

# EXTEND THE BEAM!



**INCREASE YOUR PRODUCTIVITY BY 30% WITH A  
MACHINE-MOUNTED LASER RECEIVER!**



**Contractors-Tools.com**

**CALL 1-877-866-5721**



# **RD20**

## **Wireless Remote Display**

**LR20, LR30W, LR50W, LR60W**  
**Machine Display Receivers**



# Introducing our Wireless Display Products



**RD20 – Wireless  
in-cab remote display**



**LR30W**



**LR50W**



**LR60W**

**Wireless Display Machine Receivers**



# RD20 Wireless Remote Display



**Mounts easily and quickly in the cab**  
**Links to LR's without wire**  
**Visual and audio depth indication.**  
**Controls most LR functions**



# Spectra Precision Display Receivers

- **Spectra Precision (Trimble) is the WW market leader**
- **Proven robust, durable, accurate, reliable**
- **Environmentally impervious (IP67)**
- **Enables small / medium contractors to compete with the bigger, more expensive systems**
- **Best competitive solution now offers a highly featured wireless remote in-cab display**



# How Many Machines In Use?



Backhoes	150,000
Skid-steer loader	150,000
Mini Excavator	50,000
Skid-steer w/blade	35,000
Smaller Dozer	150,000
Excavator	90,000
<b>TOTAL:</b>	<b>625,000</b>

**North America Estimate**  
**(Europe similar quantity – different mix)**  
**Majority do not have Display or Control Systems**



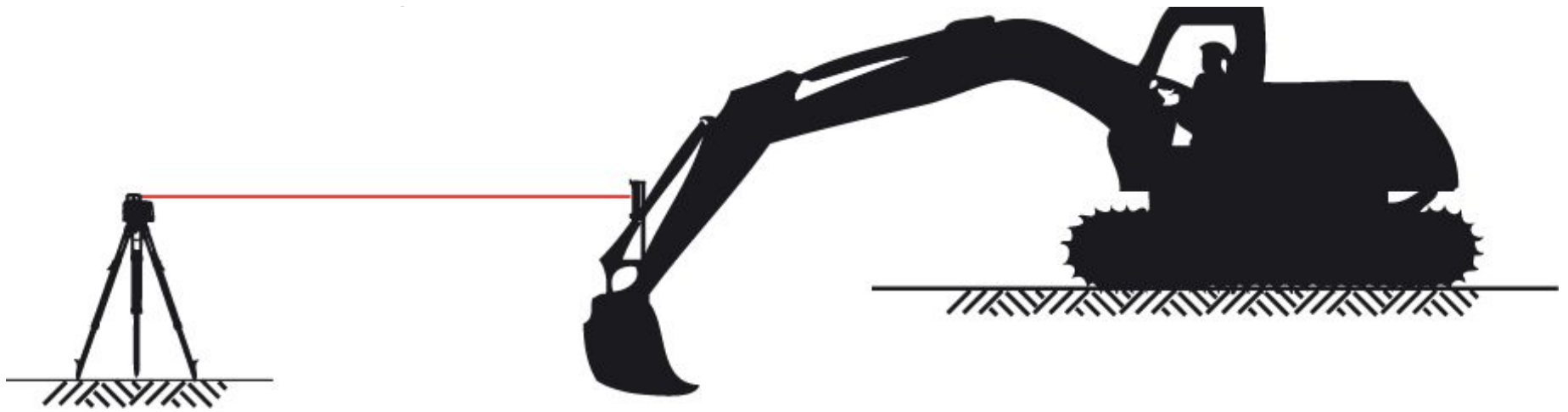


# Machine Display Fundamentals



# What Is The Machine Display Laser Concept?

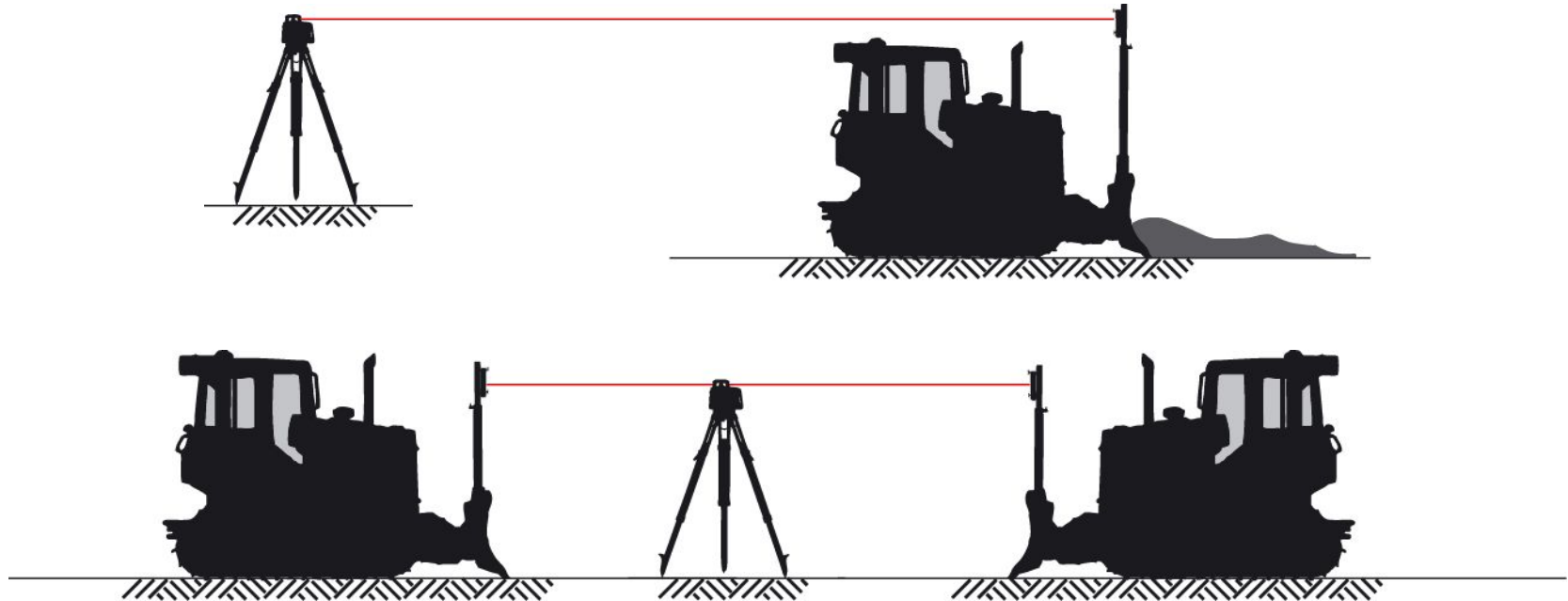
- Rotating Laser (Transmitter) sends a flat or sloped reference.
- The reference is detected by a Display Receiver mounted to a machine's blade/implement.
- Display: Using the laser reference, the machine operator controls the blade/implement according to signals on the Display Receiver or Wireless Remote Display.
- Using a laser is quicker even for a small area—no grade stakes necessary.









