

# FAQ

LIVE — Last update: 11 August 2020

otosensesms

# Table of Contents

1. FAQ .....	1
1.1. 1. Types of motors monitored by SMS .....	2
1.2. 2. Mobile app .....	8
1.3. 3. Web app.....	9
1.4. 4. Add a motor .....	10
1.5. 5. Wi-Fi Configuration .....	11
1.6. 6. Static IP .....	12
1.7. 7. Motor details .....	13
1.8. 8. Physical installation of the SMS on the motor .....	19
1.9. 9. Checking the correct operation of the SMS.....	21
1.10. 10. Learning process.....	22
1.11. 11. Fault detection.....	23
1.12. 12. Notifications .....	24
1.13. 13. Motor Status.....	25
1.14. 14. Better understanding SMS.....	26
1.15. 15. Account settings.....	28
1.16. 16. Replacing the batteries.....	29

# 1. FAQ

---

- [1. Types of motors monitored by SMS](#)
- [2. Mobile app](#)
- [3. Web app](#)
- [4. Add a motor](#)
- [5. Wi-Fi configuration](#)
- [6. Static IP](#)
- [7. Add/modify motor details](#)
- [8. Physical installation of the SMS on the motor](#)
- [9. Checking the correct operation of the SMS](#)
- [10. Learning process](#)
- [11. Fault detection](#)
- [12. Notifications](#)
- [13. Motor status](#)
- [14. Better understanding SMS input and output](#)
- [15. Account settings](#)
- [16. Replacing the batteries](#)



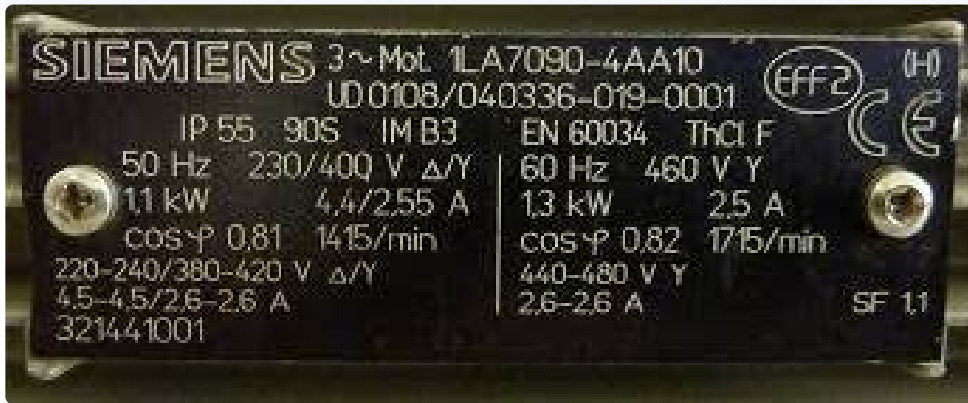
These FAQ are accessible from the mobile app settings.

# 1.1. 1. Types of motors monitored by SMS

**Can the SMS only be installed on new motors or can it also be installed on old motors – already in the field for some years?**

The SMS can be installed on new motors as well as on old motors in the field, even while they are running.

**Can this motor be monitored by SMS? Here is a photo of its nameplate:**



Yes, SMS can monitor this motor because:

- it is a low voltage (<1000V), 3-phase induction motor
- its shaft height is 90S (small)



To make sure the SMS can monitor a given motor, make sure it meets these requirements:

- 3-phases induction motor (look for “3~MOT”)
- Squirrel cage type
- Generally, all IEC or NEMA motors are suitable (on some plates, you may find the mention EN – for European Union – in place of IEC/ICE).
- Low voltage: the supply voltage is less than 1000V
- Motor shaft height (or frame) is from 90 to 400, corresponding to a rated power ranging between 0.37

and 500kW

- Motors driven with frequency inverter or direct to line.

The other type of electrical motors like DC (Direct Current), servomotor and rotor wound motor are not suitable.

