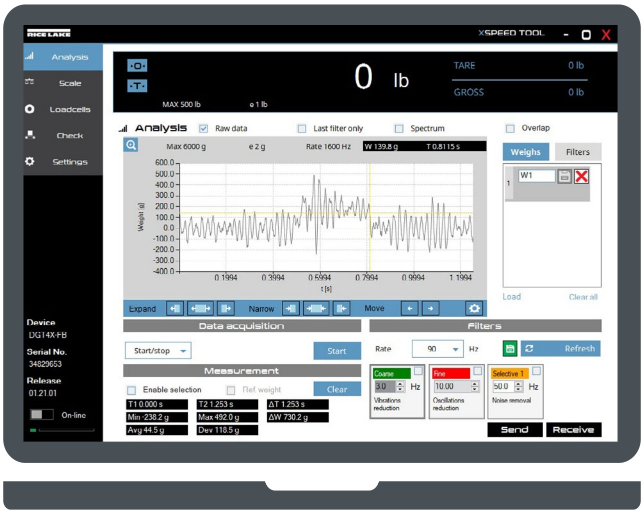
XSpeedTool

Version 01.16.00

Software Manual



June 12, 2025

RICE LAKE®
WEIGHING SYSTEMS

PN 230152 Rev A

The most current version of this publication, software, firmware and all other product updates can be found on our website:

www.ricelake.com

Revision History

This section tracks and describes manual revisions for awareness of major updates.

Revision	Date	Description
A	June 12, 2025	Initial release

Table of contents

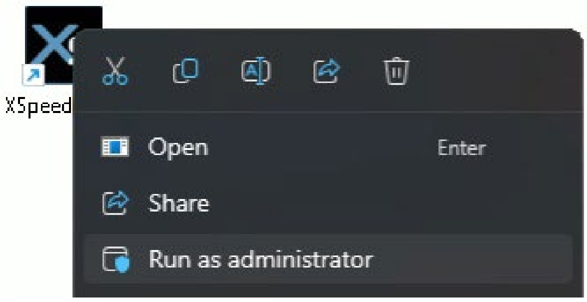
Manuals are available from Rice Lake Weighing Systems at www.ricelake.com/manuals
Warranty information is available at www.ricelake.com/warranties

Recommended system requirements

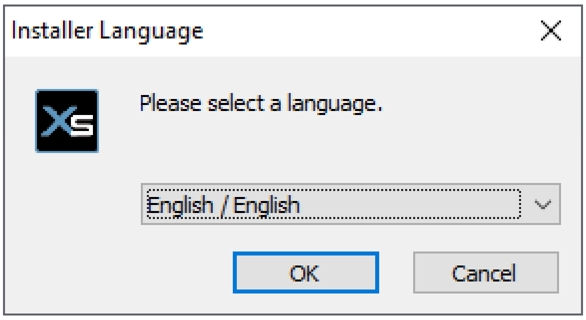
OS: Microsoft® Windows® 10 and 11
Processor: 1,6 Ghz
Ram: 4 Gb
Free space on hard drive: 250 Mb

Installation

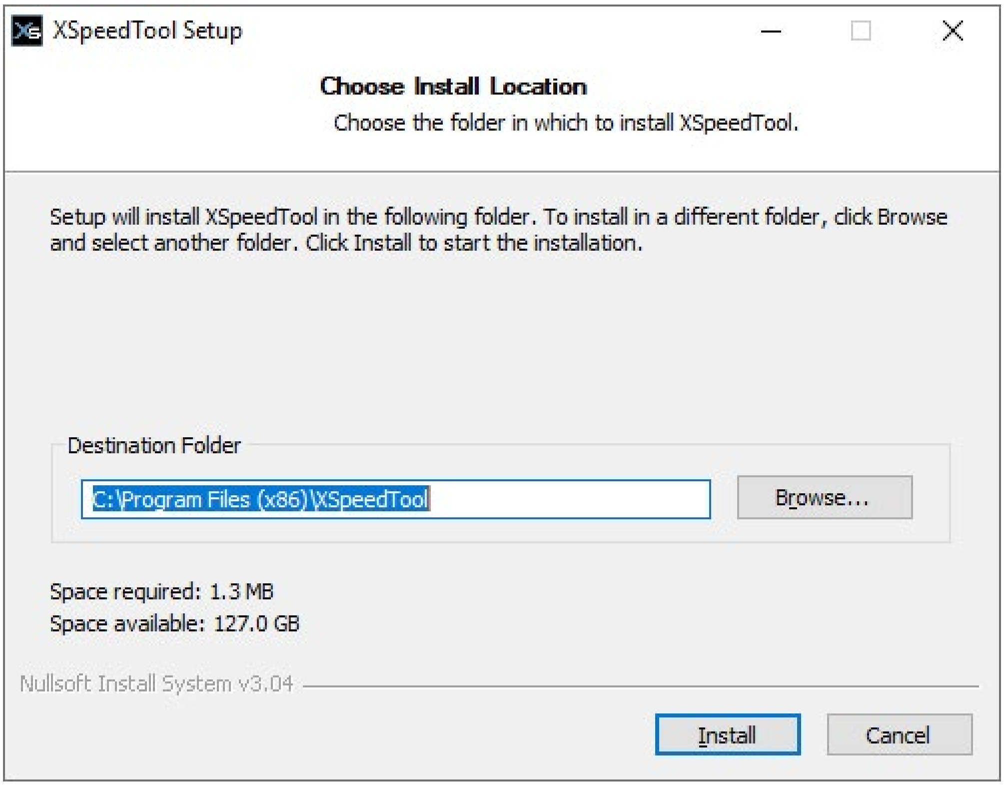
1. The application typically is provided in a *.Zip file. Extract the contents of compressed file..
2. Run the setup file as administrator (Right click -> Run as administrator).



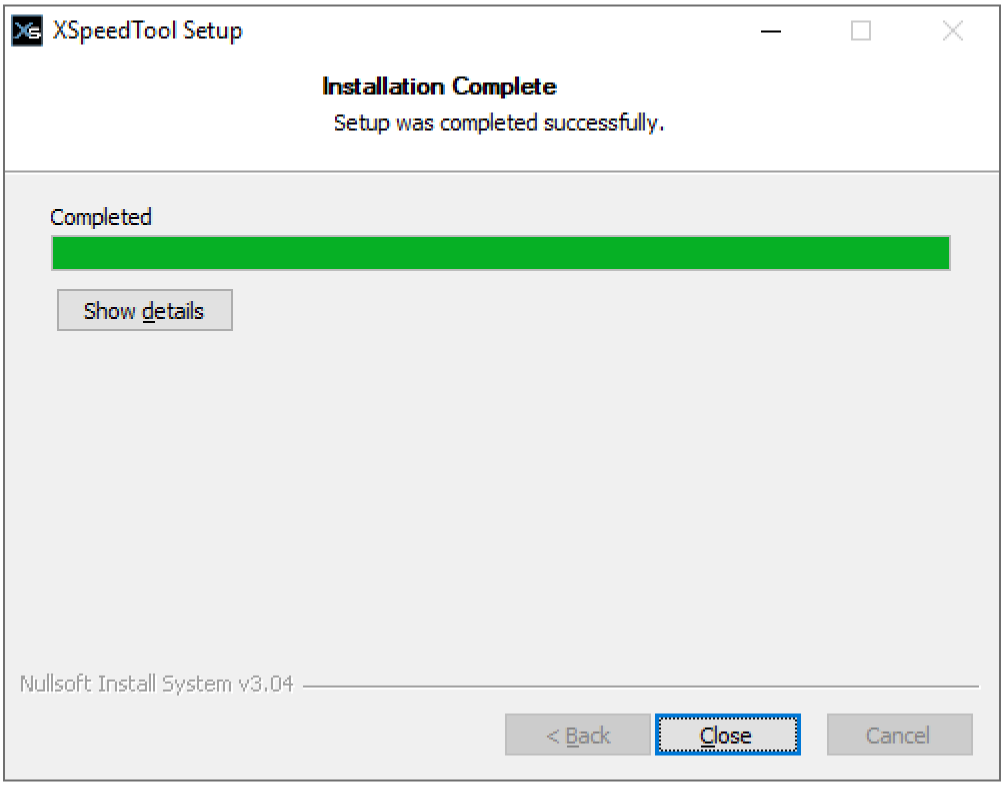
3. Select the installation language.



4. Select the installation folder (default: C:\Program Files (x86)\XSpeedTool) and then Install.



5. The software installs on the computer.



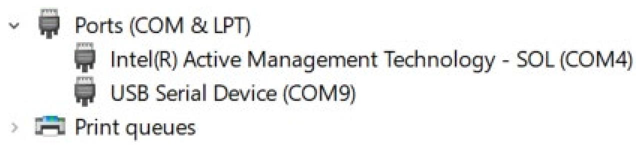
6. Once installation is complete, a shortcut is created on the desktop.

Communication settings

INSTRUMENT

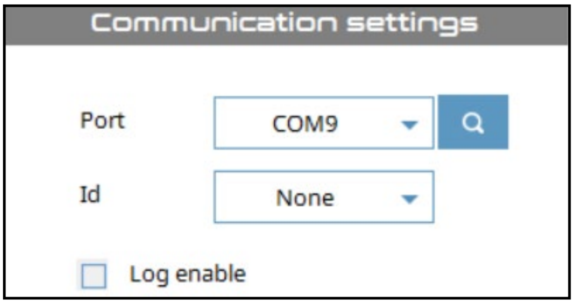
Connect the instrument to the PC using the USB port.
The instrument is configured by default to communicate with the program.

