airius

WIRELESS VIBRATION SENSOR

INSTRUCTIONS

SPM

CONTENTS

Technical data subject to change without notice.
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1. SAFETY

This sensor must only be installed, used and maintained by competent personnel. Such personnel shall have undergone training that included instruction on the various types of protection and installation practices, the relevant rules and regulations, and on the general principles of area classification. Appropriate refresher training shall be given on a regular basis (see EN 60079-17).

The installation, use and maintenance of this sensor must comply with the appropriate European, national and local regulations, which may include reference to the IEC standards IEC60079-14, IEC60079-17 and IEC60079-19. In addition, particular industries or end-users may have specific requirements relating to safety (or health) and these requirements should also be met. Instructions and specifications issued by the manufacturer must be followed.

Warning – Use only SPM 18425 battery.

Immediately remove the sensor from Ex-hazardous areas if safety is questioned or compromised. Return the product to SPM Instrument AB for examination.

For configuring the Airius sensor, only certified mobile devices are allowed to be used in Ex-hazardous areas.

The batteries are classified as dangerous goods, when transported. Transportation of batteries must be in full compliance with the appropriate regulatory provisions. UN3090 is applicable for the batteries and UN3091 is applicable when the battery is contained in the sensor.

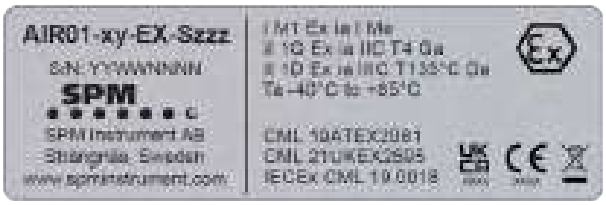
1.1 SPECIAL CONDITIONS FOR SAFE USE

None.

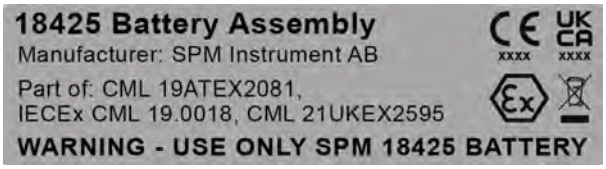
1.2 MARKING AND LIST OF STANDARDS

I M1 Ex ia I Ma
II 1G Ex ia IIC T4 Ga
II 1D Ex ia IIIC T135 °C Da
Ta –40 °C to +85 °C
CML 19ATEX2081
CML 21UKEX2595
IECEx CML 19.0018

Standards are listed in the EU Declaration of Conformity.



Sensor marking.



Battery marking.

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2. DESCRIPTION

The battery-powered wireless sensor AIR01-EX, which enables wireless condition monitoring in potentially explosive atmosphere, measures acceleration in three directions, and temperature. For remote communication, Wi-Fi and Bluetooth are used. An external push button and three RGB-LEDs are local user interfaces.

The product enclosure consists of a metal body and an ESD-protected plastic lid. To enable battery replacement, the lid is removable. Screw or glue installation on a machine is performed with an installation foot. Depending on the installation foot and place of installation, the metal body may be earthed or unearthed.

There are different versions of AIR01-EX, specified as AIR01-xy-EX-Szz, where variations do not affect Ex safety. The letters 'xy' denote measurement performance (e.g. frequency bandwidth) and 'Szz' denote variations of operating software.

AIR01-Ex is a member of the Airius family of wireless sensors. The Airius sensor is compatible with both Condmaster.NET, the application providing easy access to measurement data through a user-friendly interface, and the analysis and diagnostic software Condmaster Ruby.

The SPM Connect app, downloadable for mobile devices, is used to configure the parameters required for connection to Condmaster Entity Server (CES) or SPM Cloud.

