USER MANUAL

Wireless **Balancer**

acoem

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WELCOME TO OUR WORLD

For more than 50 years, ACOEM has helped industries throughout the world to achieve more profitable and sustainable production. We have reached where we are today by having the courage to think beyond the norm and follow slightly unconventional paths. We have had the courage to make mistakes and find new directions. Through our resolve, ambition and knowledge we have become a global player and a leader in innovative, user-friendly reliability solutions.

SUSTAINABLE INNOVATIONS

During our 50+ years in this industry, we have explored, tweaked and tested more than anyone. Some might say we are incurable innovators whereas others might say that we are highly focused. They both probably have a point. If we had not been devoted and ambitious, we would not have been the first in the field of laser alignment to have a touch screen. Nor would we have been pioneers in the use of visible lasers and dual measurement heads. Nor would we have been the first to bring a wireless vibration sensor for machine diagnostics. We are now the first to provide our customers with combined alignment, diagnostic, and balancing solutions on standard mobile devices.

Over the years, we have learnt to never compromise on quality, and we are constantly in search of new, unexplored opportunities by combining advanced technology with design and function. By doing so, we have become the leading innovator in our industry. Not only do we minimize wear, production stoppages and costs, we also help save the environment. Natural resources are in short supply and if we can contribute to a more sustainable world by making it a little bit straighter, we couldn't be happier.

TRUE COMMITMENT

One reason for our success is our solid commitment. We have ensured that we remain attentive to constantly pick up on the needs of the market. Our expert employees and dedicated dealers in over 70 countries are undoubtedly our most important asset. Satisfaction and team spirit are of particular importance to us and are consistently at the top of our priority list. With experience from a wide range of industries and manufacturing processes, we are fully aware of the problems and needs of our end-customers. We are passionate about what we do and we are driven by the desire to eliminate anything in the industry worldwide that may be even slightly out of line.

PURE USABILITY

Our design and user-friendliness are carefully interwoven. As we develop new products, they also become cleaner, smarter, more functional and more robust. An industrial environment is demanding, infinitely more difficult to work in and inevitably subject to time pressure. There is no place for equipment with unnecessary functions, complicated interfaces and that is difficult to assemble.

Usability and user friendliness mean everything, not only to us but also to our customers. We have designed products that are easy to learn and can be incorporated quickly. By removing non-essential functions, we make life less difficult for our users – and probably a little more difficult for our competitors.

END USER LICENSE AGREEMENT

The rights to use the software in this product are offered only on the conditions that you agree to all the terms stated below, i.e. the end user agreement. By using this product, you agree to be bound by this agreement. If you do not accept this agreement your sole remedy is to return the entire unused product, hardware and software promptly to your place of purchase for a refund.

The user is granted a single license to use the software contained in this product. Use is only permitted on the hardware it has been installed on at the time of purchase. The software may not be removed from the hardware. The software contained in the system is the property of ACOEM group, any copying or redistribution is strictly prohibited.

Modifying, disassembling, reverse engineering or decompiling the system or any part thereof is strictly prohibited.

Disclaimer of warranties: To the maximum extent permitted by applicable law, ACOEM and its suppliers provide the software contained in this product ‘as is’ and with all faults, and hereby disclaim all other warranties either expressed, implied or statutory.

Limited liability: No liability shall exceed the price of the product, and the sole remedy, if any, to any claim shall be a right of return and refund.

ACOEM or its suppliers shall, to the maximum extent permitted by applicable law, not be liable to any indirect, special, incidental, punitive, and consequential damage arising from the use of the system or any part thereof, authorized or unauthorized.

ACOEM is headquartered in Lyon, France.

For more information, please visit acoem.com

EC DECLARATION OF CONFORMITY

In accordance with:
2014/35/EU Low Voltage Directive
2014/53/EU Radio Equipment Directive
2012/19/EC Waste electrical and electronic equipment (WEEE)
2011/65/EU Restriction of the use of certain hazardous substances (RoHS)
2001/95/EC CE marking directive

Type of equipment

Balancing Tool

Brand name or trademark

ACOEM

Type designation(s)/Model no(s)

1-1300 Timekeeper

1-1301 Vibration Accelerometers

Manufacturer's name, address, telephone

ACOEM AB

Box 7, SE-431 21 Mölndal, Sweden

Tel: +46 31 7062800

E-mail: info.se@acoem.com

Standard/Test report/Technical

Construction file/Normative document
The following standards and/or technical specifications, which comply with good engineering practice in safety matters in force within the EEA, have been applied:

Safety
RED, Article 3.1a
EMC: RED, Article 3.1b
Radio Spectrum
RED, Article 3.2

ISO9001:2015 Ref. No/ Issued by: DNV Certification AB Certification No. 2009-SKMAQ-2704/2009-SKM-AE-1419.

The wireless device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions;
(1) this device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

Additional information

The product was CE-marked in 2025.

As a manufacturer, we declare under our sole responsibility that the equipment follows the provisions of the Directives stated above.

Date and place of issue

Mölndal 2025-04-17

Signature of authorized person

Peter Strömberg, CTO

SAFETY

Retain and follow all product safety and operating instructions. Observe all warnings on the product and in the operating instructions. Failure to observe the safety precautions and operating instructions can cause bodily injury, fire, and damage to the equipment.

Do not disassemble, modify or use the equipment in other ways than explained in the operating instructions. ACOEM will not accept any liability for such use.

WARNING!

Do not mount equipment on running machines and take all appropriate measures to prevent unintentional start-up of machines. Make sure to fully comply with all appropriate shut down procedures, safety measures and regulations at worksite and local regulations regarding safety in a machine environment.

LASER PRECAUTIONS

The laser tachometer delivered with the system is Class 2.

Class 2 is considered safe for its intended use with only minor precautions required. These are:

- Never stare directly into the laser transmitter.
- Never shine the laser directly into anyone else's eyes.

CAUTION!

USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

POWER SUPPLY

The sensors are powered by high-capacity 3.7V replaceable and rechargeable Li-Ion batteries mounted in the sensor. The batteries must be recharged out of the units.

Do not expose the sensor with open cap to rain or wet conditions. Do not expose the external battery charger to rain or wet conditions. Always unplug the charger from the electrical outlet after charging.

