

User's Manual

Push Power Measurement

Wheel System



HONDA

User's Manual

Push Power Measurement Wheel System

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1. Functions and Specifications

This product is intended for use as the wheels attached to a racing wheelchair. The system performs 3D measurement and recording of force applied to the wheels during wheelchair operation, saves the recorded data to a PC, and analyzes and displays the data.

The main specifications are as follows.

Item	Specification
Weight	4.6 kg
Moment of inertia	0.075 kg·m ²
Attachable hand rings	4-bolt hand ring: PCD328mm (13") 5-bolt hand ring: PCD368mm (14.5") 6-bolt hand ring: 328–386 mm (13"–15")
Supported tire type	Tubular
Speed measurement range	0–42 km/h
Acceleration measurement range	2-axis in wheel plane: 8 G
Translational force measurement range	Wheel plane direction: 500 N Wheel plane radial direction: 500 N
Moment measurement range	About axis perpendicular to wheel axis: 50 Nm About wheel axis: 50 Nm
Sampling	400 Hz
Continuous measurement time	Up to 1.5 hours

Recommended PC specifications

(If you use a PC that does not meet the recommended specifications, data may not be displayed or analyzed correctly.)

OS: Windows 10, 10 Pro

Memory: 8GB or more

*Please prepare your own PC.

*Mac computers cannot be used.

2. Safety Information and Precautions

This safety information is very important. Situations that could potentially result in injury to the user/operator or any other person are listed using the following notations. Make sure to read and understand this safety information before use.



DANGER

You **WILL** be **KILLED** or **SERIOUSLY HURT** if you do not follow instructions.



WARNING

You **CAN** be **KILLED** or **SERIOUSLY HURT** if you do not follow instructions.



CAUTION

You **CAN** be **HURT** if you do not follow instructions.

Other Information



INSTRUCTION

How to use this product correctly and safely.

Read this manual carefully before using this product. Make sure that you understand how to handle the product well and use it properly.

Please make sure to read the following safety instructions.



Warning

- 1) This product is a push power measurement system for wheelchairs used in wheelchair sports. Do not use the product for any other purpose as this may result in physical harm or property damage.
- 2) Before use, check the wheels for breakage, looseness, wheel skin denting, scratches, or cracks. Do not use the product if these or any other defects are present as this may result in a wheel breaking or the wheelchair tipping over.
- 3) Do not leave the product in a high-temperature environment (e.g. in a hot car or around a heating appliance). The product may become hot, creating a risk of fire, burns, or other hazards. It may also cause a puncture or other damage, potentially leading to severe damage to parts.
- 4) Carbon fiber conducts electricity. Exercise due caution around electricity or electrical equipment. This may cause electric shock or other problems resulting in death or serious injury.
- 5) Incorrect use of the battery may cause leakage, overheating, fire, or explosion, and could result in death or serious injury.
 - Do not put battery in fire, or use it near fire sources, combustible gas or in high temperatures.
 - Insert the battery so that the positive (+) and negative (-) poles are correct.
 - Keep battery fluid away from your eyes and skin. If contact occurs, rinse immediately and thoroughly with plenty of water, and seek immediate medical attention.
 - Do not use different types of batteries or new and used batteries together.

Before use, insert the batteries correctly in to the product. After use or during storage, always remove the batteries from the product.

Please check and obey all local laws and regulations for the disposal of batteries.

Please make sure to read the following safety instructions.



Caution

- 1) Attach the wheels using the specified tightening torque. If not attached properly, the product may become damaged or come off while driving, causing injury.
- 2) After attaching the measurement wheels, be sure to inspect the wheelchair and wheels properly before use.
- 3) Use the wheelchair only after checking the clearance between wheelchair frame and wheels using the clearance checker.
- 4) If measuring with a roller, take due care to ensure there is clearance between wheels and roller.

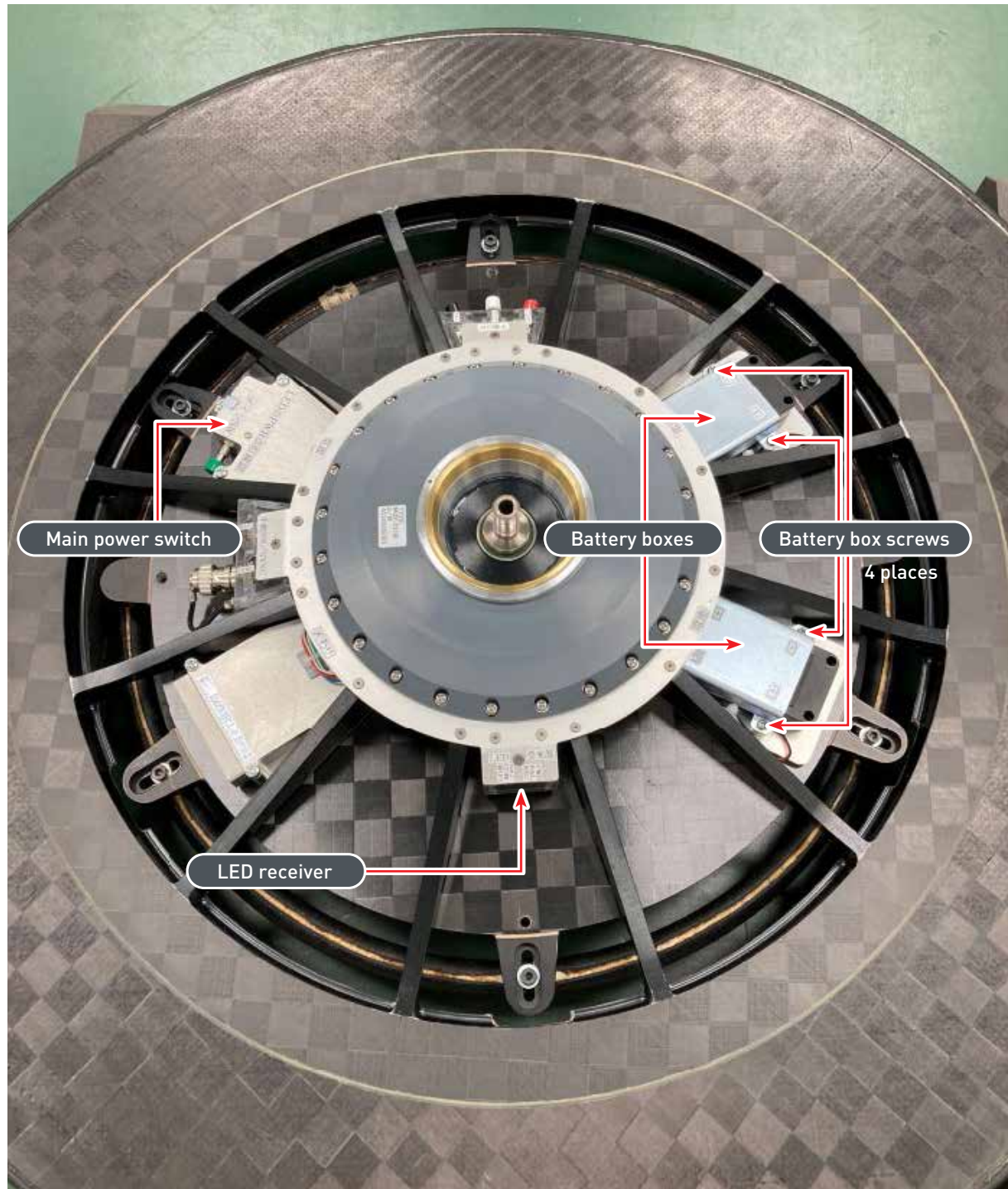
Please make sure to read the following safety instructions.

 Instruction

- 1) Do not use the wheels on rough or uneven surfaces (use on an athletics track is envisaged). Refrain from using the wheels on wet surfaces or in rainy conditions as this may result in a malfunction.
- 2) Do not leave the wheels outside as changes in weather, temperature, humidity, or other conditions could lead to significant wear. Be sure to store the wheels indoors, inside the product case.
- 3) Use only new dry batteries when replacing batteries.
- 4) Handle the measuring wheels with due care. If they are subjected to a powerful impact, they may be damaged. The measuring wheels are made of multiple layers of carbon fiber sheets laminated together form a material that is strong along the direction of the fibers. When subjected to a powerful impact, however, the layers may separate, causing the material to rapidly lose strength.

3. Names of Parts

Measurement Wheel



Names of Parts



Measurement wheel attached to a wheelchair

Names of Parts

Hand ring plate

Two types of hand ring plate are available: a 4-/6-bolt type and a 5-bolt type.

4-/6-bolt type



5-bolt type

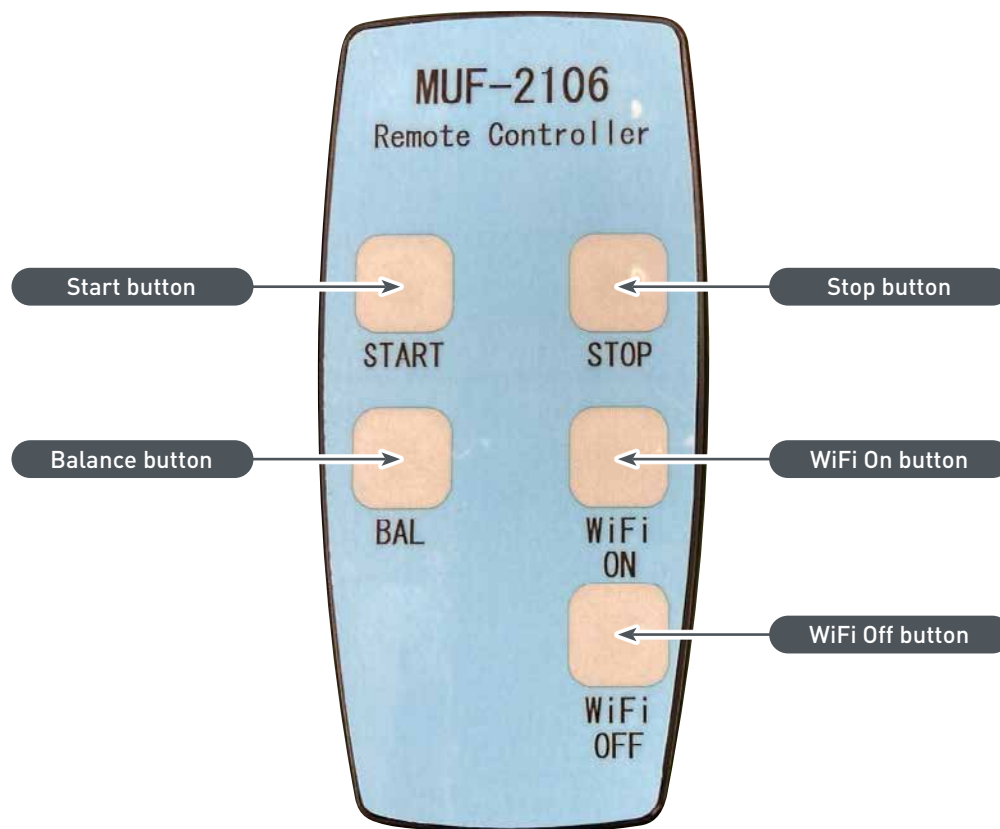


Hand ring



Names of Parts

Remote Controller and Buttons



Button	Function
START	Starts the measurement log
STOP	Stops the measurement log
BALANCE	Calibrates the 6-axis sensor
WiFi ON	Turns on the Wi-Fi connection for downloading measurement data
WiFi OFF	Turns off the Wi-Fi connection. Once the downloading is completed, turn off the Wi-Fi connection to save battery.

The remote controllers use AAA batteries .

