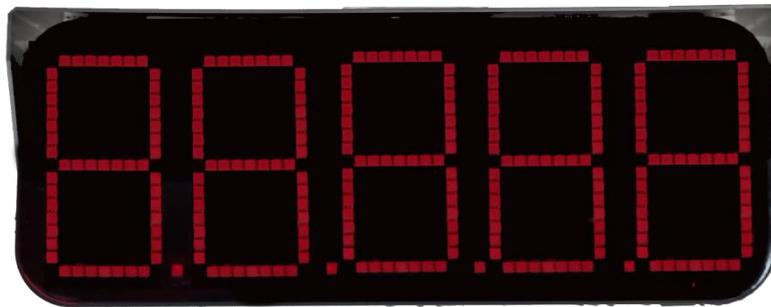




HIBEAM 200 Load Display

Model HB200



Installation and User Manual

Revision 11 – October 2024



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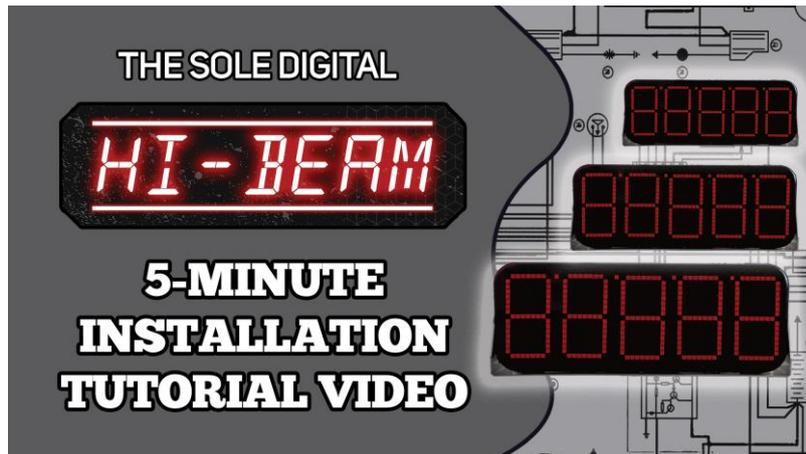


1 OVERVIEW

The HiBeam 200 load display is a compact, very bright and easy to install aftermarket display for visually indicating the load on a crane hoist. It can accept all types of load signals (mV, V, mA, Frequency, Abus LIS Q-Link or ControlPro Volts) and when used in conjunction with Sole Digital data loggers or load limiting systems, HiBeam connects wirelessly, eliminating the need for additional cabling.

Furthermore, when used with an ABUS LIS, Konecranes ControlPro or Sole Digital Liftlog™, or SmartCal precalibrated load cell, HiBeam requires no additional calibration, resulting in a significant saving in terms of test weight hire and calibration time.

For a full instruction and tutorial video on how to install your Hi-Beam please visit: <https://youtu.be/eNtEGK97kRQ>



2 SPECIFICATIONS

2.1 Physical Specifications

	Without mounting bracket	With mounting bracket
Overall length (mm):	370	385
Overall width (mm):	42	93
Overall height (mm):	137	137
Weight (kg):	1.6	2.0
Mounting:	-	Screw into bracket as required.
Electrical connections:	1 x 6 core cable – Active, Neutral, Overload Relay, Input 1, Input 2 1 x 10 pin load signal input	

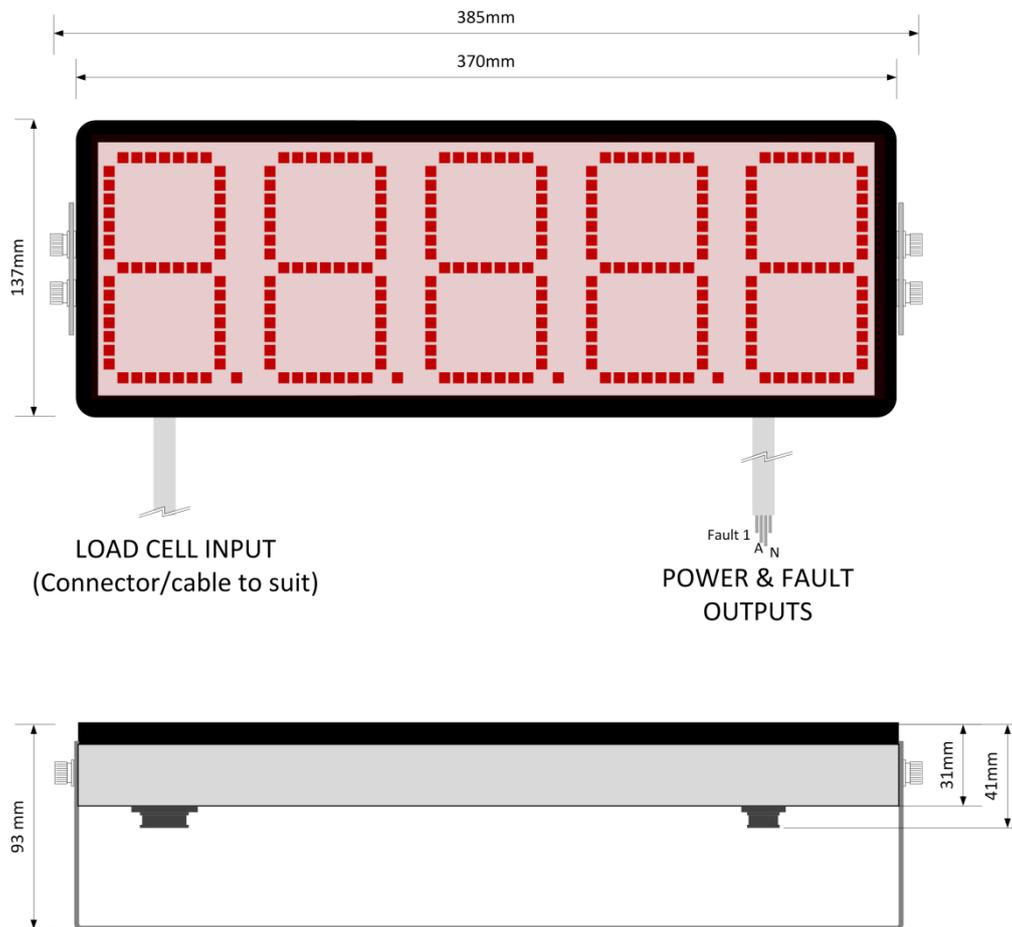


Figure 1: HiBeam Load Display Dimensions

2.2 Electrical Specifications

Parameter	Description	Min	Typ	Max	Units
V_{in}	Supply voltage	24		240	VAC/DC
P_{in}	Supply power			28	W
V_{limit}	Overload relay voltage			240	VAC
I_{limit}	Overload relay current			4	A
L_{sense}	mV load sensor sensitivity	0.5		10	mV/V
R_{in}	Input impedance of 0-10V input		560		Ohms
	Operating temperature	-35		85 ^{Note 1}	°C

