



SideWise Anti Side-Pull System

Version 2: SWP200 + SWS200



Installation and User Manual

Revision 07
CASWA Pty Ltd 2024



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1 OVERVIEW

Cranes and hoists are only designed to withstand vertical loading. Out-of-vertical hoisting, commonly referred to as side-pulling, damages wire ropes and rope guides and it can also cause incorrect spooling of the wire rope onto the drum. In more severe cases, side pulling causes derailment of the trolley or gantry, or excessive lateral loads on the crane structure resulting in catastrophic beam failure. This may occur when moving loads far smaller than the SWL of the crane. For these reasons, side pulling is prohibited by AS2550.1-2011.

SideWise is a simple anti-side-pull system that ensures loads are only lifted vertically. It can easily be retrofitted to existing cranes and consists of a sensor unit mounted on the rope with a signal processing module in the hoist control box. Crane motion is disabled as soon as any long or cross-travel horizontal loads are detected. In addition SideWise can count the number of side pulling events and send alerts (with additional hardware options) by email and SMS.

2 SPECIFICATIONS

2.1 Physical Specifications

	Processor	Sensor
Overall length (mm):	115	131
Overall width (mm):	100	68
Overall height (mm):	23	62
Weight (kg):	0.16	0.5-0.6
Mounting:	30mm DIN Rail	Clamped Directly onto rope

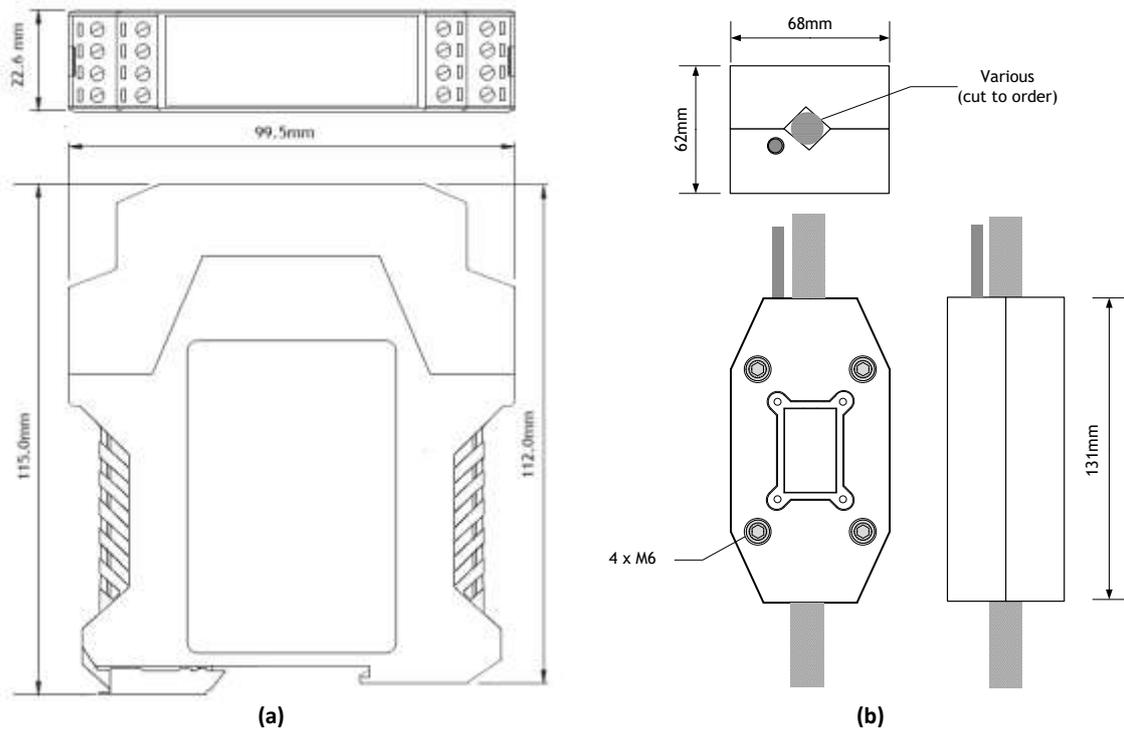


Figure 1: Dimensions of (a) Processor Case and (b) Sensor

2.2 Electrical Specifications

Parameter	Description	Min	Typ	Max	Units
V_{in}	Supply voltage	24		240	VAC/DC*
I_{in}	Supply current		40	60	mA
V_{limit}	Output relays voltage rating			240	VAC
I_{limit}	Output relays current rating	0.05		2	A
	Allowable operating temperature			85 [#]	°C

#: Extended operation at maximum temperature will reduce the life the device.

