



PROTOS

RIGGING


THE APEX SOLUTION



QUICK START GUIDE
PROTOS LOADCELL SYSTEM

PROTOS Wireless Force Monitoring System - Quick Setup Guide

This Quick Setup Guide helps you to quickly set up and run your PROTOS Wireless Force Monitoring System. A more detailed explanation of all settings and functions can be found in the User Manual. The Quick setup Guide assumes all your Load Cells and the HR handheld controller are set to the same radio channel. Instructions how to adjust the radio channel can be found in the user manual.

 **DANGER** The use of Load Cell shackles in a rigging system requires mechanical knowledge. Mis-use or use without proper knowledge might lead to serious accidents with risk of injury or death.

1. Testing and checking your PROTOS wireless Shackles

Before using the shackles in your rigging system, check all shackles for any visual damage, excessive wear or deformation. If you have any doubt about the quality of a shackle DO NOT use it (see the user manual for details of disapproval).

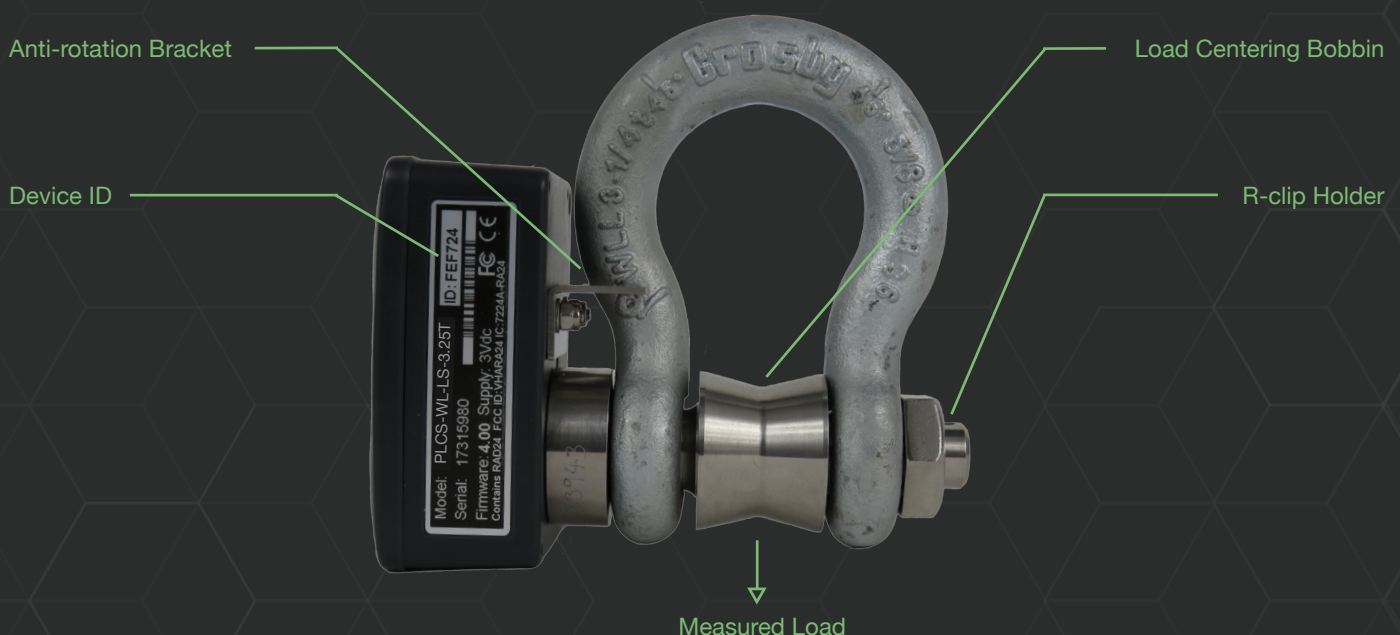
Check if

- All pairs of pins and bows have the same ID
- All pins are connected properly, with the anti-rotation bracket in place on the side of the CE marking.
- All centering bobbins are installed.
- Nut and R-clips are installed

Remove the cover and insert the 2x AA batteries, observing polarity. Wake the shackles up by switching the HR handheld display on. All shackles on the same radio channel will wake and their LEDs should start to flash. Cycle through the displayed shackles on the handheld by pressing the select button-and check that the data tag shown on the handheld matches with the last 4 digits of the Device ID on the shackle with its LED constantly on.

If all shackles are already part of an existing project in the Force Monitoring software, the Force Monitoring software can be used to wake the shackles and confirm that they are all transmitting as expected. See **using the PROTOS Force Monitoring Software**

When all Load cell shackles respond as expected go to step 2.



