CR600 Receiver

User Guide



SPECTRA PRECISION

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Features and Functions



1. **Power/Audio Button**—is a multi-functional button that turns the receiver on/off and allows you to adjust the audio volume.
2. **Grade-Sensitivity Button**—allows you to cycle through receiver's on-grade sensitivities.

   The hand-held grade sensitivities include fine: 1.5 mm (1/16 in.); medium: 3 mm (1/8 in.); and coarse: 6 mm (1/4 in.). The machine grade sensitivities include: fine 10 mm (3/8 in.) and coarse: 25 mm (1 in.). This button also allows you to select ultra-fine: 0.1 mm (0.004 in.) and super-fine: 1 mm (1/32 in.) grade sensitivity when used with the power/audio button. The machine grade-sensitivity mode has an offset for on-grade. On-grade is 50 mm (2 in.) below the top of the receiver and is not centered in the photocell.
3. **Offset Distance Scale**—coincides with the LCD bar display and is used to work at an offset distance from on-grade. Three offset scales, which include metric, hundredths of a foot, and inches, are available. Simply place the decal appropriate for your needs on the right side of the LCD.
4. **Marking Notches**—align with the on-grade portion of the photocells and are used to mark elevation readings. The marking notches are 50 mm (2 in.) from the top of the receiver.
5. **Liquid Crystal Display (LCD)**—shows the elevation, grade sensitivity, audio, out-of-level, and battery status.
6. **Groove**—is the channel that the grade-rod tongue fits into so the receiver can be attached to the grade rod or magnetic mount.





7. **Audio Port**—is the opening the sound comes out of.
8. **Battery Housing**—holds three AA alkaline or Ni-Cd batteries. The battery-housing door is also used to attach the receiver to a custom grade rod, magnetic mount, or the general-purpose clamp.
9. **Remote Contacts**—provides grade-display signals to a radio remote control.
10. **Photocell**—detects the laser beam when it strikes the receiver. The photocell allows you to face the LCD and LEDs and have access to the control buttons, regardless of your position relative to the laser beam. If the receiver does not detect the laser beam for 30 minutes, the receiver shuts off automatically.
11. **LEDs**—show the position of the receiver relative to the laser beam (above grade, on grade, or below grade).
12. **Remote Mounting Channels**—provide a recess for the radio remote control mounting guides to fit into so the radio remote control can be attached to the receiver.

LCD/LED/Audio Information

LCD Readout	Function	Audio Output	LED Indication
6 to 7 down arrows	Machine: coarse high	Fast beeping tone	High LEDs: solid red
5 to 7 down arrows	Machine: medium high	Fast beeping tone	High LEDs: solid red
4 to 7 down arrows	High	Fast beeping tone	High LEDs: solid red
3 to 5 down arrows	Machine: fine high	Fast beeping tone	High LEDs: flashing red
2 to 3 down arrows	Medium high	Fast beeping tone	High LEDs: flashing red
Center bar & 1 down arrow	Fine high	Fast beeping tone	High LEDs: flashing red
Center bar	On-grade	Continuous tone	Flashing green
Center bar & 1 up arrow	Fine low	Slow beeping tone	Low LEDs: flashing red
2 to 3 up arrows	Medium low	Slow beeping tone	Low LEDs: flashing red
3 to 5 up arrows	Machine: fine low	Slow beeping tone	Low LEDs: flashing red
4 to 7 up arrows	Low	Slow beeping tone	Low LEDs: solid red
5 to 7 up arrows	Machine: medium low	Slow beeping tone	Low LEDs: solid red
6 to 7 up arrows	Machine: coarse low	Slow beeping tone	Low LEDs: solid red

LCD/LED/Audio Information (cont.)

