



# Laser Positioning for Machines

Automatic Control and Visual Display Systems



ROUGH GRADING • FINE GRADING • EXCAVATING • BOX SCRAPER  
SKID STEER • SURVEYING • LAND LEVELING

# WHAT IS MACHINE CONTROL?

Machine Control Systems allow users to get “On-grade” quicker by using a plane of laser light to insure a proper equipment elevation.



## Save time and money with Machine Control Systems

- Increase profit by controlling cost of materials, labor, and staking
- Improve job productivity
  - Make fewer passes
  - No more waiting for grade stakes
  - Reduces machine downtime since grade is checked from the machine
- More accurate
  - Provides a continuous reference over the entire site, versus conventional intermittent stakes in a grid pattern
- Improve safety: no grade checkers on the ground with heavy equipment
- Frees up the supervisor

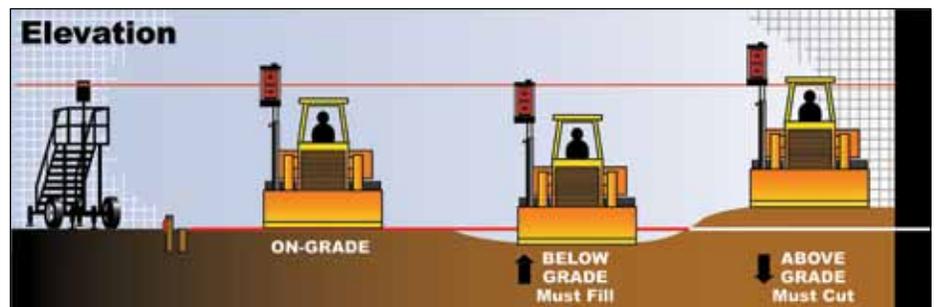
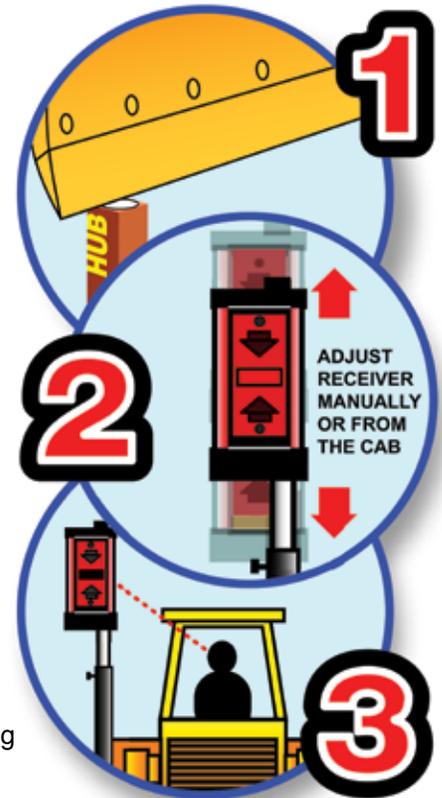
*The illustration to the right shows how easy it is to set up your machine control system.*

### Simple Solutions

1. The operator sets the blade at the desired elevation by placing the cutting edge on the reference stake.
2. The operator then adjusts the mast or receiver until an ON-GRADE signal is obtained. The equipment is now ready to operate.
3. The operator monitors the display and uses the equipment controls to manually maintain the ON-GRADE signal.

An Automatic System operates the machine’s hydraulic systems, enabling the laser to control the blade. When using an Automatic System, the operator can simply switch over to AUTO mode.

*As illustrated below, the laser transmitter (mounted to a tall tripod or portable laser trailer) emits a reference plane for the laser receiver to detect as the machine moves across the job site.*



## Prime Applications



### Construction Site Preparation

Virtually eliminate grade staking and get more “cut-time” per day. You’ll get the job done faster.

**SYSTEM RECOMMENDED:** *EZ-Grade 360 with optional Remote Display*

### Rough Grading

Takes the “rough” out of grading. Machine Control is like having a grade checker riding on your blade. It saves material and speeds up operation.

**SYSTEM RECOMMENDED:** *EZ-Grade 360 with optional Remote Display*

### Excavating

Stops over-excavation, reduces fill overages, and improves safety.

**SYSTEM RECOMMENDED:** *MR360R*

### Fine Grading

Precise grade control improves placement of subbase materials and saves on concrete overages.

**SYSTEM RECOMMENDED:** *Model 312 Automatic* (single or dual-sided)

### Agriculture Land-leveling

Precise grade control and long-range operation make us the right choice for this most demanding job. Single and tandem scraper control systems can be used with either the Manual Mast or PowerMast, or both.

