

RD20 Wireless Remote Display User Guide

Introduction

Thank you for choosing the Spectra Precision® RD20 Wireless Remote Display. It is designed to work with the LR30W, LR50W and LR60W laser receivers, and it can be quickly mounted in the cab of the machine for easy viewing. The large, very bright (adjustable) blue, red and green LEDs provide instant elevation feedback, even from the corner of the eye. The loud, adjustable speaker also provides audible tones for high, low and on-grade for use without viewing the receiver or remote display at all.

In addition to providing grade, plumb and tilt information (where applicable), the RD20 can be used to remotely set the receiver for optimal excavator operation, to remotely match on-grade for easier benchmarking, and to remotely match a tilt angle for easier sports fields construction. Please note that the tilt angle indication and matching can be displayed for LR50W and LR60W receivers only.

The RD20 gets its power from the machine or from 2 internal AA batteries. Automatic switch-over from machine power to internal batteries occurs instantly, allowing the display to be quickly detached and moved to another machine or for remote monitoring.

Before using this remote display, be sure to read this user guide carefully. Included is information about setting up, using and maintaining the remote display. Also included in this manual are Notes, which indicate important information unrelated to safety.

Mounting Hardware

The mounting hardware that is supplied with the RD20 includes a quick disconnect mounting plate, magnets and double-sided tape. An optional swivel mount with suction cup is also available. Choose the mounting hardware appropriate for your situation.

Position the remote display in the machine's cab so that you can easily see or hear the display while operating the machine. Make sure the remote display doesn't obstruct other functions.

Quick Disconnect Mounting Plate

1. To install, slide the plate over the mounting screw and slide it to the left until it locks into place.
2. To remove, press the locking tab away from the remote display and slide the plate in the opposite direction.



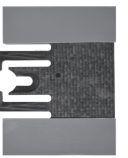
Magnets

1. Install the provided screws through the 3 magnets and the quick disconnect mounting plate as shown. Screw torque should be limited to 135 n-cm (12 in-lbs).



Tape / Fastening Strips

1. Clean the back of the quick disconnect mounting plate and the area of the machine you want to mount the remote display to.
2. Peel the protective backing from one of the adhesive sides of the tapes, and apply the tapes to the mounting plate as shown. Remove the protective backing from the remaining sides of the tapes, and apply the mounting plate to the machine.



Optional Swivel Mount w Suction Cup

1. The supplied screws can be used to install the swivel mount directly to the machine, or the suction cup can be used.



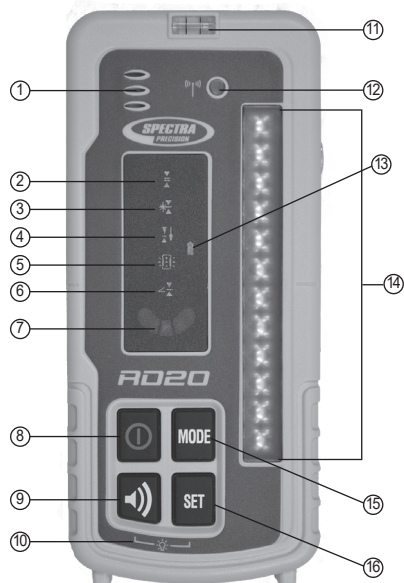
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Features, Functions and Indications



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Features, Functions and Indications

1. Audio Output (speaker)
2. Set Deadband
3. Set On-Grade Match
4. Set Excavator Mode (LR50W or LR60W only)
5. Set LR LED Brightness
6. Match Receiver Tilt (LR50W or LR60W only)
7. Tilt Display (LR50W or LR60W only)
8. RD20 Power On/Off, LR Power Off
9. Loudness Button
10. Set RD20 LED Brightness (combination press of Loudness and SET buttons)
11. Level Bubble
12. Radio Link LED
13. Low Battery LED
14. Main Elevation / Deadband / Lost Radio Link display (Red for Above Grade, Green for On-Grade and Blue for Below Grade LEDs)
15. MODE Button
16. SET Button

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Powering the RD20 and Remotely Turning Off the LR Receiver

The remote display gets its power from two "AA" internal batteries or from 6 to 30Vdc machine power via the supplied accessory power cable. When operating from machine power, system reverse voltage and over-voltage protection is built in. Switchover from internal batteries to machine power and vice-versa is instant and automatic. No charging of the internal batteries will occur when connected to machine power.

To turn on the unit, press the POWER button for 1 second. The unit will beep and initialize a function test, after which the radio link status and receiver deadband will be displayed.