Notes:

1. Extended operation at maximum temperature will reduce the life the device.



2.3 Communication Specifications

Communications between the device and a host is usually via a Bluetooth radio link. The Bluetooth device name will be set to the Crane ID, the **PIN is 0000**.

For more details on the communication protocol used to communicate with the HiBeam display, see Appendix A.

3 INSTALLATION DETAILS

3.1 Prior to Installation

Before installing your HiBeam display visually inspect the unit and check that:

- (a) The unit is not damaged and fits together securely.
- (b) The cables are secure.
- (c) The power and signal connectors are appropriate for your application.

3.2 Mounting the display

Use the included bracket to mount the display rigidly to the crane or other structure.

If the display is to be mounted facing downwards outdoors, ensure that it is angled at least 5 degree's from the horizontal to prevent damage from pooled water.

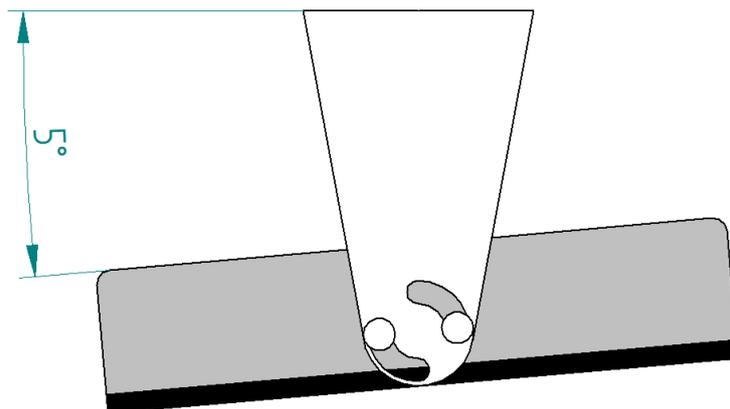


Figure 2: Installation angle



3.3 Wiring Details

For the HiBeam to operate the following must be connected as a minimum:

- a. Power supply.
- b. A source of load information, either a dedicated load pin/clamp, a signal from another device, or a HoistNet load source.

HiBeam 200 features a single load limit output that can be used to inhibit lifting if the load is greater than a threshold.

3.3.1 Connecting the Power Supply

HiBeam is designed to operate from 24-240VAC/DC grounded neutral.

The cable will have either numbered (for units shipped prior to August 2018) or coloured cores of the power cable should be connected as follows:

HiBeam Wiring Diagram

Core Number	Colour	Function
1	Black	Active
2	Brown	Neutral
3	Orange	Overload relay (previously called Fault 1)
4	Yellow	Overload relay (previously called Fault 1)
5	Green	Tare A Select
6	Red	Tare B Select

See section 'Connecting the Fault Output' for details on how to connect the Overload output.



3.3.2 Connecting Load Sensor Inputs

The HiBeam load display supports the following types of load input:

- a) Strain gauge input (e.g. CASWA rope clamp load cell).
- b) 4-20mA input.
- c) 0-10V input.
- d) ABUS LIS Q, F1 or F2 inputs.
- e) RS232.
- f) CANBus.
- g) HoistNet.

If no load source is specified at time of ordering, your device will be provided with a 10 pin female line socket to suit the male plug on the device. This can be connected as shown in Figure 3.

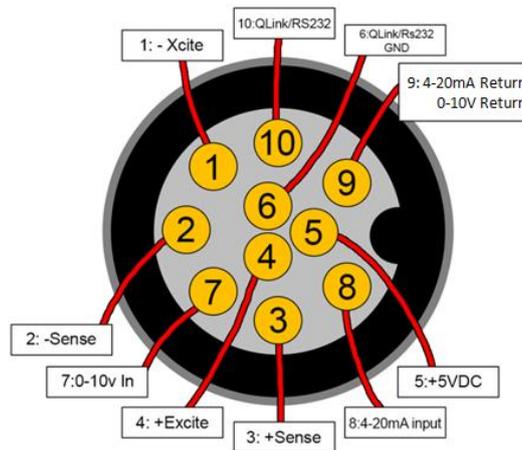


Figure 3: Wiring Diagram for a Hi-Beam

For more detailed instructions visit: www.soledigital.com.au/docs/HB200_Input_Wiring.pdf



3.3.3 Connecting the Fault Output

The overload (fault) output is an AC solid state relay that can be configured normally open or normally closed. It is typically wired in series with the UP contactor coil, as shown in Figure 4 below.

On a dual hoist crane an interposing relay may be required if both hoists are to be inhibited.

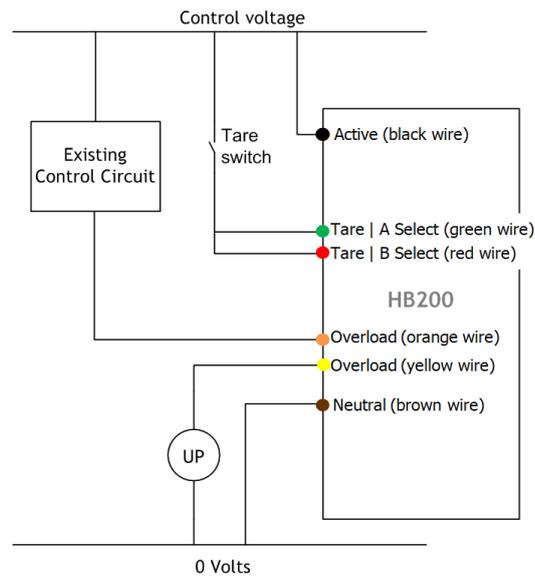


Figure 4: Power cable connections



3.3.4 Input selection (HoistNet mode)

When the HiBeam display is connected wirelessly to two sources (typically two hoists on the same crane) the default behaviour is to show the combined load, ie the total load on the crane. This works well in a “main+aux” configuration, but it may be desirable to know the load on each hoist individually. To do this, switch control voltage to Tare | A Select (green wire) and not Tare | B Select (red wire) to force display of only the load on the first HoistNet connection. Apply voltage to Tare | B Select and not Tare | A Select to force display of only the load on the second connection.

