

User Manuals

DIY app overview

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Author	Ziyad Abdulaziz
Verified	Dries Van Loon
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2. Introduction

The DIY App is a tool to enable Nanoprecise customers to configure and assign sensors to the equipment of their choice. The app has been designed to be intuitive and user friendly, but also very powerful and informative regarding sensor management and equipment configuration. This tutorial is intended to provide an overview on how to successfully utilise all aspects of the DIY app, to assure the Nanoprecise sensors are configured appropriately. The DIY app consists of three separate pages, Blink up, Asset management, and Sensor Management, with each page having its own unique uses. Each page is explained in the following sections below.

3. Blink Up

The first section of the DIY app is the blink up section. This area of the app allows the user to configure the Nanoprecise sensor to connect to a WiFi access point of the user's choice, or to allow the sensor to be configured over a cellular connection, if pre-configuration has not already been conducted by the engineers at Nanoprecise.

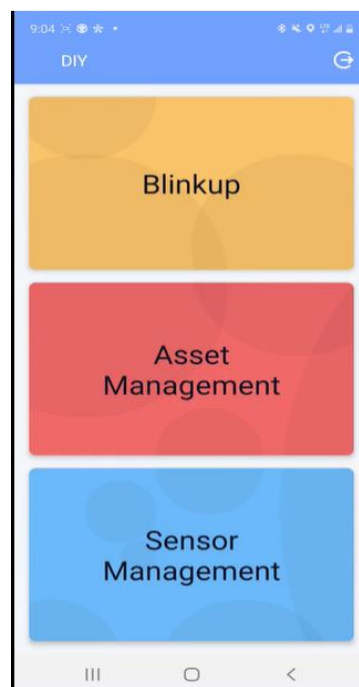


Figure 1: DIY App Home Page.



3.1. Wi-Fi Blink Up

To allow the sensor to be connected to a Wi-Fi access point, the user must enter the desired Wi-Fi SSID and Password in the fields shows below, and once the credentials are entered, the user must click on “connect production device”. Once this is done, the screen will turn black, and a countdown will begin. The user must immediately turn the face of their device towards the main front facing board of the sensor, and to ensure a successful blink up, it is recommended that the sensor be placed face down onto the screen. The user will then notice that the screen is flashing. This flashing indicates that the app is transmitting the required data to the sensor, and once the flashing is done, a green light is observed on the main board of the sensor, this indicates a successful blink up, and the user should expect to have the sensor connecting to the Wi-Fi access point in a matter of seconds. The DIY app will inform the user once the sensor is connected to Wi-Fi, as shown in figure 4.

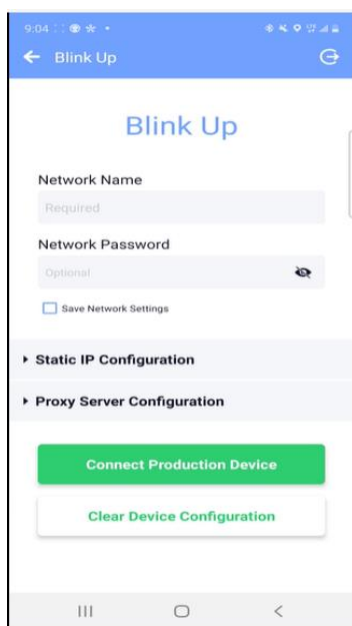


Figure 2: Credentials Page

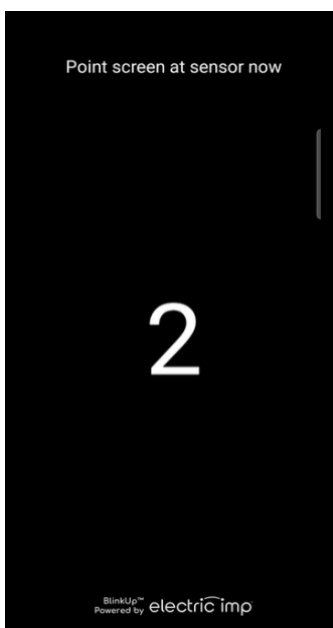


Figure 3a: Blink up Initialization

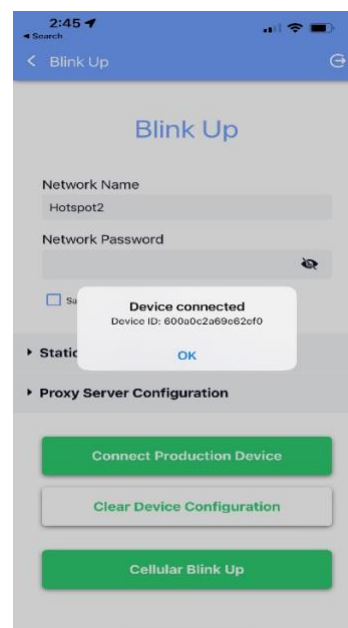


Figure 4: Blink up Confirmation.



