Magnescale

Accessory

AC20-B100

Thank you for purchasing this Magnescale product.
Read all the instructions in the manual carefully before use and strictly follow them.
Be sure to keep this manual for future reference.

This instruction manual corresponds to the special software Ver. 01.02.04.

Instruction Manual

Trademarks

Microsoft Windows is the registered trademark of Microsoft Corporation.
Intel® Core™i3 is the registered trademark of Intel Corporation.
Other system names, product and service names described in the instruction manual are trademarks or registered trademarks of their corresponding manufacturers.

Note

The text and display screens of this instruction manual, with some exceptions, assume the use of a computer running Windows7. For other operating systems, there might be cases such as restricted functionalities and or different displays.

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- The specification of the products and its software may be changed without prior notice.

Contents

1. Outline

1-1. Introduction

The AC20-B100 is a monitoring tool used to perform scale failure analysis and to check scale operation after installing or replacing scales. This tool is used by connecting it to a computer to which the special software Ver. 01.02.04[*1] has been downloaded and a compatible scale.

[*1]: Download the special software from the Magnescale website. This product is used to check the scale failure status and installation status, and does not guarantee scale functions or performance. Refer to the respective instruction manual for the scale operation method.

1-2. Major functions and features of the software

Lissajous monitoring

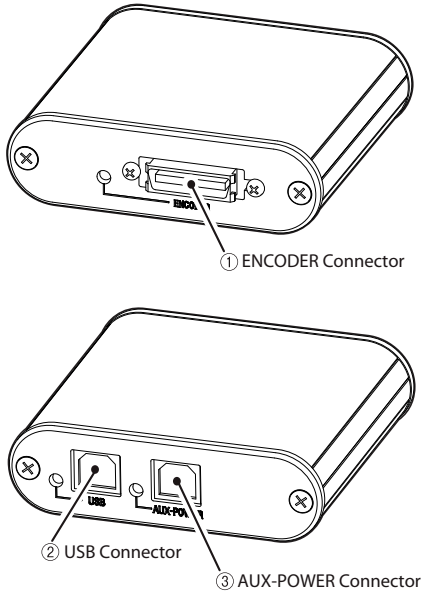
Use the monitoring function that matches the scale.

- SR/RU Lissajous monitoring function
- RS Lissajous monitoring function
- SQ Lissajous monitoring function

1-3. Product configuration

AC20-B100	
Software	MGS Monitoring System (Download from the Magnescale website.)
USB cable	× 2 (accessory)
Adaptor cable (sold separately)	CE35-02 (compatible controller: Mitsubishi Electric Corporation) CE36-02 (compatible controller: FANUC Corporation) CE37-02 (compatible controller: SIEMENS AG)
Special cable	SR77, SR87, and RU77 series require separate special cables. Contact our sales representative.

2. Names and functions of each part



Name	Description
① ENCODER Connector	Connects to the scale using the adaptor cable (sold separately)
② USB Connector	Connects to the computer using the supplied USB cable.
③ AUX-POWER Connector	Connects to the computer using the supplied USB cable to provide power when power supply to the scale is insufficient. This connector cannot be used for communication. (An external DC 5 V power supply adaptor can also be connected.)

3. System environment and setup

3-1. Compatible system environment

3-1-1. Compatible scales

The following scales are compatible.

SR27A Series

SR67A Series

SR77 Series

SR87 Series

RU77 Series

RU97 Series

RS97 Series

SQ47 Series

SQ57 Series

SR77, SR87, and RU77 series require separate special cables. Contact our sales representative.

3-1-2. System requirement

Item	Environment
CPU	Intel Core i3 or higher recommended*1
RAM	1 GB or higher recommended*1
OS	Windows 7 (32bit/64bit of each edition) Windows 10 (32bit/64bit of each edition)
Display	1080 × 800 pixels or higher*1
USB	2.0

*1 : It must satisfy the requirements of the OS.

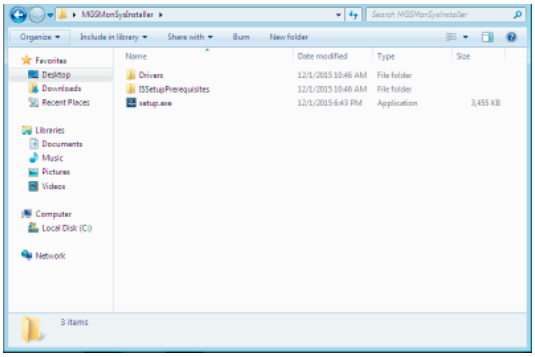
3-2. Software installation

Note : If a different version is already installed in the computer to be connected, be sure to uninstall that version before performing software installation.
(Refer to "3-4. Software uninstallation.")

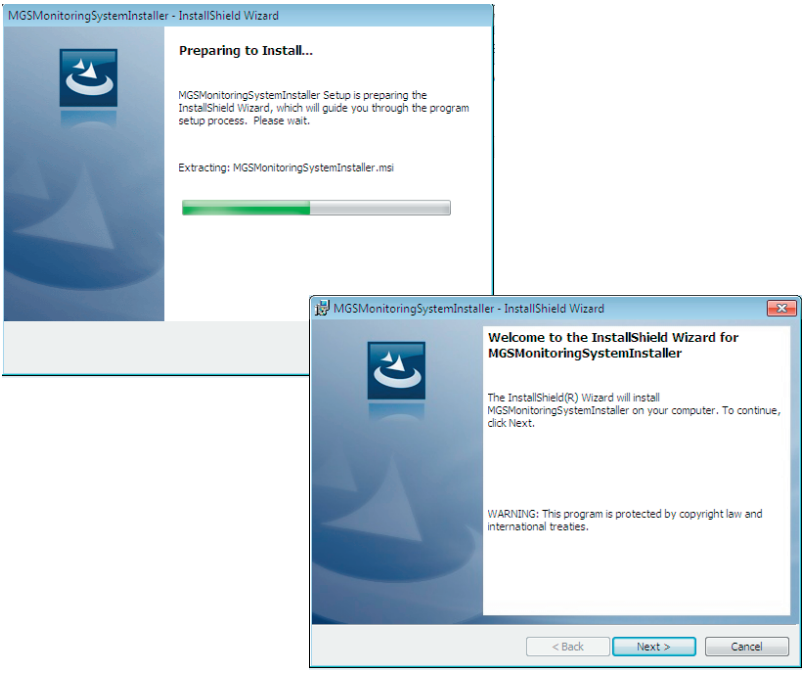
1 Download the MGS Monitoring System from the Magnescale website.
URL : http://www.magnescale.com/mgs/language/english/product/

Download :

2 Double-click the downloaded file.
The file is extracted and the folders contained in the file are displayed.



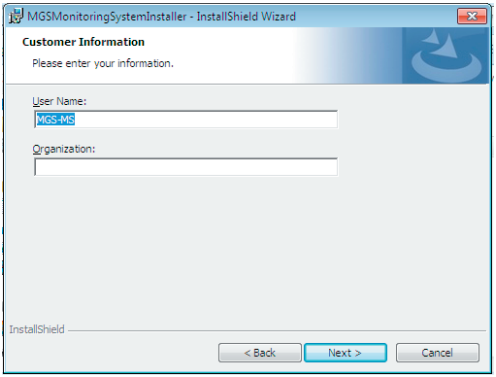
3 Double-click “setup.exe.”



