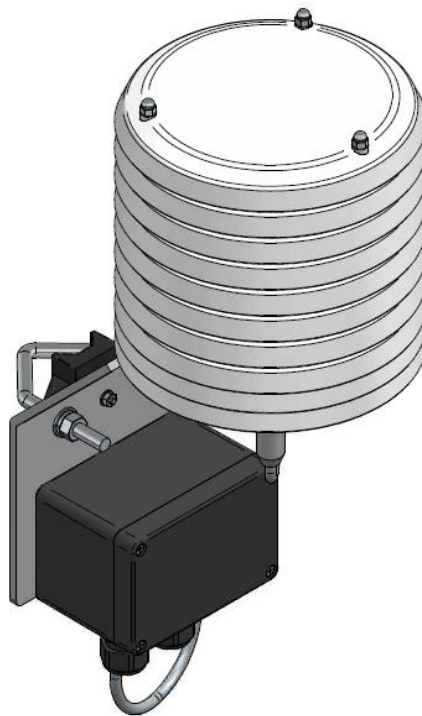




OBSERVATOR

instruments

OIC-406



Temperature & Humidity Sensor

Manual

Version 1.2 – April 2024

Author: Observer Instruments

Revisions:

0.1	(May 2016)	First issue
0.2	(August 2016)	Preliminary edition
1.01	(March 2017)	First Release
1.1	(October 2020)	Update sensor probe
1.2	(April 2024)	Update EU declaration of Conformity

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1 Introduction

Observator OIC-406 is an accurate and reliable temperature and humidity probe complete with mounting bracket, basic node and vented anti-radiation shield.

The sensor probe can be easily exchanged for calibration purposes'.

Due to the integration of the basic node other sensors – like a wind sensor - can be interfaced and the signals will be combined in 1 NMEA stream.

This manual is intended for the System integrator, Installer and Commissioner of the Observator OIC-406 temperature and humidity sensor.

When interfacing other sensors we recommend the Observator Meteolink manual for more detailed information.

The Operator can use this as a reference manual.

2 Safety



For correct functioning of Observator OIC-406 it must be installed according installation instructions.



Any unused gland should be filled with the include plug when not in use.



The OIC-406 probe is a sensitive instrument, store dry. Direct contact with salt water can make the probe unusable for humidity measurement!



Remember: instruments are tools.
They do NOT replace your own observations!



After end of life dispose this product according local regulations or return to manufacturer.

3 Description

3.1 General description

Observator Meteolink OIC-406 uses an accurate combined temperature and humidity probe..

The vented anti-radiation shield has been designed to create a natural airflow which contributes to the accuracy of the sensor. The probe signal is converted into a standard NMEA signal by the basic node, which also functions as a junction connection box. The basic node has 2 spare glands and can interface other sensors (see the Meteolink manual for more details) and link through other Meteolink sensors. All sensor data will be multiplexed in one NMEA stream.

4 Installation

4.1 General

For a correct and accurate measurement of air temperature and humidity it is very important to take great care in the selection of the mounting location of the OIC-406.

- Avoid vent pipes (and especially exhausts!).
- Avoid heat sources
- Different heights will give different temperatures.
- Avoid locations vulnerable to saltwater spray, it can make the humidity probe unusable.

- The bracket is meant for pipe mounting (pipe dia max 50mm).

- Use shielded cable (see Chapter 6 for maximum lengths).
- Use twisted pair cable for all RS422/485 connections (See Chapter 6).
- The nodes require a 12 ..24 Vdc power supply. Power can be linked through all nodes, however check the power rating of connected sensors, especially when they have heating!

**Note: Use the specific power out connections (pin 9&10 or pin 13&14) for linking nodes!
Maximum allowed total current is 10A when using these connections**

Avoid ground loops: Shield must be connected on the output side of each cable only!

4.2 Terminals

Terminals used are of the push in cage type. The terminals are opened with a **gently** push using a small screwdriver in the opening above the terminal.

Do not use any force!

5 Commissioning

Check if all installation requirements have been met.
Check all connections especially the power lines.
Power the sensor.

