



FORCE MEASUREMENT PRODUCTS

2020

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 itteration has to be more spectacular than the last. As a result, rigging has taken a prominent role in almost every show.

Rigging plots have become more complex due to performers, props, constructions 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



Wireless Load Cells	4
Wired Load Cells	5
Receivers	6
Handheld Display	7
Repeater Module	8
Wind Speed Module	S
Relay Module	10
Flight Cases	11
Logging Software	12
Advanced Solutions	13





PLCS-WL-LS-3.25T and 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.

	PLCS-WL-LS-3.25T	PLCS-WL-LS-4.75T
Weight Range (SWL)	3250 KG	4750 KG
Accuracy	Typically ±1% of load or ±	25 kg whichever is greater

Estimated Battery Life 2xAA Duracell	PLCS-WL-LS-3.25T	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





PLCS-W-DLS-3.25T and PLCS-W-DLS-4.75T Load Cell Shackles

Very similar to the the wireless load cells, the PROTOS daisychain load monitoring system is real-time, cost effective and easy to use. PROTOS wireless load monitoring systems increase safety by showing the actual load, on any given point, to the lifting operator. All that is necessary to operate these load cells is the free software available for PC, a length of cable of up to 1000 meters and a PLCS interface module. Note that this is a seperate system with different software, so it is not possible to combine the wired and wireless systems. 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.

	PLCS-W-DLS-3.25T	PLCS-W-DLS-4.75T
Weight Range (SWL)	3250 KG	4750 KG
Accuracy Typically ±1% of load or ±25 kg whichever is greater		25 kg whichever is greater



PLCS-WL-LCRD

PLCS-WL-LCR-800

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

Wireless base station in a robust, weatherproof enclosure with USB connection and more range than the 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.

	PLCS-WL-LCRD	PLCS-WL-LCR-800
USB port supply range	4,875 to 5	,125 Vdc
USB Bus Powered Operational Current	100	Ma

IP rating PLCS-WL-LCRD IP50
IP ratin PLCS-WL-LCER-800 IP67
Operating temperature range -20 to 55 °C
Storage temperature -40 to 85 °C





PLCS-WL-HR 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 PLCS-WL-HR, 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 Supplyl ow power mode	120 to 160 μA
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



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 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 μA
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 wil 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





PLCS-WSS Windspeed Meter Module

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 PLCS-WSS 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



PLCS-WL-ROR-800M Wireless Relay module

This wireless receiver with relay output offers dual power relays capable of mains power switching. Each relay can be configured as high, low or window alarms and can be associated with a group of up to eight transmitters.

Relays can be latched and a digital input or external command can be used to reset them. An alarm/error signal relay is operated if communication is lost or other selectable errors occur and this alarm resets once the source of the alarm or error is removed.

The licence free 2.4GHz direct sequence spread spectrum (DSSS) radio technology offers high integrity, error free communications which can co-exist with other wireless technologies such as Wi-Fi, Bluetooth® and Zigbee®. FCC, ETSI and IC approvals.

The relay module is housed in an IP67 sealed ABS case with an Internal antenna that offers up to 800 m (2,600 ft) range in an open field situation.

External DC Supply	9 to 32 Vdc
Operational Current All Relays Active	155 mA
Power Relays	240V 5A
Alarm Relay	24Vdc 1A to 120 Vac 1A

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





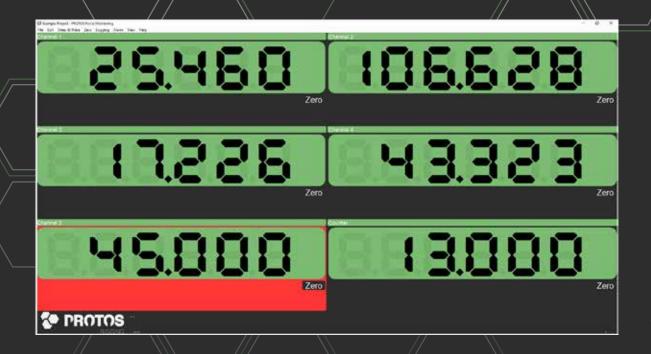
PLCS-CASE Flight Case

The PROTOS case is a durable flight case, a design that has proven itself throughout the entertainment industry. Due to the precisely cut out foam sections, tailored to fit the equipment, a safe journey for the Load Cell System is guaranteed. The foam sections are modular, and evenly devided in 4 segments. The sections interchangeable, which makes it possible to have a case holding up to 16 wired or wireless loadcells or 4 wind speed meters and anything inbetween. This makes it possible to carry various setup configurations.

