

# PROTOS

RIGGING



PROTOS PRODUCTS 2018

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## PROTOS Wireless Force Monitoring Systems

The entertainment industry is developing at a fast rate in order to keep up with the latest developments. As the hunger for state of the art shows keeps growing, concerts, plays and shows are constantly evolving as each iteration has to be more specatular than last. As a result rigging has taken a prominent role in almost every show.

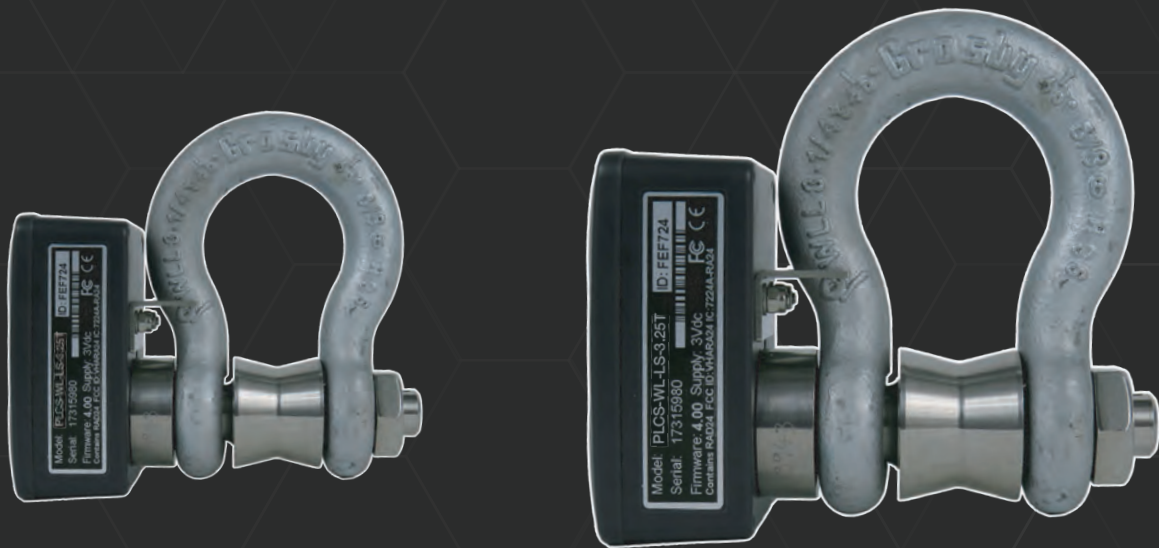
Rigging plots have become more complex due to performers, props, construction and the like being utilised as premium parts of the show. In this landscape, being able to measure the load that you're lifting is essential for safe working conditions, to protect men and priceless equipment. For this, we have developed a comprehensive range of force monitoring equipment for the entertainment industry.

To improve safety, with a focus on the flexibility and ease of use that this industry needs. Making an intuitive and affordable solution to measuring the forces on the loads you're lifting, or the structures you're building:

## PROTOS, THE APEX SOLUTION



# THE APEX SOLUTION



## PL PLCS-WL-LS-3.25T and PL PLCS-WL-LS-4.75T Load Cell Shackles

Each PROTOS wireless load monitoring system is real-time, cost effective and easy to use. PROTOS wireless load monitoring systems increase the safety by showing the actual load, on any given point, to the lifting operator. Either with a simple handheld or with free software available for PC and a USB base station. The software allows the setup of schematic stage lay-outs, maximum loads, overload warnings, and e.g. total loads. All done within minutes.

The PROTOS Load Cell Shackle is the starting point of each load monitoring system. Based on the well known Crosby Bow type shackle. Available with a WLL of 3,25T or 4,75T. Safety factor 5:1.

With an IP-rating of 67 and an operating temperature range from -20 to +50°C, all PROTOS Wireless Load Cell Shackles can be used in almost all weather conditions and use the worldwide available free 2.4GHz band. With a reading distance up to 800 meter.

