

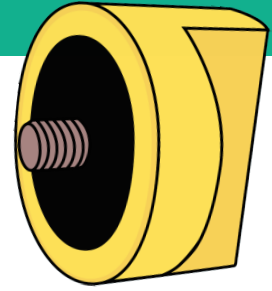
# Countroll® wireless condition monitoring sensor MANUAL

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# Countroll® wireless condition monitoring sensor

## MANUAL



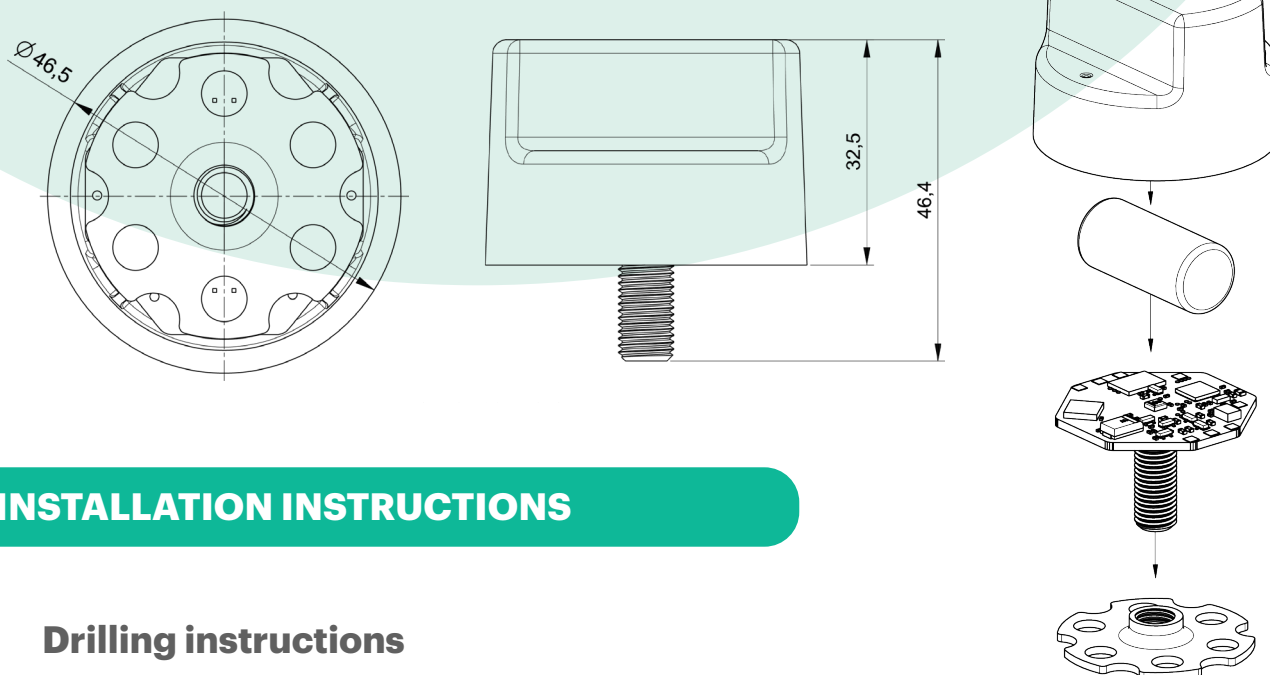
### INTRODUCTION

The countroll® rotating sensor is designed for the precise measurement and monitoring of rotational speed in rotating machinery. Additionally, it records vibration metrics to assess machine conditions, helping to prevent unscheduled shutdowns. This sensor is equipped with advanced technology to provide accurate data for predictive maintenance, allowing for early detection of potential issues. By continuously monitoring rotational speed and vibration levels, the countroll® rotating sensor helps improve overall equipment efficiency and reduce maintenance costs.

