APPARENT WIND MONITOR

Product reference : 90-60-398



USER MANUAL & INSTALLATION GUIDE

V2.1



Contents

1	Pre	Presentation				
2	Hov	How it works				
	2.1	Galvanic isolation				
2.2		Mast head unit selector				
2.3 Wind noise reduc		Wind noise reduction				
2.4 Led status		Led status				
3 Apparent Wind Monitor configuration						
3.1 M		Mast height configuration				
	3.2	Mast angle configuration				
	3.2.	1 Mast angle calibration with a <i>Multigraphic</i> 6				
	3.2.	2 Mast angle calibration with a <i>Multidisplay</i> 7				
4	Inst	Installation				
4.1 Wiring the <i>Apparent Wind Monitor</i>						
5	NM	NMEA output9				
6	Арр	Apparent Wind Monitor features				
7	7 Apparent Wind Monitor software evolution					
7.1 Upgrade from V1.6 to V2.1						
	7.2	List of software upgrades				



1 Presentation

The *Apparent Wind Monitor* incorporates **4** functions.

The Apparent Wind Monitor electrically isolates the overhead line (cables and sensors), the part of the installation most susceptible to storm surges or even short circuits as a result of premature cable wear.

The Apparent Wind monitor corrects the wind data for the boat's acceleration, which has the effect of improving steering by filtering the data less, and reducing fuel consumption.

The Apparent Wind monitor is a switch with three overhead lines

The Apparent Wind monitor is an interface for the mast angle sensor.

2 How it works

Aerial data is transmitted on the Topline bus via the *Apparent Wind Monitor in the* form of channels:

- Apparent Wind Angle (AWA)

- Apparent Wind Speed "AWS
- Air temperature

2.1 Galvanic isolation

The primary function of *the Apparent Wind Monitor* is to electrically isolate the mast cable and aerial from the rest of the Topline bus.

In the event of a short-circuit in the cable or overhead line, the rest of the installation continues to operate (Topline bus protection).

This is the interface that broadcasts the "apparent wind angle" and "apparent wind speed" channels, as well as failure messages in the event of a breakdown in communication with the airborne systems.

When an aerial is not in use, its three wires are connected to the common ground of the Topline bus (isolation function). This grounding is done automatically by the Apparent Wind Monitor.

Your Topline Bus will therefore be more robust in the event of a windvane failure.

2.2 Mast head unit selector

The interface has three inputs. The main aerial must be connected to input 1.

Entrance 3 is used exclusively for aft-facing airflow.

The selector has 4 positions:

- 1, 2 or 3 is used to select the corresponding aerial. It can also be used to configure the *Apparent Wind Monitor* and calibrate the selected aerial.

- automatic: depending on the status of the sensors, the *Apparent Wind Monitor* selects the sensor to be used, with priority given to the main sensor n°1. In the event of a short-circuit on input 1, the *Apparent Wind Monitor* automatically switches to input 2 if an aerial is present on this input.

Example of installation: Carbowind on inlet no. 1 as main wind vane and AG HR on inlet no. 2 as backup.



2.3 Wind noise reduction

This function is only available with HR type mast head unit (Carbowind and HR mast head unit).

The 'wind denoising' stage is based around a 6-axis IMU (*Inertial Measurement Unit*) integrated into the **Apparent Wind Monitor**, which instantly gives the boat's attitude. This function therefore requires the **Apparent Wind Monitor to be** installed close to the mast foot (see Installation section).

Using this attitude data and the mast height previously entered with *Multigraphic* V2.4 or higher, the raw aerial data is corrected for the boat's movements. In the end, the apparent wind angle and apparent wind speed data are "denoised".

2.4 Led status

The front panel (Lexan) features three overhead LEDs and a mast angle LED.

- Status of the AG11 - AG2 - AG3 Overhead Led:

Green: Sensor selected in automatic or manual mode and correct operation of the corresponding sensor.

Red: corresponding sensor fault. Selected sensor faulty or sensor absent.

Off: not selected.

- Mast angle sensor LED :
- steady green if function activated and sensor connected
 - red flash if function activated and sensor disconnected or out of order
 - off if function deactivated



¹ AG means mast head unit



3 Apparent Wind Monitor configuration.

The Apparent Wind Monitor must be configured using *Multigraphic* V2.4 or higher.



Attention

To configure one of the mast head unit (offset, coefficient, real wind table, mast height, etc.) place the selector on the aerial to be calibrated. The Apparent Wind Monitor integrates the wind tables for a single aerial. These tables will be the same for all three mast head unit. The wind tables are integrated into the *Apparent Wind Monitor*, which publishes them when the installation starts up.

3.1 Mast height configuration

The mast height data is required to activate wind denoising. This is the height between the windvane head and the *Apparent Wind Monitor* box. This height, in metres, must be entered in each aerial setting. You can disable wind denoising on the interface by setting the mast height to 0. The mast height is set in the APPARENT WIND SPEED menu of a *Multigraphic* or *Multidisplay*.