	PL PLCS-WL-LS-3.25T	PL PLCS-WL-LS-4.75T
Weight Range (SWL)	3,250 KG	4,750 KG
Accuracy	Typically ±1% of load or ±25 kg whichever is greater	
Estimated Battery Life 2xAA Duracell	PL PLCS-WL-LS-3.25T	PL PLCS-WL-LS-4.75T
Asleep	5+ years	
Continuous operation	3 months	
8 hours usage per day	8 months	
2 hours usage per day	30 months	

IP rating

IP67

Operating temperature range

-20 to 50 °C

Storage temperature excluding batteries

-40 to 50 °C

Humidity

0 to 95 %RH



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### PL PLCS-WL-LCRD-500M

Wireless base station mounted in a non-weatherproof USB dongle enclosure for direct connection to laptops and tablets.

### PL PLCS-WL-LCR-800M

Wireless base station in a robust, weatherproof enclosure with USB connection and more range than the PL PLCS-WL-LCRD.

When you prefer to monitor the forces on a PC, the receiving base station is the connection between the wireless signals from the transmitting Protos devices, like load cells and windspeed meters, and your computer.

The PROTOS USB base stations follow the simplicity of the entire system. When all transmitting units in your stock are set to the same radio channel it's plug and play. The receiver will automatically recognize the radio channel as used and will find the transmitter units within range.

Base stations are the interface between the PROTOS radio system and a PC, PLC or other controller. A base station would be required to configure PROTOS transmitter modules from a PC using the Protos Toolkit software and also required if you are to capture data from PROTOS transmitter modules to a PC or PLC.

#### PL PLCS-WL-LCRD-500M

#### PL PLCS-WL-LCR-800M

USB port supply range	4,875 to 5,125 Vdc
USB Bus Powered Operational Current	100 Ma

IP rating PL PLCS-WL-LCRD

IP50

IP rating PL PLCS-WL-LCR-800

IP67

Operating temperature range

-20 to 55 °C

Storage temperature

-40 to 85 °C

# THE APEX SOLUTION



## PL PLCS-WL-HR-800M Handheld Remote

Simplicity during the set up of a rigging system is key. All disciplines put the rigger under pressure to speed up and allow them to attach loads to the hoists and trusses. Although every rigger is convinced of the added value of load cells, they are not used when they are too time consuming to install. The PROTOS Wireless Load Cell system is as simple as a regular shackle. The PROTOS Handheld Remote follows this simplicity and allows you to step through the available wireless load cell shackles. Wherever you are on the stage, without connecting wires or installing computers. The easiest way to check the load on a hoist before it is lifted.

The PROTOS PL PLCS-WL-HR-800M, is a roaming handheld that can be used to view the reading supplied by an unlimited number of PROTOS Load Cell shackles or Windspeed meter transmitter modules. The transmitter module Data Tags or IDs do not need to be known beforehand. The handheld will automatically wake any module on the same channel and group key. An internal list is maintained of the top number of transmitter modules ordered by signal level and a Next key on the handheld allows cycling through this list. When in communication with a particular transmitter module the LED on that module is activated. This provides visual feedback of the selected and currently viewed module. The LED output can also appear optionally on the digital output.

Power Supply Voltage	2.5 to 3.6 Vdc
Power Supply active	35 to 40 mA
Power Supply low power mode	120 to 160 $\mu$ A
2Ahr battery life standby mode	18 months
2Ahr battery life continuous operation	35 hours

IP rating	IP67
Operating temperature range	-10 to 50 °C
Storage temperature excluding batteries	-40 to 85 °C
Humidity	0 to 95 %RH
Dimensions	90mm x 152 mm x 34 mm



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## PL PLCS-WL-RM-800M Active Repeater

Having a clear line of sight between all your PROTOS Wireless Load Cell shackles and your base station is wishful thinking. The lay-out of truss structures, scenery, LED screens and the operator position are not dictated by the system but a result of a creative process. Repeating the signals at grid level allows more flexibility in the choice of the operator positions. The Protos Active Repeater can be positioned anywhere in the area where your transmitters are. You do not need to configure any settings. It simply repeats all the signals received from the transmitters within range.

The PL PLCS-WL-RM-800 is an active repeater which will allow the Protos range of transmitter modules to span around obstacles or increase range or coverage. The module provides a battery holder for a pair of alkaline 'D' cells and has the possibility to connect an external power supply. The batteries can also be used to provide power in case of external supply failure. The case is environmentally sealed to IP67. The repeater will allow messages to be repeated once which could double the radio range under ideal conditions. Adding more repeaters will not increase range but can increase coverage. The Active Repeater module is mounted in large weatherproof enclosure with battery holder for two D cell alkaline batteries. It also has the ability to be powered from an external supply voltage.