Leaving a sensor with an empty battery for a prolonged time can reduce the capacity of the battery or even damage the battery. If the system is not used for a long time, charge the batteries to approximately 50-75% before storing the system, if kept in storage repeat this every 3-4 months (if needed).

Only use the recommended batteries and external charger specified by Acoem for use with the sensor.

Always remove batteries when shipping the system. Place the batteries in the supplied containers to prevent short circuiting.

WIRELESS TRANSCEIVER

The Acoem Wireless Balancer WBT-400 hardware is fitted with a standard Bluetooth 2.4GHz communication module to enable communication with the mobile device.

Make sure that there are no restrictions on the use of radio transceivers at the site of operation before using the wireless transceivers. Do not use on aircraft.

UNBOXING

The following packages are delivered with the WBT-400:

- 2 wireless accelerometers with bipolar magnets #1 and #2
- 1 wireless timekeeper with flat magnet
- 1 laser tachometer +/- 5VDC with reflective tape and magnet holder
- 50cm adapter to connect the laser tachometer to the timekeeper
- Power up magnet for use with accelerometer and timekeeper
- 1 plastic box for accessories
- 1 USB stick with user documentation
- USB Rechargeable batteries packed in plastic box
- USB cables for batteries charging
- Printed quickguide manual

CARE

CLEANING

Keep Clean: Regularly clean your devices with a soft, dry cloth to remove dust and debris. Avoid using liquids or harsh chemicals, which can damage the device's exterior and internal components.

The sensor is delivered with a magnet for mounting on the machinery. It is recommended after operation to dry the magnet with clean cloth to avoid any risk of corrosion of this accessory over time.

ENVIRONMENTAL CONDITIONS

Avoid Extreme Conditions: Do not expose the devices to extreme temperatures,humidity, or direct sunlight for extended periods. Ideal operating temperatures are between -20°C and 60°C (-4°F and 140°F).

HANDLING AND USAGE

Handle with Care: Avoid dropping or subjecting the devices to strong physical shocks, which can damage the internal circuitry and sensors.

Follow Instructions: Always follow the manufacturer's instructions for operating and maintaining the devices. Misuse can lead to damage or void warranties.

Avoid Liquid Exposure: Do not immerse the devices in water or expose them to heavy rain. If the device gets wet, dry it immediately and thoroughly.

Turn off and disconnect the devices from any connected systems when not in use to conserve battery life and prevent potential damage.

SEALING

The wireless units are rated IP67 with cap in closed position. It is mandatory to keep it closed in operation to avoid any damage to the unit's board resulting from external liquid drops, condensation, and others.

Damages resulting from a bad operation of the sensor without its cap in a closed position are not covered by the warranty. The cap shall only be opened in the office to replace and recharge the sensor batteries through an external charging method.

BATTERY CARE

Insertion: Always ensure batteries are inserted correctly, observing the correct

polarity (+ and -).

Regular Checks: Periodically check battery levels and recharge or replace batteries as needed. Using low battery levels for prolonged periods can affect device performance.

Use Recommended Batteries: Use only recommended batteries (14500 rechargeable lithium batteries) to ensure compatibility and optimal performance.

Remove When Not in Use: If the devices will not be used for an extended period, it is recommended to remove the batteries to prevent leakage and corrosion.

STORAGE

Cool, Dry Place: When not in use, store your devices in a cool, dry place. Avoid storage in high-humidity areas, which can lead to condensation and potential damage.

Protective Case: keep the device stored in their transport case to shield them from dust, moisture, and accidental damage.

CALIBRATION

Our instruments are delivered with a calibration certificate. To provide best diagnostic accuracy, it is recommended to perform inspection and calibration of the vibration wireless sensors 1-1301 every 24 months.

Calibration must be achieved by ACOEM approved service center.

When sending the Acoem Wireless Balancer for calibration, the full hardware kit WBT-400 shall be returned (Timekeeper + 2 Accelerometers)

ACOEM WIRELESS BALANCER

INTRODUCTION

Target application

Acoem Wireless Balancer is a wireless balancing solution allowing one or dual plane balancing of rotating machinery with rigid rotors, with a precision of 0.5° Accuracy at 3000 RPM.

This application is not suitable for sleeve bearing machines that may require proximity probes for balancing purposes.

Download the Wireless Balancer app

The WBT-400 sensors can be used with Acoem Wireless Balancer app for the specific purposes described hereafter in this manual.

ACOEM Wireless Balancer

Freely download the apps from Google Play or the App Store on compatible mobile devices.

GET IT ON Google Play Download on the App Store

Note that the display is optimized for use with tablets. User experience may not benefit from the best user experience on smartphones.

Minimal OS requirements

- iOS 12.1
- Android 6

HARDWARE PRESENTATION

Acoem Wireless Balancer is composed of the main following hardware components:

The wireless triaxial accelerometers that will be mounted on the machine to balancer. There are 2 sensors, with inside and outside labels 1 & 2 for visual identification.

The Timekeeper that is going to be connected to the laser tachometer for the measurement of speed and phase information, and insure the wireless network synchronism with the wireless accelerometers

The laser tachometer, which is connected to the time keeper with a M12-M12 connector and that has to point to a reflective target on a rotating part of the component to balance (e.g. reflective tape on the shaft or blade). The laser tachometer can be installed in a 2meter distance from the target

POWERING UP THE HARDWARE

Turn on the wireless accelerometers either by inserting batteries if no batteries are inside the units, OR passing the ON/OFF magnet from bottom to up on the side with the Acoem logo.

Turn on the Timekeer unit by inserting batteries if no batteries are inside OR passing the magnet from bottom to up on the left side of the unit looking at the M12 connector

The timekeeper is ready to be paired to a tablet/smartphone when the blue light is flashing, and actively connected once the blue light stays put.

The sensors are ready to be paired to a timekeeper when the blue light is flashing, and actively connected once the blue light stays put.

We recommend switching on the sensors first for easiest pairing.

HARDWARE INSTALLATION

Timekeeper unit placement

For best performance, the timekeeper shall remain within 10m distance of the sensors.

The user can stand up to 10m typical from the timekeeper with his mobile device for good communication quality.