### TECHNICAL SPECIFICATIONS

<b>Vibrations</b>	Bandwidth	Up to 3200 Hz
	Amplitude range	±200 g
	Resolution	12-bit output at 100 mg/LSB
	Measurement cycle	Up to every 2 minutes
<b>Rotations</b>	Speed range	> 20 rpm
	Precision	To be defined
<b>Weight</b>		72 g
<b>Mounting Style</b>		Single Bolt Mounting (M8) (Adapters available)
<b>Wireless communication</b>	Bluetooth	Range up to 50 m with line of sight; 20 m in a realistic production environment
<b>Power supply</b>		Non-replaceable battery
<b>Typical battery life</b>		Up to 2 years (depending on configuration)
<b>Operating temperature</b>		-20°C to +85°C
<b>Storage temperature</b>		-40°C to +85°C
<b>Certification</b>		CE
<b>Ingress protection</b>		IP67
<b>Materials</b>		Mounting base: steel AISI 316, housing: Polycarbonate, Luminous Yellow - Ral 1026

## DIMENSIONS



## INSTALLATION INSTRUCTIONS

### Drilling instructions

#### Where?

The most suitable position is on the front end of the roller body, preferably on the operator side (OS) for better accessibility.

Install the sensor on the axis or as close to the roller axis as possible.

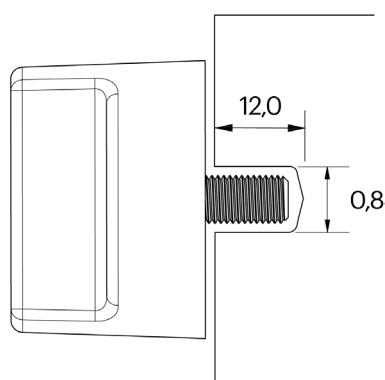
Make sure the installation surface is flat and smooth, it must also be free of burrs and foreign matter. Please remove oil and dirt on the roll surface.

#### How?

The sensor needs to be fixed, so its bolt needs to be screwed into a tapped hole in the roller body. The attached bolt has a nominal diameter of 8 mm and 1.25 mm as thread pitch.

The depth of the hole must be at least 12 mm.

Tapping requires precision and care. To achieve smooth and precise threads, the tap must be properly aligned with the pre-drilled hole, rotate with consistent force, and be lubricated appropriately. Understanding the material properties of the workpiece is also critical for determining the best tapping speed, force, and lubricant

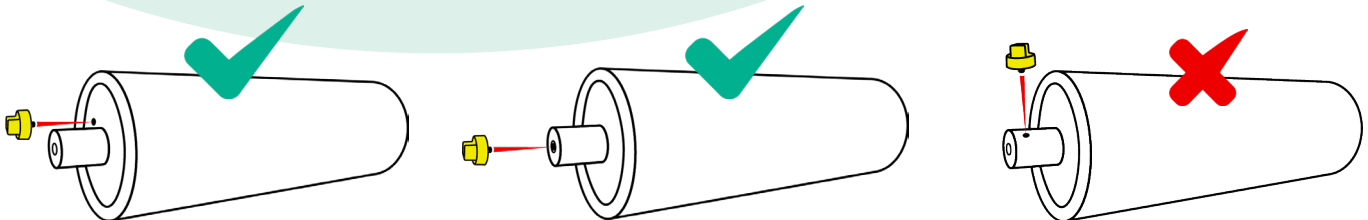


#### Suggested steps to tap the hole:

1. (Optionally) Drill a smaller pilot hole
2. Drill the center hole with a 6.8mm drill bit
3. Tap the drilled hole with an M8 tap

## Sensor orientation

The nature of the sensor hardware requires the installation to be performed in such a way that the bolt is parallel to the axis of the roller.



## Installation procedure

1. Ensure the machine is powered down and the roller is stationary before beginning the installation.
2. Locate a suitable spot on the roll front body and punch mark.
3. Drill according to instruction steps described in the previous section.
4. Install (thread) the sensor into the tapped hole (may use thread-lock adhesive).