A virtual COM port is automatically installed when connecting the instrument to the PC via the USB port. Verify the assigned port number in "**Device Manager**" in Windows:



XSPEEDTOOL

1. Launch XSpeedTool and Access Settings.
2. Select the correct COM port.
3. (Optional) Set the ID if you are using 485 protocol.
4. Select OK.



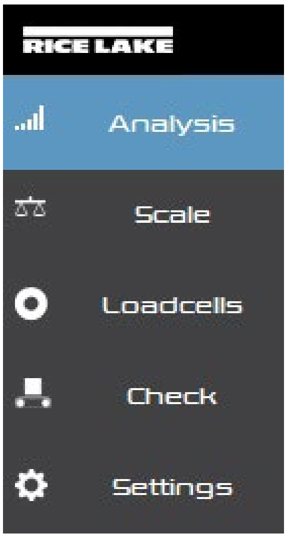
CONNECTION STATUS

Green → Connected

Grey → Ongoing connection

Red → Disconnected

Menu

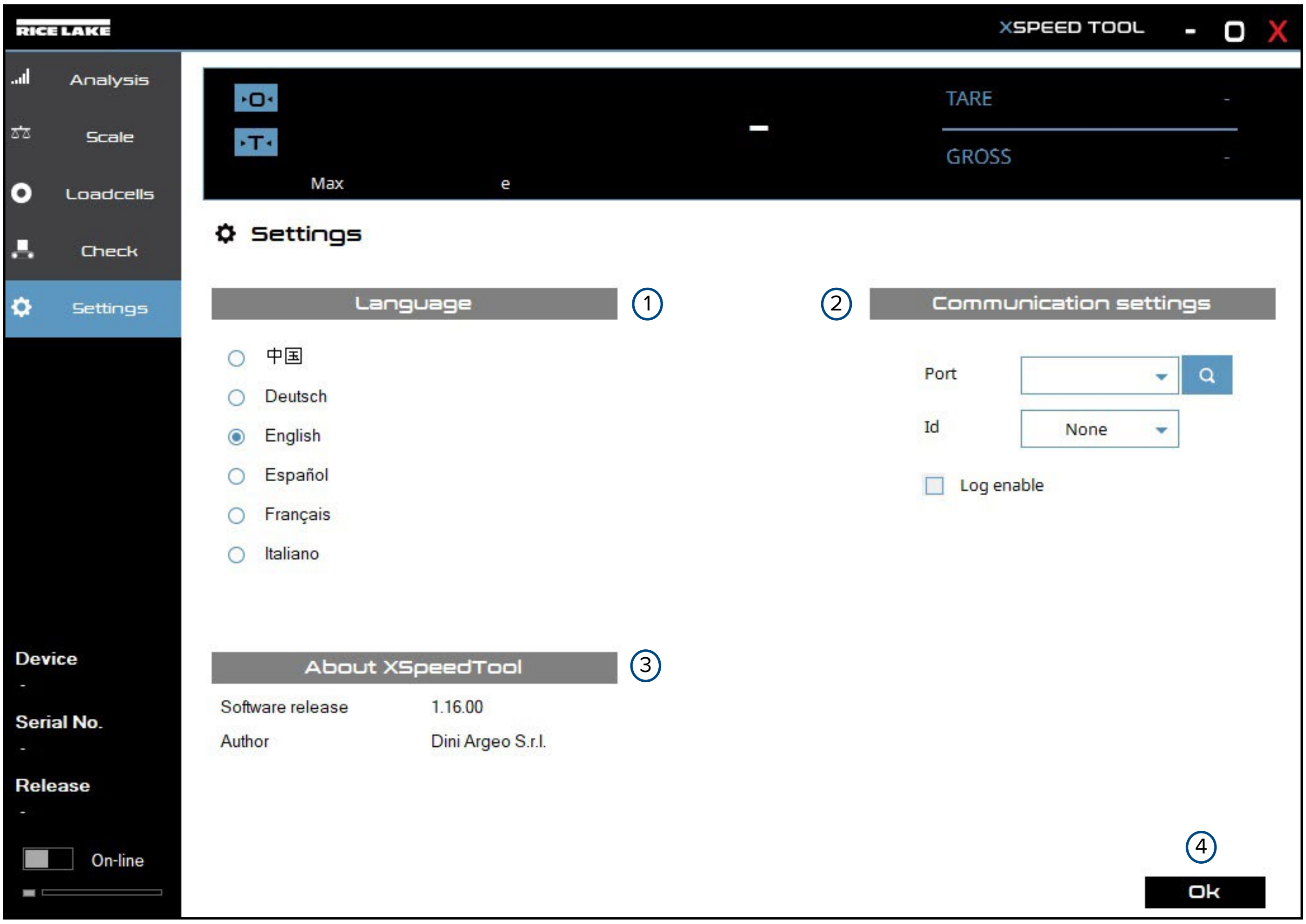


Menu Items	Description
Analysis	Provides signal analysis of weights.
Scale	Configures scale modes, settings, and calibration.
Loadcells	Configures load cell settings. **NOTE: Load cells page functionality is limited to configurations in Junction box mode.**
Check	Configures check weighing parameters.
Settings	Configures software settings.

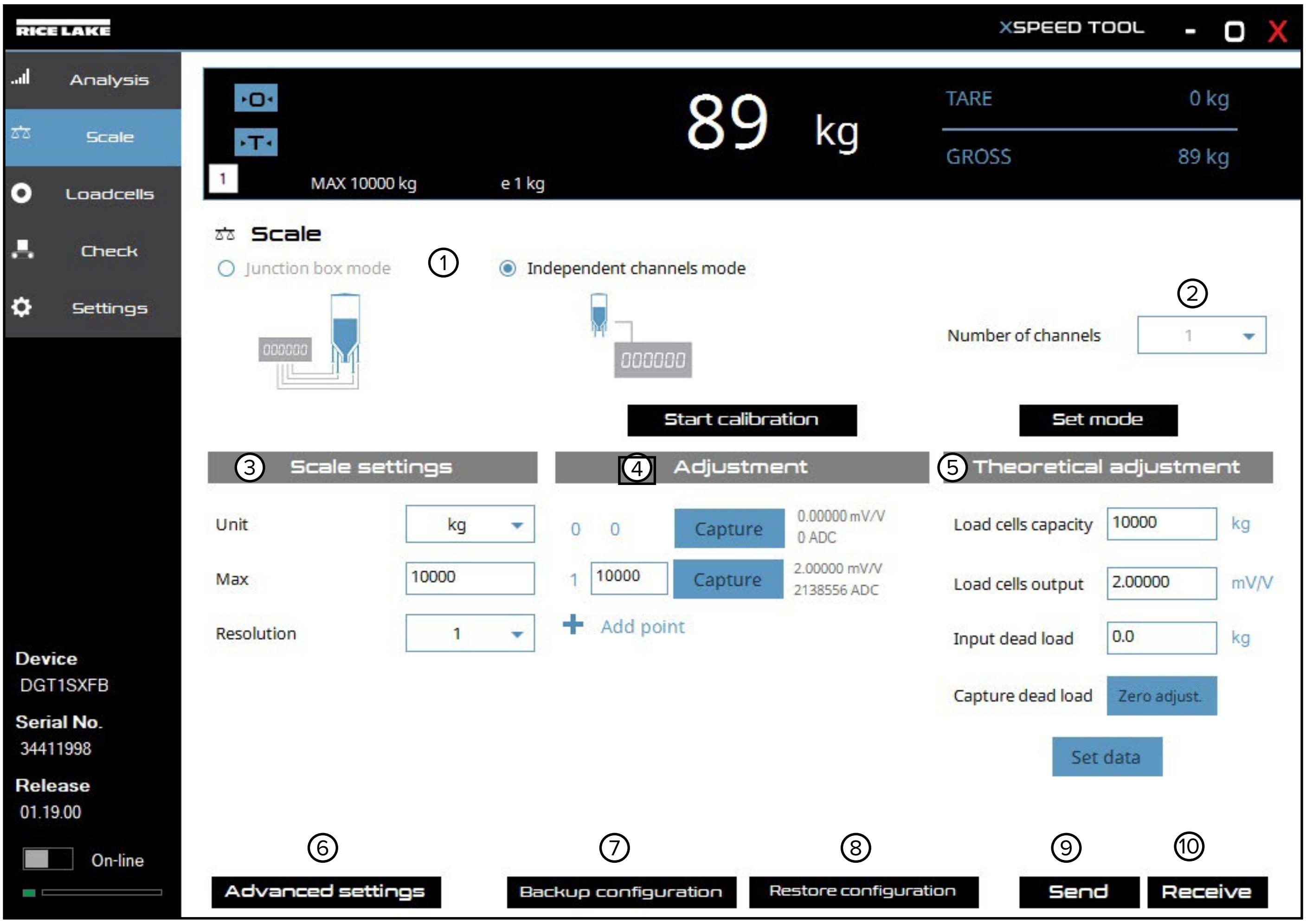
Weight Display

Element	Description
1	Zeros current weight.
2	Tares current weight
3	Displays current weight.
4	Displays current tare weight.
5	Displays current gross weight.
6	Cycles through the available scales.
7	Displays maximum scale weight.
8	Displays scale resolution.

Settings



Element	Description
1	Configures the language.
2	Configures communication setting. For more information, see page 7.
3	Displays software release and author information.
4	Commits changes.



Element	Description
1	Set scale mode as either Junction box mode or Independent channels mode.
2	Configures the number of channels (Junction box mode) or scales (Independent channel mode).
3	Sets scale calibration parameters: • Unit of measure (g, kg, t, or lb) • Max capacity • Resolution (Divisions) • Number of channels (only one channel is available in junction box mode)
4	Controls used during calibration.
5	Controls used during theoretical calibration.
6	Opens additional window with advanced settings.
7	Creates a backup of the indicator’s current settings.
8	Restores indicator with back up file.
9	Sends calibration configuration to the indicator.
10	Receive information from indicator.