*: DC model available on special request.



3 INSTALLATION DETAILS

3.1 Prior to Installation

Before installing your SideWise system visually inspect both the Processor and Sensor to check that:

- (a) The sensor size is appropriate for the rope on which it will be installed;
- (b) The Processor case is not damaged and fits together securely;
- (c) Terminals on the processor are secure;
- (d) The terminal numbering on the processor is as per the following diagram



Figure 2: Terminal Positions

NB: As each block of 4 terminals can be removed (for installation) it is important that they be reinstalled in the positions shown.

3.2 Installing the Sensor

Clamp the SideWise sensor unit to the rope at the dead end. The black cover plate with the SideWise logo should be facing West.

If the hoist has no dead end then ensure that the sensor groove is large enough to allow the rope to slide when the clamp bolts are tightened and insert a length of M8 all-thread rod into the hole in the top of the sensor block back clamp. Secure with a locking nut and secure to the trolley.

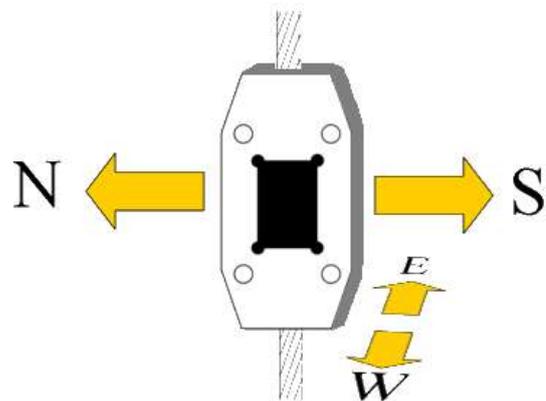


Figure 3: SideWise Sensor Installation