To turn off the unit, press the POWER button again for 2 seconds. To turn off the RD20 AND the LR receiver, press and HOLD the button for 4 seconds (NOTE: It's not possible to turn on the LR receiver from the RD20).

The Low Battery LED (item 13) flashes to indicate the two AA internal batteries should be changed.

Internal Batteries

1. Open the battery door by using a coin or your thumbnail to release the battery door latch.
2. Insert two AA batteries noting the plus (+) and minus (-) diagrams inside the battery housing.
3. Close the battery door. Push down on the door until the latch "clicks" into the locked position.



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Accessory Power Cable

1. The maximum extended length of the cable is 1.8m (6 ft).
2. Plug the small cable connector into the remote display power connector.
3. Plug the accessory connector into the machine's accessory power socket.



Radio PAIR to the LR30W, LR50W or LR60W

The RD20's digital radio is required to be configured to the specific LR30W, LR50W or LR60W it will be working with (required only once for each device, and will only operate with one device at a time). If your RD20 shipped as part of a LR system it is pre-configured (PAIR'ed) at the factory, and no action is required. If you want to PAIR your RD20 to another device use the following directions.

To PAIR the RD20 with a LR30W, Start RD20 PAIR mode:

1. Make sure the RD20 is turned OFF
2. Press the MODE and SET keys at the same time, then press the POWER key. When the RD20 starts its power-up sequence let up on all three keys.
3. After the RD20 completes its power up sequence, the Radio Link LED will blink rapidly indicating the RD20 is in PAIR mode.

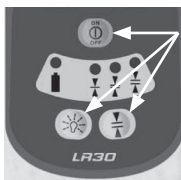
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LR30W PAIR mode:

1. Make sure the receiver is turned OFF
2. Press the BRIGHTNESS and DEAD-BAND keys, then while continuing to hold them down press the POWER key at the same time. When the receiver starts its power-up sequence let up on the keys.

3. After the receiver completes its power up sequence, the On-Grade LEDs will blink rapidly indicating the receiver is in PAIR mode.

Wait about 5 seconds for the 2 units to PAIR to each other. When PAIR is complete the rapid blink of the LEDs on both units will stop and normal operation will start.



LR50W PAIR mode:

To PAIR the RD20 with a LR50W, start RD20 PAIR mode as described in the previous section. Start LR50W PAIR mode:

1. Make sure the receiver is turned OFF
2. Press the ON-GRADE OFFSET and DEAD-BAND keys, then while continuing to hold them down press the POWER key at the same time. When the receiver starts its power-up sequence let up on the keys.

3. After the receiver completes its power up sequence, the On-Grade LED will blink rapidly indicating the receiver is in PAIR mode.

Wait about 5 seconds for the 2 units to PAIR to each other. When PAIR is complete the rapid blink of the LEDs on both units will stop and normal operation will start.



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LR60W PAIR mode:

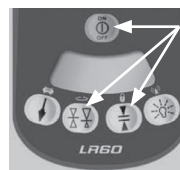
To PAIR the RD20 with a LR60W, start RD20 PAIR mode as described in the previous section. Start LR60W PAIR mode:

1. Make sure the receiver is in WIRELESS communications mode (see the LR60W user guide)

2. Make sure the receiver is turned OFF
3. Press the ON-GRADE OFFSET and DEAD-BAND keys, then while continuing to hold them down press the POWER key at the same time. When the receiver starts its power-up sequence let up on the keys.

4. After the receiver completes its power up sequence, the On-Grade LED will blink rapidly indicating the receiver is in PAIR mode.

Wait about 5 seconds for the 2 units to PAIR to each other. When PAIR is complete the rapid blink of the LEDs on both units will stop and normal operation will start.



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Audio Output

The audio output (item 1) allows the elevation of the receiver to be monitored without looking at the elevation display. The tone beeps quickly when the receiver is above the laser beam, slowly when below it, and continuously when centered in the laser beam (on-grade). A short beep is used to confirm a button has been pressed and/or acceptance of a function. On off-tone longer beep is used to indicate rejection of a requested function (such as an On-Grade Match request when no laser beam is present). Loudness of the audio output is set with the loudness button (item 9), and has 4 settings: Off, Low (75 db), Medium (95db) and Loud (105db).

Radio Link Functions and Status

A good radio link is indicated by a short double-blink of the radio link LED (item 12). If there is no link with the receiver, the RD20 will alternately flash single high and low coarse LEDs with the two on-grade LEDs. If the receiver loses link with the RD20, the receiver will alternately flash high and low coarse LEDs with the green on-grade LEDs on the main elevation display (item 14).