Here are examples of motors that can be monitored by the SMS:



Does the SMS work on motors with existing problems?

During the initial learning process, OtoSense AI builds a digital model of the specific motor the box is attached to, considering this as the baseline against which any future comparison will be made. Any further degradation will yield an alert.

We can distinguish two situations at the moment of the installation:

1. There is no symptoms of a serious problem, no imminent breakdown, there may be a minor problem, but nothing that has been identified by your operator: proceed to the installation, the SMS will work normally.
2. There is an identified existing issue and the motor is not running normally: it should be repaired before you install the SMS, otherwise the SMS won't work properly.

**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
De 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.**

Q 3~MOT 1LE0142-1AA46-4AA4 E 100L P M3 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<sup>-1</sup>
- 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** De 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	

## 1.2. 2. Mobile app

---

**What is the name of the mobile app I should download to install a SMS?**

ADI OtoSense SMS.

**What version of the mobile app do I need to install?**

We recommend to download the latest version on the App Store and to update regularly (if automatic updates aren't on).

**Can I use a tablet instead of a smartphone?**

Absolutely, the app work on the iPad as well.

## 1.3. 3. Web app

---

### **What are the supported navigator? Is there any recommended configuration?**

The websites support all modern browsers: Google Chrome, Microsoft Edge, Safari, and Firefox are recommended.

✿ IE 10 and IE 11 are NOT supported.

## 1.4. 4. Add a motor

---

**Can I use the web application to add a motor or do I absolutely need do it with the mobile app?**

The SMS can only be configured with the mobile app.

## 1.5. 5. Wi-Fi Configuration

### **How to configure the device Wi-Fi connection (add Wi-Fi SSID and password)?**

Use the mobile app, tap on the left menu: Motors -> Location -> Plant -> Process, tap on the Add Motor and select Configure Device.

### **What are the requirements for the Wi-Fi network that communicates with the SMS device? I am concerned because our company's Wi-Fi network is restricted.**

TCP/IP port 8883; for using MQTT over SSL

TCP/IP port 443; for using HTTP over SSL

There are no static IPs in SMS.

### **The Wi-Fi network of our company is restricted with ports blocked, can we use any cellular gateway ("hotspot") to provide the Wi-Fi network and connection to the Cloud?**

Yes, please contact your ADI representative to confirm the recommended model of cellular gateway/router.

### **After I configured the SMS Wi-Fi network and added the motor into the account, I cannot detect anymore the Wi-Fi network SMS00000133Z, does the SMS device work properly?**

Yes, it does. During the Wi-Fi configuration of the SMS, the device itself creates a Wi-Fi network (SMS operates like an Access Point, AP mode). This Wi-Fi network's name (SSID) has usually this format: SMS + serial number, e.g. SMS00000037Y. But this SMS Wi-Fi network only appears during 5 minutes, when the user just inserted the batteries and that the SMS cannot connect to the Internet Wi-Fi network.

After the configuration, it's normal that the mobile app does not detect the SMS Wi-Fi network anymore since the SMS connected successfully to the plant Wi-Fi network and is not creating its own Wi-Fi network.

## 1.6. 6. Static IP

---

### **How to configure the sensor a static IP?**

The SMS device uses dynamic IP (DHCP) for the Wi-Fi network by default.

## 1.7. 7. Motor details

---

### Add Motor Details

**When adding a new motor with the mobile app, where can I find the information about the parameters of the motor? Are all these parameters indicated on the motor nameplate?**

Yes, the main information requested to fill on the mobile app about the motor are indicated on the motor nameplate.

