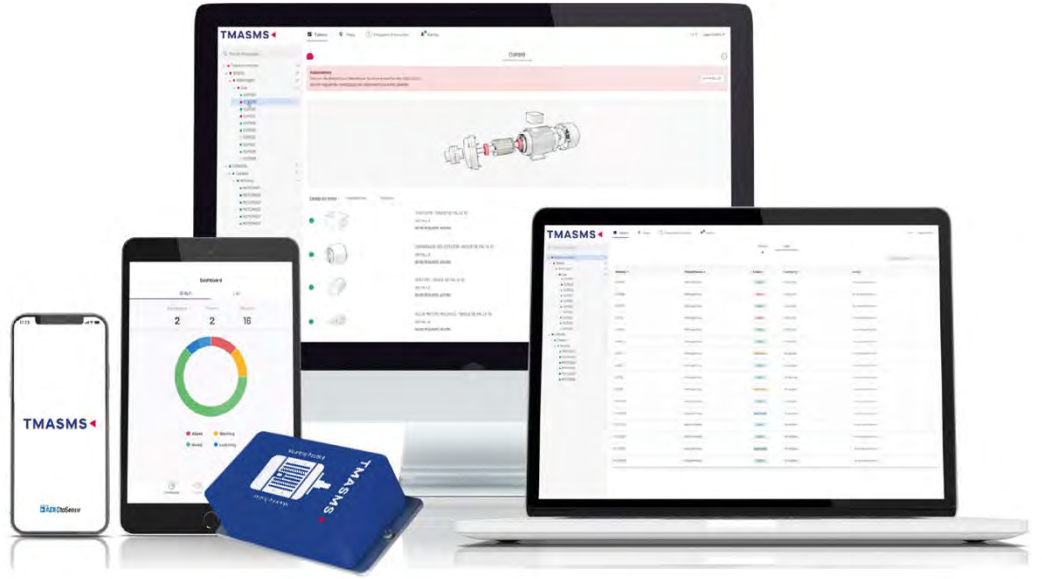


TMAS Smart Motor Sensor INSTALLATION GUIDE

TMASMS ◀
SMART MOTOR SENSOR



Contents

1. TMASMS Installation Guide	1
1.1. Introduction	2
1.2. Networking requirements	6
1.2.1. Networking Basics.....	6
1.2.2. If You Have a Corporate Firewall.....	7
1.2.3. Signal Strength.....	8
1.2.4. TMASMS App.....	8
1.3. Installation at a glance	9
1.4. Getting started	10
1.5. Invitation Process	11
1.6. Device Configuration	12
1.7. Fixing the device to the motor	25
1.8. Checking device connection	33
1.9. Learning Process	34
1.10. Repairing / replacing a motor	36
1.11. Replacing the batteries	38
1.12. Tutorial Videos	39
1.12.1. How to commission your Smart Motor Sensor	39
1.12.1. How to install a Smart Motor Sensor on a motor.....	39

1. TMASMS Installation Guide

Thank you for choosing Smart Motor Sensor (SMS) from TMAS by ADI Otosense. SMS is a device that performs predictive maintenance on low voltage electric motors.

Predictive maintenance is the ideal approach to ascertain a machine's running condition and estimate when the equipment might require servicing. This approach saves time, costs, and boosts the safety of maintenance and regular workers.

The SMS solution consists of the following components:

- The Smart Motor Sensor device, or hardware
- Expert fault prediction software hosted on the TMASMS Server
- Mobile and web app: configuration and access to dashboard

This manual acts as an installation and configuration guide for SMS. Read this manual carefully and perform the steps in sequence specified herein.

- [Introduction](#)
- [Networking requirements](#)
- [Installation at a glance](#)
- [Getting started](#)
- [Invitation Process](#)
- [Device Configuration: iOS app](#)
- [Fixing the device to the motor](#)
- [Checking device connection](#)
- [Learning Process](#)
- [Repairing / replacing a motor](#)
- [Replacing the batteries](#)
- [Tutorial videos](#)

1.1. Introduction

Important Information

The SMS works with:

- three-phase squirrel cage induction electric motors
- with frames up to 450 (IEC 600034) or 500 (NEMA MG1)
- whose power range varies from 0.37 kW to 500 kW, or 0,5 to 700HP
- driven directly to line (DOL), by frequency inverter (VFD), soft starter, star-triangle drive, or by any other driving device.

Confirm Motor Details

Motor Name (Tag)
Secondary Water Pump 1

Manufacturer Optional

Brand Name

Rated Power (Kw)
2.984

Rated Voltage (V) Optional
300

Number Of Poles
4

Frequency (Hz)
50Hz 60Hz Other

Connection Optional
Star Delta Other

Double-Star

Drive Optional
VFD

Efficiency Level
84.5

Model
1AA46

Check Motor Details

Confirm Motor Details

Confirm details match your motor correctly

Rated Speed (RPM) 3420

Rated Current (A) 7.3

EFF@100% 84.5

Bearing/Manufacturer SKF

Dr Bearing 6206

NDE Bearing 6206

Edit Motor Details

Confirm Motor Details

- A Information requested on the mobile form
- B Needed information not requested on the mobile form

3-MOT		1LE0142-1AA46-4AA4		E 100L		P MB3		IP55		LMH-1008 / 800003888993 / 001	
D V	F Hz	C HP	L A	I EFF	cos φ	K r/min	EFF.CL				
220/380 ΔΔ YY	60	4	12.6/7.3	84.5 %	0.85	3420	IE1				
440 Δ G	60	4	6.3	84.5 %	0.85	3420	IE1				
N BRG DE 6206 2Z C3		O BRG NDE 6206 2Z C3		Th.Cl. 155(F)		AMB 40°C					
OCV1104A				IEC60034				Net: 33 kg			

- A Motor Name (Tag): A name that you give to the Motor.
- B Usually situated at the top of the Motor Plate
- C 1HP (E) = 746W = 0.746Kw
- D Voltage: enter the middle value. For example, 220/380 = enter 300V for a frequency of 60Hz. 50Hz for European countries. 60Hz for USA and Australia
- E In general, the number of poles is situated on the first line with the model. In this case, enter 4 as in 1LE0...AA4.

	50Hz	60Hz
2 poles	3000rpm	3600rpm
4 poles	1500rpm	1800rpm
6 poles	1000rpm	1200rpm
8 poles	750rpm	900rpm

The rpm value in this table relates to the electrical speed. In this motor plate, the Rated Speed (rpm) relates to the mechanical speed. Thus, for a 60Hz frequency, 3600rpm = 3420rpm. For a 50Hz frequency, 3000rpm = 2920rpm.

- F 50Hz for European countries and Australia. 60Hz for USA, North America and South America
- G This motor plate indicates double-delta (ΔΔ) or double-star (YY) if we go with 300V at a frequency of 60Hz. If we select 440V, we have a Delta connection (Δ).
- H Drive: please ask Maintenance to get this information.
- I Efficiency level (also named Efficiency @100% or EFF@100%): Sometimes, Efficiency level is written as follow IE2-88(100%)-88.5(75%)-87.6(50%). In this case, choose the 100% one i.e. 88.
- J Model: 1AA46
- K Rated Speed (RPM) can also be written:
 - r/min
 - RPM
 - #/min
 - min-1
- L Rated Current (A i.e. Amps): depending on the connection, we enter 12.6 (ΔΔ), 7.3 (YY) or 6.3 (Δ). In this example, we have a double-star connection (YY) therefore we enter 7.3.
- M Bearing Manufacturer: Contact the Motor Manufacturer (Sales Department) or consult the Motor Manufacturer catalogue to get this information
- N Dr Bearing: 6206
- O NDE Bearing: 6206
- P Frame (also named Shaft Height): 100L in this example. Check Motor Manufacturer catalogue to find the information if not on the Motor Plate.

*See Frame References table for NEMA and IEC Motor Plates.
- Q 3 phase induction can be written as follow:
 - 3-MOT
 - 3-
 - PH3

IEC Frame	NEMA Frame
63	42
71	48
80	56 56H

90S	143T 145T
90L	182 184 182T 184T
100	213 215 213T 215T
112	254U 256U 254T 256T
132	284U 286U 284T 286T 284TS 286TS
160	324U 326U 324T 326T 324TS 326TS
180	364U 365U 364T 365T 364TS 365TS
200	404U 405U 404T 405T 404TS 405TS
225 S	444U 445U 444T 445T 447T 449T 444TS 445TS 447TS 449TS
225 M	
250 S	
250 M	

280 S	
280 M	
315 S, 2p	
315 S, 4p-8p	
315 M, 2p	
315 M, 4-8p	
355 S, 2p	
355 S, 4-8p	
355 M, 2p	
355 M, 4-8p	
355 L, 2p	
355 L, 4-8p	

The SMS can be installed on both old and new motors, horizontal or vertical.

Learning Process

Once the installation of the SMS on the motor and the configuration of the device (Wi-Fi Network Motor) are completed, the device starts sending data to TMASMS AI (TMASMS cloud server), which requires a process of learning about the motor's operation to be able to predict its faults. This process' duration varies, depending on the motor's operating conditions, but it usually takes approximately four weeks.

1.2. Networking requirements

1.2.1. Networking Basics

TMAS Smart Motor Sensor (SMS) devices require internet connectivity to send data to the cloud application.

To connect your *TMASMS* devices to the internet, you must use your local WiFi network. Your WiFi network must use:

- Dedicated 2.4GHz network
- Security: WEP, WPA, or WPA2

Certain network configurations are not supported:

- Proxy
- 5GHz WiFi networks
- Security: WPA3 or WPA/WPA2/WPA3 Enterprise

What to do if your network does not meet these requirements

If your network does not meet these network requirements, you can purchase a router to connect your *TMASMS* devices to the internet.