4 Click “Next>.”
The Software License Agreement appears.

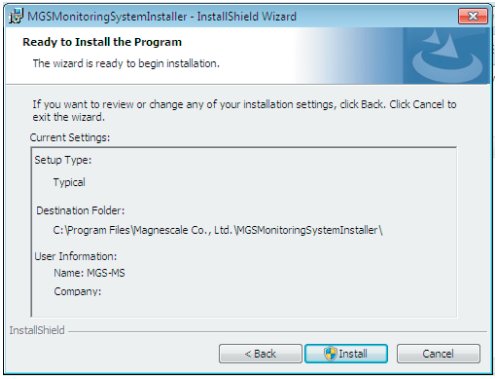
5 If you agree to the displayed license conditions, select “I accept the terms in the license agreement” and then click “Next>.”

The Customer Information dialog box appears.



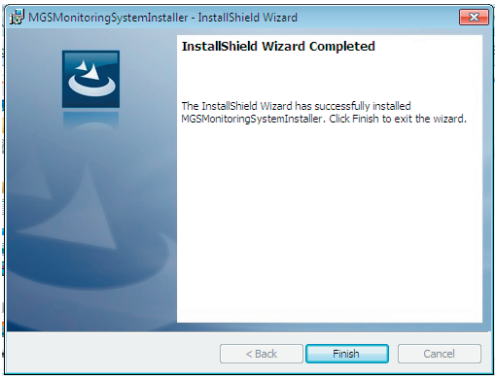
6 Enter the following items to the Customer Information dialog box.
User Name : User name
Organization: Company name

7 Click "Next>."
A dialog box appears notifying that installation is ready.



8 Click "Install."
Installation starts.
An installation progress bar appears during installation.

9 When the dialog box shown below appears, click “Finish.”



10 Confirm that the “MGSMonitoringSystem” icon appears on the computer desktop.

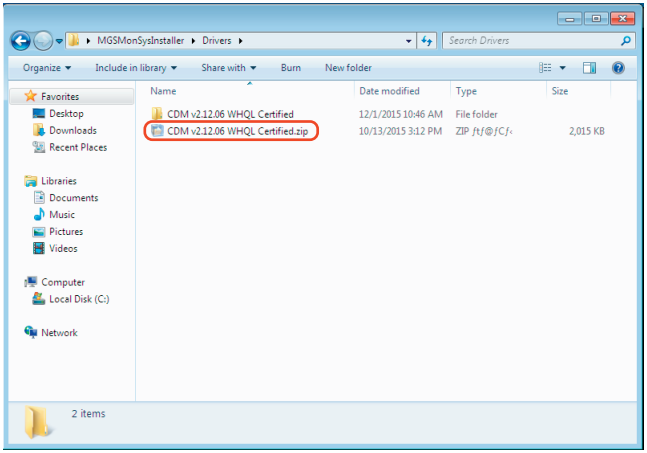
The installation is complete.

3-3. Driver installation

1 Connect the AC20-B100 to the computer using the supplied USB cable.

2 Click the “Drivers” folder contained in the file extracted in step 2 of section 3-2.

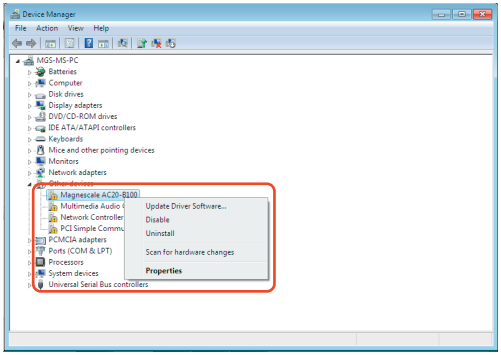
3 Double-click the “CDM v2.12.06 WHQL Certified.zip” file.



The file is extracted.

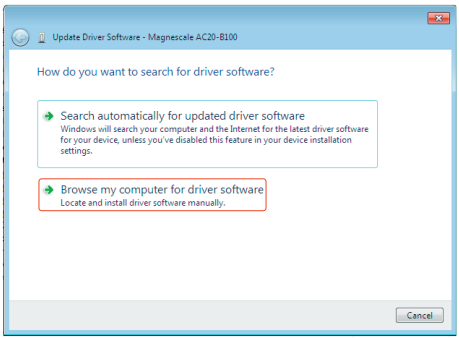
4 Click “Device Manager” on the Control Panel of the computer.

5 Right-click “Magnescale AC20-B100” and select “Update Driver Software.”

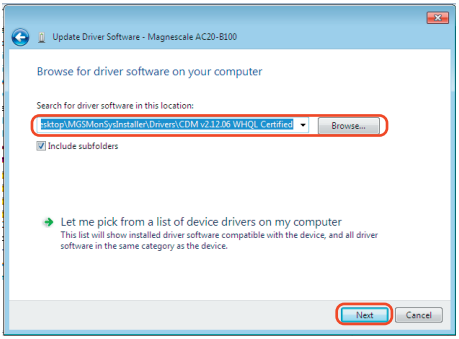


The Update Driver Software dialog box opens.

6 Click “Browse my computer for driver software.”

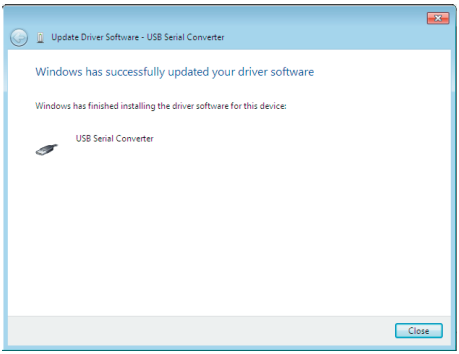


7 Designate the file extracted in step 3 in the “Search for driver software in this location” field, and click “Next.”



Device driver installation starts.