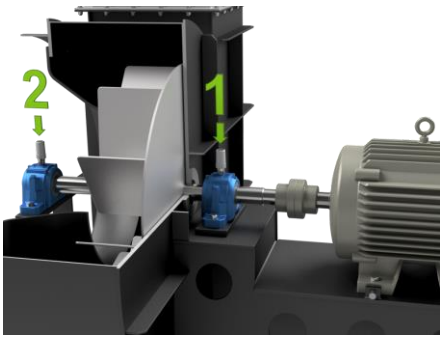
Distance from Body: When operating the Timekeeper from a mobile device (e.g. mobile phone), maintain a minimum distance of 20 cm between the devices and your body to ensure optimal performance and safety.

The timekeeper is connected to a laser tachometer with a M12 connector.

Vibration Sensor placement

The tri-axial vibration sensor must be placed on the bearing as close as possible to the load zone to best sense the components vibration.

Sensor 1 will always be the one closer to the component to balance. The situation varies if it's between bearing or overhung component, please follow onscreen instructions on the sensor's placement



Sensor placement for component between bearings

Sensor placement for overhung component

Stability: Ensure that the devices are placed on a stable surface. Secure them either by screwing them into place, by using the M6 threaded hole in the bottom, or using appropriate magnetic feet to prevent movement

Please follow the operating instructions provided to ensure compliance with all applicable limits and regulations. Adhering to these guidelines is crucial for meeting relevant standards and ensuring the safe and effective use of the devices.

Laser Tachometer target installation

The laser tachometer delivered can be installed up to 2m from the reflective target on the shaft (only one target per shaft rotation).Iif needed, the length of the connector can be extended (optional M12-M12 extension)

With Reflective tape:

- Fix a piece of reflective tape: The minimum size of the reflective target in the direction of travel should be twice the size of the light source image.
- Arrange the laser speed sensor fixing so the beam is roughly in the center of the tape.

- With the laser speed sensor connected, the LED should light as a signal is received back from the target. On fast rotating targets the LED will appear to be on continuously.

Without Reflective tape: Under controlled conditions reflective tape may not be required. If there is an existing difference in reflectivity on part of the object to be monitored then this may be used e.g. keyways and slots in bright shafts, spokes of a wheel, fan blades etc.

On bright shafts it is possible to paint a black non-reflective segment and conversely on non-reflective shafts a whitemark can be painted.

Caution

For balancing application, there must be only one target per revolution of the shaft.

The unit detects contrasts in reflectivity not differences in colour. As conditions can vary greatly from application to application some experimentation may be required to determine the best method.

The laser tachometer is powered as soon as the Wireless Balancer app is active and the Timekeeper connection with the mobile device is established.

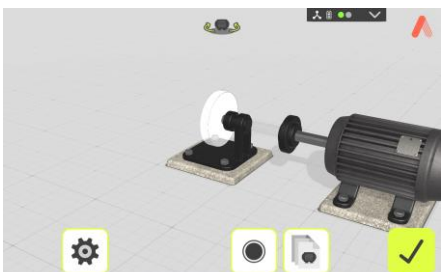
RPM value is always then available from the app control panel (see later)

STARTING UP THE WIRELESS BALANCER APP

On your mobile device, start up the Wireless Balancer app by hitting the corresponding icon.

ACOEM Wireless Balancer

App Home screen description



The following user interaction is available from the home screen

Rotate the machine 3D to display it in the desired orientation

Access to the measurement quick test function

Start a new balancing job

Browse existing balancing tests and setups available on the mobile device

Access settings menu

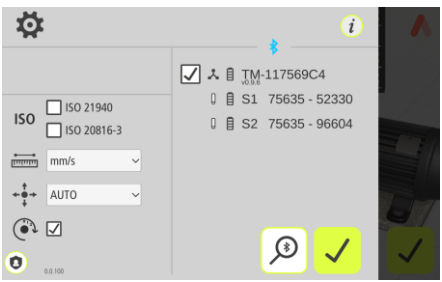
Connection panel

TIMEKEEPER PAIRING TO TABLET

First make sure that Bluetooth communication is activated on your mobile device

To pair a timekeeper to a mobile deceive, go into the Wireless Balancer app settings, and search Bluetooth devices

Tick the box of the corresponding TimeKeeper, the sensors information with SN and battery level should be displayed automatically in no longer than 30s.

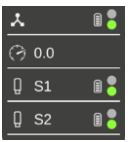


SENSOR PAIRING TO TIMEKEEPER

Sensors are delivered pre-paired to the timekeeper from Acoem.

To switch sensor pairing, check maintenance section of this manual

CONNECTION PANEL



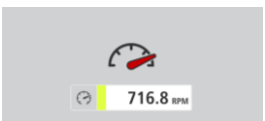
A connection panel is available at all time in the app, showing the status of the connection with sensors and timekeeper as well as RPM value and the battery status

QUICK TEST 6-CHANNEL MEASUREMENTS

From the app home screen it is possible to access a quick test feature in order to access to amplitude, phase and FFT of every directions measured the triaxial wireless vibration accelerometers

Click on the quicktest button from the homescreen to launch the QuickTest function

Before starting the measurement, the RPM value read from the tachometer is displayed and refreshed in real time:



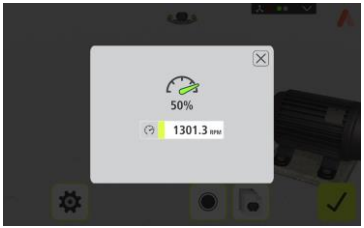
- Red icon is shown if speed unstable
- Green icon if the speed is stable

The user then starts the measurement by hitting on the acquisition button. During the measurement

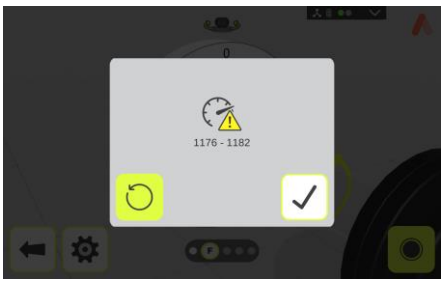
- the RPM value remains updated in real time
- the measurement progress is displayed in %

Note that the measurement time will typically take about 20s but depend on several factors