The robust corner wheels that are mounted to the case and the heavy duty adjustable handle make sure that the transport of your force measuring equipment is safe and easy.

The lid of case contains a fixed piece of foam on the inside, with slots for the minimum required equipment.

Dimensions	72x44,5x28,5
Weight	10,5KG
Tro	lly Design
Retrac	table Handle
Modula	r foam blocks
St	ackable



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





PROTOS Advanced solutions

Advanced solutions with prices and specifications on demand

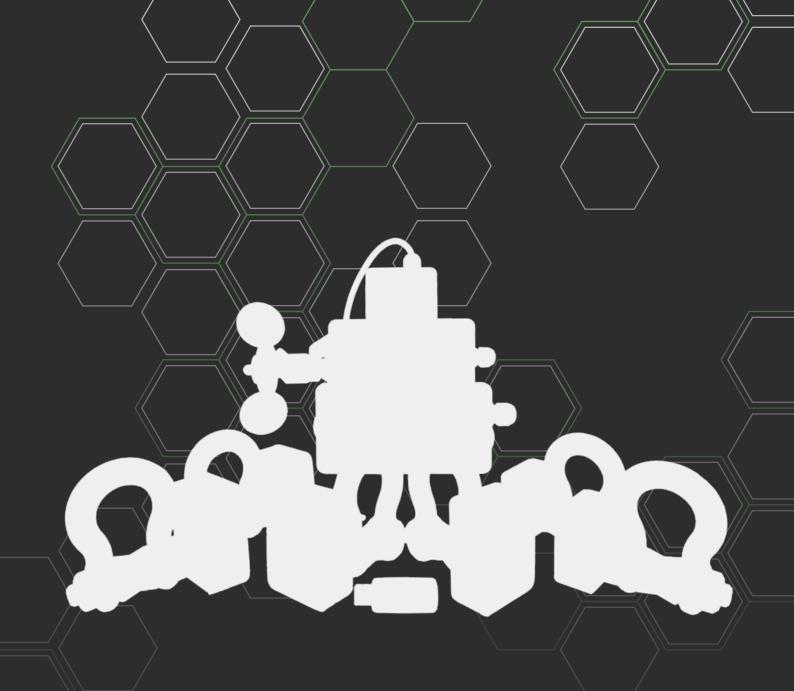
PLCS-PP Power Pack and PLCS-SP Solar Panel

provides dependable off-grid power generation and storage to support a variety of PROTOS 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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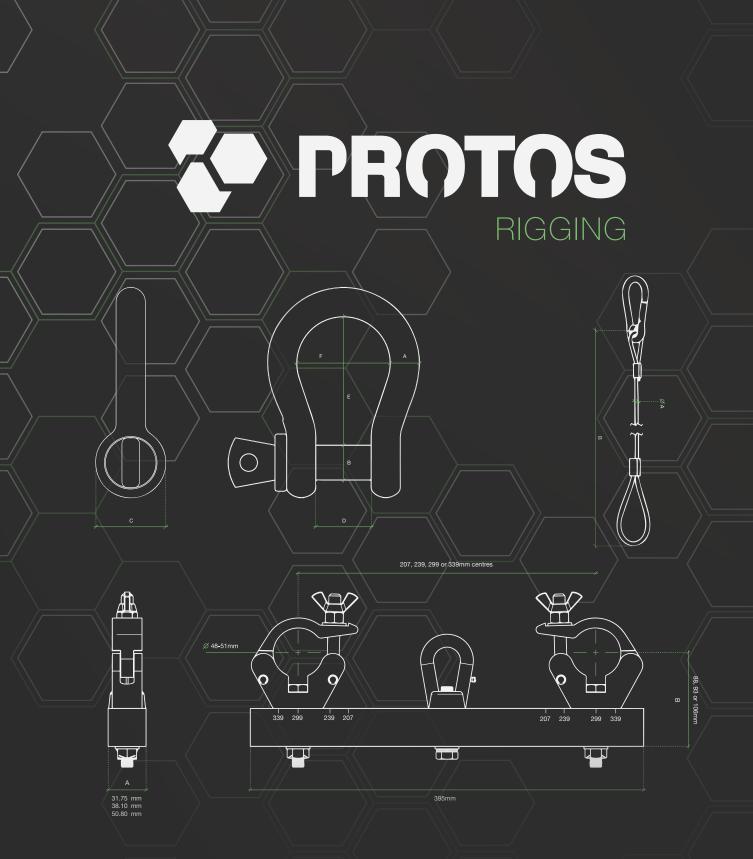












