Software user guide
M-9572-0058-05-A

RENISHAW
apply innovation™

SiGNUM™ software

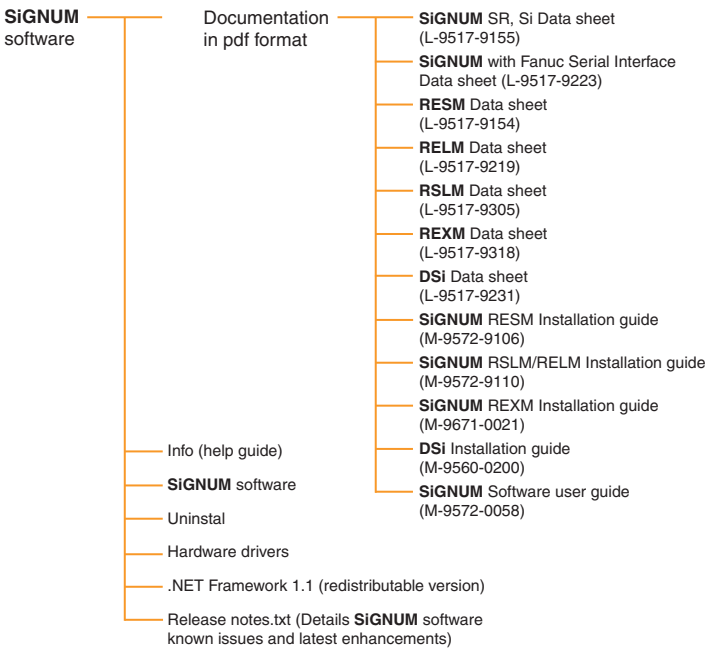
Contents

1. General Information

1.1. Minimum system requirements

- Microsoft® Windows®, 2000, XP, Vista or Windows® 7
  NOTE: SiGNUM software V5.0.0 is not compatible with Windows NT, 95, Me or 98
- Pentium® II processor
- 128 MB RAM
- USB 1.1
- .NET Framework 1.1 (redistributable version included with the software)
- Microsoft® Internet Explorer 5.01 or later (this can be obtained free from the Microsoft® website)
- Screen resolution: 800 x 600, colour quality: 16 bit or more,
  DPI setting 'normal size (96 DPI)'

1.2. SiGNUM software features



- The documentation, Info (help guide), **SiGNUM** software, hardware drivers and uninstall features are all installed on the PC during the software installation. All the latest documentation can be found at: **www.renishaw.com/encoder**
- The .NET framework and release notes are used from the CD only.

2. Installation

Full administration rights are necessary to install and uninstall the SiGNUM hardware drivers and software.

2.1. Software installation

Before installing a new version of the SiGNUM software, ensure that any previous versions have been uninstalled. (See Section 6, 'Uninstalling', for more information).

- Insert the **SiGNUM** software CD into the CD drive.
- The installation will start automatically.
- The .NET framework must be installed to use the **SiGNUM** software. The set-up program will install this automatically if it is not already on the PC. Simply follow the prompts if the .NET framework set-up program appears.
- Click *Next* to view the license agreement and read through it. Installation cannot proceed without agreement to the licensing terms.
- A prompt will now request a location for the installation folder, a default location of **C:Program Files\Renishaw\SiGNUM software** (In Windows® 7 C:\Program Files (86)\Renishaw\SiGNUM software) will be suggested.
- Once satisfied with the install location click *Next* to continue. Then click *Install* to start the installation – else click *Back* to make changes.
- The installation program will automatically run through the install process. Once it has completed simply click *Finish*.
- The hardware driver installation will auto-start straight after the software installation. Select '*Next'* then '*Finish'* when the drivers have been successfully installed.

2.2. Hardware driver installation

This should be done *after* the software has been installed.

The **SiGNUM** interface connects to the PC via the USB port. To install the **SiGNUM** hardware driver follow these steps:

- Connect the USB cable from the active **SiGNUM** interface to the PC. The USB cable will need either an integral ferrite or a looped clamp-on ferrite.