Names of Parts

LED Status

1. Main power is on
(standing by for
measurement)



Number of LEDs illuminated: 2

2. Measurement in
progress



Number of LEDs illuminated: 3

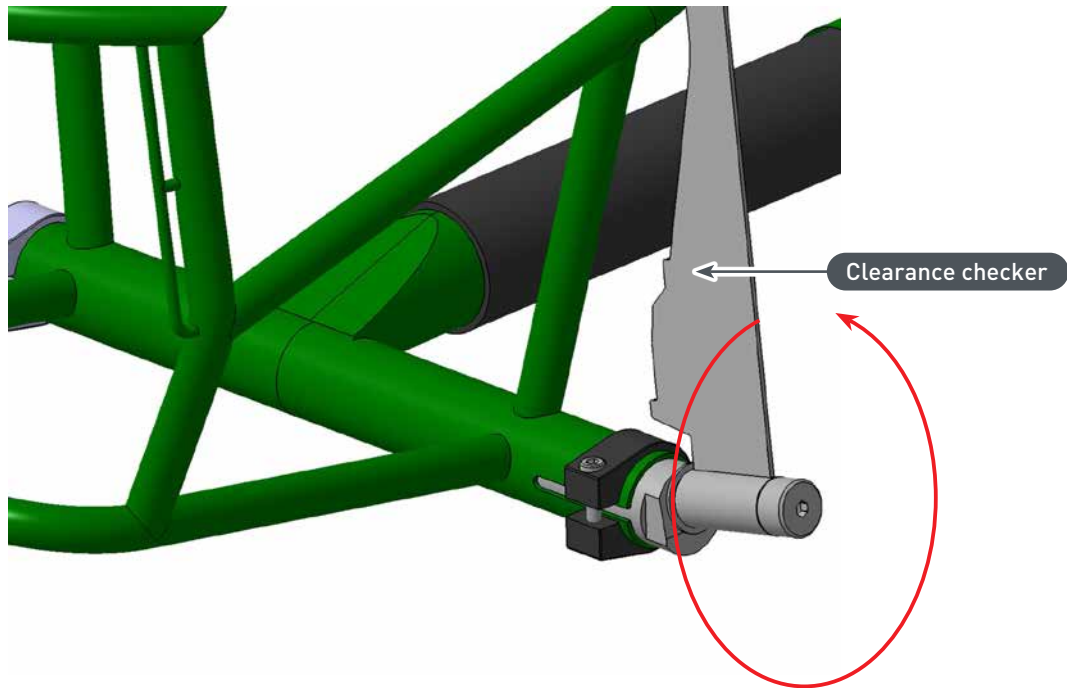
3. Wi-Fi is on



Number of LEDs illuminated: 3

4. Before You Begin

4-1. Use clearance checker to check wheelchair and measurement wheel system clearance
Before attaching the measurement wheel, use the included clearance checker to make sure the measurement wheel does not interfere with the wheelchair.



Step 1



Attach the clearance checker instead of the wheel

- Attach and tighten until the clearance checker hits the camber block. If any interference occurs, do not forcefully tighten it, but instead attempt 1–3 (see page 12).

Step 2



If the clearance checker can go through a full revolution, there is deemed to be no interference.

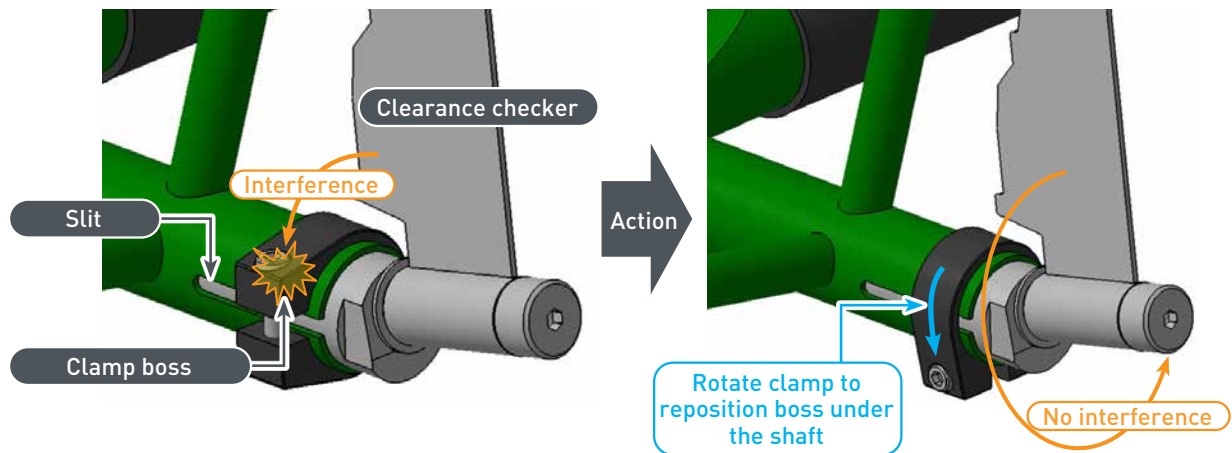
Before You Begin

If there is interference, take one of the actions 1)–3) below, or try more than one action.

Action 1) Use a spacer

If there is interference, insert a spacer (of a thickness in the range typically used) between the measurement wheel side and the camber block, then check if the interference has been resolved.

Action 2) Rotate the clamp



Example showing the clearance checker colliding with the boss of the clamp

Follow the steps below to rotate the clamp so the boss is positioned under the shaft.

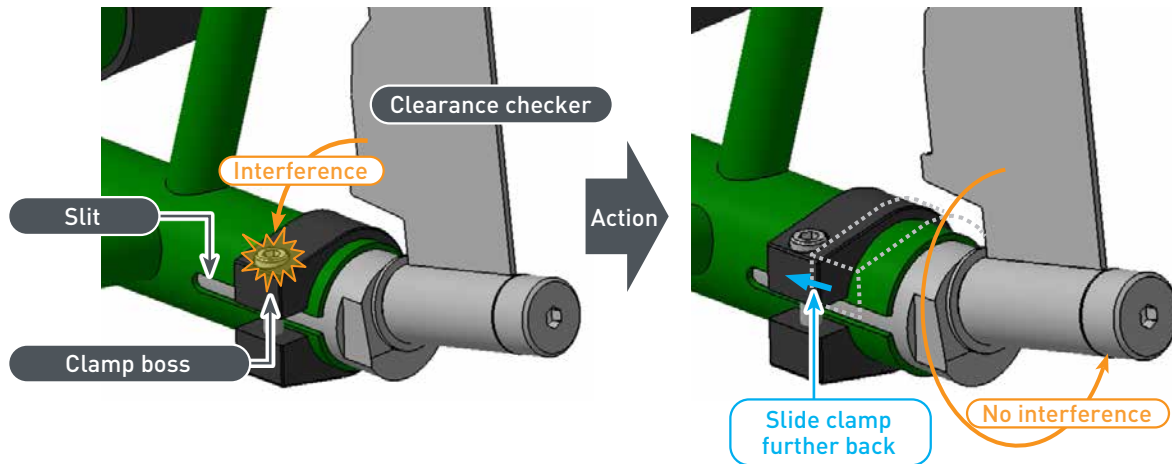
- i. Loosen the clamp's tightening screw
- ii. Rotate the clamp
- iii. Tighten the screw

*Rotate the clamp under your own responsibility.

*When loosening the screw, prevent the camber block from moving.

Before You Begin

Action 3) Slide the clamp sideways



Example showing the clearance checker colliding with the boss of the clamp

To move the clamp further back:

- i. Loosen the clamp's tightening screw
- ii. Slide the clamp back
- iii. Tighten the screw

*Reposition the clamp under your own responsibility.

*When loosening the screw, prevent the camber block from moving.

*Take care not to slide the clamp beyond the slit.

If the interference persists even after taking the above action, it is likely the attachment of the push power measurement wheels is not possible. If you would like to check the possibility of attaching the wheel, please send photos and videos of the interference to the Customer Service Counter (see the last page of this manual).

Before You Begin

4-2. Check hand ring compatibility

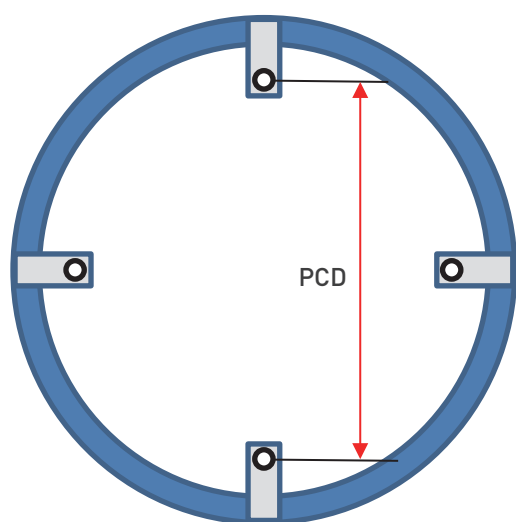
Please check the following to select the hand ring plate that fits your vehicle.

Check parameters:

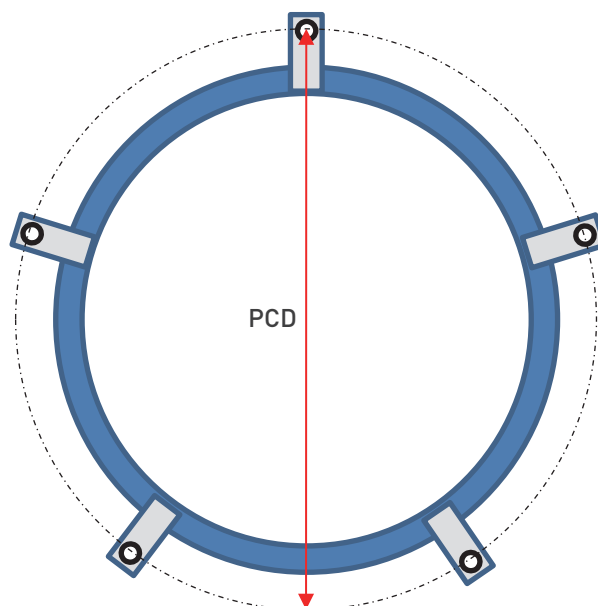
- Hand ring diameter
- Pitch circle diameter (PCD) (see diagrams below)

Compatible hand ring PCDs :

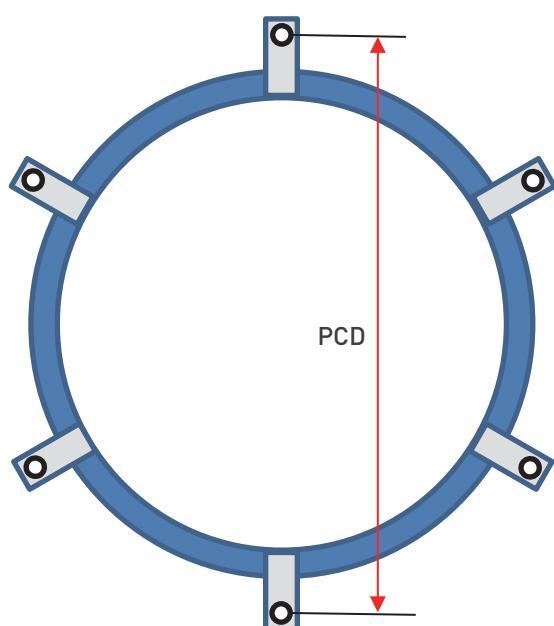
- 4-bolt: 328 mm (13")
- 5-bolt: 368 mm (14.5")
- 6-bolt: 328–386 mm (13"–15")



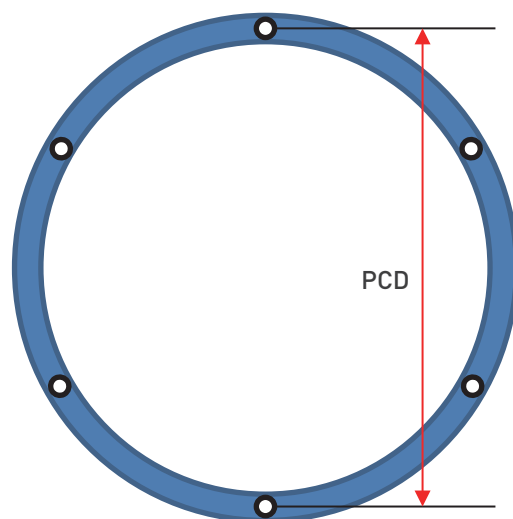
*4-bolt hand ring



*5-bolt hand ring



*6-bolt hand ring



*6-bolt hand ring

Before You Begin

4-3. Prepare batteries

Either prepare new batteries or fully charge rechargeable batteries (4 × AA batteries for each wheel, 8 batteries in total).