RIGGING GEAR PRODUCTS
2021

PROTOS RIGGING GEAR

PROTOS has a history of looking at the demands from the market when deciding what direction to take in terms of the products we offer. In our biggest update since our inception, we now offer an extensive line of high end Rigging Gear, a complete solution for any project.

The greatest strength of the line of PROTOS Rigging Gear is our ability to tailor make the products in this line to fit your exact needs, while lead times of customized products are short and reliable.

Only high quality materials are used and manufacturing and assembly is handled by skilled professionals specializing in working with a diverse selection of products, often using specially designed machinery and tools.

Our entire Rigging Gear line is ISO 9001 certified, maintaining our focus on quality as well as safety.



Shackles	
Softsteels	8
Roundslings	8
Universal Lifting Brackts	ξ
Steels	10
Chainclutches	11
Safety Bonds	12
Beam Clamps	13
Rachets and Straps	13

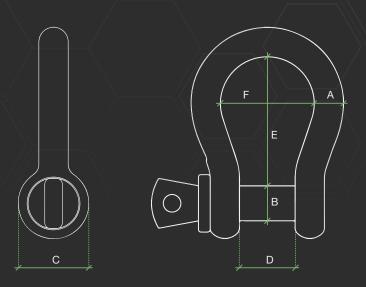




PROTOS SCREWPIN BOWSHACKLE

Material: Grade 6 | Safety factor: MBL equals 6 x WLL | Standard: EN 13889 and meets performance requirements of US Fed. Spec. RR-C-271 Type IVA Class 3, Grade A from 2T and upward these shackle comply with ASME B30.26 Finish: Hot dipped galvanized | Temperature range: -40 C up to +200 C | Certification: 2.1 2.2 3.1 MTC a DNV 2.7-1 a DNV 2.7-1 b DNV 2.22 CE

ART.NR	WLL	Α	В	С	D	E	F		
	Ton	mm	mm	mm	mm	mm	mm	kg/pc	
SLVHMBG00500	0,5			16,5	12	29	20	0,06	
SLVHMBG00750	0,75		10	20	13,5	32	// 22	0,11	
SLVHMBG01000		10	11	22,5	17	36,5	26	0,16	
SLVHMBG01500	1,5	11	13	26,5		43	29	0,22	
SLVHMBG02000		13,5	16	34	22	51	32	0,42	
SLVHMBG03250	3,25	16		40	27	64	43	0,74	
SLVHMBG04750	4,75	19	22	46	31	76	51	1,18	
SLVHMBG06500	6,5	22	25	52	36	83	58	1,77	



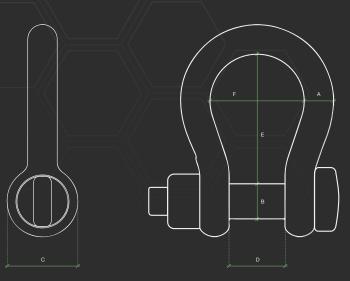




PROTOS SAFETY BOLT BOWSHACKLE

Material: Grade 6 | Safety factor: MBL equals 6 x WLL | Standard: EN 13889 and meets performance requirements of US Fed. Spec. RR-C-271 Type IVA Class 3, Grade A from 2T and upward these shackle comply with ASME B30.26 Finish: Hot dipped galvanized | Temperature range: -40 C up to +200 C | Certification: 2.1 2.2 3.1 MTC a DNV 2.7-1 a DNV 2.7-1 b DNV 2.22 CE