Batt Low

The batteries in the HR handheld are low and need to be replaced.

Sig Low

The radio signal from the Load Cell device is low. Signal may be intermittent when this indicator is visible until --- is displayed. Even with a degraded signal the display value will always be correct.

Select button

Press to cycle through available PROTOS devices. Press and hold to see selected device Data Tag.

Remote Error

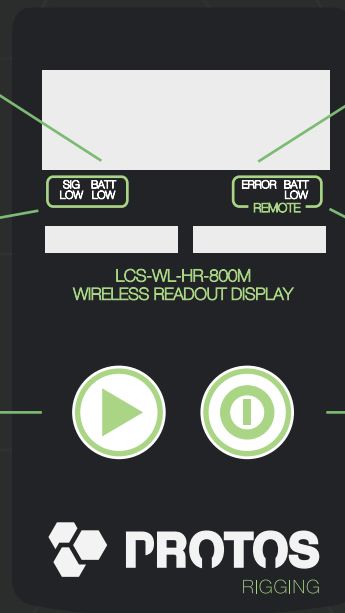
The Load Cell device has reported an error.

Remote Batt Low

The batteries of the Load Cell device are low and need to be replaced.

Power button

Press and hold to power on/off.



2. Note down the PROTOS Load Cells ID's and their position

It is good practice to note down all the Load Cell shackles' Device IDs in combination with their position within the rigging plot, either by noting the Device ID's in the drawing or by creating a list. Additional marking of the Load Cells with their position before installing, like "Chain Hoist 1" or "SR Front Tower" reduces the risk of mis-positioning and misinterpretation of the data produced by the Load Cell.

WARNING Knowing the right position of a Load Cell is crucial for identifying which loads are being measured and where.

Corresponding markings

| Device ID | Device Position |
|-----------|-----------------|
| F724 | SR Front Tower |
| K211 | SR Back Tower |
| 824E | Stage Right |
| L6S3 | Stage Left |



3. Before installing: How to create the optimum wireless signal

All maximum distances for the wireless signal are based on a direct line of sight without any interference from other radio signals. The PROTOS Force Monitoring system uses the license free 2,4 GHz band. This is the same frequency band as WIFI networks are using. In almost any entertainment environment many radio signals are transmitted. In order to assure you will have the best possible radio

signal from your Load Cells, take care of the following

- Always position the Load Cells shackle vertical, with the pin horizontal.
- Align the logo towards the receiver
- Ensure a good as possible line of sight
- Keep a reasonable distance from other objects

Low signals and low batteries do not influence the transmitted value of the load as measured.
If a signal is received the displayed value is always correct.

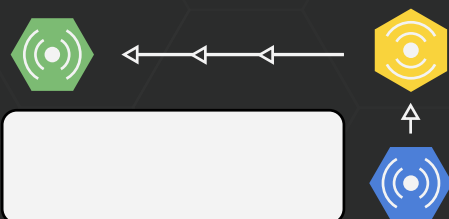
In some situations the direct line of sight between the Load cells shackles and the USB-receiver in your laptop is hard to establish.

Adding a wireless signal repeater PLCS-WL-RM-800 to your system in a strategic position will increase the signal range significantly

Range extention



Obstacle Bypassing



Combining Solutions



Loadcell



Transmitter or
Handheld




Repeater



Obstacle

4. Proper installation of the PROTOS Load Cell Shackles

It is essential to install the Load Cell Shackles in the right way.

 **DANGER** The use of Load Cell shackles in a rigging system requires mechanical knowledge. Mis-use or use without proper knowledge might lead to serious accidents with risk of injury or death.

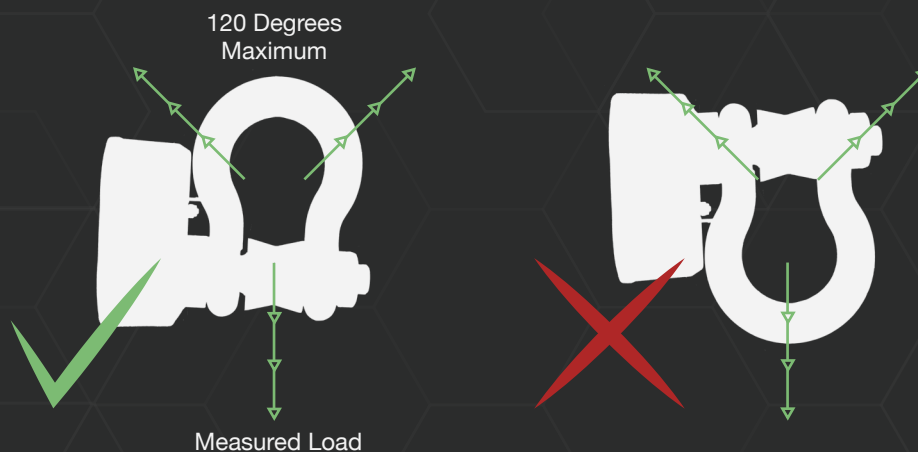
Any non-alignment, side loading or torsional loading will affect the load measurement and will load the shackle in a way it is not designed for.