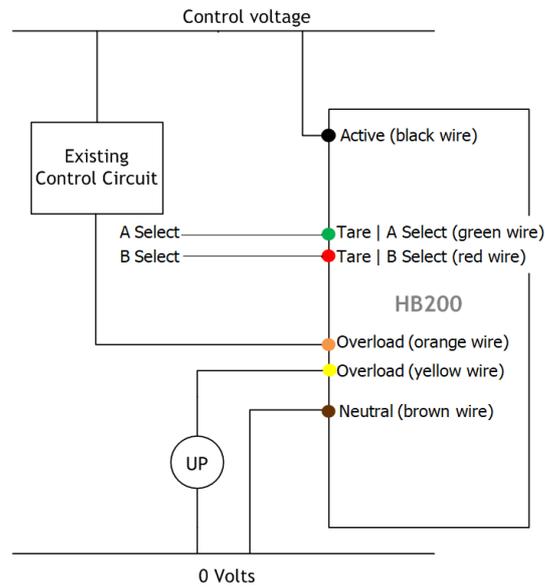


Figure 5: A-B Select Wiring Diagram

3.3.5 Tare Function

Applying control voltage to BOTH **Green** and **Red** wires of the power cable for one second will activate the tare function.

The display will show “TARE” for several seconds and the current load will be treated as zero for display purposes.



Note: Tare mode does not affect the overload setting. So, assuming a load limit is set at 10000Kg, lifting 5000Kg, activating the tare and then lifting another 5000Kg will result in the display reading 5000Kg and the overload contacts opening to prevent further lifting.

The tare setting is reset to 0Kg when the display is powered off, unless the ‘Save Tare Value’ check box is checked via the FSU. This function is explained in section 4.7.2.

When in HoistNet mode, with connections to two hoists (A and B), if only one hoist is selected using the A – B Select inputs, then only that load will be tared.



Eg, Hoist A has 1000Kg on the hook, Hoist B has 2000Kg on the hook.

- With no voltage on Tare | A Select (green wire) or Tare | B Select (red wire) then the display reads 3000Kg. (A+B)
- Apply voltage to Tare | A Select (green wire) and Tare | B Select (red wire) at the same time, and the display tares to 0Kg
- Apply voltage to just Tare | A Select (green wire) and the display shows 1000Kg (A)
- Keep voltage on Tare | A Select (green wire) and apply voltage to Tare | B Select (red wire) and the display tares to 0Kg.
- Apply voltage to Tare | B Select (red wire) only and the display shows 2000Kg (B)

4 COMMISSIONING DETAILS

HiBeam is designed to be commissioned using a laptop computer. You will need a LINK-2 Bluetooth Modem and the Field Service Utility (FSU) software application installed on a laptop.



4.1 Installing and Launching the FSU Application

4.1.1 FSU Program Installation

Ensure that your computer is switched on, connected to the internet and that the minimum required software versions are installed (see Appendix B for minimum system requirements). Ensure that the LINK-2 modem is installed and that the drivers have loaded.

4.1.2 Installing the FSU application

The latest FSU software can be downloaded from the Downloads tab of the following webpage: <https://soledigital.com.au/HiBeam.html>

You should check this location periodically for updates.

4.1.3 Launching the application

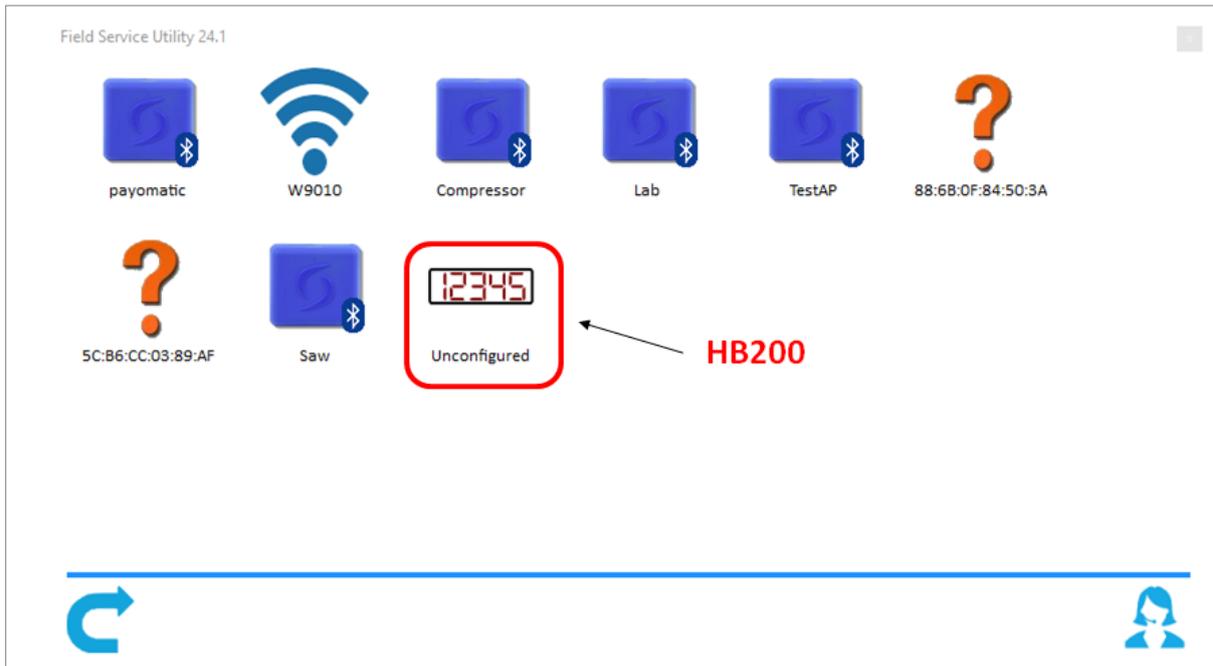
Click on the FSU program icon in the programs folder of the start menu:





4.2 Connecting to the Device

The FSU will scan for Bluetooth enabled devices. This process takes approximately 10 seconds, when complete a list of all CASWA devices within range will be displayed.