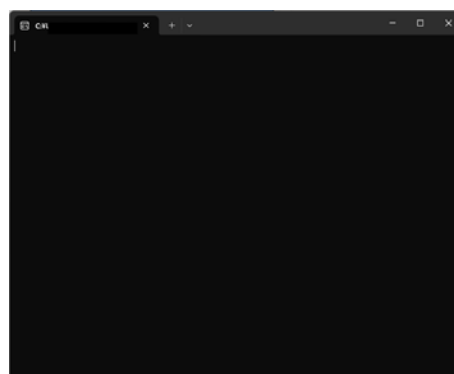
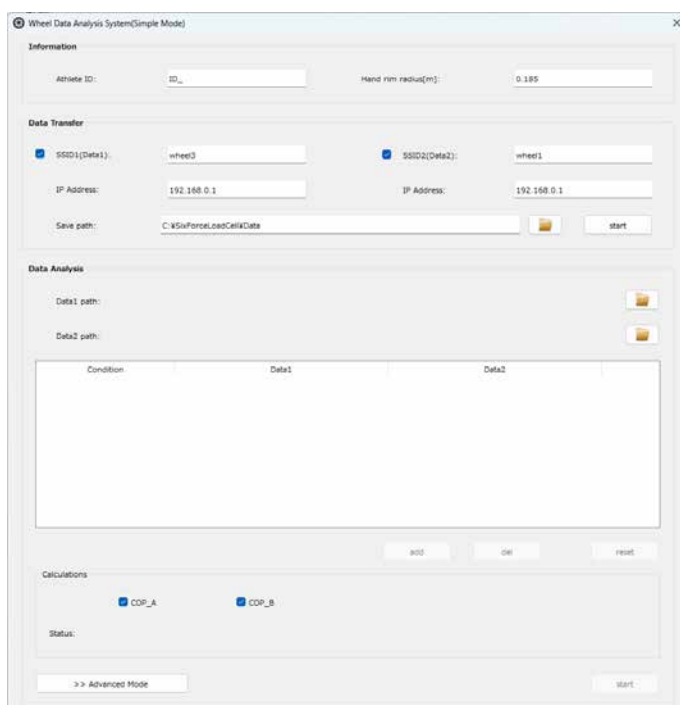
4-4. Prepare measurement PC

App installation method: Download the following .exe file in advance and copy it onto the PC to be used for measurements.

simple_mode_gui.exe

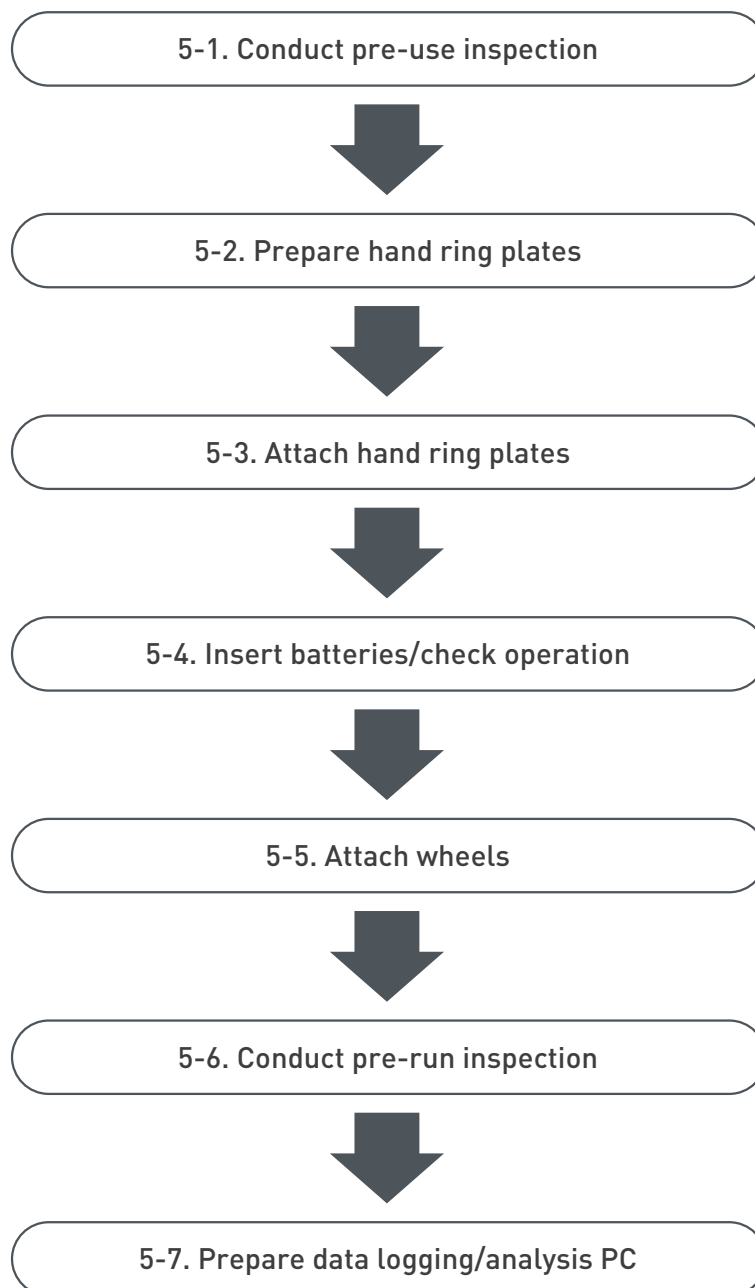
Check that double clicking the .exe file launches the application shown below.

*If the application does not start, contact the Customer Service Counter (see the last page of this manual).



5. Measurement Wheel Preparation

Measurement Wheel Preparation Flowchart



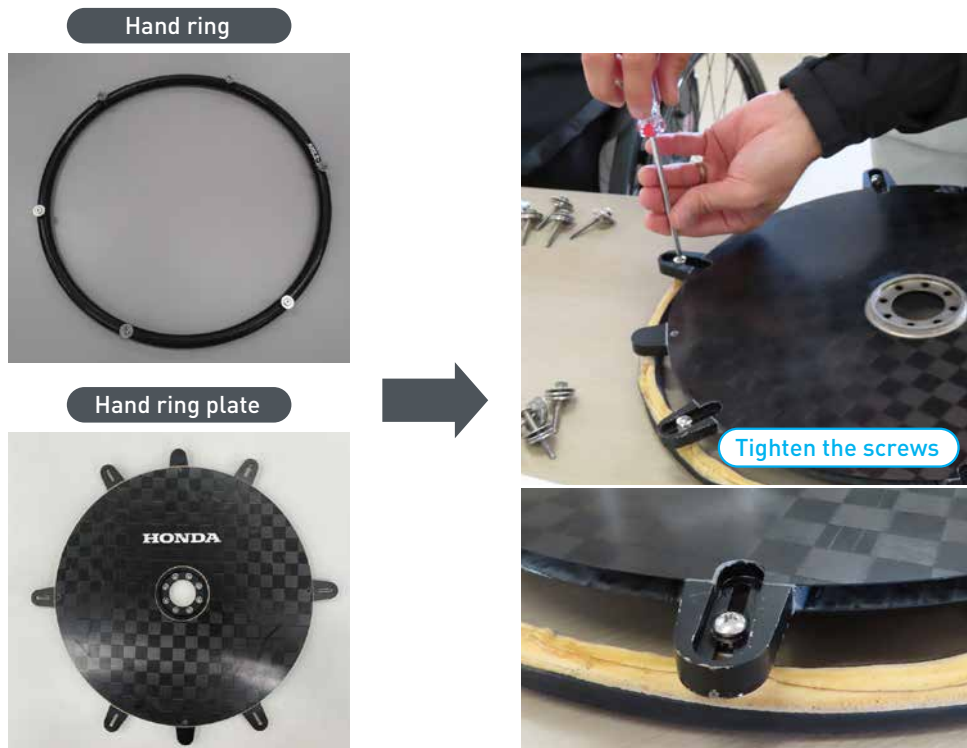
Measurement Wheel Preparation

5-1. Conduct pre-use inspection

Visually check the measurement wheels for cracks in metal parts, tearing of the carbon skin, adhesive failure, and scratches. Especially check there are no cracks or fissures on sides near the rims.

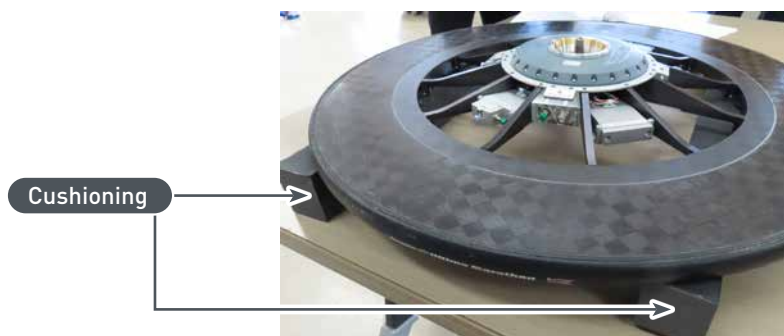
5-2. Prepare hand ring plates

- Required tools: Hex keys
- Select hand ring plates matching the number of hand ring bolt holes



- Align the holes on the hand ring plates with the holes on the hand rings and affix the hand rings using suitable screws. Fasten the screws (if the holes on the hand ring are not threaded, attach nuts). If using nuts, select mounting screws that protrude around 3 mm from the end of the nut. Use washers as appropriate to avoid damaging the CFRP or other surfaces.

(Reference) When working with a hand ring plate, place the measurement wheel on the cushioning from inside the wheel case. This makes it easier to work.



Measurement Wheel Preparation

5-3. Attach hand ring plates

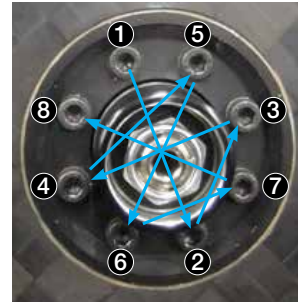
- Required tools: Hex keys
- Attach the hand ring plates to the measurement wheels. When attaching the hand ring plates, position them so all the bolt holes are visible. (Use eight M5 × 12 mm bolts; tightening torque: 3 Nm.)



Good example:



Bad example:

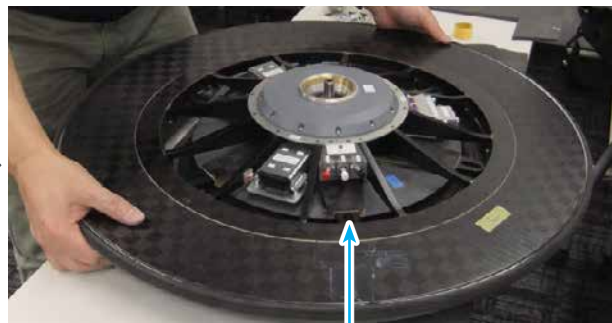


Tighten the eight M5 bolts in a crisscross sequence, as shown in the image on the right.

(Reference: Alternative procedure) Hand rings can also be attached to hand ring plates without detaching the hand ring plate from the measurement wheel.