# Basics – Laser Grading

- The laser reference can be used by different machines
- Benchmark the blade / bucket and use the light signals to hold the implement at the correct elevation



# Deadband = Accuracy

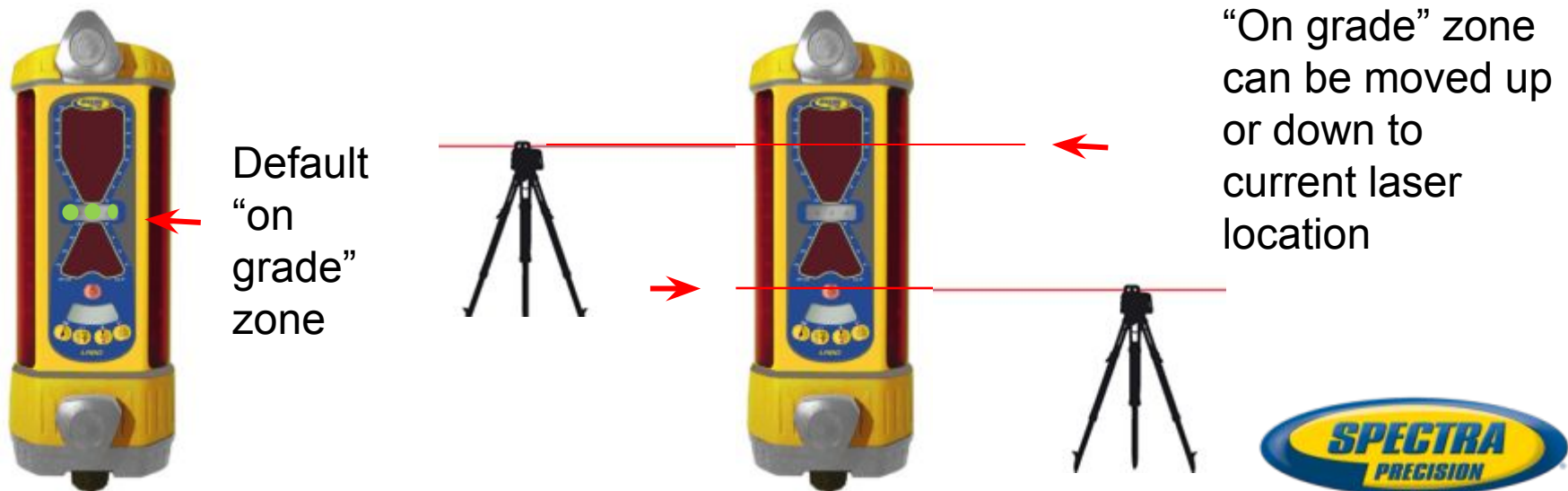
- Deadband is the “on grade” zone
- Increasing deadband reduces “noise”, reduces frequently changing readings – good for first pass, rough grading
- Decreasing deadband increases accuracy, good for final pass finish

	<u>On Grade Position</u>	<u>Fine</u> 	<u>Standard</u> 	<u>Wide</u> 
	<u>Center On-Grade</u>	<u>5 mm(.20 in)</u>	<u>10 mm(.40 in)</u>	<u>20 mm(.80 in)</u>
	<u>Offset On-Grade</u>	<u>12 mm(.50 in)</u>	<u>25 mm(1.0 in)</u>	<u>50 mm(2.0 in)</u>



# On Grade Offset

- Offset allows you to move the “on grade” zone from the center of the receiver to a desired location
- This is useful:
  - When the majority of work is either above or below grade – you can adjust “on grade” up or down so that the receiver is in the laser plane more often
  - A grade adjustment is made, you need not move LR location, just apply grade off set
  - “On Grade” up - especially effective for excavators – earlier warning you are nearing optimal depth



# Tilt indication – LR50W and LR60W

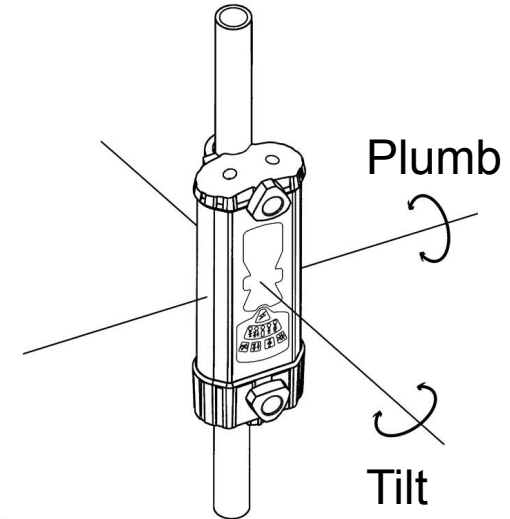
- The LR50W and LR60W recognize and display both plumb tilt angle



LR50W  
displays  
tilt

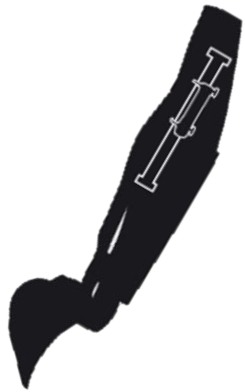


LR60W tilt  
sensor displays  
on the RD20



# Plumb indication – LR60W

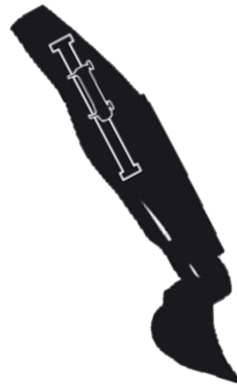
- The LR50W and LR60W recognize and displays both plumb tilt angle



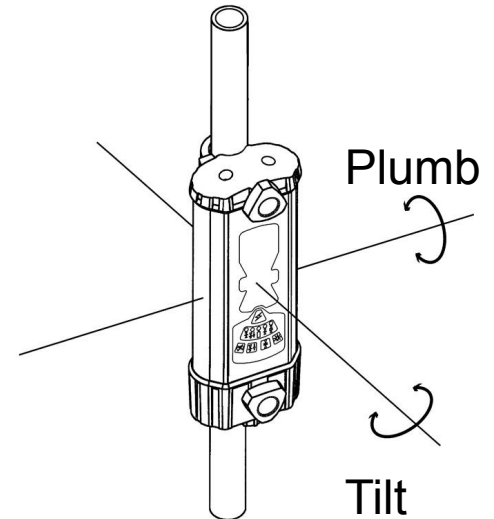
Dipper stick  
extended: LED's  
blink fast