Routers

Recommended features:

When purchasing a router, the following features are recommended:

- **Pingreboot/Keepalive** (highly recommended): when the router detects that it does not have Internet connection, it will automatically restart.
- **Periodic Reboot**: the router will periodically restart to maintain optimal performance.
- **Remote Management**: request router status or restart router remotely using API, text, or call.

Examples of routers with recommended features

- Teltonika RUT240 02U000 (North America)
- Teltonika RUT240 06E000 (Europe and UK)

SIM cards and data plans:

Each *TMASMS* consumes up to 500 MB of data per month under normal operating conditions. If purchasing a SIM card to use with your router, consider the following:

- A **contract** or **bill pay** SIM card is preferred, to avoid interruption to internet connectivity.
- If using a **prepaid** SIM card, you should apply sufficient credit to the SIM plan to cover the trial period (90 days).

1.2.2. If You Have a Corporate Firewall

You may need to configure your firewall ports to allow your TMASMS devices to connect to the cloud:

- Device communication uses MQTT over TLS/SSL, therefore port 8883 must be open
- HTTPS port (port 443) must be open

Note port 8883 will need to allow ingress traffic to support Over The Air (OTA) updates to the TMASMS.

You may also have to whitelist the following domains to ensure the device is able to connect to the cloud application:

- tmasms.otosensesms.com
- .amazonaws.com

If you have to whitelist the device MAC addresses on your network, the MAC addresses are available by request.

TMASMS does not currently support IP address whitelisting.

Useful corporate firewall configuration information

TMASMS leverages the AWS Cloud to provide scalable and reliable Internet-of-Things (IoT) connectivity. AWS publish the complete list of AWS IP Ranges used by their cloud services (<https://ip-ranges.amazonaws.com/ip-ranges.json>).

This list is dynamic and the IP addresses change periodically. Your Network Administrator can subscribe to notifications about changes and apply these to maintain your network firewall configuration. Access full details at <https://docs.aws.amazon.com/general/latest/gr/aws-ip-ranges.html>

Firewall support for AWS IP ranges

Check Point Firewall

The Check Point firewall has a feature named **Updatable Objects** that supports the dynamic AWS IP Ranges list and automatically maintains your network firewall configuration whenever IP ranges change.

- https://sc1.checkpoint.com/documents/R81/WebAdminGuides/EN/CP_R81_SecurityManagement_AdminGuide/Topics-SECMG/Updatable-Objects.htm
- https://supportcenter.checkpoint.com/supportcenter/portal?eventSubmit_doGoviewsolutiondetails=&solutionid=sk131852

The subset of AWS IP ranges that are applicable to TMASMS comprise of the following:

- **Amazon Services**
- **API Gateway Services**
- **CloudFront Services**
- **Rout53 Services**

Create an Accept rule for traffic to these services on ports 8883 and 443 in the Updatable Objects console.

Palo Alto Firewall

The **Palo Alto** firewall has a similar feature to Check Point's Updatable Objects named **External Dynamic Lists** (EDL).

- <https://docs.paloaltonetworks.com/pan-os/8-1/pan-os-admin/policy/use-an-external-dynamic-list-in-policy>
- <https://docs.paloaltonetworks.com/pan-os/9-1/pan-os-web-interface-help/objects/objects-external-dynamic-lists.html>

1.2.3. Signal Strength

Reliable connectivity between your TMASMS devices and the cloud requires a signal strength **greater than -60dB**.

* When deploying your *TMASMS* devices it is recommended to use the *Network Validator tool* in the TMASMS app, or a similar network tester, to ensure adequate signal strength where you deploy your *TMASMS devices*.

**Signal Strength indicator is only available in Android App*

**All traffic on port 8883 should be allowed initially when using the Network Validator to test that the port is open*

1.2.4. TMASMS App

Used to commission TMASMS devices. iOS and Android application available.

For Apple store link :

<https://apps.apple.com/id/app/tmasms/id1597772348>

For Google Play store link:

<https://play.google.com/store/apps/details?id=com.tmasms.otosensesms>

1.3. Installation at a glance

Here is the general procedure for installing an SMS device; Please refer to each section of this guide to see in detail the operations required at each step.

1. Install the TMASMS app on your mobile device
2. Enter your credentials on the Login screen
3. Follow the onboarding steps in the app to configure the SMS device
4. Fix the device to the motor
5. Check that the device is sending data

Revision: 1 — Last modified: 22 July 2020

1.4. Getting started

The configuration of the SMS device is done through the TMASMS mobile application, available for iOS and Android.

The shipping box contains:

- The SMS device
- [Epoxy bi-component adhesive*](#)
- [Four lithium batteries](#)
- Two fixing clamps, including screws**
- Sandpaper

*We recommend you wear gloves when using Epoxy as it's a very strong adhesive!

**If there are no cooling ribs in the frame of the motor (motors whose housing does not have cooling fins, for example), contact your TMAS Sales representative to purchase a specially designed base for the installation of the SMS.

✿ Note: You can install the device even if the motor is running. Be careful though: the motor's frame can be very hot!

Install the TMASMS app from the App Store or from Google Play. You will receive an invitation email to log in to the app.

For Apple store link :

<https://apps.apple.com/id/app/tmasms/id1597772348>

For Google Play store link:

<https://play.google.com/store/apps/details?id=com.tmasms.otosensesms>



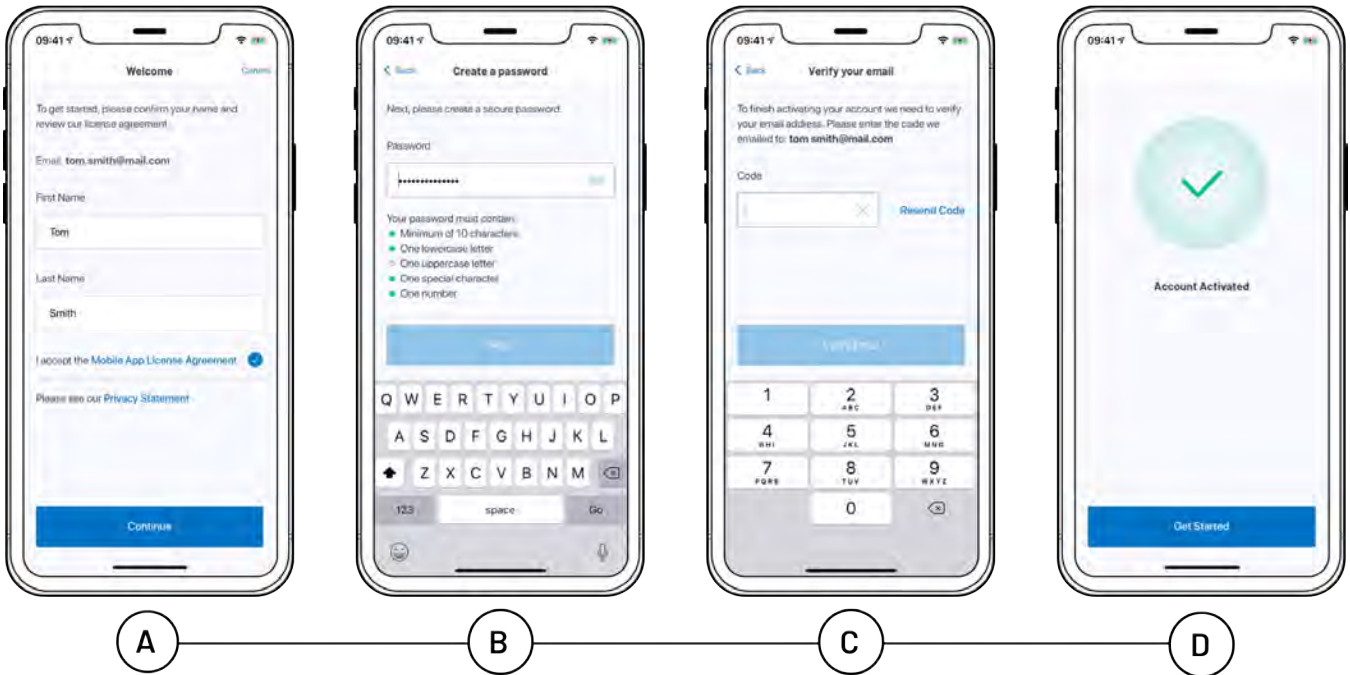
Revision: 37 — Last modified: 8 June 2021

1.5. Invitation Process

You can only log in to the TMASMS app by invitation. If you did not receive an invitation email, please contact your Sales representative.