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3. TECHNICAL SPECIFICATIONS

Approvals/Certificates:	CE, ATEX, IECEX, UKEX, FCC, Canadian RSS, China MIIT, Japan MIC, Korean CRM, Taiwan NCC, WiFi Alliance, Bluetooth SIG
Enclosure:	stainless steel body, acid proof; plastic lid, ESD protected
Weight:	215 g
Power supply:	replaceable lithium battery, SPM 18425 only
Battery capacity	13 Wh[1]
Battery shelf life	12 months[2]
Acceleration measurement:	See part numbers: Range, Resolution Bandwidth, Resolution
Temperature measurement:	
Range	–40 °C to +85 °C (–40 °F to +185 °F)
Resolution	0.1 °C
Accuracy	+/– 2 °C
Ambient temperatures:	
Operational	–20 °C to +85 °C (–4 °F to +185 °F)
Ex safety	–40 °C to +85 °C (–40 °F to +185 °F)
Storage	–40 °C to +85 °C (–40 °F to +185 °F)
Protection class:	IP69
Relative humidity:	0 to 100% (non-condensing)
Wi-Fi:	802.11 b/g/n, 2412 MHz-2472 MHz, 19.9 dBm
Wi-Fi Security:	WPA/WPA2 PSK/WPA2 Enterprise (PEAP-MSCHAPv2 and TTLS-MSCHAPv2 without certificates)
Bluetooth:	v4.2 BLE, 2402 MHz-2480 MHz, 2.7 dBm
Antenna:	Internal PCB antenna only, 3.7 dBi
Installation:	Installation foot, glue (Loctite 326 and activator Loctite 7646) or screw (M4, M6, M8, UNF ¼")

[1] Battery cell capacity is 13Wh. Affected by ambient temperature, current profile of load and shelf life above 12 months. Active sensor power consumption increases by Radio (Wi-Fi or BL) low signal strength or high traffic intensity.

Typical capacity cases:

- Four measurements per day for four years, ±0 to +40 °C, RSSI ≥ –70 dB. Sleeping sensor power consumption is increased by high ambient temperature.
- Eight years of sensor deep sleep only, ±0 to +40 °C.

The sensor calculates the remaining number of measurements based on; time from manufacture, time spent in configuration mode (BL), time between measurements, ambient temperature and Wi-Fi signal strength (RSSI).

[2] Battery Shelf Life is 12 months. After 12 months the battery capacity might be reduced. Ongoing long-time tests are performed, with the aim to prove an expected longer battery shelf life.

Part numbers

AIR01-01-EX	Airius Ex sensor, 2/4/8 g, 16 bits, 10-1000 Hz, 800/1600 lines
AIR01-10-EX	Airius Ex sensor, 2/4/8/16 g, 16 bits 10-5000 Hz, 800/1600 lines or Airius Ex sensor, 10/20/40 g, 20 bits 2-1000 Hz, 800/1600 lines

Accessories

18470	Installation kit (installation foot, M4 screw, M4 washer, M6 screw)
18471	Installation kit (installation foot, M8 screw)
18466	Installation foot, glue installation

Spare parts

100065	Ex spare part kit (battery, lid with gasket, 4 pcs M3x8 screws)

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4. INSTALLATION OF AIRIUS EX SENSOR

Installation must only be performed by competent personnel. There are two methods for installing Airius Ex sensors, either by screw installation or glue installation. Position the sensor in such a way that it can optimally perform measurements while having good Wi-Fi signal strength.

Item	Installation			Machining		
	Tool	Screw torque	Sensor torque	Drill/Counterbore	Drill min. depth	Thread min. depth
Sensor	Wrench 30 mm	-	-	-	-	-
Foot	Wrench 24 mm	-	-	30 mm	-	-
Installation foot screw						
M4 with washer	Hex 3 mm	2 Nm	2 Nm	3.3 mm	15 mm	12 mm
M6	Hex 5 mm	7 Nm	7 Nm	5.0 mm	15 mm	12 mm
M8	Hex 6 mm	17 Nm	7 Nm	6.8 mm	15 mm	12 mm
UNF ¼"-28	Hex 3/16"	8 Nm	7 Nm	5.5 mm	15 mm	12 mm
Fixing screws for lid (battery replacement)						
Sensor lid	Torx T10	0.5 Nm	-	-	-	-

4.1 SCREW INSTALLATION

1. Drill a screw hole where the sensor should be placed.
2. Drill a counterbore with 30 mm diameter on the machine.
3. Align the longest flat side of the installation foot with the x-axis of the intended measurement direction.
4. Screw the installation foot onto the machine. See table for screw torque.
5. Screw the sensor onto the installation foot. See table for sensor torque.
6. Check that the marking of the sensor aligns with the intended measurement directions. If the markings are not aligned with the intended measurement directions, adjust the installation foot.

