USER MANUAL

Meteo-LCD[pro]

Multi-Function Indicator

ID 00.14742.707002

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1. Scope of delivery and incoming inspection

The indicator is carefully packaged to protect it from mechanical impacts and prevent damage during transport. The packaging includes the following items:

- 1* Indicator Meteo-LCD[pro]
- 1* Clamping connector for 10-pin main connector
- 1* Mounting bracket
- 1* Wing nut
- 1* User manual

Please verify that the delivery is complete and check for any transport damages. If you find any issues, we kindly ask you to report them immediately in writing.

2. Safety instructions

This system is designed according to the state-of-the-art accepted safety regulations. However, please note the following rules:

⚠ **Malfunction due to interferences!** Before connection, ensure that the supply and data cables are protected against EMC influences.

- Before putting into operation please read all respective manuals!
- Please observe all internal and state-specific guidelines and/or rules for the prevention of accidents. If necessary ask your responsible safety representative.
- Use the system only as described in the manual.
- Always have the manual at hand at the installation site.
- Use the system within the specified operating condition. Eliminate influences, which might impair the safety.
- Prevent the ingress of unwanted liquids into the devices.

3. Warranty

Please note the loss of warranty and non-liability by unauthorized manipulation of the system. You need a written permission of the LAMBRECHT meteo GmbH for changes of system components. These activities must be operated by a qualified technician.

The warranty does not cover:

1. Mechanical damages caused by external impacts (e.g. icefall, rockfall, vandalism).
2. Impacts or damages caused by over-voltages or electromagnetic fields which are beyond the standards and specifications in the technical data.

3. Damages caused by improper handling, e.g. by wrong tools, incorrect installation, incorrect electrical installation (e.g. false polarity) etc.
4. Damages which are caused by using the device beyond the specified operation conditions.

4. Essential features

- Display of up to seven parameters in a single view for ideal overview
- Graphical display of apparent or true wind
- Extensive customization options for individual application conditions
- Simplified device configuration directly via control elements on the indicator
- Trend indicator for humidity according to WMO standards
- Brilliant 5.7-inch color display with wide reading angle
- Adjustable display and button brightness for different lighting conditions

5. Function

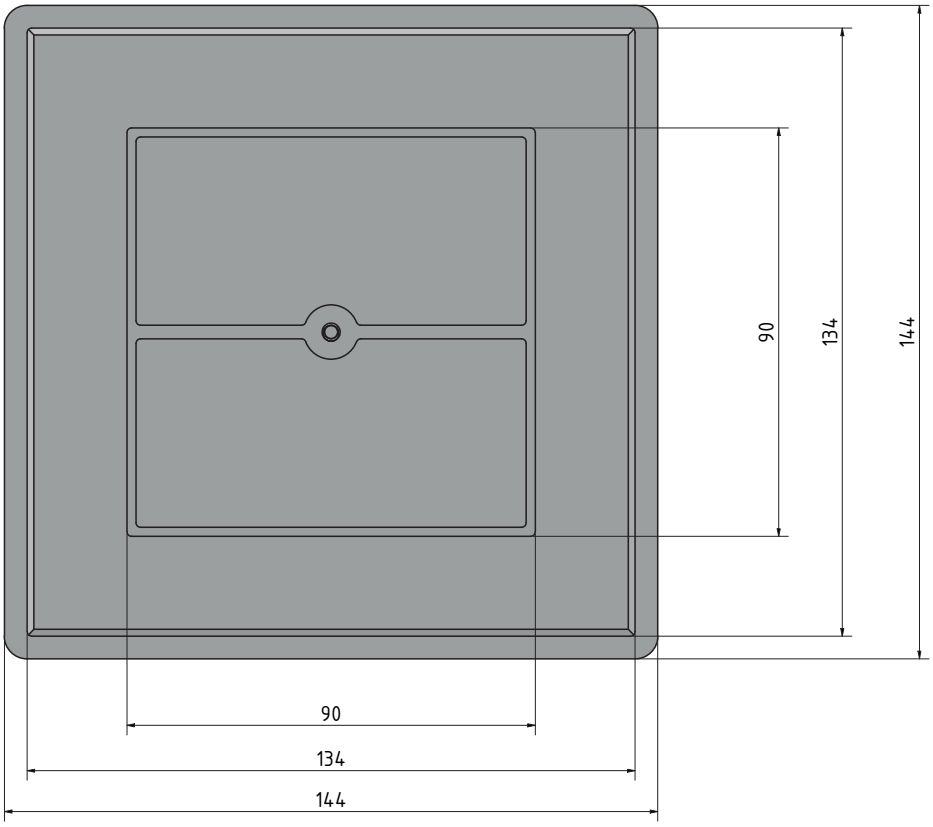
The Meteo-LCD[pro] is a compact and versatile multifunction display for meteorological and maritime applications, capable of displaying up to seven parameters. The device features an RS485 interface and can receive data in the widely used NMEA 0183 standard. The supported data sentences include $WIMWD, $WIMWV, $WIMTA, $WIMMB, $WIMHU, and $WIXDR.