Once you receive the invitation email you can activate your account via the web or mobile app,

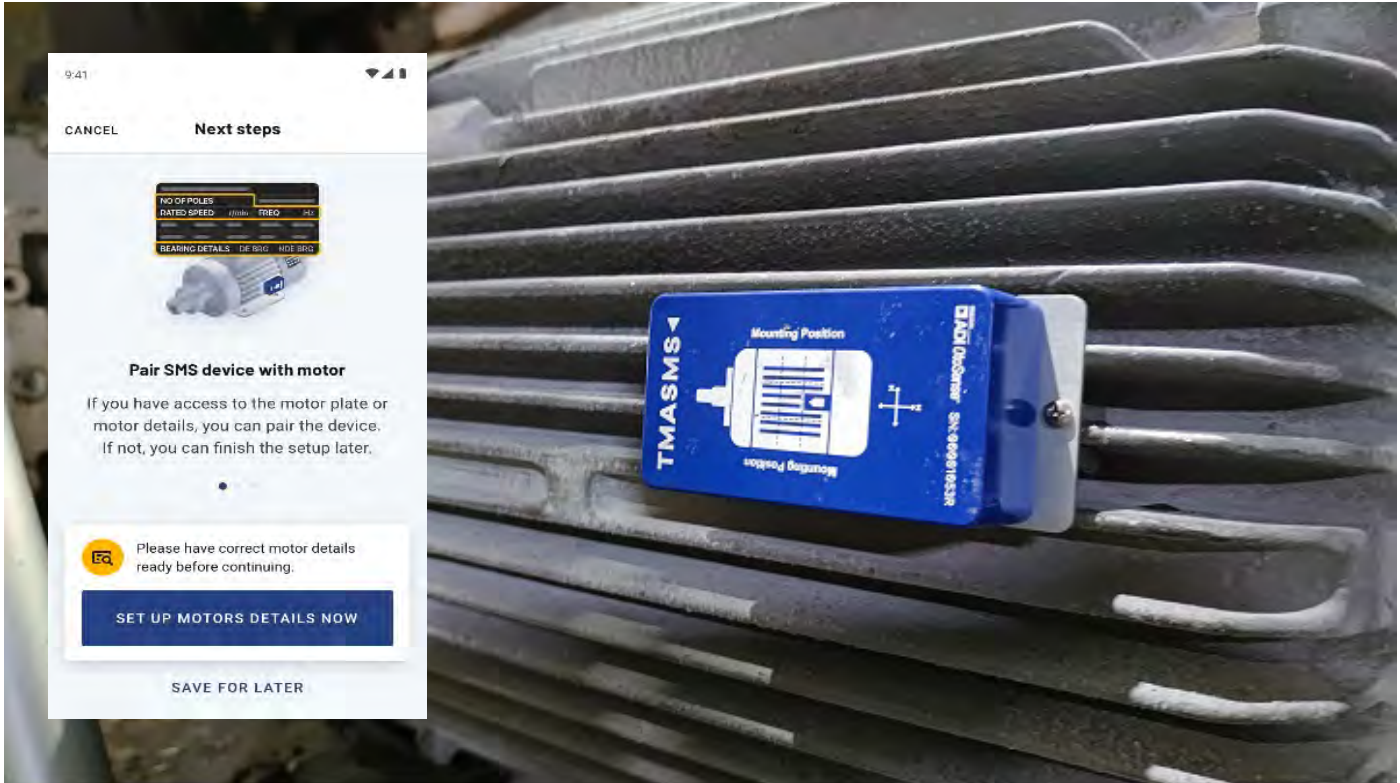
1. Enter or confirm first name, last name and create a password.
2. Verify your identity by entering the code sent to the email address specified.
3. Enter the code and tap 'Verify our email' to start working with the TMASMS app.



Revision: 27 — Last modified: 7 July 2020

1.6. Device Configuration

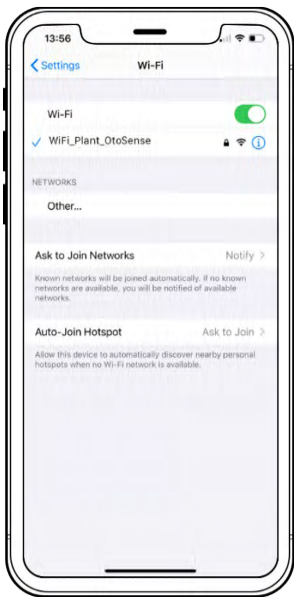
The process described below corresponds to the iOS mobile app. The process is quite similar with the Android app, only simpler as you won't have to navigate between the Wi-Fi settings of your smartphone and the TMASMS app.



<https://player.vimeo.com/video/551961335>

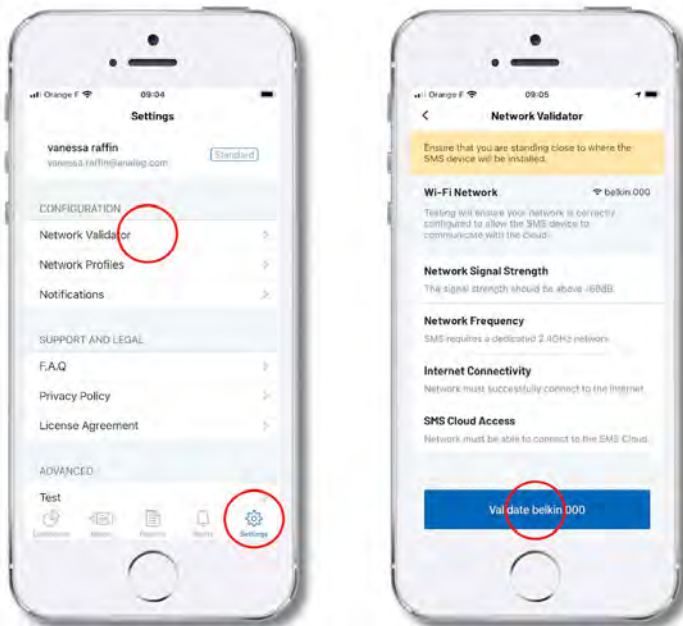
After logging in:

- * To complete the set up of an SMS on a motor, you will need to connect your smartphone to an existing Wi-Fi network on the plant, or to the router provided by TMASMS Devices/ Partner
 - a. Make sure you can see that the network is available in the Wi-Fi settings of your mobile device and that there is a good signal. This **connectivity must be enabled 24h/7**, so the device can communicate with the Cloud Server at all times.
 - b. Only **password protected** Wi-Fi networks can be used.
 - c. If you are experiencing a poor Wi-Fi or Internet connection during commissioning, please contact your company's IT department to request guidance in improving your router signal.



! You need to connect the SMS to an existing **2.4 GHz Wi-Fi network** on the plant: if the WiFi Router can support only 5GHz, you won't be able to commission the SMS. See the section [Networking Requirements](#) of this guide for more details.

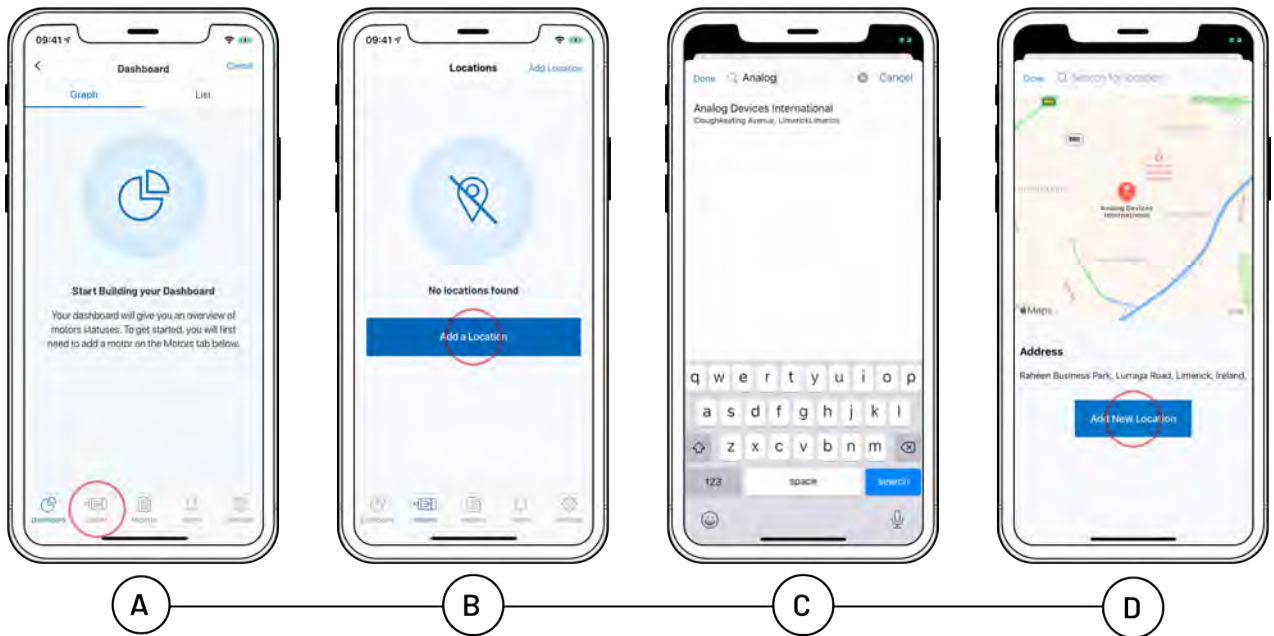
When deploying your *TMASMS* devices it is recommended to use the *Network Validator tool* in the *TMASMS* app, or a similar network tester, to ensure adequate signal strength where you deploy your *TMASMS devices*.



*Signal Strength indicator is only available in Android App

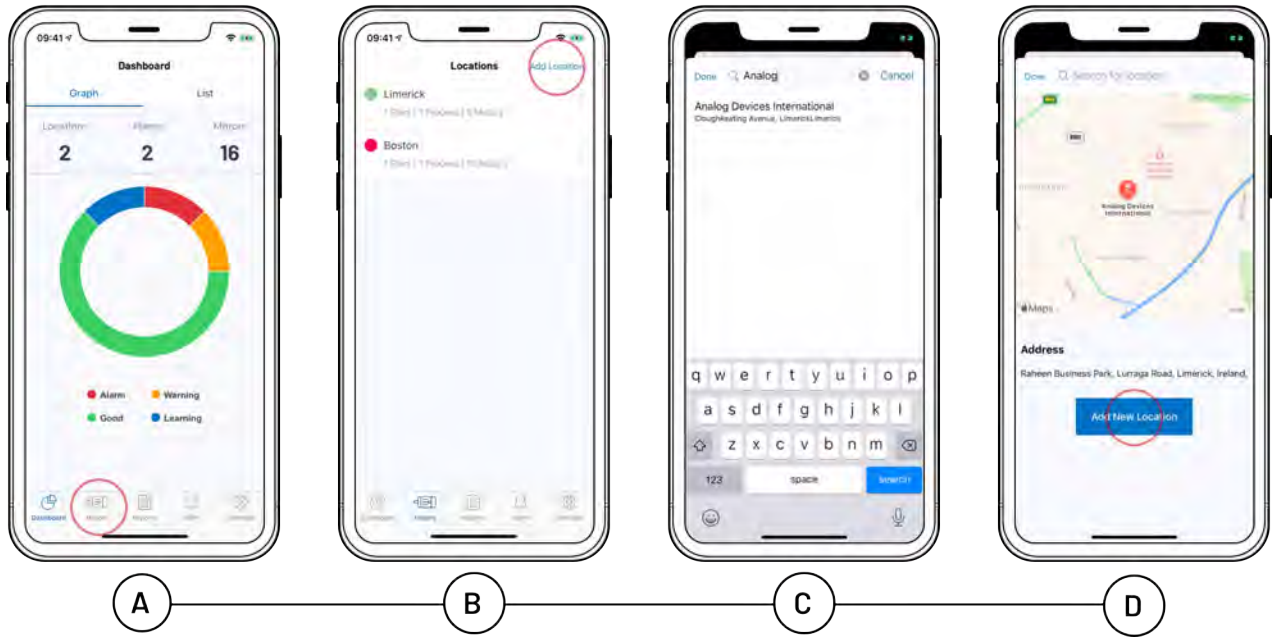
1. Go to “Motors” tab on the bottom of the screen. If this is the very first time this account is being populated, tap on “Add a Location” to enter the first location where a device will be installed.