**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

De Bearing 6206

NDE Bearing 6206

Edit Motor Details

Confirm Motor Details

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

**BRAND NAME** (H)

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

Q 3~MOT 1LE0142-1AA46-4AA4 E 100L P M3 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<sup>-1</sup>
- 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** De 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



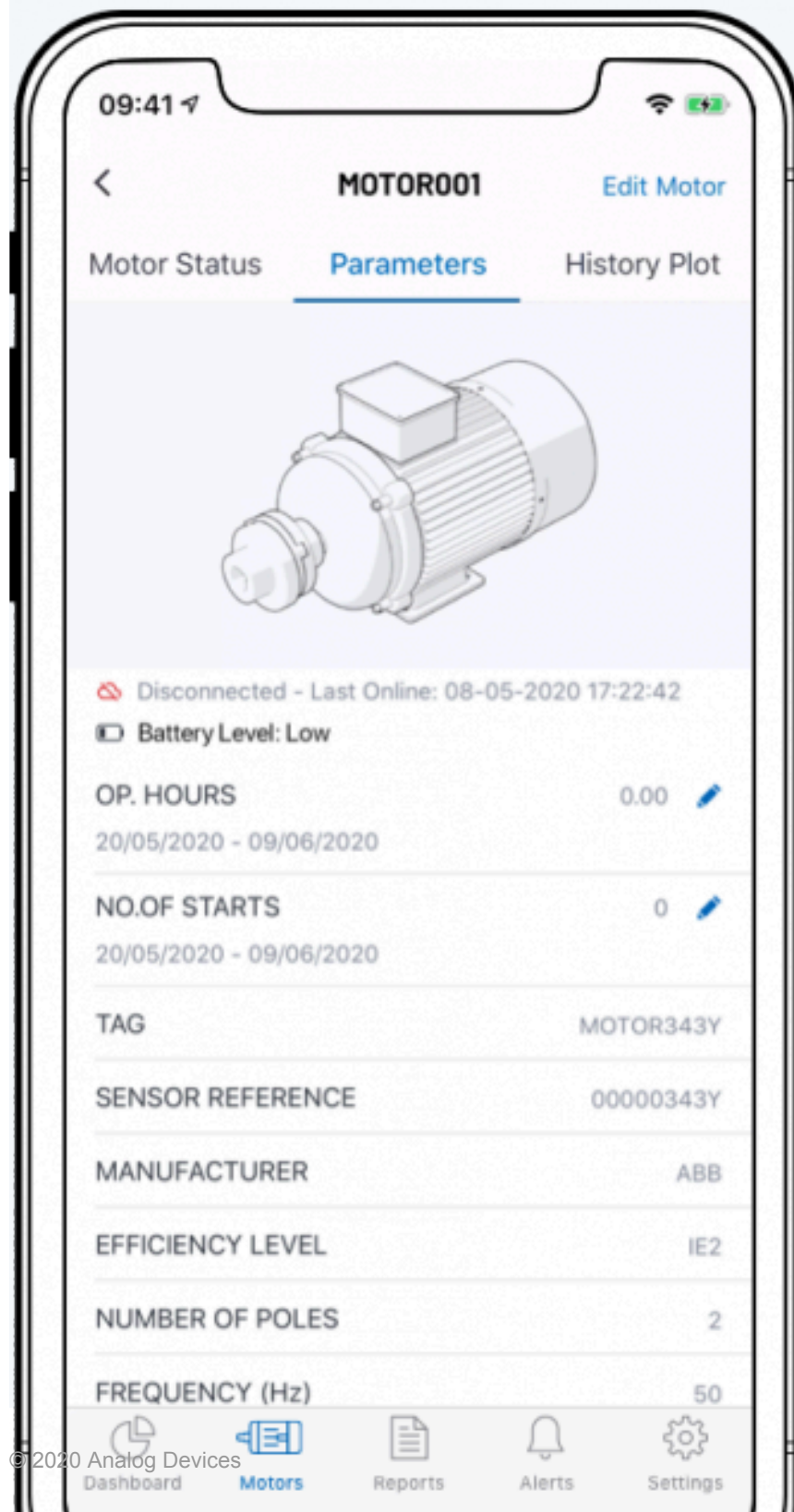
71	48
80	56 56H
90S	143T 145T
90L	182 184 182T 184T
100	213 215 213T 215T
112	254U 256U 254T 256T
132	284U 286U 284T 286T 284TS 286TS
160	324U 326U 324T 326T 324TS 326TS
180	364U 365U 364T 365T 364TS 365TS
200	404U 405U 404T 405T 404TS 405TS
225 S	444U 445U 444T 445T 447T 449T 444TS