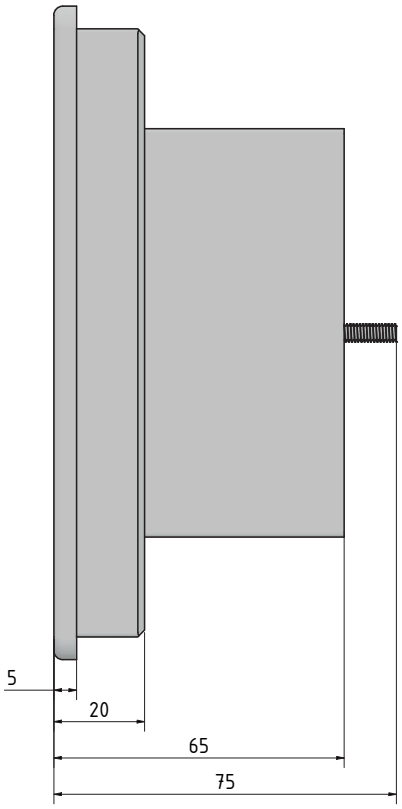
6. Mounting

The housing of the indicator conforms to the standardized size of 144 x 144 mm and can be installed into all designated control panels. The required cutout in the panel measures 138 x 138 mm. When installing, care should be taken to ensure that the surface of the panel is flat and smooth. Additionally, deformation during installation should be avoided to maintain the seal between the panel and the display.

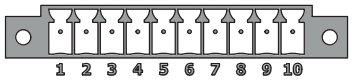
For mounting, a metal bracket included with the delivery is used, which is attached to the back of the display with a wing nut.

7. Dimensional drawings





8. Pin assignment

	Pin	Signal	Description
	1	Not connected	
	2	Not connected	
	3	Not connected	
	4	Not connected	
	5	Not connected	
	6	Not connected	
	7	RS485_A	Serial 485 A
	8	RS485_B	Serial 485 B
	9	GND	Ground
	10	U 10 ... 32 VDC	Power supply

9. Commissioning

Once the mechanical and electrical installation is complete, the Meteo-LCD[pro] can be powered on by connecting it to a 10...32 VDC power supply. During operation, the data will be displayed automatically.

10. Display layout

The individual elements of the display are shown and described below.

No.	Element	No.	Element
1	Numerical wind direction	9	Graphic humidity
2	Graphical wind direction	10	Air pressure trend display
3	Numerical wind speed	11	Numerical air pressure
4	Extreme values of wind speed	12	Graphic air pressure
5	Graphical wind speed	13	Numerical global radiation
6	Numerical air temperature	14	Numerical dew point
7	Graphic air temperature	15	Display format & averaging period
8	Numerical humidity	16	n.a.