ART.NR	WLL Ton	A mm	B mm	C mm	D mm	E mm	F mm	kg/pc	
SLVHBBG00330	0,33	5	6	12	9,5	22	16	0,02	
SLVHMBG00500	0,5			16,5	12	29	20/	0,06	
SLVHMBG00750	0,75		10	20	13,5	32	22	0,11	
SLVHMBG01000		10	11	22,5	17	36,5	26	0,16	
SLVHMBG01500	1,5	11	13	26,5	19	43	29	0,22	
SLVHMBG02000		13,5	16	34	22	51	32	0,42	
SLVHMBG03250	3,25	16	19	40	27	64	43	0,74	
SLVHMBG04750	4,75		22	46	31	76	51	1,18	
SLVHMBG06500	6,5	22///	25	52		83	58	1,77	

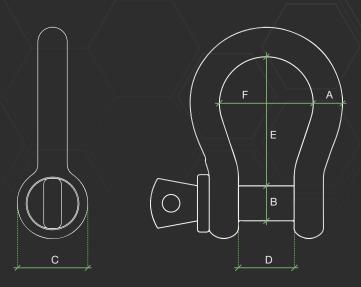




PROTOS BLACK SCREWPIN BOWSHACKLE

Material: Grade 6 | Safety factor: MBL equals 6 x WLL | Standard: US Fed. Spec. RR-C-271 | Finish: matt black Certification: 2.1 2.2

ART.NR	WLL	Α	В	C	D	E	F		
	Ton	mm	mm	mm	mm	mm	mm	kg/pc	
SLZHMBZ02000		13		32	21		33	0,42	
SLZHMBZ03250	3,25	16		39	27	59	42	0,74	
SLZHMBZ04750	4,75		22	47	32	73	50	1,18	





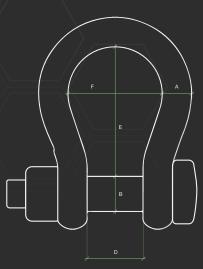


PROTOS BLACK SAFETY BOLT BOWSHACKLE

Material: Grade 6 | Safety factor: MBL equals 6 x WLL | Standard: US Fed. Spec. RR-C-271 | Finish: matt black Certification: 2.1 2.2

ART.NR	WLL Ton	A mm	B mm	C mm	D mm	E mm	F mm	kg/pc	
SLZHBBZ00330	0,33	5	6	15	9,5	22	16	0,02	
SLZHBBZ00500	0,5			\\18	12	28	19	0,07	
SLZHBBZ00750	0,75	8	10	22	13,5	32	21	0,13	
SLZHBBZ01000		10	11	26	17	35	25	0,17	
SLZHBBZ01500	1,5	11	13	28	19	42	29	0,25	
SLZHBBZ02000		13	16	32	20	47	32	0,44	
SLZHBBZ03250	3,25	16	19	39	27	60	43	0,79	
SLZHBBZ04750	4,75		22	47	32	71	50	1,26	







PROTOS SOFTSTEELS

Flexible alternative to steels | Comes with a black polyester sleeve and a steel wire rope core | Safety factor 5:1 | Approved for BGV C1 / DGUV | Custom configurations available on request

PROTOS ROUNDSLINGS

Various lengths available | 100% traceability due to unique number on labels | Safety factor 7:1 | According to NEN-EN 1492-2 | Custom configurations available on request

ART.NR	WLL	L mtr
PRHRS02000501	2 Ton	0,5
PRHRS02001001	2 Ton	
PRHRS02001501	2 Ton	1,5
PRHRS02001601	2 Ton	1,6
PRHRS02002001	2 Ton	
PRHRS02002501	2 Ton	2,5
PRHRS02003001	2 Ton	