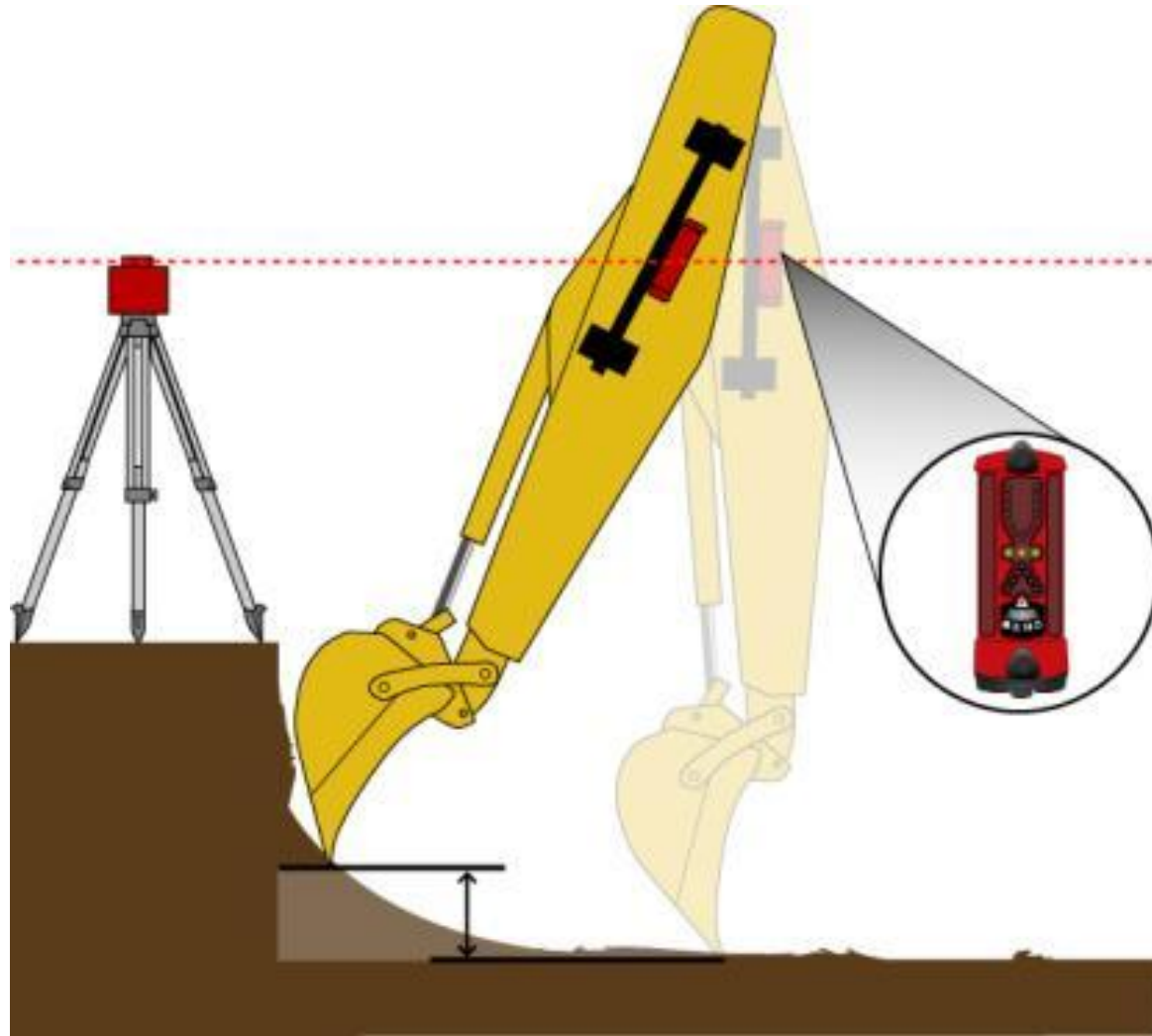
Plumb position:  
LED's are  
constantly lit



Dipper stick  
retracted: LED's  
blink slowly

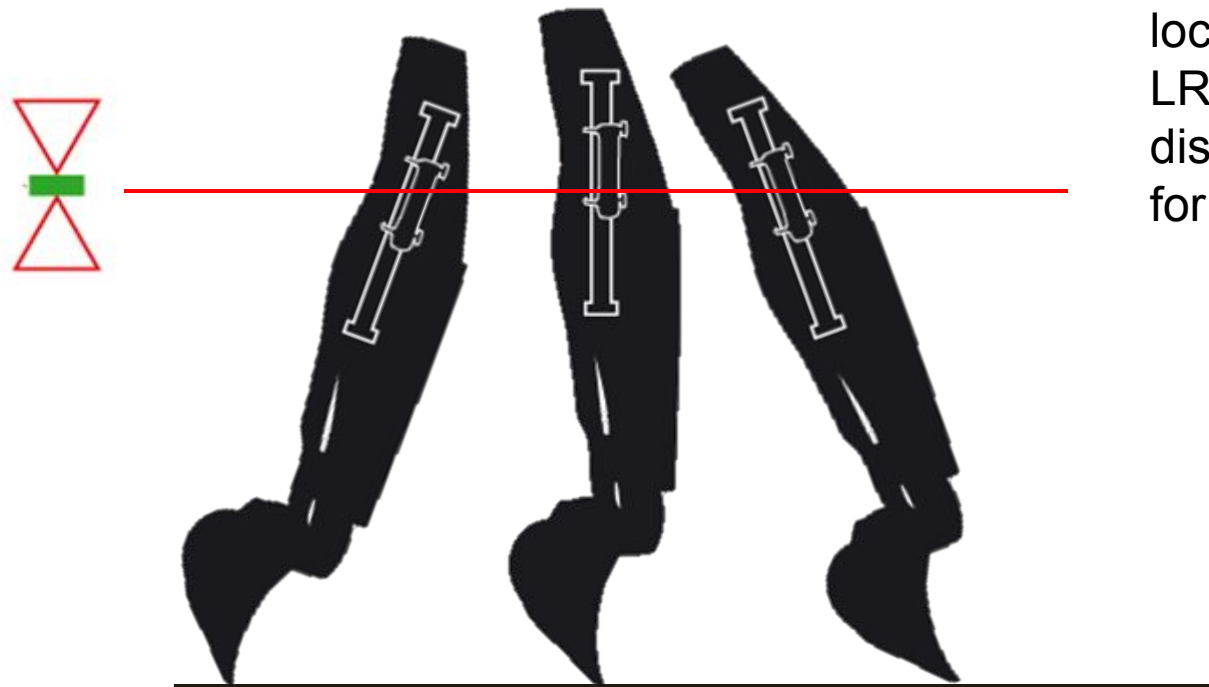


# The Problem with Standard Receivers: Angle Error!



# ACE - Angle Compensation for Excavators

- The LR60 and LR60W recognize dipper arm angle - calculate actual bucket depth
- Accurate depth readings even when dipper arm is not plumb



The laser strikes the LR60 at different locations, but the LR60W knows and displays the same depth for each position





# Contractor Applications





# Target Customers

- **Customer segments:**
  - Excavation contractors
  - Utility contractors
  - Site work contractors
  - Sports field contractors
- **Targeting applications and customers using :**
  - Skid-steer, backhoes, drag boxes, small dozers, motor graders and excavators
- **Customer qualifications**
  - Appreciates ruggedness and durability
  - Already works with lasers
  - May want to move LR's between equipment
  - Wants to get the job done right first time
  - Cannot justify \$ of full Control or GPS system