Windows® 7 users

- The PC will recognise that a new piece of hardware has been connected and 'Installing device driver software' will appear.
- Select 'Click for status'.
- Select 'Skip obtaining driver software from Windows update'.
- 'Do you want to skip getting driver from Windows update?' will be displayed, select 'Yes'.
- Wait until a green tick appears by 'Ready to use'.
- Click 'close' and the software will be ready to use.

Windows® XP and 2000 users

- The PC will recognise that a new piece of hardware has been connected, and the new drivers will be automatically installed.
- The **SiGNUM** interface will then be ready to use.

NOTE: Hardware drivers need to be installed for each USB port. After installing once, select to install automatically as the drivers will be available on the PC.

3. Using Renishaw's SiGNUM software

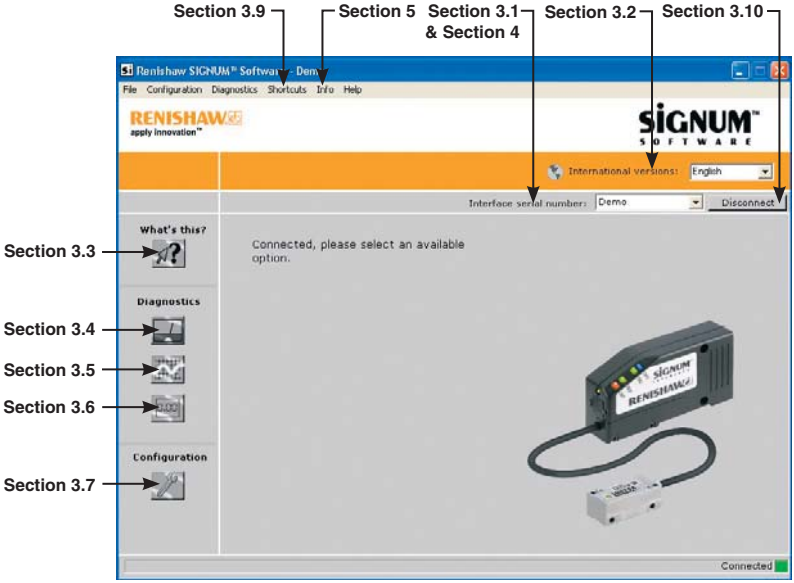


Figure 1: Software start-up screen

3.1. Connecting the SiGNUM interface

On start-up, the software is not connected to any **SiGNUM** interfaces and the function buttons on the left of the screen are inactive.

To connect to the interface:

- Connect the **SiGNUM** interface to the PC USB port, via an A to mini B USB cable. The USB cable will need either an integral ferrite or a looped clamp-on ferrite. Renishaw can supply a suitable cable (A-9572-0098).
- From the drop down box next to "Interface serial number:" select the serial number of the **SiGNUM** interface to be connected.

  NOTE: If no interface is connected, the drop down box will only allow 'Demo' to be selected. See Section 4, 'Demonstration mode', for more information.

NOTE: Multiple **SiGNUM** interfaces can be connected if there are multiple USB ports on the computer. However, each interface will require its own copy of the software to run.

3.2. Language selection

The software allows you to select the display language from English, German, Italian or Japanese at any time during operation.
To choose the language you require, open the drop down box next to "International versions": and select your chosen language.
For problems displaying in Japanese fonts refer to Section 7, 'Troubleshooting'.

3.3. What's this? options

Selecting 'What's this?' mode highlights, with a  , areas where contextual help is available.

To view the contextual help, click on the  icon.

3.4. Signal strength / IRED feedback meter

To enter this screen, select the  icon.