**SYSTEM RECOMMENDED:** *Model 312 Automatic or 304 Automatic*

### Drainage

Install and maintain drainage ditches simply, quickly, and precisely.

**SYSTEM RECOMMENDED:** *EZ-Grade 360* (Remote Display Optional)

### Levee Marking

The high-speed PowerMast™ enables the operator to mark levees and survey faster than ever.

**SYSTEM RECOMMENDED:** *Model 304 Auto Survey with PowerMast™ 4 series.*

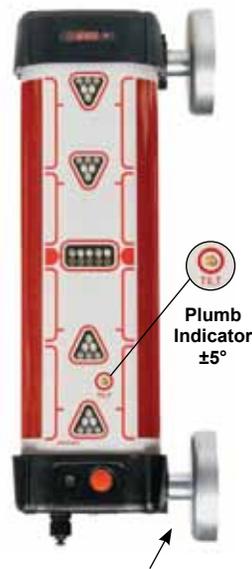
**Any system can be used for multiple applications. Consult your dealer for help in selecting the right one for your application.**

## CHOOSING THE RIGHT SYSTEM FOR YOU.

Energize your earth moving equipment with the power of laser control. We have a system for your construction or agricultural applications, all designed with features to help you get the job done faster and better.

# Visual Display System

## MR360R



Plumb Indicator  $\pm 5^\circ$

Large magnets allow for quick mounting and easy movement from machine to machine. Optional mounting clamp kit also available.



The MR360R offers accurate grade information for all visual machine control applications.

- LED indicators show position of the cutting edge in relation to the laser reference beam.
- Arrows indicate which way to move the cutting edge to reach the reference plane.
- For excavators, the built-in vertical indicator monitors angle of the stick, saving money by reducing over-or under-cutting. Receiver has plumb LED indicator; remote display has direction arrows for plumbing up the dipper stick.

To mount the MR360R with clamps, weld a bracket to your machine or purchase the post mount.



### Carry a benchmark in the cab of your machine

One-person operation saves time and money. Laser sends beam (elevation control) to receiver; operator views display on machine or inside cab.

### MD360R Remote Display

- Clear remote display panel mounts to the windshield with a heavy-duty suction cup. Won't block operator's view.
- Displays the 9 channels of the receiver, plus the plumb indicator arrows. It receives the information via wireless RF link (no cable needed).
- Both the receiver and remote have menus, enabling you to scroll through menu choices to change settings. All settings can be done through the remote display, without getting out of the cab. You can even turn off the receiver display from the remote, saving battery life.

## Selection Chart for 360° Laser Receivers

\* Range and accuracy vary depending on laser used

Models	MR360R	EZ-GRADE 360	360° Receiver
Type	<b>Visual Display System:</b> Use alone or with MD360R in-cab remote display	<b>Visual Display System:</b> Use alone or with 322 in-cab remote display. <b>Automatic system:</b> Use with 312 or 316 control box	<b>Automatic system:</b> Requires 304, 312, or 322 control box for use.
Application	Excavators or backhoes (magnets); dozers, drag boxes, or skid steers (optional clamp kit)	Dozer, motor grader, motorized scraper, skid-steer loader, excavator, or backhoe.	Multi-use; more precise for fine grading, land leveling, other grade control
Range (radius)*	650 ft. (200 m)	Up to 2,000 ft. (600 m) with AGL's long-range transmitters	
Capture Height	9.75" (25 cm)	8" (23 cm)	7.5" (19 cm)
Grading Accuracy*	Fine: 1/4" (6 mm) typical Coarse: 1/2" (12 mm) typical	$\pm .01'$ (4 mm) depending on machine tightness	$\pm .01'$ (4 mm) depending on machine tightness
Channels Of Information	7 display channels in coarse mode; 9 display channels in fine mode	7 display channels; 5 channels of hydraulic control	7 display channels; 5 channels of hydraulic control
Rotating Laser	Visible or infrared	Visible or infrared	Visible or infrared
Attachment	Magnets or clamp	Clamp	Manual or PowerMast
Power Source	Rechargeable NiMh battery Remote: 12-24V power cord with accessory plug	4 D alkaline batteries. Options: NiCd battery or 12V/24V DC power cord	Power from machine system (10 to 30V DC)
Battery Life	30 hrs.	Alkaline: 40 hrs      NiCd: 20 hrs	N/A
Environmental	Waterproof	Waterproof	Waterproof
Other Features	Built-in plumb indicator for excavator use	Brightness control: On (extra bright)/Off/Dim	Self-adjusting center beam function
Size	14.75" x 3" x 4.25" (38 x 7.5 x 11 cm)	12" x 6.25" x 8.5" (31 x 16 x 22 cm)	11.5" x 3.75" (29 x 9.5 cm)

# Visual Display or Automatic Control System

## EZ-Grade 360



The EZ-Grade 360 is a versatile, construction-tough laser receiver that can be mounted on dozers, motor graders, motorized scrapers, skid-steer loaders, backhoes and excavators. The built-in super bright display and battery pack make the EZ-Grade 360 ideally suited for visual machine control applications.

