have the Obsermet wind sensor message as output when a different wind sensor is used for input.

On the daisy chain the (option 2) the message is transmitted as received from the wind sensor.

OMC-138/139 Obsermet wind display unit
Software version 3.82

Serial nr. 00000000

RS232 output settings

0 - menu back

1 - Obsermet OMC-160 format [disabled]

2 - Obsermet OMC-160 format with dimmer [disabled]

3 - Daisy chain [disabled]

4 - NMEA knots [disabled]

5 - NMEA m/s [disabled]

6 * No output

7 - Change baud rate [4800]

Select option:

5.6 Baud rate RS232 port

The communication speed of the RS232 port can be set to one of the shown speeds.

Make a selection by typing the number in front of the required speed and press the enter button.

Change the communication speed of the device which you are using for further communication otherwise communication is not possible anymore.

OMC-138/139 Obsermet wind display unit
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Serial nr. 00000000

Baud rate RS232 port

0 - menu back

1 - 300 baud

2 - 1200 baud

3 - 2400 baud

4 * 4800 baud

5 - 9600 baud

Select option:

5.7 Currentloop/RS422 output settings

In this menu it is possible to select what message is transmitted on the currentloop/RS422 output, also the transmission speed can be set.

If the transmission speed is changed the input speed will also changed. This will not be possible is the OMC-160 wind sensor is used. This sensor is transmitting data with a speed of 300 bps en this cannot be changed.

Option 1 will output the message as received from the wind sensor.

With option 1 it is possible to have the Obsermet wind sensor message as output when a different wind sensor is used.

On the daisy chain the (option 2) the message is transmitted as received from the wind sensor.

OMC-138/139 Obsermet wind display unit
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Serial nr. 00000000

Currentloop / RS422 output settings

0 - menu back

1 - Obsermet OMC-160 format.

2 * Daisy chain

3 - NMEA knots [disabled]

4 - NMEA m/s [disabled]

5 - No output

6 - Change baud rate

[300] Select option:

5.8 Baud rate Currentloop/RS422

If the transmission speed must be changed and option 6 is selected the menu on the right is shown.

Select one of the numbers to change the transmission speed on the currentloop and or the RS422 output.

Beware of the fact that changing the speed of the currentloop/RS422 output will also affect the input. This is not allowed when an Obsermet wind sensor is used.

OMC-138/139 Obsermet wind display unit
Software version 3.82

Serial nr. 00000000

Baud rate currentloop /RS422 port

0 - menu back

1 - 300 baud

2 - 1200 baud

3 * 2400 baud

4 - 4800 baud

5 - 9600 baud

Select option:

5.9 Averaging of channels

On the front of the display a selection can be made for the averaging of the wind information. A choice can be made between 2 minutes, 10 minutes and user select. With the menu shown the user select parameters can be filled-in.

4. Average time of the analogue output for wind speed and direction can be set.

1. Direction is the average time for the actual direction indication (red circle).

2. Variation direction is the average time for the variation direction indication. (Yellow circle)

3. Speed is the average time for the speed display.

6. The analogue output average time can be set here.

Maximum wind speed (Gust) reset time can be set. If this is set to zero the maximum wind speed must be reset manually on the front panel. Maximum time setting is 600 seconds.

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Serial nr. 00000000

Averaging of channels

0 - menu back

1 - Direction [3]

2 - Variation direction [3]

3 - Speed [3]

4 - Analog output direction [3]

5 - Analog output speed [3]

6 - Max wind speed reset [0]

Select option:

5.10 Device options

If possible with the existing hardware it is possible to change the software to customers specification. Those options can then be selected in the menu "Device options".

The option "Dim on distance" provide the possibility to adjust the brightness of the display on remote location. A push button must be connected to the pulse input normally used for pulsed wind speed information.

A wind sensor with a pulse output cannot be used anymore.

The option "Deviation" is used to add an offset to the wind sensor measured value.

With a NMEA MWV input message you can select the input/output reference. This option (9) sets if the display shows relative or true wind. This option can be used when the display is connected to an OMC-131.

OMC-138/139 Obsermet wind display unit
Software version 3.82

Serial nr. 00000000

Device Options.

0 - menu back.

1 - Dim on distance [disabled].

2 - Deviation [0 deg].

3 - Use deviation with analog output [off].

4 - Use deviation with serial output [off].

5 - Watchdog timeout [10 sec].

6 - Round off knots to whole numbers [Enabled].

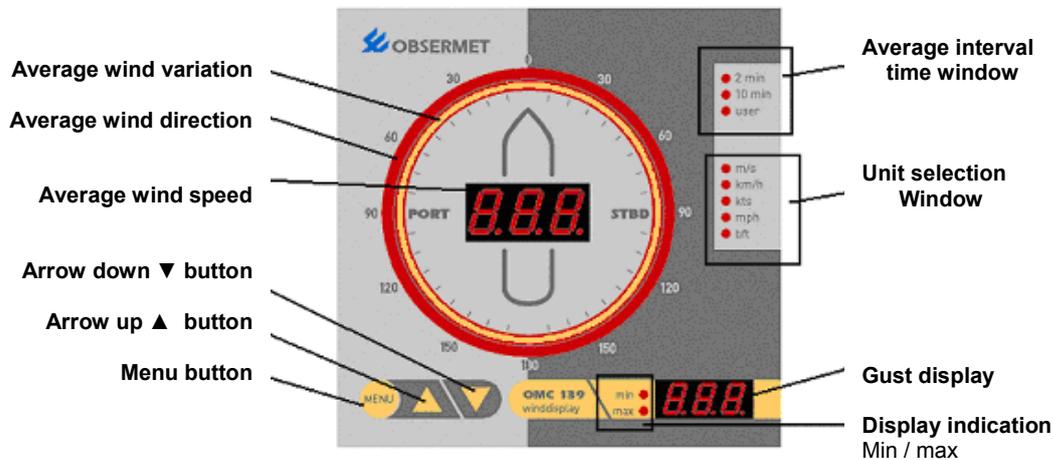
7 - Alarmsettings[Disabled].

8 - Alarm output type [Disabled].

9 - NMEA MWV input/output Reference[R/T/M][R].

Select option:

Operating instructions OMC-138/139 Display



On the front panel of the display are 3 pushbuttons. Menu, arrow up ▲ & arrow down ▼.

Brightness control:

- Adjust the brightness with the arrow up ▲ & arrow down ▼ buttons.

Min-Max indication:

- Press the 'Menu' button
- The max LED starts flashing
- The display will show the minimum over the selected interval
- After 30s the displays will switch back to the Max wind speed.

Average interval setting:

- Press 'Menu' button twice
- The LED in the 'Average interval window' will start flashing.
- Select the interval with the arrow up ▲ & arrow down ▼ buttons

Unit selection:

- Press the 'Menu' button 3 times.
- The LED in the 'Unit selection window' will start flashing.
- Select the unit with the arrow up ▲ & arrow down ▼ buttons.

Alarm setting (Only available when option OMC-123 Alarm module is installed)

- Select 'min' led with 'Menu' button and set Pre Alarm value (m/s) with 'arrow' buttons
- Select 'max' led with 'Menu' button and set alarm value (m/s) with 'arrow' buttons.

Gust display reset (only when in user average mode):

- Press 'Menu' & arrow down ▼ button at the same time.

LED test:

- Press both arrow buttons at the same time.

When the buttons are not touched for 10 seconds, the display will return to normal operation mode.