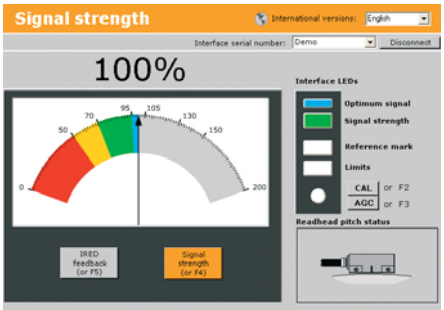
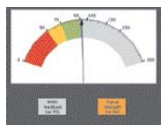


Figure 2: Signal strength

This screen has several functions:

- Displays the system signal strength on a colour-coded meter to aid system set-up.
- Displays the IRED feedback meter showing how hard the Automatic Gain Control (AGC) is working to optimise the signal level.
- Replicates the interface LEDs for remote set-up and diagnostics.
- Displays the readhead pitch status.
- Allows the system to be calibrated.
- Allows the Automatic Gain Control to be switched on and off.

Signal strength meter

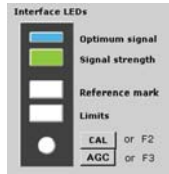


- To display the signal strength meter, select the *Signal strength* button on the bottom of the meter or press the shortcut key F4.
- The signal strength is also displayed as a percentage above the meter.

IRED feedback meter

- To display the IRED feedback meter select the *IRED feedback* button from the bottom of the meter or press the shortcut key F5.
- The IRED meter displays how hard the system is working to optimise the signal level. The OPT value is a typical set-up.
- The IRED feedback is also displayed as a voltage value above the meter.
- Select **What's this?** or **Info>>Guide** (see Section 5) for more information on this function.

Interface LED Indicator



- This replicates the LEDs on the **SiGNUM** interface.
- Select *What's this?* or **Info>>Guide** (see Section 5) for more information on the function and colour of the LEDs or refer to the SR, Si Installation guide (M-9572-0057).

NOTE: PC refresh rates might mean that in rare instances the software LEDs and the interface LEDs will not be synchronised. The interface always shows the correct visual representation.

Readhead pitch status

This displays one of three diagrams representing the angle of the readhead relative to the scale. This can be used to aid readhead set-up, particularly on small diameter rings.

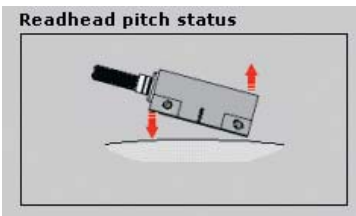


Figure 3: The cable end of the readhead is set too high and needs to be adjusted as shown by the arrows in the diagram.

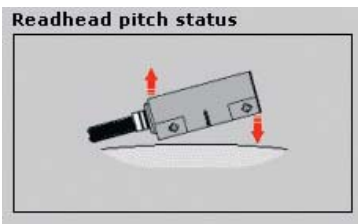


Figure 4: The cable end of the readhead is set too low and needs to be adjusted as shown by the arrows in the diagram.

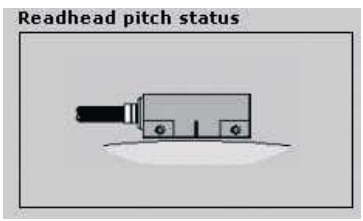
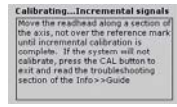


Figure 5: Optimum pitch installation has been achieved.

System calibration



- The system can be calibrated remotely via the *CAL* button on the screen or by pressing the shortcut key F2.
- The calibration instructions will appear in the box beneath the button. After each successful calibration, the interface calibration details will be saved to file. For further information on system calibration (including calibration using the CAL button on the interface), refer to the SR, Si Installation guide (M-9572-0057).

Automatic Gain Control (AGC)

- The AGC can be toggled on/off by selecting the *AGC* button on the screen or using the shortcut key F3.
- The AGC can also be toggled on/off using the CAL button on the interface. The status is displayed by the CAL button LED on the interface. (Refer to the SR, Si Installation guide (M-9572-0057) for more information)
- This method of automatic compensation is more fully explained in the **Info>>Guide.**

NOTE: AGC should be switched off when calibrating.

3.5. Lissajous / Reference mark display

To enter this screen, select the  icon.