# CR600 – Skid Steer



# LR20 - Mini Excavator

- **Applications**

- Footers
- Excavations

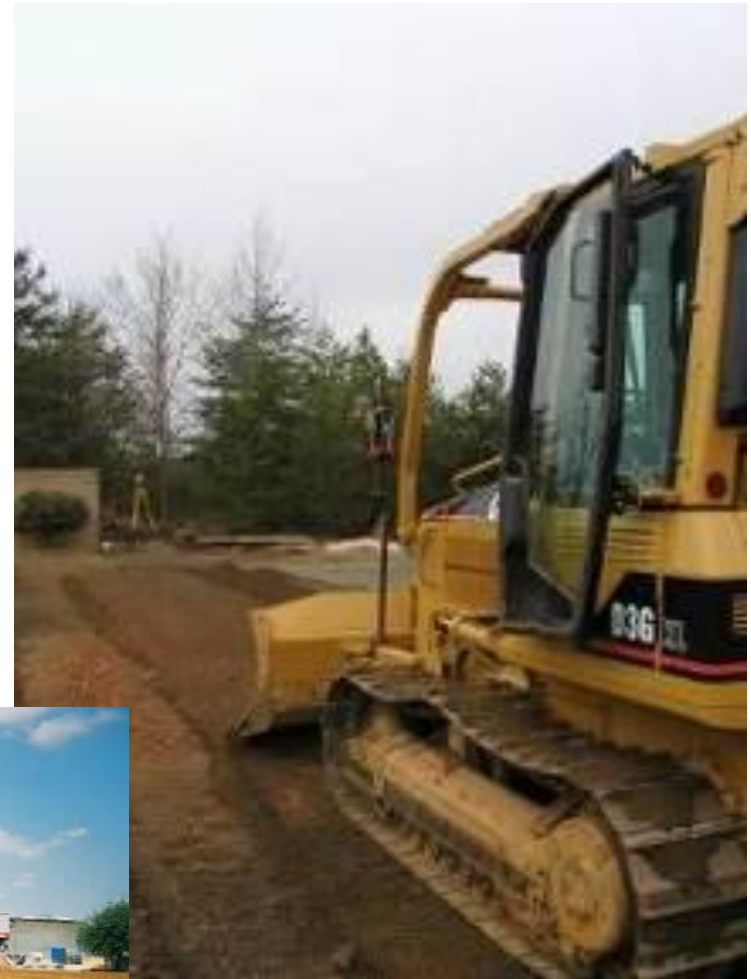
- **Benefits**

- Provides constant elevation reference
- Removes grade checker from trench/ditch
- Increases operator and machine productivity



# LR30 and LR30W: Housing and commercial pads

- Adjustable on-grade band settings match the receiver to jobsite specifications
- More pads completed in a day
- Easily installed and removed
- May be used on a variety of machines



# LR50W: Grading and Excavating

- **“Crossover”** system used for both machine types
- **Optimizes a contractor’s existing equipment**



# LR50W: Sports fields

- **Cut slopes, flat to a table top surface**
- **Use the tilt sensor and RD20 to display blade tilt for conical contours (pitchers mound to base line)**
- **Keeps up with the smaller faster moving finishing blades**
- **Reduces time to job completion**



# LR60W: Excavating

- When installing storm drains or waste pipe the operator checks grade as he works
- Keeps people out of harms way and out of the ditch
- The wireless remote display system increases versatility by utilizing the built-in tilt sensor: the system transfers easily to bulldozers





# **LR Family Laser Receiver Models Wireless Display Features and Benefits**





# Spectra Precision Machine Display Systems



- Targeted for small/medium contractor /owner-operator
- Attractive entry level pricing
- Innovative features
- Portability, useful on multiple machines
- Alternative to full Control



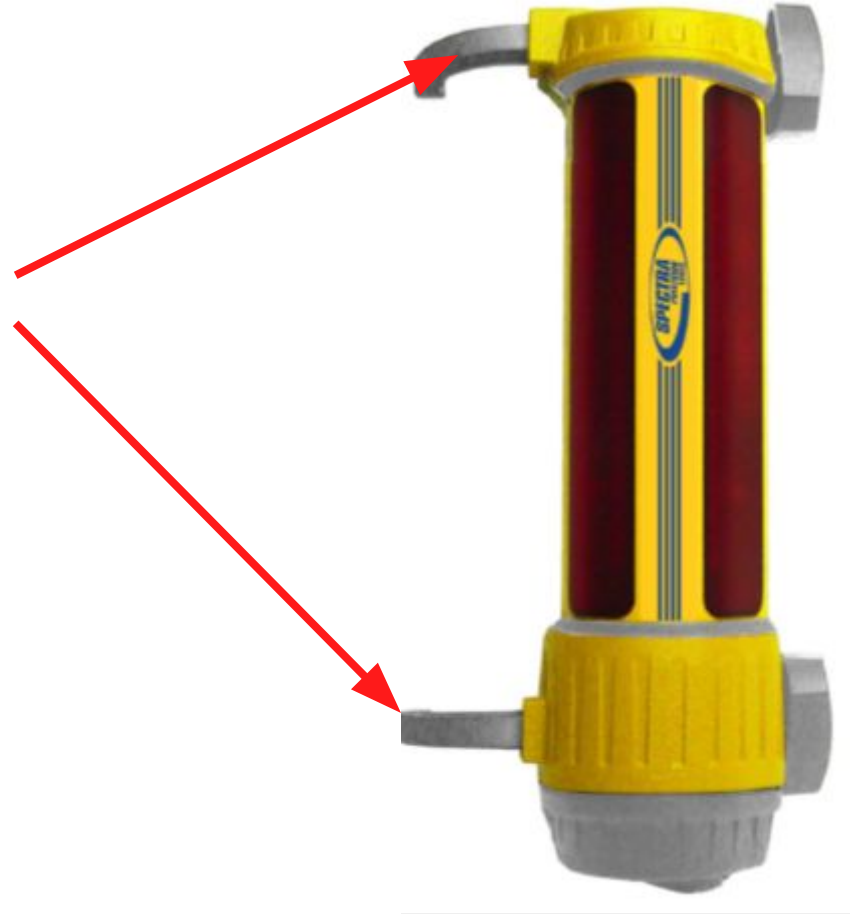
# IP67 Dust and Water Proof

- Withstands harsh jobsite conditions
- Reduced repair costs due to dust or water ingress



# Multiple Mounting Options

- **Built in clamps allow receiver to securely fasten to square or oval masts**
- **Strong clamp means receiver cannot move if slammed or shaken**



# Mount Options

Mini Mount  
CTO-MMM



Back Hoe  
Skid Steer  
Mini Excavator

Dozer Mount  
DM-20



Dozers  
(Bolt on)

Mag Mount  
MM-1



Dozers  
Excavators



# LR20 Display Receiver Features

- **20 cm (8") laser detection height**
  - More information to grade
- **Easy push button setup**
  - Start working quicker
- **Battery power indicator**
  - Alerts when charging is needed
- **Rugged polycarbonate housing**
  - Long life in harsh conditions
- **Super bright grade indication**
  - Easy to see in daylight and peripherally
- **Auto Shutoff**
  - Battery life extended



**LR20 is the correct tool for mini excavator, skid steer**



# LR30 and LR30W

5 channel display—easier to find on-grade

3 deadband settings: 5 / 12 / 32 mm

2 Brightness settings to optimize visibility and reduce eye strain



6.7-inch photocell height for large laser reception



**LR30W is the correct tool for any dozer**



# LR50 and LR50W – Cross over tool

6 channel display in excavating mode,  
5 channel display for center on-grade  
-easier to find on-grade  
-optimized for excavation  
-linear RD20 remote display

Tilt display w/ 3 accuracy  
settings for bulldozer  
operations

Plumb indication and offset on-grade for  
optimal excavator operations



6.7-inch  
photocell  
height for  
large laser  
reception

2 Brightness  
settings to  
optimize  
visibility and  
reduce eye  
strain



The tool optimized for both  
Dozer and Excavators



# LR60 and LR60W – best tool for Excavators

**9 channel display**  
-easier to find on-grade  
-linear display with RD20

**Internal tilt sensor for bulldozer operation with RD20 remote display**

**2 plumb mode settings:**  
Standard and ACE

**Angle Compensation for Excavation** allows accurate grade checking with the excavator arm out of plumb speeding up the process