Place washers where they are to be attached to the hand ring



Carefully align the bolt holes without moving the washers

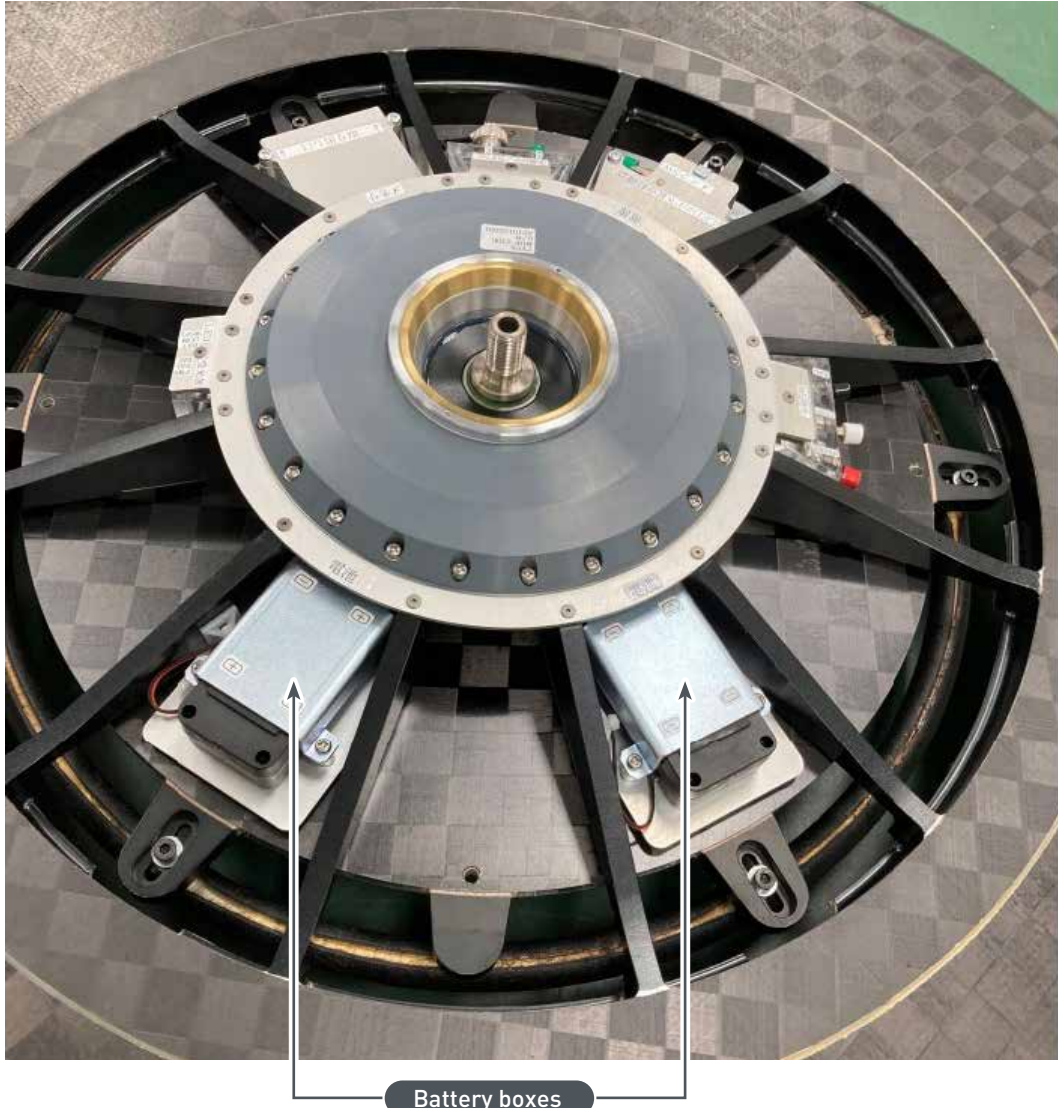


Affix the hand ring to the hand ring plate

Measurement Wheel Preparation

5-4. Insert batteries/check operation

- Required tools: Phillips screwdriver



- Remove the screws (x 2) from the battery boxes, insert dry batteries, then retighten the screws. Work carefully as the screw threads can be easily damaged. Insert batteries in the other battery boxes in the same way.
- Switch on the power to the measurement wheels. Check they are functioning normally by looking at the LEDs. Once you have done this, switch the power off.



After switching on the main power, 2 illuminated LEDs indicate normal operation

Measurement Wheel Preparation

5-5. Attach wheels

- Required tools: Hex keys, air pump
- Secure the wheelchair frame so it does not wobble. Affix each measurement wheel as you would affix a normal wheel and tighten with a hex key. (Tightening torque: 15 Nm)
- When using spacers to avoid interference, make sure they will not cause the axle to come loose. Avoid excessive use of spacers.
- Pump air into the tires (8–9 atm is appropriate).



Attach the wheels to the wheelchair frame

5-6. Conduct pre-run inspection

Check the following:

- Braking performance
- Tire pressure (8–9 atm)
- No steering play
- No abnormal sounds during operation

5-7. Prepare data logging/analysis PC

- Insert the included Wi-Fi dongle into the PC.
- Start the PC and start the software.

Key Points

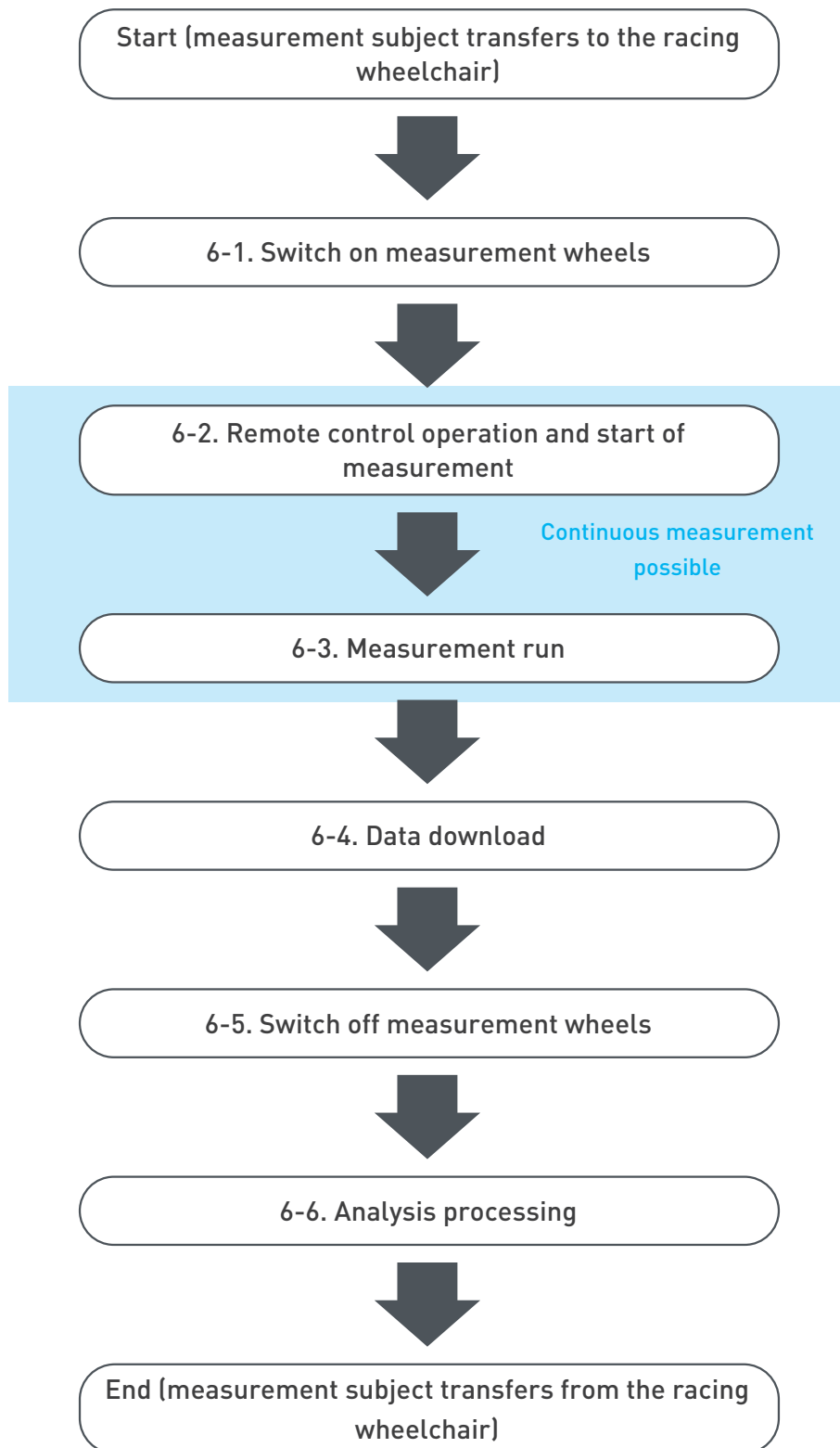
- Do not connect to any other Wi-Fi while measurement is in progress.



Wi-Fi dongle

6. Measurement Procedure

Measurement Flowchart



Measurement Procedure

6-1. Switch on measurement wheels

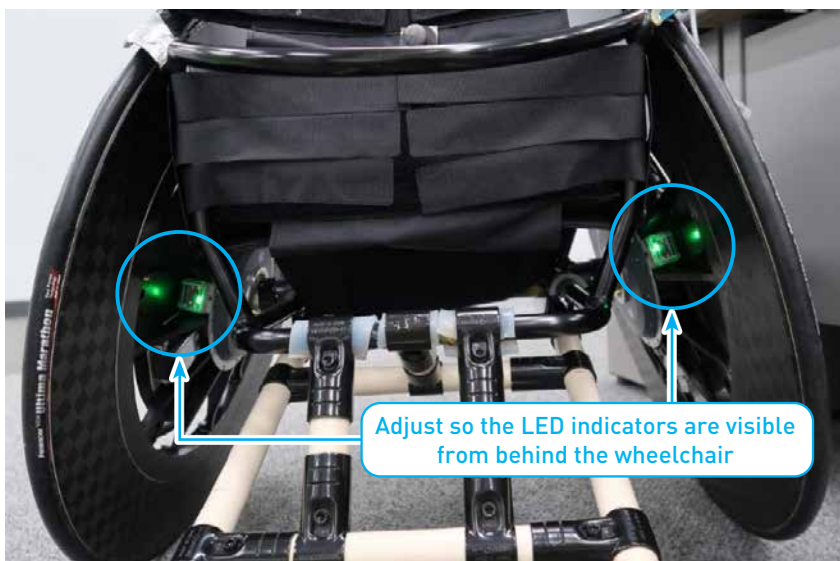
- The measurement subject transfers to the wheelchair at the appropriate time.
- Turn on the main power switches while the wheels remain stationary and wait 2 seconds.

Check that 2 LEDs are illuminated on both wheels.

*If a wheel is moving at the time, or immediately after, the power is switched on, an error will occur and the red LED will light up. If this happens, switch off the main power. Once again, make sure the wheel is not moving before switching on the main power.



Main power switch
(on inside of wheel)



Adjust so the LED indicators are visible
from behind the wheelchair

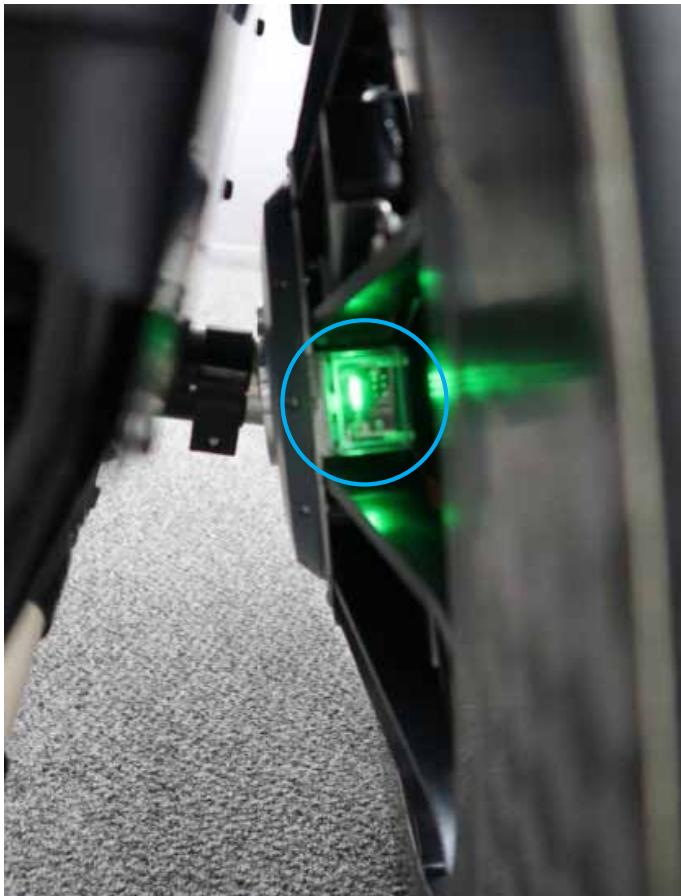


When the main power is
switched on, 2 LEDs will light
up

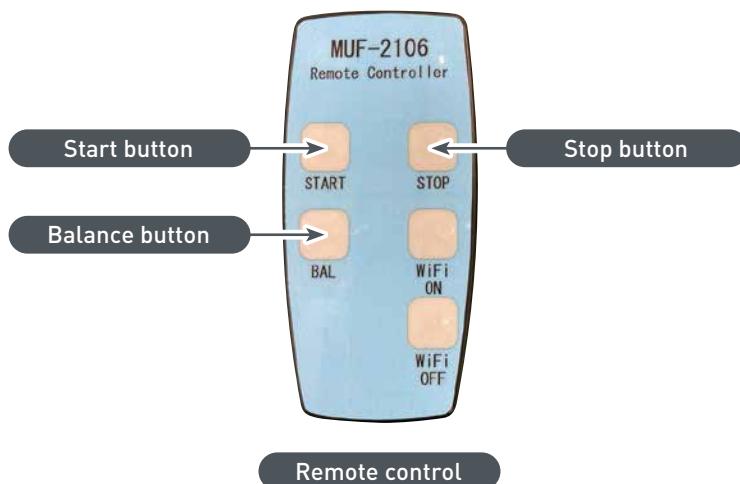
Measurement Procedure

6-2. Remote control operation and start of measurement

- Rotate the measurement wheels to adjust the position of the LED indicators on both wheels so they can be seen from behind the wheelchair. This enables simultaneous detection of remote control signals by both wheels.
- While holding the wheels to stop them rotating, press the BAL (Balance) button on the remote control to initialize the sensor. On each LED indicator, 3 lights will flash several times before returning to 2 non-flashing lights. **Take care not to touch the hand rings or hand ring plates during this time.**



When you press the Balance button, each LED indicator will show 3 flashing lights, then 2 non-flashing lights.