Fig 3b: Sensor during Blink up



3.2. Cellular Blink up

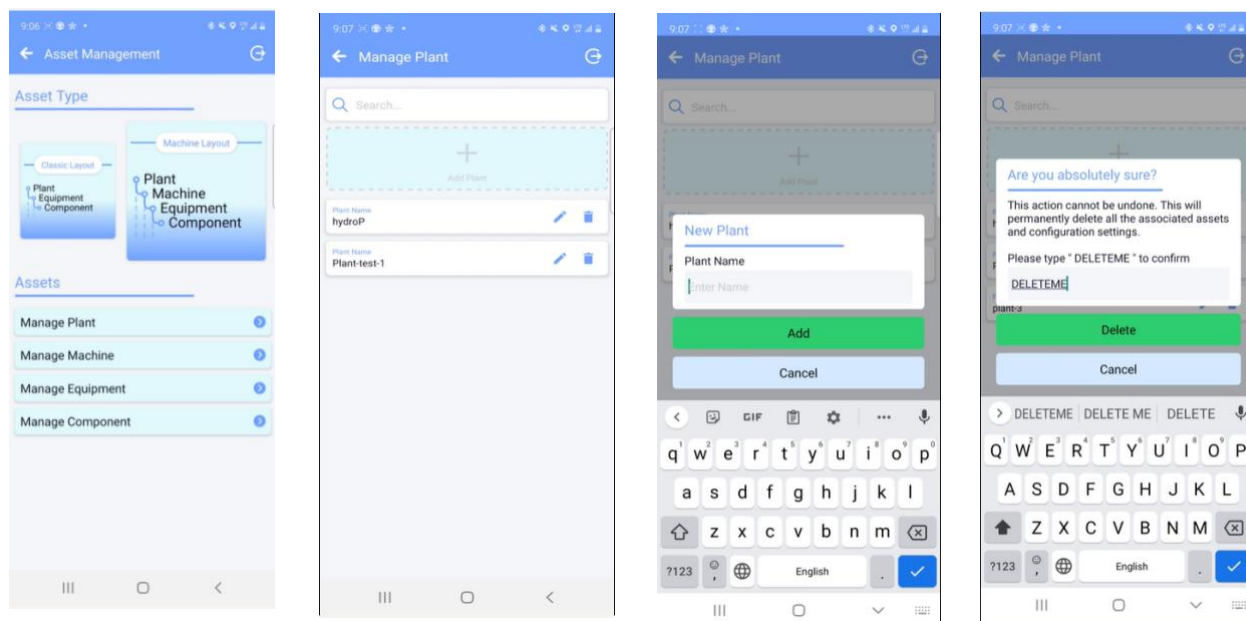
The operation behind cellular blink up is very similar to that of Wi-Fi blink up, however no input credentials are required from the user. All that needs to be done, is to go into the blink up page, and at the bottom of the screen, an option labelled “Cellular Blink Up” will be available. Click on cellular blink up, ensure that the sensor is switched on, and before the countdown is complete, ensure that the face of the sensor is facing the front of the phone where the blinking patterns are being emitted. Once the blink up is done, the sensor will activate the cellular board and will attempt to find and connect to a cellular network. Please note, for cellular sensors, they usually arrive to the user preconfigured, and so cellular blink up is not necessary. However, if an LTE sensor was configured to Wi-Fi, and cellular is now required, ensure to “Clear device credentials” first before clicking on “Cellular Blink up”, as this allows the sensor to forget the Wi-Fi credentials, and look for cellular instead.



4. Asset Management

4.1. Creating the Plant and its Respective Assets

The second option in the DIY home screen is the Asset Management page. In asset management, users can create assets respective of the equipment they have on site on which Nanoprecise sensors will be installed on. There are two distinct layouts to choose from when preparing to enter assets in the app, however the classic layout is the default and is the layout used by most of the DIY app users. Once the layout is chosen, users can begin the setup process by first creating a plant. A company can have multiple plants. Users can also remove plants from the asset management page, however removing plants will also remove all assets attached to the plant, including machines and equipment, and is a non-reversible process.