LCD Readout	Function	Audio Output	LED Indication
Level vial with out-of-level bubble	Laser out-of-level alert	High/low beeping tone (audio must be on)	———
Battery	Low battery	N/A	N/A
Horn	Audio on soft/loud	Single beep	———
Flashing horn	Audio off at on-grade	———	———
Flashing arrow	Lost beam indication	N/A	Flashing red
———	Line alert on	Beep on 1-Hz rate	All LEDs flash for 3 seconds
———	Line alert off	N/A	Both red LEDs flash
All icons on the LCD appear for 1 second	Power on	Single beep	All LEDs flash for 1 second
Flashing fine	Ultra-fine grade sensitivity	N/A	N/A
Flashing fine and medium	Super-fine grade sensitivity	N/A	N/A
Fine	Fine grade sensitivity	N/A	N/A
Medium	Medium grade sensitivity	N/A	N/A
Coarse	Coarse grade sensitivity	N/A	N/A
Fine + Machine Symbol	Machine fine grade sensitivity	N/A	N/A
Medium + Machine Symbol	Machine coarse grade sensitivity	N/A	N/A

How to Use the Receiver

Installing the Batteries



1. Turn the battery-housing knob counterclockwise.
2. Remove the battery-housing door.
3. Insert the battery as shown noting the plus (+) and minus (–) diagram inside the housing.
4. Put the battery-housing door in place. Push in the knob and turn it clockwise.

Learning the Receiver Functions

Standard

Turning On/Off the Receiver

1. Press the power/audio button to turn on the receiver.

   Note: When the receiver is initially turned on, all LCD symbols and LEDs are turned on for one second (diagnostic mode). After the diagnostic mode is complete, all the symbols of the last selected modes appear.
2. Press and hold the power/audio button for 2 seconds to turn off the receiver.

Selecting the Audio Function

The receiver always starts up in the last selected audio level (the factory default setting is soft).

1. Press the power/audio button repeatedly to cycle through the audio levels, which include off, soft, and loud.

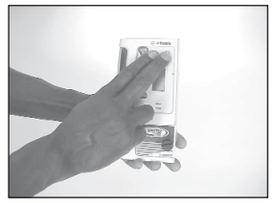
Note: The receiver beeps quickly when the receiver is above the laser beam, slowly when below it, and continuously when centered in the laser beam or on grade.

Selecting the Grade Sensitivity

The receiver always starts up in the last selected on-grade sensitivity (the factory default setting is fine).

1. Press the grade-sensitivity button repeatedly to cycle through the on-grade sensitivities, which include hand-held: fine, medium, coarse; and machine-mounted: fine, and coarse.
2. To select ultra-fine or super-fine on-grade sensitivities, press and hold the grade-sensitivity and power/audio buttons for 2 seconds.

   Note: As you hold the buttons, the receiver cycles through the ultra-fine and super-fine on-grade sensitivities.
3. Release both buttons when the sensitivity that is appropriate for your application needs appears in the LCD.



Selecting the LED Settings

The LEDs show the position of the receiver relative to the laser beam. Three LED settings can be selected from: bright, dim, and off. Dim is the factory default setting. Turning off the LEDs extends battery life.

Rod-Mounted and Hand-Held Mode

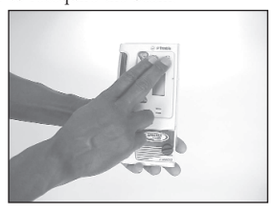
The red LEDs flash when the receiver is within 13 mm (1/2 in.) of being on grade. The low red LEDs light continuously when the receiver is between 13 and 25 mm (1/2 in. and 1 in.) of being above the laser beam. The high red LEDs light continuously when the receiver is between or 13 and 95 mm (1/2 and 3 3/4 in.) below the laser beam. The green LEDs flash when the receiver is on grade.

Machine-Mounted Mode

In fine mode, the red LEDs flash when the laser beam is more than 15 mm (9/16 in.) of being on grade. In coarse mode, the red LEDs flash when the laser beam is more than 20 mm (13/16 in.) of being on grade. The low red LEDs light continuously when the laser beam is between 15 and 25 mm (9/16 and 1 in.) of being on grade in fine mode, and between 20 and 25 mm (13/16 and 1 in.) of being on grade in coarse mode. The high red LEDs light continuously when the laser beam is between 15 and 95 mm (9/16 and 3 3/4 in.) of being on grade in fine mode, and between 20 and 95 mm (13/16 and 3 3/4 in.) of being on grade in coarse mode.