The end fitting of the steel wire or, for example, the hook of the chain hoist connected to the Load Cell shackle must allow the bobbin to centre the position of the end fitting or hook. Otherwise use an additional shackle to connect the steel wire of chain hoist hook to the Load Cell shackle

If the Load Cell shackle is part of a bridle take care of the following

- The end fitting of each bridle part that connects to the Load Cell shackle must allow the bridle legs to position themselves symmetric over the centre of the bow of the shackle. Otherwise use an additional shackle to connect the bridle parts to the Load Cell shackle.
- The angle between the bridle parts should never exceed 120 degrees.
- Bridle parts always connect to the bow of the Load Cell shackle, never the pin.



5. Respect the safe workload limit of the PROTOS Load Cell Shackles.

The displayed WLL (working load limit) on the shackle (e.g. 3,25T) is based on a safety factor 5:1. When the Load Cell shackles are used in an entertainment environment almost always a higher safety factor is required. In such cases the applicable standard for the lifting situation or a risk assessment should provide you the proper safety factor. The SWL (Safe Working Load Limit) must be calculated with this safety factor. Dynamic or moving loads will multiply the forces on the Load Cell shackle.



WARNING

Instant acceleration, like on a fixed speed chain hoist, will take place in such a short time that, depending on the interval of measurements, the actual load during this acceleration period is not displayed. Overloading might be missed without noticing.

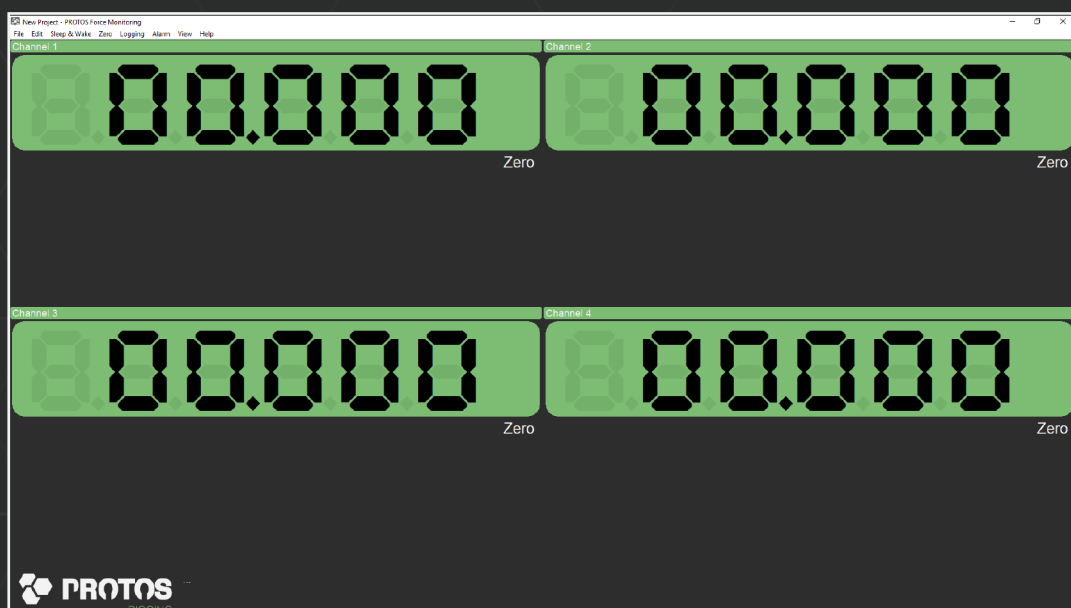
6. Using the PROTOS Force Monitoring System in safety critical control systems (e.g. SIL3)

The wireless PROTOS Force Monitoring System is not designed to be part of a safety critical control system with, for example, SIL3 requirements. Interference of the radio signal, low batteries, etc can cause a “signal lost” and a non-detection of an unsafe situation. In situations where availability of the load measuring is critical, other systems should be used or additional measures should be taken. Example of a situation where a safety critical control system is required, in an entertainment environment, is the lifting (moving) of objects above people or the lifting of people.