Calibration

Calibrate the instrument with sample weights.

1. Select the scale number in the weight display(1) until the desired scale is selected.
2. Configure Unit, Max Capacity and Resolution parameters.
3. Select + Add point to add calibration weights (if more than 1 is needed).
4. Set weight values for calibration points.
5. Remove all weights from the scale.
6. Select Start calibration.
7. Select the point 0 Capture button. Zero Calibration is performed:
   - ACQUISITION displays in the software and Pnt .0 displays on the indicator.
   - ACQUISITION OK displays in the software and Pnt0.0A displays on the indicator.
8. Place a certified test weight on the platform for the first weigh point and then select Capture.
   - ACQUISITION displays in the software and Pnt . 1 displays on the indicator.
   - ACQUISITION OK displays in the software and Pnt 1.0A displays on the indicator.
9. Repeat steps 9 to 11 for additional weigh points.
10. Select End calibration. Calibration is stored in the indicator.
11. CALIBRATION OK displays.

Theoretical Calibration

Set the values of theoretical calibration:

1. Configure Unit, Max Capacity and Resolution.
2. Select the scale number in the weight display(1) until the desired scale is selected.
3. Configure Load cell capacity as the sum of the capacities for each load cell.
4. Configure Load cells output as either the signal value of the (independent channels mode) or the sum of all signals (Junction box mode).
5. Select Start calibration.
6. Calculate the value of the points by selecting Set data.
7. Wait.. displays in the software.
8. CALIBRATION OK displays.

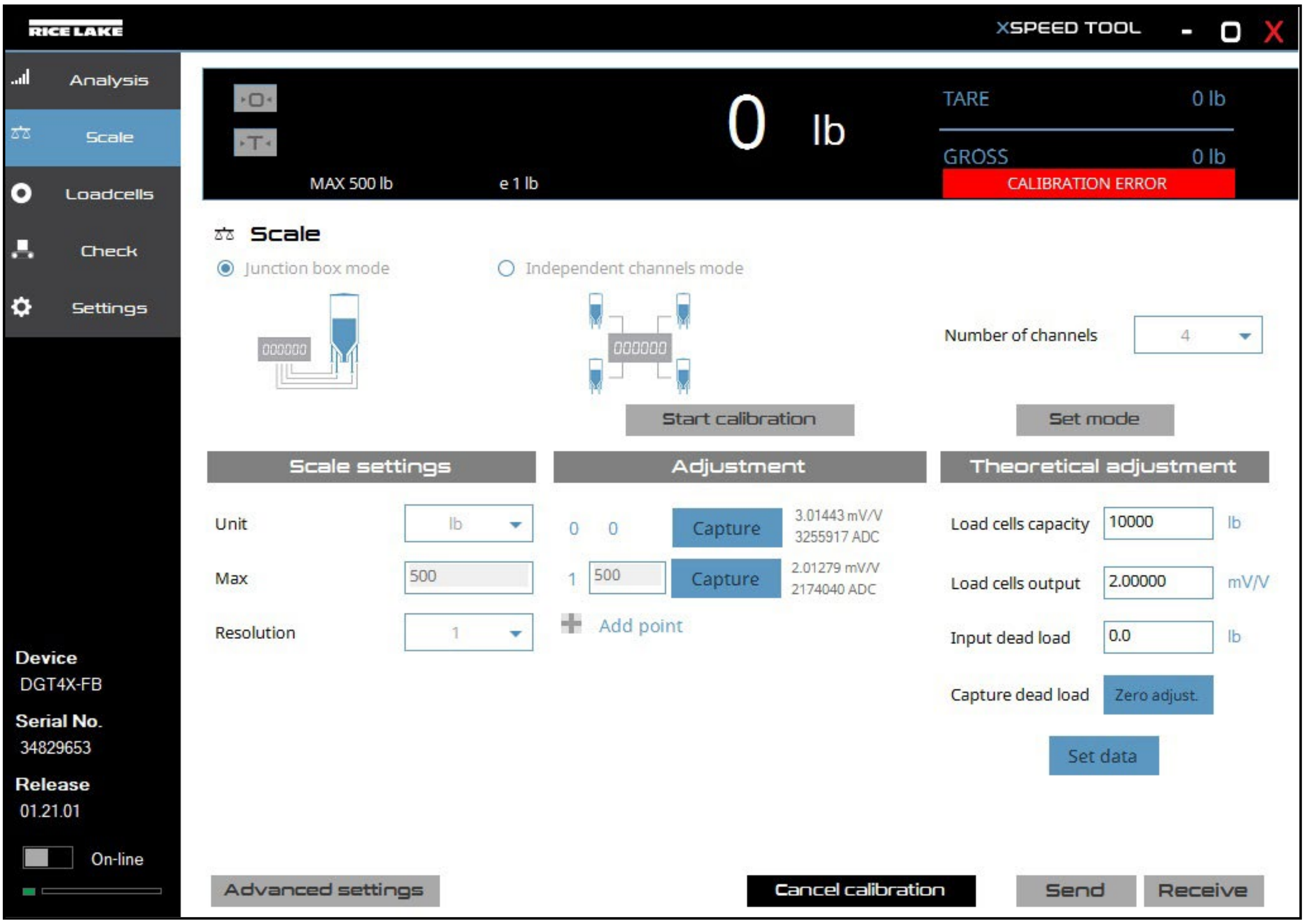
Zero Calibration

1. Remove all weight from the scale.
2. Select **Start calibration**.
3. Select **Zero adjust**. Zero Calibration is performed:
   - **ZERO CALIBRATION** displays in the software and 0.CAL lb displays on the indicator.
   - **ACQUISITION OK** displays in the software and 0.CAL .oK displays on the indicator.
4. Select **End calibration**.
5. **CALIBRATION OK** displays.

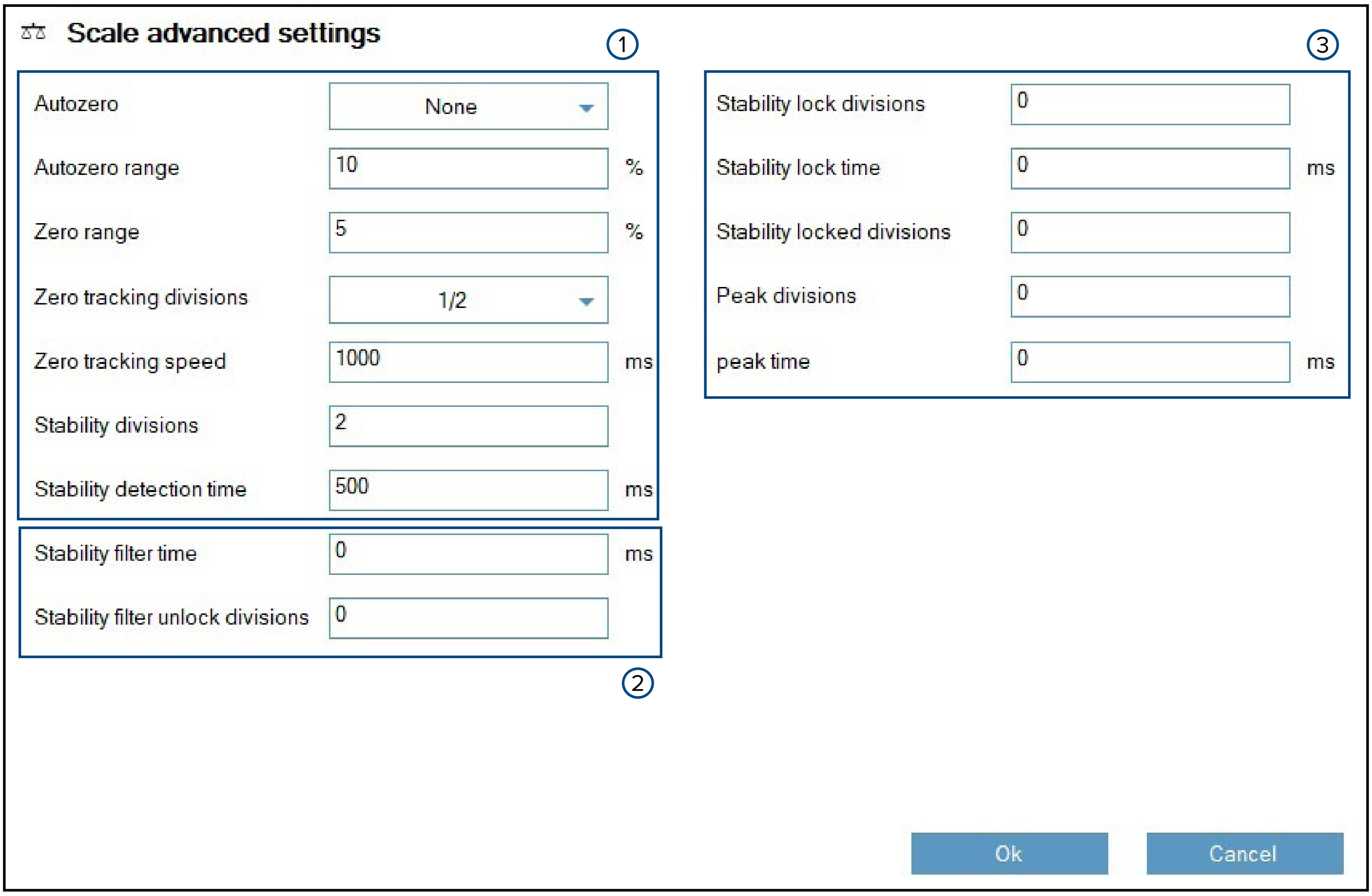
Calibration Errors

During calibration errors occasionally occur due to a variety or reasons.