11. Configuration

11.1. Basic configuration

In its basic configuration, the indicator displays the true wind direction and all six additional parameters. The $WIMWV protocol is set up and the data is neither averaged nor pre-processed. The language is set to English during initial commissioning.

11.2. Operation

The device has five individual control elements located below the screen, whose functions vary depending on the current environment and are described in the lower section of the display. When in the default state, i.e., with one of the various display options (relative, true, met), each button is assigned the same function: to access the menu bar.

11.3. Menu bar

When the menu bar is opened by pressing one of the buttons, it allows for quick switching between different display modes, access to the options menu, or minimizing the menu bar. The corresponding buttons are labeled as follows:

- Options
- True Wind
- Relative Wind
- MET Display
- Exit

11.4. Options

In the options, the device can be adjusted with minimal effort or information from the display can be retrieved. It is important to pay attention to the specific functions of the buttons:

- Select Up (Hold)
- Select Down (Hold)
- Choose / Confirm
- Not Assigned
- Back / Exit

11.4.1. Display

All optional display elements can be shown or hidden. Wind direction and wind speed are the only elements that are always visible and cannot be hidden. Additionally, one of the four following display modes can be selected, which, apart from the auto-roll function, can also be activated directly via the menu bar:

- **Auto-Roll:** This option switches intermittently between the relative or true display and the MET display. Whether it shows relative or true depends on the last selected mode. The interval duration can be set separately.
- **MET:** Tabular display of temperature, humidity, dew point, and air pressure
- **True Wind:** Display of the true wind
- **Rel Wind:** Display of the apparent wind

11.4.2. Brightness

Depending on preferences and operating conditions, the brightness of the display and buttons can be adjusted individually.

11.4.3. Language

The device supports both German and English translations. The unit of air pressure is [mbar] in German and [hPa] in English.

11.4.4. Password

To prevent unauthorized changes to the device settings, a four-digit password can be set. To disable this feature, set the code to “0000”.

11.4.5. Device data

Here, you can access various information such as the serial number, firmware version, project version, processor temperature, and supply voltage, as well as set the date.

11.4.6. Auto roll

Here, you can configure the interval duration for the auto-roll mode. The interval can be set anywhere between 3 and 10 seconds.

11.4.7. Mean value

The formation of a moving mean value for wind direction and wind speed can be set for a period between 0 (off) and 30 minutes. If averaging is activated, the extreme values for the respective period are also displayed.

11.4.8. Trend display

A graphical trend display for humidity can be activated for a period between 0 (off) and 3 hours, and it is shown in all display modes. The values are determined according to the aPPPP calculation. The following states are distinguished:

Symbol	Code	Description
	1	Increasing, then steady; or increasing, then increasing more slowly; atmospheric pressure now higher than three hours ago
	2	Increasing (steadily or unsteadily); atmospheric pressure now higher than three hours ago
	3	Decreasing or steady, then increasing; or increasing then increasing more rapidly; atmospheric pressure now higher than three hours ago
	0	Increasing, then decreasing; atmospheric pressure the same of higher than three hours ago
	4	Steady; atmospheric pressure the same as three hours ago
	5	Decreasing; then increasing; atmospheric pressure the same or lower than three hours ago
	6	Decreasing, then steady; or decreasing, then decreasing more slowly; atmospheric pressure now lower than three hours ago
	7	Decreasing (steadily or unsteadily); atmospheric pressure now lower than three hours ago
	8	Steady or increasing, then decreasing; or decreasing then decreasing more rapidly; atmospheric pressure now lower than three hours ago

11.4.9. Pre-compression

To improve the readability of the displayed information, a pre-compression of 0 (off) to 5 seconds can be set. During this period, data for all parameters are averaged, and the display is updated accordingly.

11.4.10. Units

The following units can be customized:

- Wind speed: [mph], [kn], [m/s]
- Temperature: [°F], [°C]

11.4.11. Wind protocol

Depending on the incoming signal, the device can be configured here for either $WIMWD or $WIMWV.