Power Supply Low Power Mode	5 to 20 $\mu$ A
Normal Mode	55 to 60 Ma
Reverse Polarity Protection	-32 Vdc
Battery Supply Voltage	2.1 to 3.6 Vdc
Power Supply Voltage	5 to 18 Vdc
Power Supply Ripple	50 mV ac pk-pk

Battery life using Duracell LR20 'D' cells with the module permanently activated is typically around 228 hours or 10 days, however, usually using batteries this module will be utilizing SleepDelay to return to sleep. Therefore the actual daily usage would allow for far greater than the stated battery life. For example: If the PLCS-WL-RM-800M was used for 1 hour per day then the battery life would be 6840 hours, or nearly 10 months.

IP rating	IP67
Operating temperature range excluding batteries	-20 to 55 °C
Storage temperature excluding batteries	-40 to 85 °C
Humidity	0 to 95 %RH

# THE APEX SOLUTION



## PL PLCS-WST-800M Wireless Anemometer Transmitter 800m

Temporary structures are often limited in the allowable wind forces. Measures must be taken when the windspeed crosses the allowed limit. Monitoring the windspeed is essential to take the measures in time in order to guarantee the safety of the structure, the artists, the technicians and the audience. The PROTOS Wireless Windspeed Meter is small and easy to mount on any scaffolding pole. Battery, Solar or permanently powered. To measure the windspeed on the structures and warn you when measures should be taken. Warnings can be provided via the local wireless network or via a GPRS module, as text message, to any mobile phone in the world.

The PROTOS PL PLCS-WST-800M is built on the same technology as other PROTOS wireless transmitter modules. It can be monitored with the same handhelds or base stations or send their data via a GPRS module to any cellphone or email address. It features a high quality 3-cup rotor, pressed on a stainless steel shaft. Measuring over the range of 2.25 to 55m/sec. The Protos Wireless Windspeed meter can be powered from internal batteries, solar power or an external power supply and comes standard with a scaffolding clamp.

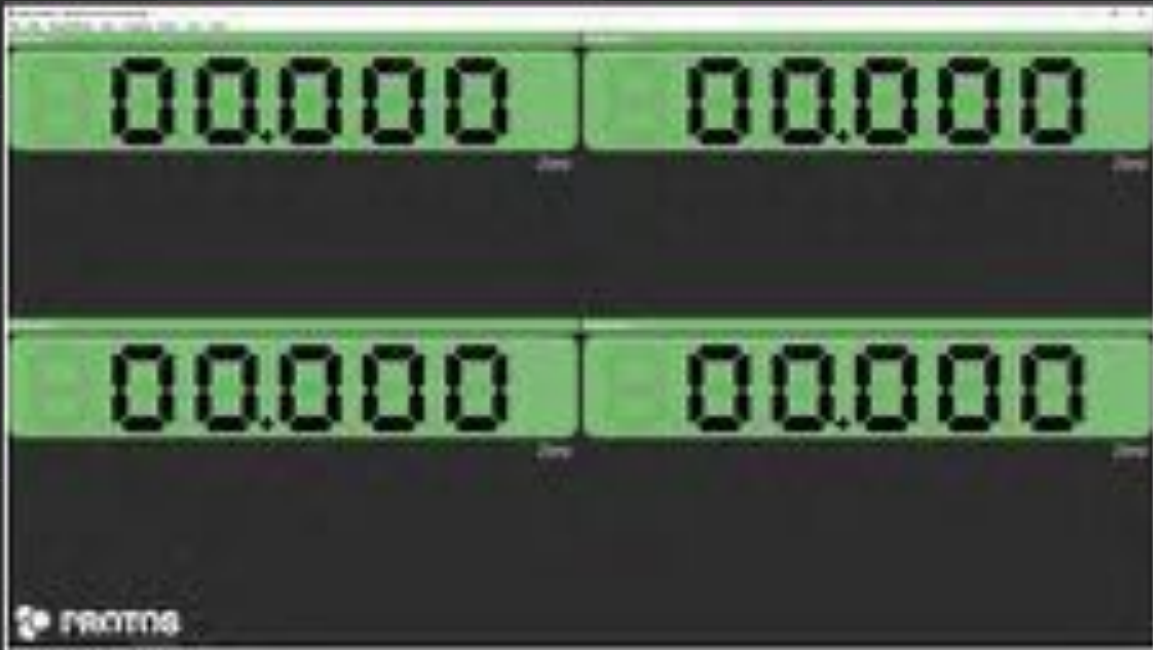
Power Supply Voltage	2.1 to 3.6 Vdc
External DC Supply	5 to 18 Vdc
Reverse Polarity Protection	-32 Vdc
Measurement Range	2.25 to 55 m/sec
Accuracy 2.25 - 4.5m/sec	0.5 m/sec
Accuracy 4.5 - 55 m/sec	± 4% m/sec
Power Supply Standby Mode	5 to 20 µA
Power Supply Normal Mode	55 to 60 mA
Power Supply voltage	5 to 18 Vdc
Power Supply ripple	50 mV ac pk-pk
Low Power mode DCELL battery life	14 days when constantly on, 1 year with 12 daily 5 minute sessions