Common areas to check when an error is received include:
- Check load cells are connected properly.
- Ensure zero calibration was not captured with a weight on the scale.
- Ensure calibration was completed with a test weight matching the configured points.



Advanced Settings



Advanced Settings Parameter Overview

Element	Description
1	Standard configuration parameters
2	Stability filter parameters. When used, the time and division stability parameters determine if the weight is either locked or unlocked. If the weight increases or decreases a value greater than the division setting, the filter unlocks. If the weight increases/decreases greater than the duration of the set time, the filter is unlocks. If the weight oscillates and does not continuously increase/decrease then the weight is frozen and the filter locks. In the unlocked state the current weight is live, in the locked state the current weight is the frozen value.
3	Peak filter is comprised of several parameters. When used, these parameters determine if the weight is either locked or unlocked. **NOTE: In the unlocked state the current weight is live, in the locked state the current weight is the frozen value. When unlocked, the live weight is the current weight. If locked, the weight is frozen. The weight is locked when it remains in the defined range of divisions for the configured Stability lock time.** **Once locked, the weight can be unlocked due to the following conditions:** • **The weight changes to more than peak divisions** • **The weight moves out of the Stability locked divisions for more than the Peak time**

Parameter	Values	Description
Autozero	None, single scale	Sets the autozero function for the selected scale.
Autozero range	1 - 50%	Defines the maximum percentage of scale capacity where automatic zero is allowed.
Zero range	1 - 50%	Defines the maximum percentage of scale capacity where the zero function is allowed.
Zero tracking divisions	none, 1/4, 1/2 (default), 1, 2, 4, 6, 8, 10 divisions	Defines when a scale automatically zeros in relation to divisions. For example, if set to 2 the scale is zeroed when scale is 2 or less divisions.
Zero tracking speed	1 - 5000 milliseconds	Every millisecond of configured time the autozero function executes. **NOTE: if the weight is inside zero tracking divisions the weight is zeroed.**
Stability divisions	1 - 99 divisions	If the weight changes a number of divisions less than or equal to this parameter for the configured stability detection time, the weight is considered stable.
Stability detection time	10 - 10000 milliseconds	Defines the duration required to be considered stable in milliseconds.
Stability filter time	1 - 2000 milliseconds	Defines the duration required to unlock a weight. If the weight continues to increase/decrease for the set time, then after the set time the filter is unlocked.
Stability filter unlock divisions	1 - 1000 divisions	Changes a weight from locked to unlocked. If the weight has an increase/decrease of a value greater than the divisions, the filter unlocks.
Stability lock divisions (Peak lock divisions)	1 - 1000 divisions	Defines required divisions to change a weight from unlocked to locked. If a weight remains in the defined range of divisions for the configured Stability lock time, the weight locks.
Stability lock time (Peak lock time)	1 - 30000 milliseconds	Defines the duration required to lock a weight in relation to the Stability lock divisions parameter.
Stability locked divisions (Peak band divisions)	1 - 1000 divisions	Defines required divisions to change a weight from locked to unlocked. If a weight increases/decrease out of the division range for the configured peak time, the weight unlocks.
Peak divisions	1 - 1000 divisions	Defines the required divisions for a weight to unlock immediately.
Peak time	1 - 30000 milliseconds	Defines the duration required to unlock a weight in relation to the configured Stability locked divisions.
OK	-	Commits changes.
Cancel	-	Aborts changes.

Advanced parameters are only needed for advanced configuration.

The Stability and Peak filters provide similar results, locking or unlocking weights. If removing peaks is unnecessary, use the stability filter; otherwise use the peak filter. Do not use the Peak and Stability filters together.

Backup Indicator Configuration

1. Select Backup configuration.
2. The software creates a backup file of the device's configuration.
3. A Save As window appears.
4. (Optional) Update the file name. SCT1SX_01.19.00_20240207_1457.mot

NOTE: The default file name is composed of the indicator model, firmware version, date and time.

5. In the file explorer, navigate to the desired location and then select Save.
6. The backup file is saved to the computer.

Restore Indicator Configuration

1. Select Restore configuration.
2. An Open window appears.
3. Navigate to and select the previously created backup file (*.mot).
4. The indicator is busy while the configuration is restored with the backup file.
5. When restored, the indicator automatically restarts and the process completes.

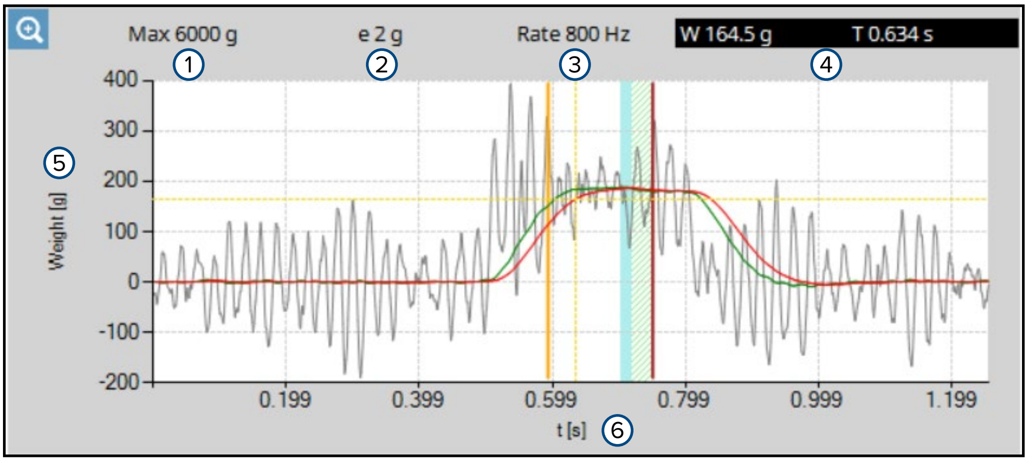
Display Mode Check Boxes

Element	Description
1	Displays a raw data signal in relation to weight and time.
2	Displays the graphic curve related to the last selected filter (course, fine or selective). **NOTE: If Last filter only is enabled only the red curve (Fine filter) is shown.**
3	Displays a data signal in relation to decibels and hertz.
4.	Displays all raw data signals in the weigh column overlaid upon one another in relation to weight and time.

NOTE: To change views, enable or disable the desired view check boxes then select Refresh.

Graph Elements

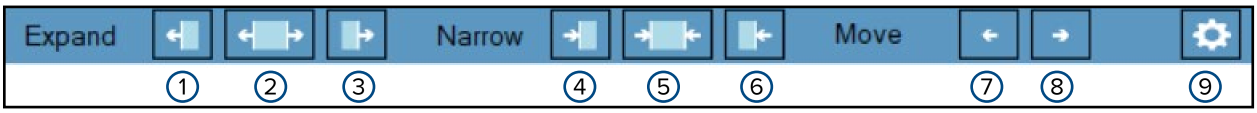
This section discusses the elements around the graph region, subsequent sections discuss graph signals specific to photocell and non-photocell instances. The type of signal varies depending on trigger, mode, and processed packages. For more information see page 24.



Element	Description
1	Displays the maximum scale weight.
2	Displays the scale resolutions.
3	Displays the filter rate (in Hertz).
4	Displays weight and time (when Raw data or Overlap is enabled) or decibels and hertz (when Spectrum is enabled) in relation to cursor position.
5	Displays weight (when Raw data or Overlap is enabled) or decibels (when Spectrum is enabled).
6	Displays time in seconds (when Raw data or Overlap is enabled) or hertz (when Spectrum is enabled).

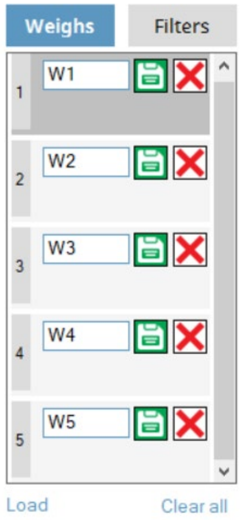
Measurement Adjustment buttons

These buttons adjust the size of the measurement (blue shaded area) and open the Check/Settings Menu.



Element	Description
1	Expands measurement size left.
2	Expands measurement size left and right.
3	Expands measurement size right.
4	Decreases measurement size left.
5	Decreases measurement size left and right.
6	Decreases measurement size right.
7	Moves measurement left.
8	Moves measurement right.
9	Opens Check/Settings menu.

Weighs List



On the right side all the acquired weighs are saved.
Select a weight to show it on the graph.

	Saves the weight on the PC.
X	Deletes the weight.
Load	Loads the weight saved on the PC (**.xsd** format).
Clear all	Deletes all weighs.

Filters List

Select to save a filter in the filters list.

Select a filter and then Refresh to see the filter result in the graph.

	Saves the filter on the PC.
X	Deletes the filter.
Load	Loads a filter saved on the PC (**.xsf** format).
Clear all	Deletes all filters.

Zoom Functions

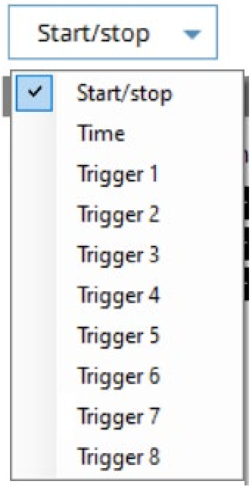
Roll the mouse wheel forward or backward on the graph to activate zoom functions.

Adjust vertical and horizontal scroll bards to change graph position.