7. Using the PROTOS Force Monitoring software to monitor loads

The PROTOS Force Monitoring software is downloadable from the PROTOS website. Install the software on your windows

PC or Tablet following the instructions. After finishing the installation of the software connect one of the PLCS-WL-LCR USB receivers and launch the software. A window similar to the one below will be shown. The PROTOS Force Monitoring software allows you to create your one configuration (project) with up to 100 channels. Making it as easy as possible to monitor and interpret the loading figures on your rig. An unlimited amount of projects can be created, stored and recalled to help configuring your today setup.



A simple setup of a project is explained here. For a more detailed instruction how to configure projects we refer to the user manual of the PROTOS Force Monitoring software.

Starting a new project

Press the **File** menu button and select **New Project**. You will be asked to save the changes to the existing project. A new project always starts with only one channel. Press the **Edit** button and select **Configure Project**. A window as shown below will appear.

The 'Configure Project' dialog box contains the following fields and controls:

- Interface:** USB (dropdown)
- Title:** New Project (text field)
- ☐ Keep Awake
- COM Port:** 1 (dropdown)
- Baudrate:** 115200 (dropdown)
- Radio Channel:** 1 (dropdown)
- Base Station Address:** 1 (dropdown)
- Displays:** 1 (dropdown)
- Log Type:** Auto (At interval) (dropdown)
- Log Interval (ms):** 1000 (text field)
- | Display | Description | Expression | Format | Tare | Timeout | Default | Underload | Warning | Overload | Function |
|---------|-------------|------------|--------|------|---------|---------|-----------|---------|----------|----------|
| 1 | Channel 1 | | 00,000 | 0 | 3 | 0 | -9999999 | 9999999 | 9999999 | None |
- Expression:** (text field)
- Title:** Channel 1 (text field)
- Timeout (s):** 3 (text field)
- Default Value:** 0 (text field)
- Format/Resolution:** 00,000 (text field)
- Tare Value:** 0 (text field)
- Underload:** -9999999 (text field)
- Warning:** 9999999 (text field)
- Overload:** 9999999 (text field)
- Function:** None (dropdown)
- ☐ Hide Button
- ☐ Hide Display
- Notes:** (text area)
- Buttons:** Auto Add, Move Up, Move Down, Delete, Copy To Next, Web Server, Reports, COG, Help, OK

Press the \vee button in the **Displays** drop down menu and select the amount of channels you want to monitor. Select Channel 1 by clicking on the line of **channel 1** in the channel list, the line will become grey. Enter or adapt the data for this channel in the field-boxes below the channel list. In the **Expression** field you enter the last four digits of the load cell shackles Device ID between $< >$ brackets. For example $<FA75>$. You can adapt the name in the **Title** field to use a more understandable name like "stage left hoist". Change the fields for **Format/Resolution**, **Tare Value**, **Underload**, **Warning** and **Overload** according to the present situation. Press the **OK** button in the bottom right corner to finish your configuration. The PROTOS Force Monitoring will now generate a new **All Channel** window



This window is based on the settings as shown in the below configuration display. For the settings of the receiver or **Interface** in the top part of the configuration, we refer the the more detailed instructions in the user manual. Make sure the **Keep awake** box is always selected.

Configure Project

Interface

Title

USB

New Project

☒ Keep Awake

COM Port

Baudrate

Radio Channel

Base Station Address

Displays

Log Type

Log Interval (ms)

1

115200

4

1

8

Auto (At interval)

1000

| Display | Description | Expression | Format | Tare | Timeout | Default | Underload | Warning | Overload | Function |
|---------|------------------|------------|--------|----------|---------|---------|-----------|---------|----------|----------|
| 1 | FHM truss le... | <U134> | 00 | -9999... | 3 | 0 | -10 | 500 | 600 | None |
| 2 | FOH truss ri... | <FA56> | 00 | 0 | 3 | 0 | -10 | 500 | 600 | None |
| 3 | Left line ara... | <FA56> | 00 | 0 | 3 | 0 | -10 | 900 | 1000 | None |
| 4 | Left line ara... | <FA60> | 00 | 0 | 3 | 0 | -10 | 900 | 1000 | None |
| 5 | Right line ar... | <FE12> | 00 | 0 | 3 | 0 | -10 | 900 | 1000 | None |
| 6 | Right line ar... | <DE34> | 00 | 0 | 3 | 0 | -10 | 900 | 1000 | None |
| 7 | LED screen L... | <DF65> | 00 | 0 | 3 | 0 | 30 | 400 | 500 | None |
| 8 | LED screen r... | <FF60> | 00 | 0 | 3 | 0 | 30 | 400 | 500 | None |