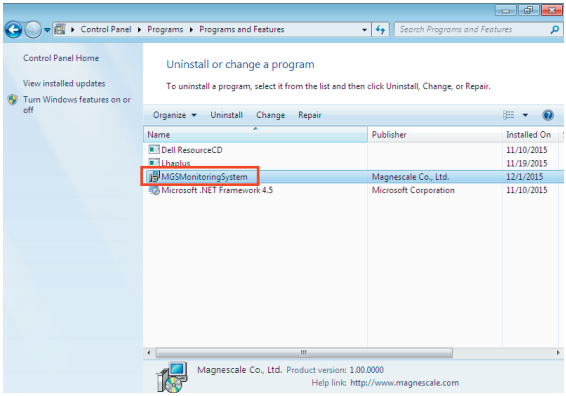
8 When the dialog box shown below appears, click “Close” to complete the installation.



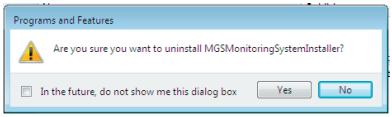
3-4. Software uninstallation

1 Click “Programs and Features” on the Control Panel of the computer.

2 Double-click “MGSMonitoringSystem” in the displayed list of software.



The dialog box shown below appears.



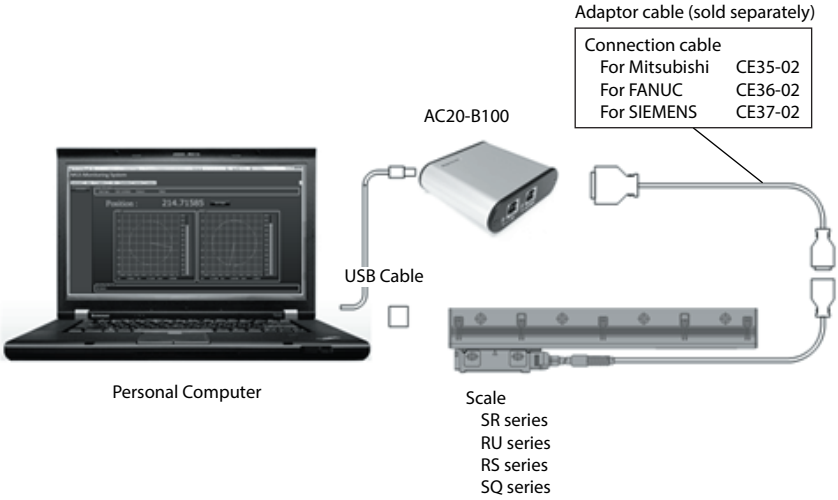
3 Confirm the message and click “Yes.”

An uninstallation progress bar appears during uninstallation.
When “MGSMonitoringSystem” disappears from within “Programs and Features”, uninstallation is complete.

3-5. Scale connection

Connect the AC20-B100 to the scale using the adaptor cable (sold separately).

* The SR77, SR87 and RU77 series require a special cable, so contact our sales representative.



Checks after connection

After all the cables are connected, confirm with the LEDs on the AC20-B100 that there are no problems with the connections.

Confirm in the condition with the computer turned on.

USB connector : Lights in green

ENCODER connector : Lights in green

Reference (AC20-B100 ENCODER connector)

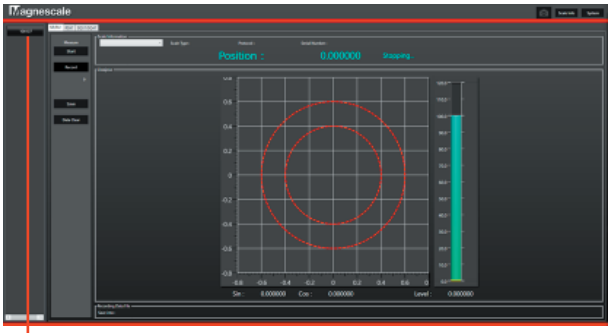
LED	Status
Blinks in green	• Immediately after power is supplied • Communication active
Lights in green	• Power supply normal • Communication not active
Blinks in red	• Error occurred
Lights in red	• Connector not connected or cable disconnected

4. Starting up the software and supplying power to the scale

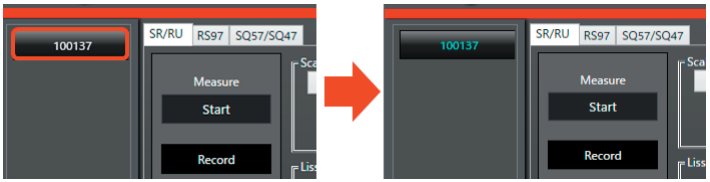
4-1. Starting up the software

1 Double-click the MGSMonitoringSystem icon on the computer desktop.

The software starts up.



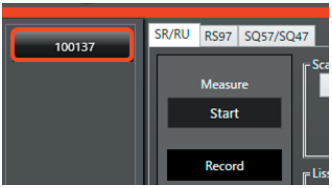
If the AC20-B100 is connected properly to the computer, a button showing the serial number of the connected AC20-B100 appears on the left side of the window. If the AC20-B100 is not connected when the software starts up, the button appears when the AC20-B100 is connected.
This button (Power button) is used to supply power to the scale. The serial number text color indicates the power supply status.



White : OFF Light blue : ON

4-2. Ending the software

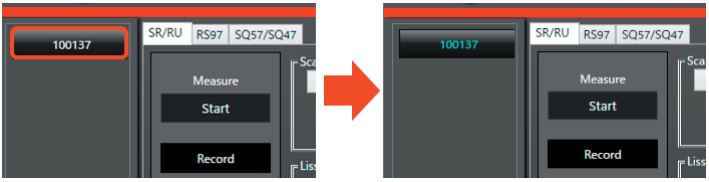
1 Make sure that the power supply to the scale is OFF (the Power button text is white).