## MAINTENANCE

**Regular Checks:** Periodically inspect the sensor for physical damage and ensure the sensor does not loosen.

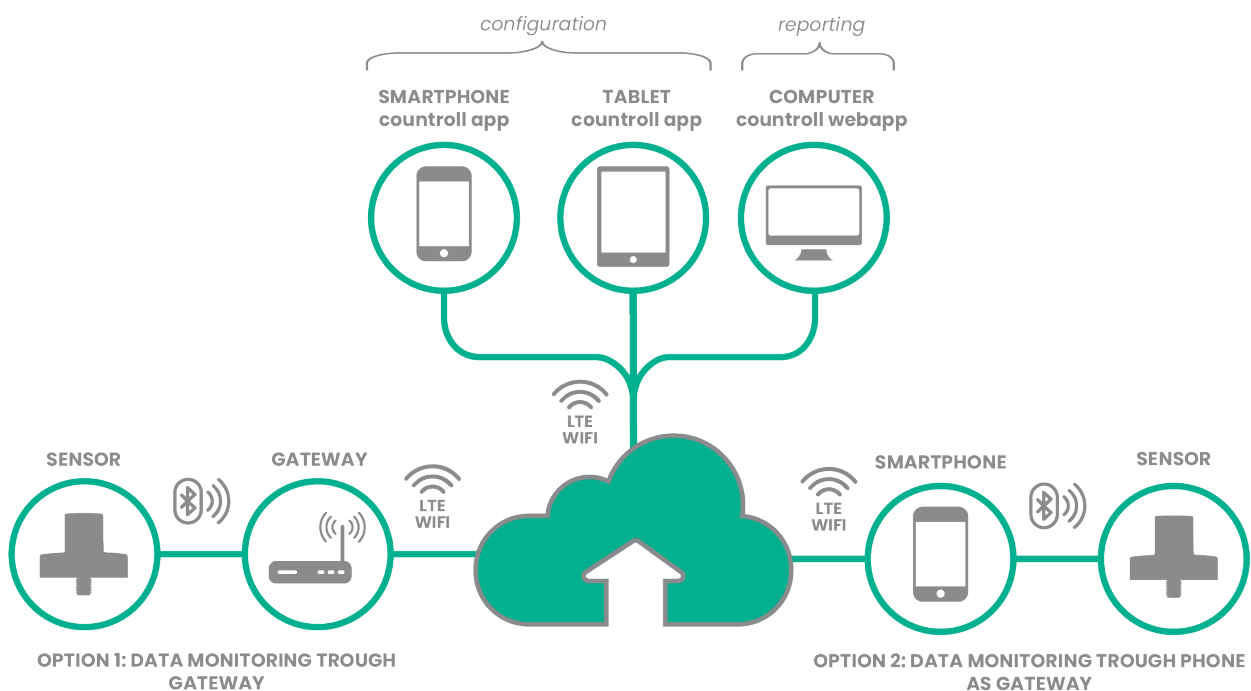
**Cleaning:** Keep the sensor and surrounding area clean to avoid debris buildup that could affect performance.

## OPERATING PRINCIPLES

The countroll<sup>®</sup> sensor system uses Bluetooth technology and cloud-based data management to offer an easy-to-use monitoring solution. The core of the system is a sensor with a Bluetooth transmitter that activates periodically to send data. This data can include rotation, vibration, or other measurements, depending on the sensor's setup. The information is sent to nearby devices with the countroll<sup>®</sup> app, which act as gateways. These devices process the data and upload it to the countroll<sup>®</sup> cloud. Once in the cloud, the data is organized and made available through the countroll<sup>®</sup> web portal, where users can remotely monitor and analyze the sensor readings in real time. This system provides a convenient way to track and manage sensor data from anywhere.

### Principles

1. Configuration: countroll<sup>®</sup> app
2. Monitoring: countroll<sup>®</sup> app + gateway
3. Reporting: countroll<sup>®</sup> webapp



## BATTERY LIFE

The battery for the countroll® sensor cannot be replaced. When the battery runs out of power, the entire unit must be replaced. A standard two-year warranty does not cover battery life.

## SAFETY PRECAUTIONS

### Protrusion Safety:

- Preventing protrusion, which could lead to an accident, is possible by keeping the sensor head flush with the front end cover.
- If protrusion cannot be avoided, the machine operator must implement measures to prevent injury. When the roller rotates, the sensor becomes indistinguishable, increasing the risk of injury.

### Recommended Safety Measures:

- Inform Personnel: Notify all machine operators about the sensor installation and its position. Place warning signs, such as "Caution Sensor," at the relevant roller position.
- Install Safety Guards: Implement appropriate safety guards to prevent accidental contact with the sensor during operation.

## CONFIGURATION INSTRUCTIONS

### Description

The countroll® app serves as the primary interface for configuring and collecting data from the countroll® sensor. This mobile application establishes a bidirectional Bluetooth connection between the sensor and an Android® device, enabling seamless communication and data exchange.

Upon initiating the configuration process, the countroll® app will guide you through this process with intuitive menus and prompts. These menus not only provide a clear view of the sensor's current status but also allow you to easily modify settings to suit your needs. For a quick start, predefined profiles are available, facilitating the setup of your measurement activities with minimal effort.