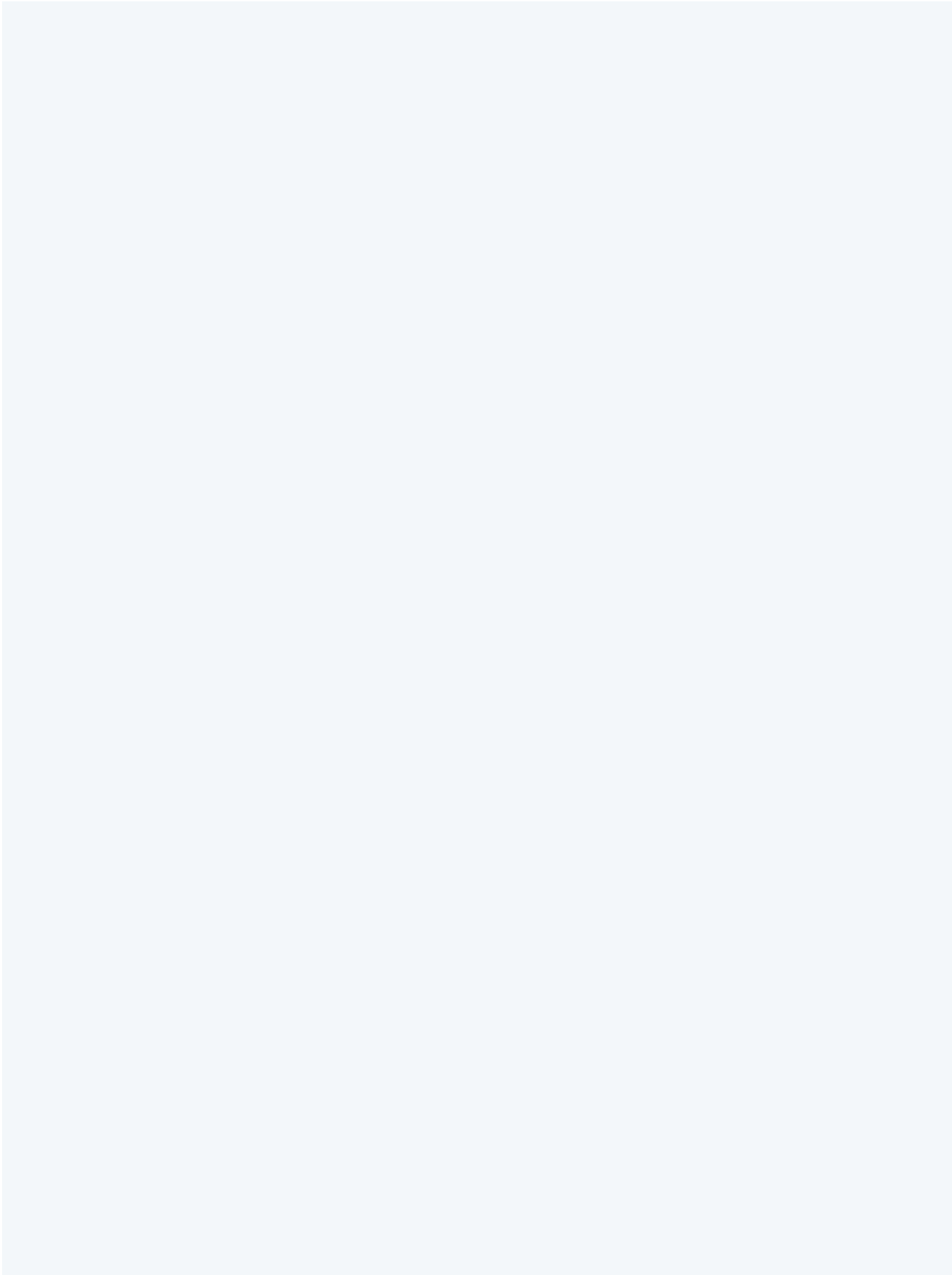
	445TS 447TS 449TS
225 M	
250 S	
250 M	
280 S	
280 M	
315 S, 2p	
315 S, 4p-8p	
315 M, 2p	
315 M, 4-8p	
355 S, 2p	
355 S, 4-8p	
355 M, 2p	
355 M, 4-8p	
355 L, 2p	
355 L, 4-8p	