2 Click "× (Close)" at the upper-right corner of the window.

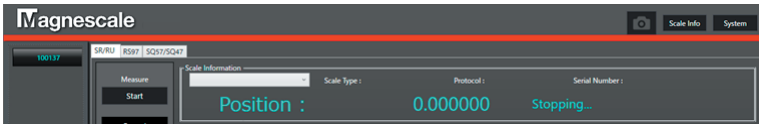
4-3. Supplying power to the scale

1 Click the Power button.
Power is supplied to the connected scale.
The Power button text changes to light blue.

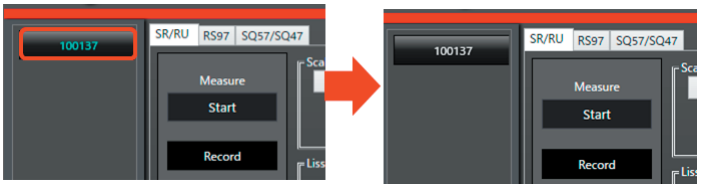


4-4. Stopping the power supply to the scale

1 Make sure that the monitoring function of the scale is stopped (the status indication is "Stopping…").

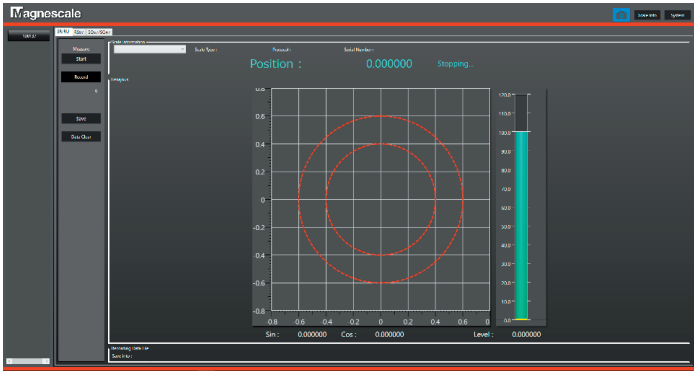


2 Click the Power button.
Power supply to the scale is stopped and the Power button text changes to white.



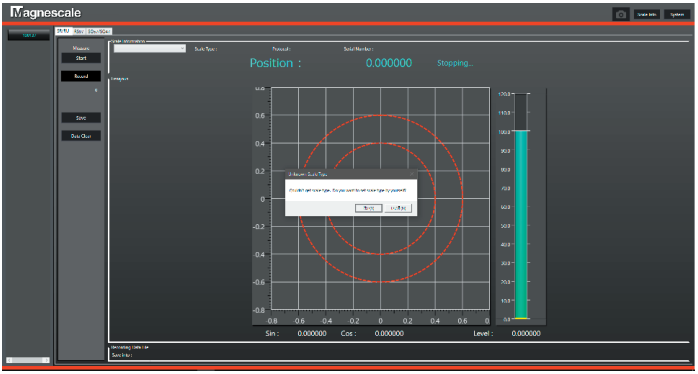
4-5. Scale recognition

When power is supplied to the scale, the system performs scale auto recognition. Once the scale is recognized, the scale to be connected can be selected from the pull-down menu.



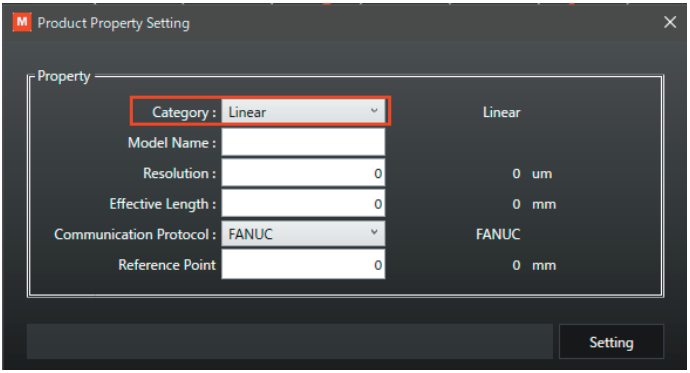
When auto recognition is not performed, a message appears. In this case, enter the information of the scale to be connected manually.

<To enter the scale information manually>



1 Click "Yes (Y)."
A dialog box for entering the scale information appears.

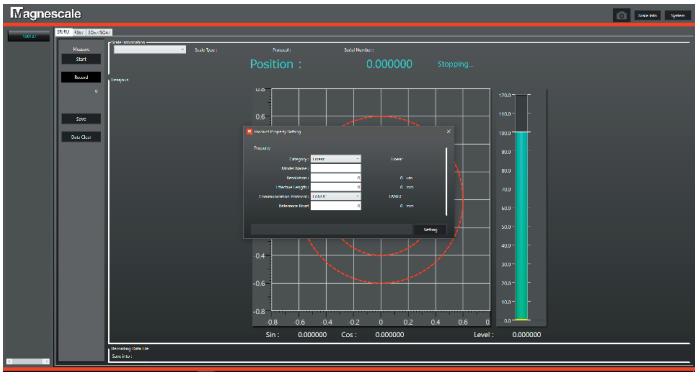
2 Select the category of the scale to be recognized from the "Category" pull-down menu.
Linear : SR27A Series, SR67A Series, SR77 Series,
SR87 Series, SQ47 Series, SQ57 Series
Rotary: RU77 Series, RU97 Series, RS97 Series
Other : Not used

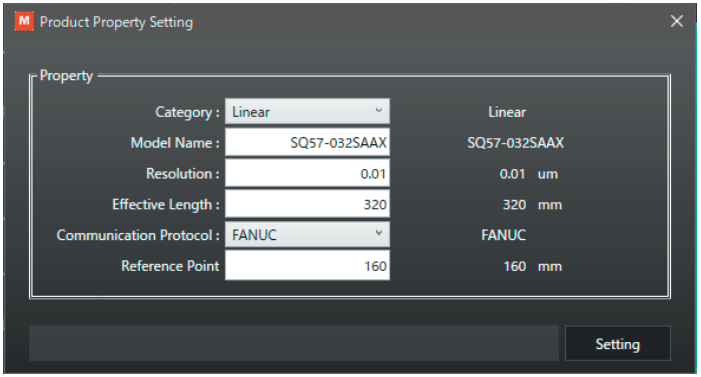


The display changes to the respective scale information entry dialog box.

3 When "Linear" is selected

Enter the scale information (Model Name, Resolution, Effective Length, Communication Protocol, Reference Point), and click the "Setting" button.