Without any location yet on the account



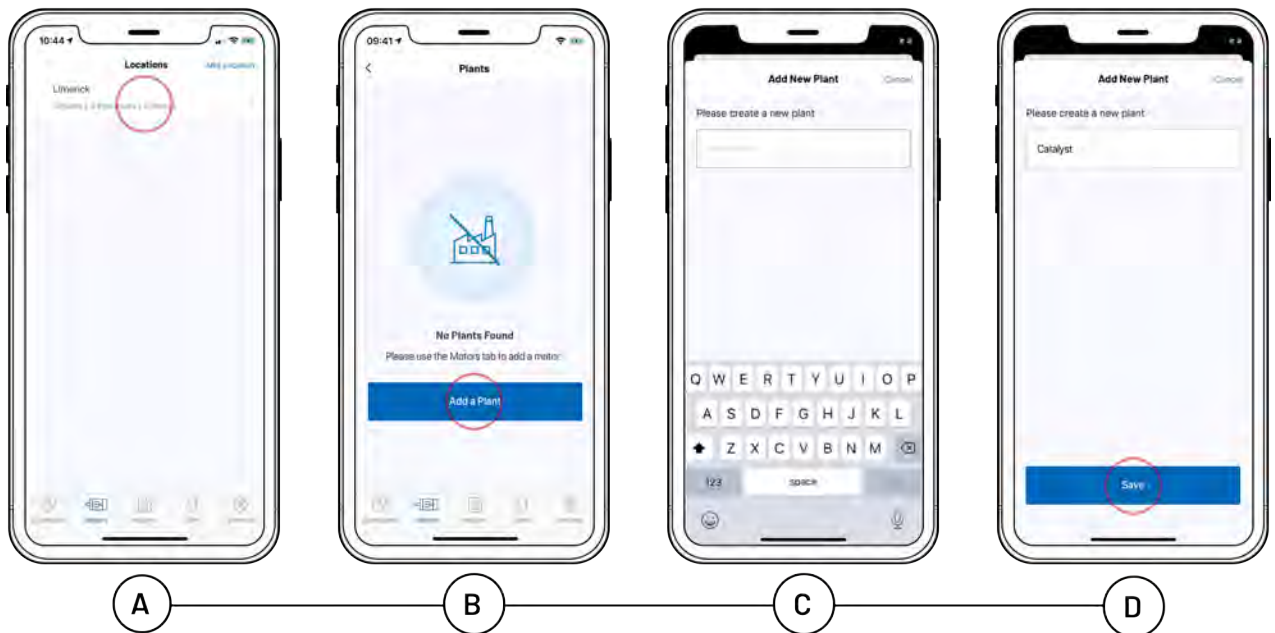
If locations have already been entered on this account, you will see these locations appear in a list. For installation of your new device, you can either choose a location in the list (and go directly to step 2) or create a new location by tapping on “Add location” in the top bar. Enter the plant location where the device will be installed and tap “Add New Location” to create the new location.

With locations on the account



2. You can either choose a plant in the list (and go directly to step 3) or create a new plant by tapping on "Add a Plant". Enter the plant name and tap "Save".

Without any plant yet on the account

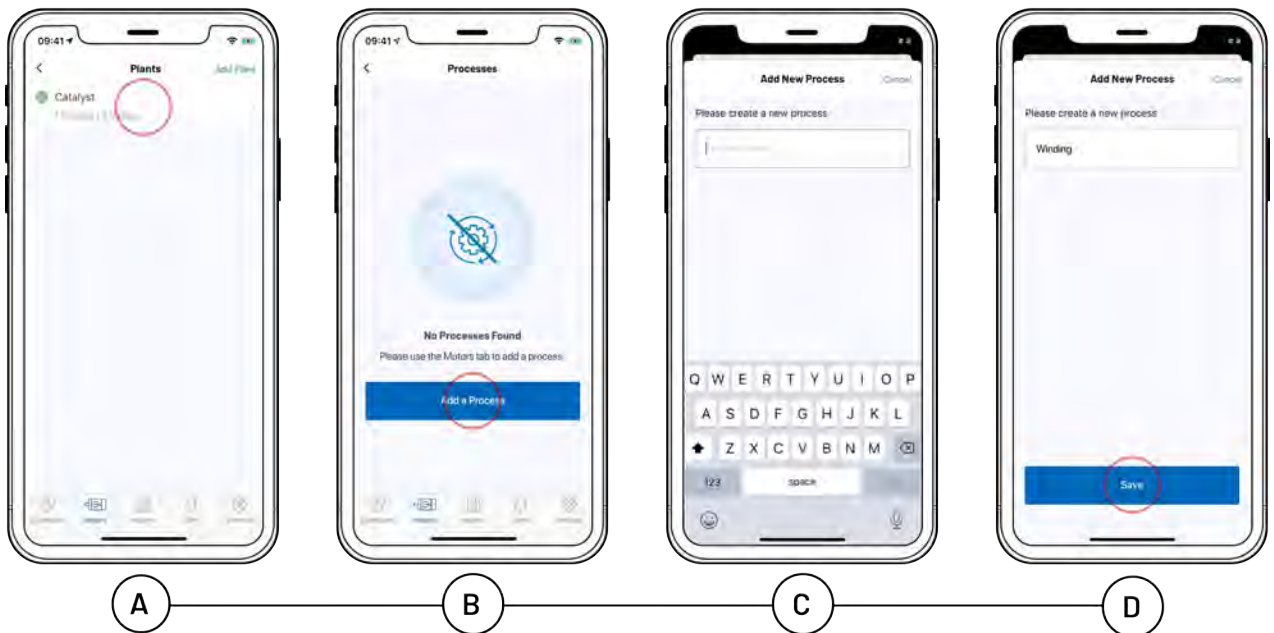


With plants on the account



3. Select the plant from the list. And tap the process in the list or “Add Process” in the top bar. Enter the process name and tap “Save” and select the process from the list.