The LEDs can also be used for lost-beam indication. If the LEDs are turned on, the top or bottom red LEDs flash for 20 seconds to show the direction to move the receiver to reacquire the beam. For additional lost-beam indication, a bank of up or down arrows in the LCD flashes for 20 seconds to show the direction to move the receiver to reacquire the beam.

1. Simultaneously press the grade-sensitivity and power/audio buttons repeatedly to cycle through the LED settings: bright, dim, and off.



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Advanced

Turning On/Off Line Alert

Line alert is used primarily when the laser is in vertical mode to monitor the "on-grade" alignment of the laser beam.

The receiver always starts up in the last selected line-alert mode. If the receiver starts up with the line alert on, all LEDs flash (bright setting) simultaneously and the receiver beeps for 3 seconds.

1. Press and hold the grade-sensitivity button for 5 seconds to enter the line alert mode.



Note: The receiver cycles through the line alert settings, which include on and off, every 3 seconds.

Note: When line alert is on, all LEDs flash simultaneously and the receiver beeps for 3 seconds. When line alert is off, both red LEDs flash for 3 seconds.

Note: On-grade monitoring starts after 5 seconds of a continuous on-grade condition. To confirm that the laser beam is still aligned to on-grade, all LEDs flash once per second every 10 seconds. If the laser beam is disturbed, blocked, or moved from on-grade for more than 5 seconds, the LEDs start flashing. After 45 seconds of the beam being disturbed continuously, the receiver starts beeping once per second, regardless of the audio setting.

Turning On/Off the "Audio On-Grade" Monitoring Mode

The audio on-grade monitoring mode allows you to use the audio function to monitor whether or not the receiver is on grade. When the monitoring mode is off, the receiver beeps when the receiver is on grade. When the monitoring mode is on, the receiver is silent when the receiver is on grade.

The receiver always starts up in last selected monitoring mode.

1. When turning on the receiver, continue to press and hold the power/audio button for 2 seconds to enter the audio on-grade monitoring mode.



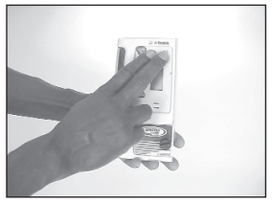
Note: When the monitoring mode is on, the horn symbol in the LCD flashes. When the monitoring mode is off, the horn symbol in the LCD is on continuously.

2. Press the power/audio button to turn off the monitoring mode.

Resetting the Factory Default Settings

When using this function, you can reset the receiver to its factory default settings, which include: LEDs–dim; grade sensitivity–fine; and audio–soft.

1. When turning on the receiver, press and hold the power/audio and grade sensitivity buttons simultaneously for 5 seconds.



Note: After 5 seconds, all indicators flash to show that the defaults have been reset.

Attaching the Receiver to the…

General-Purpose Clamp

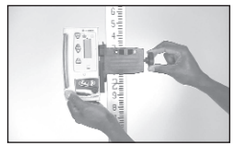
The general-purpose clamp attaches to the receiver so the receiver can be used with a grade rod or wooden pole.

1. Turn the battery-housing knob counterclockwise to loosen the battery-housing door.
2. Slide the receiver's groove onto the clamp's tongue until it stops at the edge stop.
3. Turn the battery-housing knob clockwise to hold the receiver securely in place.
4. To attach the clamp to a rod, turn the jaws screw counterclockwise to open the clamp's jaws.
5. Slide the clamp onto the rod.
6. Turn the jaws screw clockwise to tighten the clamp to the rod.









Note: The level vial on the clamp can be viewed from above or below to verify that the rod is plumb.

Magnetic Mount

The magnetic mount attaches to the receiver for use on machines or for special vertical applications mounted to a tripod or a batter board.