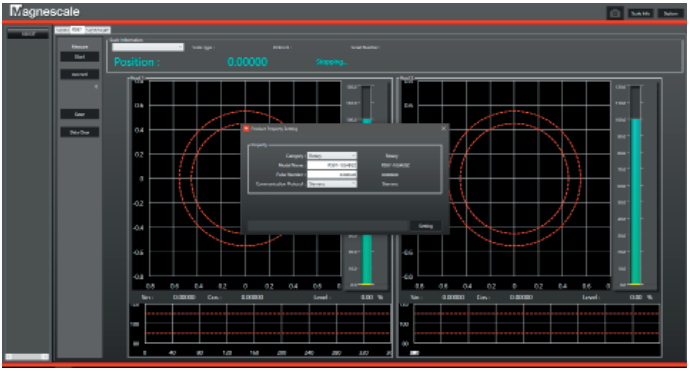
(Example above)

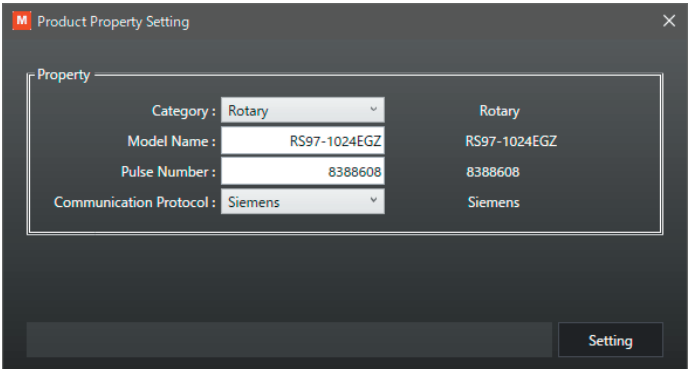
Category	: Linear
Model name	: SQ57-032SAAX
Resolution	: 0.01 μm
Effective length	: 320 mm
Communication protocol	: FANUC
Reference point	: 160 mm (X : center)

Note: In case of a SQ47/SQ57 series scale, the resolution, effective length, supported communication protocol, and reference point are automatically entered when the scale name (Model Name) is entered. If the automatically entered contents are incorrect, correct the contents and then click the "Setting" button.

When "Rotary" is selected

Enter the scale information (Model Name, Pulse Number, Communication Protocol), and click the "Setting" button.





(Example above)

Category	: Rotary
Model name	: RS97-1024EGZ
Pulse number	: 8388608
Communication protocol	: Siemens

The contents entered to the scale information dialog box are held within the software, so when the same scale is connected again thereafter, it is automatically recognized.

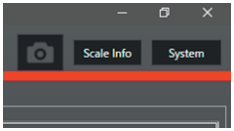
To reset the entered contents, open the "SystemMenu" tab and select "System Setting"_"Manual Scale Info". (Refer to "4-6. System settings.")

4-6. System settings

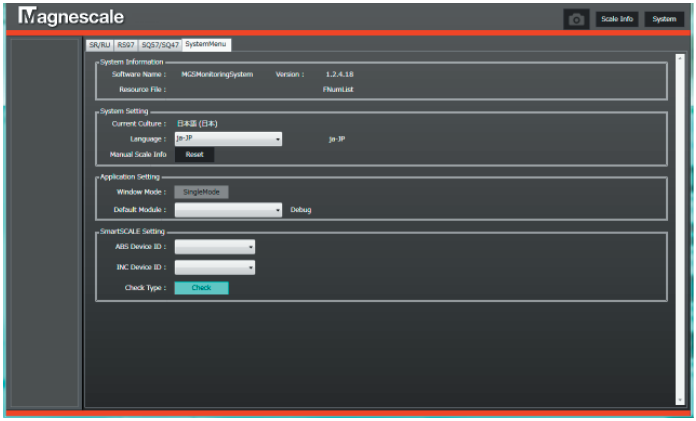
Make the software settings, such as the message language and the window display method.
The contents set here are automatically saved when the software is ended normally.

1 Make sure that power supply to the scale is stopped.

2 Click “System” at the upper-right corner of the software window.



Open the “SystemMenu” tab to display the system settings window.



System Information

This displays the software name and version and the internally held information.

System Setting

Language : Selects the message language. (Japanese / English)
The language selected here is displayed in “Current Culture.”

Manual Scale Info : Resets all scale information entered manually during scale recognition. Note that all saved manually entered information will be reset.

Application Setting

Window Mode : Selects the window display. (tab display / single windows)

Default Module : Selects the functions to be displayed as standard when the software starts up.

SmartSCALE Setting

ABS Device ID : Selects the device to be connected to an absolute type scale (SQ47/SQ57).

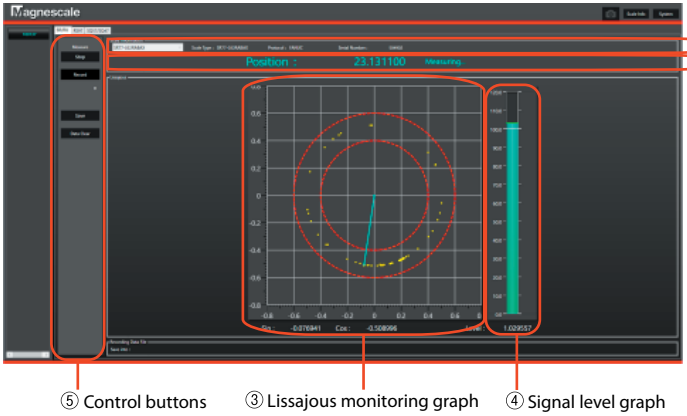
INC Device ID : Not used.

Check type : Select "Check" (the color changes to light blue) to display a manual entry field when the scale model name could not be automatically recognized. In the default condition, this is selected.

5. Monitoring Lissajous signals

5-1. Monitoring the Lissajous signal of SR27A/SR67A/SR87/ SR77/RU77/RU97

5-1-1. SR/RU series window



① **Scale information**
This displays the information of the connected scale.

② **Scale position and monitoring status**
This displays the position information read by the scale and the monitoring status. The position is displayed from 0 degrees to 360 degrees for a rotary scale, or as the absolute position (unit: mm) for a linear scale.

③ **Lissajous monitoring graph**
This graph displays the monitored scale Lissajous. When the signal is inside the two red dashed lines, the signal is normal.

④ **Signal level graph**
This graph displays the Lissajous signal level.

⑤ Control buttons

"Start/Stop" button
This starts and stops monitoring. This button can be used when power is supplied to the scale and a scale is selected in the pull-down menu. Always stop monitoring before stopping the power supply to the scale.