Measurement Procedure

6-3. Measurement run

- Ensure good visibility of LED indicators (LED receivers) on both wheels from behind the wheelchair, then press the Start button on the remote control. When 3 lights are illuminated on both LED indicators, logging will begin. Commence the measurement run.

Key Points

- Do not touch the hand rings or rotate the wheels after the Balance button is pressed and before logging begins.
- Remember data logging must start simultaneously for both wheels. Make sure of this by holding the remote control close to your eyes and pressing the Start button while watching the LED indicators on both wheels.
- After completing the measurements, stop the logging of data. Data logging does not have to be stopped simultaneously for both wheels. Rotate the measurement wheels so the LED indicators are visible from behind, then press the Stop button on the remote control. Check that 2 lights are illuminated on each LED indicator. To continue to the next measurement, return to "6-2. Remote control operation and start of measurement."



Number of LEDs illuminated: 2
Main power is on



Number of LEDs illuminated: 3
Measurement can begin



Number of LEDs illuminated: 3
Wi-Fi is on

*Refer to the Appendix for LED illumination specifications.

Measurement Procedure

6-4. Data download

Use the PC to download measurement data.

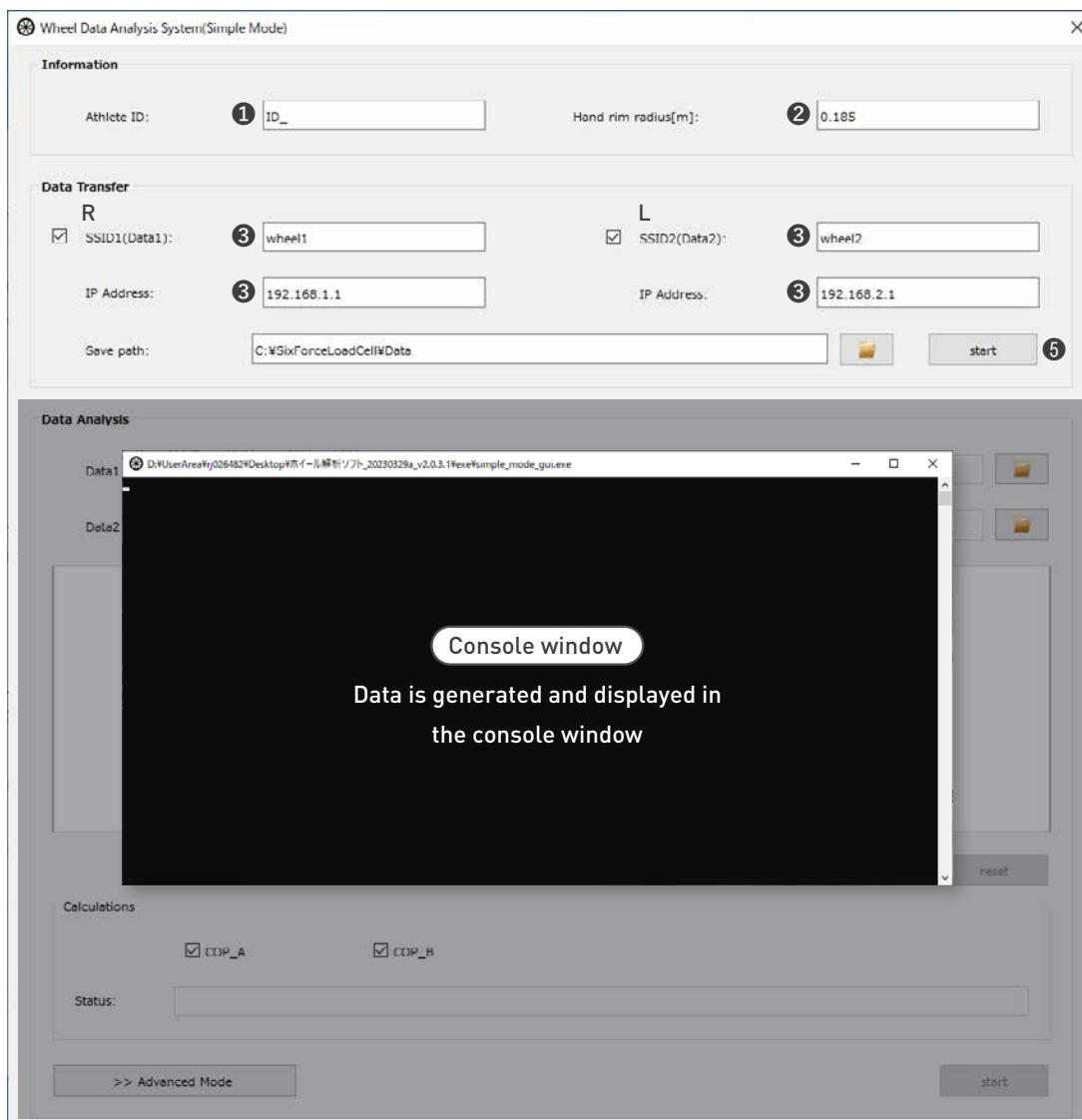
Run the "simple_mode_gui.exe" software. The measurement wheelchair should be brought close to the PC for this.

- 1) Enter an athlete ID at your discretion.
- 2) Enter the hand ring radius.
- 3) Enter the SSID and IP Address. They are listed on the sticker attached to the vehicle side of the measurement wheel.

Example: SSID1 (Data1): wheel1, SSID2 (Data2): wheel2

Example: IP Address (Data1 side): 192.168.1.1, IP Address (Data2 side): 192.168.2.1

- 4) Point the remote control at the LED receivers on both wheels and press the WiFi On button.
Check that 3 LEDs are illuminated on both wheels. This does not have to be performed simultaneously for both wheels.
- 5) Press the start button on the software.
- 6) Download progress is shown in the console window. Check the download is complete, then press the WiFi Off button on the remote control.

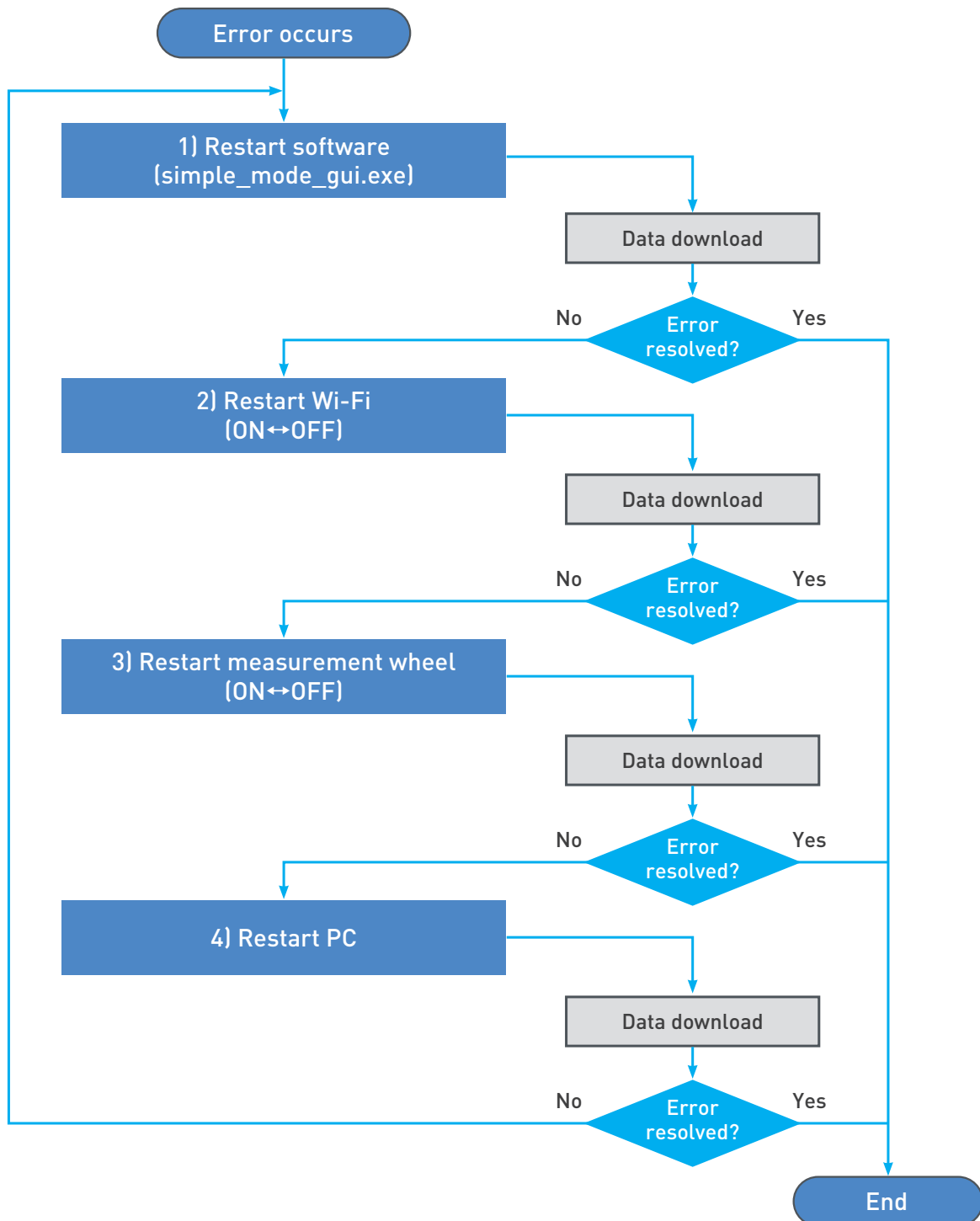


Measurement Procedure

6-4. Data download

[Troubleshooting]

