



//AGPS LEVEL & LEVEL+ USER MANUAL

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Welcome

Thank you for purchasing AGPS Level™ or AGPS Level+™. This manual will guide you through the setup and running of the program. This manual covers both versions of the program, please note that some options are AGPS Level+™ only and will be labeled as such. When discussing features present in both versions, this manual will refer to AGPS Level(+)[™].

AGPS Level(+)[™] provides assistance in land shaping operations. The program can level, cut to a single or dual grade or (if you have AGPS Level+[™]) build a best-fit slope design by taking topography data in the field and building using OptiSurface InCab[™].

If you have further questions, please contact your AGPS Dealer or the AGPS technical support via email: support@agpsinc.com

Basic Concepts

AGPS Level(+)[™] will design (either in the field or in the office) single or dual slope designs, convert it to a cut/fill map (AGPS Level+[™] only) and control the machine making the cut.

The touch-screen interface has an on-screen keyboard function – when you need to enter text (job name, naming a control point, etc.) simply touch where you need to enter text and the on-screen keyboard will pop-up.

Set the Job Name

The Job Name must be 4 to 16 characters long.
Use only letters and digits and underscore.
For example: EXAMPLE7 or SAMPLE12_SAMPLE3

Enter the Job Name :
JobNameHere

Enter a Description of the job :
Description Here

OK CANCEL

svyfilejoba

Enter the Job Name :

DEMO

1	2	3	4	5	6	7	8	9	0	CLR	<-BKSP
q	w	e	r	t	y	u	i	o	p	[	]
a	s	d	f	g	h	j	k	l	;	'	OK
z	x	c	v	b	n	m	,	.	/	Up	-
Shift	Space Bar			\	Left	Down	Right	Cancel			

Units of Measure

AGPS Level(+)[™] can be set to work in Feet (International); Feet (U.S. Survey); or Meters. A typical user in the United States will choose Feet (U.S. Survey). For both Feet (International) and Feet (U.S. Survey) will be calculated and displayed in tenths of feet, so that 6.5' is the same as 6'6".

Inches and Eighths to Decimals of a Foot

In.	0	1/8	1/4	3/8	1/2	5/8	3/4	7/8
0	.00	.01	.02	.03	.04	.05	.06	.07
1	.08	.09	.10	.11	.12	.14	.15	.16
2	.17	.18	.19	.20	.21	.22	.23	.24
3	.25	.26	.27	.28	.29	.30	.31	.32
4	.33	.34	.35	.36	.38	.39	.40	.41
5	.42	.43	.44	.45	.46	.47	.48	.49
6	.50	.51	.52	.53	.54	.55	.56	.57
7	.58	.59	.60	.61	.62	.63	.64	.65
8	.67	.68	.69	.70	.71	.72	.73	.74
9	.75	.76	.77	.78	.79	.80	.81	.82
10	.83	.84	.85	.86	.88	.89	.90	.91
11	.92	.93	.94	.95	.96	.97	.98	.99

Example: 3-1/2" = .29"

Glossary of Terms

Capture	Auto Capture: Automatically captures a data points after user set interval (typically 10 feet) has been traveled. This distance uses both horizontal and vertical measurement. Toggling the Auto Capture button on and off will capture a single point at your current location. Toggled ON/OFF by keyboard spacebar.
Machine Control	In the program the term Machine Control refers to the automatic control of the blade. The control can be toggled by keyboard 0. There are other places in the program that blade used in a sentence will have different context.
Control point (.ctl file)	Sometimes called a benchmark or reference point, this point is a known world feature in which coordinates are also known. Control points are important to make your coordinates match those used earlier. See Control Points on page 21, and "Collecting a Reference (Control) Point" on page 31.
Data folder	All job file data opened and saved by the program is stored by default in C:\amw\data\
Device	Other forms: Device Menu, External Device, Control Device, etc. The Device refers to interface device that operates the automatic blade control, such as a DAC-7000™ or a LaserTech™ 308 control module.
Instrument	Other forms: Instrument Menu, Measuring Instrument, Read Instrument, etc. The instrument is the positional equipment. Although typically a GPS, there are many other types, and combinations of multiple instruments. See Working with RTK-GPS on page 18.
Local Point	A NEZ coordinate system that uses "fake" coordinates, meaning they are not consistent with State Plane or UTM. An example of this is program default "ptafake 5000 2000 100".
NEZ	Abbreviation for Northing(N) Easting(E) Elevation (Z). Coordinates are always in NEZ. NEZ coordinates are in Feet (or meters if selected) rather than Latitude Longitude and Altitude.
.nez file	A file that uses the following columns: "Name Northing(N) Easting(E) Elevation(Z) Description". (Description is optional)
Plot	Other forms: Plot Menu, Plot Window, etc. The Plot is the lower screen that the field is graphically drawn in. Any options to adjust a feature drawn here are found in the Plot Menu. See Plot Menu on page 39.
Resetup mode	A toggled option to automatically start AGPS-Dirt and Resetup Program (same job), instead of going to the Main menu to select an application.
Rod (length)	The distance from the reading point (on the GPS antenna) to the blade or ground. See Rod Length on page 20.

Odometer	The current distance from the start of the selected Path.			
Status (GPS)	Shown on the working screen to describe GPS status and other related messages. Shows something like "ok: 9 4 1.1 /53" Where 9=satellites 4=datatype 1.1=precision and /53=read counter. Use the table below to evaluate the data type and precision meaning for your GPS.			
		RTK Fixed	RTK Float	No RTK base
	GGA (Most manufacturers)	4	5	1
	John Deere™	4	3=extend 5=float.	1
	NovAtel™ (Raven™/AgLeader™)	50	49/48/34/17	16
	Topcon™ (Javad™ GGA)	4	5	1
	Trimble™ (GGK)	3	2	1
Surface file (.fbg)	A file that shows a proposed or existing ground. This file is created automatically when you create a Surface. See Creating a Surface on page 32.			
Survey File (.svy)	This file will contain all data points captured. Also, "Location Instrument" setup information and other relevant information are logged to this file. Points from this file will be displayed on your plot window as dots. The Survey File Menu includes options to modify this file.			
UTM	A NEZ coordinate system with zones designed on Longitude lines. The program can automatically detect your UTM zone. See UTM on page 45.			

Differences in versions

	Dirt-Pro	Level+	Level
Grade design profile generation:			
Drive A point and B point and set long and cross slope	✓	✓	✓
Collect Topography data for best fit design	✓	✓	✗
Import slope design from best fit software	✓	✓	✗
Import complex multi slope designs	✓	✗	✗
Compatibility/Machine Control:			
Works with any brand GPS	✓	✓	✓
Works with Proportional and bang-bang or remote valves on JD, Case, & Challenger	✓	✓	✓
Real-time feedback: Side view to blade to ground offset	✓	✓	✓
Supports dual GPS for slope control	✓	✗	✗
Guidance:			
Cut/Fill color grid	✓	✓	✗
Background drawing (contours/proposed features)	✓	✗	✗
Background image (.bmp picture)	✓	✗	✗
On Screen Light bar displaying vertical correction	✓	✓	✗

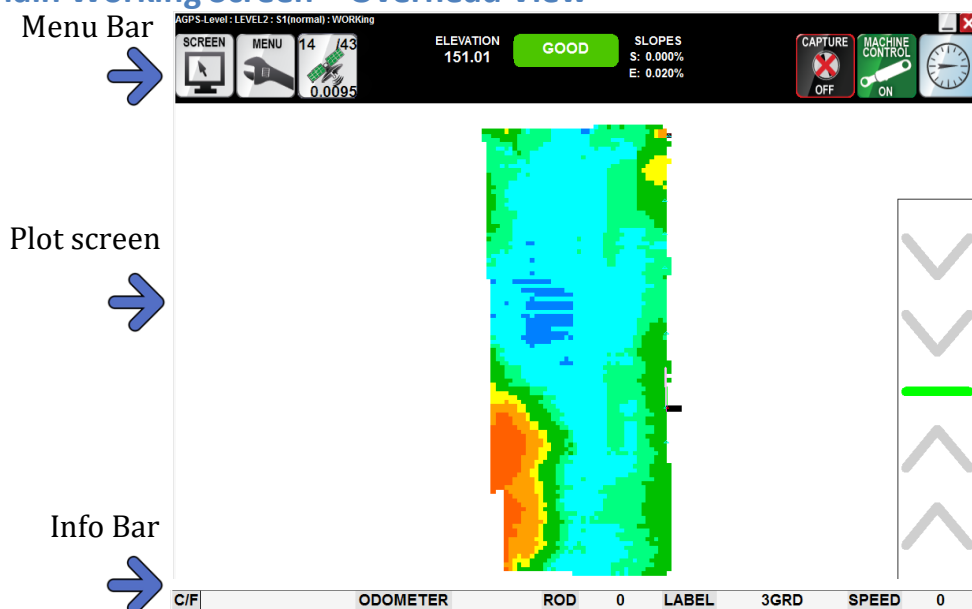
Coordinate Options:			
2/1 Local Point	✓	✗	✗
State Plane coordinates	✓	✗	✗
UTM coordinates	✓	✓	✓
Data Collection:			
As built points (.dxf or text export)	✓	✓	✓
Distance Report	✓	✓	✗
Display elevation of selected point	✓	✓	✓

The Main Working Screen

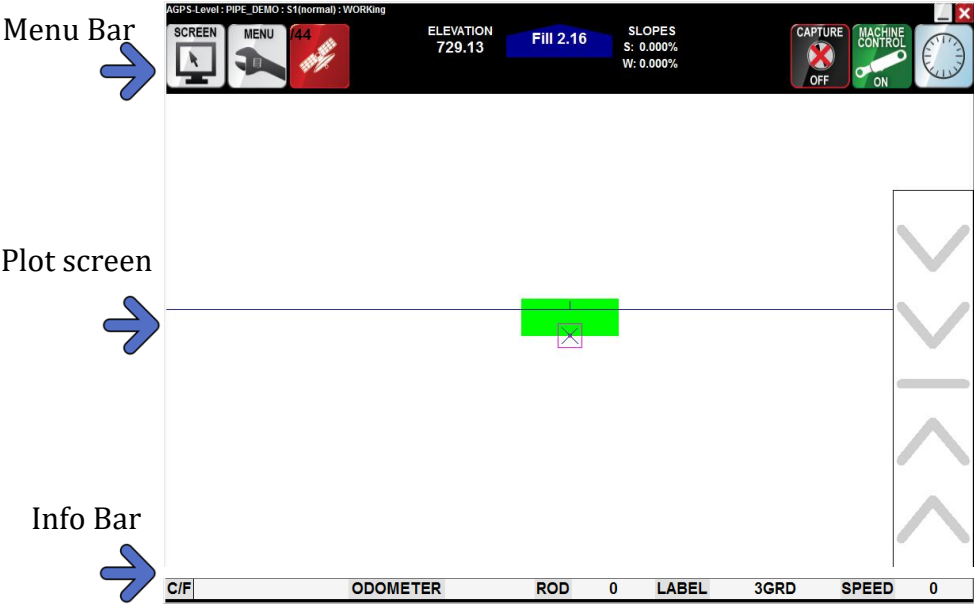
The AGPS Level(+)™ working screen is divided into three sections:

1. The Top Menu Bar on page 8
2. The Middle Plot Screen, with an Overhead View on page 9 and a Profile View on page 10
3. The Bottom Info Bar on page 10