3.3 Wiring Up the Signal Processor Unit

3.3.1 Wiring Diagram (Anti sidepull)

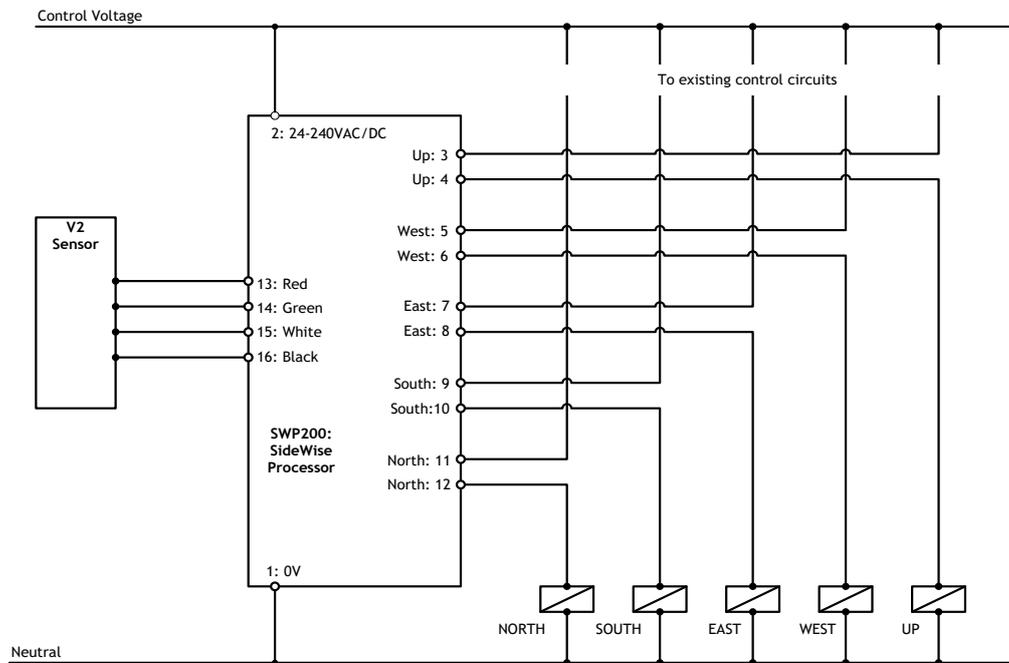


Figure 4: SideWise wiring diagram with 4-wire, version 2 sensor, anti sidepull

3.3.2 Wiring Diagram (Auto center and follow)

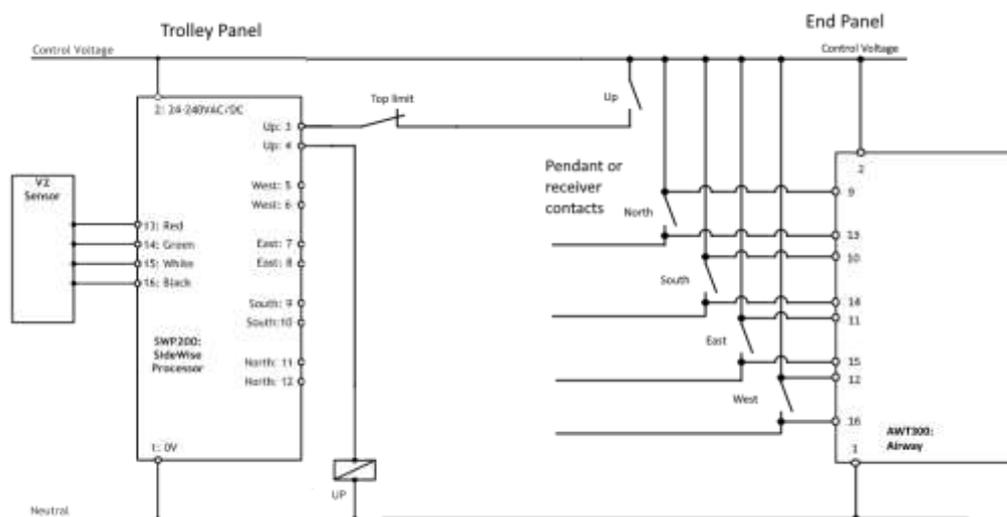


Figure 5: SideWise wiring diagram with 4-wire, version 2 sensor, auto center



4 COMMISSIONING DETAILS

SideWise-2 units are designed to be commissioned using a laptop computer. You will need a CASWA Link-2 Bluetooth Modem and the Field Service Utility (FSU) software application loaded on a laptop.



Figure 6: Link-2 Bluetooth Modem

Note: Always test the SideWise calibration by moving the crane in each direction whilst an operator holds the hook. NEVER test the SideWise by deliberately side-pulling a load. Side-pulling is inherently dangerous!

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 product page:

<http://www.soledigital.com.au/sidewise.html>

You should check this location periodically for updates.

4.1.3 Launching the application

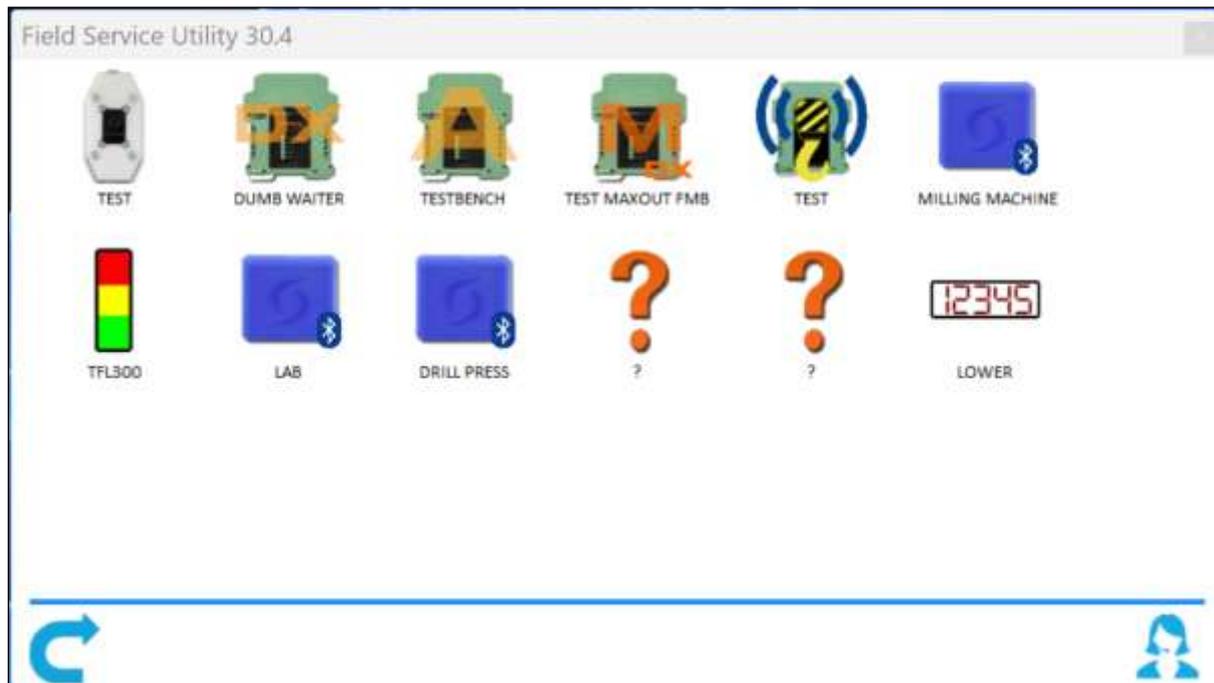
Double click on the FSU program icon: .