**4 deadband settings**



**LARGE**  
8.75-inch  
photocell height  
for largest laser  
reception area



**LR60W is the correct tool for any excavator**







May, 2013

# RD20 Wireless Remote Display System



# RD20 Wireless In-Cab Display

- Installs Quickly and Easily in minutes
- No Wires
- Robust “Zygybee” wireless protocol – not wifi
- Grade can easily be monitored without averting operator attention



# RD20 Wireless In-Cab Display

- The RD20 will work only with wireless-capable LR's.
- Our new LR30W, LR50W and LR60W are wireless-capable
- LR20, LR30, LR50 and LR60 continue to be available
- Most existing field LR receivers can be updated to wireless to boost remote sales via upgrade kit



# RD20 Remote Display Competitive Advantages

- Bright RED-GREEN-BLUE LEDs for better “corner of the eye” grading, plus the industry’s loudest simultaneous audible tones
- More functionality: Set current beam position to on-grade, adjust receiver dead-band, adjust receiver LEDs brightness, set receiver to excavating mode, set current tilt to on-grade
- The LR30W, LR50W and LR60W are linear receivers, that allow functions such as On-Grade Match and Excavator Modes (not available with Agatec)
- RD20 includes Tilt display for the LR60, making our high-end receiver even more versatile
- Dual power: Machine power cable or 2 AA batteries.
- Mounting options - magnetic, sticky tape, bolt-on, swivel suction cup option