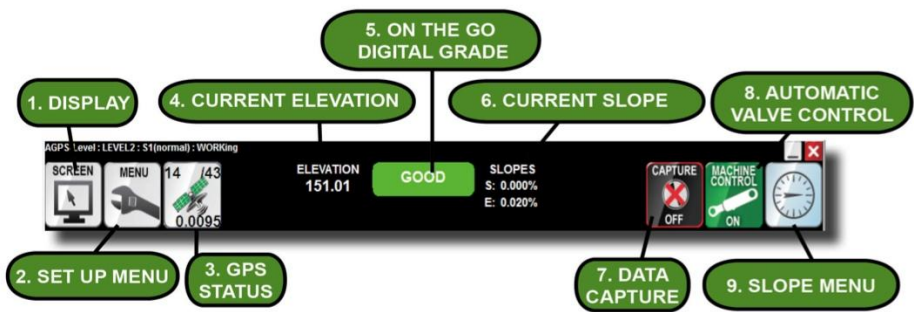
The Main Working Screen – Overhead View



The Working Screen – Blade View



The Working Screen – Menu Bar

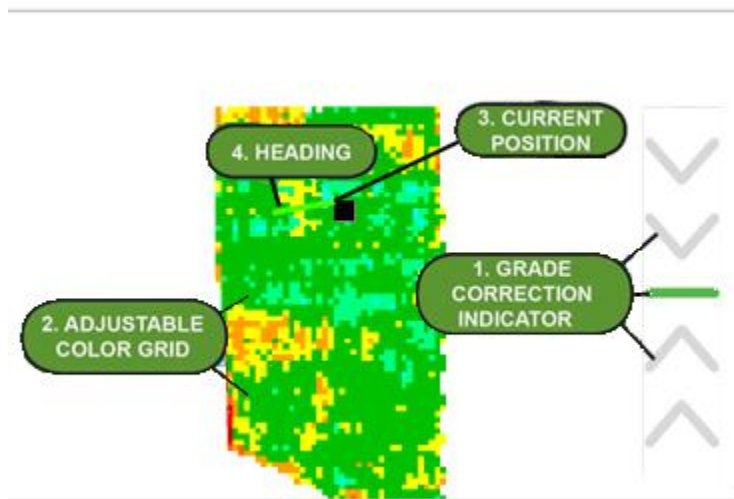


The majority of icons in the Menu Bar are touch active. Several also have a secondary function that can be accessed by pressing and holding the icon for 3 seconds.

1.	Display	Touch this icon to drop down the display menu where you can adjust the zoom level, scroll around the screen or adjust the grid. See Adjusting the View on page 21.			
2.	Set Up Menu	Touch this icon to select your job, setup the program or create a surface using OptiSurface™. See Setting up the Program on page 11.			
3.	GPS Status	Icon showing current GPS status. Must be green for the program to work. Touch to access the Instrument Menu see Instrument Menu on page 38. The following menu shows the data types for often used RTK-GPS systems. Shows something like “ok: 9 4 1.1 /53” Where 9=satellites 4=datatype 1.1=precision and /53=read counter.			
			RTK Fixed	RTK Float	No RTK base
		GGA (Most manufacturers)	4	5	1
					Precision
					HDOP

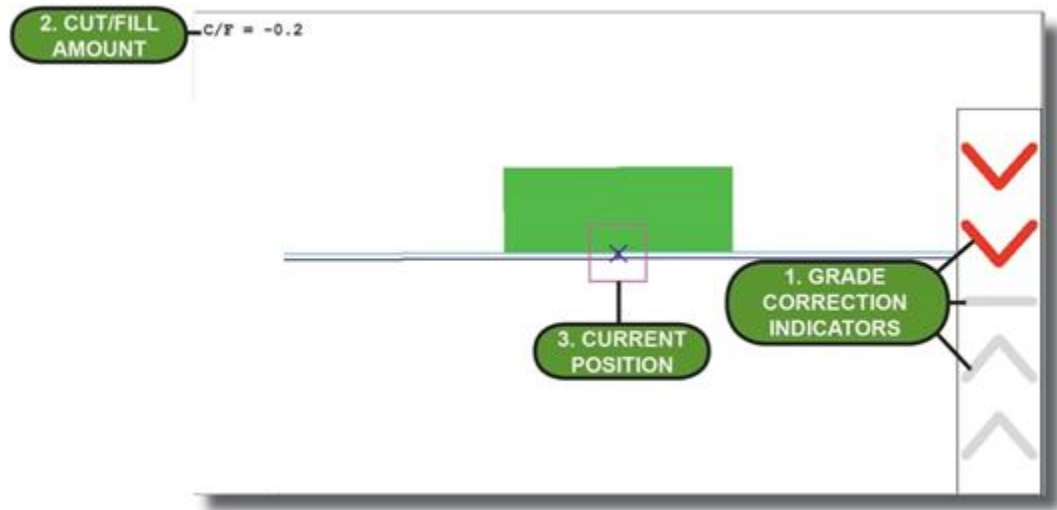
	John Deere™	4	3=extend 5=float.	1	HDOP
	NovAtel™ (Raven™/AgLeader™)	50	49/48/34/17	16	Alt. Std. Deviation
	Topcon™ (Javad™ GGA)	4	5	1	HDOP
	Trimble™ (GGK)	3	2	1	PDOP
4.	Current Elevation	The current elevation of the blade. Can be in meters, feet-international or feet-survey. See Setting up the Program on page 11.			
5.	Digital Grade	Visual real-time indicator of the position of the blade in relation to designed grade. Cut will be displayed in Red, On Grade in Green and Fill in Blue			
6.	Current Slope	Tells input slope amount (if leveling, both will be zero)			
7.	Data Capture	Data Capture icon. Touch to capture the perimeter, random ground or reference point Green for On, black/red for Off.			
8.	Valve Control	Automatic control of the machine. Green for On, black/red for Off. Press and Hold to access the Devices (machine control menu).			
9.	Slope Menu (Waterflow icon)	The waterflow icon will point which direction is downhill. Touching the icon will allow you to set an A-B Line to determine the slopes. See A-B Line on page 16.			

The Plot Screen –Overhead View



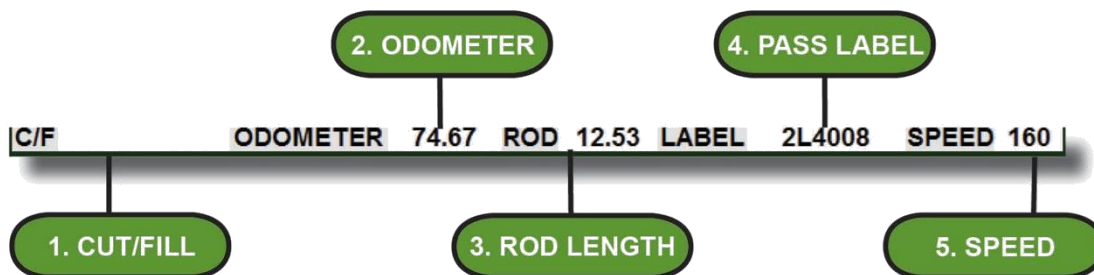
1.	Grade Correction Indicator	Tells you how far from grade you are.
2.	Adjustable Color Grid	Color grid can be set to display Cut/Fill amount. See Color Grid Menu on page 28
3.	Current Position	Visual real-time indicator of the position of the blade. The upper left-hand corner of the icon is considered the 'true' position of the blade. You can set a 'fake' position by touching the screen and either setting where you touched as the fake position or by 'snapping' to a point and setting that as the 'fake' position. 'Fake' positions are useful in rotating the grid around a point.
4.	Heading	Green line that shows real time heading of the current position. The heading is drawn from the upper left-hand corner of the icon.

The Plot Screen – Blade View



1. Grade Correction Indicators	Real time Elevation guidance light bar. Visual indicator of how far off the Profile the blade is.
2. Cut/Fill Amount	Amount the blade is offset above or below finish grade.
3. Current Position	Visual real-time indicator of the vertical position of the blade. The X of the icon is considered the 'true' position of the blade. Can be offset if using a slope sensor to get a more 'true' position of the blade.

The Working Screen – Info Bar



1. Cut/Fill	The current amount above or below grade AGPS Level(+) TM is controlling the blade. Touch to set a different Cut/Fill, OR "Zero-Out" to set current position to on-grade.
2. Odometer	Real time odometer of the distance of the current path (if a path is selected)
3. Rod Length	The Current Rod Length. The rod length is defined as the distance from the measuring instrument (i.e. GPS globe) and the tip of the blade. See Rod Length on page 20
4. Pass Label	Current point label. Touch to choose a different label. See Point Labels on page 30.
5. Speed	Current speed in feet or meters per minute

Setting up the program

Starting a New Job or Restarting a Current Job, via Dashboard:

Explanation of the Startup Dashboard used to start AGPS Level(+)[™].

Start AGPS Level(+)[™]



If the program does not load on computer startup, locate & double tap the Start the AGPS icon on the desktop. A starting screen will briefly appear.



Dashboard

26.0329

16

1

Program

Level





2

Job Name

SAMPLE



3

Setup Type

UTM Coordinates, 0 point



4

Region

16

Antenna Height

14



5

GPS Instrument

General GGA GPS

7

12 / 73



0.8

8

CHECK



SETUP

9

USER PREF



10

JOB



MANAGEMENT

11

UTILITIES



12

HELP



13

SHUTDOWN



COMPUTER

14

EXIT



15

START



- ① Program

Select a program to open. It should say Level.
Press the down arrow to show/select other programs purchased.
- ② Job Name

Select a Job Name from the dropdown list.
For a New Job: Select **Make New Job**, at the top of the list.

Job Management - Job Name:

SAMPLE

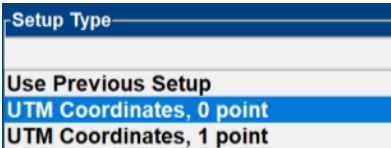




Make New Job

ALBERTSOUTH_T

ALBERTSOUTH_T

③ Setup Type		- If you have no control point, like starting a new job, Select UTM, 0 point. See Zones on the last page of this manual. - If you have a control point, Select UTM, 1 point.
	- If you are re-setting up on the same job and nothing has changed, select: Use Previous Setup.	
④ Region	(also called zone) displays the region selected in #3 above.	
⑤ Antenna Height	Also called Rod Length, is the distance from the GPS Antenna to the tip of the blade on a plow or the bottom of the wheel on a trencher.	
⑥ GPS Instrument	Displays the type of instrument, or simulator. This cannot be changed from the Dashboard, see Instrument Menu on page 38	
⑦ GPS status	Displays the same information as on working screen, on page 8. If there is an error, that is labeled below the icon. Touching the icon will open the “Control the Instrument” menu with some settings options that vary with each type of instrument.	
⑧ Check setup	Not currently implemented.	
⑨ User Pref	Preferences menu that allows customization of menu colors/font, as well as a few menu behavior settings.	
⑩ Job Management	Various tabs to make changes to control points, design surface, background image, & more.	
⑪ Utilities	Miscellaneous Utilities. Change Distance units. Security Menu (Show or Set Capabilities)	
⑫ Help	Not currently implemented.	
⑬ Shutdown Computer	Close the program, and safely Shutdown the Computer. (every 10 th time will ask if you want to save a backup of program setting database)	
⑭ Exit	Exit the program, back to Windows desktop	
⑮ Start	Start the program, with the chosen settings.	
⑯ Version	Displays the version of the software currently installed.	