ART.NR WLL	WLL	L
	ton	mtr
PRHRP01000501	1 Ton	0,5
PRHRP01001001	1 Ton	
PRHRP01001501	1 Ton	1,5
PRHRP01002001	1 Ton	
PRHRP01002501	1 Ton	2,5
PRHRP01003001	1 Ton	
PRHRP01003501	1 Ton	3,5
PRHRP01004001	1 Ton	
PRHRP02000501	2 Ton	0,5
PRHRP02001001	2 Ton	
PRHRP02001501	2 Ton	1,5

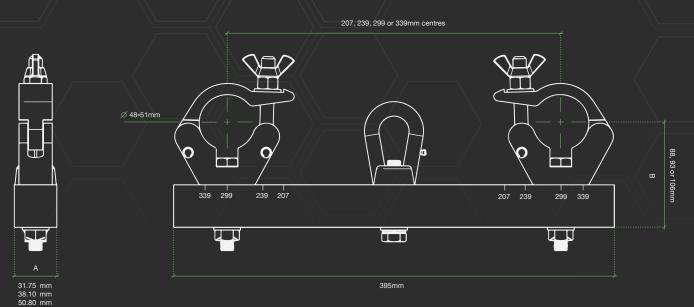




PROTOS UNIVERSAL LIFTING BRACKET

Manufactured from solid high tensile aluminium | Solid Hanging Truss adaptor features a 'Bow Nut' to accommodate larger hooks | Truss adaptor is pre-drilled to fit most major brands of truss | Comes fitted with two Slimline Doughty Clamps

ART.NR	WLL	Α	В			
	kg	mm	mm	Color	kg/pc	
PRD55720	250	31.75	88	Silver		
PRD55725	250	31.75	88	Black		
PRD55750	500	38.1	93	Silver		
PRD55755	500	38.1	93	Black		
PRD55780	1000	50.8	106	Silver		
PRD55785	1000	50.8	106	Black		





PROTOS BEAMCLAMP

Colour: black Easy installation Suitable as temporary lifting point

ART.NR	WLL Ton	beam width mm	f min mm	f max. mm	Ø axle mm	kg - pc	
BALKRB00011	Υ	7 5 - 230	150	90	19	3,5	
BALKRB00022		75 - 230	150	90	21	4,5	
BALKRB00033		80 - 320	220	145	23	9,5	

PROTOS RATCHET SET

Various lengths available





PROTOS STEELS

Standard in construction 6x36WS+IWRC dry | Pressed with standard aluminium ferrules | Both sides with a stub-end thimble | 1T steels with oversized thimble suitable for a 3,25T shackle | 2T steels with oversized thimble suitable for a 4,75T shackle | Certificate available | Other configurations available on request

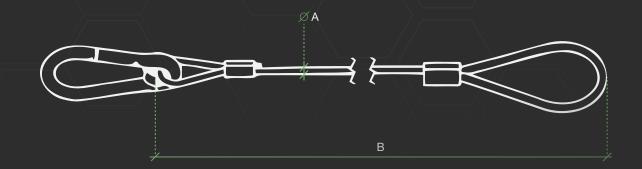
<u>_</u>							
Silver	A - ø in mm	Black	A - ø in mm	B in mtr	С	D	WLL Ton
PRS10000502	10	PRZ10000500	10	0,5	57	/35	1\
PRS10000752	10	PRZ10000750	10	0,75	57	35	
PRS10001002	10	PRZ10001000	10 ///		57	35	
PRS10001502	10	PRZ10001500	10///	1,5	57	35	
PRS10002002		PRZ10002000	10		57		
PRS10002502	10	PRZ10002500	10	2,5	57		
PRS10003002	10	PRZ10003000	10		57		
PRS10004002	10	PRZ10004000	10		57		
PRS10005002	10	PRZ10005000	10 ///		57		
PRS10006002	10	PRZ10006000	10///		57		
PRS10007502	10	PRZ10007500	10	7,5	57		
PRS10008002	10	PRZ10008000	10		57		
PRS10010002	10	PRZ10010000	10		57		
PRS14000652	14	PRZ13000500	13	0,65			
PRS14000752	14	PRZ13000750	13	0,75	65		
PRS14001002	14	PRZ13001000	13///		65		
PRS14001502	14	PRZ13001500	13	1,5	65		
PRS14002002	14	PRZ13002000	13		65		
PRS14002502	14	PRZ13002500	13	2,5	65		
PRS14003002	14	PRZ13003000	13				
PRS14004002	14	PRZ13004000	13		65		
PRS14005002	14	PRZ13005000	13		65		
PRS14006002	14	PRZ13006000	13				
PRS14007502	14	PRZ13007500	13	7,5			
PRS14008002	14	PRZ13008000	13				
PRS14010002	14	PRZ13010000	13	10			