   NOTE: There are markings for z, x and y on the sensor, indicating the directions of the measurement.

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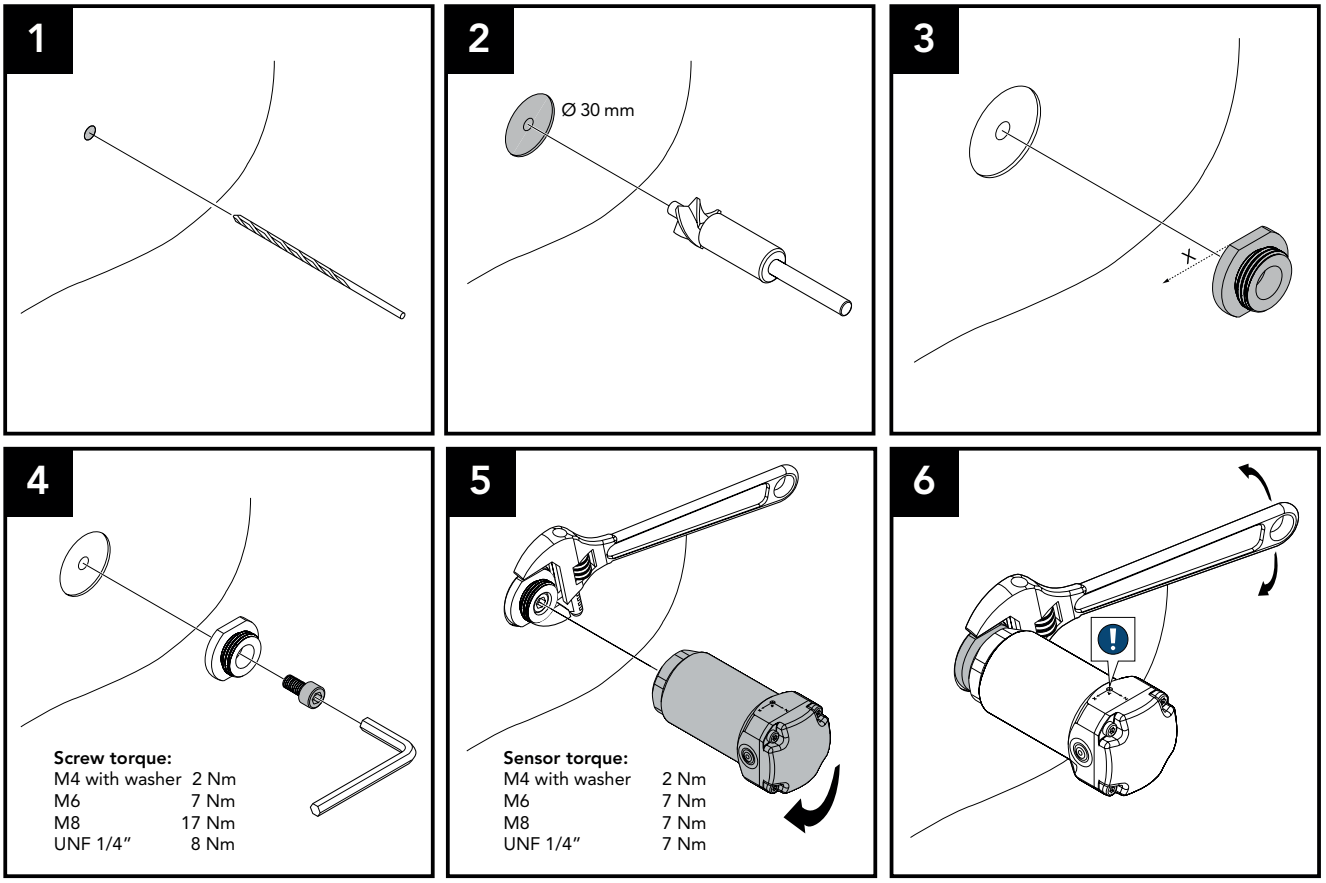