Figures 5-8: Asset management page, adding a plant, and deleting a plant.



Once the plant is created, the user can now add a machine, and configure the machine type. For machine types, the user can search through the already curated types of machines available within the app, or if the user can not find the specific machine they require, they can create their own machine. Once the machine is created, the user can then proceed by adding equipment under the machine. When adding equipment, the user can search for the equipment type through the various equipment available to choose from on the app, or the user can create a new equipment type. Once the equipment is added, the user can proceed to add the component under that equipment. Once the component is added, the plant layers should be complete and should resemble figure 13 shown below.

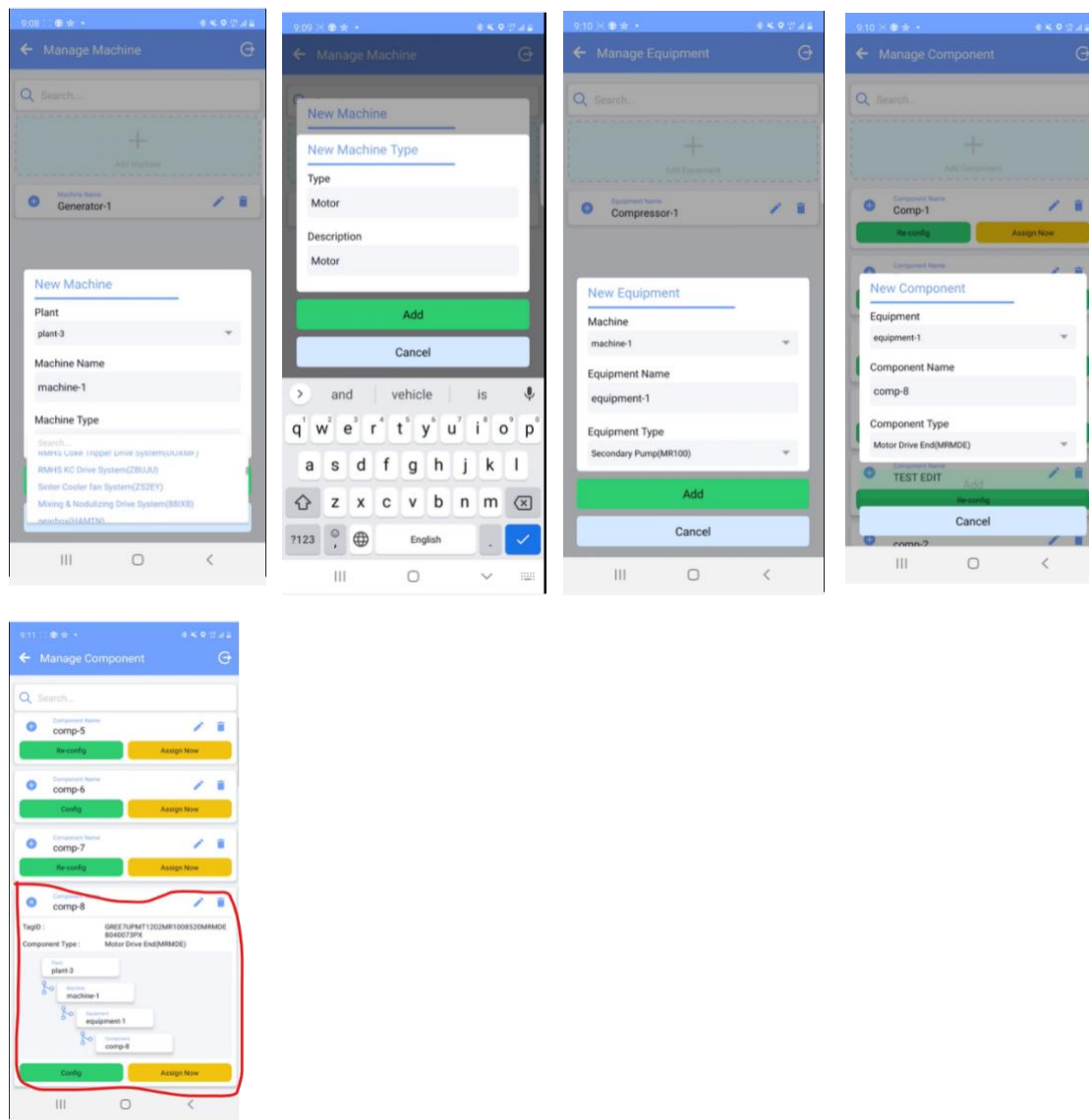


Figure 9-13: Demonstrating the various steps required to add a component, starting by adding a machine under the already created plant.



