LR30 & LR30W Laser Receiver

User Guide



SPECTRA PRECISION

LR30/LR30W

www.spectraprecision.com

Introduction

Thank you for choosing the Spectra Precision® Laser Receiver LR30. The laser receiver is a rugged, multi-purpose, easy-to-use electronic sensor that detects laser light generated by rotating laser transmitters. The receiver works with nearly all models of rotating lasers and detects both visible and invisible beams.

Before using the receiver, be sure to read this user guide carefully. Included in it is information about setting up, using, and maintaining the receiver. Also included in this manual are **WARNINGS!**, **CAUTIONS**, and **Notes**. Each of these words represents a level of danger or concern. A **WARNING!** indicates a hazard or unsafe practice that could result in serious injury or death. A **CAUTION** indicates a hazard or unsafe practice that could result in minor injury or property damage. A **Note** indicates important information unrelated to safety.

Your comments and suggestions are welcome; please contact us at:
Spectra Precision (USA) LLC
3265 Logistics Lane, Suite 200
Dayton, OH 45377 USA
888-527-3771 (Toll Free)
www.spectraprecision.com

NOTE: The LR30W ships configured to wireless (Radio) communication mode for use with a RD20 remote display. To change to wired (RS-485) mode for use with a control box, press the power, deadband and right-hidden buttons simultaneously (make sure the receiver is powered up first). Pressing this 3-button combination will toggle the receiver between wireless (Radio) and wired (RS-485) modes as indicated by the following:

Radio Mode Indication: The two outer on-grade LEDs double-blink every few seconds

Wired (RS-485) Mode Indication: The center on-grade LED double-blinks every few seconds

Once configured the receiver will remember it's setting after a power cycle. For additional wireless RD20 operating features please see the RD20 User Guide.

Safety

Please follow all operating and safety instructions in this guide and that of your machinery. Perform periodic checks of the product's performance. Spectra Precision LLC or its representatives assume no responsibility for results of the use of this product including any direct, indirect, consequential damage, and loss of profits. Check your work frequently.

⚠ **WARNING:** When working near construction or agricultural machinery, follow all safety precautions as described in the machinery's user guide.

⚠ **WARNING:** When excavating, follow all excavation and trench safety regulations and practices.

⚠ **WARNING:** Be aware of all overhead obstructions and electrical power lines. The receiver and mast may be higher than the machinery. Remove when transporting machinery.

CAUTION: Do not disassemble any part of the receiver other than to replace batteries. The receiver is to be serviced by authorized Spectra Precision LLC service personnel only.

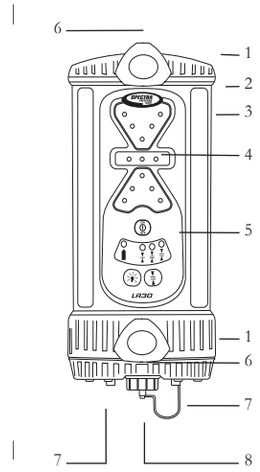
Maintenance and Care

Your receiver was shipped in a protective carrying case. If the receiver is transported from job to job inside its protective case and normal instrument precautions are followed, the receiver will provide many years of service. When storing the receiver, be sure to store it in its carrying case.

Do not wipe dust or dirt off the receiver with a dry cloth as scratching could occur, possibly damaging these surfaces. Use only a good quality glass cleaner with a soft cloth on all external components. If these surfaces have hardened concrete or other materials on them, take the system to your Authorized Service Center for cleaning.

If the receiver will not be used for more than 30 days, remove the alkaline batteries from it. Be sure to dispose of all batteries properly. Refer to your state or local requirements for the disposal information.