Typical daily workflow, would be:

Confirm (or adjust) ① **Program** ② **Job Name** ③ **Setup Type**
 ⑮ **Start**

Setting up the program for the first time:

Follow these procedures for the first time you set up AGPS Level(+)TM. If you have previously set up the program or an AGPS Level(+)TM Technician has completed these setup procedures, please skip to **Starting a New Job or Restarting a Current Job** on page 11

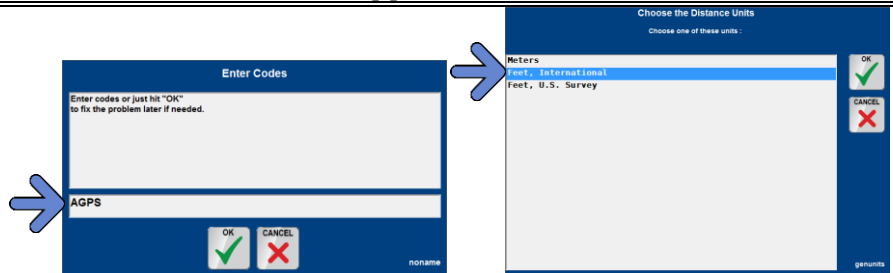
Start AGPS-LevelTM



If the program does not load on computer startup, locate the AGPS icon on the desktop or in the Start Menu to load. A starting screen will briefly appear.

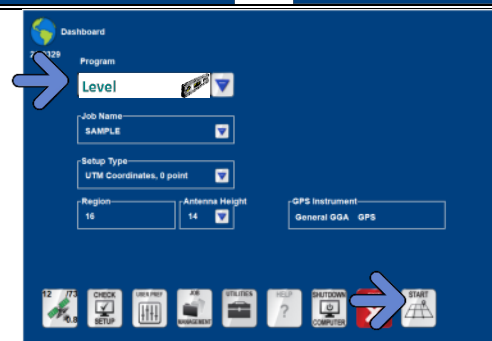
Enter the code **AGPS**. Touch the entry field to pull up a touch screen keypad.

Select the unit of measure (typically Feet U.S. Survey for U.S. users).

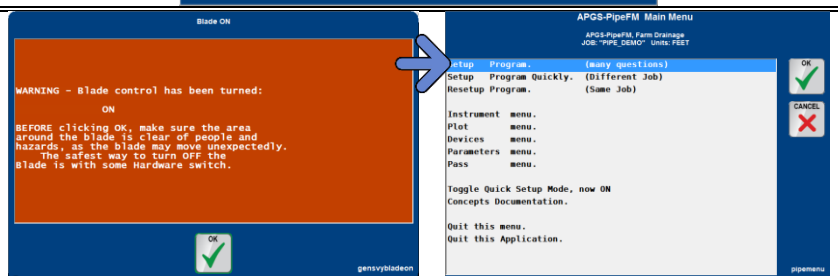


Select Level from the Dashboard's "Program" Dropdown menu.

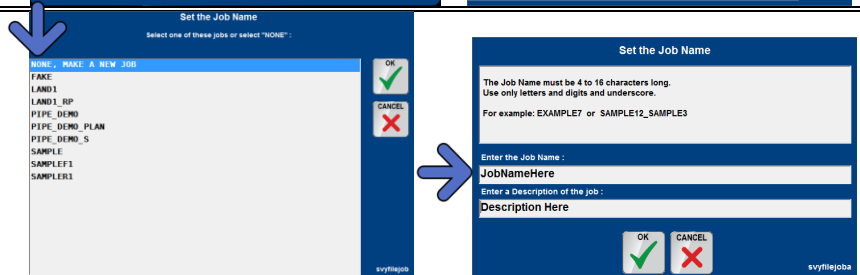
Press Start button.



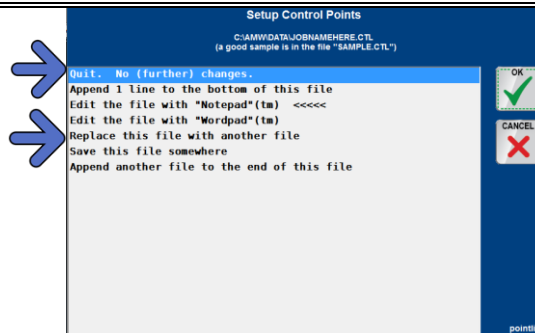
Press Menu   **Select Setup Program (many questions).**



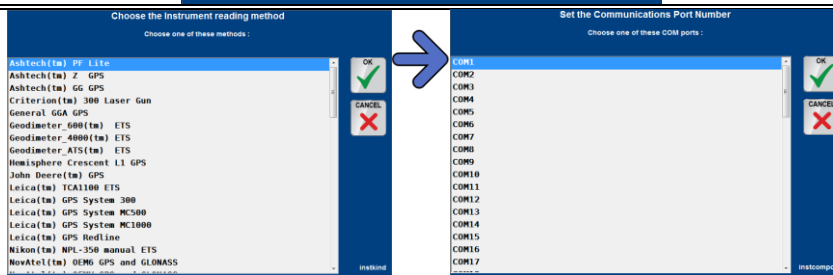
Select None, Make a New Job.
Enter the name of the job (i.e. the name of the field or the name of the customer). You may also enter a description of the job.



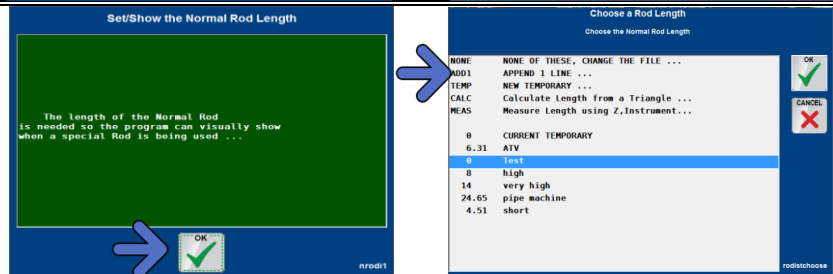
Setup your control points. If you have no control point for this job, select **Quit, No (further) Changes.** If you have control points (see Control Points on page 21 and on page 31) you can choose to **edit the control point file** and add the point.



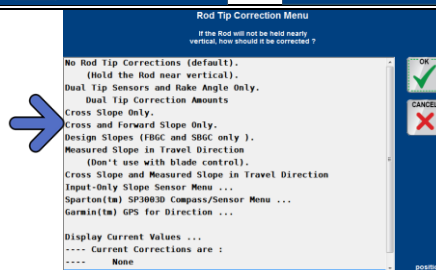
Choose the Instrument (GPS). The GPS instrument must be configured to output the correct message type. Consult the GPS manufacturer for specifics. Then **Choose the Com Port** the GPS is outputting messages to.



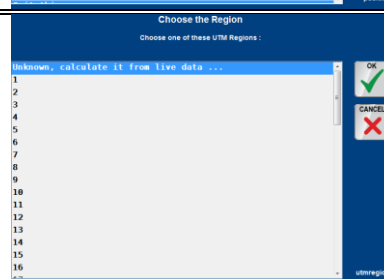
Select the Normal Rod Length. The Normal Rod is the typical rod length. To add your rod length, select **Add1.**



Select Rod Tip Corrections. If you have a slope sensor, select it here.



Set the Location-Instrument Position. Select UTM 0 point. If you do not know the UTM zone, select Unknown, Calculate. If you use **State Plane**, select **State Plane 0 point** and select the State Plane.

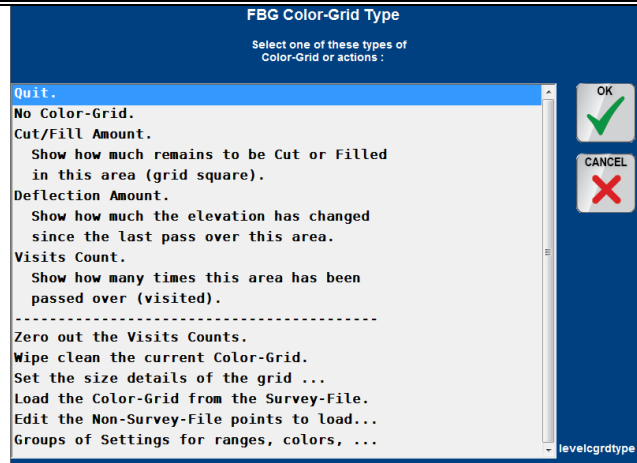


Color-Grid Type

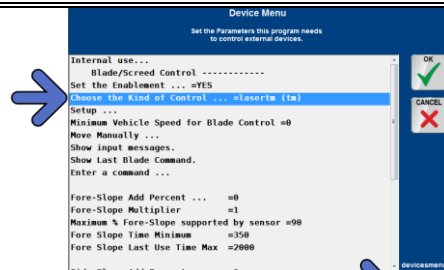
Only available in Level+.

Select and adjust the type of Color Grid you would like.

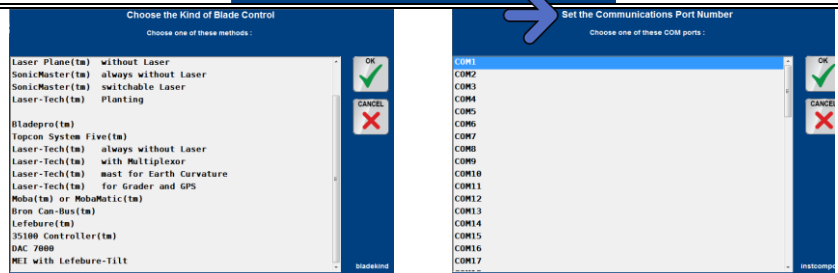
For more details, see Color Grid Menu on page 27



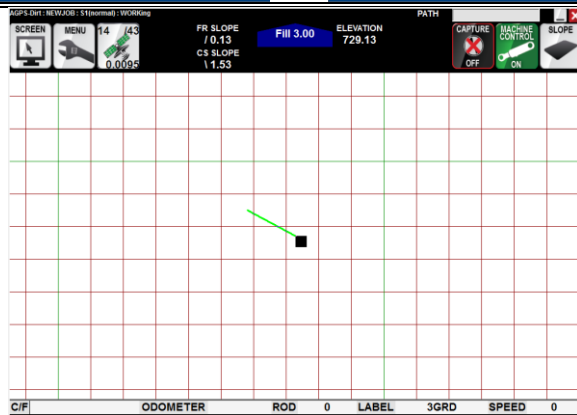
Device Menu. Select the type of auto-blade controller you have. Contact the Auto-Blade control manufacturer for more details on setting up the device.



Typical controllers are the LaserTech™ with MultiPlexor or DAC 7000™ control. Then select the Com port the controller is plugged into.



The Main Working Screen will appear: You should be able to begin working.



TroubleShooting Tips:

I finished the setup, but the screen flashes red

This is typically related to the GPS signal. See Troubleshooting My GPS on page 19.

I missed/mess up a step

You can go through the setup process again from the Main Menu. Press the Menu Icon on the Working Screen.

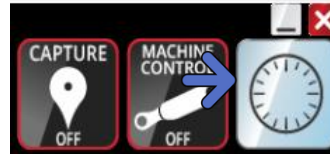
A-B Line Setup

An A-B Line is used for on the job setup of single or multi-slope leveling. You start at an on-grade point, set A point, then drive to where you want the main slope (long slope) to drain. The program will calculate the real slope between the two points, which you can use or you can enter your own slope. You can also then enter a cross slope.