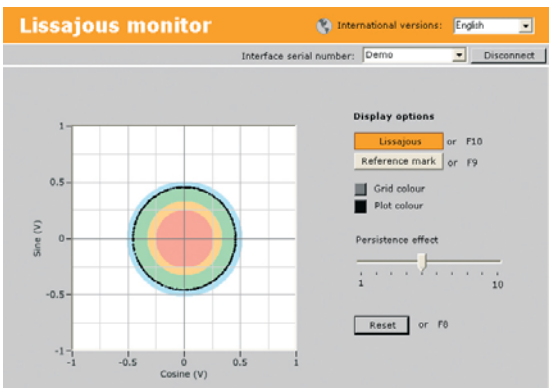


Figure 6: Lissajous monitor screen

The 'Lissajous monitor' display is a plot of the sine versus cosine output, with coloured bands on the background to represent the signal strength and optimum LED colours to aid installation of the readhead.

The ‘Lissajous monitor’ screen can be customised as follows:

- The colour of the plot can be changed by selecting the buttons labelled *Grid colour* and *Plot colour.*
- To adjust the length of time the points remain on the plot, the *Persistence effect* can be adjusted. Move the slider to give the desired persistence: the higher the number, the longer the points will remain on the plot.

The *Reset* button or the shortcut key F8 will reset any changes in the persistence or colour settings back to the factory default settings.

To display the reference mark phasing, select the *Reference mark* button from the display options or press the shortcut key F9. (To return to the Lissajous monitor screen, select the *Lissajous* button from the display options or press the shortcut key F10)

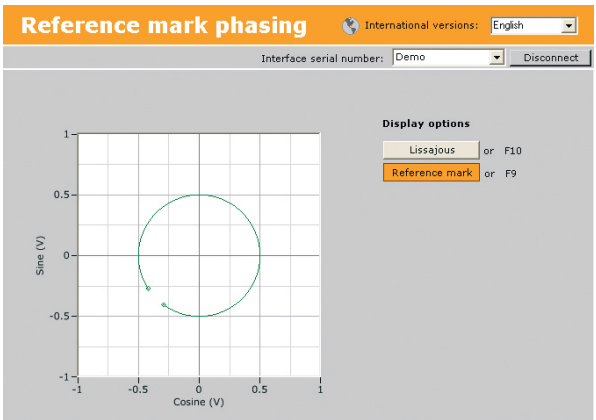


Figure 7: Reference mark phasing screen

The ‘Reference mark phasing’ plot displays a graphical representation of the reference mark width and phasing relative to the incremental signals.
The colour of the plot is a visual representation of its set-up condition.

Colour	Function
Green	Reference mark well phased, no adjustment required
Orange	Reference mark phasing is acceptable, but re-calibration could be beneficial
Red	Reference mark phasing is unacceptable, needs re-calibration

Refer to the SR, Si Installation guide (M-9572-0057) for details on reference mark calibration.

3.6 Digital readout (DRO) display **(Only displayed with serial output interfaces)**

To enter this screen, select the  icon.

Figure 8: DRO screen

This screen has several functions:

- Displays the encoder position.
- Displays the count at the reference mark position.
- Displays the number of revolutions (for a rotary system).
- Allows the display to be configured for linear or rotary encoder systems.
- Allows the continuous count to be zeroed or a preset value to be loaded.
- Save the continuous count value to clipboard.

Preset continuous count

A preset value can be loaded into the continuous count via a pop-up box

To use this function, select the  icon

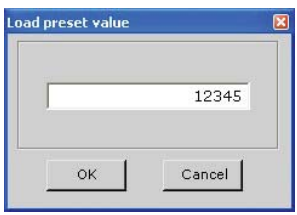


Figure 9: Load preset value pop-up box

DRO set-up

To enter this screen, select the DRO Set-up icon.