Data can be retrieved through an additional gateway or with the help of the app. Both allow recorded data to be sent from the sensor to the countroll® platform so that it may be examined more closely.

### Getting started with the countroll® app

Installing the countroll® app

1. Download the countroll® app on Google Play for Android
  - Google Play store: <https://play.google.com/store/apps/details?id=com.countroll>
  - App Store: the countroll® app for iOS does not contain the sensor functionality and thus cannot be used for the sensor.
2. Install and open the app.
3. Do one of the following:
  - If you already have a countroll® account, sign in.
  - If you do not have a countroll® account, create one and log in.

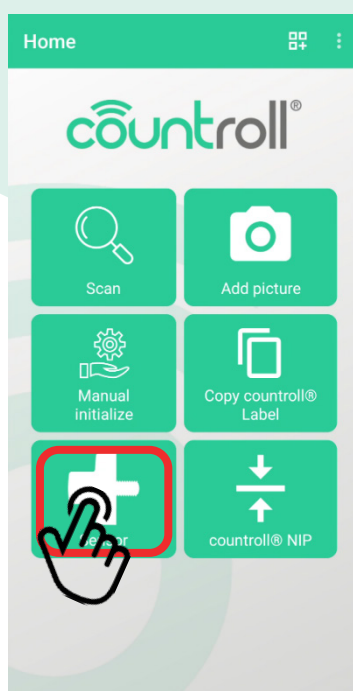
Creating a countroll® account

1. Open the countroll® app.
2. Select Register.
3. Select the language of the interface from the drop-down menu.
4. Enter your email address, full name, and password.
5. Select the checkbox next to I have read and accepted the Privacy Statement, Cookie Policy, and License Agreement
6. Select Register.

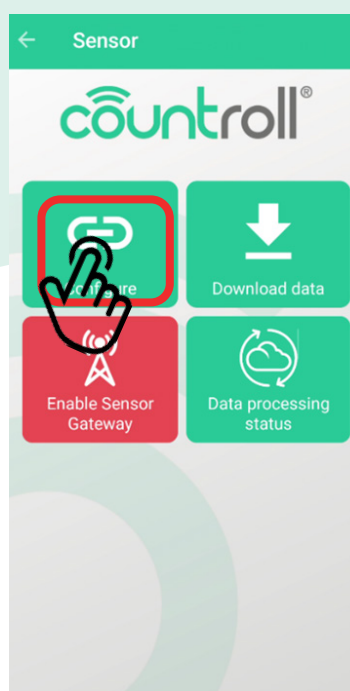
All registrations will be validated by countroll® to prevent abuse and guarantee high-quality service; this may cause a slight delay in the time it takes for your account to become fully operational.

After registering, you can use the same account to access the web portal.

## Overview of the countroll® app



The first screen that appears after logging in will have a number of options. You can see more or fewer buttons, depending on your profile. You may access the Sensor menu by pressing the Sensor button.



Once you've accessed the sensor menu, You will be able to see more or fewer buttons, depending on your profile. Enter the configuration flow by clicking the Configure button.

## Order of operations

1. Connect to the sensor through the application to configure it.
  - A powerful magnet can be approached to activate the sensor.
  - Choose the preset that best suits the function you want the sensor to carry out.
2. The configuration will be transmitted to the sensor once the link between it and the roller has been established.
3. Scan the QR code associated with the roller or appliance you plan to measure or monitor to identify it.  
Refer to an additional procedure to learn how to initialize a QR code so that the countroll® app can identify it.
4. From this point on, data will be generated and stored on the sensor until it gets downloaded by a gateway.

## Configuration of the sensor

### Connecting to the sensor

With the use of a magnet, the sensor's contact can be made active. Briefly touch the sensor at the bottom side of the logo. The sensor will enter the listening state as a result.



To initiate communication with the sensor, press the "Start connecting" button. After the connection has been established successfully, the following step will be displayed to you.



## Configuration presets

The device's settings are determined by choosing the appropriate preset. The sensor's versatility allows you to conduct a wide range of investigations in a variety of settings.

There are predefined settings available. These settings provide a range of options from basic rotational data to comprehensive vibration analysis. The choice between them would depend on the specific monitoring needs, the criticality of the machine being monitored, and the level of detail required for analysis.