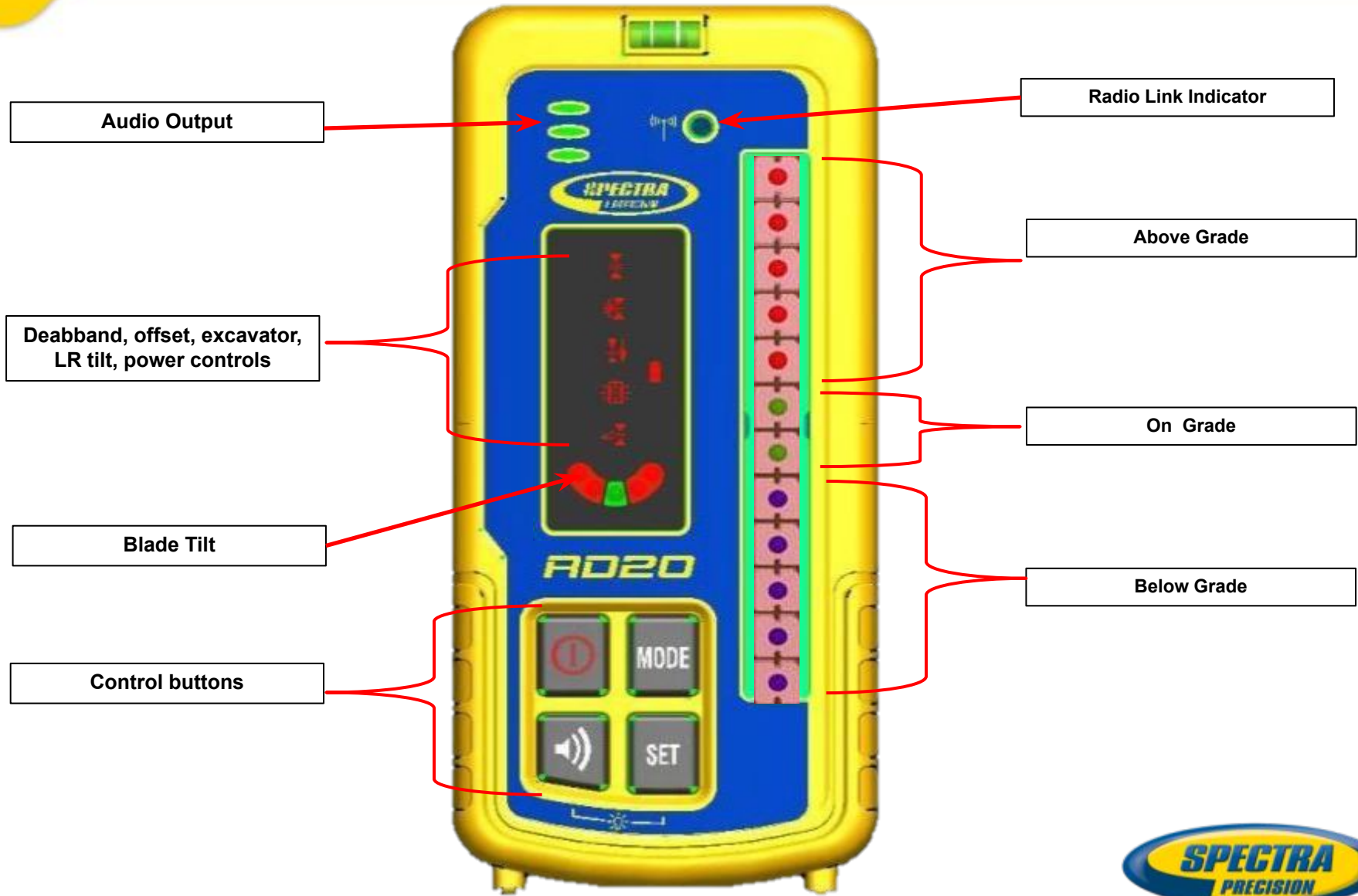




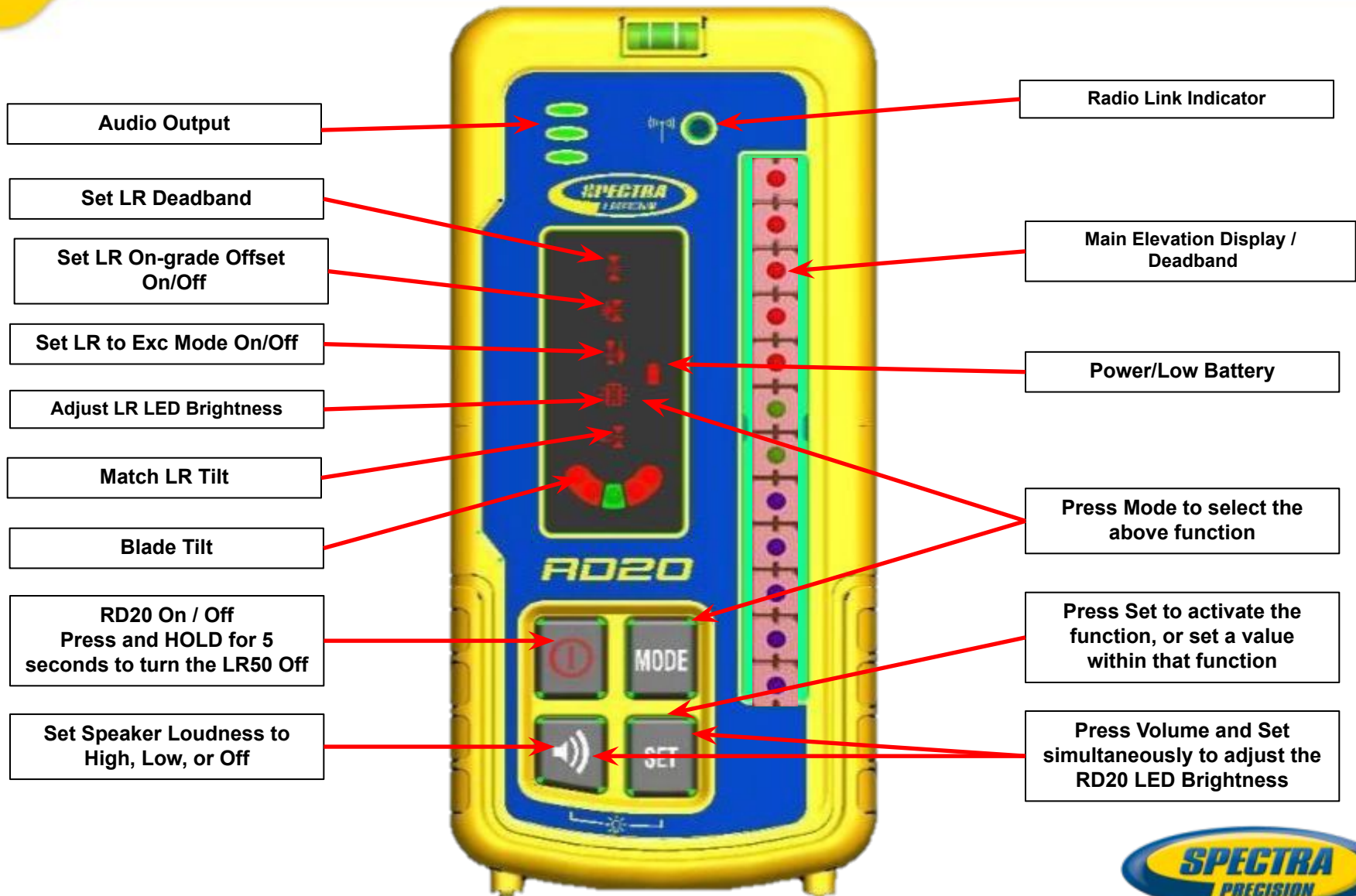
# Hands On



# RD20 Controls and Indicators



# RD20 Controls and Indicators - Details



# Powering the RD20

## Internal AA Batteries:

Battery life about 20 hours (alkaline)

## Machine Power:

Included power cable P/N 010983 connects machine's power port (10 to 30VDC) to the RD20.

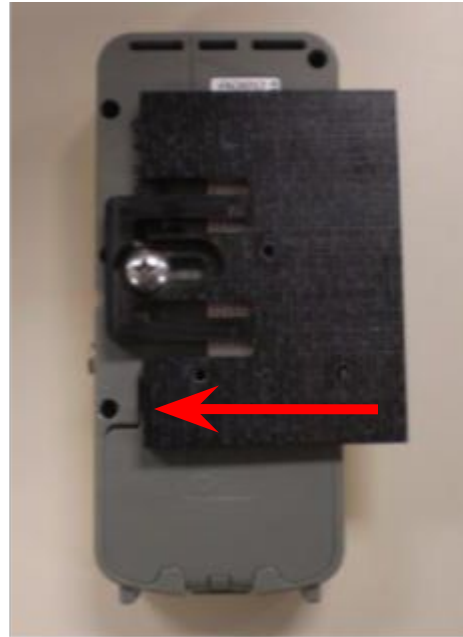
**Note:** The internal batteries are automatically disconnected when Machine Power is operating: No charging of the internal batteries will occur.





# RD20 Mounting – Quick Disconnect Mounting Plate

To install, slide the plate over the mounting screw and slide to the left until it locks into place



# RD20 Mounting – Adhesive Tape

Remove the backing from the supplied adhesive tape, and apply the tapes between the Quick Disconnect Mounting Plate and the machine's mounting surface.



Machine  
Surface



# RD20 Mounting – Magnetic

Use the supplied hardware to install the 3 magnets as shown on the Quick Disconnect Mounting Plate. Magnetically clamp the assembly to the machine's mounting surface.



Machine  
Surface



# Optional Mount – Swivel with Suction Cup

Use the supplied mounting screws, swivel mount and suction cup to secure the RD20 to the inside window of the machine



Machine  
Window



# Power Up / Down, Receiver Power Down



## **Power Up**

- Radio link established, LINK LED illuminates
- Main display indicates receiver DEADBAND setting

## **Power Down**

## **Receiver Power Down**

Both receiver power and RD20 power down if held > 5 seconds.



# Wireless Link Status



Wireless connection is indicated by flashing yellow LED next to antenna symbol



RD20 - if no link with the receiver, the RD20 will alternate flash 1) top red and bottom blue then 2) on grade 2 green LEDs

Receiver - if it loses link with the RD20, it will alternate flash 1) red LED in 4 corners the 2) center green LED.

**NOTE:** To use the receiver by itself (with no RD20), cycle power to clear the lost link indication.



# Elevation Display – Full Display or Battery Saver

Standard



Battery saver



- Standard – multiple LEDs indicate height
- Battery saver – only 1 LED indicates height

- To toggle between the two modes 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 remembered after a power cycle.



# Speaker Volume and RD20 LED Brightness

## Sound



- **Beeper volume options: High (105db), Medium (95db), Low (65db) and Off**
- **Press to cycle through options (low beep indicates volume off)**
- **Hi, On-Grade and Low tones to match elevation LEDs**
- **The RD20 remembers the last volume setting after a power cycle.**

## LED Brightness



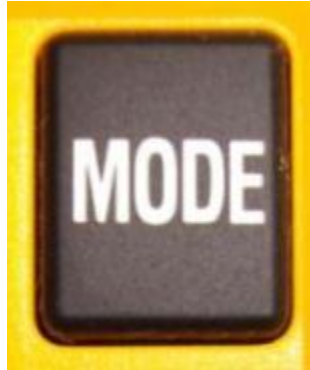
- **Simultaneous press sets the brightness of the Elevation and Tilt LEDs to Bright, Medium, or Dim.**
- **The RD20 remembers the last brightness setting after a power cycle**





# Function Select - Mode

**MODE functions work only when linked to a receiver**



**Press Mode until desired function/LED symbol lights. Cycle through functions.**



**Then press Set to cycle through options.**

**If no button is pressed after 5 seconds the selected LED goes out**



# Set LR Dead-Band



**Press Mode until DEAD-BAND LED lights**

**Press Set to cycle through options**

Fine=Green on-grade LEDs flash,

Medium=on-grade and single high and low LEDs flash,

Coarse=on-grade and 2 high and low LEDs flash,  
LR60

Very Coarse= on-grade and 3 high and low LEDs flash

Dead band changes are also indicated on the receiver

The RD20 and receiver remember the last dead-band setting after a power cycle



# Set LR On-Grade Offset



**Press Mode until ON-GRADE OFFSET lights**

**Press Set to set the current laser elevation to On Grade.**

If successful, the green On Grade LEDs will light to show on grade. The green LEDs will double flash to indicate on Offset has been entered.

If no laser is hitting the receiver, offset cannot be set and the green LEDs will not light.



# Set LR to Excavating Mode



**Press Mode until Excavator Mode lights**

**Press Set to start excavating mode**

- offsets to current laser height
- plumb indication is “turned on”
- Excavator LED continues to flash
- (does not work with LR60 in ACE mode)

**To return to center grade, press Mode and Set again.**



# Adjust LR LED Brightness



**Press Mode until Excavator Mode lights**

**Press SET till LR BRIGHTNESS LED lights**

Cycle through options (feedback from LR)



# Match LR60 Tilt



**NOTE:** Tilt display must be enabled at the LR60 for the RD20 to display or match tilt. To toggle Tilt Display On/Off at the LR60:

1. Turn the LR60 on
2. Momentarily and simultaneously press the Power, Plumb and Dead-band buttons at the same time. This toggles Tilt display at the RD20 On or Off.