4.2. Configuring the Components

Once the plants/equipment/components are created, the user can proceed to configuring the components that they have just added. They can do this by clicking on the green configure button that is shown below their created plant as shown in figure 14 below. Configuration of components is very important, as this allows the Nanoprecise analytics engine to apply the necessary fault detection algorithms. Once the user clicks on “Config”, the first configuration question will ask the user if this is a rotational equipment, as shown in figure 15 below. If the equipment is not a rotational equipment, then fault detection will not be possible for this specific piece of equipment, however anomaly detection will still be performed on the captured data. The second question will ask the user if the machine is constant or variable speed, and if it is variable speed, it will ask for the minimum and maximum RPM.

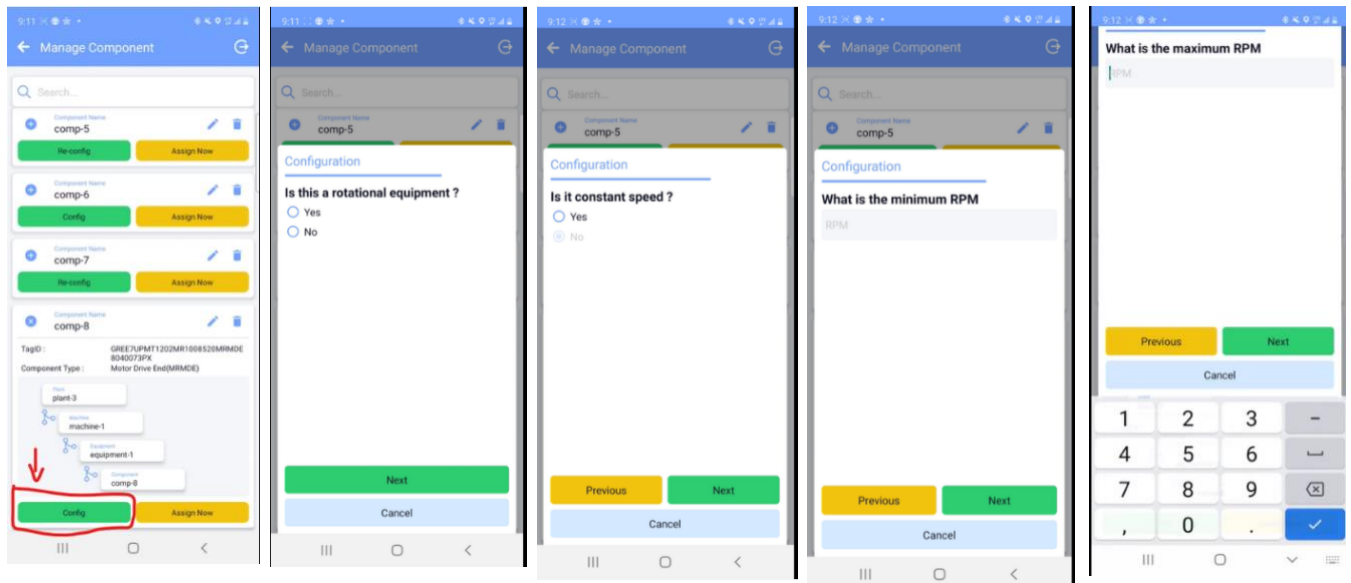


Figure 14-18: Configuring the equipment.



The third question will ask the user whether a magnet is installed on the shaft of this equipment to measure RPM. For variable speed equipment, it is necessary to have very accurate readings of the RPM for these types of equipment, to accurately conduct fault detection, and so a magnet on the shaft allows for RPM readings to be measured on the edge of the sensor itself, thus allowing for real time RPM, and significantly improving the results of the fault detection. Once that is configured, the next question asks the user whether the sensor on this component will be measuring RPM. The reason behind this question is, if for example the sensor is being installed on a motor non drive end, and there is another sensor installed on a motor drive end, what is the ratio between the sensors in terms of RPM measurement. If the user answers “no” to the above question, then the app will ask the user to select the primary component that will measure RPM, and the ratio of RPM between this component and the RPM of the primary component. If however, the user answers “yes” to whether this sensor will be measuring RPM, then they are taken straight to the next configuration question.