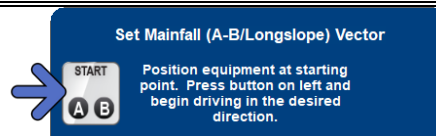
Lower the blade

to the elevation you would like to start Grade at.

Touch the Waterflow Indicator.



Click Start A B to capture your A Point.

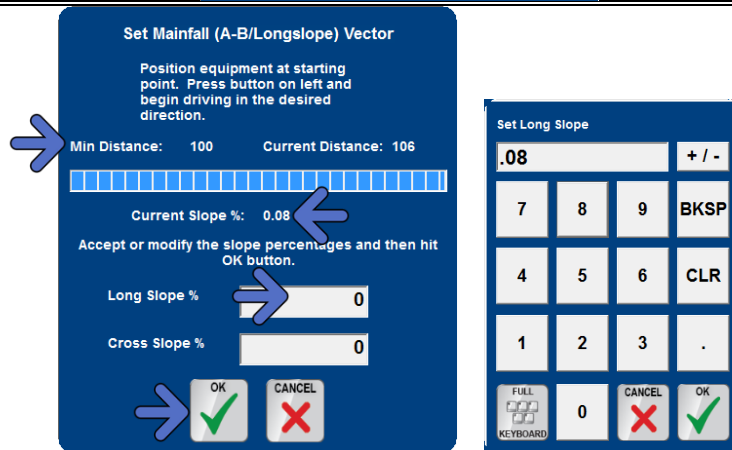


Drive in the direction you want the Long Slope to be.

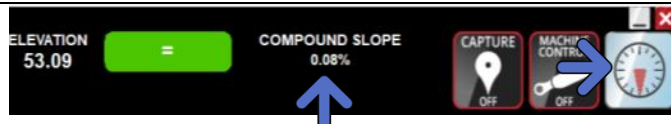
You must go the Min Distance set in the Miscellaneous Menu, on page 42.

The Current Slope % will tell you the actual slope between your A point, and the blade now.

Touch the Long Slope % and/or Cross Slope % box to enter your desired slopes. Press OK.



Your working screen should now show the Waterflow direction you selected, as well as the slope % number.



Adjusting current Slopes

Once an A-B Line is set, the Slopes can be adjusted. However, the slopes are always relative to your A Point, pointing in the direction of your B point. *If these points need to change, repeat the "A-B Line Setup" above OR "Heading/Slope Setup" on the Next Page.*

To change slope values, Touch the Waterflow Icon.



Then Touch Set Slopes.

Clicking the text box will allow you to enter a new value.

Set Mainfall (A-B/Longslope) Vector

START
A B
Position equipment at starting point. Press button on left and begin driving in the desired direction.

SET HEADING & SLOPES
Enter the desired heading and slopes.

SET SLOPES
Enter the desired slopes.

NRCS PAD
Set Pad Slope and Azimuth from NRCS Design

SLOPE STATS EXPORT CANCEL

Set Mainfall (A-B/Longslope) Vector

Accept or modify the slope percentages and then hit OK button.

Long Slope % 0.08

Cross Slope % 0

OK CANCEL

Heading/Slope Setup

“Set Heading & Slopes” is an alternative to an A-B Line. If you know what you want for these values, you start at an on-grade point, enter the numbers. Driving for the heading is not required. The values default will be your last slope setup.

Lower the blade

to the elevation you would like to start Grade at.

Touch the Waterflow Indicator.



Touch “Set Heading & Slopes”

Set Mainfall (A-B/Longslope) Vector

START
A B
Position equipment at starting point. Press button on left and begin driving in the desired direction.

SET HEADING & SLOPES
Enter the desired heading and slopes.

SET SLOPES
Enter the desired slopes.

NRCS PAD
Set Pad Slope and Azimuth from NRCS Design

SLOPE STATS EXPORT CANCEL

Tap in any of the 3 boxes to enter the heading and slope values you want.

Heading refers to 0-359.99 degrees from North, where North is 0, West is 270, etc. Long slope % is the slope in the direction of the heading, uphill when +, downhill when -.

Set Mainfall (A-B/Longslope) Vector

Enter the desired heading and slopes.

Enter heading and slope percentages and then hit OK button. Your position will be the new start point.

Heading 45.00

Long Slope % 0.080

Cross Slope % 0.000

OK CANCEL

Working with RTK-GPS

AGPS Level(+)[™] is designed to be used with most high-grade RTK-GPS systems. The accuracy of AGPS Level(+)[™] is directly related to the accuracy of the RTK-GPS system that you utilize. Not all RTK-GPS systems are the same and offer the same accuracy and repeatability. Contact your AGPS Level(+)[™] dealer for recommendations on current RTK-GPS systems.

Configuring my GPS

The following tables list the output options that should be enabled on common brands of GPS systems. If your GPS system does not appear on this list, please contact your AGPS Level(+)[™] Dealer or Technician for setup details. The Hz (update) rate and Baud rate must also be set in the AGPS Level(+)[™] program. To set these, press the Menu icon, select Instrument Menu, Control the Instrument and adjust both the Hz and Baud rates.

	<i>Ashtech</i>	<i>TopCon</i>	<i>JD ITC</i>	<i>JD 3000</i>
Msg type	GGA	GGA	GGA	GGA
HZ rate	10	10	5	10
BAUD rate	57600	57600	38400	57600

	<i>NovAtel</i>	<i>300/ 410</i>	<i>Trimble (older)</i>	<i>Trimble (newer)</i>
Msg type	BestPos	BestPos	GGK	GGA
HZ rate	10	10	10 & ASAP	10
BAUD rate	57600	57600	38400	57600

GPS Status

Each individual RTK-GPS system will have it's own standard for being in 'fix' and the type of data/degree of precision it returns.

Common GPS Systems data:

	RTK Fixed	RTK Float	No RTK base	Precision
GGA (Most manufacturers)	4	5	1	HDOP
John Deere [™]	4	3=extend 5=float.	1	HDOP
NovAtel [™] / Raven [™]	50	49/48/34/17	16	Alt. Std. Deviation
Topcon [™] (Javad [™] GGA)	4	5	1	HDOP
Trimble [™] (GGK)	3	2	1	PDOP

A Note on 'DOP':

HDOP, VDOP, and PDOP are respectively Horizontal, Vertical, and Positional (3D) Dilution of Precision. The precision of multiple satellites in view of a receiver combine according to the relative position of the satellites to determine the level of precision in each dimension of the receiver measurement. When visible GPS satellites are close together in the sky, the geometry is said to be weak and the DOP value is high; when far apart, the geometry is strong and the DOP value is low. Thus a low DOP value represents a better GPS positional precision due to the wider

angular separation between the satellites used to calculate a GPS unit's position. Other factors that can increase the effective DOP are obstructions such as nearby mountains or buildings.

DOP Value	Rating	Description
<1	Ideal	This is the highest possible confidence level to be used for applications demanding the highest possible precision at all times.
1-2	Excellent	At this confidence level, positional measurements are considered accurate enough to meet all but the most sensitive applications.
2-3	Good	Represents a level that marks the minimum appropriate for making business decisions. Positional measurements could be used to make reliable in-route navigation suggestions to the user.
>3	Poor	Should be used only to indicate a very rough estimate of the current location.

Troubleshooting my GPS

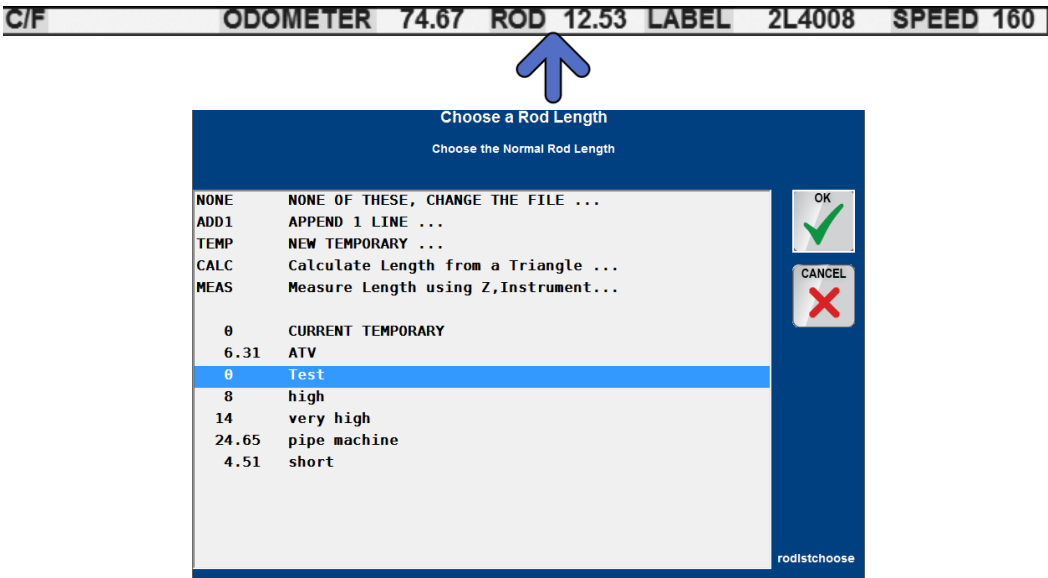


TroubleShooting Tips:

<i>COM Port already in use</i>	The Communications Port that the GPS is plugged into is being used by another program or is closed for some reason. 1. Verify that the GPS is plugged into the correct COM port. 2. Unplug the GPS from the COM port, power-cycling the computer, restarting AGPS Level(+)[™] and then re-plugging the GPS.
<i>No GPS Data</i>	The GPS is sending no signal, or the computer is receiving nothing. 1. Verify the GPS is powered on. 2. Verify the GPS is plugged into the COM port. 3. Verify the GPS is sending the configured correctly as described in Configuring my GPS on page 18.
<i>Bad Data</i>	The GPS is sending bad or incorrect data 1. Verify the GPS is plugged into the correct COM port 2. Verify the GPS is configured correctly 3. Verify AGPS Level(+)[™] is configured to the correct instrument and to the correct incoming Baud and Update rate.
<i>Bad Position Type X (#)</i> <i>Where X is the type, see table under "GPS Status"</i>	The GPS is not seeing the base station 1. Verify the base station is powered on. 2. Verify the base station is within the manufacturer guidelines for distance. 3. Verify the rover is configured to read the base station. 4. Double check radio antennas and cable connections.
<i>Goes in and out of fix</i>	The GPS going in and out of fix can be a symptom of several different problems: • Poor line-of-site with the base. • Poor Satellite visibility. • Damaged GPS Rover Antenna.

Rod Length

The rod length is the distance from the GPS Antenna to the bottom of the cutting edge. This number may change. To adjust your Rod Length, press the Rod Length button on the bottom Info Bar.



NONE	Allows you to change the entire rod length list, adding or deleting any lengths/descriptions you would like.
Add1	Adds a user-defined label to the Rod Length list.
Temp	Creates a new temporary length but does not add it to the permanent list.
CALC	Calculate the length from a triangle. Not used in AGPS Level(+) TM
MEAS	Measures the length using Z and the Instrument. Not often used.
The remainder are the rod lengths saved in the program.	

Control Points (.ctl file)

A Control Point (sometimes referred to as a Benchmark) is a known location in the real world that has associated coordinate data and can be accessed at a later date.