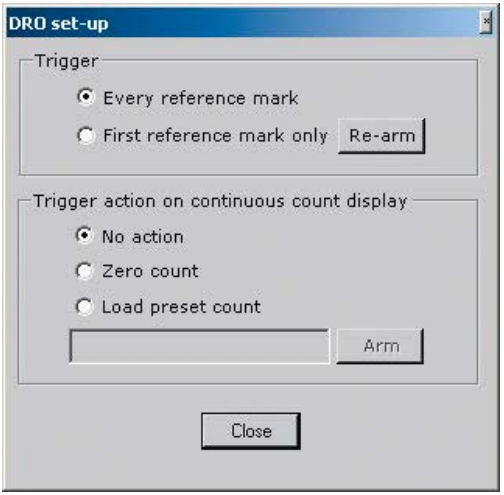


Figure 10: DRO set-up pop-up box

This pop-up box enables the configuration of the action on the “Continuous count:” and “Count at reference mark:” displays when a reference mark is detected.

- Trigger configures when the continuous count value will be read and displayed in the “Count at reference mark:” display. This action can be configured to occur:
  - Every reference mark
  - First reference mark only. Pressing the re-arm button will enable a trigger action at the next reference mark event.
- Trigger action configures the action on the “Continuous count display:” when a reference mark is detected. The actions are:
  - No action
  - Zero count
  - Load a preset count value - type the value into the box and click ‘Arm’, this value will then be loaded.

3.7. Configuration summary

To enter this screen, select the  icon.

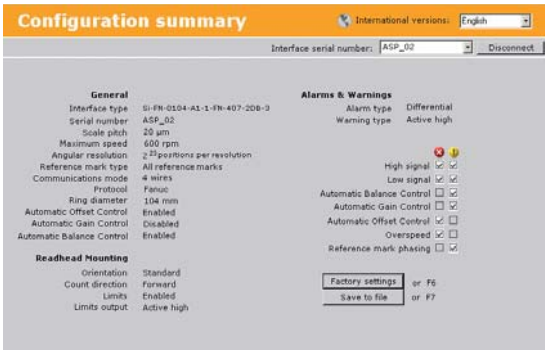


Figure 11: Configuration summary screen

The 'Configuration summary' screen has several functions:

- Displays the description of the interface.
- Displays the fixed configuration of the system, including system resolution and minimum clock frequency.
- Displays the alarms and warnings that can be generated:
  - Greyed box indicates options that are not possible.
  - White box/no tick indicates options that are possible but not ordered from Renishaw.
  - White box/tick indicates the selected alarms & warnings of the current interface.
- Allows the configuration details to be saved as a text file.
- Allows factory default calibration values to be reloaded in case of re-installation or calibration failure.

3.8. Alarms and warnings

When an alarm and/or warning occurs on the system, an alarm flag will appear in the bottom left hand corner of the screen. indicates an alarm has been raised, indicates a warning has been given.

NOTE: The alarm flags do not appear when viewing the 'Configuration summary' screen.

To view the alarms and warnings, left mouse click on the alarm flag. The tick boxes display:

- All current alarms and warnings.
- All alarms and warnings that have occurred since they were last cleared on the software, including alarms that occurred whilst the software was not connected.

To clear the alarms and warnings display, click the *Clear* button on the bottom of the display. If an alarm or a warning is still present the indication will reappear.

NOTE: The on-screen flags are latched and need to be cleared. The interface outputs are not latched and will clear when the alarm condition has been removed.

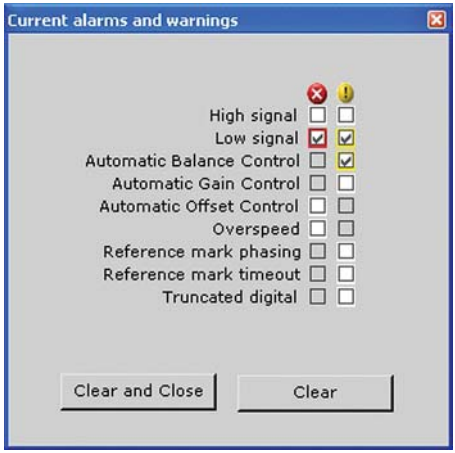


Figure 12: Current alarms and warnings screen

The current alarms or warnings that have occurred, are displayed.