## Modify Motor Details

**If a motor parameter (like rated current) is not indicated on the list by default, how can I enter it (or modify a wrong information)?**

You can edit the motor details by selecting a motor in the mobile app: you will land on the **Motor Status** tab. Tap **Edit motor** at the top right corner: you will be able to add any missing parameter and confirm your changes.





## 1.8. 8. Physical installation of the SMS on the motor

### Which tools are required to install the SMS device on the motor?

The tools required to install the device are enclosed in the SMS shipping box:

- Sandpaper
- Epoxy
- Fixing clamps and screws

### What are the characteristics of the bi-component Epoxy adhesive used for the SMS installation?

You need to use a metal to metal bonding, with a minimum hardness of D84.

### During the installation, is it necessary to stop the motor?

No, the SMS can be installed with safety on the frame of the motor even when the motor is operating.



The operator who performs the installation needs to be careful as the motor frame can be hot!

### Can we install the SMS on a vertical motor?

Yes, the SMS can be installed on a vertical motor: simply rotate the sketch displayed in the “Fixing the device to the motor” section of the Installation so that it corresponds to the way your motor is positioned.



**Can the SMS be installed on this motor with IP23 since this motor doesn't have heat dissipation fins?**



If the motor doesn't have heat dissipation fins, ask your ADI representative to send you a special installation kit: it's a magnetic base to fix the sensor on the motor frame, as shown on this picture:



## 1.9. 9. Checking the correct operation of the SMS

---

**After provisioning the motor, how can I verify that the SMS is correctly communicating with the OtoSenseSMS cloud?**

You can check that the device is sending data to the cloud by watching the plots of the different sensing modalities collected.

After the end of the provisioning, you can go to the OtoSense SMS web application: search and select the right motor, 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 waveform or FFT of the data collected.

## 1.10. 10. Learning process

---

**I installed the SMS on the motor last Friday and the motor is still in learning stage: when will it complete this learning process and begin to detect the faults?**

Once the SMS device is installed on the motor and its Wi-Fi is configured, the device starts sending data to the OtoSenseSMS cloud. It carries out a learning process about the motor operation to be able to detect its faults. The duration of the learning process will vary depending on the type of motor operation, usually lasting approximately four weeks.

**After replacing the batteries of the SMS, will the previous learning stage data be lost? Is it necessary to go through a new learning phase?**

No, all the motor's data is stored on the cloud, so no need to go through a new learning phase.



## 1.11. 11. Fault detection

---

### **What is the threshold (limit) values to detect the faults and launch alarms?**

The SMS system doesn't use threshold values to detect the faults. For each monitored motor, the SMS system generates its own Machine Learning models, which are used to detect the components failures. Unlike many "classic" monitoring products, you don't need to manually configure any threshold.

### **Can the SMS sensor detect the faults during the learning stage?**

No, the alarm detection feature is activated only after the learning process is completed. So during the learning stage, the SMS sends data to the Cloud, but it will not trigger any alarm status on the motor.

