

# AFix: industrial air-cooling maintenance software

- Besnate, November 2022 -



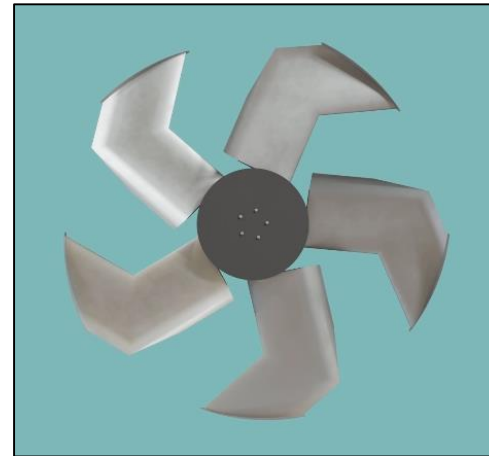
# Company Presentation

***Axial Fans Int S.r.l.** is an international company, based in Besnate, Italy, since 2009. It is a leader in design and manufacturing of axial fans for industrial applications, related to air-cooling systems such as cooling towers or air fin heat exchangers. In particular, the company is specialized in low noise and high efficiency solutions.*

*Our patented products are currently installed in thousands of plants worldwide, operating in critical environments and challenging climates.*



*SML Solution*



*Stealth Solution*

# Industrial Applications

*Our axial fans are mainly installed in cooling plants located at refineries, petrochemical plants, power stations, resulting in with the consequence that numerous fan units have to be managed and maintained*



*Need for a cloud-based software tool to record and catalogue large amounts of data and information in order to improve the management of fans installed at plants*



# Solution

## *Management application software: OpenMaint*



### *Reasons for our choice:*

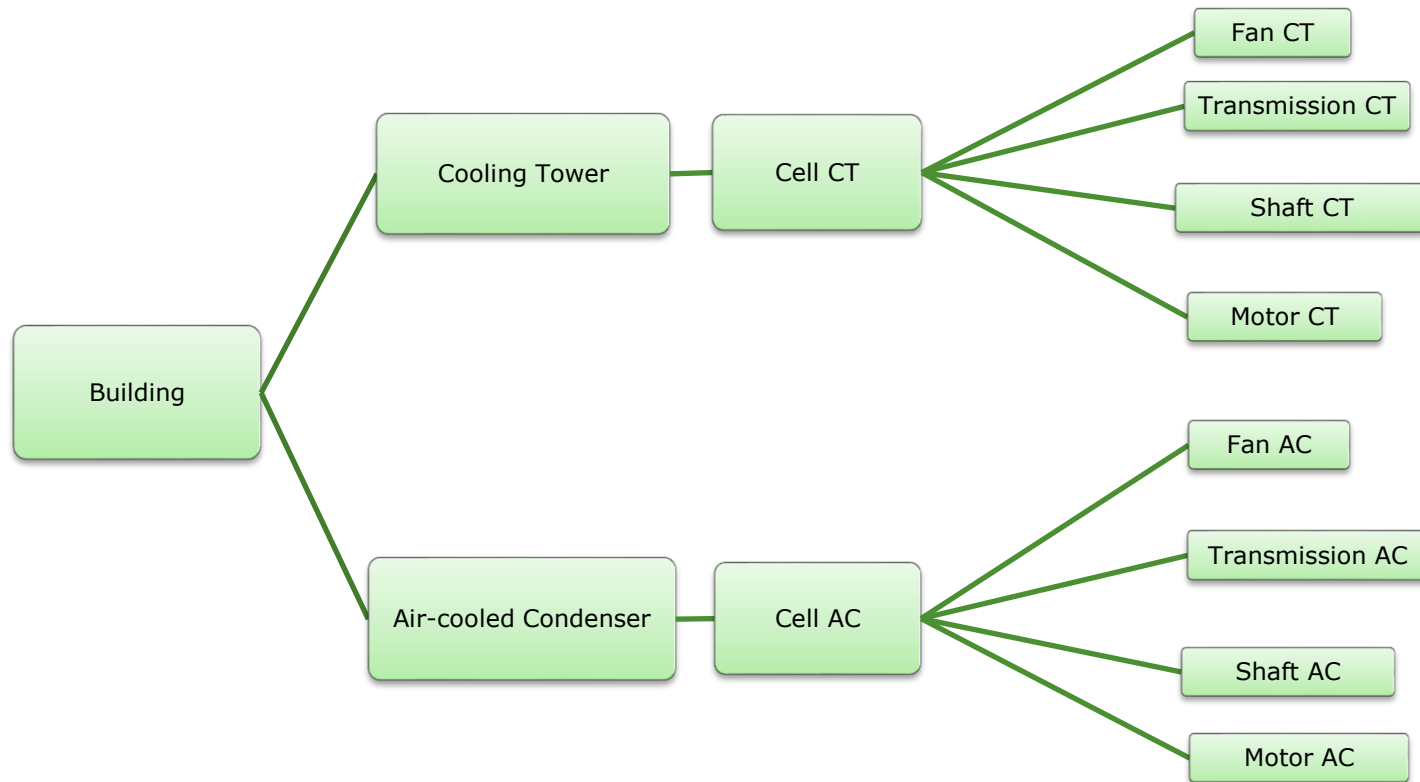
- *Full-featured application*
- *Flexible and customizable*
- *Adaptable to multiple context*