Features and Functions



1. **Aluminum-Cast Upper and Lower Housings**—protect the receiver.
2. **Polycarbonate Housing**—protects the electronics.
3. **Receiving Windows**—include photocells for laser beam reception.
4. **Super-Bright LEDs**—are highly visible and graphically display grade position. The green LEDs display on-grade information, and the red LEDs display high and low information.
5. **Touch-Panel**—contains power, deadband, and display-brightness buttons. The panel also displays low-battery warning and deadband selection. Unmarked buttons and button combinations provide additional functions. For more information, see the "Operation" section of this guide.
6. **Mounting Knobs**—are attached to stainless steel clamps. The large front-facing knobs allow for quick and easy installation to a round pipe, square tubing, or magnetic mount.
7. **Access Screws**—allow easy access to battery compartment so the batteries can be replaced.
8. **Accessory Connector**—accepts the cable to the optional remote display, machine power cable, or automatic control box. The connector also accepts Ni-MH battery charger. A dust cap covers the connector to help keep it clean.

Installing and Recharging the Batteries

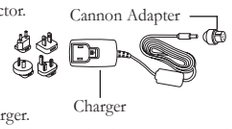
Alkaline Batteries

1. Hold the receiver so the accessory connector is pointing up.
2. Remove the dust cap from the accessory connector.
3. Loosen the two thumb screws and remove the battery-access cover.
4. Install four "C" cell alkaline batteries as shown on the label diagram inside the battery compartment noting the (+) and (–) terminals.
5. Replace the battery-access cover. Firmly tighten the two thumbscrews.
6. Replace the accessory-connector dust cap.

Nickel Metal Hydride Batteries (Ni-MH)

Rechargeable batteries require an initial and subsequent charging time of approximately 3 hours. Two or three charging cycles may be required to obtain maximum battery life. To charge:

1. Remove the dust cap from the accessory connector.
2. Insert the cannon adapter into the receiver accessory connector aligning the slot and connector key. Insert the charger female barrel into the cannon adapter.



3. Make sure the proper AC prongs are on the charger.
   Note: To change the prong adapter, press the tab release in the direction indicated by the arrow and remove the existing prong. Insert the proper adapter and release the tab.
4. Plug the charger into an appropriate outlet. The receiver will not operate when it is charging.
   Note: The charge-status indicator located on the back of the housing remains solid when the batteries are charging. The left LED flashes when the batteries are fully charged.
5. When the batteries are charged, unplug the charger from the outlet, and remove the cannon adapter from the accessory connector. Replace the dust cap.

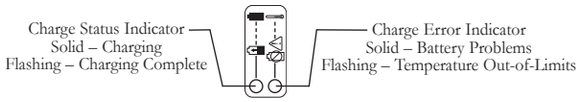
Battery Safety

Built-in overcharging protection prevents damage to the receiver if it is left on charge after being fully charged. Charge protection also prevents damage if you accidentally try to recharge alkaline batteries.

CAUTION: Do not attempt to charge alkaline or other disposable batteries.

Note: The batteries should only be charged when the receiver is between 0 °C to 45 °C (32 °F to 113 °F).

The rechargeable battery electronics include charge status and charge-error indicators located on the back of the housing.



(Located on lower rear of polycarbonate housing)

Charge Status Indicator: The LED remains solid when the batteries are charging. The LED flashes when the batteries are fully charged. When the batteries are charged, unplug the charger from the outlet, and remove the cannon adapter from the accessory connector.

Charge Error Indicator: The LED is solid when the internal battery connection has an error, the batteries are installed incorrectly, the battery type is incorrect, or a battery cell is dead. A flashing LED indicates that the temperature is too hot/cold to charge. Charging automatically starts when the temperature is within the above noted range.

Battery Replacement

1. Remove the dust cap, loosen the two thumb screws, and remove the battery-access cover.
2. Remove the old batteries. Install new batteries as previously described. See "Alkaline Batteries" for more information.
3. Replace the access cover, firmly tighten the two screws, and replace the dust cap
   Note: Refer to your local requirements for proper battery disposal.