Expression

<DF34>

☒

Title

FOH truss left hoist

Timeout (s)

3

Default Value

0

Format/Resolution

Tare Value

Underload

Warning

Overload

Function

00

-9999999

-10

500

600

None

Hide Button

Hide Display

☐

☐

Notes

Auto Add

Move Up

Move Down

Delete

Copy To Next

Web Server

Reports

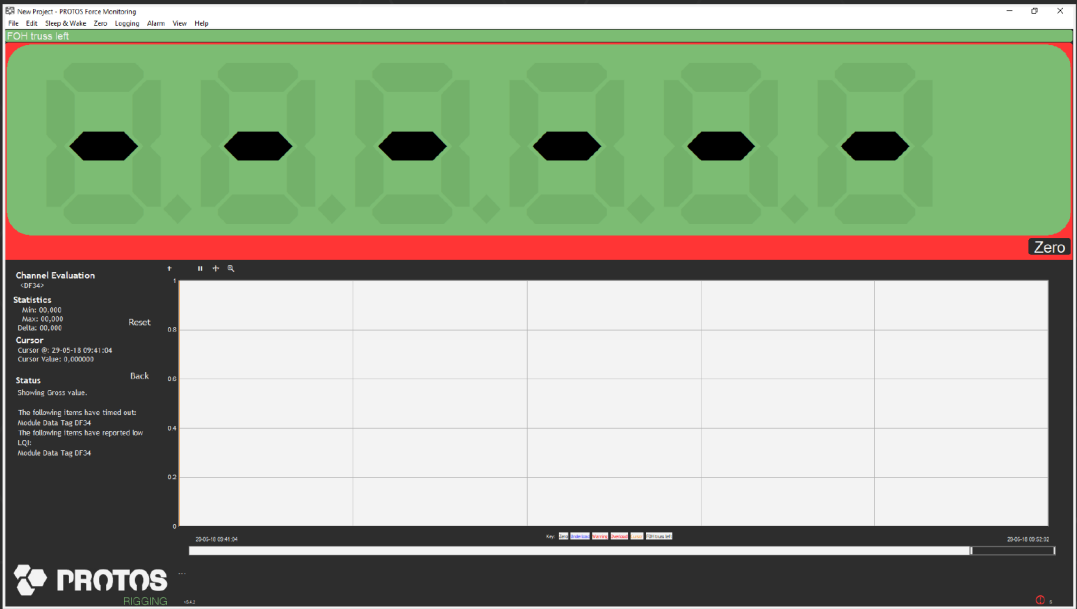
COG

Help

OK

When the **All Channel** window is displayed, go to the **Sleep & Wake** menu and select **Wake** in order to wake up your loadcells. Double clicking on a channel will show you more a more detailed window per channel. In this window statistics in time can be read.

Troubleshooting



1. Check if your load cell shackles are awake or wake them up with the wake command.
2. Check if all your load cells shackles, receiver and Force Monitoring software are all set to the same radio channel. Selecting a different channel on the Force Monitoring software **configuration** screen is the easiest way to find the radio channel of your receiver. Select the new channel, return to the **All channels** window by pressing **OK** and select the **wake** command. Repeat this until you have found the right channel.

The receiver can only be set to one radio channel. All Load cell shackles in the configuration must be set to the same radio channel.

8. Troubleshooting

Non responding Load Cell shackles:

Following this Quick Set-up Guide should help you troubleshoot non responsive Load Cell shackles. Repeat the steps as described, this should solve the problem.

Unexpected values are displayed

If the Force Monitoring software shows unexpected values to following checks should be done:

- Check if the displayed channel has been zeroed. Moving the mouse pointer over the channel will show an additional Information display telling you if the **NET** or GROSS value is showed. Click the **Gross** in the display window.
- Check if the channel settings are correct in the **Configure Project** window e.g. no mathematical functions added to the **expression** field or a function selected in the **function** field.
- Check if the correct units have been set (kg or lbs).

Visit to the PROTOS website to find additional info, manuals and instruction video's.

WWW.PROTOS-ONE.COM



Document Title
Applies To
Part Number
Issue Number
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In the interests of continued product development, Protos reserves the right to alter product specifications without prior notice.

ETSI



FCC

CE