Without any process yet on the account

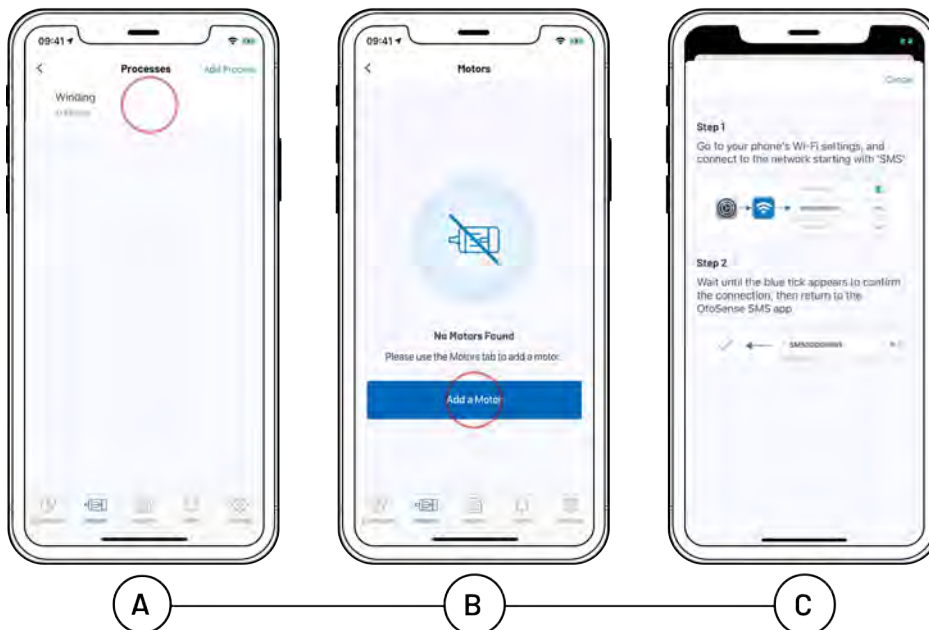


With processes on the account

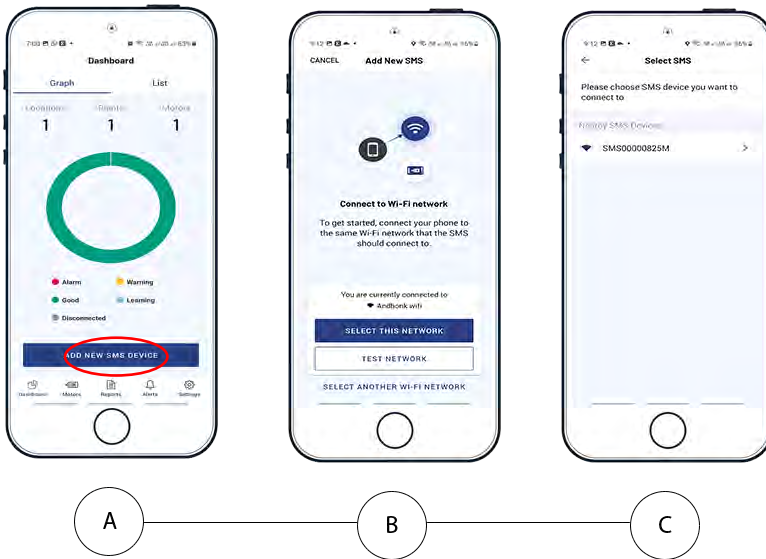


4. And tap “Add Motor”.

Without any motor yet on the account



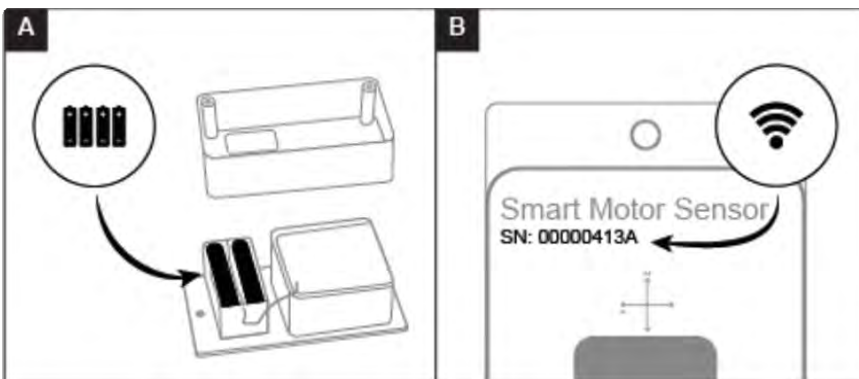
WITH MOTORS ON THE ACCOUNT



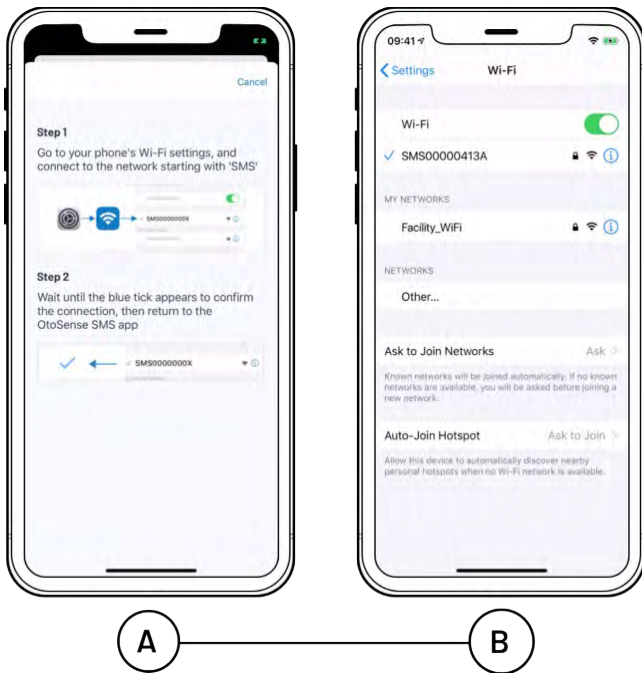
5. Insert the batteries in the device. It will generate a Wi-Fi network with the same numbering as the device, for example: SMS00000825M.

Note: The device must be configured within 5 minutes because the network cannot remain active any longer.

- a. If the client’s plant connection is not enabled for any reason (client AP turned off, SSID/Wi-Fi network name or password changed, etc.) after the five minutes have elapsed, remove the batteries from the device so that you don’t drain them (after five minutes, the device will work in a more consuming mode). Make sure the plant’s Internet connection is in a working state before you re-insert the batteries and try the connection process again.
- b. If for any reason you didn’t succeed in provisioning the device within the 5-minute timeframe, remove the batteries, wait for roughly 20 seconds, re-insert the batteries and start the process again.

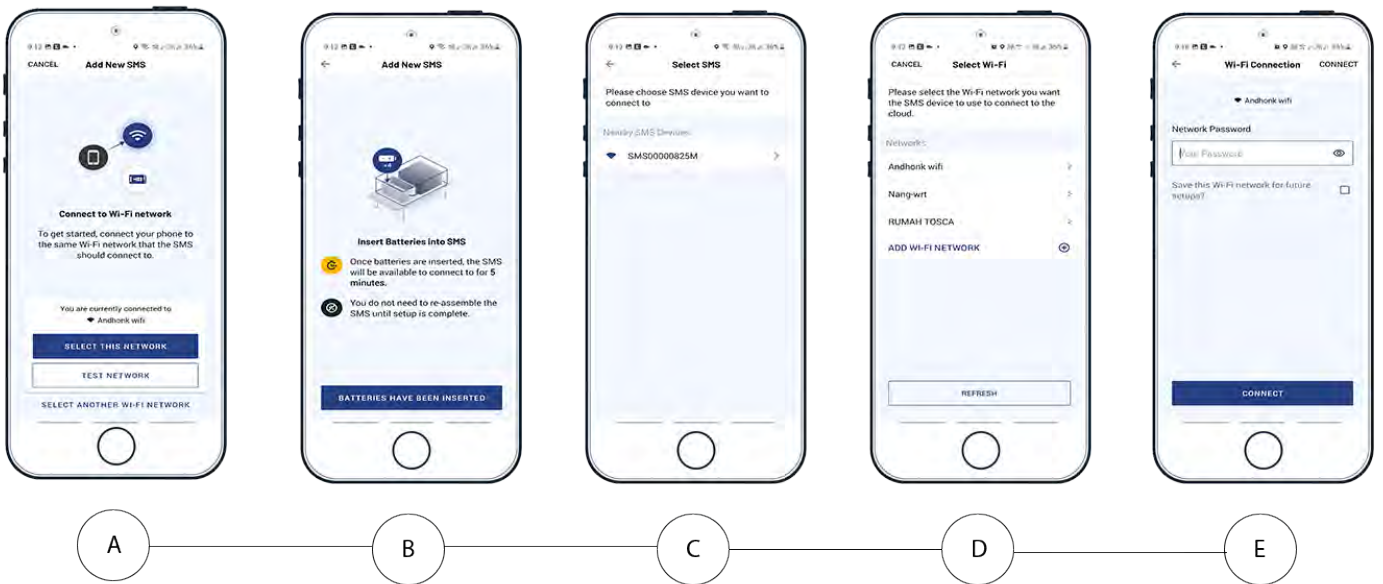


6. Access your smartphone's Wi-Fi settings and connect to the Wi-Fi network whose name starts with 'SMS'. Wait until the blue tick appears to confirm that the connection with the SMS has been established. Then, return to the TMASMS app.

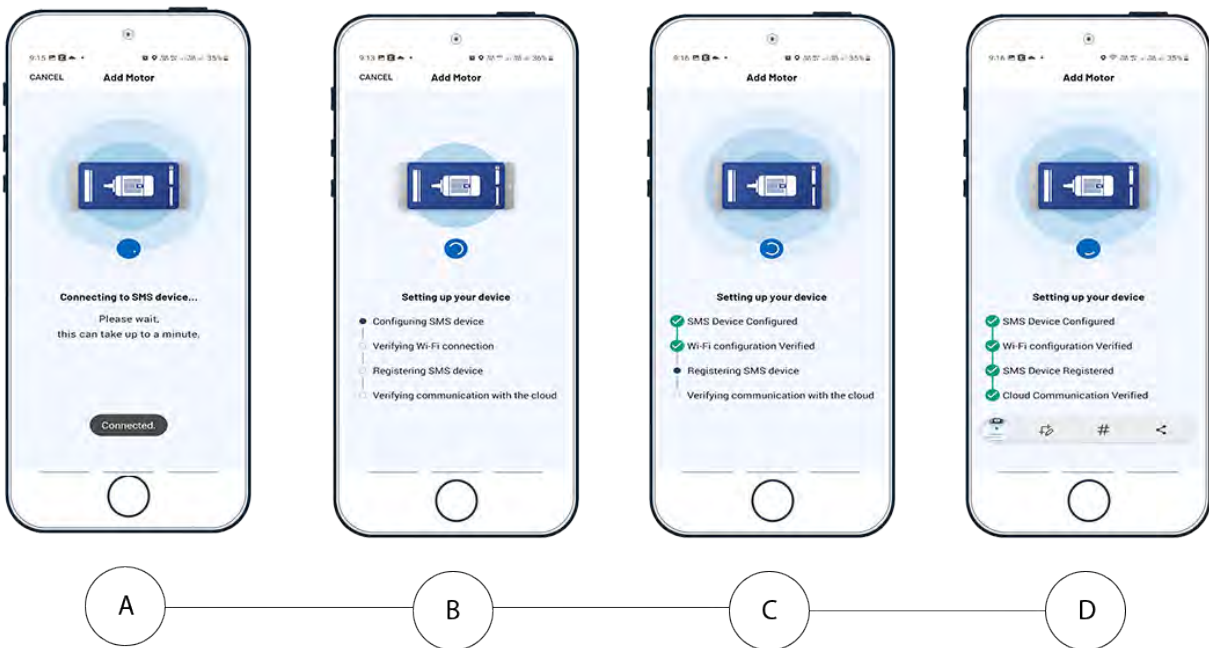


7. Once connected, tap 'Next Step.' The list of available Wi-Fi networks will appear. Select the appropriate option, enter the password and tap Save.

* Note: Only password-protected Wi-Fi networks can be used. When using iOS, if it takes more than 90 sec for the connection to be established, you may see a pop up message asking you if you want to use Cellular data instead of Wi-Fi: select "Keep Trying Wi-Fi".