PROTOS SAFETY BONDS

Black steel wire rope bond with soft loops at each end | Comes with a spring hook at one end | Custom configurations available on request

ART.NR	WLL kg	A - ø mm	B cm	Carbine		
PRT2840001			50	M4		
PRT22001			58	M4		
PRT22101			58	M4		
PRT2841001	20		60	M6		
PRT220025	25		58	M6		
PRT2820501	50		70	M8		
PRT2844001	36		60	M8		
PRT2844501	36		100	M8		
PRT2849001	36		100			



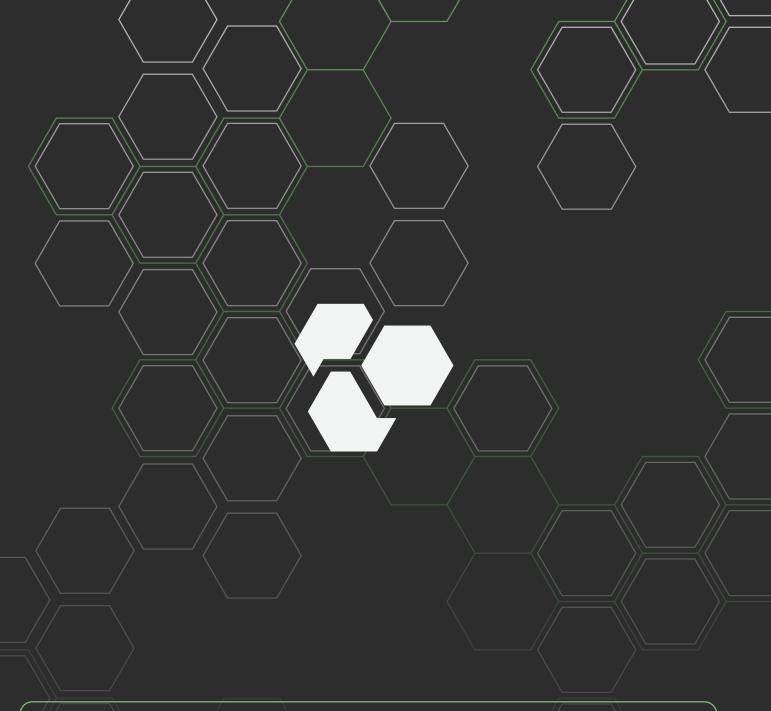




PROTOS CHAINCLUTCH

Black components | Grade 80 EN818-2 chain | Fitted with master link and clevis hook | Certificates available | Four standard variants: shortening clutch with safety, grabhook with safety, shortening clutch without safety and grabhook without safety

Shortening Clutch With Safety	Grabhook With Safety	Shortening Clutch Without Safety	Grabhook Without Safety	WLL Ton	A mm	B mm
RDBCZ0601000	RDBCZ0601001	RDBCZ0601002	RDBCZ0601003	1	6	1
RDBCZ0602000	RDBCZ0602001	RDBCZ0602002	RDBCZ0602003			
RDBCZ0603000	RDBCZ0603001	RDBCZ0603002	RDBCZ0603003			
RDBCZ0801000	RDBCZ0801001	RDBCZ0801002	RDBCZ0801003			
RDBCZ0802000	RDBCZ0802001	RDBCZ0802002	RDBCZ0802003			
RDBCZ0803000	RDBCZ0803001	RDBCZ0803002	RDBCZ0803003			



Document Title

Applies To

Part Number

Issue Number

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PROTOS Rigging Gear 2021

PROTOS Rigging Gear Products

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In the interest of continued product development. PROTOS reserves the right to alter product specification without prior notice.