- Number of averages (see settings)
- Distances
- Environmental conditions



If the speed was not stable during the measurement progress, a warning is shown to the user:

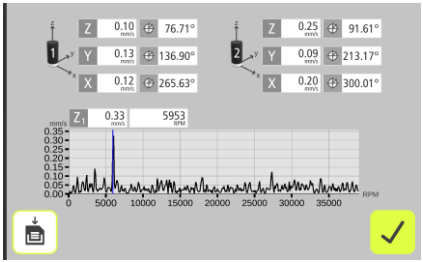


A tolerance of 5% speed variation is allowed by the system, above, the warning pop up is displayed

Once completed, the following information are available:

- Amplitude
- Phase
- FFT
- Rotation Speed (RPM)

The FFT and RPM display is interactive based on the sensor direction selected. simply hit on the direction values to update the FFT display



Screenshot can be taken to be integrated at the report edition process

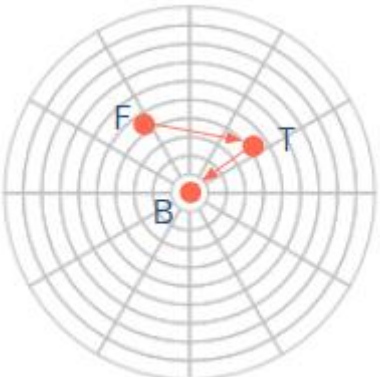
BALANCING PROCESS

Balancing process

The balancing app will guide you through the balancing procedure:

- Free Run (as found) (F)
- Trial Run 1 (with known mass addition on plane 1) (T)
- if 2 plane is required: Trial run 2 (with known mass addition on plane 2)
- Balancing run (B)
- if desired: Trim runs

The app will automatically guide the user through the best balancing procedure possible.



Balancing with 1 or 2 sensors

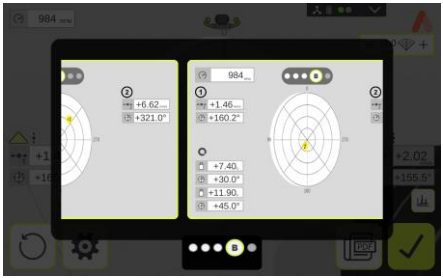
It is strongly recommended to always use the 2 sensors, even for one plane balancing. The second sensor will be used as a control plane (see later).

It is however possible to only use one sensor, the app functionality will be limited to single plane balancing in this situation.

Navigation Toolbar

Once a balancing test is started, a navigation toolbar is available at the bottom of the screen to remind you where you are in the process and allow for navigation into previous steps results.

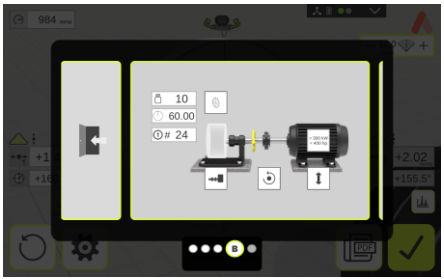
Hitting on the navigation bar opens a quickview window, the user can see the synthesis of the corresponding balancing step information and can browse through the test by swiping left or right. to get full access to the corresponding step, simply hit the desired screen.



If the user is navigating in previous steps of the procedure, the navigation toolbar changes to yellow colour.

Access/Modify Setup

From the navigation view, by hitting on the setup synthesis screen, it will be possible to view and modify the setup information



Exit Test

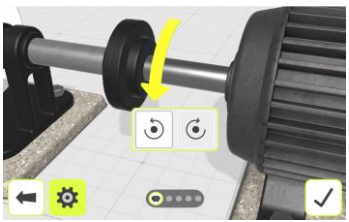
To exit the current test and go back to the home screen, click on the exit door icon on the far left of the navigation toolbar menu.

START A NEW BALANCING TEST

Balancing Setup

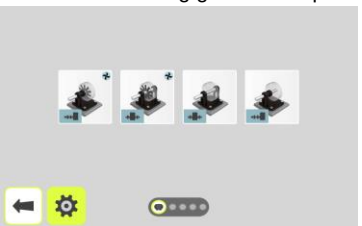
By starting the balancing process, the user is guided through the step-by-step setup process and will go through the following:

Shaft Rotation Direction



Component type selection

- Overhung Fan
- Between Bearing fans
- Between bearing generic components
- Overhung generic component

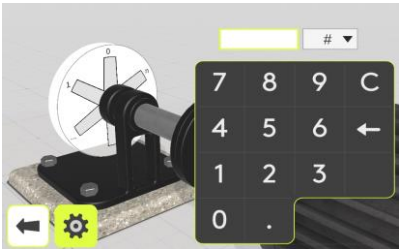


The choice of the component will influence:

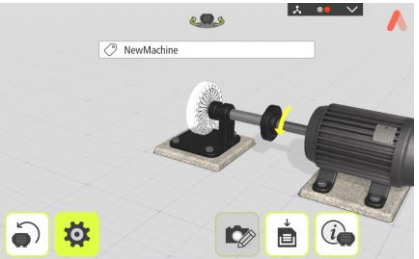
- overhung/between bearing: the sensor position placement
- Fan: possibility to display and count in the number of blades (holes, or custom units) to facilitate weight placement. Generic components will stick to Degrees presentation.

This choice can be modified during the procedure

If fan: number of blades input



- Machine Name



The machine name will be displayed in the report and in the list of balancing tests available on the app.

The following interactions are possible

Reset to home screen without saving

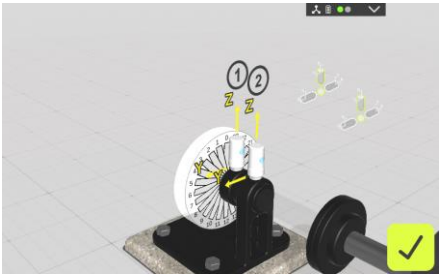
Save setup for future use

Access setup synthesis information

Enter App Settings

To continue in the balancing process, the Timekeeper and sensors must be connected to the mobile device.

Sensor placement

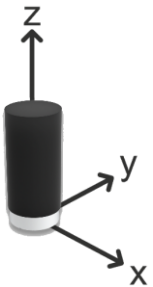


Make sure of the sensor placement (sensor 1 and sensor 2), check the cap and inside sensor identification if any doubt.