8. Once SMS is connected to the cloud via Wi-Fi, tap 'Set up Motor Details'.



9. Fill in the motor's details. Start by adding a photo of the motor and its nameplate.



10. Fill in the motor data

- Motor name (TAG): Identification of the motor
- Manufacturer: Enter manually if it does not appear on the list
- Rated Power (kW)
- Rated Voltage (V)
- Number of Poles
- Frequency (Hz)
- Connection
- Drive
- Efficiency level
- Model



Note: The TMSMS application features some pre-filled data. Tap the relevant field to change the information, if needed.



IMPORTANT: Bearing models are required to identify potential problems!

A list with all the motor data is displayed. Confirm or edit as required.

Confirm Motor Details

Motor Name (Tag)
Secondary Water Pump 1

Manufacturer Optional

Brand Name
2 984

Rated Power (Kw)
300

Rated Voltage (V) Optional
300

Number Of Poles
4

Frequency (Hz)
50Hz 60Hz Other

Connection Optional
Star Delta Other

Double-Star

Drive Optional
VFD

Efficiency Level
84.5

Model
1AA46

Check Motor Details

Confirm Motor Details

Confirm details match your motor correctly

Rated Speed (RPM) 3420

Rated Current (A) 7.3

EFF@100% 84.5

Bearing/Manufacturer SKF

Dr Bearing 6206

NDE Bearing 6206

Edit Motor Details

Confirm Motor Details

- A Information requested on the mobile form
- B Needed information not requested on the mobile form

BRAND NAME (H)

Made in P.R.China BRAND NAME STANDARD MOTORS LTD.

3-MOT, 1LE0142-1AA46-4AA4 E 100L P MB3 IP55 LMH-1008 / 800003888993 / 001

D V	F Hz	C HP	L A	I EFF	cos φ	K r/min	EFF.CL
220/380 ΔΔ YY	60	4	12.6/7.3	84.5 %	0.85	3420	IE1
440 Δ G	60	4	6.3	84.5 %	0.85	3420	IE1

N BRG DE 6206 2Z C3 O BRG NDE 6206 2Z C3 Th.Cl. 155(F) AMB 40°C

OCV1104A IEC60034 Net: 33 kg

- A Motor Name (Tag): A name that you give to the Motor.
- B Usually situated at the top of the Motor Plate
- C 1HP (E) = 746W = 0.746Kw
- D Voltage: enter the middle value. For example, 220/380 = enter 300V for a frequency of 60Hz. 50Hz for European countries. 60Hz for USA and Australia
- E In general, the number of poles is situated on the first line with the model. In this case, enter 4 as in 1LE0....A44.

	50Hz	60Hz
2 poles	3000rpm	3600rpm
4 poles	1500rpm	1800rpm
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8 poles	750rpm	900rpm

The rpm value in this table relates to the electrical speed. In this motor plate, the Rated Speed (rpm) relates to the mechanical speed. Thus, for a 60Hz frequency, 3600rpm = 3420rpm. For a 50Hz frequency, 3000rpm = 2920rpm.

- F 50Hz for European countries and Australia. 60Hz for USA, North America and South America
- G This motor plate indicates double-delta (ΔΔ) or double-star (YY) if we go with 300V at a frequency of 60Hz. If we select 440V, we have a Delta connection (Δ).
- H Drive: please ask Maintenance to get this information.
- I Efficiency level (also named Efficiency @100% or EFF @100%): Sometimes, Efficiency level is written as follow IE2-88(100%)-88.5(75%)-87.6(50%). In this case, choose the 100% one i.e. 88.
- J Model: 1AA46
- K Rated Speed (RPM) can also be written:
 - r/min
 - RPM
 - #/min
 - min-1
- L Rated Current (A i.e. Amps): depending on the connection, we enter 12.6 (ΔΔ), 7.3 (YY) or 6.3 (Δ). In this example, we have a double-star connection (YY) therefore we enter 7.3.
- M Bearing Manufacturer: Contact the Motor Manufacturer (Sales Department) or consult the Motor Manufacturer catalogue to get this information
- N Dr Bearing: 6206
- O NDE Bearing: 6206
- P Frame (also named Shaft Height): 100L in this example. Check Motor Manufacturer catalogue to find the information if not on the Motor Plate.

*See Frame References table for NEMA and IEC Motor Plates.
- Q 3 phase induction can be written as follow:
 - 3-MOT
 - 3-
 - PH3

IEC Frame	NEMA Frame
63	42
71	48
80	56 56H

90S	143T 145T
90L	182 184 182T 184T
100	213 215 213T 215T
112	254U 256U 254T 256T
132	284U 286U 284T 286T 284TS 286TS
160	324U 326U 324T 326T 324TS 326TS
180	364U 365U 364T 365T 364TS 365TS
200	404U 405U 404T 405T 404TS 405TS
225 S	444U 445U 444T 445T 447T 449T 444TS 445TS 447TS 449TS
225 M	
250 S	
250 M	

280 S	
280 M	
315 S, 2p	
315 S, 4p-8p	
315 M, 2p	
315 M, 4-8p	
355 S, 2p	
355 S, 4-8p	
355 M, 2p	
355 M, 4-8p	
355 L, 2p	
355 L, 4-8p	

Revision: 98 — Last modified: 2 June 2021

1.7. Fixing the device to the motor

* We recommend you wear gloves when using Epoxy as it's a very strong adhesive!

Most of the time, there are cooling ribs in the frame of the motor, and you will use clamps to fix the SMS to the motor. For motors whose housing does not have cooling ribs, contact your TMAS Sales representative to purchase a specially designed base for the installation of the SMS.

If you are using clamps to fix the SMS to the motor:

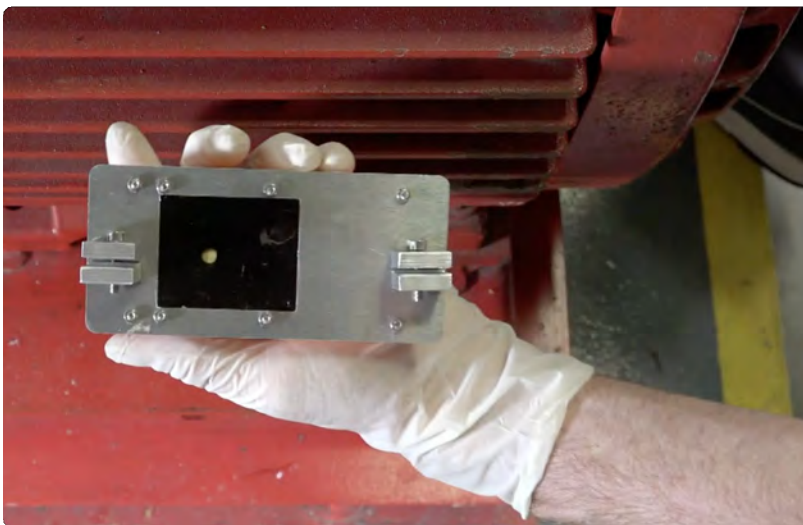
[See tutorial video](#)



- 1. Make sure the batteries are installed in the device and put the case back on, verify that the foam area covers the battery holder – Fig 2.



- 2. Screw the fixing clamps on the base of the device. Make sure they do not exceed beyond the edge of the SMS. Don't completely tighten at this time – Fig. 3.



- 3. Place the device in the back-center area, as shown in the sketch on the SMS case (respect these indications whether the motor is in a vertical or horizontal position) and mark with a pen on the fins where the clamps will be placed – Fig.1.





- 4. Next, sand the surface where the device will be fitted to remove the paint. This surface preparation will improve adhesion – Fig. 4.

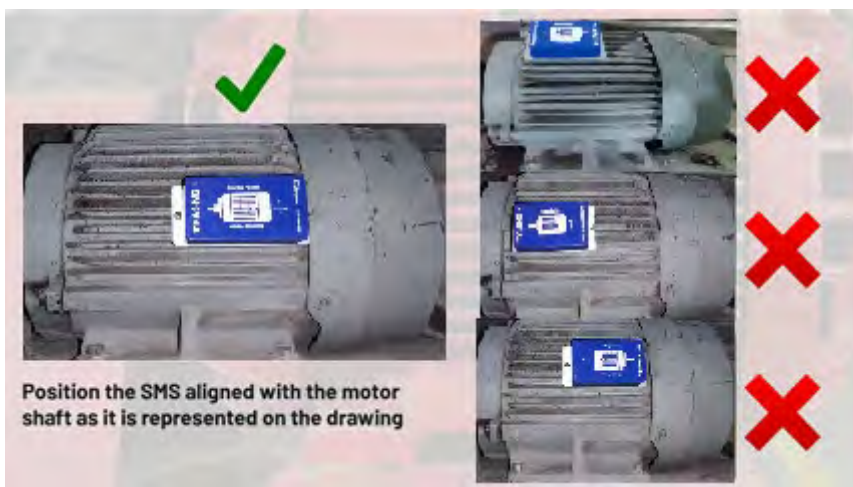


- 5. Make the mixture of the bi-component adhesive on a piece of cardboard. Place adhesive on both sides of the cooling fin in the sanded area where the clamps are to be placed – Fig. 5.