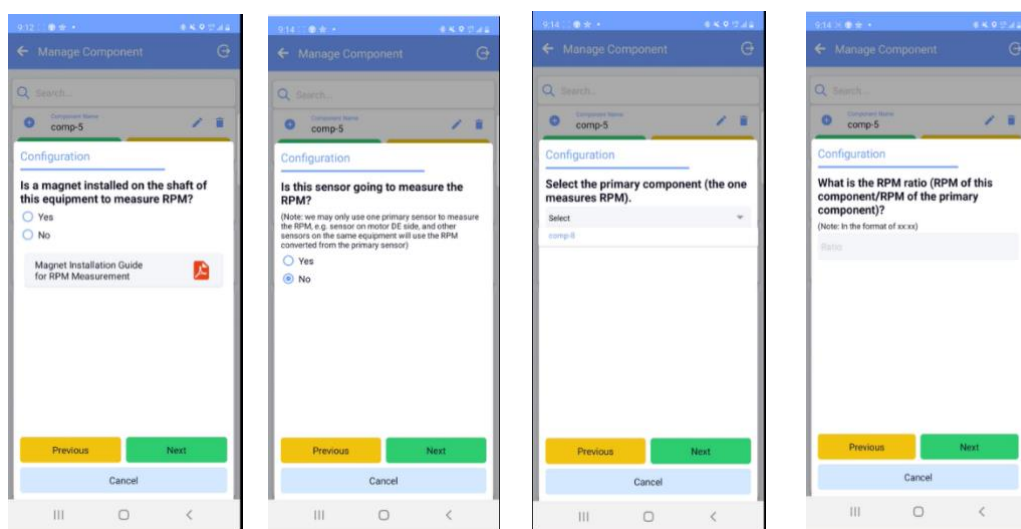
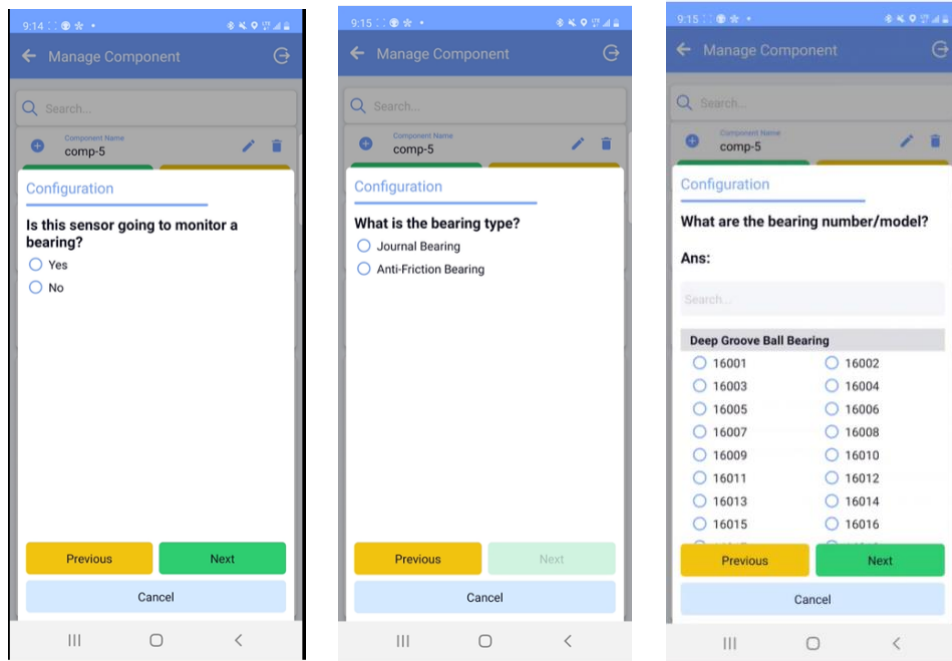


Figure 19-22: Continued configuration of component RPM.