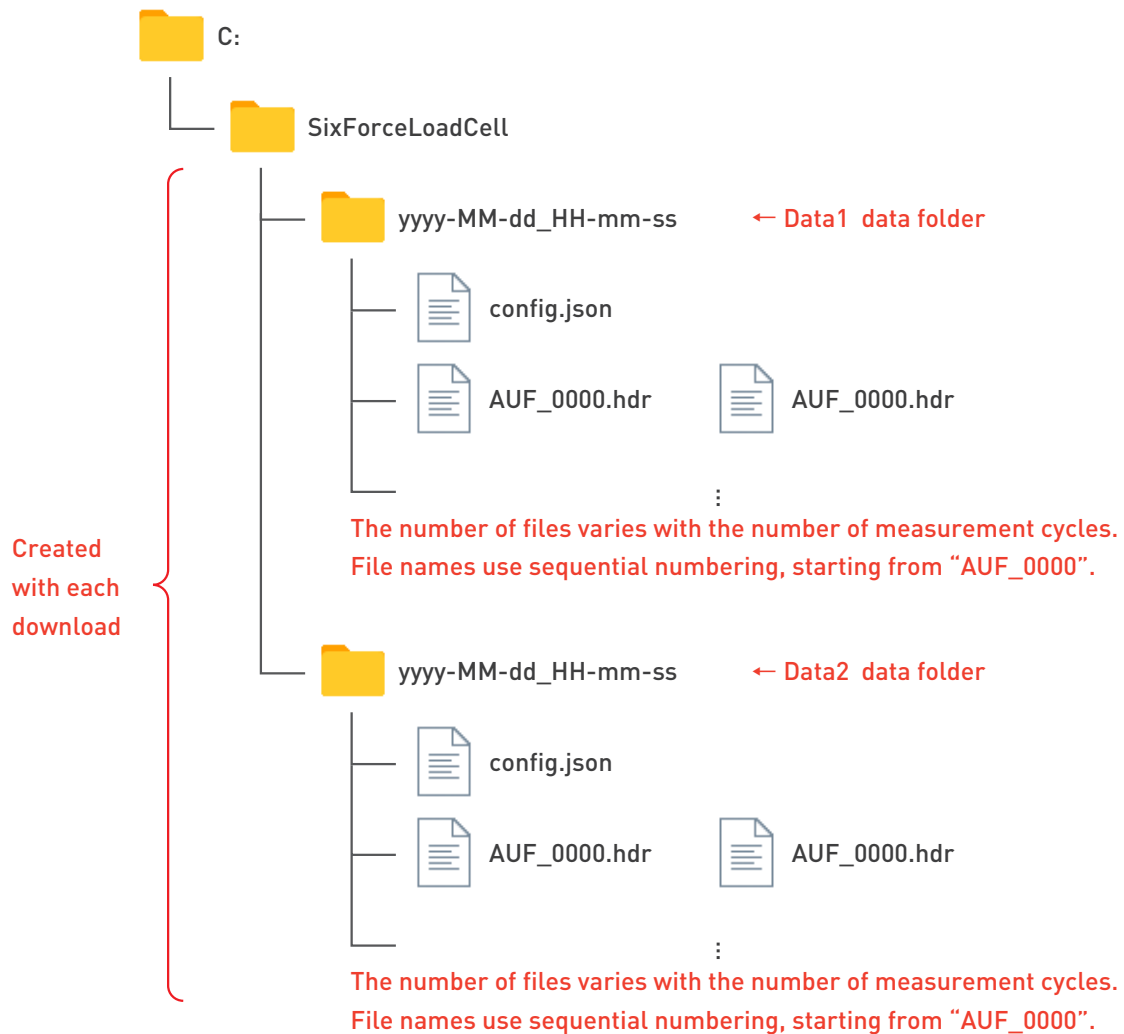
Follow the procedure below if an error appears in the dialog box or if downloading does not end.



Measurement Procedure

6-4. Data download

Folder Structure



*"yyyy-MM-dd_HH-mm-ss" is a time stamp indicating the time that downloading commenced.

Measurement Procedure

6-5. Switch off the measurement wheel

- Once the data download is complete, push the main power switch on the measurement wheel to turn the power off.
- To perform another measurement, return to “6-1. Switch on measurement wheels .”
- If you have finished, the measurement subject should exit the wheelchair at the appropriate time. (The measurement subject may exit the wheelchair before “6-4. Data download.”)

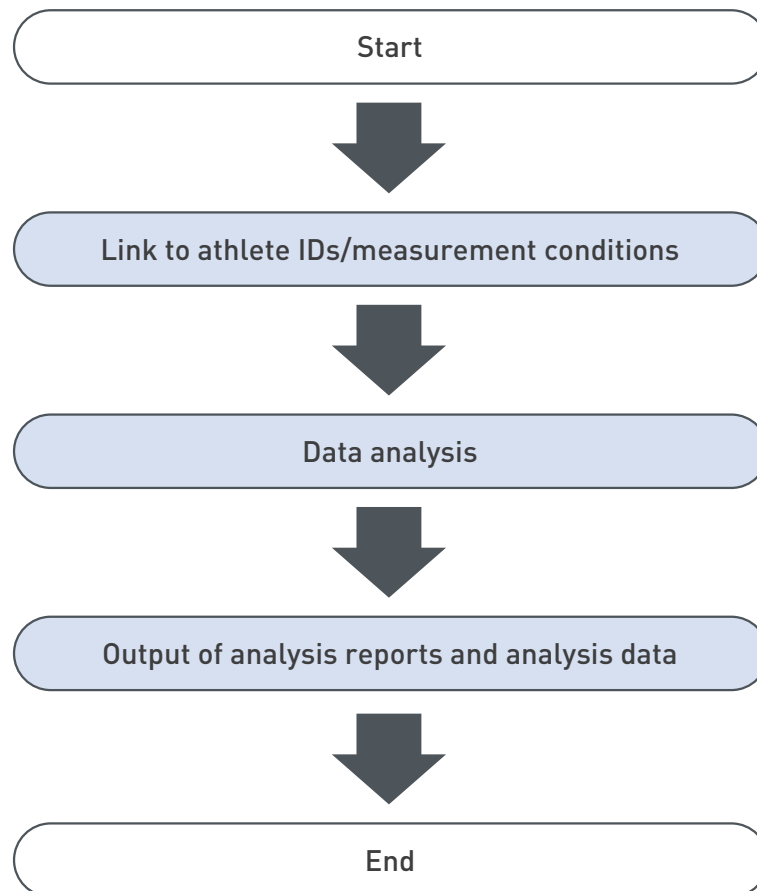


Main power switch
(on inside of wheel)



Measurement Procedure

Main GUI Measurement Data Analysis Flowchart



Measurement Procedure

6-6. Analysis processing

	GUI	Functions
1)	Main	• Link athlete IDs and measurement conditions to measurement data • Analyze measurement data • Output analysis results to a PDF or CSV file • Output analysis results to a pickle file
2)	Re-analyze	• Analyze measurement data (applicable to data linked to an athlete ID and measurement condition) • Output analysis results to a PDF or CSV file • Output analysis results to a pickle file
3)	Compare Data	• Display two sets of analysis results together and compare • Display cycle by cycle • Capture screenshots of displayed comparison results

The data analysis processing app has the above functions. Operation of the Main GUI is explained here. Re-analyze and Compare Data GUIs are explained in the Appendix at the back of this manual.

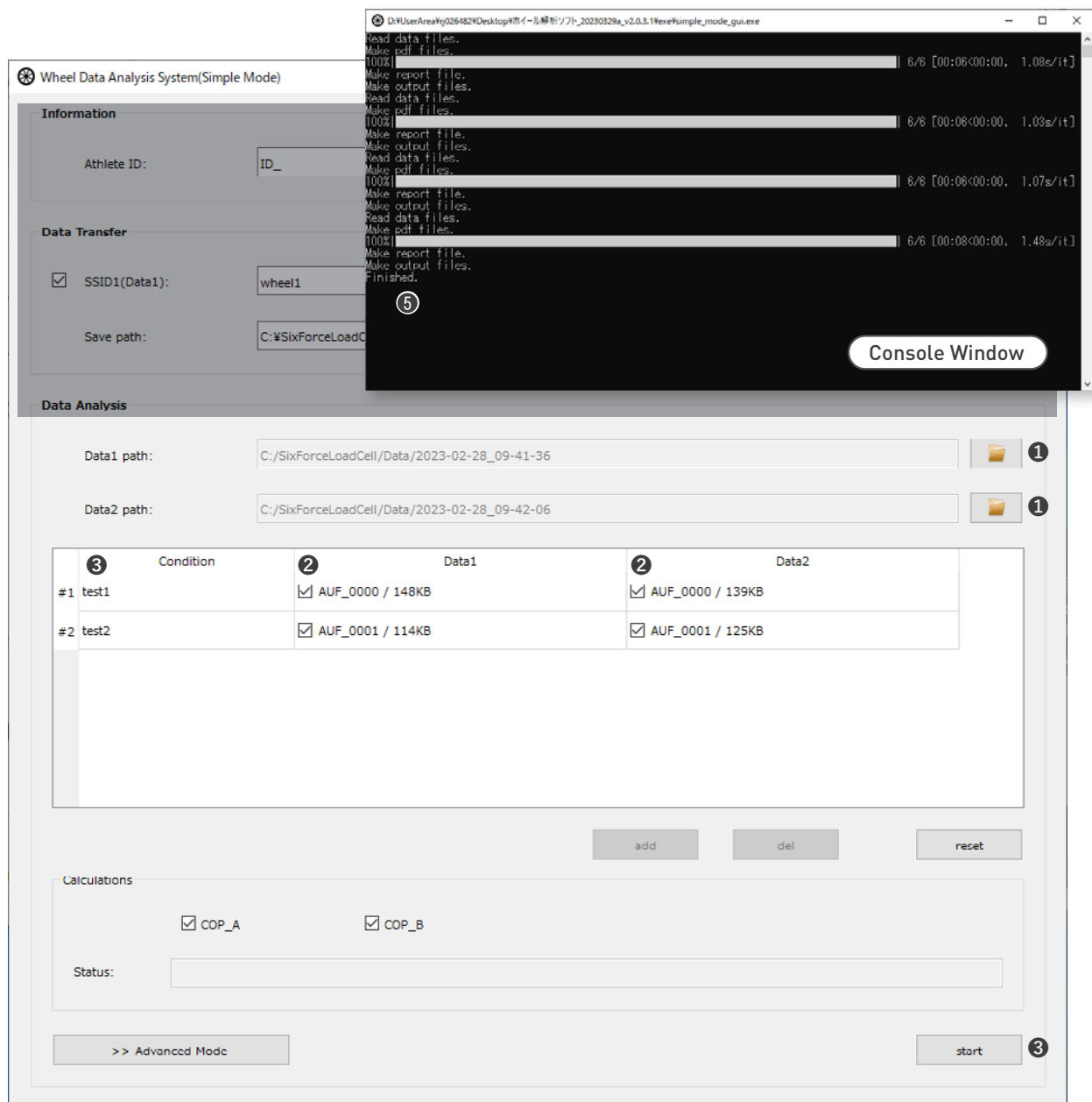
Measurement Procedure

6-6. Analysis Processing (Main GUI)

Use the PC to conduct an analysis of the measurement data.

Run "simple_mode_gui.exe".

- 1) Select the folders containing the data (folders you have just downloaded will be selected by default).
- 2) Check the Data1 and Data2 files you wish to analyze. (Uncheck error data, as determined by file size and measurement order.)
- 3) Enter the measurement condition.
Example: 100 m, 400 m (roller), etc.
- 4) Press the start button.
- 5) Analysis progress can be followed in the console window. When the analysis is finished, the word "Finished" will appear in the console window.



Measurement Procedure

[How to Check Analysis Results]

Analysis results are saved in the report folder (see below).

*.pdf: Results report

*.csv: Measurement data

Documents\wheel-data\ID_****\<Date>

\<Measurement condition>\report_a(report b)

For more information, refer to the separate manual on how to interpret the data.

Measurement Procedure

Fixes for App Operation Errors

■ Fix for being unable to start measurements with both wheels simultaneously

Problem:

- The number of measurements is different for left and right wheels

Fixes:

(1) Before analysis, uncheck the data for which there was an invalid measurement.

(Example)

	Condition	Data1		Data2
#1	test1	☒ AUF_0000 / 148KB	← Paired data →	☒ AUF_0000 / 154KB
--		☐ AUF_0001 / 114KB Invalid data		☐ ----

1) Uncheck

(2) Before analysis, use the add button to create a dummy data slot, ensuring the correct data pairing.

(Example)

	Condition	Data1		Data2
#1		☒ AUF_0000 / 148KB	← Paired data →	☒ AUF_0000 / 89KB
#2		☒ AUF_0001 / 114KB	← Paired data →	☒ AUF_0001 / 170KB Invalid data
		☐ ----		☐ AUF_0002 / 93KB

2) Select cell.

