



# Product Manual

## Differential Air Pressure Sensor DAPS-10

PROPRIETARY &  
CONFIDENTIAL

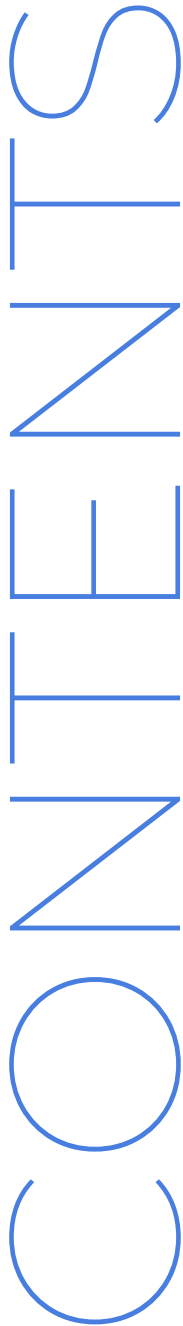
# ABOUT THIS DOCUMENT

This manual contains instructions for installing and operating the Differential Air Pressure Sensor DAPS-10.

The manual is intended for personnel familiar with the rules for performing installation work in the field of electronic and electrical equipment.

**wanwave** LTD. reserves the right to make changes to this document related to improving equipment and software, as well as to eliminate document deficiencies.

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# 1. BASIC INFORMATION ABOUT THE DEVICE AND ITS PURPOSE

## 1.1 General information

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**Full name of the device:**

**wanwave** Differential Air Pressure Sensor DAPS-10

**Abbreviated name of the device:**

DAPS-10

## 1.2 Purpose and operating principles of the device

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The DAPS-10 sensor is designed to continuously measure the difference in air pressure at the sensor connectors and transmit the measured values via the **wanwave** LPWAN radio channel.

Some scenarios for the use of the sensor include measuring:

- Differential pressure in poultry houses, cowsheds, and other facilities;
- Operational parameters of air purification systems and the creation of positive pressure in cleanrooms across various industries;
- Performance parameters of ventilation systems and their components, including monitoring air filter contamination levels and evaluating overall ventilation system efficiency;
- Air supply pressure, vacuum pressure, and exhaust gas pressure within boiler units, including monitoring pressure in chimneys.

## 1.3 Compliance with requirements and standards

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The sensor operates in any of the following unlicensed frequency ranges (the specific range will be set for you, in accordance with your territory's regulations, as part of the manufacturing process): 863.0-870.0 MHz, 920.0-925.0 MHz.

## 1.4 Delivery set

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An DAPS-10 installation kit is supplied with the following items:

- DAPS-10 with power supply
- Product passport



## 1.5 Additional equipment

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For operation of the sensor, the following is additionally required:

- Air tubes are not included in the delivery set and should be selected depending on the operating conditions and the controlled process.
- For connection to the sensor, it is recommended to use a food-grade PVC hose with a reinforced inner diameter of 4 mm, withstanding a pressure of 2 bar or more and having an operating temperature range from -30°C to +50°C.
- The length of the hoses should not exceed 20 meters.

# 2. OPERATING THE SENSOR

## 2.1 Operating Principles

### 2.1.1 Switching the sensor on and off

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To switch the sensor on or off, do the following:

- Press and hold the button on the front panel for more than 5 seconds. The LED will indicate the change in status: green LED means the device is on, red LED means the device is off.
- To check the operating status, briefly press the button. If the green LED lights up, the device is on.

If the LED blinks, the sensor has detected an error.

**NOTE:** When switched on or off, the sensor sends a message via the [wanwave](#) channel, including information about the presence of errors.

### 2.1.2 Measurement range

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The range of measured values varies depending on the sensor version:

- DAPS-10 Version 1: -125 to 125 Pa with a resolution of 0.1 Pa;
- DAPS-10 Version 2: -500 to 500 Pa with a resolution of 0.1 Pa.

The sensor measures the pressure difference at the sensor connectors once every 60 seconds. Every 10 measurements are filtered to exclude sharp pressure surges and transmitted via the [wanwave](#) radio channel.

## 2.1.3 Sensor connectors

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The sensor has two connectors for connecting air tubes (routes):

- Left for connecting a high-pressure tube;
- Right for a low-pressure tube.

## 2.1.4 Unique Identifier

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Each sensor has a unique, unalterable hardware identifier (network address), programmed at the manufacturing stage.

- This identifier remains constant throughout the product's lifecycle.

## 2.1.5 Wireless Communication Security

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The combination of data transmission technologies and message integrity checks ensures:

- Protection against denial of service attacks.
- Prevention of false messages.
- Continuous monitoring of product functionality.

## 2.1.6 Firmware Integrity

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The sensor operates without an external operating system. Key security features include:

- Integrity checks are performed during firmware loading.
- Debugging modes, memory rewrite capabilities, and input/output ports are disabled.
- Protection against unauthorized modifications to firmware and memory data.

The sensor's robust design and secure communication protocols ensure reliable and secure operation in monitoring underground utility access points.

## 2.2 Server communication

### 2.2.1 Transmitted data

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The data transmitted by the sensor contains:

- The pressure difference between the two sensor connectors in Pascals.
- The air temperature at the pressure sensor. The range of values is from -40°C to 80°C with a step of 1°C. Temperature data is optional and should not be used for pressure monitoring.