## *Data management*



# Plant Tree Diagram Organization



*Based on this, ad hoc data management data sheets were generated, taking advantage of the existing master data and customizing it to our needs*

# Building

The screenshot displays the 'Axial Fans Int S.r.l.' software interface. The top navigation bar shows the company logo and name. The left sidebar contains a 'Navigation' menu with categories like 'Global search', 'Facilities and assets', and 'System architecture'. The main area is titled 'Cards Building' and features a search bar and a table of building cards. The table has columns for Code, Name, Main use, Address, ZIP Code, and City. Below the table, there are tabs for 'Card', 'Details', 'Notes', 'Relations', 'History', 'Emails', and 'Attachments'. The 'Card' tab is active, showing a detailed view of a building card with sections for 'General data' and 'Location data'. The 'General data' section includes fields for Code, Name, Main use, Company, Customer employee, and Internal employee. The 'Location data' section includes fields for Address, ZIP Code, and City. There are also 'includes (0)' sections. On the right side of the card view, there are buttons for 'Dossier' and 'Service status'. The footer of the interface contains the website URL 'www.openmaint.org', 'Info', and 'Copyright © Tecnoteca srl'.

Code	Name	Main use	Address	ZIP Code	City

**General data**

Code	Name
Main use	Company
Customer employee	Internal employee

**Location data**

Address	ZIP Code
City	

includes (0)

includes (0)

# Air-cooled Condenser AC

The screenshot displays the 'Axial Fans Int S.r.l.' software interface. The top navigation bar includes the company logo, name, and user information ('Super user'). A left-hand navigation menu lists various asset categories, with 'Air cooler AC' selected. The main content area shows a 'Cards Air cooler AC' view with a search bar and a list of 12 items. The selected item's details are shown in a card view, organized into three sections: General Data, Environmental Data, and Technical Data.

General Data	
Code	Name
JobNumber	Model
Configuration	

Environmental Data	
Area classification	Minumum environment temperature
Maximum environment temperature	Environment relative humidity
Altitude	Class ISO12944

Technical Data	
Cell number	Layout
Air inlet longitudinal	Air inlet width
Stairs number	Ladder stairs number