Adjust the position of each sensor: vertical, horizontal in one or the other direction

Importantly make sure that the blue LED is facing the motor.

Sensor axis orientation



The sensor measures in three directions.

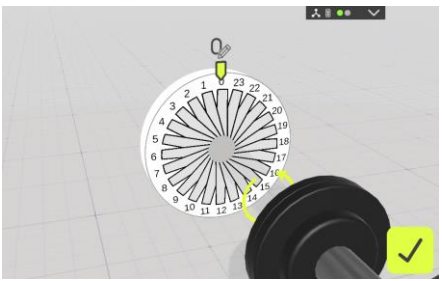
X axis, positive direction looking to the motor (blue LED / Acoem logo mark at the base)

Y axis, positive direction on the left when looking at the Blue LED

Z axis, positive direction upwards

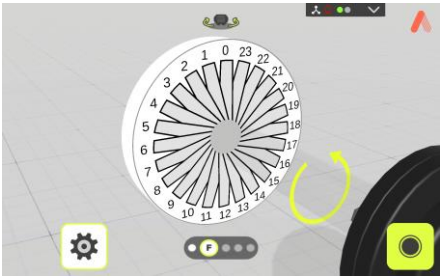
Mark 0 position (reference)

Before starting any measurement, make sure you have defined and mark the 0 position from which it will be counted. It is recommended to place it in the vertical position to best follow the guided procedure.



Start Free Run measurement

Click on the acquisition button to open the measurement screen



The live RPM value of rotation speed is displayed, hit the acquisition button to start the free run measurement

Free run result

Free run results are automatically presented onscreen.

- Sensor 1 values are always displayed on the left
- Sensor 2 values are always displayed on the right
- The graphical plot projection is interactive. Hide/display sensor 1 / sensor 2 value by clicking on the sensor values
- By default, one direction is displayed. Refer to the icon to understand which direction is currently onscreen.

Phase value

Vertical direction amplitude from sensor 1

Vertical direction amplitude from sensor 2

Horizontal direction amplitude from sensor 1

Horizontal direction amplitude from sensor 2

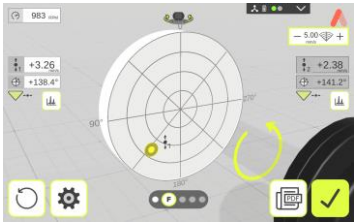
Show Vertical direction

Show Horizontal direction

Zoom/unzoom scale on polar graph

Erase/redo measurement

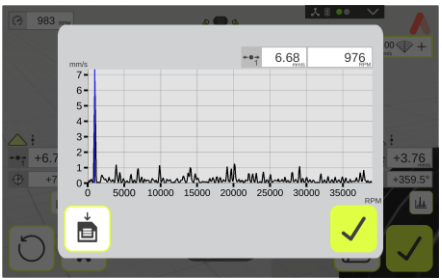
Example with vertical direction display, only sensor 1 displayed:



Example with vertical direction display, both sensor 1 and sensor 2 are displayed

FFT Display

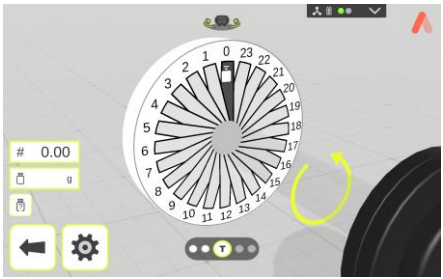
It is possible to display individually the FFT of radial directions of each sensor after each measurement Select the FFT Icon below the corresponding sensor values. You can zoom and pan the graph.



Screenshot can be taken to be integrated at the report edition process.

suggestions. Click on the trial weight icon.

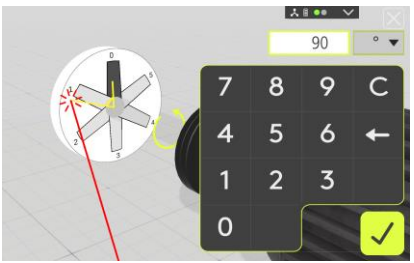
Trial Run settings



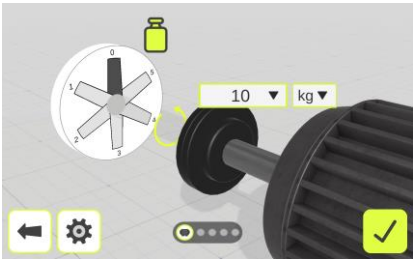
If you don't know which weight to place, the Wireless Balancer app can automatically make

Additional information will be required:

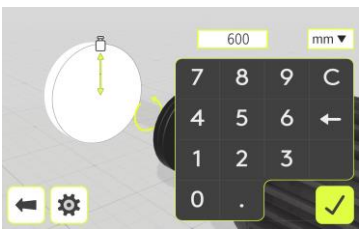
- Tachometer position angle (vs. 0 reference)



- Rotor Weight



Radius from center to mass positions

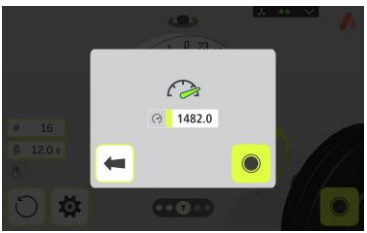


Note:

The trial weight calculator will use automatically measurement values from the direction with the highest amplitudes to make its proposition, unless the balancing direction is forced by the user in the settings menu.

Trial Run measurement

Go through the acquisition process



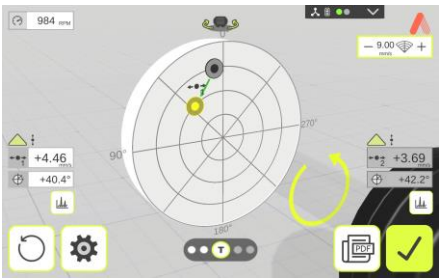
It is important for the balancing program to be efficient to get a significant difference between initial run and trial run.

If the amplitude or phase values are too close between the two runs (within a radius of 10%

of freerun vector), a warning is shown to the user. In this situation, it is recommended to increase the mass added, and/or alternatively place it in another position so that a bigger difference is observed between the free run and trial run. Note that the Wireless Balancer program is often conservative for the first proposition to avoid creating any safety issues when performing balancing of rotating machinery.