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4.2 GLUE INSTALLATION

1. Drill a counterbore with 30 mm diameter on the machine where the sensor should be placed.
2. Screw the sensor onto the installation foot. Tightening torque: 7 Nm.
3. Apply glue (Loctite 326) and activator (Loctite 7649) to the installation foot.
4. Check that the markings of the sensor align with the intended measurement directions. Press the sensor onto the flat surface. Hold steady for three minutes.

   NOTE: There are markings for z, x and y on the sensor, indicating the directions of the measurement.

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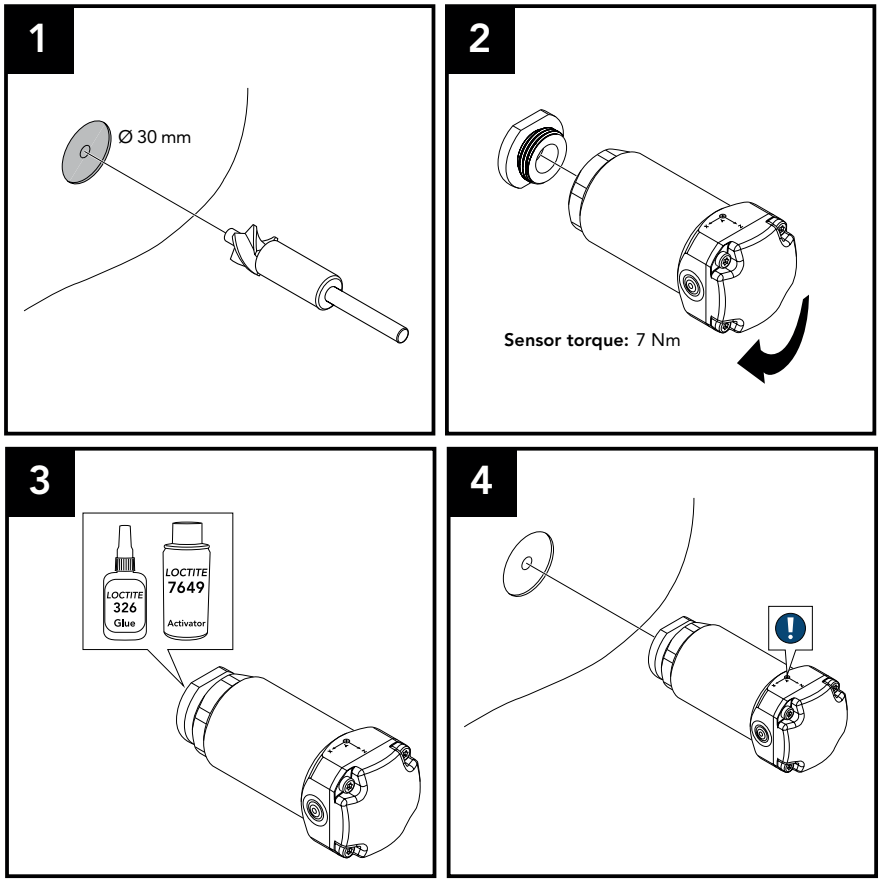