Control points allow for exact repeatability from topography collection to day-to-day operations. They assure that the GPS correction data is correct from day-to-day, month-to-month and year-to-year, independent of a base station or repeater system.

AGPS Level(+)TM requires the use of Control Points in any pre-survey operation (such as designs created from previously collected data) and recommends the use of control points in day-to-day operations.

See more info “Collecting a Reference (Control) Point” on page 31.

TroubleShooting Tips:

Where should I set the control point?	A location that isn't likely to change and that you can easily re-locate and access in the future (e.g. culvert, fence-post)
What's the best way to capture/load control points from day-to-day	Simply capture a control point where you stop for the day (with the blade raised up to avoid settling) and load the control point before moving the next day.
My RTK Base station has an internal memory; do I still need control points?	We highly recommend using them. Base stations can lose their memory; people can steal the tripod you left in the field.

Working with the Program

Adjusting the view

To adjust the view in the Working Screen

Press the Screen Icon

Note: When in Overhead View, the Side View Icon will be visible, and when in Side View, the Topography Icon.



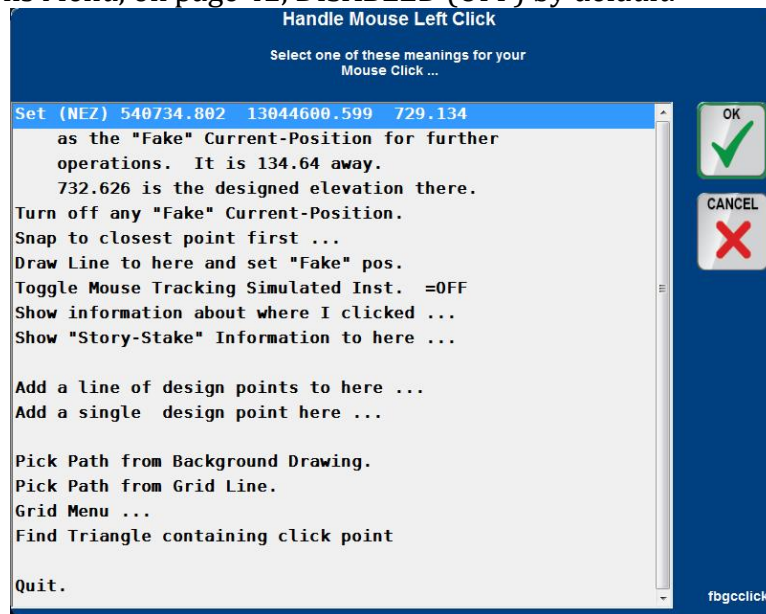
Zoom In

Pressing the Zoom In Icon will Zoom the view in, centered on your current position (either real or fake).

	View All	Pressing the View All Icon will Zoom the screen to show all completed lines or the entire background image/drawing.
	Zoom Out	Pressing the Zoom Out icon will Zoom the view out, centered on your current position (either real or fake).
	Neighborhood	The Neighborhood Icon will Zoom the screen into the neighborhood of your current position (either real or fake).
 	Side/Top View	Toggles between a Side View (Topography) and Top View (Blade View).
	Clean	Locks the screen for 45 seconds, allowing you to wipe the screen clean.

The Click Menu

When you touch the screen you will see the click menu. This menu has many operations that you may want to do while surveying or working. You can toggle the Click Menu on and off in the Miscellaneous Actions Menu, on page 42, DISABLED (OFF) by default.

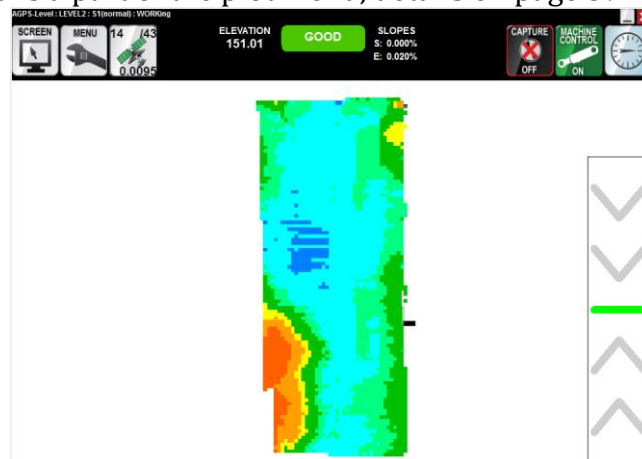


Set NEZ as 'fake position'	Sets the current NEZ (it will be displayed) as a 'fake position'. A 'fake position' will be used for any zoom, grid, and other functions, rather than your actual position.
Turn off any 'fake' current positions	Turns off any 'fake' positions. After using the scroll icon to move around the screen, you must turn off any 'fake' positions to re-center the screen on the real current position.
Snap to closest point	Will snap to the closest captured point for the NEZ point to be used instead of the clicked point.
Draw Line to here	Will draw a line between the current position and where you clicked (or snapped to closest point)

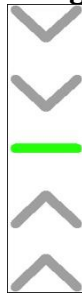
Toggle Mouse Tracking Simulated Inst.	Used for GPS Simulators.
Show information about where I clicked	Will show information about where you clicked, including it's NEZ (if a previously captured topo is loaded or if you clicked a known point), it's distance from the current position, slope distance and angle (very useful for rotating a grid to a known point).
Show 'Story-Stake' Information to here	Gives information for putting a line of grade stakes between your location and your click.
Add a line of design points to here	Design points will be added to the surface file, between your nearest point (or a fake position) and the point you clicked. You will be shown more information about these two points, and asked how far apart the new points should be.
Add a single design point here	Adds a design point to the file.
Pick Path from Background Drawing	Will choose the closest background line for guidance.
Pick Path from Grid Line	Will choose the closest grid line for guidance.
Grid Menu	Opens the Grid Menu. See Grid Menu on page 25.
Find Triangle containing click point.	Displays a single triangle from the Surface file.

The Light Bar

The Light Bar allows a visual indication of your vertical accuracy. The lightbar also acts as a blade offset. The lightbar menu is a part of the plot menu, details on page 39.

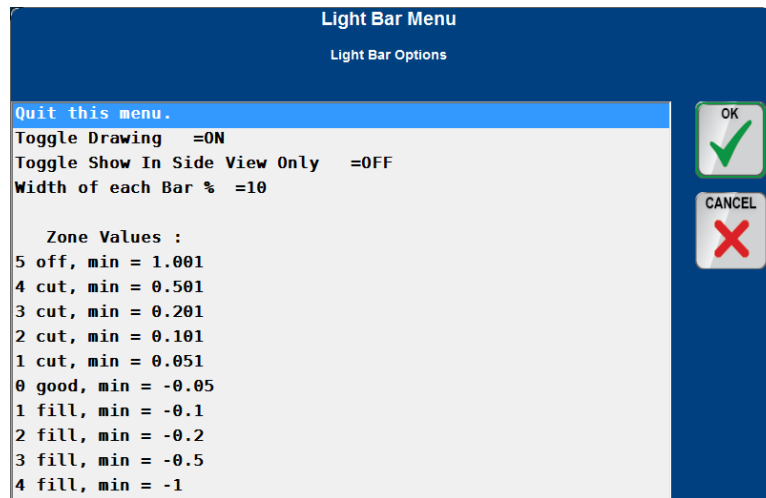


Vertical Lightbar



The Vertical lightbar will indicate how far from grade the machine is operating. It also acts as a blade offset. By pressing the down or up chevrons, the program will offset the blade the amount set in "Distance Blade Moved by PgUp,PgDn". To change this amount, see the Miscellaneous menu on page 42.

The Light Bar Menu



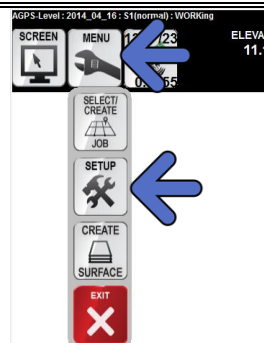
Toggle Drawing	Toggles between the light bars being ON or OFF. Must =ON to see the light bars.
Toggle show in Side View Only	Toggles showing the light bars in the side (blade) view only.
Width of each Bar	The % width of the Vertical Bar(s). Increase to make the Vertical Bar(s) wider.
Zone Values	The value(s) at which the Vertical Light Bar will display the given correction. The Default values are shown. In the defaults shown, the Vertical Bar will display Green for good between .051 and -.05

The Grid

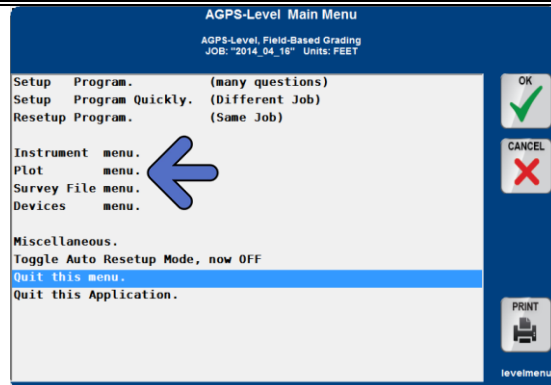
The Grid allows for a visual indication of distance. The grid can be set to any spacing and rotated to any angle. There is also a color grid option of 3 different sets of data: cut/fill amount; deflection amount; and visits count. If you are building your design in OptiSurface InCab™, this data will often be included in the file. If you are designing in the field, you would need to capture this data.

Setting up the Grid

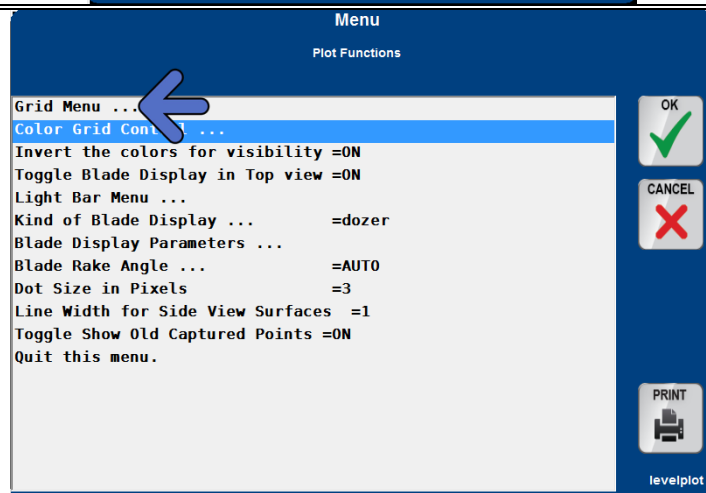
Press the Menu Icon, and then press the Setup Icon.