NOTE: to use the receiver by itself (with no RD20), disable the link by pressing the Deadband, Brightness and Power keys at the same time.



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Set Elevation Display Mode

The RD20 can operate in standard (multiple LEDs) or single LED modes. Single LED mode greatly extends battery life when using the RD20's internal batteries for power. To toggle between the two modes, with the RD20 powered up press and hold the POWER and SET buttons simultaneously until the LEDs flash (about 2 seconds). The RD20 ships from the factory in standard display mode. The last selected mode is retained after a power cycle.



Set RD20 LED Brightness

Simultaneously press the Loudness and Set buttons to adjust the brightness of the display and mode LEDs to bright, medium or dim. The brightness setting will be indicated on the main elevation display (item 14). The RD20 retains the last brightness setting after a power cycle.

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Setting Functions: MODE and SET Buttons

To select the below functions, press the MODE button (item 15) repeatedly to cycle through the functions

While the function that you want to use is illuminated (4 second duration), press the SET button (item 16) to activate the function. The last selected function always illuminates first when the MODE button is first pressed. Functions with multiple settings (such as SET DEADBAND) utilize multiple SET button presses to cycle through all the settings.

Set Deadband



With the Deadband Mode LED (item 2) illuminated press the SET button repeatedly to cycle through the available deadbands. The selected deadband will be displayed on the LR receiver and also on the main RD20 elevation display (item 14), with FINE indicated by the 2 on-grade LEDs, and wider deadbands (up to 4 total depending on the receiver) indicated by additional LEDs above and below on-grade. The receiver and RD20 retain the last deadband setting after a power cycle.

NOTE: The available deadbands are limited to fine and standard sensitivities only when the LR60W is in the angle compensation (ACE) mode.

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Set LR LED Brightness



This function sets the brightness of the receiver LEDs between bright or dim. With the LR LED Brightness Mode LED (item 5) illuminated press the SET button repeatedly to cycle between bright and dim settings. The receiver retains the last brightness setting after a power cycle.

Match Receiver Blade-Tilt



This function sets the current tilt position of the LR50W or LR60W to indicate center (green LED) on the RD20. This function is used to match an existing tilt for drainage or for grading conical shapes, such as baseball infields or water tank drains. To activate this function:

LR60W: Blade-tilt display must be enabled at the receiver for the RD20 to display or match tilt. To toggle blade-tilt display on/off at the LR60W, make sure the receiver is turned on, then momentarily and simultaneously press the Power, Plumb and Deadband buttons at the same time. This toggles blade-tilt display at the RD20 on or off. Tilt accuracy on the LR60W is fixed at the fine (+/- 0.5°) setting.

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Warranty

Spectra Precision LLC warrants the remote display 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, or the entire product, for which notice has been given during the warranty period. This warranty period is in effect from the date the system is delivered by Spectra Precision LLC or its authorized Dealer to the purchaser, or is put into service by a Dealer as a demonstrator or rental component.

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.

Customers should send the product to the nearest authorized Factory, Dealer or Service Center for warranty repairs or exchange, freight prepaid. In countries with Spectra Precision LLC Service Subsidiary Centers, the repaired or exchanged products will be returned to the customer, freight prepaid.

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Set On-Grade Match



This function allows a current laser strike location to become the on-grade location. This function is useful when benching the machine, or to make minor changes to the graded elevation, in order to reduce operator trips out of the cab. To activate this function:

1. Position the receiver to the desired elevation while receiving a laser strike.

2. With the Set On-Grade Match Mode LED (item 3) illuminated, press the SET button to set the receiver and RD20 elevation displays to On-Grade at the current valid receiver beam strike location. NOTE: If the command is accepted, the receiver and RD20 green on-grade LEDs will illuminate, the RD20 will emit a short beep, and the RD20 On-Grade Match LED will transition to a continuous double-blink indication to show an offset is being used. If the command is not accepted an off-tone long beep is emitted and no changes or indications are shown.

NOTE: The vertical range over which a receiver will accept this function depends on the model and selected deadband. The acceptance limit on proportional receivers is about 2.5 cm (1 in.) from the edge of the photocell array so that both above and below grade information can be displayed.

NOTE: The match function does not operate when the LR60W is in the angle compensation (ACE) mode.