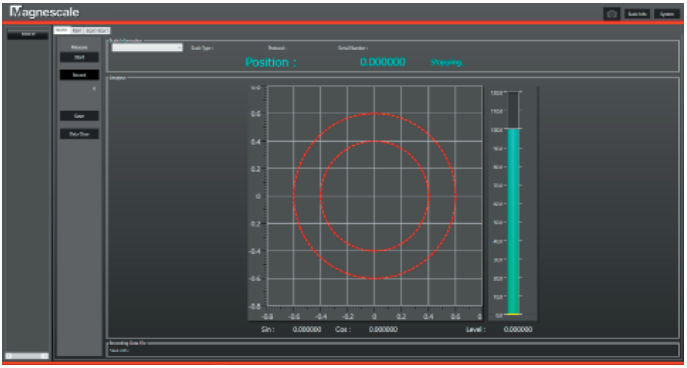
"Record" button
Select this button (On: the button text is light blue) to record the monitored Lissajous data. The Lissajous data currently being monitored is accumulated.

"Save" button
This saves the data accumulated using the "Record" button in a folder. Always stop monitoring before saving data.

"Data Clear" button
This clears the data accumulated using the "Record" button and the Lissajous monitoring graph.

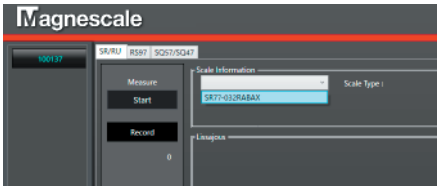
5-1-2. Starting and stopping monitoring

1 Click the "SR/RU" tab in the condition with the MGSMonitoringSystem started up. The window shown below appears.



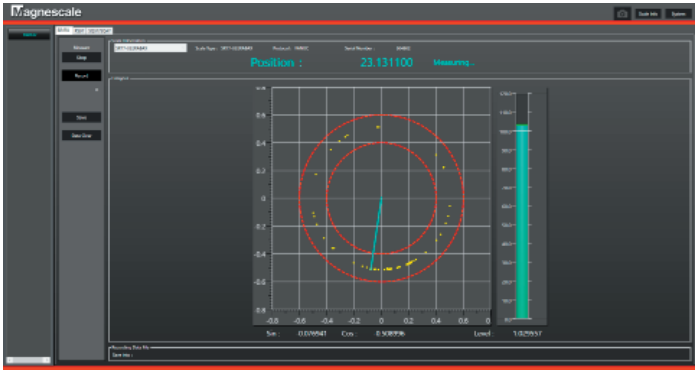
2 Make sure that power is supplied to the scale (the Connect button text is light blue).

3 Click the “Scale Information” combo box and select the scale to be connected.



The scale model name, protocol name, and serial number are displayed in the “Scale Information” field.

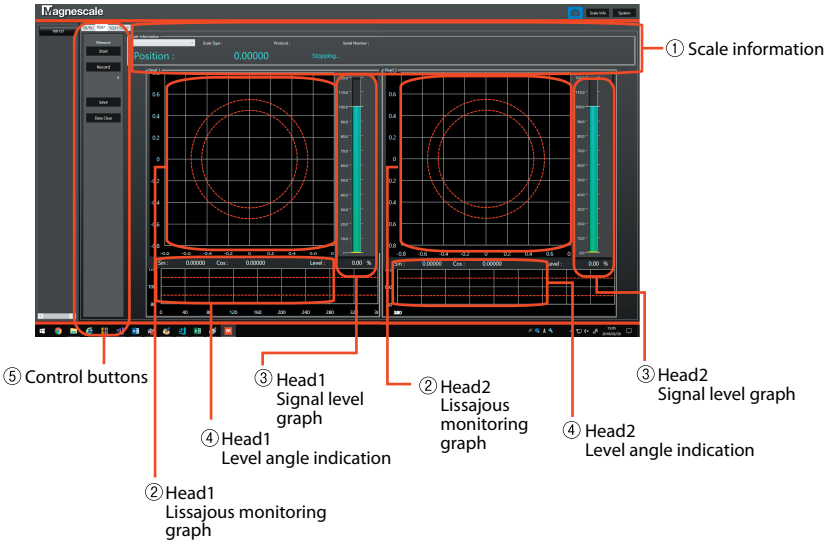
4 Click the “Start” button in the “Measure” field.
The status indication changes from “Stopping…” to ”Measuring…”, and monitoring starts.



When the “Stop” button in the “Measure” field is clicked while the status indication is “Measuring…”, monitoring stops and the status indication changes to “Stopping….”

5-2. Monitoring the Lissajous signals of RS97

5-2-1. RS series window



① **Scale information**

This displays the information of the connected scale. During monitoring, the position information read by the scale and the monitoring status are also displayed here. The position information is displayed from 0 degrees to 360 degrees.

② **Lissajous monitoring graph**

These graphs display the monitored scale head Lissajous. When the signal is inside the two red dashed lines, the signal is normal.

③ **Signal level graph**

This graph displays the Lissajous signal level.

④ **Level angle indication**

This shows the signal level at each angle from 0 degrees to 360 degrees.

⑤ Control buttons

"Start/Stop" button
This starts and stops monitoring. This button can be used when power is supplied to the scale and a scale is selected in the pull-down menu. Always stop monitoring before stopping the power supply to the scale.

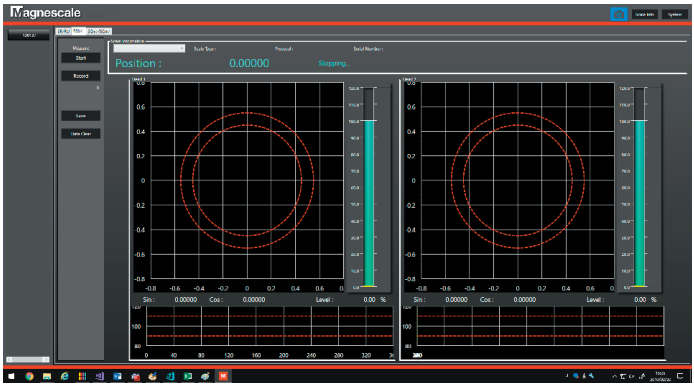
"Record" button
Select this button (On: the button text is light blue) to record the monitored Lissajous data. The Lissajous data currently being monitored is accumulated.

"Save" button
This saves the data accumulated using the "Record" button in a folder. Always stop monitoring before saving data.

"Clear Data" button
This clears the data accumulated using the "Record" button and the Lissajous monitoring graph.