1) Uncheck

3) Press add.

add del reset

*Press Reset to return to the initial list.

	Condition	Data1		Data2
#1		☒ AUF_0000 / 148KB	← Paired data →	☒ AUF_0000 / 89KB
--		☐ ---- Dummy data slot		☐ AUF_0001 / 170KB
#2		☒ AUF_0001 / 114KB	← Paired data →	☒ AUF_0002 / 93KB
--		☐ ----		☐ ----

7. Disassembly and Storage

Required tools: Hex keys, Phillips screwdriver

- Detach the measurement wheels from the wheelchair frame.
- Remove the batteries from the battery boxes.
- Detach the hand ring plates from the measurement wheels.*
- Remove the hand rings from the hand ring plates.
- Pack the parts into the storage case.
- Store at room temperature. Avoid overly humid or dusty places.
- To remove dirt, use a cloth with fine fibers, such as a cloth for eyeglass lenses. When doing so, note that excessive cleaning or repeated cleaning may cause scratches. Also, do not use solvents such as alcohol or benzine to remove dirt.

*Optional

8. Appendix

8-1. Explanation of measurement data analysis

In Re-analyze mode, two windows will open.

The screenshot shows the 'Wheel Data Analysis System (Simple Mode)' window. It has a title bar with a close button. The window is divided into several sections: 'Information' with fields for 'Athlete ID' (containing 'ID_') and 'Hand rim radius[m]' (containing '0.165'); 'Data Transfer' with checkboxes for 'SSID1(Data1)' and 'SSID2(Data2)' (both checked), input fields for 'wheel1' and 'wheel2', a 'Save path' field (containing 'C:\SixForceLoadCell\Data'), a folder icon, and a 'start' button; 'Data Analysis' with 'Data1 path' and 'Data2 path' fields, each with a folder icon; a table with columns 'Condition', 'Data1', and 'Data2'; 'Calculations' with checkboxes for 'COP_A' and 'COP_B' (both checked), a 'Status' field, and buttons for 'Add', 'Del', and 'Reset'; and a bottom section with a '>> Advanced Mode' button and a 'start' button.

GUI transition

The screenshot shows the 'Wheel Data Analysis System (Processing)' window. It has a title bar with a close button. The window contains a 'Data Folder' field with a folder icon, an 'Option' button, and a 'Run' button. At the bottom left, it displays the date and time '2022/06/06 16:32:12'.

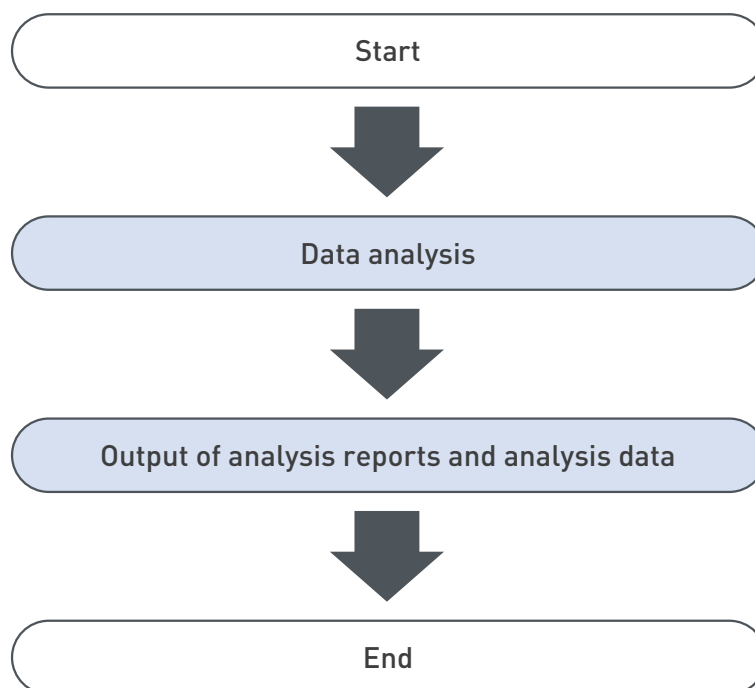
Re-analyze (general-purpose) GUI

The screenshot shows the 'Compare Data' window. It has a title bar with a close button. The window contains a table with 4 columns and 6 rows. The first column is empty, and the other three columns contain data. The table is titled 'Compare Data'.

Compare Data GUI

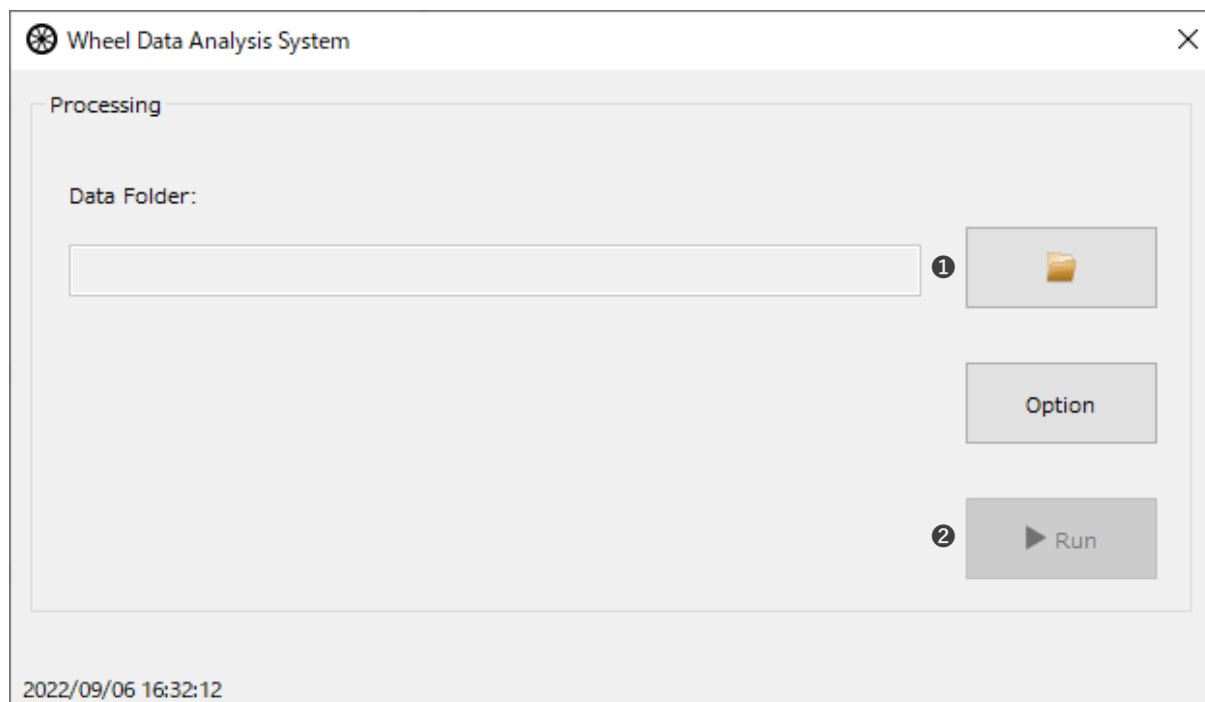
Appendix

Re-analyze Mode Processing Flowchart



Appendix

Re-analyze (general-purpose) GUI



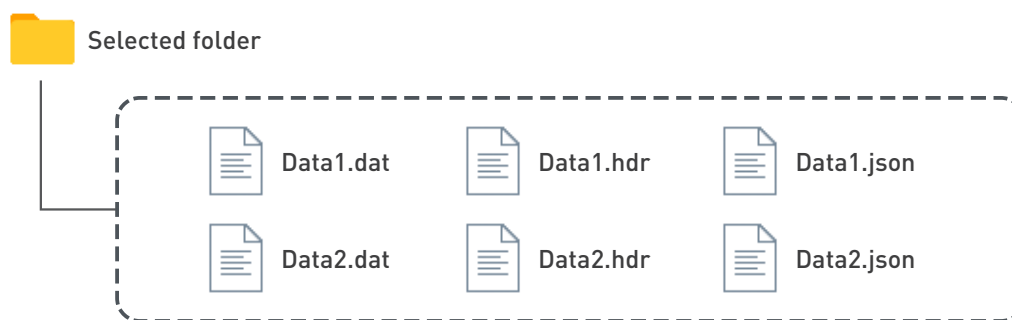
[Instructions]

1) Select the folders containing the data you wish to analyze.

2) Press Run.

*Selected folder structure

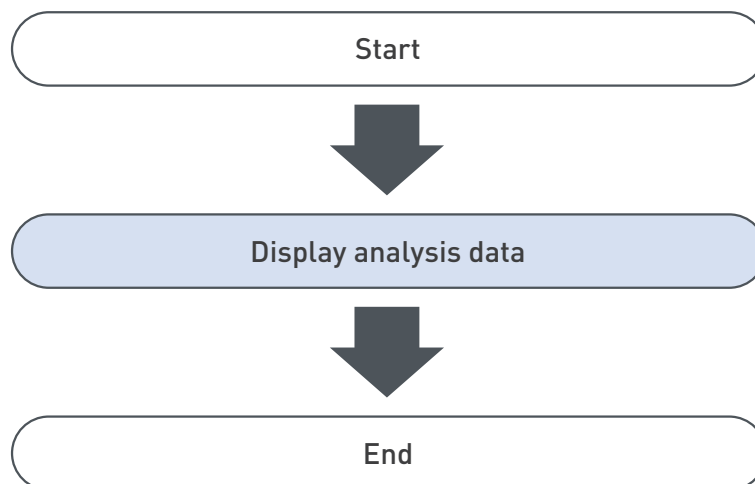
The folder must contain the data shown in the figure below (data from both left and right wheels).



*Names of files corresponding to the same wheel are consistent with one another.

Appendix

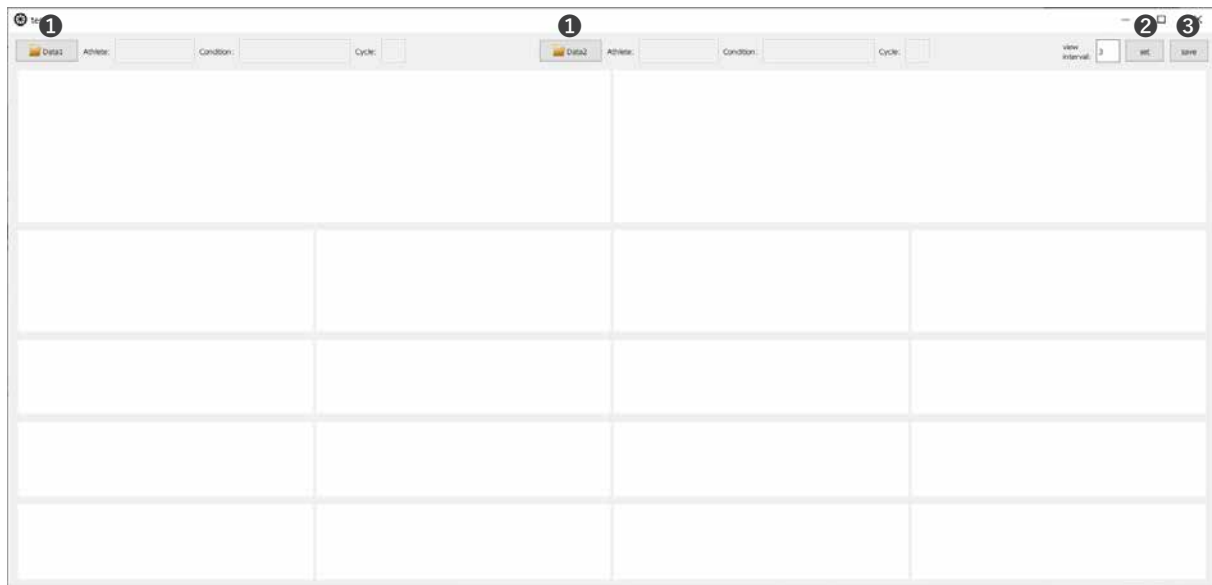
Compare Data Mode Processing Flowchart



Appendix

Compare Data GUI

- Enables comparison between two sets of analysis results by displaying them together.
- Allows results to be displayed cycle by cycle.
- Allows screenshots of displayed comparison results.