Footer: www.openmaint.org · Info · Copyright © Tecnoteca srl



# Cell AC

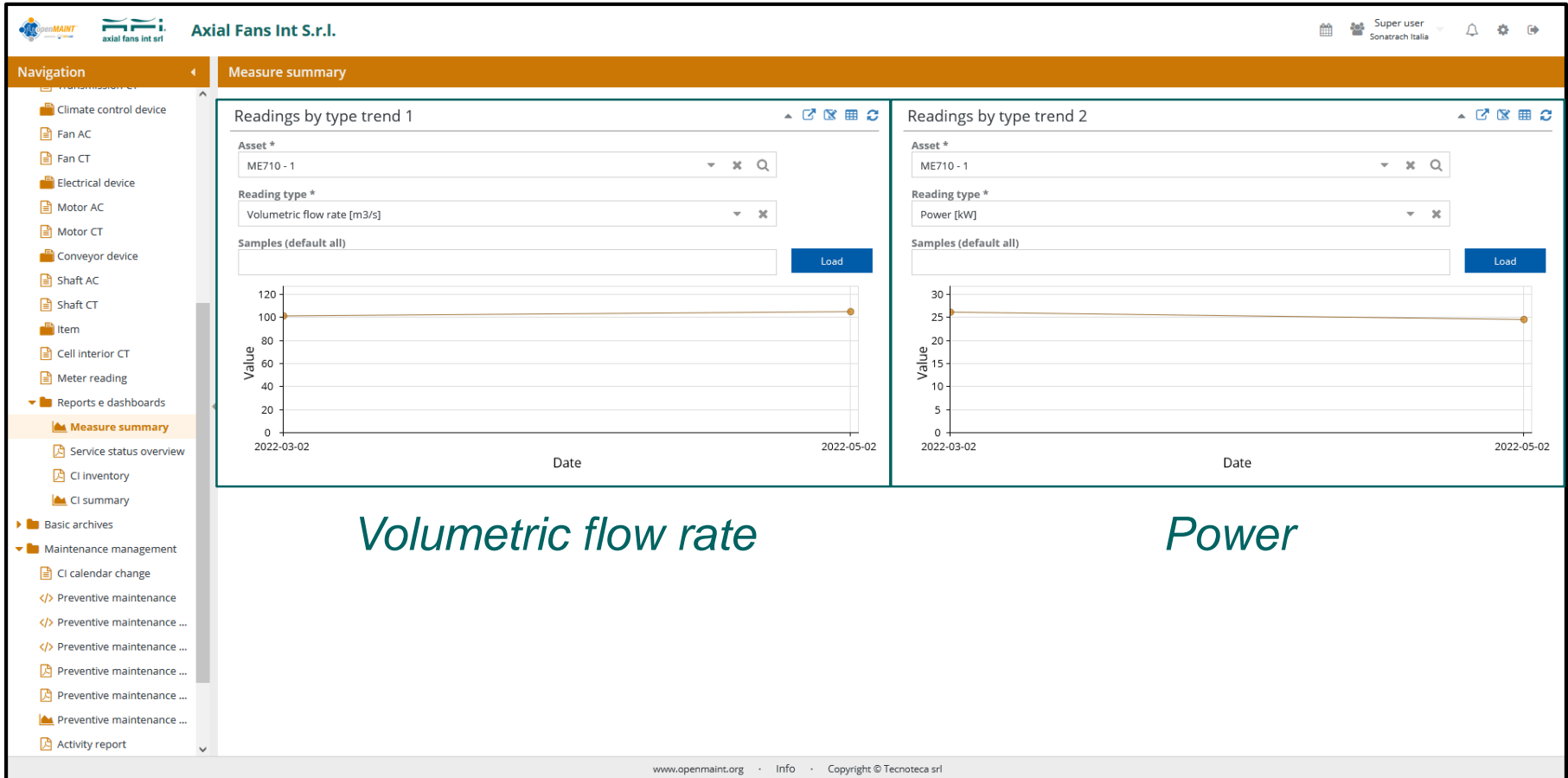
The screenshot displays the 'Axial Fans Int S.r.l.' software interface. The left sidebar shows a navigation menu with 'Cell AC' selected. The main area shows a table titled 'Cards Cell AC' with 98 items. The table columns are: Building, System / Plant, Name, Point 0, Point 1, Point 2, Fan Installed, Warranty start, Warranty end, Point 0 Date, Point 1 Date, and Point 2 Date. A callout box with the text 'Maintenance status display' and a green arrow points to the 'Fan Installed' column.

Building	System / Plant	Name	Point 0	Point 1	Point 2	Fan Installed	Warranty start	Warranty end	Point 0 Date	Point 1 Date	Point 2 Date
SRA - Sonatrach Raffineria Augusta	T5	ME110/2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
SRA - Sonatrach Raffineria Augusta	T5	ME113/1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
SRA - Sonatrach Raffineria Augusta	T5	ME113/2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
SRA - Sonatrach Raffineria Augusta	T5	ME113D	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
SRA - Sonatrach Raffineria Augusta	T5	ME116/1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
SRA - Sonatrach Raffineria Augusta	T5	ME116/2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
SRA - Sonatrach Raffineria Augusta	T5	ME116/3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
SRA - Sonatrach Raffineria Augusta	T5	ME116/4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
SRA - Sonatrach Raffineria Augusta	T5	ME116/5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
SRA - Sonatrach Raffineria Augusta	T5	ME116/6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
SRA - Sonatrach Raffineria Augusta	T5	ME153	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
SRA - Sonatrach Raffineria Augusta	T5	ME155BX	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
SRA - Sonatrach Raffineria Augusta	R4	ME210A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				2022-03-01	
SRA - Sonatrach Raffineria Augusta	R4	ME210B	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				2022-03-01	
SRA - Sonatrach Raffineria Augusta	R4	ME210C	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				2022-03-01	
SRA - Sonatrach Raffineria Augusta	R4	ME210D	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2022-05-27	2027-05-27	2022-05-27	2022-03-01	2022-06-21
SRA - Sonatrach Raffineria Augusta	R4	ME210E	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2022-05-18	2027-05-18	2022-05-18	2022-03-01	
SRA - Sonatrach Raffineria Augusta	R4	ME210F	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2022-05-30	2027-05-30	2022-05-30	2022-03-01	2022-06-22
SRA - Sonatrach Raffineria Augusta	SCANFINER	ME281A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				2022-05-19	
SRA - Sonatrach Raffineria Augusta	SCANFINER	ME281B	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				2022-05-19	
SRA - Sonatrach Raffineria Augusta	SCANFINER	ME281C	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				2022-05-19	