To return to the original view, select or Refresh.

Data Acquisition

Acquisition can be accomplished in several ways:



> ⚠ If the instrument is configured in junction box mode (dependent channels) the available acquisition rates are: 5, 10, 20, 40, 80, 160, 320.

START/STOP

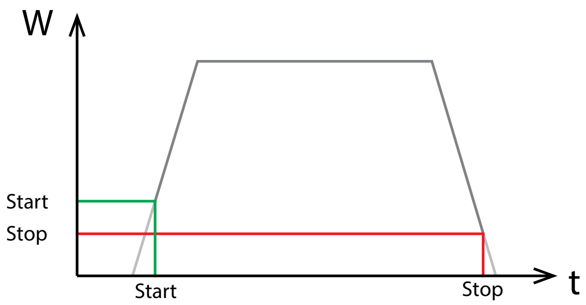
The acquisition begins when you press **Start** and ends when **Stop** is pressed.

TIME

The acquisition begins when you press **Start** and ends automatically after the time set in Time (s).

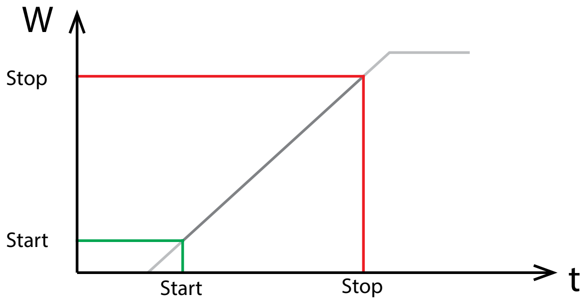
TRIGGER 1

Once **Start** has been pressed, the acquisition begins when the weight exceeds the upper threshold (Start) and ends when the weight falls below the lower threshold (Stop).



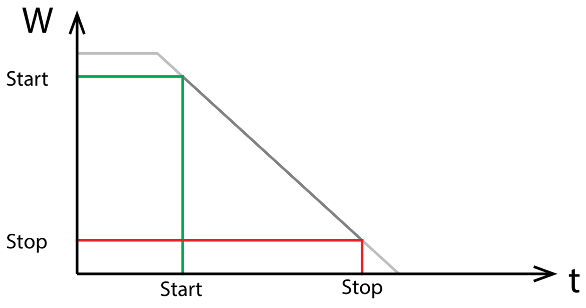
TRIGGER 2

Once **Start** has been pressed, the acquisition begins when the weight exceeds the lower threshold (Start) and ends when the weight reaches the upper threshold (Stop).



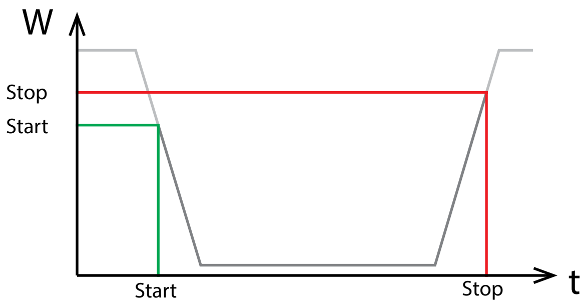
TRIGGER 3

Once **Start** has been pressed, the acquisition begins when the weight falls below the upper threshold (Start) and ends when the weight falls below the lower threshold (Stop).



TRIGGER 4

Once **Start** has been pressed, the acquisition begins when the weight falls below the lower threshold (Start) and ends when the weight reaches the upper threshold (Stop).



TRIGGER 5
Start has been pressed, the acquisition begins when a package obstructs the first photocell and ends when the packages unblocks the second photocell along the belt path. During this trigger, the input signals change from 0 to 1 when packages obscures photocells and 1 to 0 when packages unblock photocells. This trigger is used for PNP type sensors.

TRIGGER 6
Start has been pressed, the acquisition begins when a package obstructs the first photocell and ends when the packages unblocks the second photocell along the belt path. During this trigger, the input signals change from 1 to 0 when packages obscures photocells and 0 to 1 when packages unblock photocells. This trigger is used for NPN type sensors.

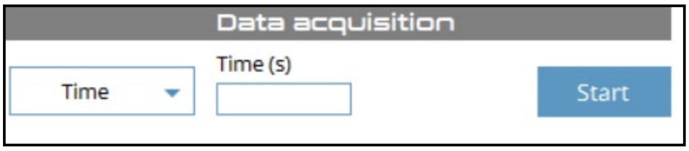
TRIGGER 7
Acquisition occurs for the set time n relation to photocells transitions. The relevant transitions are: from clear to obstructed status for the first photocell, from obscured to clear status for the second photocell. When photocell is obstructed the indicator will read a high level on the related digital input.

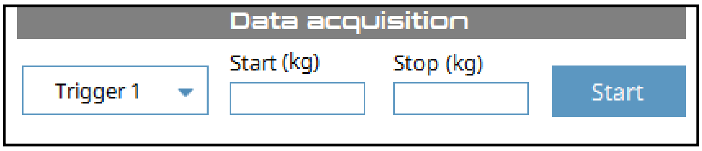
TRIGGER 8
Acquisition occurs for the set time in relation to photocell transitions. The relevant transitions are: from clear to obstructed status for the first photocell, from obscured to clear status for the second photocell. When photocell is obstructed the indicator will read a low level on the related digital input.

> Systems with photocells can use any trigger, however Triggers 5 or 6 are typically used. Triggers 5 through 8 are only for systems with photocells. Systems without photocells can use Start/Stop, Time, and Triggers 1 to 4. If uncertain of which trigger to use, Trigger 1 is often a good starting point.

Additional Trigger Parameters

When Time, 1, 2, 3, 4, 7 and 8 triggers are selected, additional parameters must be configured:

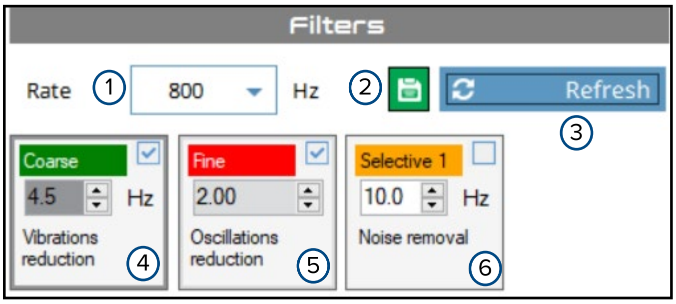




Selected Trigger	Additional Parameter	Description
Start/Stop, 5 - 6	-	-
Time, 7 to 8	Time(s)	The acquisition time duration in seconds.
Trigger 1 to 4	Start (kg) Stop (kg)	The weight required to start data acquisition. The weight to stop data acquisition.

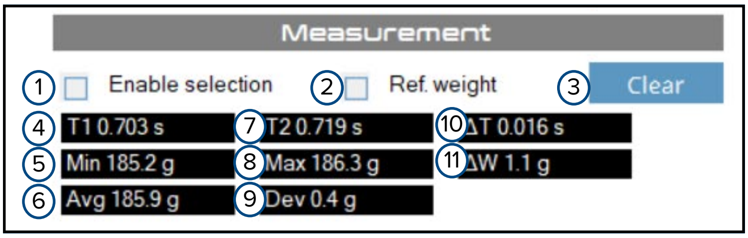
1. If needed, configure additional parameters.
2. Select **Send**.
3. Select **Start** if ready to being processing.

Filters



Element	Description
1	The configured filter (in Hertz).
2	Adds current filter configuration to the filter column. The filter can be saved by selecting the disk icon and following on-screen prompts.
3	Refreshes graph display. Typically used after filters are adjusted.
4	Coarse filter removes signal vibrations and is defined in hertz. Indicates the result after applying the Coarse filter with a green line. Recommended value: 2 to 10 Hz (go below 2 only with 2600 Hz rate). This value must be lower than rate / 2. Typically a value of 3 is a good starting point.
5	Fine filter removes signal oscillations and defined as a percentage. Indicates the result after applying the Fine filter (or Coarse and Fine filters if both are enabled) with a red line. Recommended value: 10 to 50 %. Typically a value of 10 is a good starting point.
6	Selective filter removes a fixed frequency (hertz) noise.

Measurement



Element	Description
1	Defines a measurement zone (blue shaded area) using the mouse on the signal.
2	Adjusts measurement values with reference weight added. Typically unused for Check Weigh Mode.
3	Clears all measurement parameters (including in settings).
4	Starting time of measurement.
5	Minimum weight during measurement.
6	Average weight during measurement.
7	Ending time of measurement.
8	Maximum weight during measurement.
9	Standard deviation of weights.
10	Difference between start and end measurement times.
11	Difference between maximum and minimum weight.

Send

To send the filter to the instrument, select **Send**.

Receive

To receive the filter from the instrument, select **Receive**.

Signal Overview (Photocells)

The example below displays a sample signal that uses photocells during package processing.

Element	Description
1	A gray line that illustrates the unfiltered signal of the processed package.
2	A green line that illustrates the result after applying the Coarse filter.
3	A red line that illustrates the result after applying the Fine filter (or Coarse and Fine filters if both are enabled).
4	A vertical orange line that illustrates the start of measurement (displays only in photocell modes).
5	A dashed orange line that moves along the Fine filter (red line). This indicates weight and time relative to cursor position.
6	Blue shading that indicates the measured area. The Measure area parameter is configured with the Check/ Settings Menu, Measurement Adjustment controls, or Enable selection option.
7	Green shading indicates the area that is skipped during measurement. The Final skipped data parameter is configured in Check/Settings Menu.
8	A vertical red line that indicates the end of measurement.

Raw Data

Raw data is enabled by default. The Raw data view displays the acquired signal in relation to time and weight.