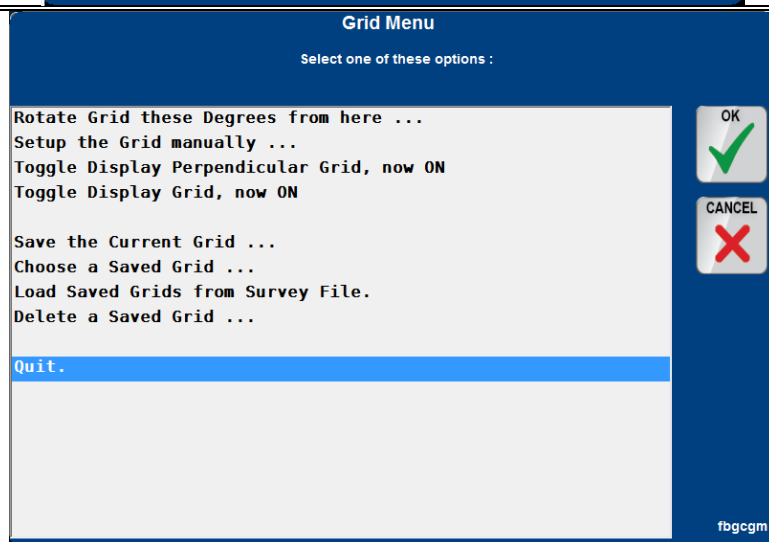
Select Plot Menu



Select Grid Menu

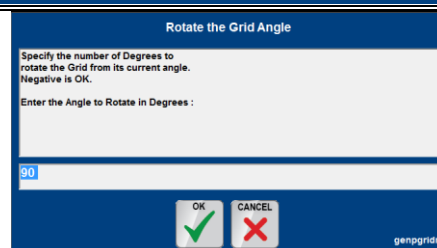


The grid menu is where you adjust the grid



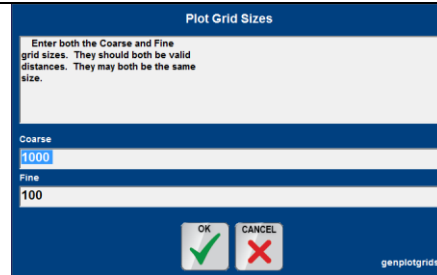
Rotate Grid these Degrees

Allows you to rotate the grid a number of degrees from its current angle.



Setup Grid Manually

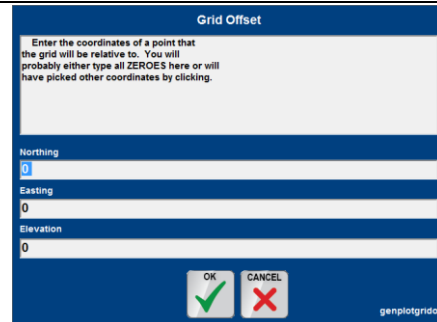
Allows you to set the course and fine of the grid. Fine will be displayed in RED, course in GREEN. For instance, if your blade is 15 feet wide, you would set the course for 30 and the fine for 15, alternating the grid red and green every 15 feet.



The 'Plot Grid Sizes' dialog box has a title bar 'Plot Grid Sizes'. Below the title bar is a text area with instructions: 'Enter both the Coarse and Fine grid sizes. They should both be valid distances. They may both be the same size.' Below this are two input fields: 'Coarse' with the value '1000' and 'Fine' with the value '100'. At the bottom are 'OK' and 'CANCEL' buttons with green and red checkmarks respectively. The text 'genplotgrids' is in the bottom right corner.

Setup Grid Manually Grid Offset

Allows you to offset the grid some amount N (north) and E (east) and Z (elevation – uncommon) For instance, if you wanted to offset the grid 10 feet NorthWest from your current grid, you would add 10 feet to N and subtract 10 feet from E.



The 'Grid Offset' dialog box has a title bar 'Grid Offset'. Below the title bar is a text area with instructions: 'Enter the coordinates of a point that the grid will be relative to. You will probably either type all ZEROES here or will have picked other coordinates by clicking.' Below this are three input fields: 'Northing' with the value '0', 'Easting' with the value '0', and 'Elevation' with the value '0'. At the bottom are 'OK' and 'CANCEL' buttons with green and red checkmarks respectively. The text 'genplotgrids' is in the bottom right corner.

Toggle Display Perpendicular Grid

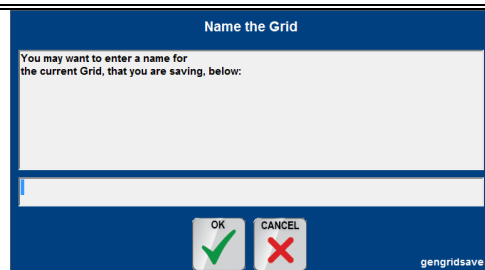
When the perpendicular grid is ON, there will be two grids meeting at right angles. Turning it OFF goes to a Single Grid (like parallel tile lines)

Toggle Display Grid

Toggle the entire grid On and OFF.

Save the Current Grid

You can save and name your current grid to return to it later



The 'Name the Grid' dialog box has a title bar 'Name the Grid'. Below the title bar is a text area with instructions: 'You may want to enter a name for the current Grid, that you are saving, below:'. Below this is a large text input field. At the bottom are 'OK' and 'CANCEL' buttons with green and red checkmarks respectively. The text 'gengridsave' is in the bottom right corner.

Choose a Saved Grid

Recall a saved grid



The 'Choose a Grid' dialog box has a title bar 'Choose a Grid'. Below the title bar is a text area with instructions: 'Select one of these saved Grids to be the Current Grid ...'. Below this is a list box containing two items: '05/02,15:28:36.17 1000 x 100 Saved Grid 2' and '05/02,15:28:31.59 1000 x 100 Saved Grid 1'. To the right of the list box are 'OK' and 'CANCEL' buttons with green and red checkmarks respectively. The text 'engridchoose' is in the bottom right corner.

Load Saved Grids From Survey File

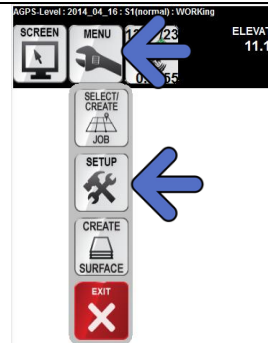
Selecting this option will allow you to pick from grids saved across different jobs. After selecting it, Choose a Saved Grid.

Delete a Saved Grid

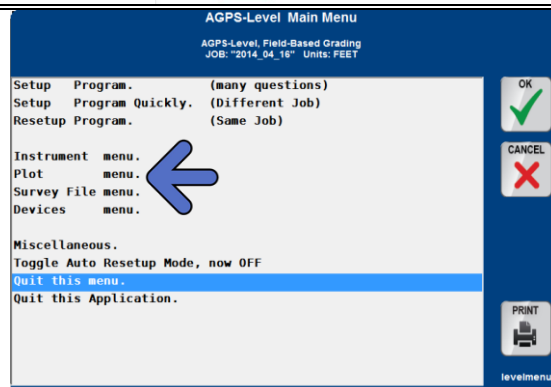
Delete a grid you have saved.

Setting up the Color Grid

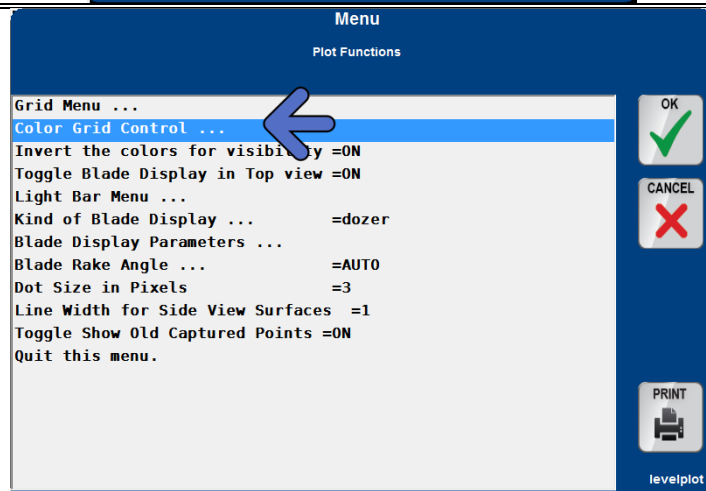
Press the Menu Icon, and then press the Setup Icon.



Select Plot Menu

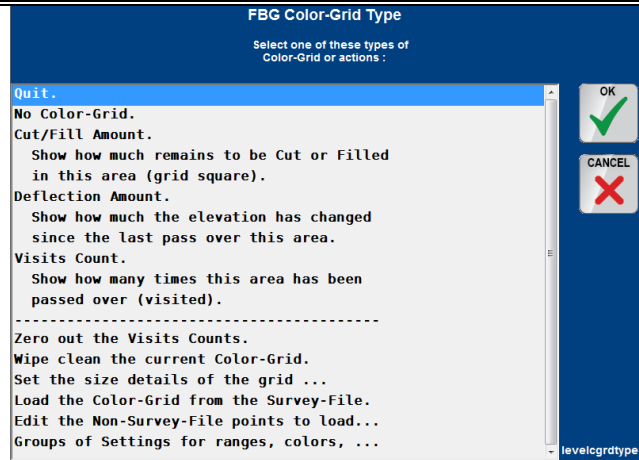


Select Color Grid Control



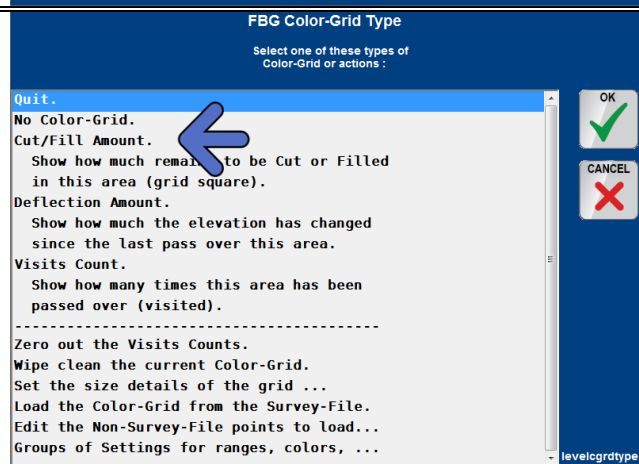
Color Grid Type

The menu for the Color Grid Type.



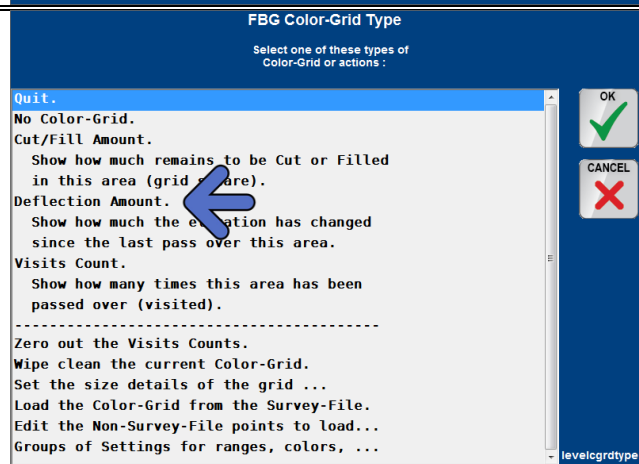
Cut/Fill Amount

Shows the amount to be cut/filled for each grid section. After you select the option you can change the color for each zone (not recommended).



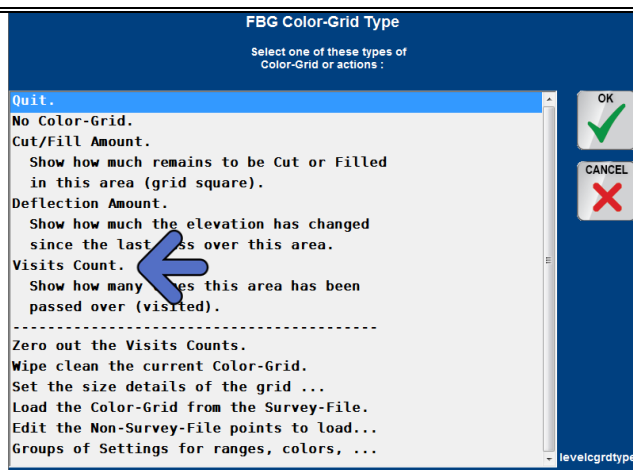
Deflection Amount

Shows how much the elevation has changed since the last pass over the area. After you select the option you can change the color for each zone (not recommended).