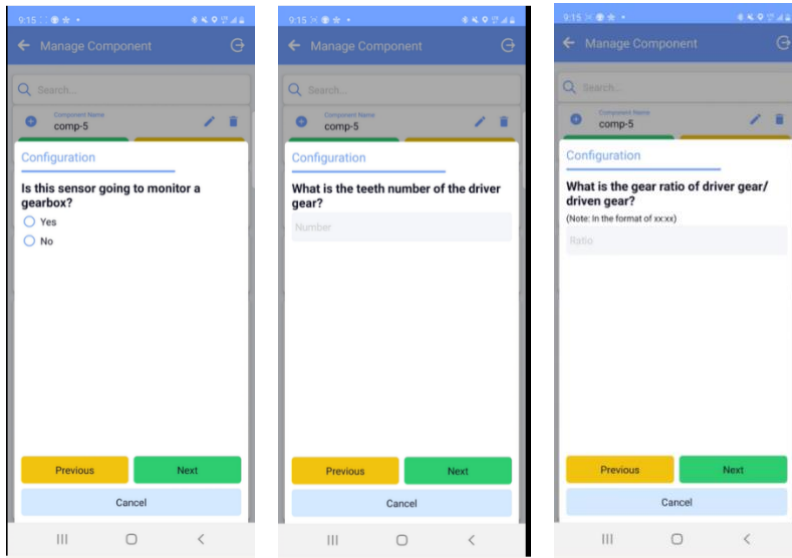
Once the RPM questions are out of the way, the app will ask the user if the sensor will be monitoring a bearing. If the answer is “Yes”, the app will continue asking bearing related questions, such as “What is the bearing type?”, and “What is the bearing number/model?”. The user can filter between the various bearing numbers already included within the app. If a bearing number does not show up on the existing options within the app, the required number can still be entered, and the user can continue to the next steps, however that information will be configured manually later, once specification of that specific bearing is provided to the Nanoprecise team. See figures 23-25 below.



Figures 23-25: Showing bearing Configuration.



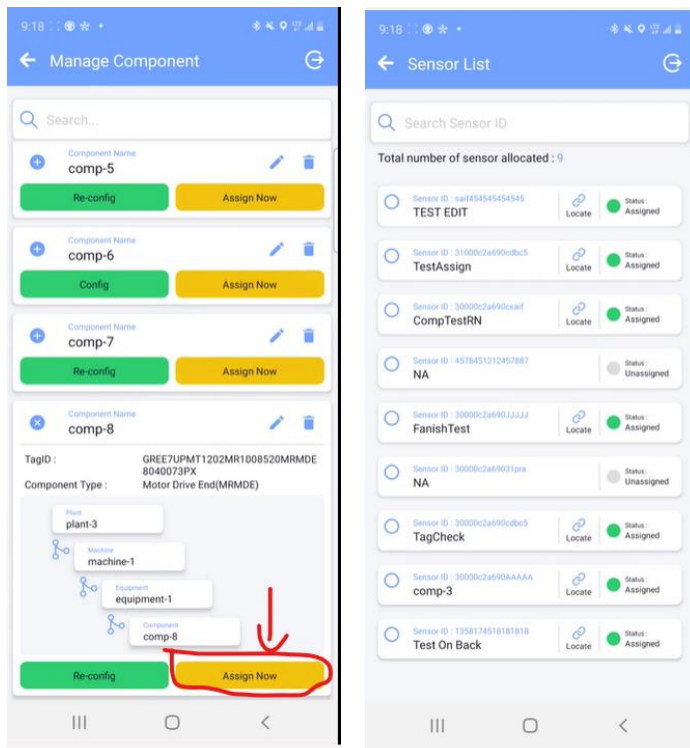
The next question is whether the sensor will be monitoring a gearbox, and if the user answers “Yes”, then the app will continue to ask gearbox related questions, such as “What is the teeth number of the driver gear?”, and “What is the gear ratio of the driver gear/driven gear?”.



Figures 26-28: Configuration of Gearbox.



The app will continue to ask more configuration questions to ensure as much information has been collected as possible. Once the asset has been successfully configured, a Tag ID will be provided to the asset, and if any information needs to be edited or added, the asset can always be reconfigured by clicking on the “Re-config” option. The final step post asset configuration is attaching a sensor to the newly created asset. To assign a sensor, simply click on the “Assign now” option, as shown in figure 29 below, and this will take the user to a page consisting of all available sensors to assign, as shown in figure 30. Assigning sensors can also be done through the “Sensor Management” page on the DIY app home screen, and that will be shown in the following section.



Figures 29-30: Showing how to assign sensors to configured components.