12. Firmware update

You can check the current version of the device software in the options menu.
On our website (https://www.lambrecht.net), the ***Free Software Tools & Firmware*** category can be found under ***Service*** in the ***Resources*** section. There you can easily download the latest firmware and software tools for your product and benefit from ongoing improvements and new features.

Save the file as **"$update.GDZ"** on a blank USB stick. Turn off the device by disconnecting the power supply, then connect the USB stick to the USB port on the back of the device. The next time you turn on the device, the update will be performed automatically, and the USB stick can be removed after the update is complete.

13. Error messages

During operation, two types of errors can be displayed on the display. If no new data is received for one or more parameters within 4 seconds, "----" will appear for the affected values. If incorrect values are received instead, "9999.9" will be shown. Possible causes for these errors include faulty data records or exceeding the following value ranges:

- Wind speed: 0…999.9
- Wind direction: 0…360
- Air temperature: -999.9…+999.9
- Air pressure: 0…9999.9
- Relative humidity: 0…100
- Dew point: -999.9…+999.9
- Global radiation: 0…9999.9

14. Format of the NMEA 0183 data protocols

COMMUNICATION PARAMETERS

Protocols according to: **NMEA 0183**

Baud rate: **4800 Baud**

DATA PROTOCOL WIMWV – WIND DIRECTION AND WIND SPEED

Example of a comma-separated data sentence:

$WIMWV,357.0,R,5.2,M,A*CS

Field separator: , (comma)

Header: **$WIMWV**

Wind direction **(WD)**: 0.0...360.0

Reference: **R** = relative, **T** = true

Wind speed **(WS)**: 0.1...85.0

Unit: **M** = m/s, **N** = knots, **K** = km/h

Status: **A** = valid, **V** = invalid

End of sentence: <CR><LF>

Error code: **WD** = 999.9

Error code: **WS** = 999.9

DATA PROTOCOL WIMWD – WIND DIRECTION AND WIND SPEED

Example of a comma-separated data sentence:

$WIMWD,045.0,T,023.0,M,4.5,N,2.3,M*CS

Field separator: , (comma)

Header: **$WIMWD**

T: True wind direction **(WD_T)**: 0.0...359.9

M: Magnetic wind direction **(WD_M)**: 0.0...359.9

N: Wind speed in knots **(WS_N)**: 0.1...85.0

M: Wind speed in meters per second **(WS_M)**: 0.1...85.0

End of sentence: <CR><LF>

Error code: **WD_T** = 999.9

Error code: **WD_M** = 999.9

Error code: **WS_N** = 999.9

Error code: **WS_M** = 999.9

DATA PROTOCOL WIMTA – AIR TEMPERATURE

Example of a comma-separated data sentence:

$WIMTA,-25.0,C*CS

Field separator: , (comma)

Header: **$WIMTA**
Temperature **(TA)**: -40.0...+70.0
Unit: **C** = °C
End of sentence: <CR><LF>
Error code: **TA** = 999.9

DATA PROTOCOL WIMHU – RELATIVE HUMIDITY AND DEW POINT

Example of a comma-separated data sentence:
$WIMHU,100.0,,-30.0,C*CS
Field separator: , (comma)
Header: **$WIMHU**
Relative humidity **(RH)**: 0.0...100.0
Dew point **(DP)**: -40.0...+70.0
Unit: **C** = °C
End of sentence: <CR><LF>
Error code: **RH** = 999.9
Error code: **DP** = 999.9

DATA PROTOCOL WIMMB – AIR PRESSURE

Example of a comma-separated data sentence:
$WIMMB,,,1050.0,B*CS
Field separator: , (comma)
Header: **$WIMMB**
Air pressure **(BP)**: 600.0...1100.0
Unit: **B** = mBar
End of sentence: <CR><LF>
Error code: **BP** = 9999.9

DATA PROTOCOL WIXDR – SOLAR RADIATION

Example of a comma-separated data sentence:
$WIXDR,SR,500.0,W,01*CS
Field separator: , (comma)
Header: **$WIXDR**
Solar radiation **(SR)**: 0.0...1600.0 W/m²
Unit: **W** = W/m²
End of sentence: <CR><LF>
Error code: **SR** = 9999.9

15. Storage

For long-term storage, the indicator should be kept in a dry, dust-free environment with a temperature range between -30°C and +80°C.