Using the Receiver

Operation

Touch Panel

Power Button

1. Press the power button to turn on the receiver.
   Notes: All the LEDs light briefly. Quickly following, each LED grade-display row turns on and off from top to bottom and each status indicator turns on and off. Additionally, the current deadband status momentarily displays. If the receiver is out of a laser beam, the center green LED flashes to confirm power is on. If the receiver is in a laser beam, a corresponding LED grade display lights.
2. To turn off the receiver, press and hold the power button until the LEDs light; then release the button. Settings will be retained the next time the receiver is turned on.

Default Settings

The factory default settings are: Deadband - Standard; Display - Dim; Out-of-Beam Indication - On; Laser Out-of-Level Warning - Off; and Beam Averaging - On. The receiver always starts up in the last selected settings.

Deadband (Accuracy) Button

The deadband, or on-grade accuracy, has three options: fine, standard, and wide. This selection can be changed to meet various job conditions. To show the current selection, press the button once; the status LED lights. To change the current selection, press the button again. The deadband and corresponding LED change with each press.



Fine Deadband 3/16" (0.20"/5mm)

Standard Deadband 1/2" (0.45"/12mm)

Wide Deadband 1-1/4" (1.25"/32mm)

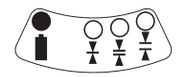
Display-Brightness Button

The display-brightness button controls the brightness for the LED grade display. Options include Bright and Dim. Use dim for normal and lower light conditions and bright for sunny daytime operation. Dim conserves battery life.

When the receiver is out of the laser beam and the display-brightness button is pressed, the LEDs display a circle showing the current setting. To change the setting, press the button again while the LEDs are activated. The LEDs then display the new setting.

When the receiver is in the laser beam, simply press the button and the setting changes.

Low-Battery Warning



The receiver has a low-battery warning LED. During normal operation with good batteries, the LED is off. When the batteries are low, the LED begins flashing. When the warning occurs, the receiver continues to operate as normal, but about 90 minutes of battery life remain. When the batteries are too low for normal operation, the LED remains on, the four corner grade-display LEDs flash, and the receiver no longer receives laser signals. Replace the batteries (or recharge them if you're using rechargeable batteries). The warning does not operate when the receiver is connected to machine power via a power cable.

CONTRACTORS-TOOLS.COM
SURVEY EQUIPMENT AND SUPPLIES

1-877-866-5721

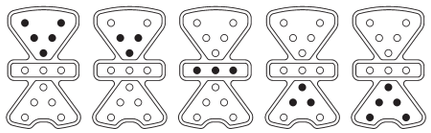
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Grade Display

Five channels for grade information show when the blade/cutting edge is on-grade or needs adjusting. The LEDs form directional arrows that show whether to move the blade/cutting edge up or down.

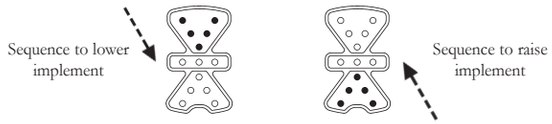


High Lower Implement | **Fine High** Lower Implement | **On-Grade** (Green LEDs) | **Fine Low** Raise Implement | **Low** Raise Implement

Out-of-Beam Indication

The receiver has an out-of-beam (OOB) function. When it is turned on, the LED grade display indicates that the receiver has moved beyond the vertical laser reception range. A sequence of LEDs indicates which direction to move the blade or cutting edge to pick up the laser beam. If the receiver is above the beam, move the edge down. If the receiver is below the beam, move the edge up. The sequence stops as soon as a laser signal is received. Otherwise, the function shuts off after two minutes.

The factory default setting is for the out-of-beam function to be on. The LED display sequences inward toward on-grade to indicate that the function is on. To turn the function off, press the two outside buttons (Unmarked Buttons) at the same time. The LED display sequences outward from on-grade to indicate that the function is off.



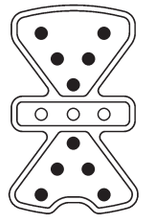
Out of Beam Indication ON

Out-Of-Level Warning

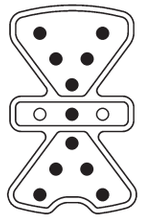
The out-of-level (OOL) warning is used with lasers that can indicate that they are out of level by changing their rotation speed. The factory default setting is for the warning to be off.