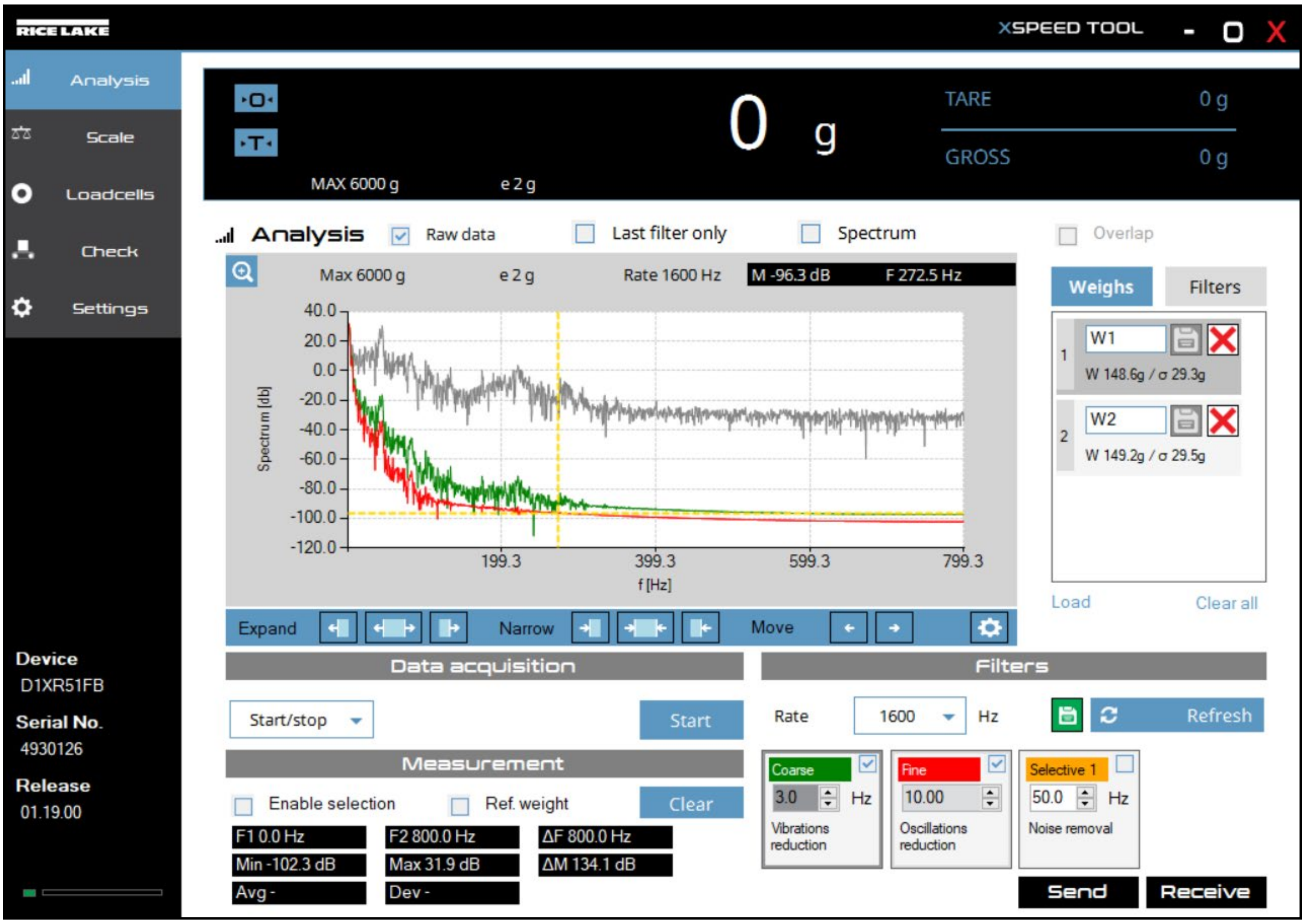
By analyzing the spectral graph of the signal and applying the appropriate filters, you can eliminate the vibrations and disturbances that negatively affect system performance.

Spectrum

The spectrum displays the acquired signal frequency. By analyzing the spectral graph of the signal and applying the appropriate filters, you can eliminate the vibrations and disturbances that negatively affect system performance.

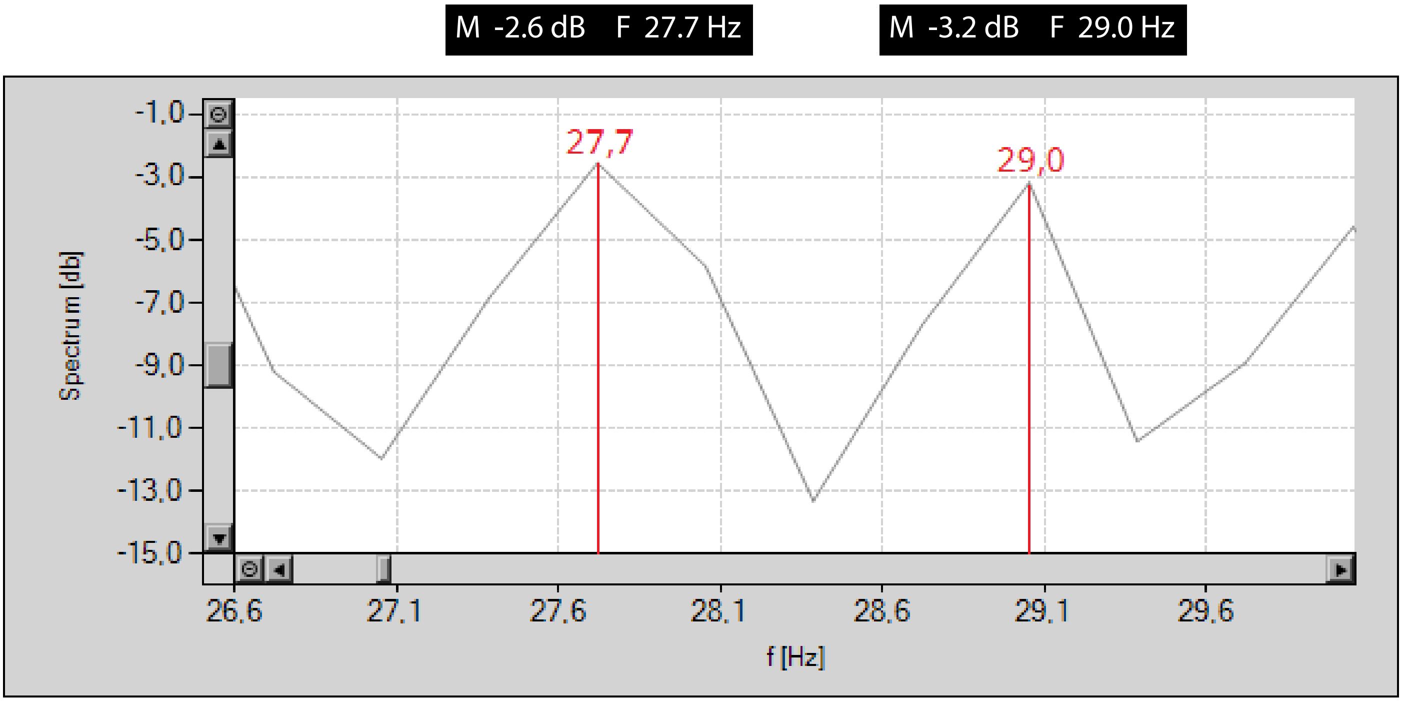
Enable the Spectrum check box to use this feature.

NOTE: The spectrum calculation may take several seconds, depending on the amount of data to be analyzed.



Spectrum analysis

To evaluate the vibration frequency, zoom in on the graph until you see the wavelength of the signal.



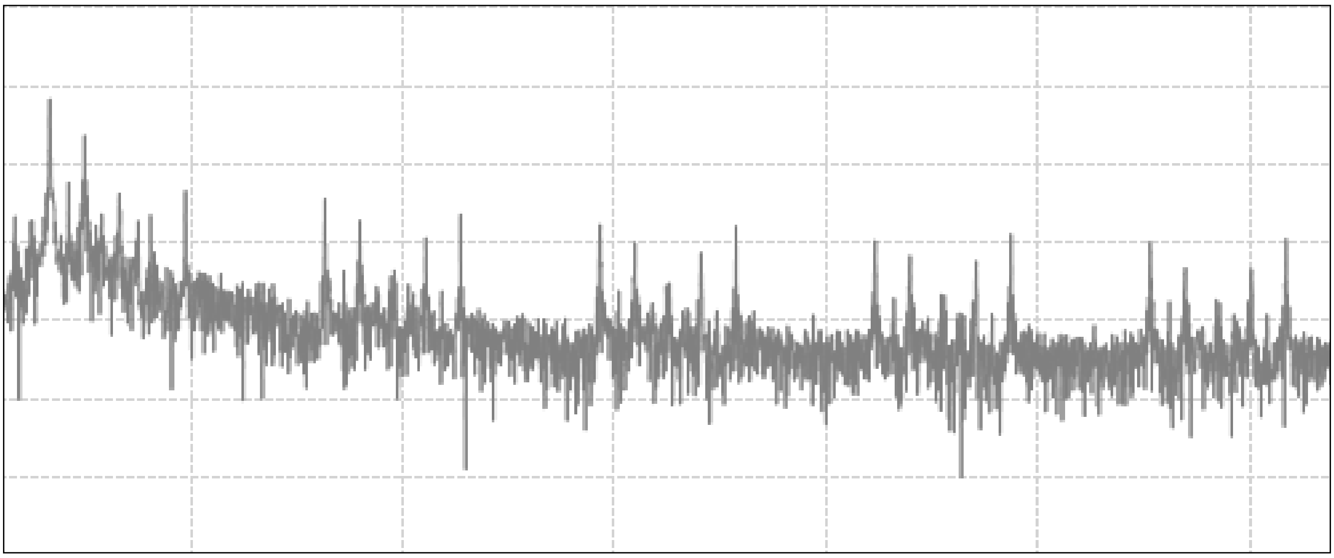
In the example of the above graph, the wavelength is given by the difference 29,0 - 27,7 = 1,3 Hz.