Visits Amount

Shows how often you have visited an area of the grid. After you select the option you can change the color for each zone (not recommended).



Zero out the Visits Count

Allows you to set the visit count to zero (cannot be undone)

Wipe clean the current color-grid

Removes the data for a given color-grid

Set the size details of the grid

Allows you to manually set the size of the grid (same as setting up the grid)

Load a Color-Grid from the survey-file

Reloads the Color-Grid information from the file.

Edit the non-survey-file points to load

Edit the .GPE points file. This file is similar to a .NEZ file, and should be loaded with topo points that are not in the .SVY

Groups of Settings for ranges, colors ...

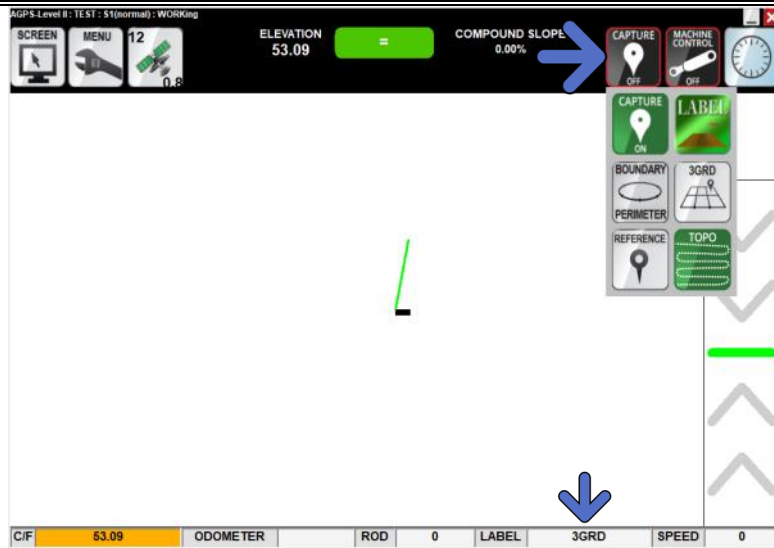
Allows you to save a group of settings for the color-grid (if you have created custom colors, etc)

Collecting Field Data

Topography data and Point Labels

Point labels define the type of data you are collecting (Boundary Perimeter, Random Ground or Reference Point). If you are going to design in the field by using OptiSurface, you must capture your topography data first. There are several different types of data you can collect in AGPS Level(+)TM.

Press the Capture Icon.
To see what label is currently selected, look at the label portion of the bottom working bar (or touch Label icon).



	Capture On/Off	Touch to toggle capturing data On/Off. Note that when there is a design loaded, Machine Control will control to grade regardless if Capture is turned On or Off.
	Boundry Perimeter	Select to set data collection to Boundry/Perimeter. This will tell the program where the edge of the job is. Its point label is 2PER.
	Random Ground	Select to set data collection of Random Ground. This is topography data collected throughout the field. Its point label is 3GRD.
	Reference	Select to collect a reference point (also known as a control point) somewhere in the field.
	Label	Opens the Point Label menu, allowing you to select a custom label for the points.
	Topo ON/OFF	Pressing this icon will turn ON Topo mode, to collect data with a "Topo mode offset (Blade to Ground)". See Miscellaneous Menu starting on page 42 to set this measurement.

Collecting a Reference (Control) Point



Select your Rod Length

This may be the typical rod length of the blade or a different Rod Length (e.g. if you were taking the GPS globe off of the machine to reach a culvert)

Choose a Rod Length
Choose the Normal Rod Length

NONE	NONE OF THESE, CHANGE THE FILE ...
ADD1	APPEND 1 LINE ...
TEMP	NEW TEMPORARY ...
CALC	Calculate Length from a Triangle ...
MEAS	Measure Length using Z,Instrument...

0	CURRENT TEMPORARY
6.31	ATV
0	test
8	high
14	very high
24.65	pipe machine
4.51	short

rodistchoose

Read the Instrument

On this screen you may also

- Control the Instrument
- Pause before read (usually used if capturing a control point by yourself)
- Set the "Tries" for averaging (10 is common, if you are in dense tree cover you may increase it to 20)



Check Setup
Interactive Instrument Reading

Read the Instrument now ...

Control the Instrument first ...

Pause before read amount =0 seconds ...

Tries # for averaging purposes =10

Rod Length being used =0

Quit without reading. =0

instreadia

Name the Point

You will receive a confirmation that the reads were successful.

You can name the point and put a description. The default name is a1 (this number increases each time you capture a control point.)

The point name must be between 1 and 8 letters and/or numbers long.

Description can be any length.

Check Setup

10 successful reads were performed.

The averaged results are :

Northing : 548772.382 RMS=0

Easting : 13844729.989 RMS=0

Elevation : 729.134 RMS=0

Raw : xyh(13844729.989,548772.38186,729.13378697)

instotcapr

Capture a Control Point

Enter a name for the new Control Point

NEZ: 540748.702 13044753.509 729.864

with raw data:

xyh(13044753.509,540748.70186,729.86388697)

Control Point Name

Control Point Description

instotname

Set your Rod Length back

If you changed your Rod Length you can set it back.

Choose a Rod Length
Choose the Normal Rod Length

NONE	NONE OF THESE, CHANGE THE FILE ...
ADD1	APPEND 1 LINE ...
TEMP	NEW TEMPORARY ...
CALC	Calculate Length from a Triangle ...
MEAS	Measure Length using Z,Instrument...

0	CURRENT TEMPORARY
6.31	ATV
0	test
8	high
14	very high
24.65	pipe machine
4.51	short

rodistchoose

Creating a Surface

Creating a Surface allows AGPS-Level+ to interface with 3rd party design software, to calculate designed grades. When a Surface is available, Level+ will use it without requiring the user to manually enter the slopes. Note that this feature is not available in basic AGPS-Level.

Optisurface InCab™

OptiSurface InCab is a powerful analysis and design software for agricultural landforming. It calculates the optimized field topography that satisfies water management goals whilst minimizing earthworks and without ditches. OptiSurface has a built-in compatibility with Level+. By collecting field data, you can quickly design an optimal surface and immediately load it into Level+.

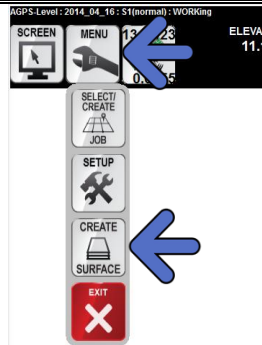
OptiSurface must be licensed and activated separately from AGPS . Contact your AGPS dealer with any questions.

Working with OptiSurface from AGPS Level+™

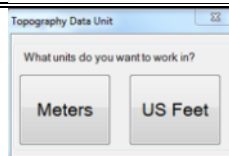
OptiSurface InCab™ will be utilized after you have collected field topography data using AGPS Level+™ or AGPS Topo™.

After you have collected the data, **Press the Menu Icon, and then the Create Surface icon.**

OptiSurface must be activated to create a surface.



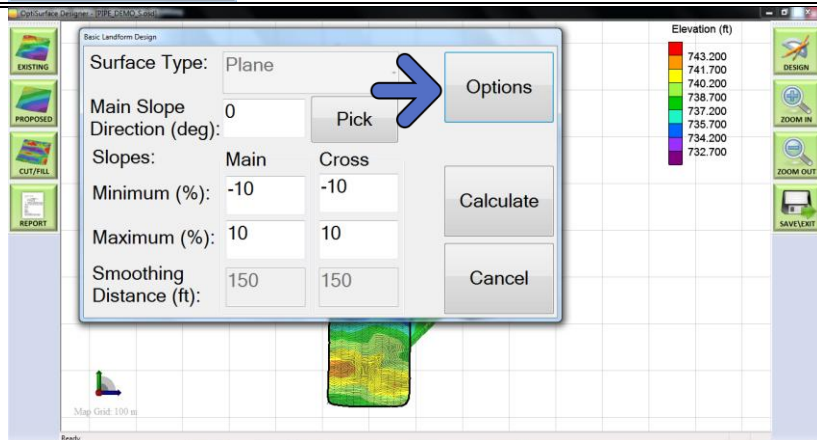
Select your Unit – Meters or US Feet



The Basic Landform Design screen will be displayed.

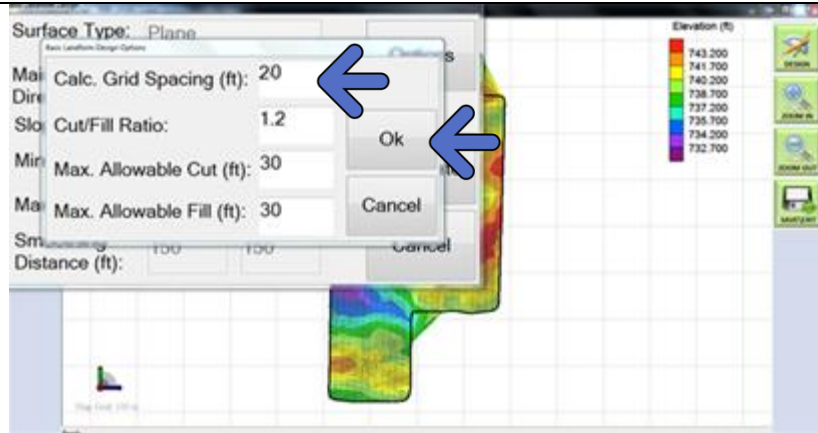
You can adjust the Minimum and Maximum slopes.

Press Options to adjust the Grid and Cut/Fill



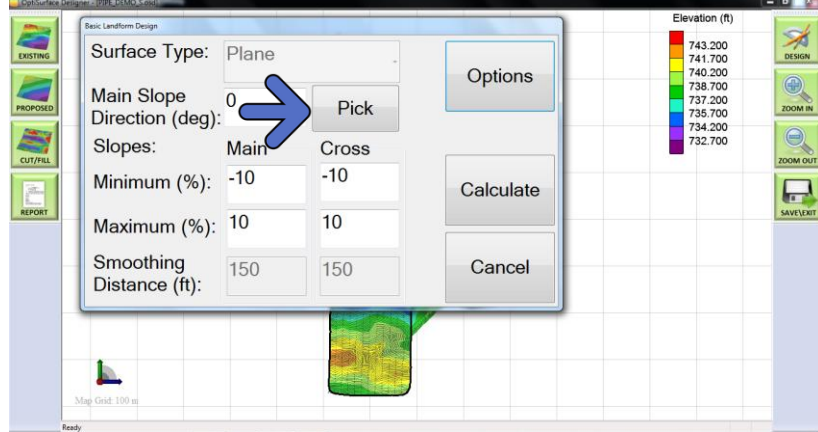
You can adjust the Grid Spacing and the Cut/Fill options in this Options Menu.
***It is recommended to reduce the Grid Spacing to the width of your blade.**

When you have finished, press OK



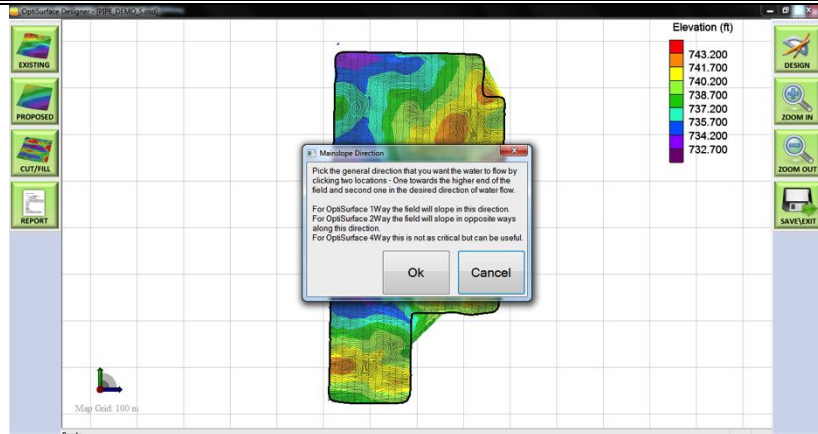
You will return to the Basic Landform Design Screen.