### Setting 1: Rotation monitoring

This basic preset is designed for straightforward applications where simple rotational data is sufficient for monitoring machine performance. It focuses on two key metrics

- **Rotation Count:** The system accurately tracks and records the total number of rotations completed by the monitored component over time. This data is useful for maintenance scheduling based on usage and for productivity analysis.
- **Rotation Speed:** The preset continuously measures and logs the rotational speed, typically in revolutions per minute (RPM). This information helps in ensuring the machine operates within its designed speed range and can indicate potential issues if unexpected speed variations occur.

This setting is ideal for:

- Routine monitoring of less critical machinery
- Applications where vibration analysis is not necessary
- Establishing baseline performance data
- Quick checks on operational status
- Long-term rotation monitoring

### Setting 2: Condition monitoring

Building upon the rotation monitoring capabilities, this preset adds periodic vibration analysis for a more comprehensive approach to machine health monitoring:

- **Rotation Count and Speed:** As in Setting 1, the system continues to track rotation count and speed.
- **Daily Vibration Spectrum Sample:** Once every 24 hours, the system captures a full vibration spectrum sample. This data can be exported as raw data for further analysis.
- **Historical Comparison:** By consistently collecting daily samples, this setting enables the building of a historical database of vibration signatures. This is crucial for:
  - Detecting gradual changes in machine condition over time
  - Identifying emerging issues before they become critical
  - Establishing normal operating patterns and deviation alerts

This setting is suitable for:

- Regular monitoring of critical machinery
- Predictive maintenance programs
- Early detection of developing mechanical issues
- Long-term trend analysis of equipment performance

Each of these settings offers progressively more detailed analysis capabilities, allowing users to choose the most appropriate level of monitoring for their specific needs and equipment criticality.

## Link the sensor with the roller

To ensure accurate data tracking and differentiation between various sensors or measurement sessions, it's crucial to properly link the sensor with the specific roll it is installed on. This process requires using a unique QR code that the cōntroll® cloud platform recognizes.

### Scanning the QR Code

To identify the roller or appliance you plan to measure:

- Locate the QR code associated with the specific roller.
- Use the smartphone's camera to scan the QR code.
- This scan will link the sensor's data to the unique identifier of the roll, ensuring all subsequent measurements are correctly associated with that particular roller.

## Using the sensor

The sensor starts collecting data as soon as it is configured. It doesn't need to be started. Mount the sensor on the roll according to the installation instructions.

## Data collection

The most effective and recommended way to retrieve data from the sensor is through our gateway, which ensures seamless and automatic data collection in all situations. The gateway continuously monitors the sensor and retrieves data without requiring any manual intervention, making it the ideal solution whether the sensor is easily accessible or located in a difficult-to-reach area.

In cases where you can safely access the sensor, you also have the option to download the data directly using our app. This manual method provides flexibility for quick access when needed, but using the gateway remains the preferred approach due to its reliability and convenience. By utilizing the gateway, you can rest assured that your data is collected consistently and securely, freeing you from the need to manage data retrieval manually.

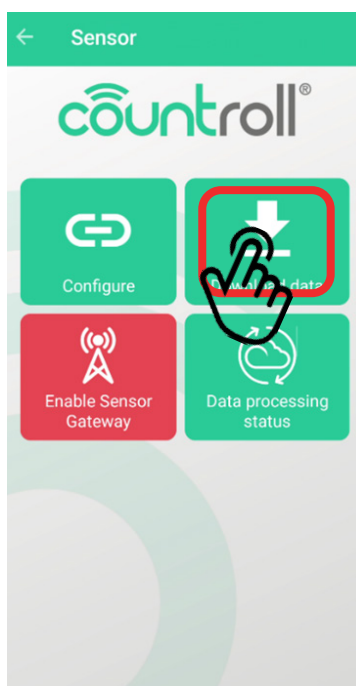
### External Gateway

We have developed a gateway that facilitates downloading data from the sensor and uploading it to the countroll® cloud. This gateway streamlines the process of transferring information, ensuring seamless integration with our cloud-based platform. For thorough usage instructions, refer to the additional gateway manual.

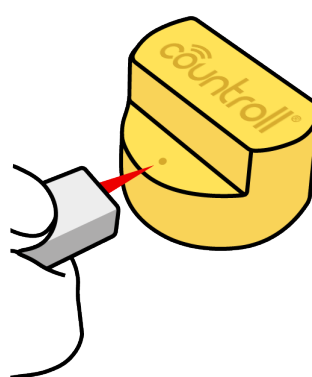
### Manual download

In certain situations, you can gather data directly from the sensor by manually activating it using the app. This method can be useful when you are in a safe and secure environment, and the sensor is not spinning. Always ensure that it is safe to approach the sensor before proceeding with manual activation.