The trial run result is then presented automatically and presented with a new yellow bullet. The freerun is represented by the grey bullet, and an arrow shows the movement from Free Run to Trial run result.

If the vibration behavior was improved from the previous measurement, the arrow is shown in green. if the vibration behavior got worse, the arrow is shown in red



By default the direction presented is the one used by the balancing program for balancing.

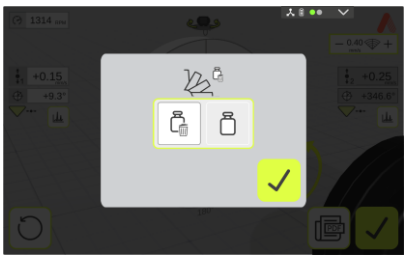
As for the free run, it is possible to display values in horizontal or vertical values, and

sensor 1 and / or sensor 2 values interactively.

FFTs from each sensor and each radial direction can be displayed and saved for report if desired.

Add or remove trial weight

Depending on the situation, you may have the possibility to remove the trial weight from the machine (preferred), but this is not always possible as you may have welded or removed material. The program needs to know in which situation you are. To do so, select the corresponding icon



Keep trial weight

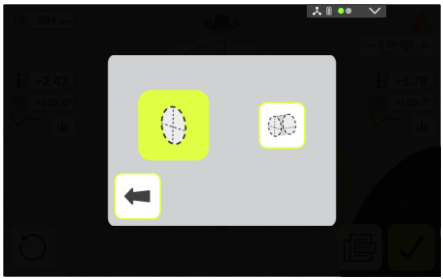
Remove trial weight

1 or 2 plane balancing

Based on the vibration behavior observed between the two planes, the Acoem Wireless Balancer will recommend automatically to go for a 1-plane or 2-plane balancing. Note that the user can override the program recommendation

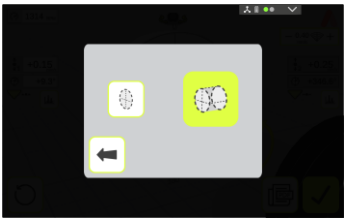
In case of a two-plane balancing the user will be guided to the second plane definition and trial run 2 measurement.

Illustration of a 1-plane balancing recommendation:



Once selected, a confirmation is required. For a one plane balancing directly go to the balancing Run section of this manual.

illustration of a 2-plane balancing recommendation:



Once selected, a confirmation is required.

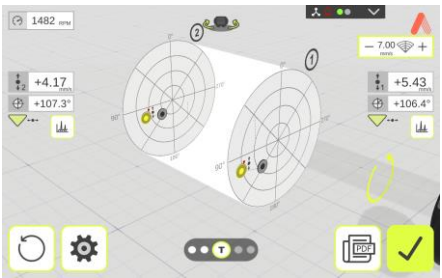
The setup of the 2nd plane is now required:

- number of blades (if fan component was selected)

The user now must define the trial weight for the second plane through the same procedure as for the trial run 1. Refer to trial run definition of this manual for more information

Trial Run 2 result presentation

The trial run 2 will present the impact of the weight added on the trial run 2 as seen by both sensors, on plane 1 and plane 2. Sensor 1 and 2 are no longer projected on the same polar plot as previous results, but on distinct planes shown in a 3D format.



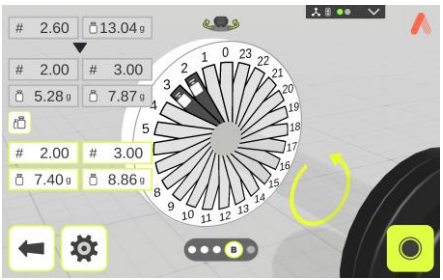
Plane 1

Plane 2

The other information is displayed identically to 1 plane results

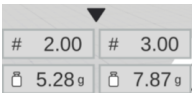
Balancing Run settings

The Acoem Wireless Balancer will recommend automatically the mass and position where it should be added to balance the machine with precision.

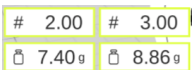


Note about weights input: in some cases it is possible to remove matter, so it is possible to input negative values to reflect this situation.

Automatic weight and position recommendation



Auto split Weight recommendation*



User Real input

Access to auto split weight editor to adjust weights positions. Recommendations are updated automatically.

**Automatically displayed for fan component, displayed only if split weight function is used for generic component*

Balancing Run measurement

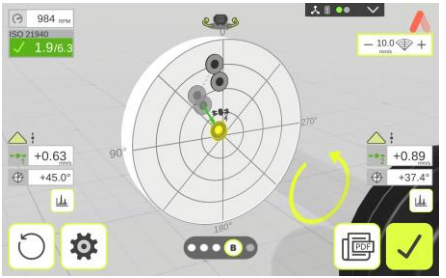
Start the balancing measurement by pressing the acquisition button.

Results are then displayed automatically. Result screen interactivity is identical from previous screens.

Example of result without ISO comparison.

ISO comparison can be activated from the app settings.

Example of result with ISO comparison

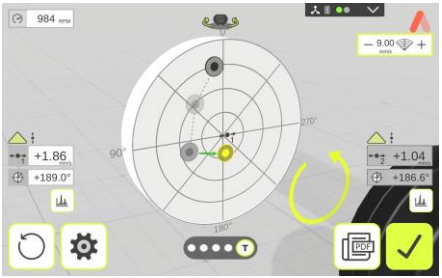


- **ISO20816-3 conformity**

The colour of the direction arrows shows how the vibration velocity amplitude of each direction and each sensor compares to the ISO20186-3 standard. If not entered previously, additional information such as power and type of foundation are asked to make this comparison

- **ISO201940 assessment**

The balancing grade indicator on the top left corner shows the balancing quality as compared to the ISO21940 standard. If not entered previously, additional information such as the rotor weight, the radius, and the type of machinery (choice from list) are asked to make this evaluation.