- Greyed box indicates options that are not possible.
- White box/no tick indicates there is no current alarm/warning due to this cause or options that were not ordered from Renishaw.
- White box/tick indicates the current alarm/warning.

3.9. Shortcut keys

The 'Shortcuts' menu on the top toolbar lists all the supported shortcut keys for the application. If a menu item is greyed out then it is not available for use on that particular screen.

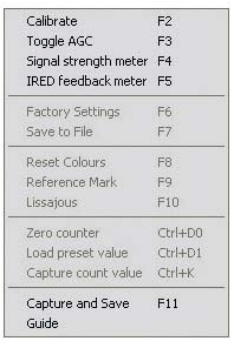


Figure 13: Shortcuts menu

3.10. Disconnection

The **SiGNUM** system can be disconnected from the software in two ways:

- Unplug the USB cable from either the PC or the interface.
- Select *Disconnect* at the top right hand corner of the display.

4. Demonstration mode

If a **SiGNUM** interface is not connected to the PC, the software will only display 'Demo' in the drop down box. When a system is connected 'Demo' will not be displayed.
The 'Demo' mode simulates the behaviour of an 'example' system being connected to the software including;

- Signal strength (Meter and Lissajous)
- System calibration
- Reference mark
- Limits
- DRO - with limited functuality

5. Info

5.1. Info>>Guide

The **SIGNUM** software info guide contains technical information regarding the system.
The guide aims to increase the user's understanding of how the **SiGNUM** system has been designed. It explains the automatic compensation methods employed within the product and gives a more comprehensive explanation of the output signals (e.g. incremental, ref. mark, alarms, warnings, limits and pitch status).

A basic troubleshooting guide for the system is also included, incorporating suggestions of how to deal with possible installation problems.

Click *Info* and then *Guide* on the top toolbar or press the shortcut key F1. The Info guide can be navigated as a standard Windows® help file.

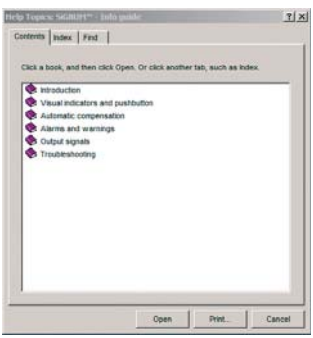


Figure 14: SiGNUM Info guide screen

5.2. Info>>Documents

Click *Info* and then *Documents* to view **SiGNUM** installation guides, data sheets and user guides in pdf format.

6. Uninstalling

6.1. Uninstalling the SiGNUM software

All users

- Ensure that there are no copies of the Renishaw **SiGNUM** software running before attempting to uninstall.
- Navigate to the **SiGNUM** software menu by selecting **Start menu>>All Programs>> Renishaw>>SiGNUM software** and then click on the *Uninstall* icon.
  Select *Next* to view a summary of the software to be removed.
- Press the *Uninstall* button to begin the uninstall process. This removes the **SiGNUM** software from the computer. Any calibration files saved in the folder *Calibration Files* will also be deleted.
  NOTE: the .NET Framework will not be automatically removed.
- Once uninstall is complete select *Finish.*

6.2. Uninstalling the hardware drivers

NOTE: When removing the hardware driver from the system it will not be displayed in the devices list if it is not plugged in.

Windows® 7 and XP users

- Ensure Renishaw's **SiGNUM** software is not running before attempting to uninstall the hardware.
- Open the Control Panel by selecting **Start menu>>Control Panel.**
- Select the *System* option to open the System Properties.
- Select the *Device Manager* button to display a list of the hardware devices installed on the machine.
- 'Renishaw **SiGNUM** Interfaces' will appear in the list as a category of hardware under Universal serial bus. Select the plus sign next to the name.
- Select the **SiGNUM** interface that has appeared in the category 'Renishaw **SiGNUM** Interfaces'.
- Right click, and select *Uninstall*. The system will then remove the hardware driver from the machine.