If you are monitoring the data via a terminal, you should see XDR messages once a second after the start up. Also a VER message will be transmitted at start up and once every 30 minutes.

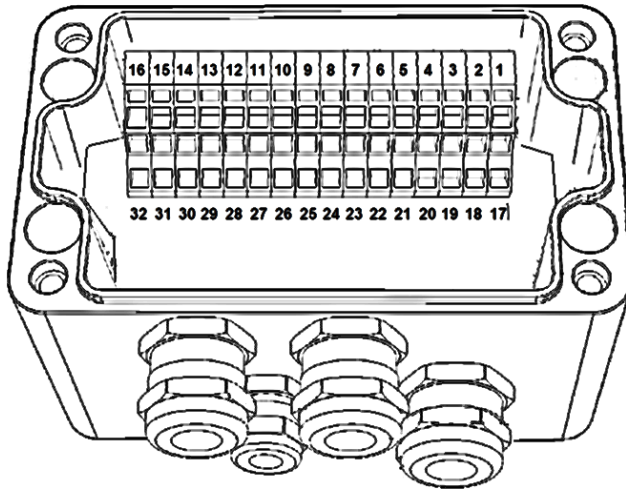
Check the data is sensible. No adjustments are possible or required.

Note in case a heated probe (optional or early versions) is used:

The sensor will start heating first (for humidity measurement) and will not produce data until the first cycle is finished.

It can take up to 6 minutes before the OIC-406 produces data at start up or after a power cycle.

6 Basic Node connections



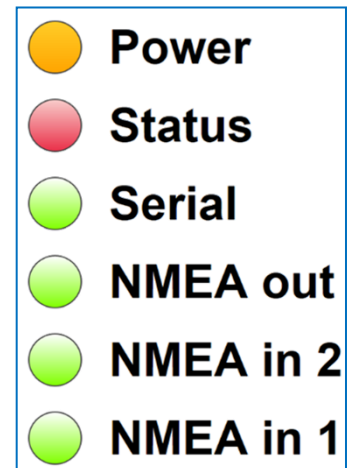
Basic node

Top	Bottom
1 GND (Supply) 2 VIN [12-24VDC] 3 NMEA_OUT_A 4 NMEA_OUT_B 5 SHIELD	17 GND (Sensor) 18 SUPPLY 19 RS232_TX 20 RS232_RX
6 NMEA_RETURN_A 7 NMEA_RETURN_B 8 SHIELD	21 RS485_422_IN_A 22 RS485_422_IN_B
9 GND (Supply) 10 SUPPLY 11 NMEA1_IN_A 12 NMEA1_IN_B	23 GND (Sensor) 24 SUPPLY 25 0-5VDC_IN_1
13 GND (Supply) 14 SUPPLY 15 NMEA2_IN_A 16 NMEA2_IN_B	26 GND (Sensor) 27 SUPPLY 28 0-24mA_IN_1
	29 GND (Sensor) 30 CMOS_SUPPLY (3.3V) 31 CMOS_TX 32 CMOS_RX

6.1 Device status LED's

There are six LED's on the bottom right corner of the printed circuit board, they indicate the status of the device. After power-up the orange LED indicates that the microcontroller is powered. The second LED is red and indicates a bus overflow, when this LED blinks there is too much data input to send all incoming messages as output. In this case the device has to ignore some input messages and information might not be sent as output and information might get lost.

The other four green LED's indicate the status of the *Serial*, *NMEA out*, *NMEA in 2*, *NMEA in 1* inputs. When valid messages are received these LED's blink. All NMEA messages have to be compliant in order to let the LED blink. For the serial LED a blink means that a valid RS-485, RS-232 or other sensor message is received. For each serial sensor a software driver is included in the device. In order to connect jet unknown sensors an additional driver and new firmware is needed.



If you experience difficulties connecting with the device; Check if the LED's are blinking, Check the wiring of the Tx/Rx or A/B wires; Check the data settings of your COM port.