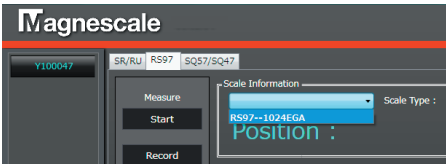
5-2-2. Starting and stopping monitoring

1 Click the "RS97" tab in the condition with the MGSMonitoringSystem started up. The window shown below appears.



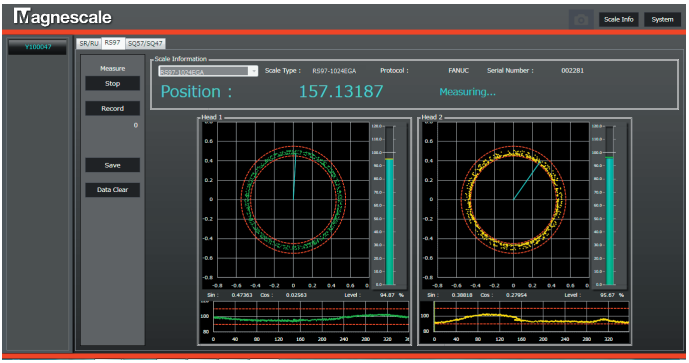
2 Make sure that power is supplied to the scale (the Connect button text is light blue).

3 Click the “Scale Information” combo box and select the scale to be connected.



The scale model name, protocol name, and serial number are displayed in the “Scale Information” field.

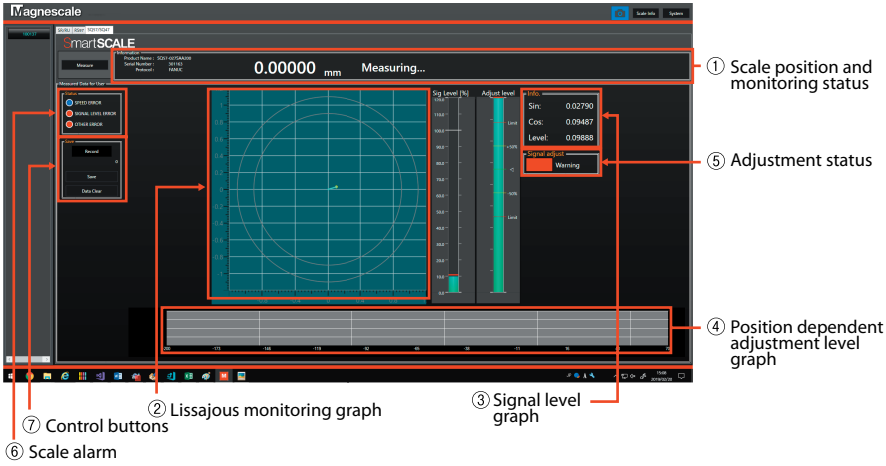
4 Click the “Start” button in the “Measure” field.
The status indication changes from “Stopping…” to ”Measuring…”, and monitoring starts.



When the “Stop” button in the “Measure” field is clicked while the status indication is “Measuring…”, monitoring stops and the status indication changes to “Stopping….”

5-3. Monitoring the Lissajous signals of SQ57/SQ47

5-3-1. SQ series window



① **Scale position and monitoring status**

This displays the position information read by the scale and the monitoring status. The position is displayed as the absolute position (unit: mm).

② **Lissajous monitoring graph**

This graph displays the monitored scale Lissajous. When the signal is inside the two red dashed lines, the signal is normal.

③ **Signal level graph**

This graph displays the Lissajous signal level.

④ **Position dependent adjustment level graph**

This displays the scale and sensor adjustment levels* at the positions passed by the head using different colors. The adjustment levels are constantly updated. Once drawn, the graph remains even after communication with the AC20-B100 stops, but disappears and a new graph is drawn when scale monitoring is restarted.

* These adjustment levels change according to the clearance between the scale and the head.

Clearance display range: Scale effective length ±15 mm

Green : Recommended position
Red : Outside recommended range
When red is displayed, recheck the head and scale mounting positions.

⑤ Adjustment status

This displays the current scale and head adjustment status.
Green (Good) : Recommended position
Red (Warning) : Outside recommended range
When red (Warning) is displayed, recheck the head and scale mounting positions.

⑥ Scale alarm

Alarm	Cause	Countermeasure
SPEED ERROR	Over-speed	• Check the scale feed rate.
SIGNAL LEVEL ERROR	Low signal level	• Check the head and scale mounting positions. • Check whether the scale or head are damaged.
OTHER ERROR	Other error	

⑦ Control buttons

"Record" button

Click this button to record the monitored Lissajous data. The Lissajous data currently being monitored is accumulated. The button is light blue while data accumulation is underway.

"Save" button

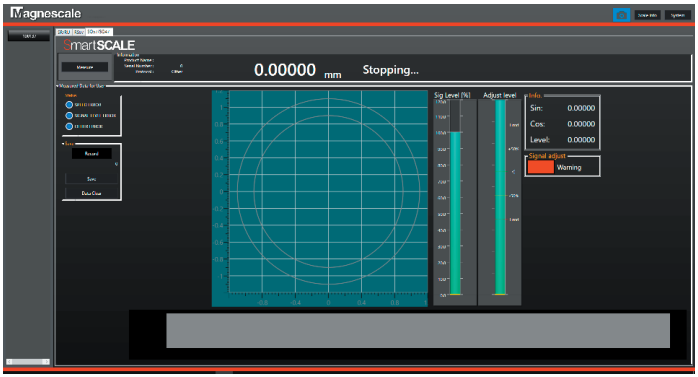
This saves the data accumulated using the "Record" button in a folder. Always stop monitoring before saving data.

"Data Clear" button

This clears the data accumulated using the "Record" button and the Lissajous monitoring graph.

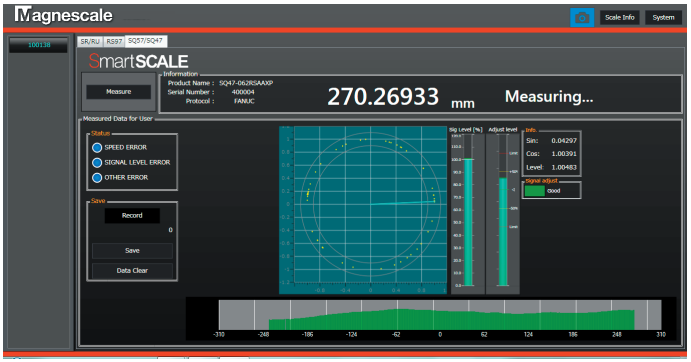
5-3-2. Starting and stopping monitoring

1 Click the “SQ57/SQ47” tab in the condition with the MGSMonitoringSystem started up.
The window shown below appears.



2 Make sure that power is supplied to the scale (the Power button text is light blue).

3 Click the “Measure” button.
The status indication changes from “Stopping…” to ”Measuring…”, and monitoring starts.



When the “Measure” button is clicked while the status indication is “Measuring…”, monitoring stops and the status indication changes to “Stopping….”