If a particular HiBeam 200 display is not found, ensure it is powered up and press . Note that the symbol for a HB200 display differs from a HBD100 and shows 5 digits rather than 4.

NB: The Bluetooth link between the Laptop using a Link-2 and a HiBeam has a range of approximately 100m.

Select the HiBeam display you wish to configure by double clicking on the icon.

4.3 Managing Firmware

If you running an older version of the FSU application on your laptop then you should update this before continuing to ensure you have the latest firmware file for your SoleDigital device.

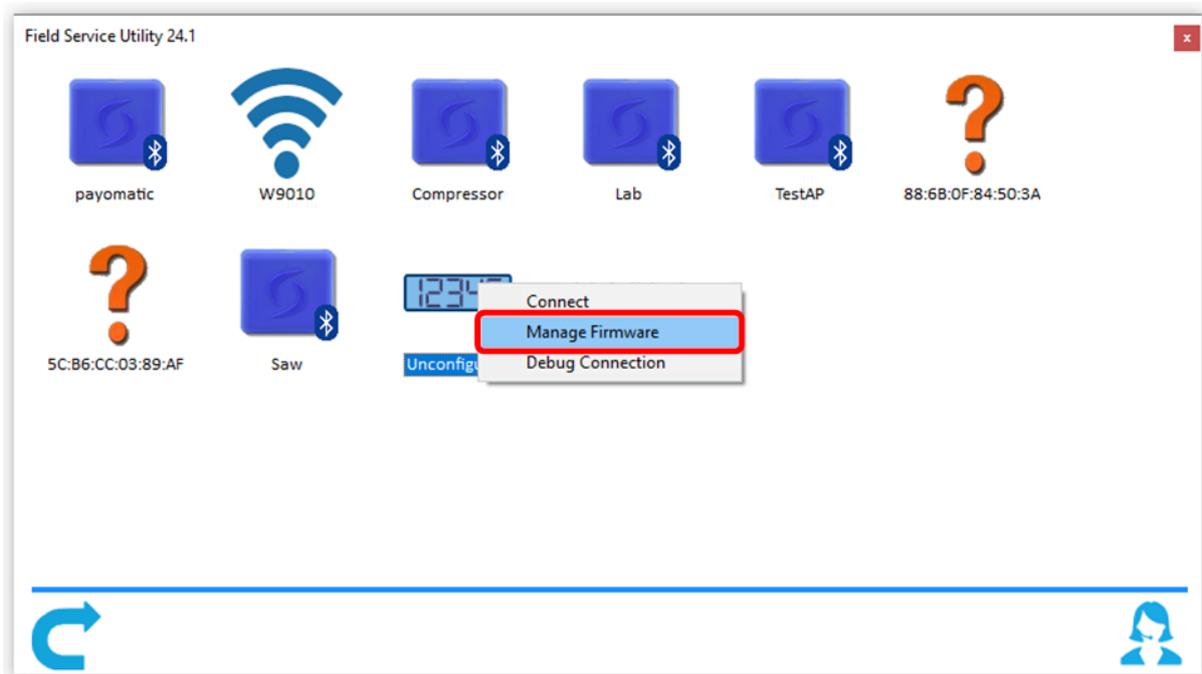
N.B. The process for updating the firmware on your Sole Digital device has changed.



Firmware should only be updated if you:

- a) Specifically want a new feature that is only available in later versions;
- b) Are experiencing a problem that has been rectified by a later version;
- c) Are experiencing a problem and need to roll back to an earlier firmware version that didn't cause the problem you are experiencing; or
- d) Have been specifically instructed to do so by your HiBeam supplier.

To check for new firmware versions or to access old firmware versions, return to the Device Display screen and right click the desired equipment icon. Select 'Manage Firmware'.



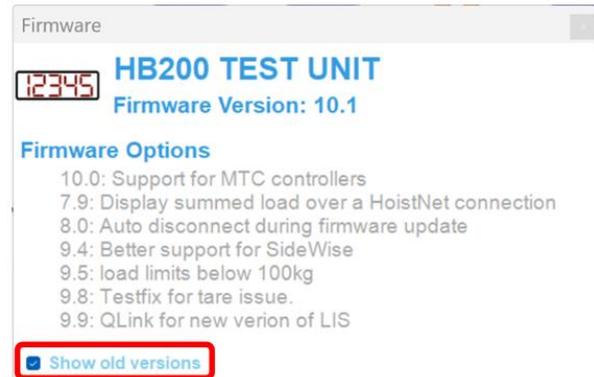
A new window will popup and show the FSU software connecting to the device. When this is complete, the window will show the name of the device, its current firmware version and a list of newer firmware that is available for the device.





If you need to roll back to an earlier version, check the <Show old versions> box in the lower left corner of the window.

Select a firmware version and then press the <Apply firmware> button that appears in the lower right corner of the window.

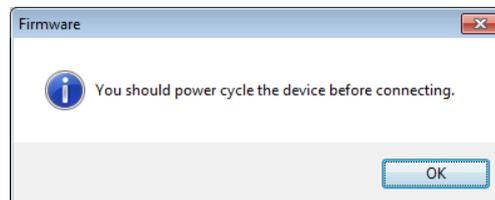


The display will change to the following:



As the message states, **DO NOT switch off the HiBeam or the computer running the FSU software, or remove the Link2 modem or close out the Firmware window** until you are prompted to do so. If either device loses power then the HiBeam may become unusable and the display will need to be returned to your supplier for repair.

When the firmware has finished updating successfully you will see a  **Success** message in the popup window and also be told to power cycle the device before reconnecting:



Close this window, wait for the manage firmware window to close (this may take 20 seconds) and power cycle the device as instructed. You will be returned to the first FSU screen.



4.4 Configuring your HB200

All configuration options are shown on a single screen.