To activate the out-of-level warning, turn the receiver on. Press and hold the power button then press and release the brightness button. An "X" pattern flashes and the center green LED lights to confirm that the warning is on. Pressing the button combination again while the "X" pattern is lit, allows you to toggle between having this function turned on and off. When the center green LED is not lit, the warning is off.

When the warning is turned on and the laser drops to 300 RPM, a flashing "X" pattern appears on the display to indicate that the laser is out of level.



Laser Out Of Level OFF

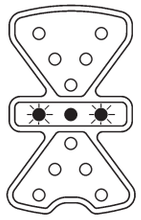


Laser Out Of Level ON

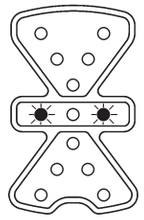
Beam Averaging

The beam-averaging function senses the laser strikes and applies the highest level of averaging appropriate for the laser rotation speed. Averaging stabilizes the LED display in unstable laser setups, such as windy conditions or long-range applications. The factory default setting is for beam averaging to be on. The beam-averaging function can also be turned off. When the function is off, the receiver processes and displays each laser strike.

To change between having this function turned on or off, press and hold the power button then press and release the deadband button. The outer green on-grade LEDs flash to indicate that averaging is selected. When the center LED is on, averaging is on. When the center LED is off, averaging is off. Pressing this button combination while the LEDs are activated changes the current selection between on and off.



Averaging ON



Averaging OFF

Specifications

Beam Reception Range	360 degrees		
Operating Range	Over 460 m (1500 ft) radius, laser dependent		
Laser RPM	Minimum: 105; Maximum: 1200		
Vertical Reception	171 mm (6.75 in.)		
Accuracy: On-Grade Width	Fine: 5 mm (0.20 in.)	Standard: 12 mm (0.45 in.)	Wide: 32 mm (1.25 in.)
5 Channel Display	High, Fine High, On-Grade, Fine Low, Low		
Display Output	Bright or Dim		
Power Options	Alkaline – 4 x "C" Cell – Standard Nickel Metal Hydride – 4 x "C" Cell Power Cable – 10 -30 V dc		
LR30 Battery Life – Alkaline *(Continuous in beam)*	75 hours, Display Dim 50 hours, Display Bright		
LR30 Battery Life – Ni-MH *(Continuous in beam)*	50 hours, Display Dim 40 hours, Display Bright		
LR30W Battery Life – Alkaline *(Continuous in beam)*	40 hours, Display Dim 30 hours, Display Bright		
LR30W Battery Life – Ni-MH *(Continuous in beam)*	30 hours, Display Dim 20 hours, Display Bright		
Battery Recharge Time	3 – 4 hours		
Automatic Control Capability	Yes with CB20, CB25 & CB30 Control Boxes		
Automatic Shutoff	75 minutes with no laser beam		
Out-of-Beam Indication	High and Low, Selectable On or Off		
Weight (with Batteries)	2.7 kg (6.0 lb)		
Dimensions (LxWxD)	343 mm x 142 mm x 149 mm (13.50 in. x 5.58 in. x 5.88 in.)		
Mounting Pipe Round Tube (Outside Diameter) Square Tube	42 mm to 50 mm (1.66 in. to 2.00 in.) 38 mm (1 ½ in.)		
Operating Temperature	–20 °C to +60 °C (–4 °F to 140 °F)		

**Specifications subject to change without notice*

Installation

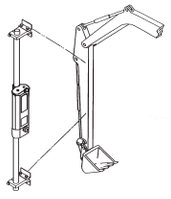
1. Position the machine so the blade or bucket can be set to the desired finished elevation (typically on a benchmark or hub stake).