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. SideWise Units are depicted by

an  icon.



If a particular SideWise unit is not found, ensure it is powered up and press  to repeat the search. (Also, remember that version 1 SideWise processors do not have a Bluetooth modem and won't appear in this list as they can not be configured using the FSU.)

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

To get help on Sole Digital products, go to our website or open a remote support session. These links

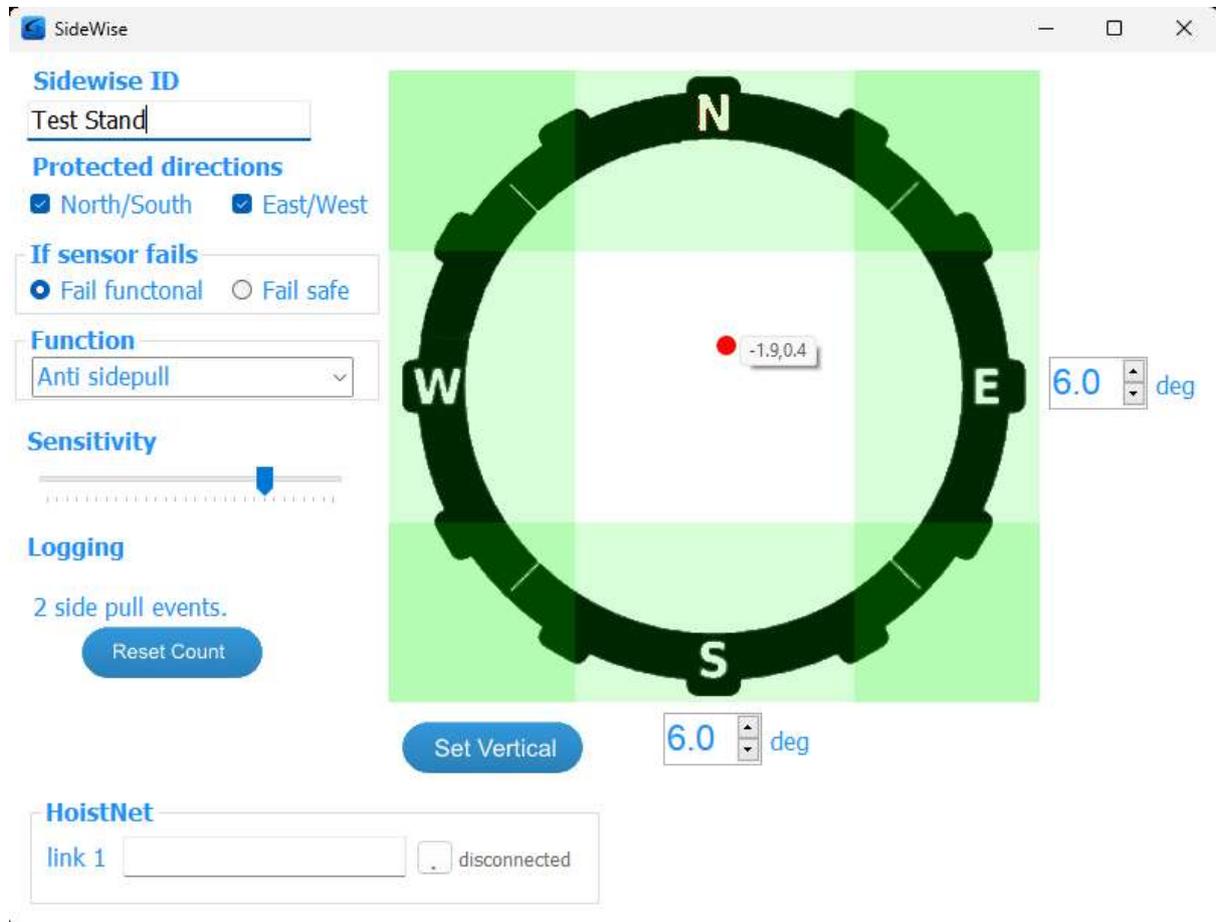
are found by clicking the  icon on the bottom right of the FSU screen.