4.4.1 Display ID

The Display ID text is used to identify the HiBeam display when the FSU app searches for devices. It can be up to 18 characters long.

NB: If the Display ID does not show the name of the HiBeam unit you selected when you connected to a device on the first FSU screen, power cycle the load display and try connecting again.

4.4.2 Testing the Display

To test the display (and check that all LEDs are working correctly) press the Test Display button. All sectors of the display will be powered up for 5 seconds.





4.5 Load Input Configuration

HiBeam load displays can either be used in one of two modes:

- (a) Direct input: The load signal is connected directly to the display, this may require the unit to be loaded and calibrated prior to usage. All standard input types (4-20mA, mV, 0-10V, AbusQ, AbusF, RS232, Stahl CANBus, Kone CANBus) can be used.
- (b) Bound to a HoistNet device: The load signal is retrieved from a HoistNet enabled device.

4.5.1 Input Selection

Select the button that corresponds to the type of load sensor input you are using. If using a Sole Digital rope clamp load cell then select the mV Load Cell as the Load Sensor type.

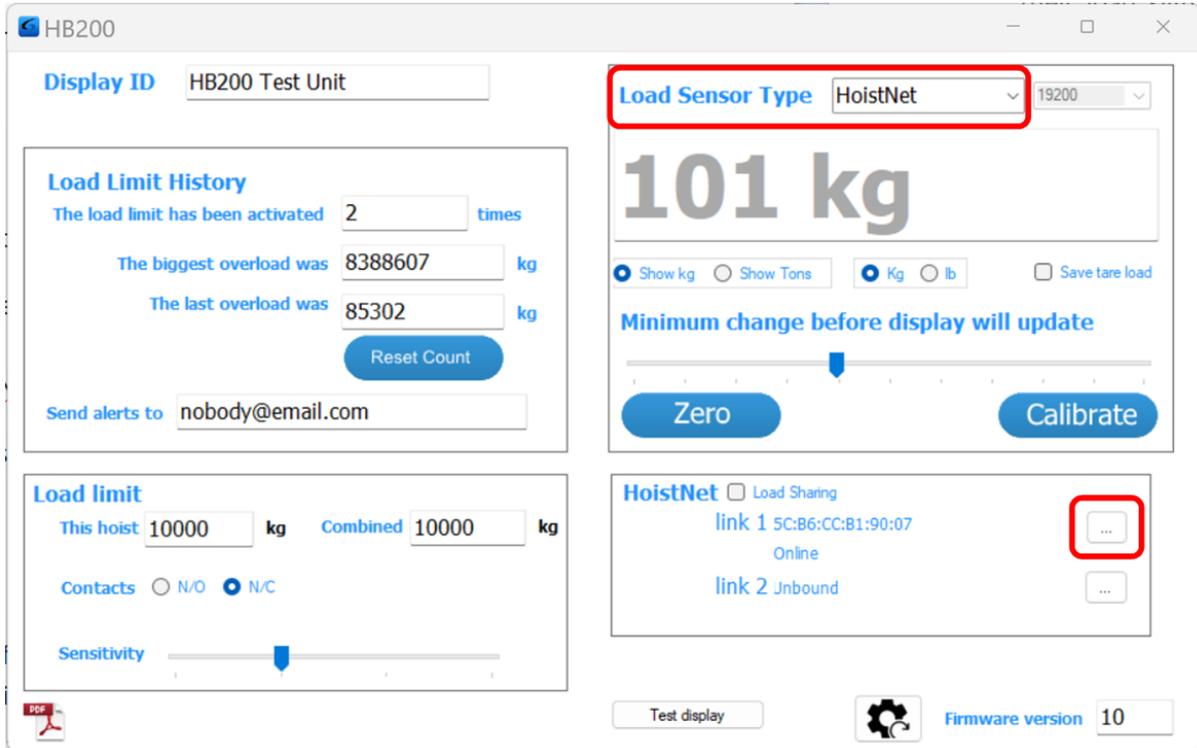
The screenshot shows the configuration interface for an HB200 load display. The window title is 'HB200'. The 'Display ID' is 'HB200 Test Unit'. The 'Load Sensor Type' is set to 'mV Load Cell' (highlighted with a red box) with a value of '19200'. The main display shows '102 kg'. Below this, there are radio buttons for 'Show kg', 'Show Tons', 'Kg', and 'lb', with 'Kg' selected. There is a 'Save tare load' checkbox. A slider for 'Minimum change before display will update' is visible. At the bottom of this section are 'Zero' and 'Calibrate' buttons. The 'Load Limit History' section shows 'The load limit has been activated 1 times', 'The biggest overload was 8388607 kg', and 'The last overload was 8388607 kg'. There is a 'Reset Count' button and a 'Send alerts to' field with 'nobody@email.com'. The 'Load limit' section shows 'This hoist 10000 kg' and 'Combined 10000 kg'. There are 'Contacts' radio buttons for 'N/O' and 'N/C', with 'N/C' selected. A 'Sensitivity' slider is also present. The 'HoistNet' section has a 'Load Sharing' checkbox and two links: 'link 1 5C:B6:CC:B1:90:07 Online' and 'link 2 Jnbound'. At the bottom, there is a 'Test display' button, a gear icon, and 'Firmware version 10'.

4.5.2 Using / Removing a HoistNet Input

HiBeam 200 displays are compatible with SoleDigital's HoistNet. This means that they can obtain their load signal wirelessly from any other HoistNet enabled device, eliminating the need for long cable runs between the load cell and display. They can also sum the loads from two different HoistNet devices (e.g. two hoists on a dual hoist crane).



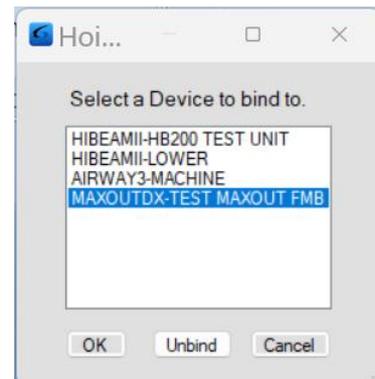
To specify a HoistNet load signal, select HoistNet as the Load Sensor type. The options in the HoistNet box on the bottom right of the screen will be enabled.