7 Specifications

7.1 Specifications OIC-406 probe

Temperature:

- Temperature range: -50°C..+100°C
- Accuracy: $\pm 0.1^\circ\text{C}$ (10-30 °C)

Humidity:

- Humidity: 0..100%RH
- Accuracy: $\pm 0.8\%$ RH (10-30 °C)
- Long term drift: <1%RH/annum

7.2 Specifications Meteolink general

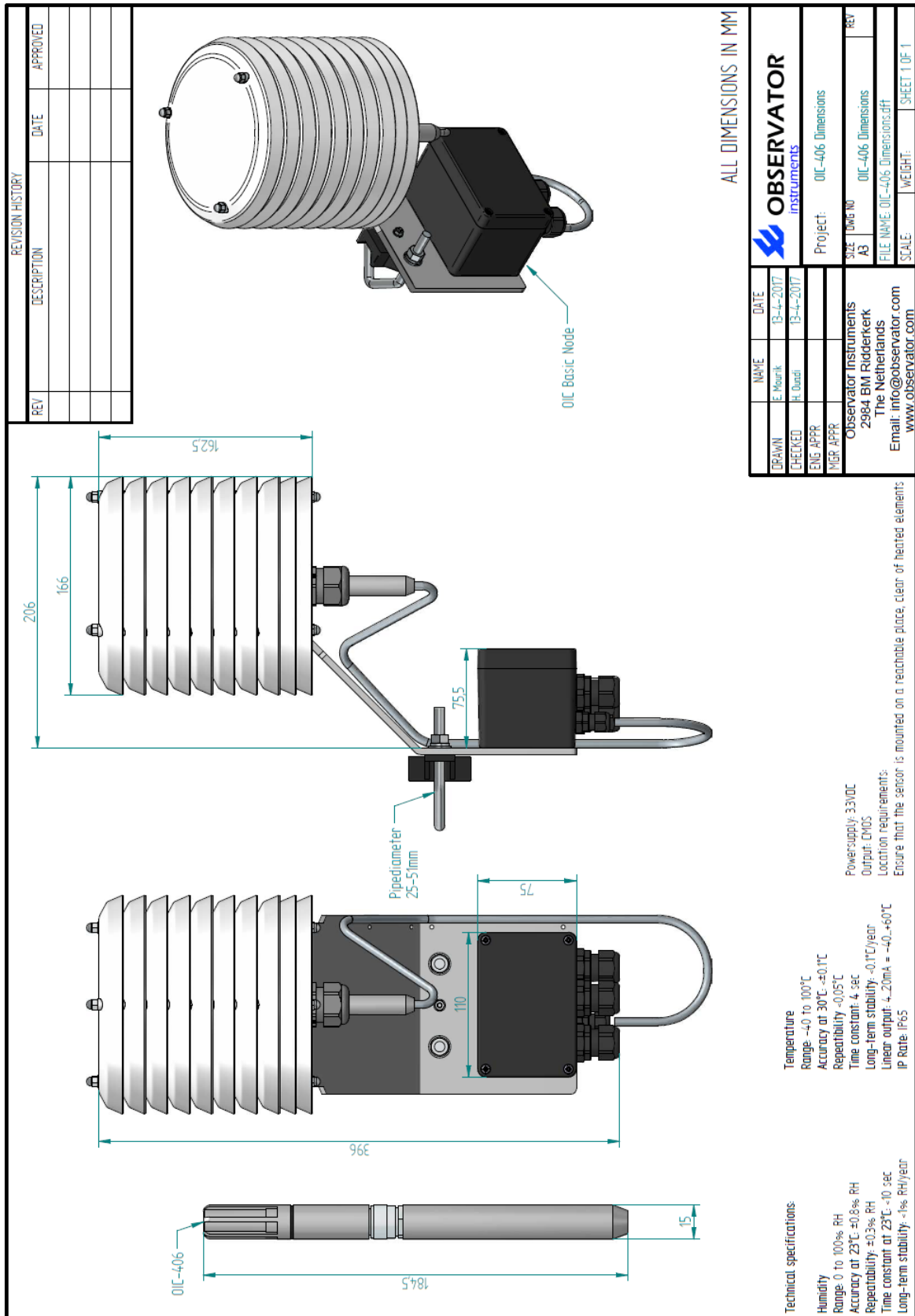
	Basic node	SMART node	Remarks
Voltage	12..24 Vdc	12..24Vdc	
Power consumption	<1W	< 1.5W	Without sensors
Max current pass through via SUPPLY & GND(SUP) (terminal 1,2 & 9,10 & 13,14)	10A	10A	For linking through nodes
Max total current via SUPPLY & GND(sensor)	500mA	500mA	Total of all sensor connections per node.
Max current CMOS_SUPPLY	50mA	50mA	
IP rating	IP 65	IP 20	SMART node must be installed indoors.
Terminals wire size	0.5 .. 2.5 mm ²	0.5 .. 2.5 mm ²	push in cage type
NMEA in	2	2	
NMEA out / return*	2	2	2 nd is either return or output.
Serial in (RS232/422/485)	1	2	2 nd is 485 connection on the same port!
Analogue in 0-5 VDC	1	2	
Analogue in 0 – 24 mA	1	1	
Rain (pulse) input	-	1	
UTP	-	1	Configuration only
QNH, QFE & Dewpoint calc	-	yes	
Custom string converter	-	yes	