Otherwise, select the SideWise you wish to configure by double clicking on the desired icon.



4.3 SideWise Configuration Screen

The following screen will appear.



This screen shows the:

- SideWise ID (Usually set as your crane/hoist ID)
- Protected axes (North/South and/or East/West)
- Failure mode setting
- Input sensitivity setting
- Total number of Side Pull events and a reset counter button
- Location of the rope within the current bounds
- Side-pull angle limits for the selected directions
- Hoistnet connections to other SideWise devices
- Current firmware version operating on the device



4.3.1 Set the SideWise ID

The purpose of the SideWise ID field is to identify the individual unit in the list of devices that can be viewed using the FSU application.

It is also important that, if you have a Link-4 installed, the ID of the SideWise match the name shown on the web reporting system

Type in the desired name in the 'ID' field. This must be 18 characters or less.

Sidewise ID

Test Stand

4.3.2 Select the Directions to Protect and Set the Zero

Select the axes(s) you wish to prevent side pulling (North/South and/or East/West) occurring by checking the corresponding check box.

If you only select one axis the screen will change to show only the information about this axis (only its angle input box and limit bounds).



Physically move the rope into the vertical position.

Press the **Set Vertical** button on the screen. The location of the red dot (representing the rope) will move to the centre of the screen.

NB: If you change or add enabled directions, you will need to re-zero the device.



4.3.3 Set the Maximum Angle

Physically pull the rope to the maximum amount of side-pulling you want to allow. The numbers next to the red dot show you what angle this corresponds to.

Set the angle you wish to limit side-pulling to by entering the desired value in the control box adjacent to the desired direction:

Press enter after you type in the number to set the value.



This angle will be used for limiting side-pulling in either of the two directions along the relevant axis (e.g. 6 degrees from the 'zero' position in either East or West direction).

The coloured bands will adjust to reflect the new limit.

4.3.4 Adjust the Limit Sensitivity

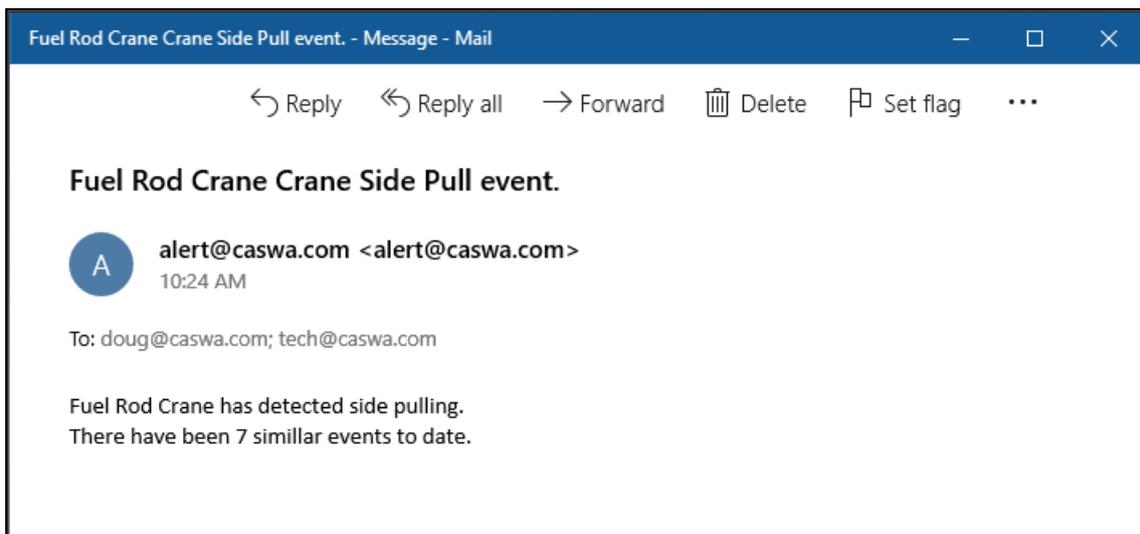
The sensitivity is controlled by a slider that changes how sensitive the side-pulling limit is to short side loads caused by signal noise or a swinging load. Moving the slider to the left will make it less sensitive, so that it will effectively take longer to respond to a real side-pulling event. Moving it to the right will make the unit respond quicker to real side-pulling, but also make it more susceptible to spurious trips.