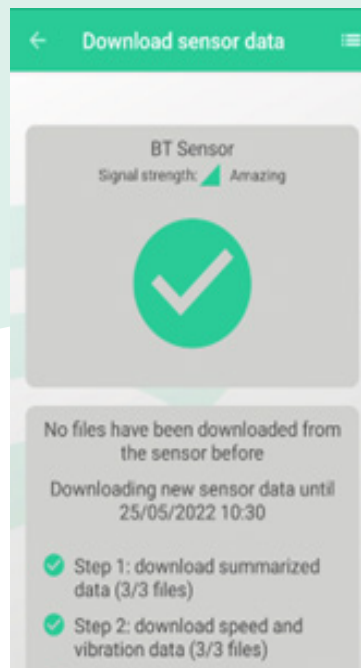
Open the countroll® app and enter the Sensor menu.



Click on DOWNLOAD DATA



Activate the sensor by approaching a magnet to the spot indicated by the double circle or the bottom side of the logo



Find the sensor in the list and **Connect**. This list shows all sensors that are actively listening for connections.



Wait for the process to finish. Your mobile phone will now transmit the data to the countroll® cloud.

### Gateway on mobile application

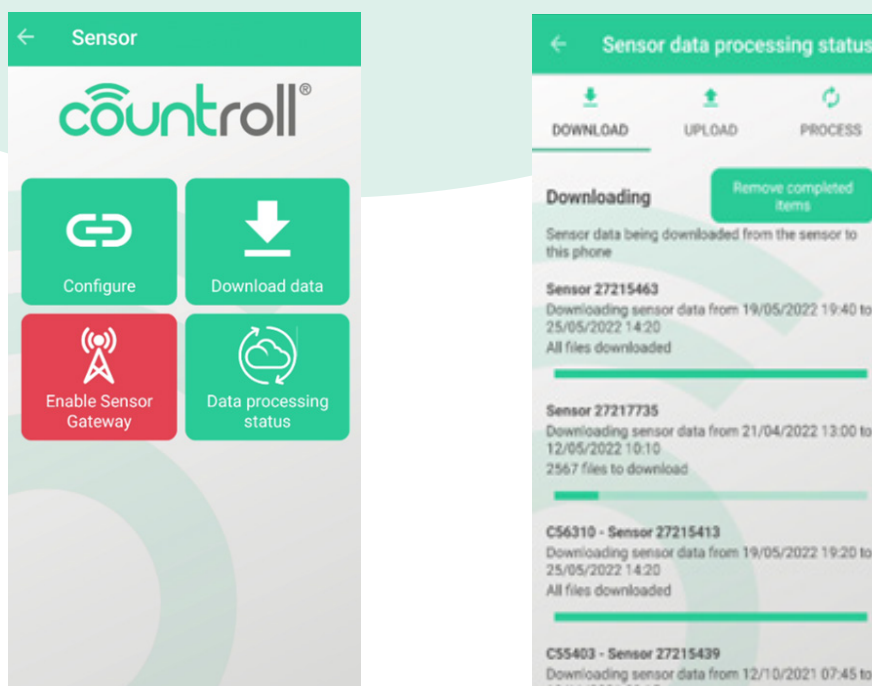
Downloading data from a sensor that is spinning and not accessible can be done in an automated fashion.



Click on Enable Sensor Gateway in the Sensor menu. You will now have to wait for at least the configured interval for the sensor to wake up. The duration of the interval depends on the chosen configuration:

Rotation monitoring	Condition monitoring
12 hours	12 hours

Once the mobile gateway picks up the sensor it will start downloading the data. You will be able to monitor the process from the Data processing status menu:



Your mobile phone will now transmit the data to the cōntroll<sup>®</sup> cloud. Please ensure that your phone has an active internet connection to successfully send the data.

## Data inspection

You will be able to find the sensor data on the web portal (<https://app.cōntroll.com>). On the overview page, there's a roller data table with specific information on each roller. One of the columns is the Sensor column, which will display a sensor icon on the row corresponding to the roller to which you have connected the sensor. Clicking on that row will take you to the roller's profile page. On that profile page the Sensor Data tab will be useful for browsing collected sensor data.