### Construction Tough

The integral molded rubber housing components provide maximum protection from shock, water, and dust. All of the controls and plugs are recessed for protection. LED brightness can be selected by the user – super bright to view in bright sunlight or dim for low light. The EZ-Grade 360 is the choice of the professional contractor.

### Greater Information

The EZ-Grade's 8" (20cm) capture height, 360° reception, and 7-channel super-bright display provide the operator with the information needed to get the job ON-GRADE!

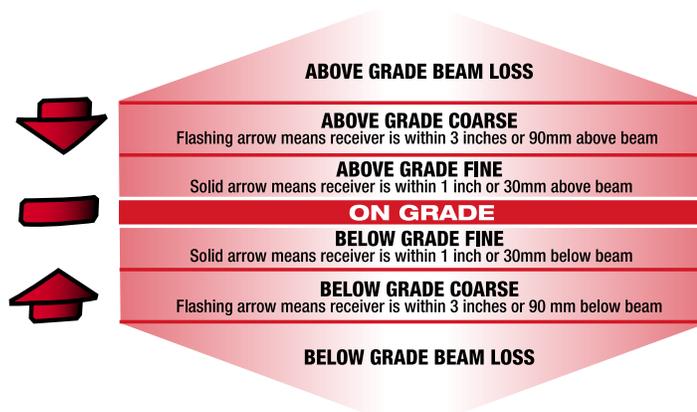


### Mounting

The receiver's dual clamping method is simple, reliable and versatile. It will mount easily to any pipe or tube with an outside diameter of 1" (2.5cm) to 2" (5cm).

Use alone as a visual display, with the 322 remote display (see below) or as part of an automatic system (see next pages).

### Seven Channels of Information



### Upgrade to Automatic Machine Control

The EZ-Grade 360 receiver is so versatile, it's like having two receivers in one. Use the EZ-Grade as a manual display for rough grading, or upgrade to automatic machine control using the AGL control panels on the next pages. Consult your AGL Machine Control dealer for the right system for your application.



Add the 322 remote display for in-cab or multiple-angle viewing



## 360° Laser Receiver

The 360° Receiver has the range, accuracy, and rugged construction needed for even the toughest machine control applications.

In addition to sending a signal to the control display in the cab, it also has a built-in display for simple setup and heads-up operation.

### Accurate With All Lasers

Unique “Automatic Gain Control” feature adjusts the On-Grade zone to its highest accuracy, compensating for different laser spot size, rotation speed, and distance from the transmitter.

### Long Range Reception

The electronic circuitry and super sensitivity of the auto gain control system allow the 360° to sense a beam at distances well beyond the range of other machine control receivers. When used with AGL long-range transmitters, the 360° receiver has a range of 2,000 ft. It also has a special housing that eliminates interference from sunlight or other light sources.

### Construction Tough

- Manufactured from precisely machined aircraft aluminum and top-of-the-line electronic components
- Waterproof, dustproof, and resistant to shock and vibration
- Sturdy mounting system locks receiver to the mast; removes easily with quick release button

### Applications

- precise land leveling for agriculture
- levee marking
- construction of building pads, dams, ponds
- precise asphalt and concrete pad paving or reconstruction jobs

## Model 312 Automatic Control System

For all rough and fine grading applications; economical motor grader system

The 312 control panel combines high-tech control with old-fashioned simplicity.

- Visual grade information for manual or automatic hydraulic control at the push of a button
- Integrated three-light display for one-man setup and elevation adjustment when using a manual mast
- Power and protection circuitry eliminates shorted coils or wires. Military grade connections.

### Easy Setup

Independently adjustable valve speed settings and sensitivity can be selected to match your machine. Select the proportional or on-off valve mode via the switch bank. A diagram explaining switch location and potentiometer location is on the back of the access panel.

The 312's small size and versatile mounting bracket simplify installation; hook up the two cables and the box is ready to operate.