IP rating	IP67
Operating temperature range	-20 to 55 °C
Storage temperature excluding batteries	-40 to 85 °C
Humidity	0 to 95 %RH



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## PROTOS Logging Software

Measuring forces created by loads and wind is one thing. Interpreting the loads and protecting the structures and lifting systems within their limits is the next step. Each structure and each lifting device requires specific settings for warnings and overloads. The PROTOS Logging Software allows you to visualize the measured values and gives the opportunity to show calculated values like the summarized loads on a suspension point. Net loads, tare levels, overload levels, warnings, etc can all be set per channel. Specific Stage lay-outs can be added by importing an image file.

- Windows based free software
- View and log up to 100 channels
- Logging at pre-set intervals
- Logging of over- and underloads
- Web server functionality to allow remote viewing on tablets and smart phones
- Import drawing or image files to simplify the interpretation of displayed values

### Mathematical functions allow

- Visualization of summarized loads at suspension points
- Bridle loads
- Warnings for unequal distribution of loads



# THE APEX SOLUTION



## PROTONS Advanced solutions

Advanced solutions with prices and specifications on demand

### PLCS-WL-RDC Remote Data Collection Module

This module collects data from remote PROTONS transmitter modules and generates CSV files, custom SMS reports and triggered reports that are delivered over the cellular GPRS network and GSM network for SMS messaging. You can either define the active group of remote transmitter modules or allow the module to work automatically, adding new modules as it detects them.

The main logging functionality is to collect data from the remote modules and place the results into a CSV file. You can specify the amount of data stored in the CSV file, the interval the CSV file is delivered and a maximum of 3 destinations, which can be an email address, SMS phone number, FTP server, raw socket or delivered as an HTTP POST to a web server.

SMS reports can be user designed to deliver data values from specific modules and can be triggered by sending an SMS message to the module. Up to 10 SMS reports can be designed. The remote modules can be referenced either by channel number or data tag. These reports are always sent back to the phone that triggered the message. Up to 20 triggered reports can be user designed that can look for individual modules exceeding limits, reporting errors or local events such as loss of external power and lid open, or even just at set intervals.

### PLCS-PP Power Pack and PLCS-SP Solar Panel

provides dependable off-grid power generation and storage to support a variety of PROTONS products. Packed in an IP67 sealed case with rugged waterproof connectors the PLCS-PP has two sources of charge for the internal battery with both solar and mains power input charging.

The PLCS-SP features hail-proof tempered glass and closely packed polycrystalline cells, sealed into a robust aluminum frame. The junction box on the rear of the panel does not protrude beyond the frame, so installation can be simple and neat. The solar cell comes with 5 meters of cable as standard.

The PLCS-SP and PLCS-PP combined are designed to provide a perpetual power supply for a 12 V system drawing an average of 53mA, even during winter. The PLCS-PP can also be used as a mains powered 12 Vdc supply with 33 Ah battery backup.

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**Document Title**  
**Applies To**  
**Part Number**  
**Issue Number**  
**Dated**

PROTOS Product Folder  
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In the interests of continued product development, Protos reserves the right to alter product specifications without prior notice.

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