Trim Run

It is possible to continue and improve the balancing process going through Trim Runs via the same process as the balancing run (definition, measurement, result interpretation)

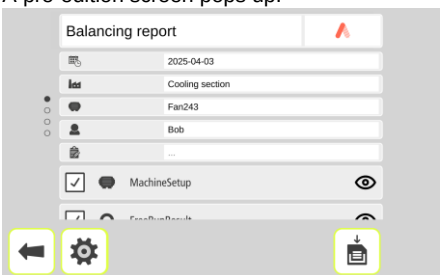
Note that if the machine cannot be balanced after a few trim runs, it should be considered that the root cause of the machine abnormal vibrations is not unbalance or that other actions shall be taken prior to balancing (soft foot verification, check resonance frequency, run expert vibration diagnostic…)

PDF REPORT

Edit report

To edit a pdf report, press on the pdf icon available from any screen.

A pre-edition screen pops up.

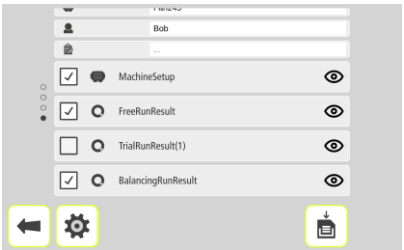


Customization possibilities are:

- Logo change: press on the acoem logo on the top right of the screen

- Text field can be changed:
  - Machine Name
  - Site
  - User
  - Notes

- Select screens you want to include in the report. A preview function is available in front of each screen available



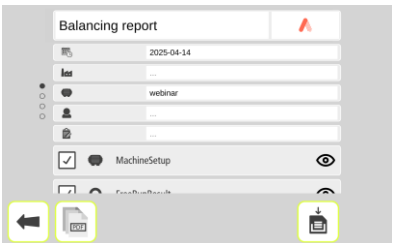
Save report

To save your PDF report, click on the Save icon.it is then saved in the app files

You can open it with a pdf reader on your mobile device, or share it instantly with you mobile device functions (email, whatsapp…)

Access list of existing PDF reports

Once a report has been edited, you can access list of previous PDF reports generated with the app



OPEN AN EXISTING BALANCING TEST

Browse existing tests

Browse the list of balancing tests available on the mobile device

Upon selection, the test information is enlarged and the following options are available

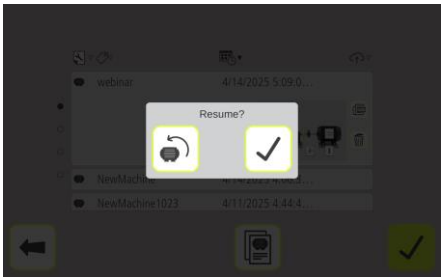
Access to the pdf report corresponding to the test if already existing,

Delete the test

Enter the test to access detailed results

Duplicate the test

On validation, the following options are proposed



Resume: restart the test where you stopped

Restart: erase measurement are restart using the same setup information

One Run Balancing

To perform a one run balancing, on a machine that was previously balanced and keep its balancing coefficients, proceed as follows:

- Reopen the previous balancing test
- Erase/Redo a measurement of the last run of the stored tests, with your new “free run”
- The next balancing recommendations (trim run) are considering these new values and the existing balancing coefficients so you can achieve a 1 run balancing.

SETTINGS MENU

User Manual

Download the latest user manual online.

Note: as internet access is required

App Settings

Measurement unit: mm/s or inch/s

Balancing direction used by the program: auto (default), horizontal, vertical

Counting convention: opposite to shaft rotation (unchecked) or same as shaft rotation direction (checked)

Avgs Number of time synchronous averages processed by the sensors (slide down the menu settings to see this value)

Note:

By default, Acoem Wireless Balancer will process 8 averages. In some situations, especially if there are disturbances from a nearby machine, increasing the number of averages may be necessary (e.g. 20; 50; 100…). This will increase the measurement time and reduce battery life of the sensor as more measurements are processed by each sensor at each step of the balancing

ISO Standards comparison

ISO 21940 balancing grade indicator evaluates if the residual unbalance is acceptable based on the typology of machine (selection from list, rotor weight, radius)

ISO 20816-3 will evaluate if the vibration velocity is acceptable based on the typology of the machine (speed, power, foundation) if the standards were not already activated at the beginning of the procedure, the user will be guided through additional setup questions required for correct use of these standards upon validation.

App version

Read the app version from the bottom of the screen of the settings menu. Make sure your app is always up to date to benefit from the last improvements and fixes.

Privacy policy

Click on the icon to access Acoem Privacy Policy

Note: internet access is required

MAINTENANCE & TROUBLESHOOTING

PERIODIC MAINTENANCE

- Software Updates: Check for firmware or software updates from the manufacturer regularly. Keeping your devices updated ensures they have the latest features and security enhancements.
- Inspection: Periodically inspect your devices for any signs of wear or damage. Look for cracks, loose parts, or other signs that might indicate the need for repair or replacement.

BATTERY REPLACEMENT

Safety warning

The battery +/- blades can be cut, handle with care when inserting batteries to avoid any injury. refer to the Care section of this manual for more instructions regarding batteries

Battery replacement

Acoem Wireless Balancer is designed to be used with rechargeable batteries that need to be recharged out of the sensors and timekeeper. In the event where the batteries get worn, damaged or do not offer sufficient charge after some time, replace them with a new set of batteries respecting battery recommendations from Acoem as specified in this user manual.

SENSOR PAIRING

Sensors come paired to their TimeKeeper from Acoem deliveries.

In case of sensor replacement is needed, the pairing process works as follows:

- Remove batteries from the sensor
- Push 5s on the button inside the timekeeper located at mid-height to empty the list of paired sensors
- Insert batteries in the sensor that you want to assign as Sensor 1: the sensor LED will flash in red
- Insert the batteries in the sensor that you want to assign as Sensor 2: the sensor LED will flash in red
- Note: The sensors need to be switched on within 10 seconds after the timekeeper has started the pairing process.
- Press the button on the Time Keeper to validate the pairing process.

TROUBLESHOOTING

Devices Not Powering On

- Check Battery Installation: Ensure the batteries are correctly inserted with the correct polarity.
- Replace Batteries: If the batteries are old or depleted, replace them with new ones.
- Inspect Battery Contacts: Check the battery contacts for signs of corrosion or debris. If necessary, clean them gently.