### **What is the difference between the warning status (in yellow) and the alarm status (in red)?**

The warning indicates a change of status on the motor that doesn't require any action from the customer, whereas the alarm indicates that the system has detected a severe fault on the motor that normally requires an action from the customer.

## 1.12. 12. Notifications

---

### **What types of notification are available and how are they sent to the user of SMS?**

Here are the available notifications:

1. Completion of learning
2. Notification of a motor failure
3. SMS device disconnection
4. Recovery of SMS device communication
5. Low battery level

All of them can be configured from the mobile app (Settings -> Notifications) or the web app (user name on the top right corner -> notifications).

You can choose how (email or push notification) to be notified and when.

## 1.13. 13. Motor Status

---

### **What exactly is the component *Performance* in the Motor Status?**

The *Performance* component is used to capture an abnormal state of the engine such as the overall increase in vibrations, the relevant changes in motor RPM, motor load or temperatures, etc. Basically it is used to indicate all faults which do not correspond to any of the other nine fault categories.

## 1.14. 14. Better understanding SMS

### What signals data are sent by the SMS device to the cloud?

The SMS sends the following data:

- Two vibrations signals data: Vibration X (tangential vibration) and Vibration Z (axial vibration)
- One electrical signal: it is the magnetic field generated by the motor
- Two temperatures: one sensor measures the environment temperature and the other measures the motor frame temperature

The vibrations signals and magnetic field signal are acquired with a sampling frequency of 6.25kHz and 15k samplings data points.

You can visualize the plots of this data by selecting a motor and going to History plot -> Performance

### What is the health index?

The health index represents an evaluation of the state of each fault category, and goes from 0 to 10: the closer to 0 the result, the worse the condition of that component, and the closer to 10, the better.

red: 0-4

yellow: 5-6

green: 7-10

### Can you explain the type of faults detected by SMS?

The SMS can identify nine components of the motor as origin of the faults.

#### 1. Power system

Electrical: Problems in the three phases of the power supply, which can generate an imbalance of the motor currents. *E.g. Loss phase*

#### 2. Stator Winding

Electrical: Problems in one of the phases of the motor, which can generate an imbalance of the motor currents. *\_E.g. Coil short circuit \_*

#### 3. Rotor

Electrical: Short circuit rings problems. *\_Eg.. Broken rotor bar \_*

#### 4. Motor Shaft / balance

Mechanical: Unequal distribution of mass that causes the load to shift from the center of rotation. *E.g. Rotor flexion.*

#### 5. Eccentricity

Mechanical & Electrical: Asymmetric air gap between the rotor/stator *\_ E.g. Bent shaft; Improper bearing installations \_*

## 6. Bearing

Mechanical: Mechanical stresses or contamination can lead to small cracks or defects that occur in the bearing, creating vibration problems. *E.g. Pitting*

## 7. Misalignment

Mechanical: Occurs when two rotating shafts (motor and the load) are not aligned, external misalignment. *E.g. Pulleys misalignment*

## 8. Cooling System

Temperature: Applicable to motors cooled with an external fan. Can determine problem with the fans attached to the shaft or externally attached to the motor. *E.g. Fan cover collapsed*

## 9. Loose foot

Mechanical: Structural looseness occur when the motor base or connection to the motor base are not properly tightened. *E.g. Motor not fixed to the base frame.*

## 1.15. 15. Account settings

---

### Can we create other users account for our colleagues?

Yes, the customer user with the Administrator level can enter the **Manage Users** menu and invite other users to review the same motors data.

## 1.16. 16. Replacing the batteries

---

**We need to replace the SMS batteries, which model of battery is recommended for the replacement?**

The recommended batteries are Energizer L91 lithium AA batteries. You will need 4 batteries per device.

**After replacing the batteries of the SMS, will the previous learning stage data be lost? Is it necessary to go through a new learning phase?**

No, all the motor's data is stored on the cloud, so no need to go through a new learning phase.