   Note: When an excavator or backhoe is being used, the dipper arm should be vertical or near vertical, and the bucket positioned so that it can easily be put in the same position each time a grade reading is taken.
2. Set up the laser in an appropriate location for receiver visibility and efficient machine operation. Turn on the laser.
3. Turn on the receiver.
4. Slide the receiver up or down along the length of the mounting pipe to make sure that the laser beam intersects the pipe where the receiver will be mounted.

   Note: Ideally you should be able to move the receiver far enough in either direction to use the entire reception range (receiving all the grade displays and out-of-beam indicators). Adjusting the height of the laser may be necessary.
5. Turn the top and bottom mounting knobs counterclockwise until the mounting clamps in the back of the receiver open enough to fit around the mounting pipe.
6. Place the receiver on the pipe. Move the receiver up or down until the on-grade LEDs light.
7. Turn the knobs clockwise to tighten the clamps. Do not mount the receiver on painted poles. Paint can accumulate on the clamps and deteriorate the clamps' gripping capacity.

   Note: When the receiver is mounted to a bulldozer, motorgrader, scraper, or other grading machine, keep the blade at the proper elevation by manually controlling the blade so that the receiver stays within on-grade range. The LEDs show which direction the blade needs moving to be on grade.

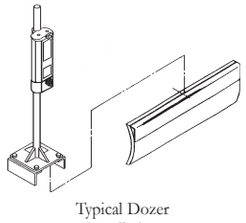
Note: When the receiver is mounted to an excavator or backhoe, the receiver is a grade checker and allows the depth of cut to be monitored from the cab of the machine. To check grade, put the dipper arm in the vertical position and the bucket in the setup position. Touch the bucket to the bottom of the ditch.



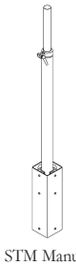
Typical Excavator / Backhoe Installation



MM-1 Magnetic Mount for Excavator / Backhoe



Typical Dozer Installation



STM Manual Telescoping Mast

8. To remove the receiver from the machine, loosen the two clamps and remove the receiver from the mounting pipe. Be sure to store and transport the receiver in its carrying case.

Declaration of Conformity

This receiver to which this declaration relates is in conformity with the essential requirements and other relevant requirements of the Directive 2004/108/EC (EMC), Directive 2006/95/EC (LVD) and Council Directive 1999/5/EC R&TTE.

Safety: (article 3.1a)	BS EN60950-1: 2006/A12:2011 EN 62311:2008
EMC: (article 3.1b)	ETSI EN 301 489-1 V1.9.2 (2011-09) in accordance with the specific requirements of CISPR33, ETSI EN 301 489-17 V2.1.1 (2009-05)
Spectrum: (article 3.2)	ETSI EN 300 328 V1.7.1 (2006-10) EN61000-9-2, EN61000-9-3, EN61000-9-6, EN61000-9-8

We hereby declare that the equipment specified above conforms to the above Directive(s).

Spectra Precision (USA) LLC.
3265 Logistics Lane, Suite 200
Dayton, OH 45377 U.S.A.

August 24, 2012

Warranty

Spectra Precision LLC warrants the receiver to be free of defects in material and workmanship for a period of two years.

Spectra Precision LLC or its authorized service center will repair or replace, at its option, any defective part for which notice has been given during the warranty period. If required, travel and per diem expenses to and from the place where repairs are made will be charged to the customer at the prevailing rates.

Customers should send the product to the nearest authorized service center for warranty repairs, freight prepaid. In countries with Spectra Precision LLC subsidiary service centers, the repaired product will be returned to the customer, freight prepaid.

Any evidence of negligent, abnormal use, accident, or any attempt to repair the product by other than factory-authorized personnel using Spectra Precision LLC certified or recommended parts, automatically voids the warranty.

The foregoing states the entire liability of Spectra Precision LLC regarding the purchase and use of its equipment. Spectra Precision LLC will not be held responsible for any consequential loss or damage of any kind.

This warranty is in lieu of all other warranties, except as set forth above, including any implied warranty merchantability of fitness for a particular purpose, are hereby disclaimed. This warranty is in lieu of all other warranties, expressed or implied.

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