5. Sensor Management

This section of the DIY app allows for a very simple and intuitive sensor allocation process. There are three different methods to assign sensors to configured equipment and components. The first method is to click on view sensor list and to see all available sensors under the User's company and allocate accordingly. The second option is to search for the specific sensor ID in which allocation is being required, and finally the third and easiest option is to scan the QR code on the housing of the sensor and allocate that way. There are two operations when allocating sensors to an equipment. The first is when an equipment already has a sensor assigned to it, and so the user can choose to unassign the sensor and reassign the new sensor to the same component. The second operation is to assign a sensor to a component that has never had a sensor assigned to it before.

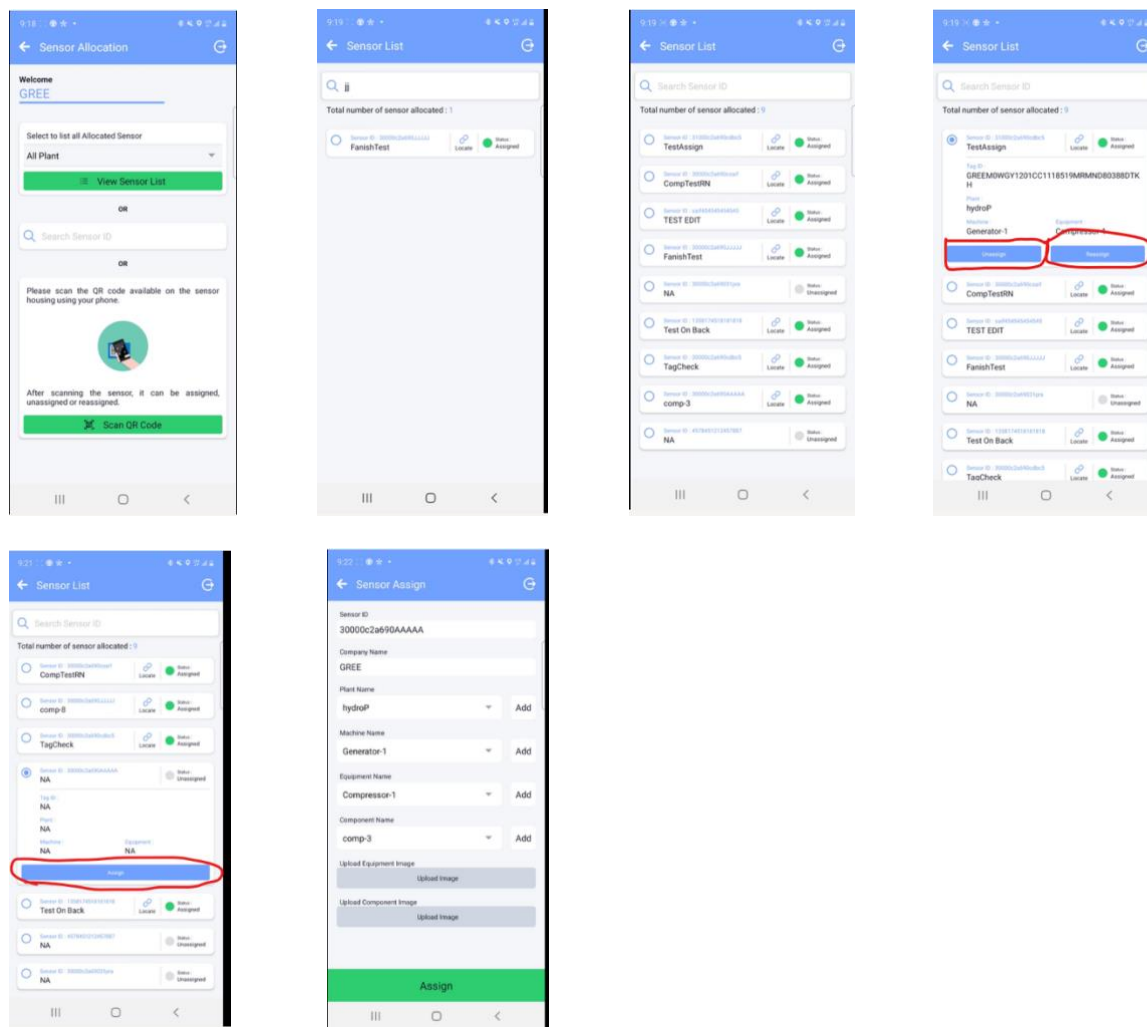


Figure 31-36: Showing how to Unassign and Reassign sensors to components, as well as assigning new sensors to new components.