Maintenance status display



# Measure summary chart





# *Maintenance management*



# Fault reporting

The screenshot shows a web application interface for 'Axial Fans Int S.r.l.' with a navigation menu on the left and a main form area. The form is titled 'Add card CI calendar change' and is divided into a 'Base data' section. The form fields are as follows:

- Number**: A text input field.
- Description \***: A text input field.
- Class name \***: A dropdown menu with a clear (X) button.
- Card \***: A dropdown menu with a clear (X) button and a search (Q) icon.
- Start date and time (included)**: A date and time picker.
- Stop date and time (excluded)**: A date and time picker.
- Service status \***: A dropdown menu with a clear (X) button.

At the bottom right of the form, there are three buttons: 'Save', 'Save and close', and 'Cancel'. The navigation menu on the left includes 'Global search', 'Facilities and assets', 'Basic archives', 'Maintenance management', 'CI calendar change' (highlighted), 'Preventive maintenance', 'Maintenance configuration', 'Configurations', 'Scheduler', and 'All items'. The top right corner shows the user 'Super user' and the company name 'axial fans int srl'.

# Preventive maintenance calendar

The screenshot displays the 'Preventive maintenance calendar' interface. At the top left, the 'openMAINT' logo and 'axial fans int s.r.l.' are visible. The user is logged in as 'Super user' from 'Sonaracch Italia'. The navigation sidebar on the left includes sections for 'Facilities and assets', 'Basic archives', 'Maintenance management', 'Maintenance configuration', 'Configurations', and 'All Items'. The main calendar area shows a monthly view for November 2022. A search bar at the top of the calendar allows filtering by 'Building...' and 'Team...'. An information banner states: 'The calendar events preview is available up to 2022-04-12 10:52:53'. The calendar grid shows events for November 8, 9, 13, 15, and 16. Event details include 'PM.2022.0007 - Vibration measurement', 'PM.2022.0012 - Cell interior inspection', and 'PM.2022.0008 - Vibration measurement'. The footer contains the website 'www.openmaint.org' and copyright information for 'Tecnoteca srl'.

Sun	Mon	Tue	Wed	Thu	Fri	Sat
30	31	1	2	3	4	5
6	7	8 PM.2022.0007 - Vibration measurement	9	10	11 PM.2022.0012 - Cell interior inspection	12
13 PM.2022.0012 - Cell interior inspection	14	15	16 PM.2022.0008 - Vibration measurement	17	18	19
20	21	22	23	24	25	26
27	28	29	30	1	2	3
4	5	6	7	8	9	10

# Checklist compilation

The screenshot displays the 'Axial Fans Int S.r.l.' software interface. The top navigation bar includes the company logo, name, and user information (Super user, Sonatrach Italia). The left sidebar shows a navigation menu with categories like 'Facilities and assets', 'Maintenance management', 'Preventive maintenance', and 'Configurations'. The main content area is titled 'Preventive maintenance' and shows a list of maintenance tasks with a 'Start Preventive maintenance' button. Below this, there are tabs for 'Scheduled', 'Acceptance', 'Execution' (active), 'Suspension', 'Completed', and 'Canceled'. The 'Execution' tab is further divided into 'Assignment data' and 'Task instances (425)'. The 'Assignment data' section shows 'Team: Sonatrach global' and 'Assignee'. The 'Task instances' section shows a dropdown menu set to 'CTW1/2 GR 1' and a table of tasks with columns for 'Subtask', 'Outcome', and 'N.D.'. The table lists various vibration and evaluation tasks, some with checkboxes for 'Outcome' and 'N.D.'. At the bottom right, there are buttons for 'Save', 'Save and close', 'Execute', and 'Cancel'.

Navigation: Global search, Facilities and assets, Basic archives, Maintenance management, CI calendar change, Preventive maintenance, Preventive maintenance pl..., Preventive maintenance cal..., Preventive maintenance cal..., Preventive maintenance ta..., Preventive maintenance su..., Activity report, Maintenance configuration, Team, Preventive, Maintenance manual, CI subset, Preventive mainten..., Checklist, Maintenance plan, Preventive mainten..., Preventive mainten..., Configurations, Scheduler, All items.