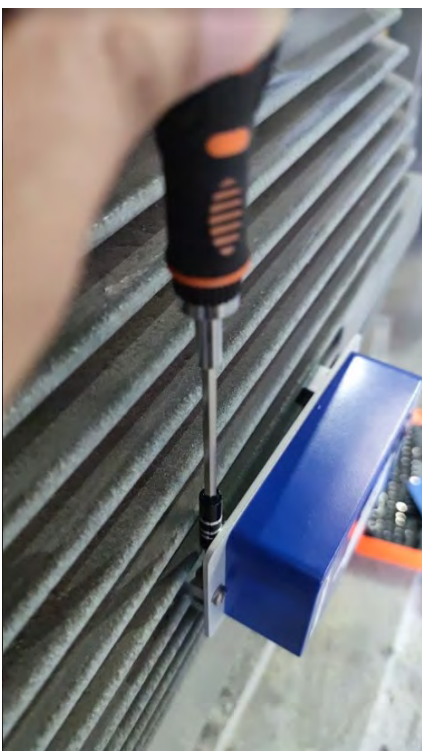




- 6. Place the device on the cooling fins using the fixing clamps. Please take note of the orientation of the device with respect to the motor as indicated on the case – Fig. 6



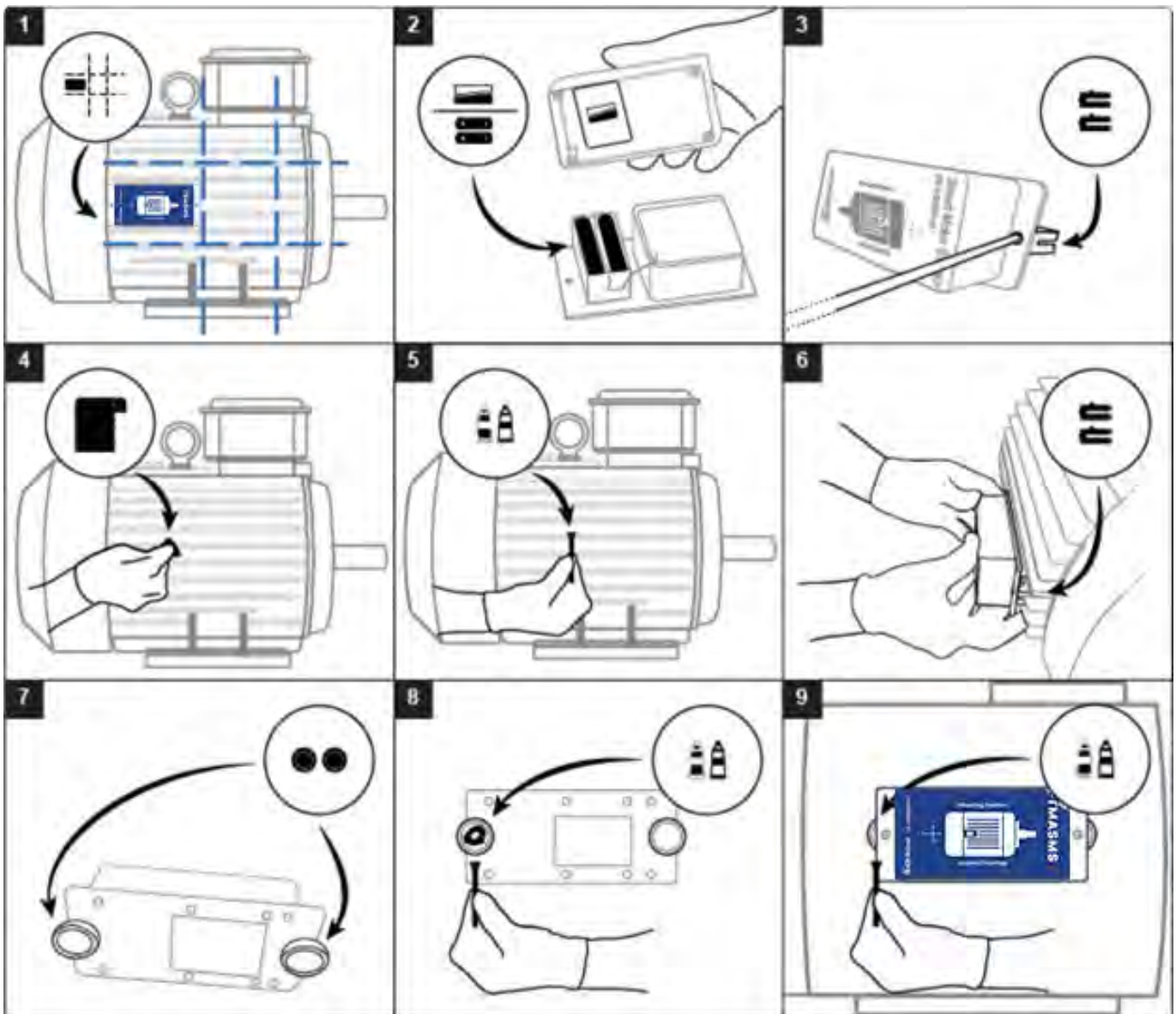
- 7. Tighten the screws on top of the clamps using an Allen Wrench. Using a Philips screwdriver finish tightening the screws to secure the SMS to the clamps.



If your motor doesn't have cooling fins

1. You will need to use a magnetic base – Fig. 7.
2. Screw the magnetic base to the base of the device.
3. Place the device in the back-center area, as shown in the sketch on the SMS case (respect these indications whether the motor is in a vertical or horizontal position) and mark with a pen where magnetic base will be placed – Fig.1.
4. Next, sand the surface where the device will be fitted to remove the paint. This surface preparation will improve adhesion – Fig. 4.
5. Mix the bi-component adhesive mixture and apply it to the magnetic base – Fig. 8
6. Fix the device using the magnetic bases with the bi-component adhesive to the motor housing.

* Note: The adhesive is required in addition to the magnetic base.



Dos and don'ts



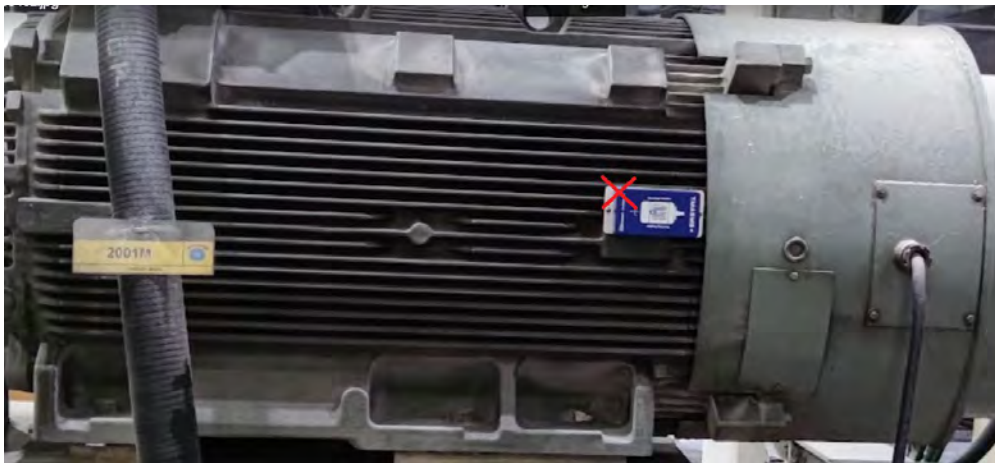
Correct installation of the SMS. Note that depending on the size of the motor, the SMS will take up more surface than what is shown in the sketch on the SMS case.



Device is not placed in the back-center area



Device is not placed in the back area (in regards with the shaft of the motor)



Device is not parallel with the cooling fins and it is laterally-inverted, in relation to the motor shaft. The motor shaft in the sketch must point in the same direction as the real motor shaft.

1.8. Checking device connection

Once the device is installed and configured (Wi-Fi Network – Factory/Plant), the device starts sending data to the cloud server.

You can log into the dashboard and check that the device is visible in a learning mode (it is displayed in blue on the dashboard).

You can also check that the device is correctly sending data to the server by watching the plots of the different sensing modalities collected. To do so, search and select the right motor on the Web application, choose the tab **History Plot**, then the sub-tab **Parameters**. Select any parameter and the date and time corresponding to the moment of the installation: you should see the corresponding waveform.

1.9. Learning Process

The AI requires a learning process about the operation of the motor to 'learn' to predict component faults. During this learning process, the motor should ideally run at all RPM and with all loads that will apply in a typical operation. If this is not possible at the time of installation, you will be able to initiate a re-learning when the time comes by sending a request to the support email address

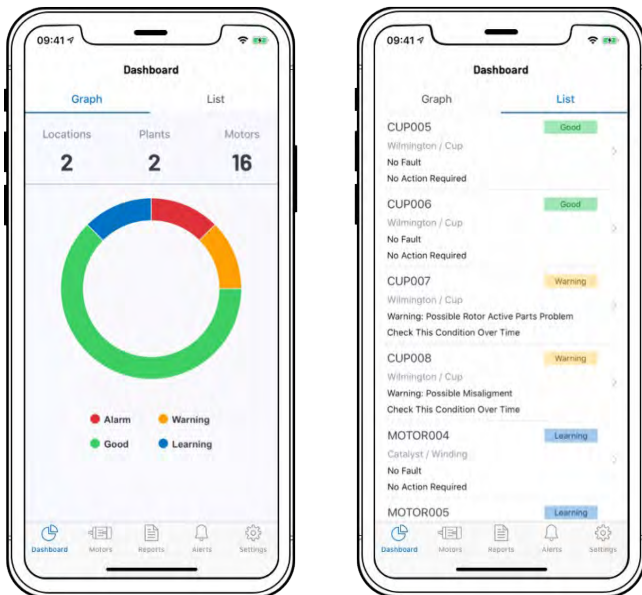
tmsupport@tmeic.co.id .

Likewise, when different RPMs and loads than initially learned are applied during normal motor operation, the AI detects this and raises a Performance alarm. If you want to integrate these RPMs and loads in your model, please request Relearning by contacting our support team at tmsupport@tmeic.co.id: they will add this new data to the existing model of this motor.

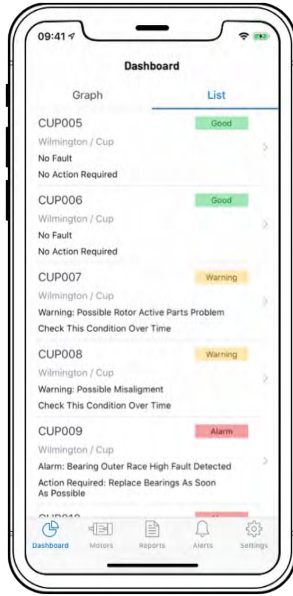
The duration of the learning process varies depending on the type of motor operation, but normally lasts four weeks.