Windows® 2000 users

- Ensure Renishaw's **SiGNUM** software is not running before removing the hardware.
- Open the Control Panel by selecting **Start menu>>Settings>>Control Panel.**
- Select the *System* option to open the system properties.
- Under the Hardware tab, select the *Device Manager* button to display a list of the hardware devices installed on the machine.
- 'Renishaw **SiGNUM** Interfaces' will appear in the list as a category of hardware. Select the plus sign next to the name.
- Select the **SiGNUM** interface that has appeared in the category 'Renishaw **SiGNUM** Interfaces'.
- Right click, and select *Uninstall*. The system will then remove the hardware driver from the machine

7. Troubleshooting

Problem	Solution
When plugging an interface into a new USB socket, a reinstallation of the hardware drivers is requested.	The operating environment of the **SiGNUM** software is port specific and requires the installation of the hardware drivers for each USB port used. Follow the instructions given in Section 2.2.
The software disconnects from the interface and will not reconnect when the motor drive is switched on.	To ensure reliable operation of the interface in a noisy industrial environment, the USB cable used to connect the **SiGNUM** interface to the PC needs to incorporate a ferrite clamp. Otherwise the wide bandwidth of the PC's USB port may misinterpret noise as faulty data – and so disconnect. For optimum performance, use a clamp-on ferrite with one loop of cable through the clamp. Suitable clamps are available from such companies as TDK, Tokin, Fair-Rite, Steward etc. Alternatively obtain a suitable cable from Renishaw (A-9572-0098).
SiGNUM disconnects from the software when my laptop goes into power saving mode.	Power-save mode disconnects all USB devices, switch power-save mode off on the laptop.
The buttons on the left-hand side of the screen are inactive when the **SiGNUM** software is first run.	The buttons only become active when an interface (or the demo) is connected to the PC. To connect to an interface, select one from the drop-down list labelled 'Interface serial number:'.
The software does not recognise the interface plugged into the USB port.	Try re-installing the drivers, following the steps described in Section 2.2.
There is no **SiGNUM** icon displayed on my desktop.	**SiGNUM** software does not automatically put an icon on the desktop. To create a shortcut, right click and drag the icon from **Start Menu>> Programs>>Renishaw>>SiGNUM software** onto the desktop. Select *Copy Here*.
Only 'Demo' is displayed in the "Interface serial number:" drop down box.	If there is no **SiGNUM** interface connected, 'Demo' is the only option in the drop down box. This is a virtual device, which simulates the behaviour of an example interface, see Section 4.

Problem	Solution
When selecting the Japanese version, the text does not display correctly.	To view the Japanese version, your computer must have the Japanese character set installed and have the correct regional settings. Installing the Japanese character set: (if loaded onto the PC) ▶ Open the Control Panel by clicking on **Start>>Control Panel.** ▶ Select **Regional and Language Options** and view the *Languages* tab. ▶ Under the *Supplemental Language Support* option, select the box to *Install files for East Asian languages* and click the *Apply* button. ▶ Click *OK* on the *Install Supplemental Language Support* message box, followed again by the *Apply* button. Applying the correct regional settings: (if loaded onto the PC) ▶ Open the Control Panel by clicking on **Start>>Control Panel.** ▶ Select **Regional and Language Options** and view the Advanced tab. ▶ Select Japanese from the drop down menu in the *Language for non-Unicode programs* Section and click the *Apply* button. ▶ Click *Yes* to use existing files and restart the computer.
Japanese text appears correctly except in the **Info>>Guide** and **'What's this?'** mode.	The correct regional settings are not loaded. (see above)
Text and displays do not correctly fit inside **SiGNUM** software window.	Change DPI setting. ▶ Right click on desktop. ▶ Properties > settings > advanced > DPI setting > normal size (96 DPI). ▶ Restart PC.
There is no DRO option available.	The DRO option is only available for serial output interfaces.

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