16. Maintenance

The Meteo-LCD[pro] has been designed for long-term, maintenance-free use, so regular servicing is generally not required. However, occasional visual inspection of the device is recommended. To clean the display, a lightly dampened microfiber cloth should be used without any additional cleaning agents to prevent damage to the display.

17. Disposal

LAMBRECHT meteo GmbH is listed and registered at the Stiftung Elektro-Altgeräte Register ear under:

WEEE-Reg.-Nr. DE 45445814

In the category of monitoring and control instruments, device type: “Monitoring and control instruments for exclusively commercial use”.

Within the EU

The device has to be disposed according to the European Directives 2002/96/EC and 2003/108/EC (Waste Electrical and Electronic Equipment). Do not dispose the old device in the household waste! For an environmentally friendly recycling and disposal of your old device, contact a certified disposal company for electronic waste.

Outside the EU

Please follow the regulations in your country regarding the appropriate disposal of waste electronic equipment.

18. Technical data

Meteo-LCD[pro] Multi-Function Indicator	
ID	00.14742.707002
Mechanical Data	
Body material	Plastic, black
Dimensions (W x H x D)	144 x 144 x 70 mm
Installation dimensions (W x H)	136 ±0.5 x 136 ±0.5 mm
Weight	Approx. 575 g
Mounting	Panel mounting via clamping bracket
Protection rating	Front side: IP65 Rear side: IP54
Operating temperature	-20...+70 °C
Storage temperature	-30...+80 °C
Electrical Data	
Operating voltage	10 ... 32 VDC
Power consumption	2,4 W
Fuse	Self-resetting
Processor	ARM9 ®; 32-Bit; 400 MHz
Memory	32 MB Flash; 64 MB RAM; 8 kB FRAM
Interface	1 x RS485 1 x USB 2.0 Device Ethernet 10/100 MBit/s
Display	
Display	TFT color
Format	4:3 (VGA); approx. 115 x 86 mm; 5,7" diagonal
Resolution	640 x 480 pixel
Background illumination	400 cd/m² (typically)
Contrast ration	450 : 1 (typically)
Viewing angle	65°, 55°, 75°, 75° (Θ_{Y+}, Θ_{Y-}, Θ_{X+}, Θ_{X-})
Optical Bonding	None
Cover lens	Mineral glass with anti glare surface

Test Standards and Regulations	
CE marking	EMC acc. EU directive 2014/30/EU RoHS acc. to EU directive 2011/65/EU
EMC	EN 61000-6-2:2005 (EMC-Noise immunity standard) EN 61000-6-3:2007 (EMC-Emission standard) EN 61000-4-2:2009 Immunity against ESD, Level 4: 15 kV EN 61000-4-4:2012: Immunity against Burst, Level 4: 4 kV EN 61000-4-5:2014: Immunity against Surge, Level 3: 1 kV
Load Dump	ISO 16750; Pulse 5b Level 3
Vibration	EN 60068-2-6:2008 Sinus 4...150 Hz; 5g; 10 cycles/axis
Shock	EN 60068-2-27:2009 100 G / 11 ms; 5 shocks
Cold	EN 60068-2-1:2007 Test temperature -20 °C / 2 h
Dry heat	EN 60068-2-2:2007 Test temperature 70 °C / 2 h
Temperature change	EN 60068-2-30:2009 Upper temperature 70 °C; lower temperature -20 °C, no. of cycles: 6
Damp heat	EN 60068-2-30:2005 Upper temperature 55 °C, number of cycles: 6
Salt spray	EN 60068-2-52:2000-02 Severity level 3 (motor vehicle)
Certifications	
E1 marking	UN/ECE-R10

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