4.4 SMS and Email Alerts for Sidepull Events

The SideWise system has the ability to send alerts when paired with one of our Link-4 modems. When commissioning a SideWise, if the FSU discovers a Link-4 modem within range, a new field 'Send Alerts To' will appear on the screen which will allow you to input an email address as shown below.



When a Sidepull event occurs the Link-4 will detect it and send an email alert (as below).





4.5 Functional Modes

4.5.1 Anti sidepull

Function
Anti sidepull

When the function selector is set to Anti sidepull a side pull in excess of the configured threshold will inhibit hoisting and travel in any direction that would increase the side pull angle.

4.5.2 Follow Me Feature

Function
Follow me

When the function selector is set to Follow Me and the crane is equipped with a Sidewise and Airway unit wired as per section 3.3.2 then the hoist will move to correct any angle in the rope.

This is useful on small cranes as it lets an operator move the crane by pulling on the hook. Nb, hoisting will be inhibited whilst the crane is moving.

Nb, It is important to include the AirWay device when using Follow Me as it ensures that the travel limits are never bypassed.

4.5.3 Automatic Centering Feature

Function
Auto center

When the function selector is set to Auto Center and the crane is equipped with a Sidewise and Airway unit wired as per section 3.3.2 then the hoist will move to correct any angle in the rope when UP is pressed.

Hoisting will be inhibited until the rope is vertical and will then resume. Releasing UP will stop all motion.

This is useful when lifting tall items or turning an object.

Nb, It is important to include the AirWay device when using Auto center as it ensures that the travel limits are never bypassed.

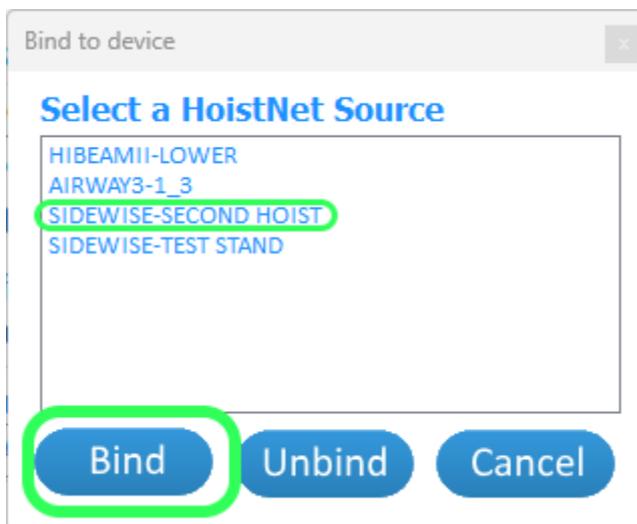


4.5.4 Tandem operations

When a crane has two hoists that operate in tandem most of the time:

It is desirable to stop both hoists if one of them detects side pulling.

To do this, ensure that both SideWise units are powered up and click on the button next to Link-1 in the HoistNet box



Select the other SideWise unit and click



Nb, you only need to bind one SideWise. Do not bind the second unit back to the first.



5 TROUBLESHOOTING

Fault	Cause	Fix
LED flashes continuously on power up	Unit not calibrated	Recalibrate as per section 5 of this manual.
	No signal from sensor	Check wiring to sensor. Check wire to sensor for damage. Check terminal positions on processor (as per figure 2).
	Stuck button (V1 only)	Wiggle the button. Ensure button is fully released and no debris is preventing release.
	Faulty power supply to/in processor	Check that voltage between pins 13 and 14 is between 4 and 6V. If all ok, then power supply is fine. If not, then check input voltage across pins 1 and 2 is between 24 and 240V. If it isn't, then check control voltage. If control voltage is ok, but input voltage is not, processor may be faulty. Contact supplier.
Not detecting a SidePull	Limits set too far	Recalibrate as per section 4 or 5.
	Faulty sensor (can be caused by incorrect sensor wiring)	Contact supplier – Accelerometer may be damaged from incorrect wiring.
	Incorrect orientation of sensor on rope	Orient sensor as per section 4 or 5.
	Incorrect cabling from sensor to processor. (NB: LED will be flashing on processor.)	Check wiring.
Crane up motion not working	Incorrect contactor wiring (NB: If power wiring is correct, LED will not flash on processor.)	Check wiring.
	Incorrect calibration (NB: LED will be flashing on processor.)	Recalibrate.



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;