Overlap

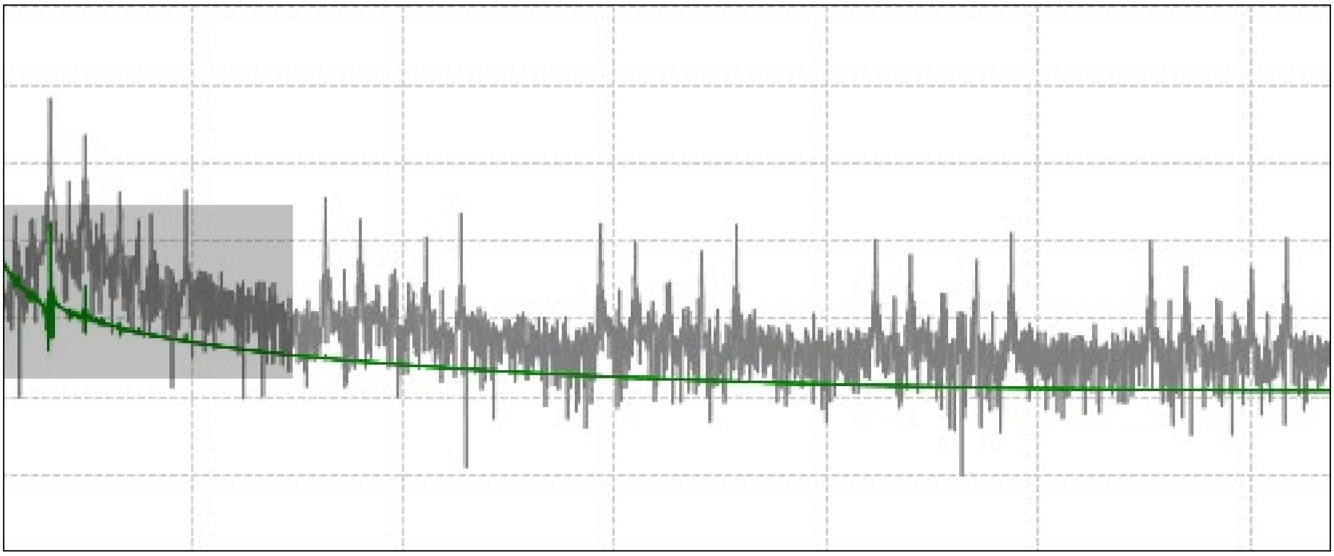
The Overlap view displays multiple weigh signals overlapping each other with different colors for easy identification and the last selected filter enabled (Course, Fine or Selective). Typically, this view is simultaneously used with Raw data.

Examples

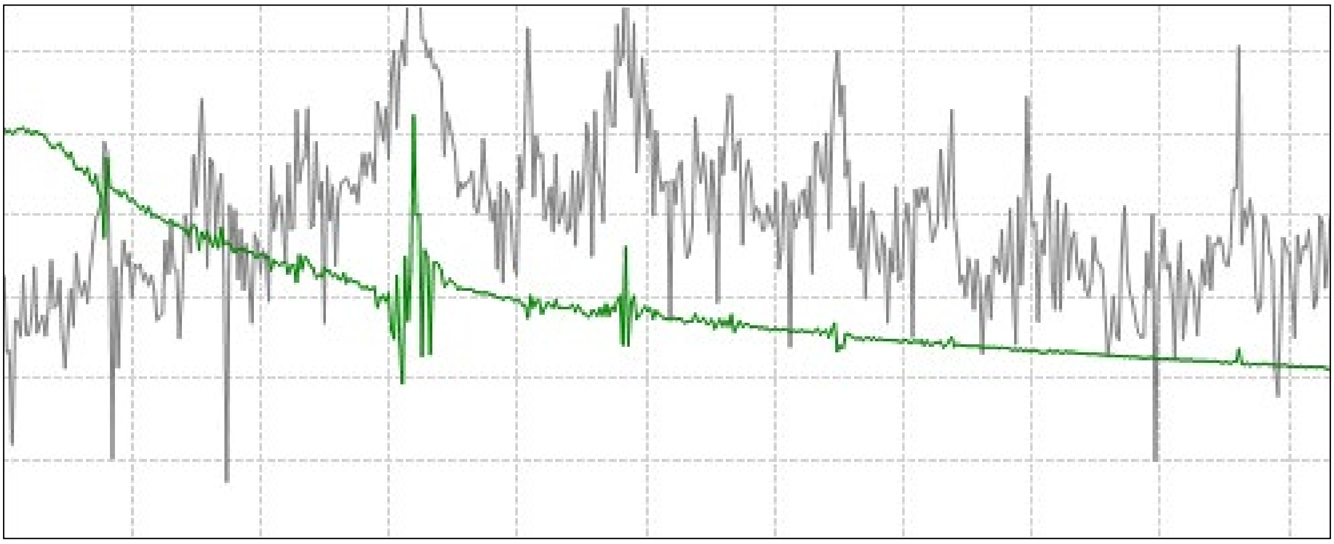
After acquiring the weight, the representation of the signal appears:



By applying a coarse filter at 10 Hz:

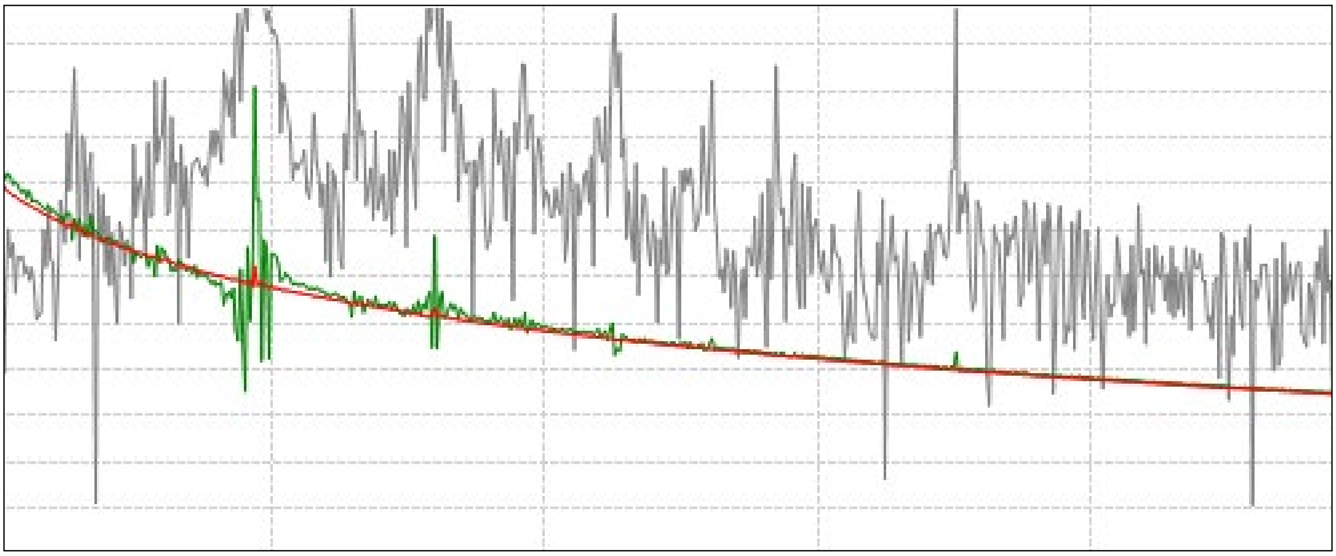


The signal is still not stabilized (zoom in to check the stability in each area of the graph):



There are two ways to proceed:

1. Further reduce the frequency of the Coarse filter.
2. Activate the Fine filter:



The signal above has been obtained by setting the fine filter to 50%.

The combination of the two filters removes instability due to vibrations and at the same time maintains an weighing speed.

An additional filter (two for some models) is also available for noise removal. Apply the filters in case you observe noise caused by a specific frequency.
For example, power supply frequencies can cause noise. Typically European and Australian power supplies use 50 hz while North American power supplies use 60 Hz.

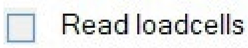
The Loadcells page only functions in Junction box mode (see page 10).

Page Elements

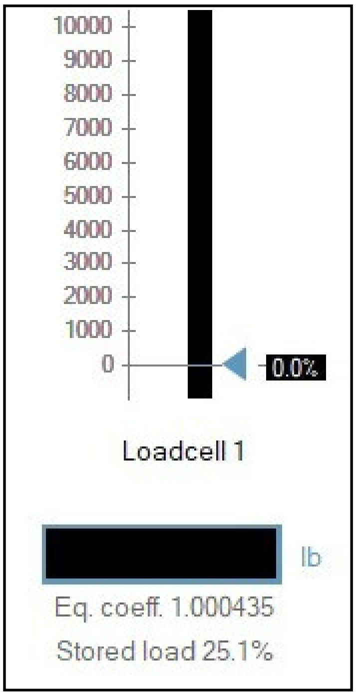
Element	Description
1	Sets the maximum percentage of variation allowed compared to the stored values.
2	Sets the maximum percentage of allowed variation at zero compared to stored values.
3	Sets the the duration of the alarm delay in seconds before the load distribution alarm sounds.
4	Enables or disables viewing load cell details (current weight, imbalance percentage and warnings).
5	Displays a representation of load cells connected to the junction box with the maximum capacity and in connection order.
6	Displays the load percentage on a load cell related to total weight.
7	Displays the estimate weight on a load cell weight.
8	Displays the load cell status (equalization coefficient, stored load, etc).
9	Initiates the equalization process.
10	Clears the current equalization on the indicator.
11	Stores the current load distribution on load cells to the indicator.
12	Sends Max imbalance % value, Max imbalance % zero value and Alarm delay to the indicator.