Preventive maintenance: Start Preventive maintenance

Number: PM.2022.0014, PM.2022.0008

Scheduled Acceptance Execution Suspension Completed Canceled



Assignment data: Team: Sonatrach global, Assignee

Task instances (425): CTW1/2 GR 1, Outcomes bulk assignment

Subtask	Outcome	N.D.
Motor vibration x-axis [mm/s]	<input type="checkbox"/>	<input type="checkbox"/>
Motor vibration y-axis [mm/s]	<input type="checkbox"/>	<input type="checkbox"/>
Motor vibration z-axis [mm/s]	<input type="checkbox"/>	<input type="checkbox"/>
Motor vibration x1-axis [mm/s]	<input type="checkbox"/>	<input type="checkbox"/>
Motor vibration y1-axis [mm/s]	<input type="checkbox"/>	<input type="checkbox"/>
Motor vibration z1-axis [mm/s]	<input type="checkbox"/>	<input type="checkbox"/>
Motor vibration evaluation according to ISO 10816	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Fast shaft vibration reducer [mm/s]	<input type="checkbox"/>	<input type="checkbox"/>
Anomaly reducer measuring fast shaft	<input type="checkbox"/>	<input type="checkbox"/>
Slow shaft vibration reducer [mm/s]	<input type="checkbox"/>	<input type="checkbox"/>
Gearbox anomaly measurement slow shaft	<input type="checkbox"/>	<input type="checkbox"/>
Vibration rating reducer to ISO 10816	<input type="checkbox"/>	<input type="checkbox"/>

Save Save and close Execute Cancel

# Maintenance report



**Axial Fans Int S.r.l.**


Super user  
Sonatrach Italia

**Navigation**

- </> Global search
- ▶ Facilities and assets
- ▶ Basic archives
- ▶ Maintenance management
  - 📅 CI calendar change
  - </> Preventive maintenance
  - </> Preventive maintenance pl...
  - </> Preventive maintenance cal...
  - 📅 Preventive maintenance cal...
  - 📅 Preventive maintenance ta...
  - 📅 Preventive maintenance su...
  - 📄 **Activity report**
  - ▶ Maintenance configuration
    - 📄 Team
    - ▶ Preventive
      - 📄 Maintenance manual
      - 📄 CI subset
      - 📄 Preventive mainten...
      - 📄 Checklist
      - 📄 Maintenance plan
      - 📄 Preventive mainten...
      - 📄 Preventive mainten...
  - ▶ Configurations
  - 📅 Scheduler
  - ▶ All items

**Activity report**

## Automatic report printout



Company	Sonatrach Italia	Job number	GS0131A21_22
Site	SRA - Sonatrach Raffineria Augusta	Execution	09/11/2022
Address	Contrada Marcellino, 96011, Augusta, ITA	Week	45

**Activity report Vibration measurement**

Notes

**Checklist**

CTW1/2 GR 1		
Task	Outcome	Notes
Motor vibration x-axis [mm/s]		
Motor vibration y-axis [mm/s]		
Motor vibration z-axis [mm/s]		
Motor vibration x1-axis [mm/s]		
Motor vibration y1-axis [mm/s]		
Motor vibration z1-axis [mm/s]		
Motor vibration evaluation according to ISO 10816		
Fast shaft vibration reducer [mm/s]		
Anomaly reducer measuring fast shaft		
Slow shaft vibration reducer [mm/s]		
Gearbox anomaly measurement slow shaft		

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# Multi-tenant access

The screenshot displays the Axial Fans Int S.r.l. web application interface. The top navigation bar includes the company logo, the name "Axial Fans Int S.r.l.", and a user profile dropdown menu. The user profile menu is open, showing the current user "Super user Multi Client" and "Azzolin Gianmarco". The menu options include "Ignore Client", "Change Cliente" (highlighted), "Preferences", "Change password", "Administration module", and "Logout". The main content area shows a "Preventive maintenance" section with a search bar and a table with columns for "Number", "Opening date", "Short description", "Status", and "Site". A large green arrow points from the text box to the "Change Cliente" option in the user profile menu.

*By logging in with personal credentials and selecting the username, it is possible, in case of proper privileges, to move between different clients, each time displaying a different and separate portion of the application*

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# Foreseen benefits from OpenMaint using

- *Consistent information storage*
  - *Accessibility*
- *Easy identification of spare parts*
- *Predictive/preventive maintenance aid*
- *Accurate monitoring of energy consumption*
  - *Downtime reduction*
- *Plant availability and reliability increase*
- *Improved communication between maintenance teams (i.e., automatic messages and alerts)*

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Thank you for your attention