**MATCH LR TILT LED** illuminated: Sets the receiver null and RD20 Tilt displays to On-Grade at the current valid receiver tilt angle. Tilt-angle set to NULL is indicated by a double-flash indication, then the LED goes out.



# Match LR50 Tilt



**NOTE:** Tilt display must be enabled at the LR50 for the RD20 to display or match tilt. To toggle Tilt Display On/Off at the LR50:

1. Turn the LR50 on
2. Press and release the tilt button to toggle tilt on or off



**MATCH LR TILT LED** illuminated: Sets the receiver null and RD20 Tilt displays to On-Grade at the current valid receiver tilt angle. Tilt-angle set to NULL is indicated by a double-flash indication, then the LED goes out.



# LR30W Radio Pairing



**NOTE:** The RD20 and LR30 receiver are PAIRed at the factory. The below procedure is in case a RD20 needs to be PAIRed with a different LR30 receiver.

## To start 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 release 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.



## To start RD20 PAIR mode:

1. Make sure the RD20 is turned OFF
2. Press the POWER, MODE and SET keys at the same time. When the RD20 starts its power-up sequence release the keys.
3. After the RD20 completes its power up sequence, the yellow ANTENNA LED will blink rapidly indicating the RD 20 is in PAIR mode.
4. Wait about 10 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 Radio Pairing

**NOTE:** The RD20 and LR50 receiver are PAIRed at the factory. The below procedure is in case a RD20 needs to be PAIRed with a different LR50 receiver.

## To start LR50 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 release 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.

## To start RD20 PAIR mode:

1. Make sure the RD20 is turned OFF
2. Press the POWER, MODE and SET keys at the same time. When the RD20 starts its power-up sequence release the keys.
3. After the RD20 completes its power up sequence, the yellow ANTENNA LED will blink rapidly indicating the RD20 is in PAIR mode.
4. Wait about 10 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.



# LR60W Radio Pairing



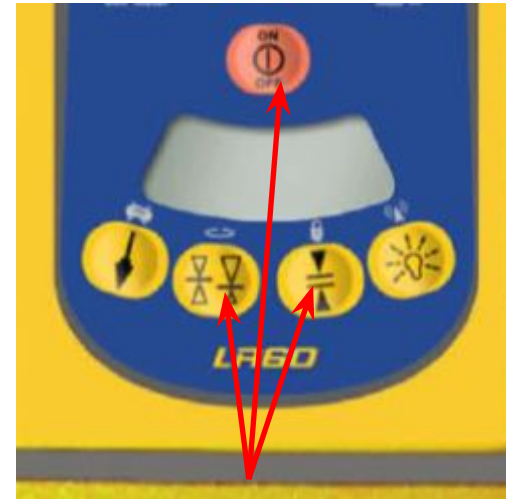
**NOTE:** The RD20 and LR60 receiver are PAIRed at the factory. The below procedure is in case a RD20 needs to be PAIRed with a different LR60 receiver.

## To start LR60 PAIR mode:

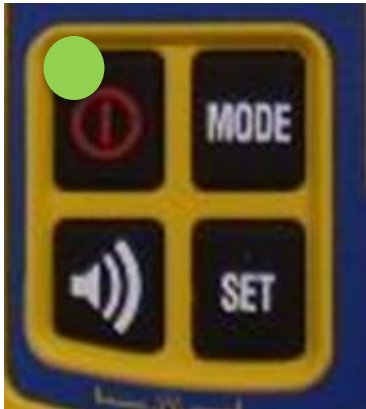
1. Make sure the receiver is turned OFF
2. Press the ON-GRADE OFFSET and DEAD-BAND keys, then while continuing to hold them down press the POWER key at the same time. When the receiver starts its power-up sequence release the keys.
3. After the receiver completes its power up sequence, the On-Grade LED will blink rapidly indicating the receiver is in PAIR mode.

## To start RD20 PAIR mode:

1. Make sure the RD20 is turned OFF
2. Press the POWER, MODE and SET keys at the same time. When the RD20 starts its power-up sequence release the keys.
3. After the RD20 completes its power up sequence, the yellow ANTENNA LED will blink rapidly indicating the RD20 is in PAIR mode.
4. Wait about 10 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.



# RD20 Control Summary



Power on / off



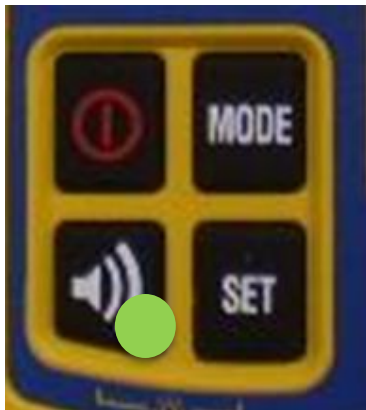
Battery Saver



Pairing with LR



LED brightness



Sound Volume



Functions

1 Cycle through Functions:

-  Dead band
-  On Grade Offset
-  Excavating Mode
-  LR LED Brightness
-  Match LR60 Tilt

2 Select Setting



# LRW can switch between Wireless and RS485

This button combination will toggle between Wireless Mode and Hard-Wired RS-485 Mode  
(Note: after putting in Wireless Mode, the LRW and RD20 must be “Paired”)

LR30W



LR50W



LR60W



Use LR30W  
“hidden”  
button



# How to recognize “W” model

W and non-W models look the same!



LR30W  
LR30



LR50W  
LR50



LR60W  
LR60



Front – same – no W!



W models have a radio compliance label on the back side.



Case is clearly marked.





# LR Machine Display Receivers Sales Materials



# Machine Receiver Benefits

- **The benefits of your existing laser can be extended to the machine: One person does it all**
- **Simple, install yourself, portable,**
- **Increase Machine/User productivity of 30%**
- **Proven, rugged, reliable, SAFER**



# LR30



## Versatile Laser Receiver



### Applications

- Small dozers, box blades, grading attachments, backhoes
- Building and residential pads, landscaping, trenching
- General construction grade and depth control

### Features & Benefits

- 360 degree reception provides large working area
- Ultra bright LED's show red arrows if high or low or Green bar when on-grade for quick-glance grade checks
- Three selectable accuracies for various jobsite tolerances - from rough grading to final finishing
- Self contained batteries for ease of use and quick installation
- Long battery life with automatic shut off - Alkaline or NiMH

### Specifications

#### Vertical Reception Range

- 6.75 inches (171 mm)

#### Accuracy - Grading Fine

- 0.20 in (5 mm), Standard: 0.45 in (12 mm), Wide: 1.25 in (32 mm)

#### Display Channels

- 5 channels plus Out-of-Laser indication

#### Battery Life

- 75 Hr Alkaline / 50 Hr NiMH

#### Warranty

- 2 Years

PN 002507-023 (01/00)





## EXTEND THE BEAM!



INCREASE YOUR PRODUCTIVITY BY 30% WITH A MACHINE-MOUNTED LASER RECEIVER!