7.3 Maximum allowed cable lengths

I/O connection	Max cable length (m)	Cable type
DC power	200	Shielded
NMEA input	200	Shielded twisted pair
NMEA output	200	Shielded twisted pair
RS232	15	Shielded
RS422 / 485	200	Shielded twisted pair
0-5V input	2	Shielded twisted pair
0-24mA	200	Shielded twisted pair
Rain (puls)	200	Shielded twisted pair
UPT	100	Shielded twisted pair
CMOS	2	Shielded twisted pair

Above cable lengths may not be exceeded to comply with EMC regulation.
Shield must be connected to transmitting or load side only!

8 Dimensional drawings



9 XDR messages

All data will be put or converted into a XDR format message, with the exception of wind data (which will be a MWV message).

To comply and make use of calculated data (Dewpoint, QNH & QFE) the correct identifiers and units must be used.

\$WIXDR, a,x,x,a,c—c,..... , a,x,x,a,c—c *hh
 1 2 3 4

1. Transducer type
2. Data
3. Unit
4. Text (optional)

Parameter	Type	Unit	Text	remarks
Water Temperature	C	C	Water	Unit is Celsius
Air Temperature	C	C		Unit is Celsius
Humidity	H	P		Unit is Percentage
Barometric Pressure	P	B		Unit is Bar

MeteoLink uses the following formats for output:

Parameter	Type	Unit	Text	remarks
Voltage	U	V		Output Analogue Voltage input
Current	I	A		Output Analogue 4-20mA input
QNH	P	B	QNH	Calculated baro Sea Level
QFE	P	B	QFE	Calculated baro Runway Level
Dewpoint	C	C	DP	Calculated Dewpoint

XDR messages can be send individual or can contain multiple parameter data.

Example:

\$WIXDR,H,52.93,P,,C,16.22,C,*42 (humidity & temperature)

Is identical to:

\$WIXDR,H,52.93,P,*6B (humidity)
 \$WIXDR,C,16.22,C,*79 (temperature)

Both ways of ending data are correct.

10 EU Declaration of Conformity



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EU DECLARATION OF CONFORMITY

- (1) Apparatus model: **OIC-406**
- (2) Manufacturer:
Observator Instruments B.V.
Rietdekkerstraat 6
2984 BM Ridderkerk
The Netherlands
- (3) This declaration of conformity is issued under the sole responsibility of the manufacturer.
- (4) Object of the declaration:

OIC-406 Meteolink Temperature and Humidity node
- (5) The object of the declaration described above is in conformity with the relevant Union harmonisation legislation:
 - Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility
 - Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment
- (6) References to the relevant harmonised standards used:

EN IEC 60945:2002 including EN IEC 60945/C1:2008
EN IEC 61326-1:2013
EN IEC 63000:2018
- (7)
- (8) Ridderkerk, 23 November 2023,
Observator Instruments B.V.



dr. R. de Vries
CEO