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5. SENSOR OPERATION

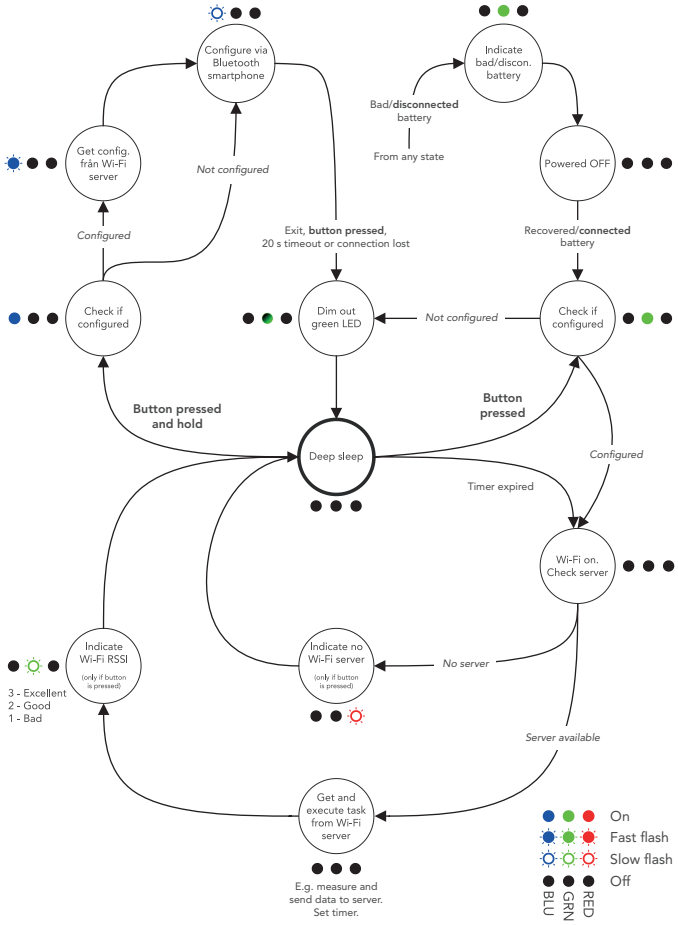
LED indication and push-button management are shown in the functional state diagram to the right.

5.1 RESET TO FACTORY DEFAULT

Press and hold the internal push button while the battery is reconnected. Factory default clears all settings and reverts to the software installed during factory production.

5.2 CLEAR SETTINGS VIA THE SPM CONNECT APP

Clear settings continue to use the latest software while all settings are cleared. For more information, see chapter '*Setting up Airius with SPM Connect*'.



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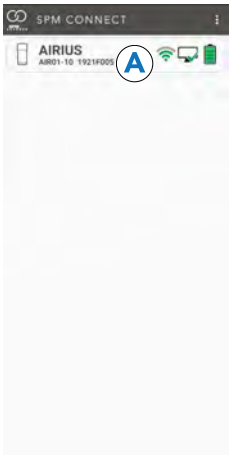
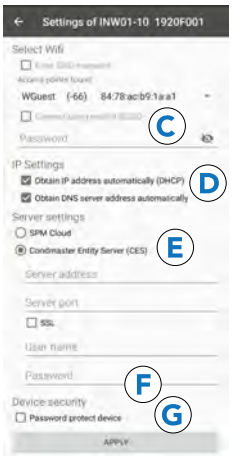
5.3 SETTING UP AIRIUS WITH SPM CONNECT

1. Download the SPM Connect app via App Store or Google Play.
2. Press and hold the button on the Airius sensor until it lights blue.
3. Open the SPM Connect app.
4. Swipe down to search for a sensor. Choose a sensor in the list (A).
5. Select **Configure** (B).
6. Choose Wi-Fi from the list and enter a password (C). To connect to a hidden network, select **Enter SSID manually**.
7. Choose dynamic ("**Obtain IP address automatically (DHCP)**") or static IP addressing (D). If static, enter IP address.
8. Choose **SPM Cloud** or **Condmaster Entity Server (CES)**, depending on the method of connection. Enter server address, server port and whether SSL should be activated or not (E).
9. To create a password for the sensor, select **Password protect device** (F).
10. Select **APPLY** (G).
11. To perform a function and connection test, press the button on the sensor. Immediate green flashing means that the sensor works. When the connection to the server is successful, the sensor flashes green. The number of flashes corresponds to the Wi-Fi signal strength (1-3). If the connection is unsuccessful, the sensor lights red.
12. Follow the steps in '*Setting up vibration measurements in Condmaster Ruby*' or '*Setting up vibration measurements in Condmaster.NET*', depending on your software.