During the learning process, the status indicator on both the mobile application and the web page will remain blue.

* Note: The device **cannot** detect motor faults during the learning process.

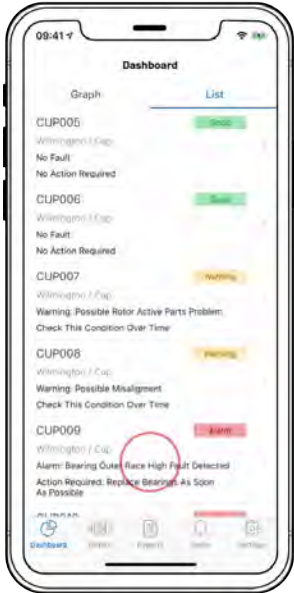


TMASMS will notify about the end of the learning with an email and a push notification in the mobile app. From this point on, the device can detect faults, and the traffic lights will indicate active values.



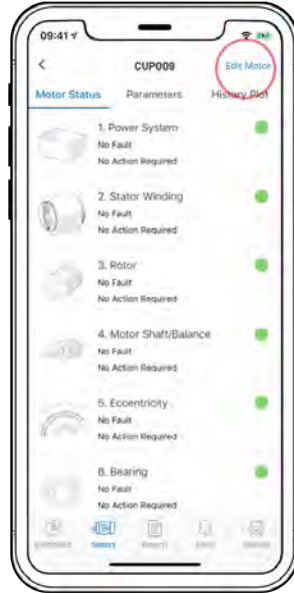
1.10. Repairing / replacing a motor

If the motor (or any of its parts) is repaired, or needs to be replaced, the new part or motor's details need to be updated in the mobile app. Tap 'Edit' to update the necessary fields.



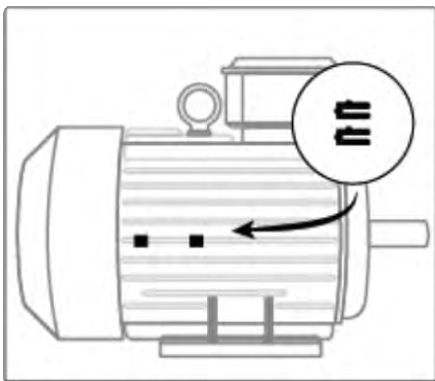
Physical step:

In this example, replace bearings as soon as possible for CUP009.



Request a new set of fixing clamps from your TMAS Sales representative if a new motor is installed.

✿ Note: It is not necessary to replace the fixing clamps in case of repair work.



Once the new or repaired motor is running again, confirm the details in the 'Parameters' screen.



Important: A new learning process is necessary in both cases.

Confirm Motor Details

50Hz 60Hz Other

50

Connection Optional

Star Delta Other

Star

Drive Optional

DOL

Efficiency Level Optional

EFF1

Model

Induction

Check Motor Details

Confirm Motor Details

Confirm details match your motor correctly

Rated Speed (RPM)	1784
Rated Current (A)	172.0
EFF @100%	95.8
Bearing Manufacturer	SKF
Di Bearing	6313
NDE Bearing	6313

Edit Motor Details

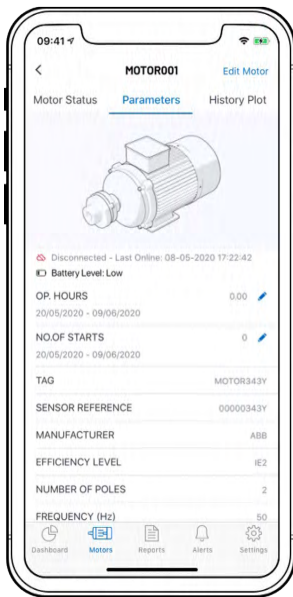
Confirm Motor Details

Revision: 7 — Last modified: 23 July 2020

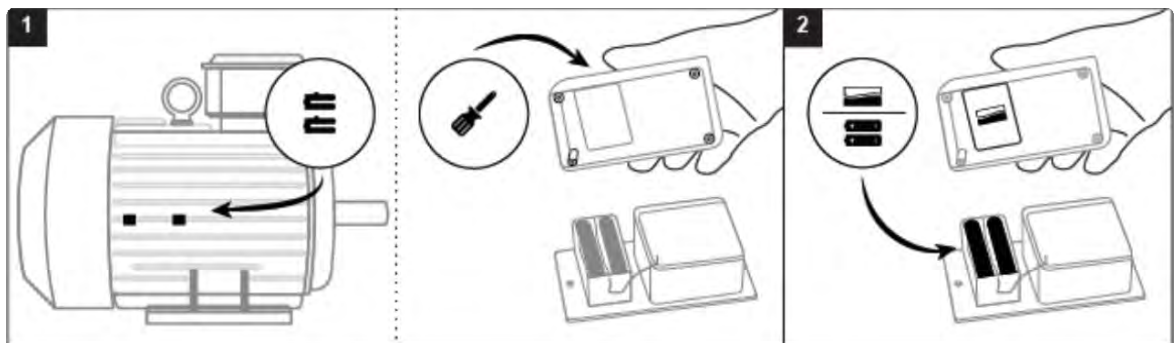
1.11. Replacing the batteries

The Parameters screen, both in the mobile and web applications, displays the battery status. The device will send an email and create a push notification in the mobile app in a low-battery situation.

A low-battery status means that the batteries will need to be replaced shortly. Replace the batteries before they become fully depleted. The SMS requires four lithium batteries with an output of 3000 mAh. We recommend Energizer L91 lithium AA batteries.

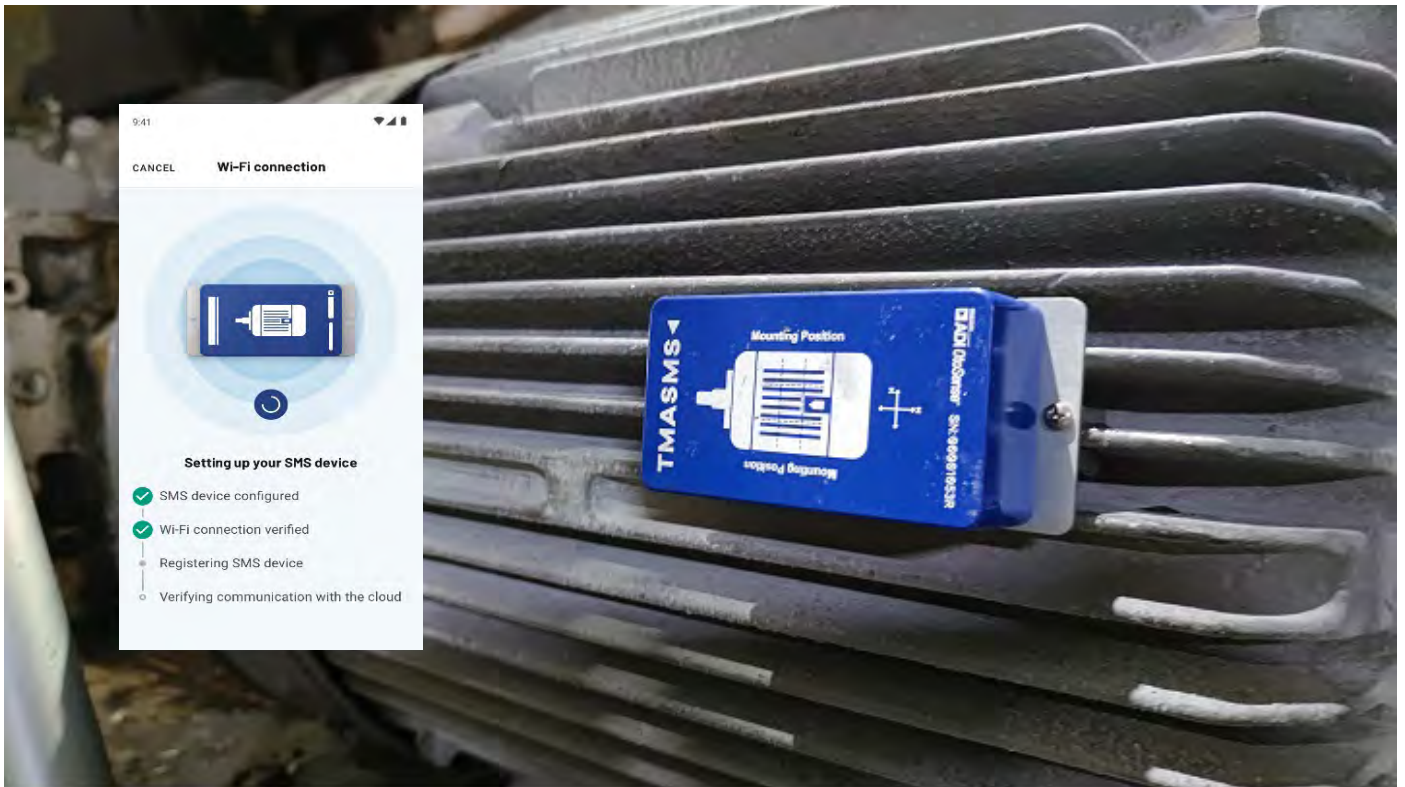


1. To replace the batteries, remove the SMS from the fixing clamps and then remove the device's case.
2. Insert the new batteries and replace the case, ensuring that the foam area covers the batteries. Replacing the batteries does not require any further action or learning process.



1.12. Tutorial Videos

1.12.1. How to commission your Smart Motor Sensor



<https://player.vimeo.com/video/551961335>

<https://player.vimeo.com/video/551961335>

1.12.1. How to install a Smart Motor Sensor on a motor



<https://player.vimeo.com/video/564696194>