Weak or No Wireless Signal

- Reduce Interference: Ensure that no other electronic devices or physical obstructions cause interference with the wireless signal.
- Move Closer: Bring the devices closer to each other to improve signal strength.

Not able to restore BLE Communication TimeKeeper

In case of loss of communication with the timekeeper, if it does not reconnect automatically and does not appear in the bluetooth devices available, the following actions may restore the situation:

- Verify battery charging status and battery types inserted in the product. Batteries must be14500 Lithium Ion rechargeable 3.7V nominal, refer to Battery Recommendations section
- Reset Timekeeper using the ON/OFF magnet or by removing/reinserting batteries
- Quit the app: Swipe the app preview upwards to quit the

application. This will stop all its processes, then restart the app.
- Deactivate / reactivate bluetooth on the mobile device.

Measurement cannot be completed successfully

Verify battery charging status and battery types inserted in the product. Batteries must be14500 Lithium Ion rechargeable 3.7V nominal, refer to Battery Recommendations section

RPM Value incorrect or fluctuating

- Verify that the laser beam is correctly hitting the target.
- Verify that no reflection is disturbing the measurement process that could explain different speed value
- Test different laser tachometer positions so it hits the shaft with some angle.

RPM=0, laser beam active

- Verify the beam is correctly hitting the reflective target on the machine
- Verify the laser is within acceptable distance (up to 2m) from target
- Verify the laser tachometer is mounted in stable position and not moving during the process
- In case the laser beam was interrupted and the RPM measurement does not resume automatically, restart the

Timekeeper using the ON/OFF magnet or removing/resinserting batteries.

RPM=0, laser beam not powered

Laser is powered only when the Wireless Balancer app is running.

- Verify the TimeKeeper is connected in bluetooth and associated to the app,
- Verify M12 cable correct connection on both ends
- If you have another M12 cable, try another cable
- If you have another tachometer (same as falcon), try another tachometer

If none of the above solve the issue, your TimeKeeper might need repair, please contact our technical support team for more assistance.

Inconsistent or Erratic Sensor Readings

Stable Surface: Ensure that the accelerometers are placed on a stable surface and are not subject to unintended vibrations or movements during measurements.

Environmental Factors: Consider environmental factors such as temperature and humidity, which might affect sensor readings. Ensure that the devices are used within the specified operating conditions.

Calibrate Sensors: Perform a calibration with your approved Acoem repair center.

BATTERY RECOMMENDATIONS

Overview

For optimal performance and longevity of your Timekeeper and Wireless Accelerometers, we recommend using 14500 lithium batteries.

Specifications of 14500 Lithium Batteries

- Type: Rechargeable Lithium-Ion Battery
- Size: 14500 (similar in size to AA batteries)
- Voltage: 3.7V nominal
- Capacity: Typically ranges from 600mAh to 1000mAh
- Dimensions: 14mm in diameter and 50mm in length

Safety Precautions

- Do not overcharge or over-discharge: Use a quality charger designed for lithium-ion batteries to prevent damage.
- Avoid short circuits: Ensure that the battery terminals do not come into contact with metal objects.
- Do not expose to high temperatures:Check the batteries for suitable temperature range. Store batteries in a cool, dry place to prevent overheating and potential hazards.
- Inspect regularly: Check for signs of damage or swelling and replace batteries if any issues are detected.

Using 14500 lithium batteries ensures that your Timekeeper and Wireless Accelerometers operate efficiently and reliably, providing you with accurate and consistent data.

Recommended Battery references

● KEEPPOWER 14500, 3.7V Lithium Ion USB Rechargeable with built in protection circuit (move battery out of the sensor prior to charging)

● TOPWELL 14500 3.7V Lithium Ion rechargebale with use of external charger

Recommended external charger: Nitecore i8

Specifications of 14500 Lithium Batteries

● Type: Rechargeable Lithium-Ion Battery

● Size: 14500 (similar in size to AA batteries)

● Voltage: 3.7V nominal

● Capacity: Typically ranges from 600mAh to 1000mAh

● Dimensions: 14mm in diameter and 50mm in length

Battery level indication

Note that the battery indication is approximative as the batteries are recharged out of the unit.

The system is specified for 10 balancing jobs on average with full charge. In case the batteries were insufficiently charged to complete the balancing test, hot swap of batteries is possible during the procedure, the balancing test can be restarted where the user stopped prior to battery replacement.

TECHNICAL SPECIFICATION – WBT-400

Part. No. 1-1301 - Vibration Accelerometer

Case Material	304L Stainless steel, PA12
Operating Temp	-20°C to 60°C (-4 to 140°F)
Storage Temp	-20°C to 60°C (-4 to 140°F)
Relative humidity	0-95% non-condensing
Protection	IP67
Sensor Weight	350g
Sensor Dimensions	Ø51 mm, H105mm
Mounting	M6 threaded hole
Battery Type	Li-Ion 14500 rechargeable, 3.7V nominal
Operating time	10 balancing jobs in average with one charge
Acquisition type	Triaxial Synchronous acquisition
Full scale	+/-16 g peak
Frequency response ± 3 dB (Z)	1 Hz to 7.5 kHz
Interface	Magnetic ON/OFF Switch
Communication range	Up to 10m from TimeKeeper
Radio certifications	CE, FCC, IC

Part. No. 1-1300 TimeKeeper

Case Material	304L Stainless steel, PA12
Operating Temp	-20°C to 60°C (-4 to 140°F)
Storage Temp	-20°C to 60°C (-4 to 140°F)
Relative humidity	0-95% non-condensing
Protection	IP67
TimeKeeper Dimensions	Ø51 mm, H123mm
TimeKeeper Weight	515g
Mounting	M6 threaded hole
Battery Type	Li-Ion 14500 rechargeable, 3.7V nominal
Operating time	10 balancing jobs in average with one charge
Interface	Magnetic ON/OFF Switch
Laser tachometer input type	+/-5VDC
Laser tachometer input connector	M12
Communication range	Up to 10m from accelerometers Up to 10m from Mobile device using 2.4GHz BLE
Radio certifications	CE, FCC, IC

Specifications are subject to change without notice.

acoem

CREATING ENVIRONMENTS OF POSSIBILITY

Publication: User Manual Wireless Balancer, 1st ed

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