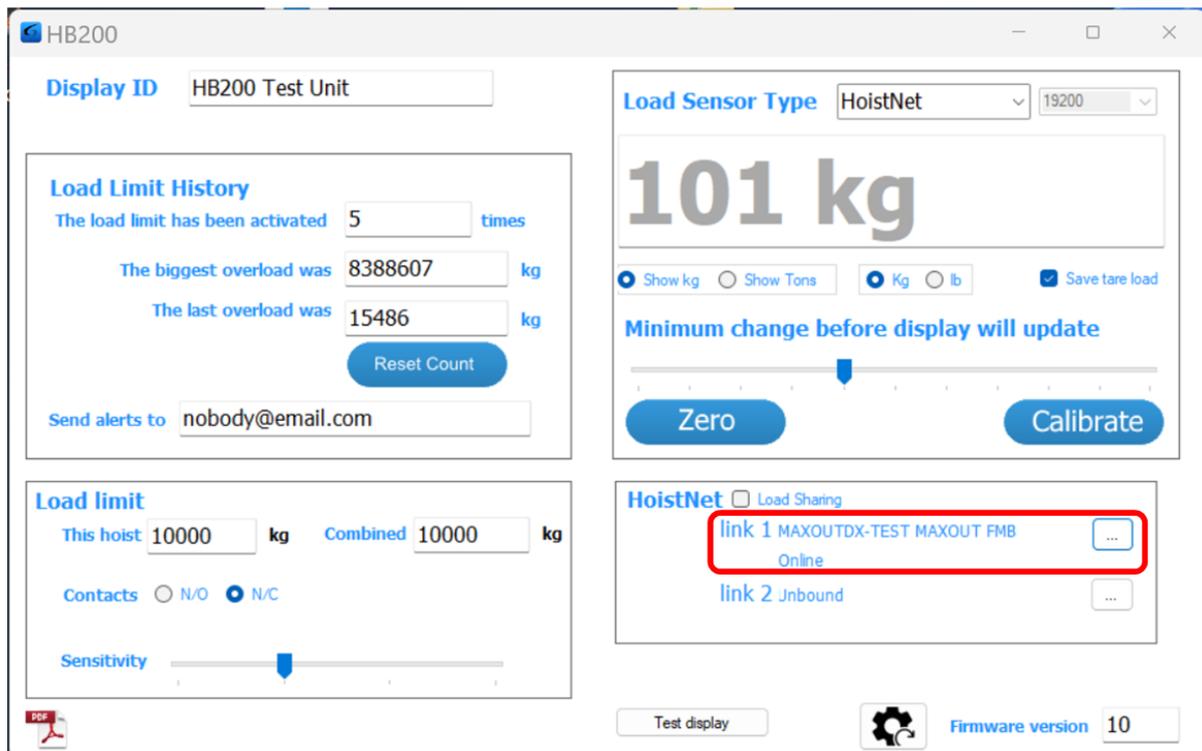
To select the first load source press the top  button.

A box will appear asking you which HoistNet enabled device you want to connect to:

Select the device that has the load signal to be used and press <OK>.



When you click OK, the name of the bound HoistNet device will be shown on the Load screen. The connection status will also be shown.

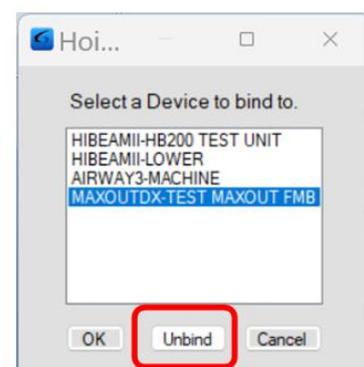


NB: You will need to ensure that the device the HB200 is connecting to has been calibrated correctly.

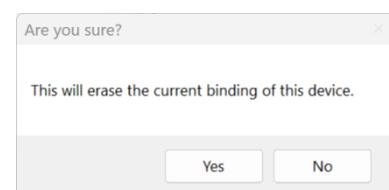
If you want the HiBeam to display the sum of two separate hoists, press the lower  button after completing the first binding, and repeat the connection process to the second device.

NB: You can only make one binding to each HoistNet device.

To unbind a HiBeam from a HoistNet device, or to change the bound device, press the  button on the Load screen and then select <Unbind> on the HoistNet popup box.