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5.4 SETTING UP VIBRATION MEASUREMENTS IN CONDMASTER RUBY

1. Go to the **Graphical Overview** tab and select **View as tree** in the ribbon bar.
2. Expand Components.
3. Right-click **Components**, choose **Create** and select **Component**.
4. Enter component number and name.
5. Select **Save**.
6. Right-click the created component, choose **Create** and select **Measuring point**.
7. Enter Measuring point number and name.
8. Choose a vibration measurement technique (Vibration, 2 or 3 channel vibration, or ISO 10816) and select **Add**.
9. Choose **Online** under Instrument, choose settings as desired and select **OK**.
10. Go to the **Online** tab, select the Airius sensor and direction (z, x or y) under Address. Select **OK**.
11. Go to the **Settings** tab, name the assignment and edit the settings as desired.
12. For settings regarding conditions and filtering of results, go to the **Online Advanced** tab.
13. Go to **RPM** and enter fixed or variable speed (as a global value).
14. Select **Save**.

For further information regarding these steps, see chapter '*Setting up measuring assignments for Airius Ex vibration sensors*' in the '*Condmaster Ruby User guide*' (72261).

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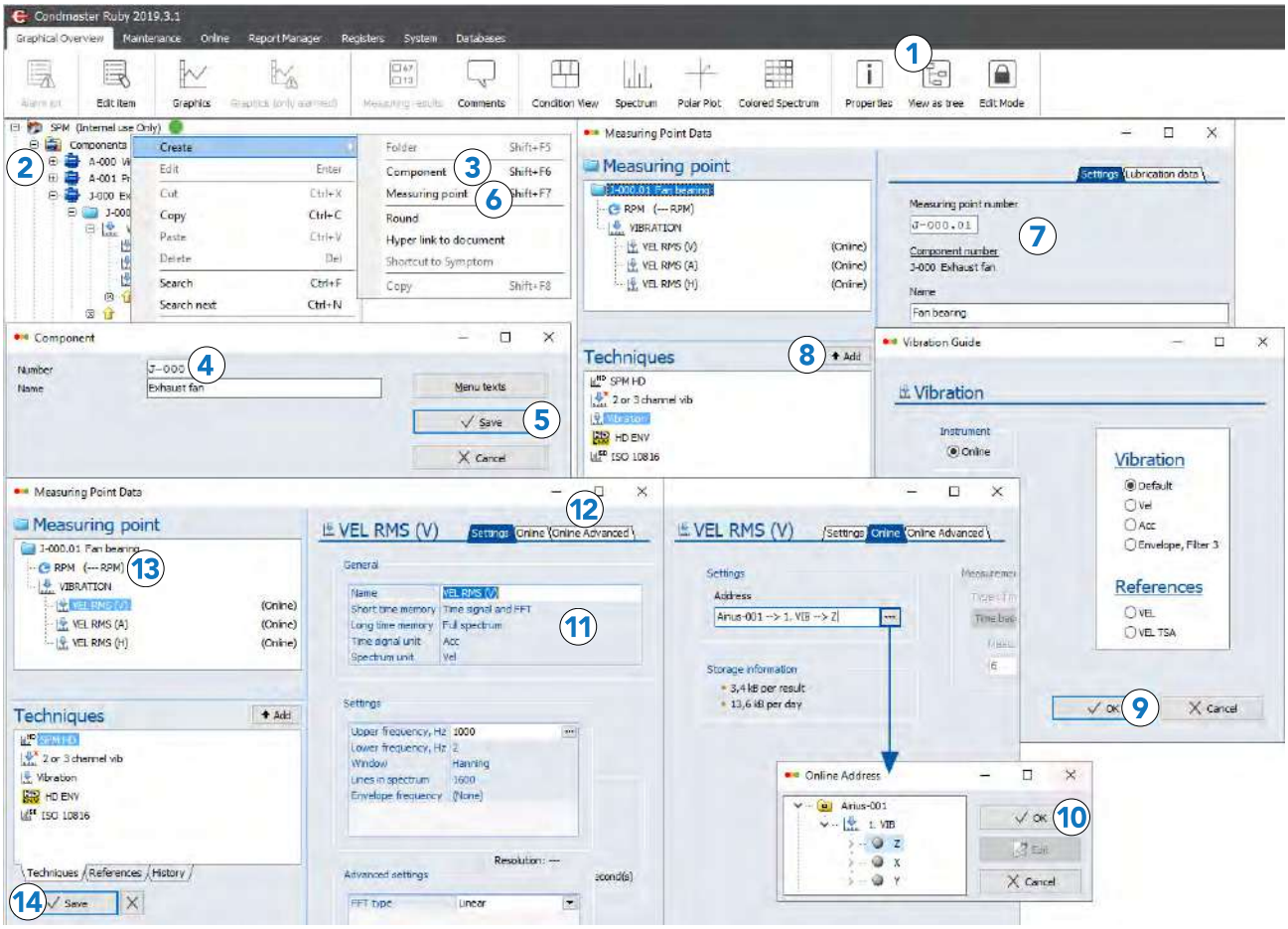