1. Turn the battery-housing knob counterclockwise to loosen the battery-housing door.



2. Slide the receiver's groove onto the mount's tongue until it stops at the edge stop.
3. Turn the battery-housing knob clockwise to hold the receiver securely in place.



Note: The marking notches on both sides of the receiver/magnetic mount align with the on-grade portion of the photocell and are used to mark vertical position readings. The marking notches are 50 mm (2 in.) from the top of the receiver/magnetic mount.



Note: The $^{5}/_{8}$-11 tripod mount aligns with the on-grade portion of the photocell and is used to mount the receiver on a tripod or a batter board.



Specifications

Housing	Heavy-duty metal (die-cast magnesium) capable of a 3 m (10 ft) drop on concrete
LCD Channels	15 linear display segments
Offset Decals	English 0.01 ft. increments, Imperial in. increments, metric increments
Capture Height	114 mm (4.5 in.)
Acceptance Angle	270°
LCD Readout	Front, regardless of the receiver's orientation to the laser beam
On-Grade Sensitivity	Ultra-fine: 0.1 mm (0.004 in.) Super-fine: 1 mm ($^{1}/_{32}$ in.) Rod-Mount/Hand-Held Mode: Fine: 1.50 mm ($^{1}/_{16}$ in.) Medium: 3.00 mm ($^{1}/_{8}$ in.) Coarse: 6.00 mm ($^{1}/_{4}$ in.) Machine-Mount Mode: Fine: 10 mm ($^{3}/_{8}$ in.) Coarse: 25 mm (1 in.)
Power Source	Three 1.5-V batteries (type LR6/AA)
Battery Life @ 20 °C (68 °F)	Alkaline: >100 hours
Battery Indicator	LCD battery symbol
Automatic Shutoff	30 minutes after last laser detection or push-button actuation
Spectral Sensitivity	Operates with red visible and infrared lasers with wavelength between 610 and 900 nm
Marking Notch	50 mm (2 in.) below top of receiver
Audio Function	Soft/loud/off
Operating Temperature	–20 °C to +50 °C (–4 °F to +122 °F)
Storage Temperature	–40 °C to +70 °C (–40 °F to +158 °F)
Weight	.5 kg (1.1 lb)
Dimensions (T x W x L)	3.0 x 9.3 x 18 cm (1.2 x 3.6 x 7.0 in.)

EMC Declaration of Conformity

This receiver has been tested and found to comply with the limits for a Class B digital device for radio noise for digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communication, and is pursuant to part 15 of the Federal Communication Commission (FCC) rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This receiver generates radio frequency. If it's not used in accordance with the instructions, it may cause harmful interference to radio or television reception. Such interference can be determined by turning the receiver off and on. You are encouraged to try eliminating the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the laser and the receiver.

For more information, consult your dealer or an experience radio/television technician.

CAUTION: Changes or modifications to the receiver that are not expressly approved by Spectra Precision could void authority to use the equipment.

Declaration of Conformity

Application of Council Directive(s):	89/336/EEC
Manufacturer's Name:	Spectra Precision (USA) LLC
Manufacturer's Address:	3265 Logistics Lane, Suite 200 Dayton, Ohio 45277 U.S.A.
European Representative Address:	Spectra Precision (Kaiserslautern) GmbH, Am Sportplatz 5 67661 Kaiserslautern, Germany
Model Number:	CR600
Conformance to Directive(s):	EC Directive 89/336/EEC using EN55022 and EN50082-1
Equipment Type/Environment:	ITE/residential, commercial & light industrial
Product Standards:	Product meets the limit B and methods of EN55022 Product meets the levels and methods of IEC 801-2, 8 kV air, 4 kV contact IEC 801-3, 3 V/m 26 to 1000 MHz 80%, @ 1 kHz



Warranty

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

Spectra Precision 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 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 certified or recommended parts automatically voids the warranty.

The foregoing states the entire liability of Spectra Precision regarding the purchase and use of its equipment. Spectra Precision 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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