To complete the unbind process click <Yes>

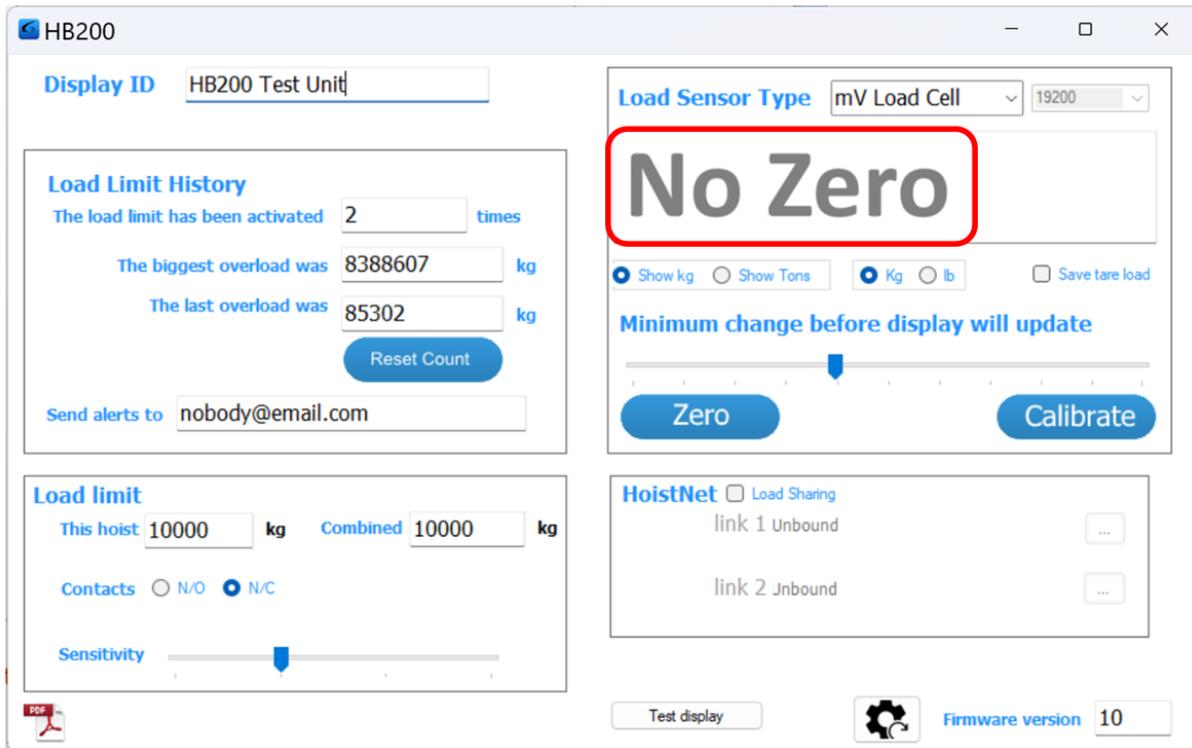




4.5.3 Calibration with test weights

If the HB200 has not been factory calibrated, then the display will initially show that no acceptable zero load has been configured.

With no load on the hook, press the **Zero** button.



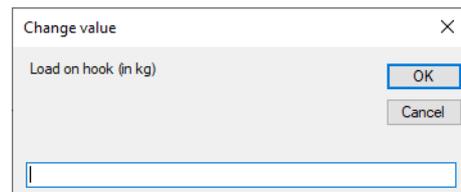
After a brief pause the indicated load will change to 'No Cal' (unless you are just re-zeroing a calibrated display).

Next, lift a known load with the crane. Ideally this load should be >80% of the cranes lifting capacity.

Note: In practice, it is often not possible to arrange test weights for every install. An acceptable calibration may be performed with 30-50% of the cranes capacity. However, if this is done, the HiBeam display should be recalibrated when the crane is next subject to a full load test.

With this known load lifted, press the **Calibrate** button. The FSU application will prompt you to enter the load. Do so and press <OK>.

After a brief pause the indicated load will match the load on the hook.





4.5.4 Display units

You can choose to display the load in kg or lb and metric or short tons.

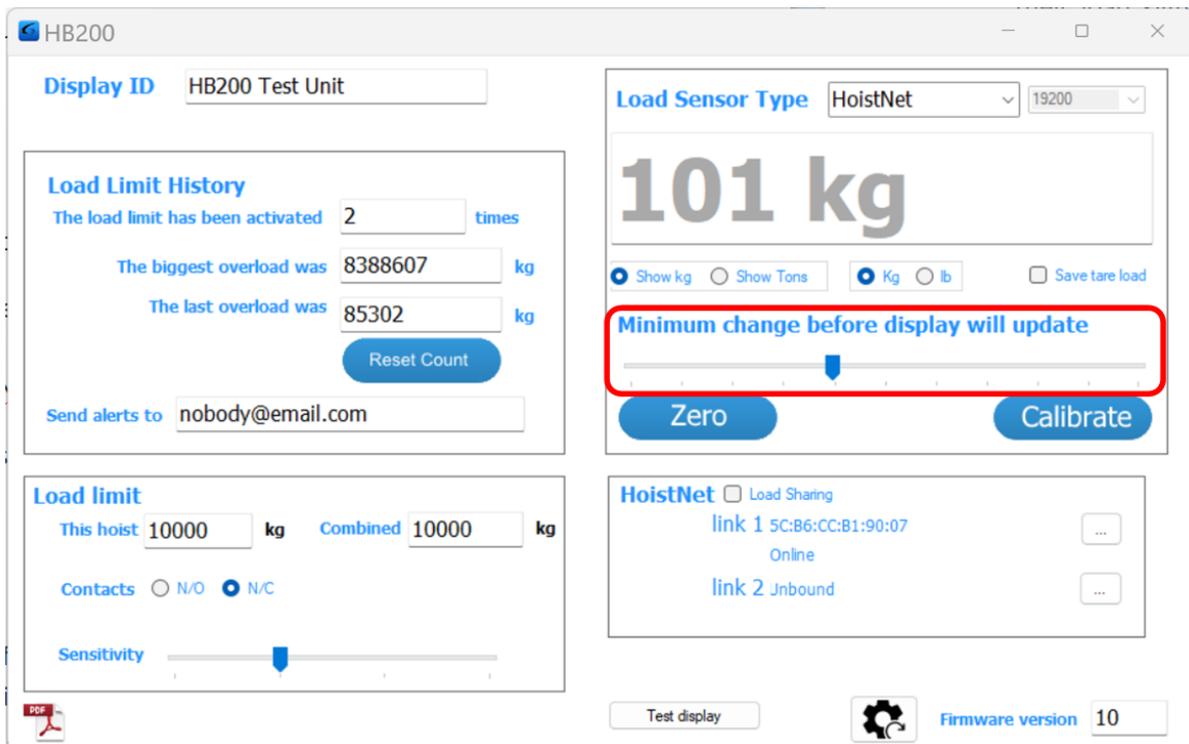
Select the desired units by selecting the appropriate button, located under the load window.



4.5.5 Display Hysteresis

The HB200 allows you to adjust the display sensitivity (the minimum change that needs to be detected before the screen changes). This adjustment is useful to prevent the display from flickering between different values.

Adjust the slider (located below the unit buttons) to set the amount that the load must change before the display updates.



Move the slider to the right to increase the display hysteresis. This increases the amount the load needs to change before this change is displayed by HiBeam. High hysteresis values cause the display to be less likely to flicker, but very small genuine changes in the load being lifted may not be displayed quickly.



Conversely, move the slider to the left to decrease the amount that load needs to change before this change is displayed.

4.6 Setting Load Limits

HB200 can be used as a load limiter (except when configured as an ABUS display).

To utilise this functionality, ensure your HB200 fault output is wired as per Section 3.3.3, and enter the desired overload (in Kg or Lb) into the Load box on the FSU screen:

4.6.1 Overload Sensitivity

The overload sensitivity is controlled by a slider that changes how sensitive the overload is to short overloads caused by signal noise. Moving the slider to the right will make it less sensitive, so that it will effectively take longer to respond to a real overload event. Moving it to the left will make the display respond quicker to real overloads, but also make it more susceptible spurious trips.