[www.spectra-productivity.com/lr](http://www.spectra-productivity.com/lr)



## GRADE CHECKER ON BOARD



**LR20**  
Ideal for use on  
side excavators and  
compact machines



**LR30**  
Ideal for grading, road  
at, ditches and other  
grading operations



**LR50**  
Ideal for grading and  
excavating, ditches, cut  
and punch operations



**LR60**  
Ideal for excavating  
with advanced  
digging features

[www.spectra-productivity.com/lr](http://www.spectra-productivity.com/lr)

## LASERS FOR EVERY JOBSITE

**LL LASER LEVELS**  
Automatic Self-Leveling  
Durable on Earth



**GL GRADE LASERS**  
Single & Dual Grade  
Horizontal, Grade and  
Vertical capabilities



**HV HORIZONTAL  
& VERTICAL LASERS**  
Interior and Exterior Versatility



[www.spectra-productivity.com/lr](http://www.spectra-productivity.com/lr)

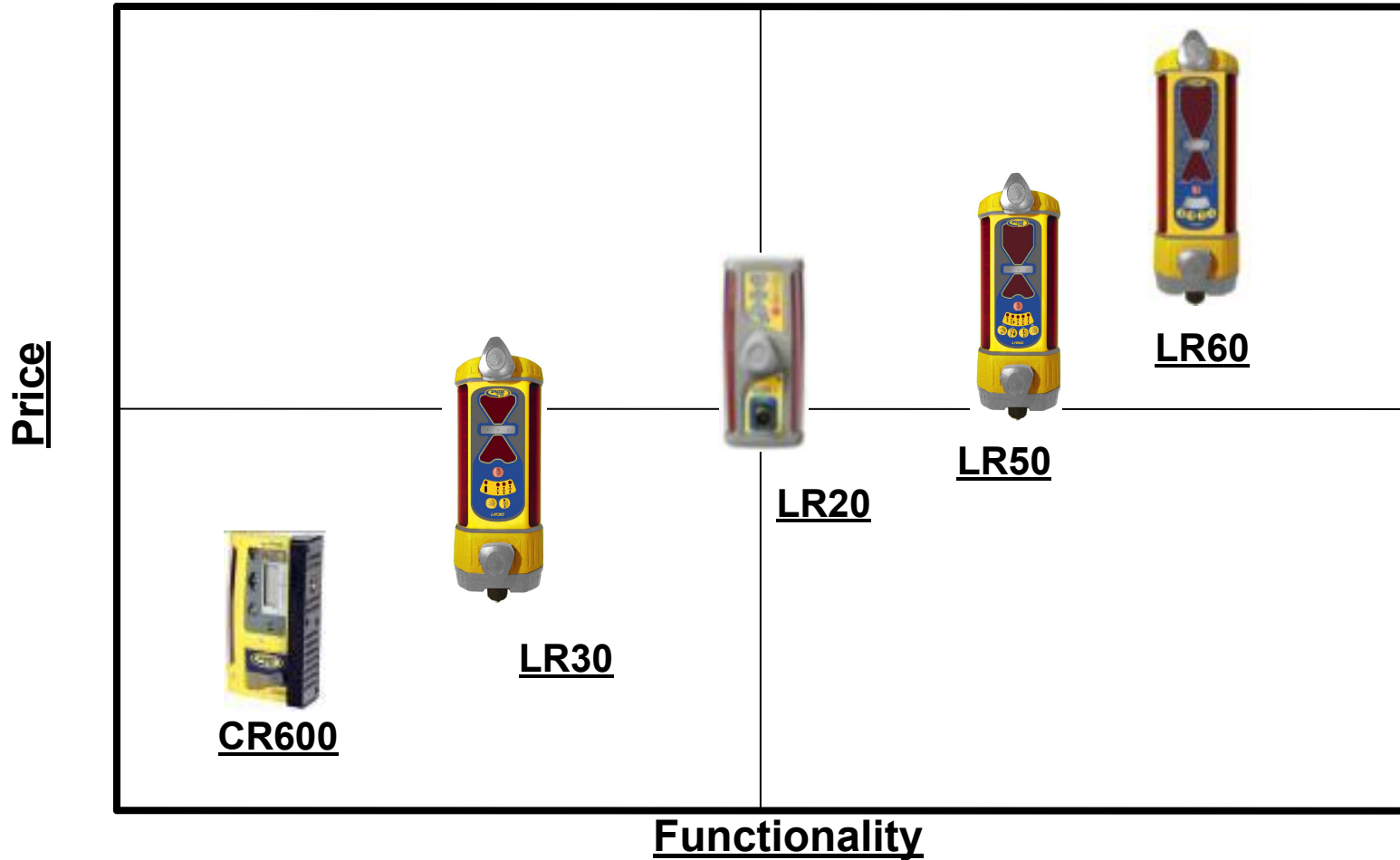




# Product Selection and Ordering



# Display Product Positioning



# Which Product ?



Backhoes	CR600/LR50	Elevation Display
Skid-steer loader	CR600/LR30	Elevation Display
Mini Excavator	CR600/LR20	Elevation Display
Skid-steer w/blade	LR30, LR50	Elevation Display/Lift control
Smaller Dozer	LR30, LR50	Elevation Display/Lift control/Lift & tilt control
Smaller Excavator	CR600/LR20/LR50	Elevation Display



# What to Order? Configuration Guide



# Remote Display Options

RD20



Power Cable  
010983  
(included)



Swivel Suction Cup  
RDM-1



(Option)



RD10 will be discontinued when current stock is depleted.



# Mount Options

Mini Mount  
CTO-MMM



Back Hoe  
Skid Steer  
Mini Excavator

Dozer Mount  
DM-20



Dozers  
(Bolt on)






Mag Mount  
MM-1



Dozers  
Excavators





















# RD20 and LR30W

Model	Description	Included
<b>Remote Display</b>		
RD20	Wireless Remote Display w/ Quick Mounting System (Service Upgrades)	
RDM-1	RD20 Swivel Mount w/ Suction Cup	
<b>LR30W</b>		
LR30W	LR30 Wireless w/ NiMH, RD20	
LR30W-MM	LR30 Wireless w/NiMH, RD20, MM-1	
LR30W-DM	LR30 Wireless w/NiMH, RD20, DM-20	





# LR50W and LR60W

Model	Description	Included		
<b>LR50W</b>				
LR50W	LR50 Wireless w/ NiMH, RD20			
LR50W-MM	LR50 Wireless w/NiMH, RD20, MM-1			 
LR50W-DM	LR50 Wireless w/NiMH, RD20, DM-20			 
<b>LR60W</b>				
LR60W	LR60 Wireless w/ NiMH, RD20			
LR60W-MM	LR60 Wireless w/NiMH, RD20, MM-1			 



# Current models

Model	Description
<b>Mounts</b>	
MM-1	Magnetic mast mount
DM-20	Bulldozer mast
CTO-MMM	Min mag mount (for LR20)
<b>Other Models available</b>	
LR20	LR20 Display Receiver
LR20-1	LR20 with mini mag mount
LR30-1	LR30 w/ Alkaline
LR30	LR30 w/ NiMH
LR30-DM	LR30 w/NiMH, DM-20
LR30-MM	LR30 w/NiMH, MM-1
LR50-1	LR50 w/ Alkaline
LR50	LR50 w/ NiMH
LR50-MM	LR50 w/NiMH, MM-1
LR50-DM	LR50 w/NiMH, DM-20
LR60-1	LR60 w/ Alkaline
LR60	LR60 w/ NiMH
LR60-MM	LR60 w/NiMH, MM-1





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