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LR50W: Blade-tilt display must be enabled at the receiver for the RD20 to display or match tilt. To toggle tilt display on/off at the LR50W, make sure the receiver is turned on, then press and release the blade-tilt button on the receiver to toggle tilt display at the RD20 on or off. Tilt accuracy is also set at the receiver and has 3 settings: fine (+/- 0.5°), standard (+/- 1.5°) and wide (+/- 2.5°). To cycle through and select one of these options, press and hold the receiver power button; then simultaneously press the blade-tilt button. The current accuracy selection flashes rapidly. To change the current selection, continue pressing this button combination while the status LED is flashing.

1. With the Match Receiver Tilt Mode LED (item 6) illuminated, press the SET button to set the current receiver tilt to the center, green LED on the tilt display. The RD20 will emit a short beep, and the RD20 Blade-tilt Display will change to the center green LED. The RD20 retains the last set blade-tilt angle after a power cycle.

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Request for Service

To locate your local dealer or authorized Spectra Precision Service Center outside the U.S.A for service, accessories, or spare parts, contact one of our offices listed below or www.spectraprecision.com.

North & Latin America
Spectra Precision
3265 Logistics Lane, Unit 200
Dayton, Ohio 45377
U.S.A.
(888) 527-3771 (Toll Free)

Europe, Africa & Middle East
Spectra Precision Kaiserslautern GmbH
Am Sportplatz 5
67661 Kaiserslautern
GERMANY
Tel +49-(0)6301-71 14 14
Fax +49-06301-32213

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NOTE: If the LR60W and LR50W are in excavator mode the On-Grade Match function valid range is limited to the center of the photocells up to 2.5cm (1 in.) from the top of the photocells.

3. To return to the center on-grade location, press the MODE button to illuminate the Set On-Grade Match LED, then press and hold the SET button for 4 seconds. A short beep will be emitted, the On-Grade Match LED double-blink indication will stop, and on-grade position returns to the default location. Another way to return to the center on-grade location is to cycle power on the RD20.

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Specifications

Compatible Receivers:	LR30W, LR50W, LR60W
Radio:	Full 2-way communication, operation and security lock with PAIR'ed device
Radio Working Radius:	30m (100 ft) typical, depending on conditions and orientation of PAIR'ed device
Power Options	Internal AA batteries (2) 10-30Vdc with external power Cable Automatic switchover from internal to external power
Battery Life (internal):	20 hours typical
Beeper Volumes:	Loud = 105 dBA Medium = 95 dBA Low = 75 dBA
LED Grade Indicators:	Green on-grade, red high, blue low w/ 3 brightness settings
Automatic Shut Off:	30 minutes if no beam strike or loss of radio link with receiver
Environmental:	Waterproof, dustproof to IP67
Weight (without Mount):	323g (11.4 oz.)
Dimensions (without Mount):	168.0 x 76.0 x 36.0 mm (6.6" x 3.0" x 1.4")
Operating Temperature:	-20°C...+60°C (-4°F... +140°F)
Storage Temperature:	-30°C...+70°C (-22°F...+158°F)

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Set Excavating Mode



This function sets up the LR50W or LR60W for optimal excavator operation, by doing two things: setting the receiver to offset on-grade, and turning the receiver plumb indication on. Offset on-grade is a position on the receiver indicated by a symbol on the back of the receiver, and is used to provide excavator operators more notice they are approaching finished elevation (so they don't over dig). Plumb indication on the receiver tells the operator how plumb the excavator boom is by flashing the elevation LEDs (slow blink = boom retracted, fast blink = boom extended, solid LEDs = boom is plumb).

To activate this function:

1. With the Excavating Mode LED (item 4) illuminated, press the SET button to set the LR receiver to optimal excavating mode. The RD20 will emit a short beep, and the RD20 Excavator Mode LED will transition to a continuous double-blink indication to show that excavator mode has been set.

NOTE: This function does not operate when the LR60W is in the angle compensation (ACE) mode.

2. To return the receiver to center on-grade position, press the MODE button to illuminate the Set Excavator Mode LED, then press the SET button. A short beep will be emitted, the Excavator Mode LED double-blink indication will stop, and receiver on-grade position returns to the center location.

NOTE: When in Excavator Mode, the On-Grade Match function valid range is limited to the center of the photocells up to 2.5cm (1 in.) from the top of the photocells.

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EC 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

CISPR22 Class A,

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).

August 24, 2012

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



Spectra Precision (USA) LLC
3265 Logistics Lane, Suite 200
Dayton, OH 45377 USA
888-527-3771 (Toll Free)

www.spectraprecision.com

Spectra Precision
(Kaiserslautern) GmbH
Am Sportplatz 5
67661 Kaiserslautern
Germany
+49-6142-2100-0 Phone



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