You should set this slider as far to the left as possible without the overload tripping during normal operation. A text warning will display if this is set too high.

4.6.2 Invert Output

The fault output on the HB200 is a normally closed relay. Checking the N/O box will change the normally closed output to normally open. You may need to do this:

- If there is an interposing relay between the HB200 and the up contactor;



- You want the HiBeam to operate in a “fail functional” rather than a “fail safe” mode
- You are using the HiBeam for slack rope detection.

4.7 Logging Overloads

The HB200 display is able to log overloads.

The information that will be logged and is displayed on this screen includes:

- a) The number of times the load limit function has been activated;
- b) The biggest overload recorded in kg/lb; and
- c) The size of the most recent overload in kg/lb.

These values are valid from the last time **Reset Count** was pressed.

The screenshot shows the HB200 web interface. The 'Load Limit History' section is highlighted with a red box and contains the following information:

- Display ID: HB200 Test Unit
- Load Sensor Type: mV Load Cell (19200)
- Current load: 6 kg
- Load Limit History:
 - The load limit has been activated: 2 times
 - The biggest overload was: 8388607 kg
 - The last overload was: 85302 kg
- Send alerts to: nobody@email.com
- Reset Count button
- Load limit: This hoist 10000 kg, Combined 10000 kg
- Contacts: N/O, N/C
- Sensitivity slider
- HoistNet: Load Sharing, link 1 Unbound, link 2 Jnbound
- Test display button
- Firmware version: 10

4.7.1 Sending Alerts

If you have a Link 4 installed on site, the HiBeam can be configured to send an email or SMS to a mobile phone whenever an overload event occurs.

To configure alerts enter a single email address or a 10 digit mobile phone number in the Send alerts to field.

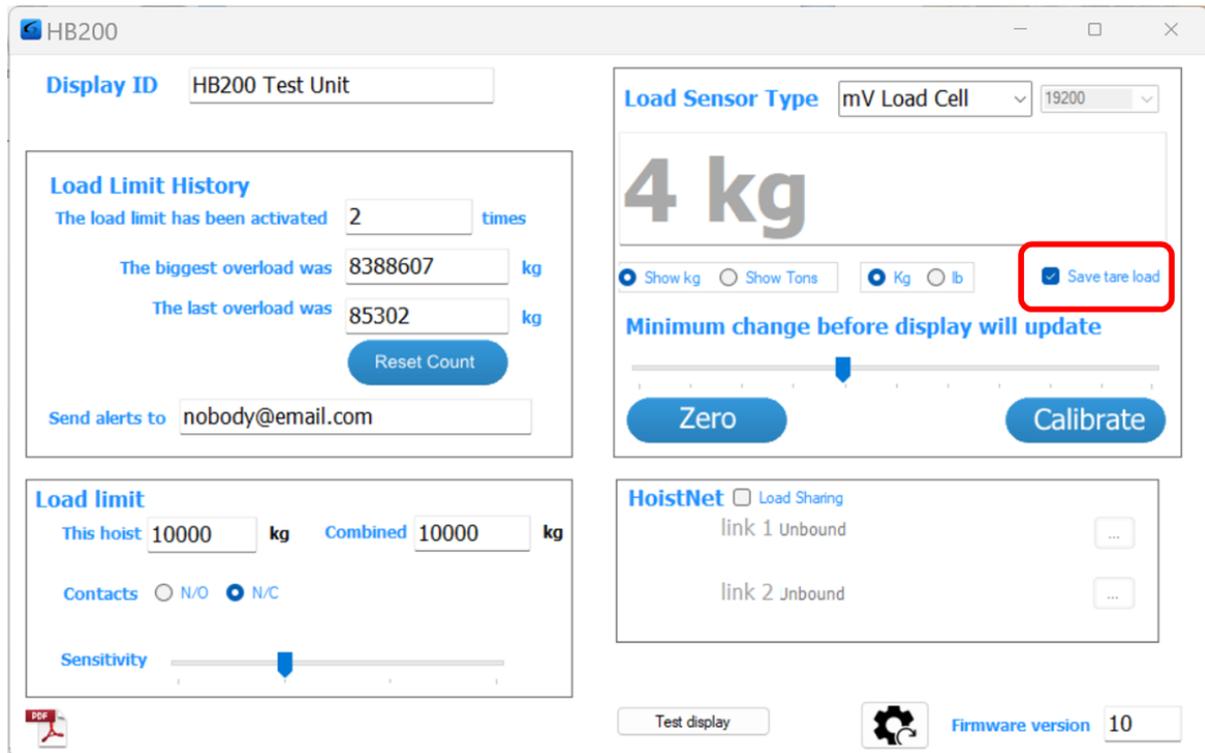
To send alerts to multiple addresses or to get a logged history of overloads via the web contact support@caswa.com



4.7.2 Persistent Taring

To tare the display, connect the HB200 as described in Section 3.3.5.

When the save tare load checkbox is checked, the display will remember the tare setting after it has been powered off.



If this checkbox is empty (not ticked), then any taring of the display will only be temporary. As soon as the HiBeam is switched off and on again, it will revert to its stored (pre-tare) settings.

4.7.3 Load Sharing

Load Sharing is a feature that enables two-way wireless communication between 2 x HoistNet devices for the purposes of activating limits based on individual AND combined loads.

This is different to displaying a combined load.

Contact support@caswa.com for more details on how to use your HB200 for load sharing.



5 ROUTINE MAINTENANCE

There is no routine maintenance required for this device.

APPENDIX A: COMMUNICATION PROTOCOL

The host sends structured character commands to the device to write or query parameters.

Each command must be followed by a carriage return <CR>(ASCII 13).

Where the command is a query command, no arguments are sent and the device will respond with a single the requested value in ASCII text followed by a <CR>.

Where the command is a set command, an argument may be included between the command and the <CR> .

Where numbers are sent or received, they are sent as clear text; eg "1234"

A detailed list of all available communication commands are available on request.

APPENDIX B: FSU SYSTEM REQUIREMENTS

The minimum requirements for operating CASWA's Field Service Utility (FSU) and Link-2 Bluetooth modem are:

- Windows 10 or later;
- One Spare USB port;
- Microsoft .NET framework 4.5;
- An internet connection