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5.5 SETTING UP VIBRATION MEASUREMENTS IN CONDMASTER.NET

1. Open Condmaster.NET and log in. If required, choose a database.
2. Select **Settings**.
3. Select **Components**.
4. Select **Add**.
5. Enter the component details.
6. Select **Create**.
7. Select **Measuring points**.
8. Select **Add**.
9. Enter the measurement point details.
10. Select **Create**.
11. Enter a name for the measuring assignment.
12. Choose a sensor under Measuring device.
13. To edit measuring interval, operational hours or measuring range for the Airius sensor, select **Edit device settings**.
14. Select the axes (**z**, **x**, **y**) to be measured.
15. Choose frequency range.
16. Choose spectrum unit.
17. Set alarm limit for each condition parameter that should have an alarm limit.
18. Select **Create**.

For further information regarding these steps, see chapter 'Getting started' in the 'Condmaster.NET User guide' (72239).

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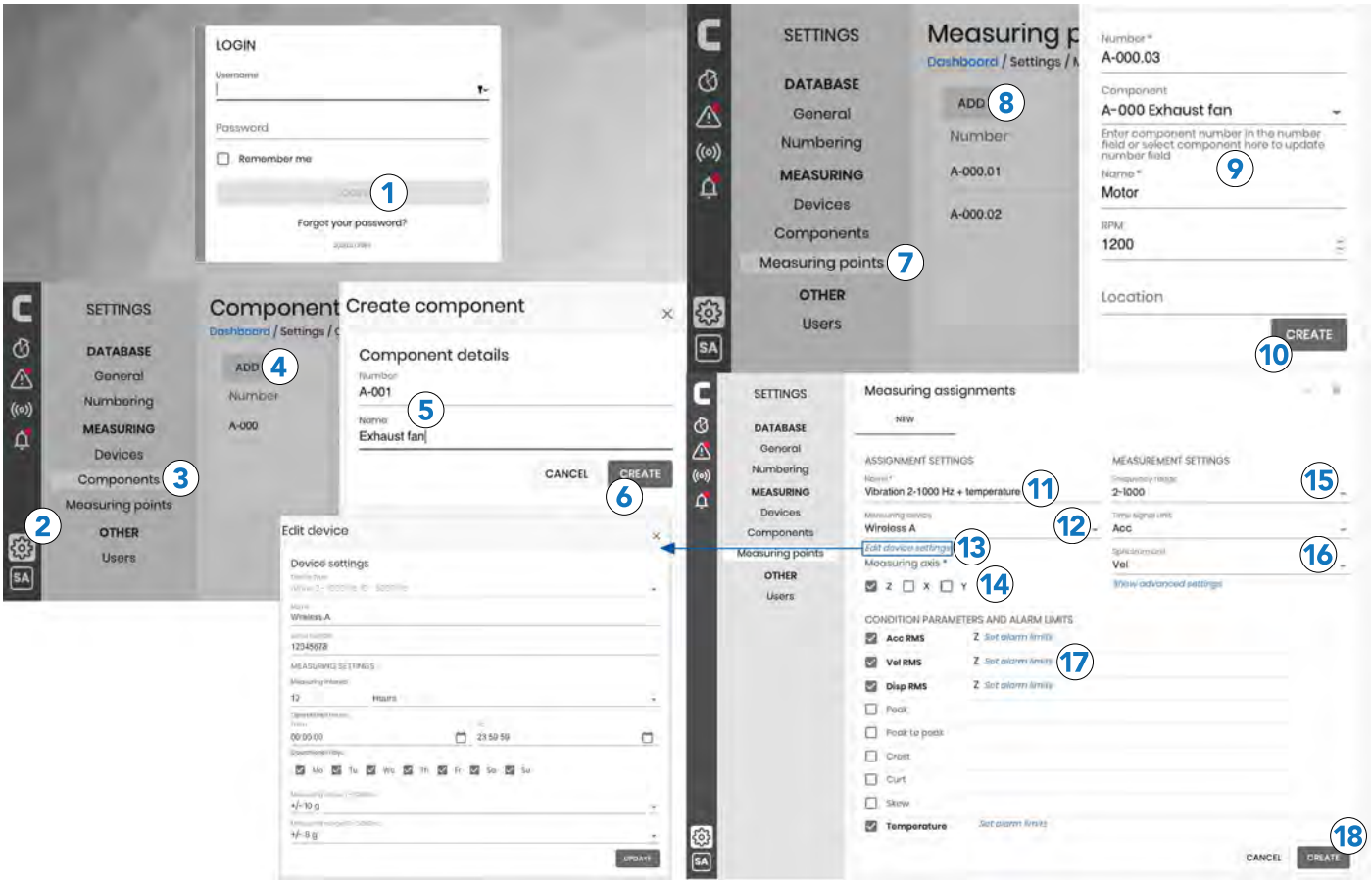