### 2.2.2 Control messages

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Once every 24 hours, the sensor transmits a service message about the current status of the sensor, the presence of errors, and the battery voltage.

## 2.3 Routine Maintenance

### 2.3.1 Maintenance Frequency

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The frequency of maintenance for the sensor is dependent on its operating conditions, including:

- Environmental factors such as dust or potential flooding.
- Contamination levels at the installation site.

### 2.3.2 Maintenance Procedures

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Routine maintenance tasks include:

- **Inspecting Fasteners:** Ensuring all fastenings are secure and undamaged.
- **Checking the integrity of the air tubes** and the absence of pinching or twisting;
- **Cleaning the air tubes:** Cleaning the air tubes includes cleaning the inside of the tubes by blowing or flushing, as well as areas near the ends of the tubes. When cleaning, disconnect the tubes from the sensor connectors. Flushing is not recommended using aggressive chemical compounds. Cleaning is recommended at least once a year.
- **Cleaning the Sensor:** Removing foreign objects or debris from the area around the sensor to ensure optimal performance.
- **Checking the integrity of the sensor housing**

Proper and regular maintenance is essential for reliable sensor operation, especially in challenging environments.

# 3. INSTALLATION

## 3.1 Choosing a Placement Location

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- Avoid using metal fasteners for mounting the sensor, as they may shield the antenna and significantly reduce the sensor's data transmission range.
- Refrain from installing the sensor on metal structures. If no alternative installation options are available, ensure the sensor is mounted at least 5 cm away from any metal components.

## 3.2 Installation Procedure

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The installation of the sensor should be carried out in the following steps:

**1. Determine the Installation Location:**

- Choose a suitable location for the sensor's placement following the recommendations in Section 3.1 "Choosing a Placement Location".

**2. Check the Radio Signal:**

- Ensure the selected location provides adequate radio signal strength for communication.

**3. Check the air tubes**

- Check for the presence of mechanical damage, twists, pinches, and other features that impede the free flow of air in them;
- The air tubes must be connected to the appropriate connectors on the sensor.

**4. Turn On the Sensor:**

- Follow the activation process outlined in section 2.1.1 to switch on the sensor.

**5. Install the Sensor:**

- Attach the sensor to the selected location.

**6. Check Functionality:**

- Verify the sensor's operation by confirming that the sensor messages are received in the [wanwave](#) portal.

# 4 TECHNICAL SUPPORT

## 4.1 Requesting support

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For technical assistance, contact the **wanwave** support team at [support@wanwave.com](mailto:support@wanwave.com). Note that support will be provided based on the SLA terms provided at the time of purchase of the equipment.

To ensure a faster and more effective response, please include the following details in your inquiry:

- **Organization Name:** Provide the name of your organization and the contact information for the person requesting support.
- **Issue Description:** Clearly describe the nature of the issue and the time it occurred.
- **Device Information:** Include the device number.
- **Visual Documentation:** Attach relevant screenshots or photographs that illustrate the problem, if applicable.

Providing this information will help expedite the resolution process.

# 5 TECHNICAL SPECIFICATIONS

## 5.1 Manufacturer Information

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**Manufacturer**

wanwave LTD.

**Physical address**

12 Woodlands Park, Bridgend, CF33 6DY, UK

**Mailing address**

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**Contact information**

[info@wanwave.com](mailto:info@wanwave.com)

**Technical support**

[support@wanwave.com](mailto:support@wanwave.com)

## 5.2 Main parameters and characteristics

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The DAPS-10 differential air pressure sensor has the following parameters and characteristics:

| #  | PARAMETER                                                                     | UNIT   | VALUE                          |
|----|-------------------------------------------------------------------------------|--------|--------------------------------|
| 1  | Operating temperature range                                                   | °C     | From -40 to +80                |
| 2  | Protection against external influences<br>(in accordance with IEC 60529:2013) | Class  | IP67                           |
| 3  | Range of measured differential pressure, v. 1                                 | Pa     | From -125 to 125               |
| 4  | Range of measured differential pressure, v. 2                                 | Pa     | From -500 to 500               |
| 5  | Resolution                                                                    | Pa     | 0.1                            |
| 6  | Inner diameter of the connected air tube                                      | mm     | 4                              |
| 7  | Battery life of the sensor (not less than)                                    | months | 60                             |
| 8  | Power supply                                                                  | Type   | Autonomous                     |
| 9  | Nominal supply voltage                                                        | V      | 3.6                            |
| 10 | Battery Type                                                                  | Type   | ER 34615                       |
| 11 | Weight                                                                        | gram   | 255                            |
| 12 | Dimensions                                                                    | mm     | 89x80x47                       |
| 13 | Frequency range                                                               | MHz    | 863.0 - 870.0<br>920.0 - 925.0 |

| #  | PARAMETER                                                                                   | UNIT | VALUE |
|----|---------------------------------------------------------------------------------------------|------|-------|
| 14 | Transmitter output power                                                                    | mW   | 25    |
| 15 | Length of unique identifier                                                                 | bit  | 32    |
| 16 | Probability of non-delivery in the radio coverage area of a message about a manhole opening | -    | 10    |

THANK YOU

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## CONTACT

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