6. Troubleshooting

6-1. Trouble when connecting the power supply

6-1-1. The Connect button is not displayed.

Cause	Action
The AC20-B100 is not connected to the computer.	Check the connection. If the USB LED on the AC20-B100 lights in green, the AC20-B100 is connected properly.
The driver is not installed.	Refer to "3-3. Driver installation" and install the driver software.
The USB cable is too long.	The USB standard specifies that USB cables should be 5 m or shorter. Replace the USB cable with one that conforms to the standard.
Noise is superposed onto the USB cable.	Keep the USB cable (and the computer) as far as possible from sources of noise. When used in a noisy environment, noise may be superposed onto the USB cable and prevent normal communication.

6-1-2. Power is not supplied to the scale even when the Connect button is clicked.

Cause	Action
The AC20-B100 and the scale are not connected.	① Check the connection between the AC20-B100 and the adaptor cable. If the Encoder LED on the AC20-B100 lights in green, the adaptor cable is connected properly to the AC20-B100. ② Check the connection between the adaptor cable and the scale cable. ③ Check the connection between the scale cable and the scale.
Insufficient power supply	When using a scale with high power consumption such as the RS series, bus power supply using only the USB cable from the computer or other device may be insufficient. Connect a USB cable to the AUX-POWER connector of the AC20-B100 and to the computer or other device and supply power.
Power supply was not stopped properly when a different scale was connected.	End the software, disconnect and reconnect the USB connector of the AC20-B100, restart the software, and then perform connection again. If a different scale is connected in the condition with the software started up, the connection and disconnection operation may not be performed properly and normal communication may not be possible.

6-1-3. The message “Couldn't power on scale.” appears when power is supplied.

Cause	Action
Insufficient power supply	When the cable between the scale and the AC20-B100 is long, the power supply may be insufficient due to the cable internal resistance in rare cases. Connect a USB cable to the AUX-POWER connector of the AC20-B100 and to the computer or other device and supply power.
Power supply was not stopped properly when a different scale was connected.	End the software, disconnect and reconnect the USB connector of the AC20-B100, restart the software, and then perform connection again. If a different scale is connected in the condition with the software started up, the connection and disconnection operation may not be performed properly and normal communication may not be possible.
An incompatible scale is connected.	The MGSMonitoringSystem can be connected only to specific scales. Refer to “3-1-1. Compatible scales” for the connectable scale products.
The proper cable is not used.	A special scale cable is required only when using the SR77, SR87 or RU77 series. Contact our sales representative.

6-2. Trouble during monitoring

6-2-1. Monitoring does not start even when “Start” or “Measure” is clicked.

Cause	Action
Power is not supplied to the AC20-B100.	Select the AC20-B100 to be connected from the device list on the left side of the software window, and supply power.
The appropriate scale is not selected.	Select the scale to be connected from the ”Scale Information” combo box in the condition with power supplied.
An incompatible scale is selected.	Select the compatible scale tab in the software window.
The scale is not responding properly.	Power may have been supplied again without stopping the power supply correctly during the previous monitoring. Disconnect and reconnect the USB connector of the AC20-B100, restart the software, and click “Start” or “Measure” When monitoring still cannot be performed properly, the scale may not be operating correctly. Contact our Service Department.

6-2-2. Monitoring does not stop even when “Stop” or “Measure” is clicked.

Cause	Action
The connection cable with the AC20-B100 has become disconnected.	Click “X” at the upper-right corner of the window to forcibly end the software. Then, restart the software, check the connections with the AC20-B100, and perform the procedure again starting from supplying power.

6-3. Trouble when stopping the power supply

6-3-1. Stopping the power supply fails even when the Connect button is clicked.

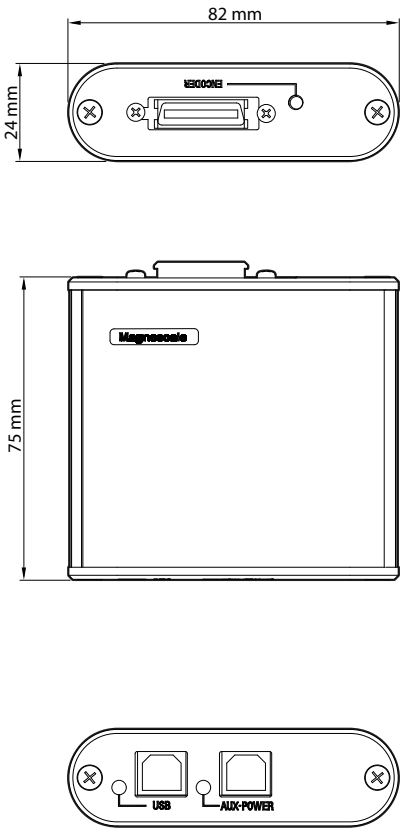
Cause	Action
Monitoring is underway.	Click “Stop” or “Measure” to end monitoring and check that the status indication is “Stopping...”, then stop the power supply. When the status indication is “Measuring...”, monitoring is underway. Power supply can be stopped only in the condition with monitoring stopped.

7. Specifications

AC20-B100

Item	Specifications
Connection with the computer	USB 2.0 Full Speed (12 Mbps)
Power consumption	0.4 W max. (AC20-B100 standalone)
Input voltage range	DC 5 V ± 0.25 V (USB bus power standard)
Operating temperature	0 °C to 40 °C (no condensation)
Storage temperature	−10 °C to 60 °C (no condensation)
Mass	150 g
External dimensions	Refer to “8. Dimensions”

8. Dimensions



(Unit: mm)

9. Appendix

Release notes

Version	Notes	Date
01.00.00	1st Release	2017/03/31
0.1.01.00	SmartSCALE supported.	2017/04/03
01.02.00	SmartSCALE GUI corrected.	2017/08/28
01.02.03	SmartSCALE Siemens Model supported. GUI corrected	2018/07/19
01.02.04	GUI corrected Supported SmartSCALE models added.	2018/11/13

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