### Manual Mast

With Model 312, use the EZ-Grade 360 or 360° receiver on the telescoping mast.



Telescoping mast mounts securely at the elevation you need. Rugged and sturdy to absorb machine vibration. Calibrated mast insert available in 5- and 8-ft. lengths.



# Model 304 Auto/Survey System

Records survey data; ideal for agricultural fields, upgradable to GPS

## Digital Display

It has the same features as Model 312, plus a digital display for accurate elevation control. Data can be displayed in 10ths and 100ths of a foot, inches and decimal inches, or metric elevations.

The built-in survey function calculates an average elevation and it has an RS-232 data port for survey data collection.

## Simple Operation

The 304's small size and versatile mounting bracket makes installation simple. Hook up the two cables and the box is ready to operate. Other ease-of-use features:

- Toggling the blade switch takes the 304 out of automatic, allowing the bucket to be moved up or down.
- Use with On-Off or proportional valves. Independent up-and-down valve speed settings allow the system to be fine-tuned to your machine.
- Cut and fill at different elevations: operator can rapidly change grade elevation by a preset value
- Remote switch box capabilities



**PowerMast**  
High speed,  
heavy torque

## PowerMast Model 30" or Model 4

Electric telescoping mast offers ruggedness, smooth operation, and a variety of models, including one for high-speed survey applications. Choice of short and tall, 30" and 42" travel.

All components are completely enclosed in a sealed housing. The PowerMast is secured with shock absorbing rubber mounts inside a stout, cast aluminum mounting frame. Single 3/4-10 threaded stud attaches mount to a standard AGL Blade Mount allowing easy removal or transfer to other machines. 15 amp maximum with mast drive outputs. 12V DC mast motor is standard; specify 24V DC if required.

## New PowerMast

The new PowerMast incorporates an integrated receiver for receiving abilities of four and six feet. A fully enclosed receiver ensures no dust nor water will penetrate the housing and with the faster, built-in, receiver your work will be smoother allowing you to work more efficiently. And with the receiver and mast being built in an all-in-one package, the costs are even lower.



**Blade Mount for Manual or PowerMast**  
Choice of 5 settings for plumb



With Model 304,  
use the 360°  
Receiver on the  
PowerMast



Made In U.S.A.

## Choose a System for Your Application

Systems	322	312	304	316
Manual Visual Control	✓	✓	✓	✓
Automatic Hydraulic Control		✓	✓	✓
LED Indicators for Visual Adjustment and Rough Grading	✓	✓	✓ + Digital Readout	
Survey Data Collection			✓	
Application	Agriculture and Construction	Economical Agriculture and Construction	Agriculture and Construction	Skid-steers; Small Graders
Recommended Receivers	360°	360°	360°	Dual Receivers
Power	All systems are 10 to 30V DC, negative ground, with nominal 10 amp minimum current.			
Operating Temperature	All systems are -4° to 158° F (-20° to 70° C)			



## Model 316 Dual Skid-Steer Control System

This is an entry-level automatic dual receiver system for small machines that use one or two hydraulic cylinders for blade control. Ideal for skidsteer loaders with a motorgrader attachment, or for small motorgraders used for fine grading of concrete pads.

- Two independent sensor inputs; two hydraulic drive outputs
- Automated control of On/Off and proportional valves for two independent hydraulic cylinders
- Independent adjustments for blade up and down speeds
- Compact size for easy mounting



Uses two EZ-Grade receivers and 316 control box



## EZ Dig PRO

Depth Control for Excavators

- Ideal for fixed depths and slopes, on any size excavator or backhoe.
- Wireless sensors mounted on the excavator are calibrated to the machine, measuring movement and angle of the bucket, boom, and dipper stick.
- Provides real-time depth information, 20 times a second; no lag time.
- Can be installed and calibrated in 45 minutes or less; no welding required.



Slope



Fixed Depth



Laser Control



Profiling

## Keep Your Machine Digging



AGL offers a full line of precision lasers for machine control, from dual grade to extra-long range.

### Installation and Training

Systems requiring automatic hydraulic control should be installed by an authorized technician from either your local distributor or one of our regional service centers. Training is also provided to help operators use the system for maximum productivity. Most installations and training can be done in two days.



2202 Redmond Rd., Jacksonville, AR 72076  
Phone: 501.982.4433 Fax: 501.982.0880  
Toll Free: 800.643.9696  
sales@agl-lasers.com www.agl-lasers.com  
Specifications subject to change without notice.  
Printed in USA 2/11 AM1012