A long press on takes you directly to the carousel, where you select to display the "Sensors" page.





3.2 Mast angle configuration.

By your installer: Activate the mast angle function (if sensor connected):

The Apparent Wind Monitor's mast angle function is not activated when it leaves the factory. Use the Toplink software to activate this function and set the *MAST_SENSOR* bug **to 1**.

3.2.1 Mast angle calibration with a *Multigraphic*

A long press on takes you directly to the carousel, where you select to display the "Sensors" page. Then select the mast angle data created by the *Apparent Wind Monitor*.

- Configuration of the matte angle offset



- Configuration of the matte angle coefficient





Initialisation = total initialisation of the mast angle section of the *Apparent Wind Monitor* to factory default values.



3.2.2 Mast angle calibration with a *Multidisplay*

From a *Multidisplay, the* matt angle is configured in the same way as with a *Multigraphic*.

In the Sensor menu, select the mast angle item, then select the offset for zero adjustment Enter the value and press OK to confirm. You can also modify the coefficient in the same way.

Initialisation = total initialisation of the mast angle section of the *Apparent Wind Monitor* to factory default values.

4 Installation

The *Apparent Wind Monitor* must be installed on a vertical bulkhead with the lexan towards the rear of the boat (standard mounting) or with the lexan towards the front of the boat (reverse mounting). It is mandatory that it is installed perfectly horizontally in order to obtain optimum noise reduction. For reverse mounting, see below

Standard mounting :







4.1 Wiring the Apparent Wind Monitor

The Apparent Wind Monitor is supplied with 3 binder 620 male 4 terminal connectors for soldering to your downpipes.

The wiring diagram for the connectors is :

Binder 620 4pts	Description	Wire colour
Terminal 1	GND	Grey
Terminal 2	N.C.	N.C.
Terminal 3	Data	Black
Terminal 4	VCC	White





From the mark (white line or large coding pin) the male terminals pointing towards you, numbered 1 to 4, turn anticlockwise.

Bus connection:

Connect the bus cable in a "Topline bus" connection box as follows:

White = +12 volts Braid = GND Black = Data Red = NMEA 0183 output Yellow = NC Green = NC

Mast angle wiring

The mast angle sensor has a pre-wired 5-pin 620 binder connector.

Binder 620 5 dots	Designation	Rudder angle and mast sensors 90-60-010 and 90-60-388
1	GND (OV)	
2	V+ (3.3V)	Red
3	V- (OV)	Blue
4	VBus	
5	Wine	White





From the mark (white line or large coded pin) the male terminals pointing towards you, numbered 1 to 5, turn anticlockwise.

If the direction of rotation is reversed on the display, the red (V+) and blue (V-) cables must be reversed.

5 NMEA output

An NMEA \$PNKEV frame is sent on power-up to check the software version and the date and time of compilation.

\$PNKEV,Wind Monitor nke,V2.0,Jan 18 2023,16:09:12*66

A sentence MWV is issued:

\$IIMWV,339,R,9.7,N,A*24

6 Apparent Wind Monitor features

Parameter	Value
Dimensions	120 x 51 x 90 mm (L x W x H)
Power supply	DC (continuous) 8V - 32V
NMEA output	NMEA 0183 38400bauds
Weight	360 grams with cable
Consumption in operation 12Volts	100mA
Topline bus power cable	Ø5.5mm, 4 wires + earth wire, length 3m
Mast Head Unit connectors	3 mast head unit inputs 3 conductors
Mast angle connector	1 x 3-conductor input
Operating temperature	-10°C / 50°C
Storage temperature	-20°C / 60°C
Waterproofing	IP 54 splash-proof



7 Apparent Wind Monitor software evolution

7.1 Upgrade from V1.6 to V2.1

If you wish to update an *Apparent Wind Monitor* V1.6 and below to V2.0 and above, you need to go through the V0.1 transition version.

If you have not upgraded to V0.1, the *Apparent Wind Monitor will appear* as "boot(0,0)" in TopLink2 and will no longer be functional on the bus. You can apply V0.1 and then V2.0 or higher at any time to get the *Apparent Wind Monitor* back up and running.

REV	Date	Information
V1.0	29/06/2018	Original version
V1.1	24/01/2019	Addition of true wind tables
V1.2	14/03/2019	 Addition of NMEA MWV frame transmission with toplink activation
V1.3	01/10/2019	 Correcting the measurement of the mast angle
V1.4	26/11/2019	Improved wind denoising
V1.5	12/03/2020	Suppression of table reset after update
V1.6	09/02/2021	Correction of mast angle calculation
V0.1	21/12/2022	 Transitional version for upgrading from V1.6 and below to V2.0 and above.
V2.0	18/01/2023	Hardware modification
		 Correction of apparent wind angle alarm
V2.1	13/06/2023	Default transmission of NMEA frames

7.2 List of software upgrades