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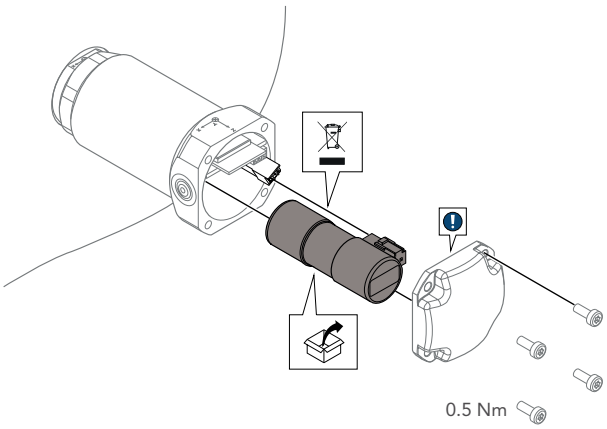
6. MAINTENANCE AND SERVICE

The installed sensor may only be maintained, inspected or repaired by competent personnel.

Immediately remove the sensor from Ex-hazardous areas if the safety is questioned or compromised. Return the product to SPM Instrument AB for examination.

Battery assembly, lid and screws may be replaced. All other repair measures may only be performed by SPM Instrument AB. To clean the external surfaces of the product, wipe the enclosure with a damp cloth and mild detergent. Always take necessary ESD precautions when the sensor is maintained or repaired.

6.1 BATTERY REPLACEMENT



1. Loosen the screws and remove the lid.

   Note: Observe the position of the lid.

2. Remove the battery and disconnect the plug.

   Note: If the battery is stuck, carefully pull the cables or use a long thin hook.

3. Connect the plug and insert the new battery.

   Warning: Use only SPM battery.

4. Carefully press down the plug and cables below the top of the battery.

5. Clean the surfaces between the lid and the sensor body.

6. Screw on the new lid with new screws. Tightening torque: 0.5 Nm.

   Note: Ensure the lid protrusion is above the battery.

7. Ensure the battery health indicator is aware of the battery replacement. For more information, see chapter '*Setting up measuring assignments for Airius Ex vibration sensors*' in the 'Condmaster Ruby User guide' (72261) or '*Getting started*' in the 'Condmaster.NET User guide' (72239), depending on your software.

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This product must be disposed as electronic waste and is marked with a crossed-out wheeled bin symbol in order to prevent it being discarded with household waste.

When the life cycle of the product is over You can return it to Your local SPM representative for correct treatment, or dispose it together with your other electronic waste.

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