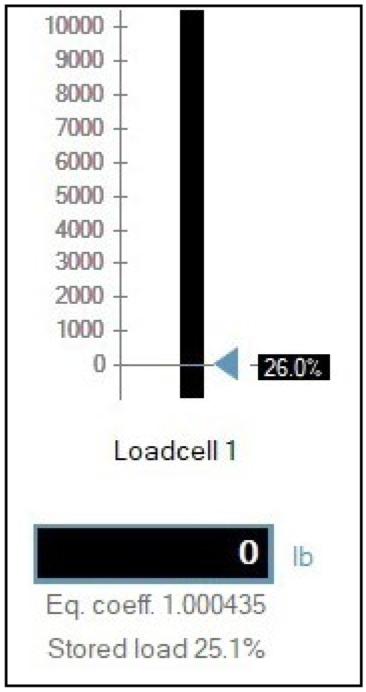
Read Loadcells

Enable the Read loadcells check box to allow XSpeedTool to read and display load cells weights, loads and imbalance alarm status.



When enabled, additional items are displayed in the load cell representation. The following examples display the representation with the Read load cells check box disabled and enabled.





Equalization Overview

Most instruments have an active imbalance function that monitors load cell signals for unevenly distributed loads compared to the stored distribution values. When dependent channels mode is enabled on the indicator, it can estimate the weight on every load cell and calculate the load distribution of the weight in a percentage on every load cell. An alarm sounds when the calculated load on a cell deviates more than the maximum set % from the stored load. The stored load is the percentage saved when either the Store load button or indicator function is activated.

Complete equalization requires the functions to be used in the following order:

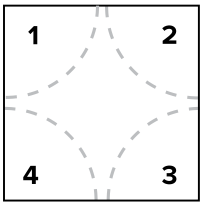
- Equalization
- Store load
- Send unbalance

NOTE: After equalization is completed, calibration should be performed.

Equalization

Equalization requires acquiring the zero point with the scale unloaded and then placing a certified test weight (about 20% of the maximum capacity) on each cell in a specific order while acquiring the equalization data.

1. Unload the platform.
2. Select Start equalization. Equalization is performed:
    - EQUALIZATION ZERO displays in the software and WAit displays on the indicator.
    - ACQUISITION OK displays in the software and Eq.0 OK displays on the indicator.
3. Add certified test weight to the platform over load cell 1 according to the following diagram:



4. Select Equaliz. Cell 1.
    - EQUALIZATION 1 displays in the software and Eq 1 displays on the indicator.
    - ACQUISITION OK displays in the software and Eq.1 OK displays on the indicator.
5. Move the test weight to the next load cell position (indicated in Step 5).
6. Repeat Steps 4 through 6 for remaining load cells.
7. When all load cells are equalized, CALIBRATION OK displays in software and Eq.oK displays on the indicator.

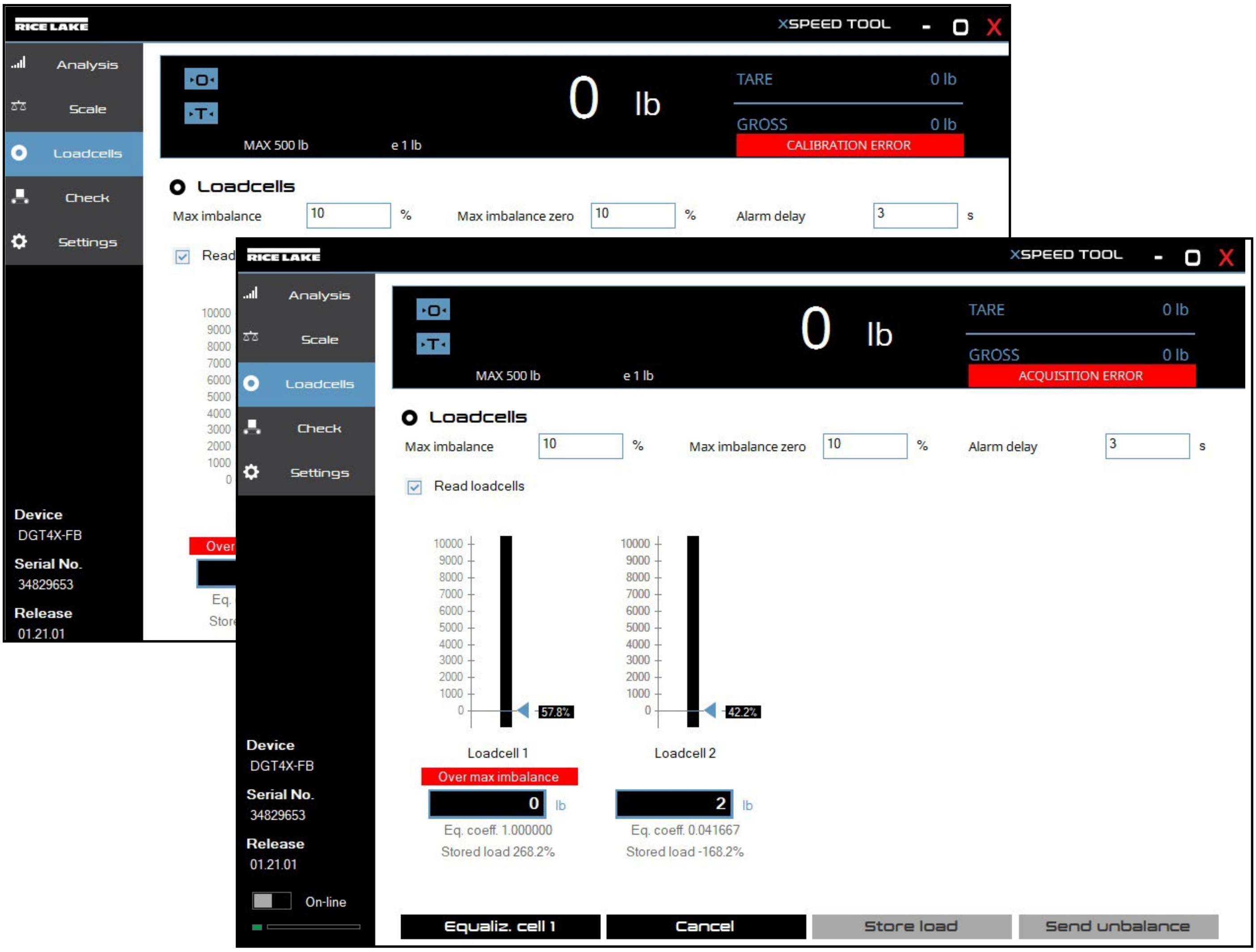
Equalization Errors

During equalization errors occasionally occur due to a variety or reasons. Common error messages include:

1. Calibration error
2. Acquisition error

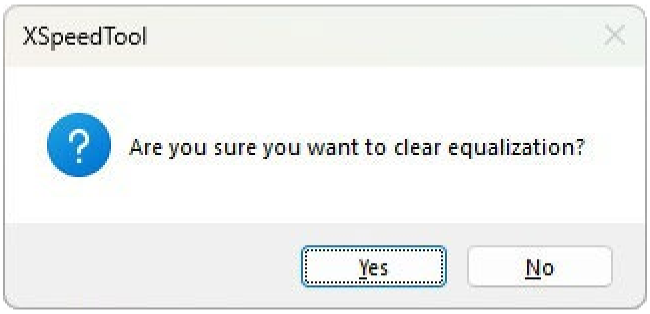
Common areas to check when an error is received include:

- Check load cells are connected properly
- Ensure scale was unloaded prior to equalization zero
- Ensure test weight was moved above each load cell during equalization



Clear Equalization

1. Select **Clear equalization**.
2. The clear equalization prompt appears.
3. Select Yes to clear or No to abort.

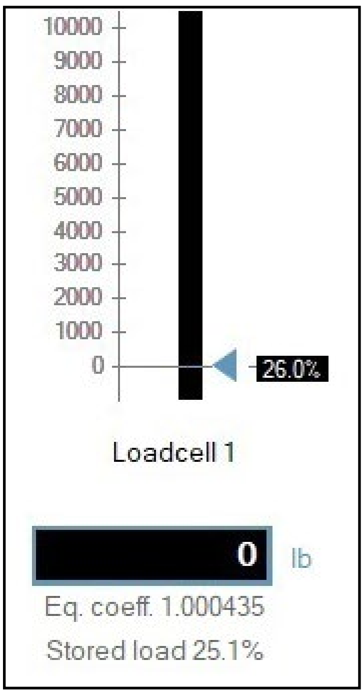


Store load

Store load acquires the current load distribution percentage of each load cell for the indicator. Load distribution for new weightments made are compared against these stored values.

1. Select **Store Load**.
2. **UNBALANCE ACQUISITION** displays in software WAit displays on indicator.
3. **ACQUISITION OK** displays in software and unbAL OK displays on indicator.

NOTE: Stored load value appears under load cell representation.



Send unbalance

The Send unbalance function sends the Max imbalance value, Max imbalance zero value and Alarm delay to the indicator.

1. Select Send unbalance.

Notes

Notes

Notes

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