[Instructions]

- 1) Select the sets of analysis data you wish to compare.
- 2) Press the set button.
- 3) To capture a screenshot, press the save button.

[Note]

- Analysis data will use the ".pickle" file extension.

Appendix

Data Analysis Output Fields

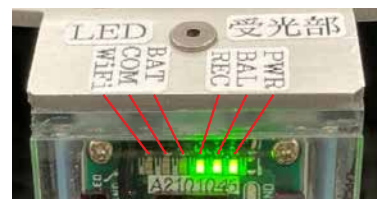
Analysis results data (saved in CSV format)		
	GUI	Functions
1	time[sec]	Time elapsed since the start of the measurement
2	cycle[count]	Number of propulsion cycles since the start of the measurement
3	acc_x_R[m/s2]	Acceleration in the x direction of the right wheel sensor coordinate system
4	acc_y_R[m/s2]	Acceleration in the y direction of the right wheel sensor coordinate system
5	gyro_z_R[rad/s]	Acceleration in the z direction of the right wheel sensor coordinate system
6	force_x_R[N]	Force in the x direction of the right wheel sensor coordinate system
7	force_y_R[N]	Force in the y direction of the right wheel sensor coordinate system
8	force_z_R[N]	Force in the z direction of the right wheel sensor coordinate system
9	moment_x_R[Nm]	Moment in the x direction of the right wheel sensor coordinate system
10	moment_y_R[Nm]	Moment in the y direction of the right wheel sensor coordinate system
11	moment_z_R[Nm]	Moment in the z direction of the right wheel sensor coordinate system (this concerns the torque around the axle, which is directly related to acceleration and deceleration. Pay attention to the axle direction on each side: on the right side, positive (+) indicates acceleration, while on the left side, positive (+) indicates deceleration.)
12	speed_R[km/h]	Right wheel travel speed
13	distance_R[km]	Distance traveled since the start of the right wheel measurement
14	theta_cop_R[deg]	Angle of the right wheel propulsion force application point
15	tangential_force_R[N]	Tangential force at the right wheel propulsion force application point
16	radial_force_R[N]	Radial force at the right wheel propulsion force application point
17	axle_force_R[N]	Axial force at the right wheel propulsion force application point
18	phi_cop_R[deg]	Right wheel propulsion force application point (on the hand ring pipe)
19	m_copz_R[Nm]	Torque that twists the wheel around the contact point
20-36	Data fields 3–19 for the left wheel for the same items	
*Filenames include ID, measurement condition, and time of measurement		

Appendix

8-2. LED Illumination Specifications (1)

This data recording system has 6 LED control outputs.

LED illumination patterns and corresponding statuses are as follows.



1) PWR LED (power status indicator)

Status	Illumination pattern
Power is on (Initialization is complete)	Continuous illumination 

2) BAT LED (low battery indicator)

Status	Illumination pattern
Normal	Off 
Low power supply voltage caution	Flashing: 800 ms on, 200 ms off 
Low power supply voltage warning	Flashing: 200 ms on, 200 ms off 

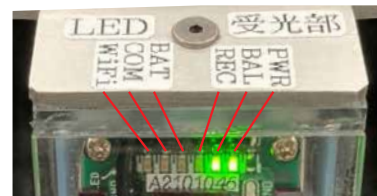
3) BAL LED (calibration status indicator)

Status	Illumination pattern
Calibration has not been performed	Off 
Calibration in progress	Flashing: 50 ms on, 50 ms off 
Balanced Reading of balance value from memory successfully completed	Continuous illumination 
Calibration failed	Flashing: 500 ms on, 500 ms off 

*Calibration takes around 5 seconds.

Appendix

LED Illumination Specifications (2)



4) REC LED (recording status indicator)

Status	Illumination pattern
On standby	Off 
Recording	Continuous illumination 

5) COM LED (error status indicator)

Status	Illumination pattern
Normal	Off 
No SD card	Flashing: 500 ms on, 500 ms off 
File creation error	Flashing: 200 ms on, 200 ms off 
Hardware error, etc.	Flashing: 50 ms on, 50 ms off 

6) Wi-Fi LED (Wi-Fi status indicator)

Status	Illumination pattern
Wi-Fi is off	Off 
Wi-Fi is on	Continuous illumination 

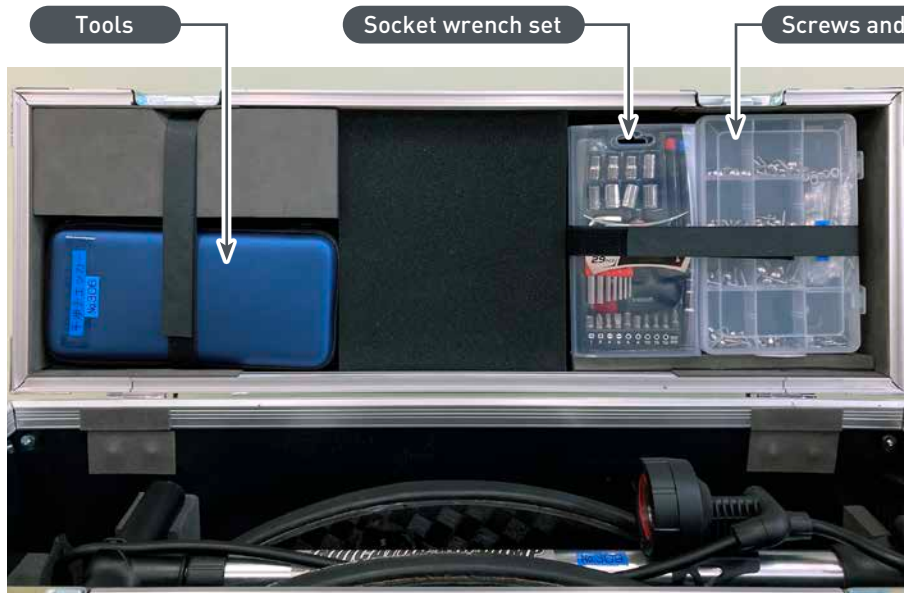
Appendix

8-3. Shipped items

Case	Qty
Case (holds 2 measurement wheels)	1
Measurement wheel	2
4-/6-bolt hand ring plates	2
5-bolt hand ring plates	2
Clearance checker	1
Peripheral equipment	
Remote control	2
Tools	
Hex key set (for wheels, hand rings, and hand ring plates)	1
Phillips screwdriver (for hand ring)	1
Socket wrench set	1
Air pump (includes Hirame pump head and air pressure gauge)	1
Screws and bolts	
Axle spacers (1 mm)	3
Axle spacers (2 mm)	7
Spacer (3.4 mm) for hand ring interference avoidance	12
JIS B 1111 M4 × 8 mm (hex socket button head screws)	20
JIS B 1111 M4 × 10 mm (hex socket button head screws)	20
JIS B 1111 M4 × 12 mm (hex socket button head screws)	20
JIS B 1111 M4 × 14 mm (hex socket button head screws)	20
JIS B 1111 M4 × 16 mm (hex socket button head screws)	20
JIS B 1111 M4 × 18 mm (hex socket button head screws)	20
JIS B 1111 M4 × 20 mm (hex socket button head screws)	20
JIS B 1256 washers (for M4 screws)	30
JIS B 1251 spring washers (for M4 screws)	20
Lock nuts (for M4 screws)	20
Information processing	
Wi-Fi dongle	1
Software (data download)	1

Appendix

Shipped items



Store the socket wrench set, box of screws, and tool set in the lid of the case



Hand ring plate

Store one set of hand ring plates in the bi-fold bag and hang the bag over the partition in the center of the case. (Store the other set of hand ring plates attached to the measurement wheels.)



Air pump

The main section of the case holds the measurement wheels and hand ring plates. Place the air pump on top of these.

Appendix

Shipped items

Toolbox Contents



The tools stored in the case



Appendix

Shipped items

4-/6-Bolt Hand Ring Plates

Store attached to the measurement wheels



5-Bolt Hand Ring Plates

Store this set in the bi-fold bag and hang the bag over the partition in the center of the case



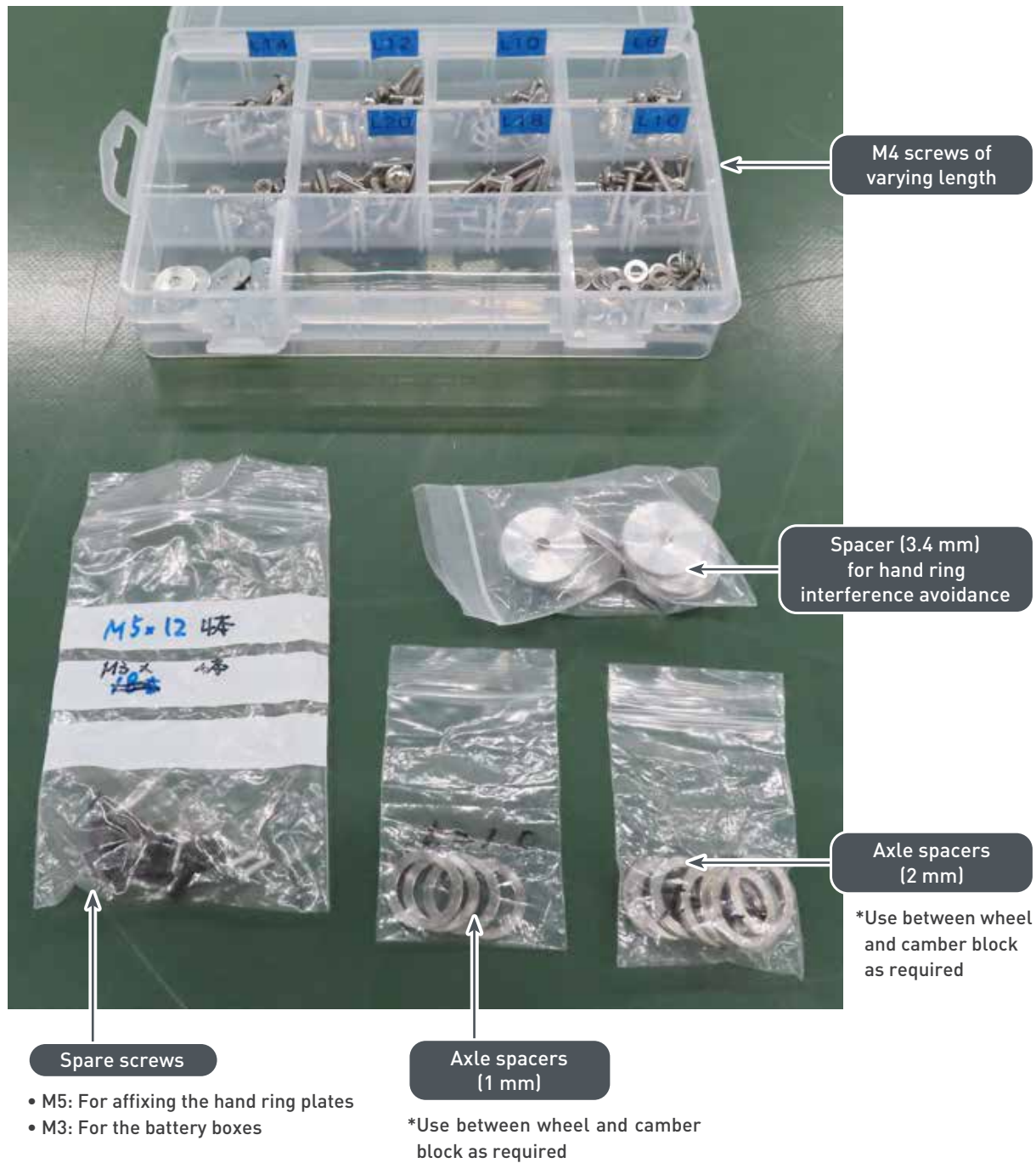
Air pump



Appendix

Shipped items

Screws and bolts



For inquiries about the Honda Push Power Measurement Wheel Systems, contact:

If you have any questions or concerns about this product, feel free to contact our customer service below.

Honda Sun Co., Ltd.

Racing Wheelchairs Customer Service Counter

Email: racer@honda-sun.co.jp