(Optional) Press Pick to set the Main Slope Direction or skip to next page.



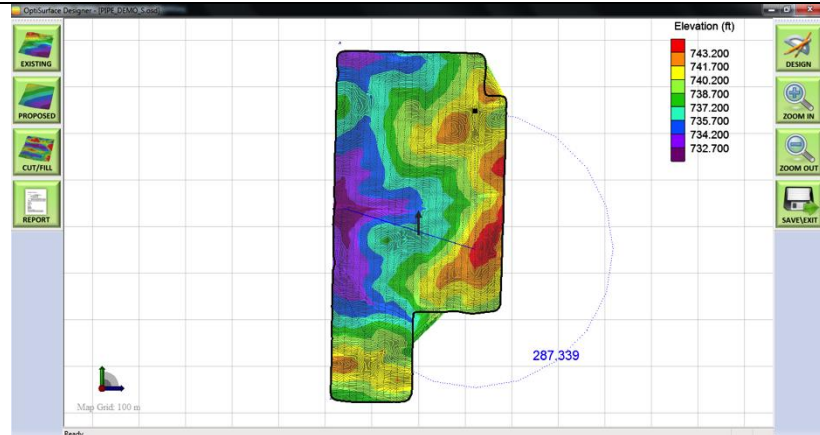
You will be instructed how to pick the Main Slope Direction.

Press Ok



Pick your Main Slope.

Touch or click the screen at a high point you want drain from to a low point you want to drain to.



(Optional) Adjust your Main and Cross slope Minimum % and Maximum % .

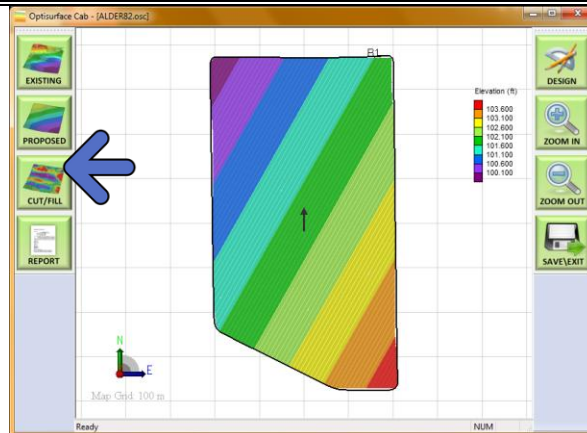
Press Calculate to design.

A Design Summary Report will be displayed

Press Close to finish the design

The proposed design will be displayed.

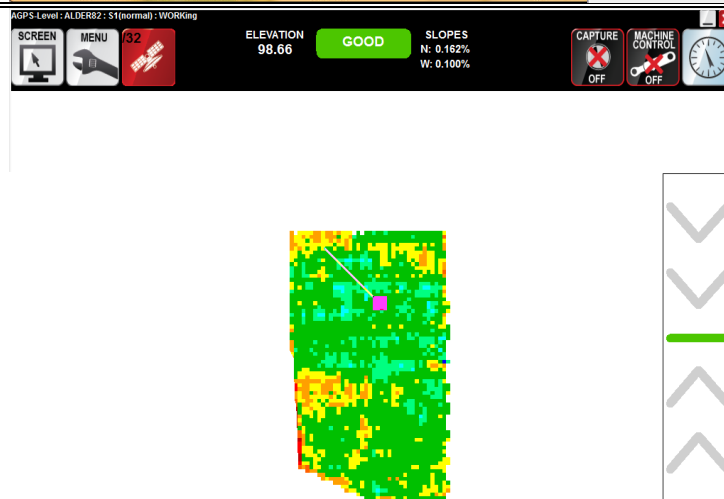
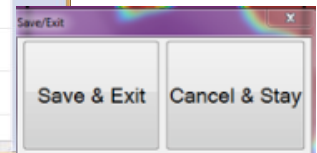
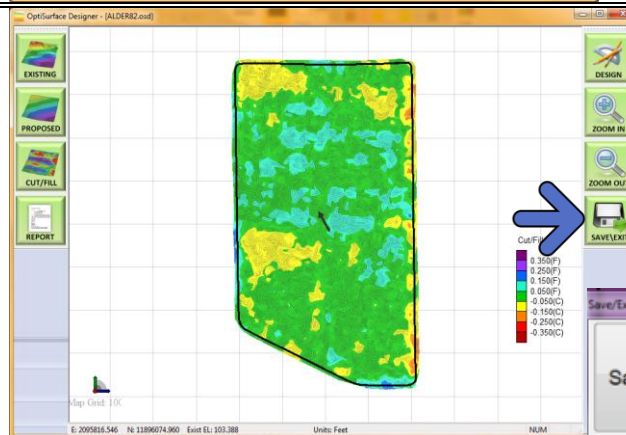
You can press Proposed and Cut/Fill to see the different images.



This is the proposed Cut/Fill map.

If you are satisfied with the design, press Save/Exit.

Press Design if you want to adjust any design settings.

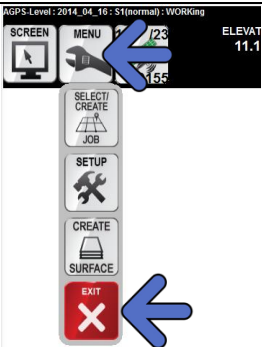


You will be returned to AGPS, where the design will be automatically loaded.

Finishing a Job

Quitting the program

To Quit the program, **Touch Menu, and then Exit.**



Opens a dialog that allows you to Import and Export data to a USB drive.



Close the program to return to the Windows™ desktop.



Shuts down and turns off the PC.



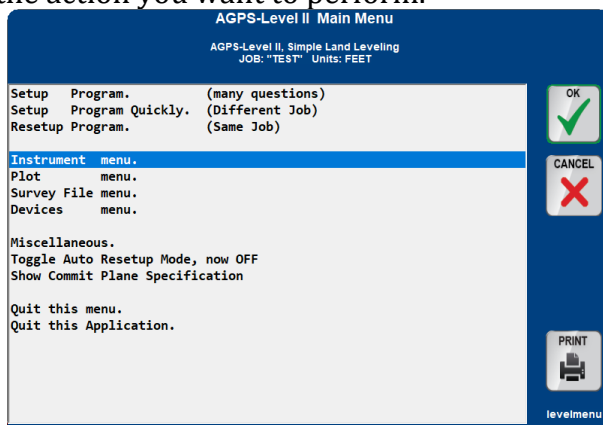
Brings up the Quit Menu, which will allow you to quit the program as well as export data or capture a control point. See Quit this Application Menu on page 44.

Menus

Main Menu



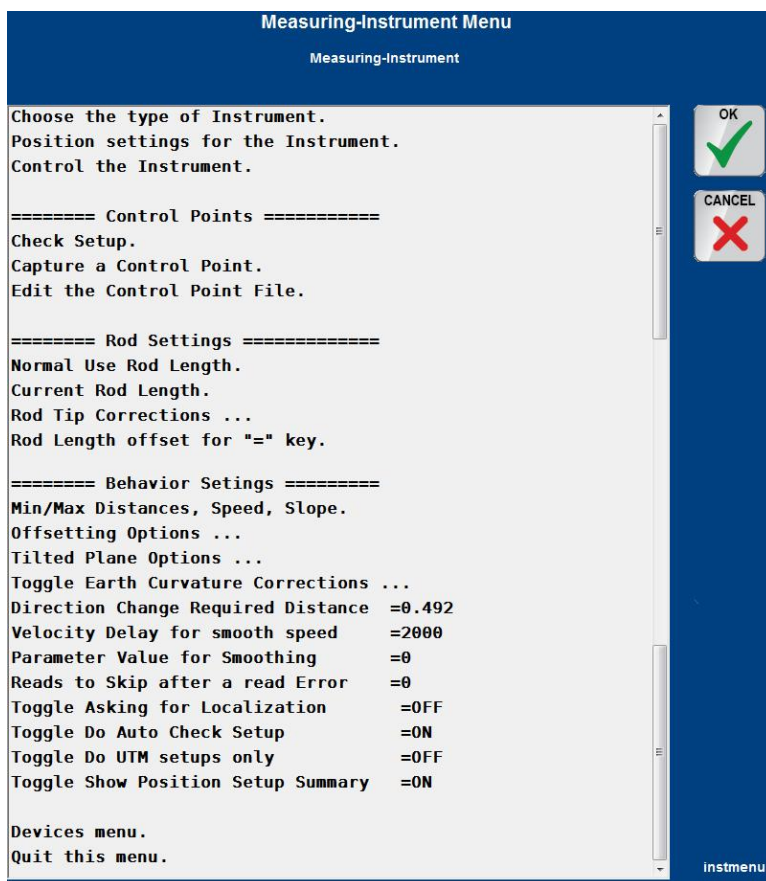
Pressing the Menu Icon, and then Setup Icon will bring up the Main Menu. From here you can select the action you want to perform.



Setup Program (many questions)	Used to perform an initial set-up of the program (select GPS, machine control, etc.). See Setting up the Program for the first time on page 11
Setup Program Quickly	Used to start a new job or to select a previously created job. See Starting a New Job or Restarting a Current Job on page 11 .
Resetup Program	Used to continue in the job you are currently working on. See Starting a New Job or Restarting a Current Job on page 11 .
Instrument Menu	Control the GPS and the GPS Settings as well as Control Point settings and Rod settings. See Instrument Menu on page 38 .
Plot Menu	Controls how things are drawn/displayed on the Main Working Screen. See Plot Menu on page 39 .
Survey File Menu	Control how the survey file is saved, export survey file, or edit the survey file. See Survey File on page 40 .
Devices Menu	Set or adjust Machine Controls and/or slope sensors. See Devices Menu on page 41 .
Miscellaneous actions	Miscellaneous actions that can be performed. See Miscellaneous actions on page 42 .
Toggle Auto ReSetup Mode	If Quick Setup Mode is toggled ON, AGPS Level(+) [™] will skip asking you to choose the program you want to run on startup and load directly to the AGPS Level(+) [™] Main Menu.
Show Commit Plane Specification	Displays the “Slope Stats” information screen showing current commit point, heading, and slope.
Quit this Menu	Closes the current menu
Quit this Application	Brings up the Quit Menu, which will allow you to quit the program as well as export data or capture a control point. See Quit this Application Menu on page 44 .

Instrument Menu

The Instrument Menu controls the GPS and other forms of measurement
From the Main Menu Select the Instrument Menu.

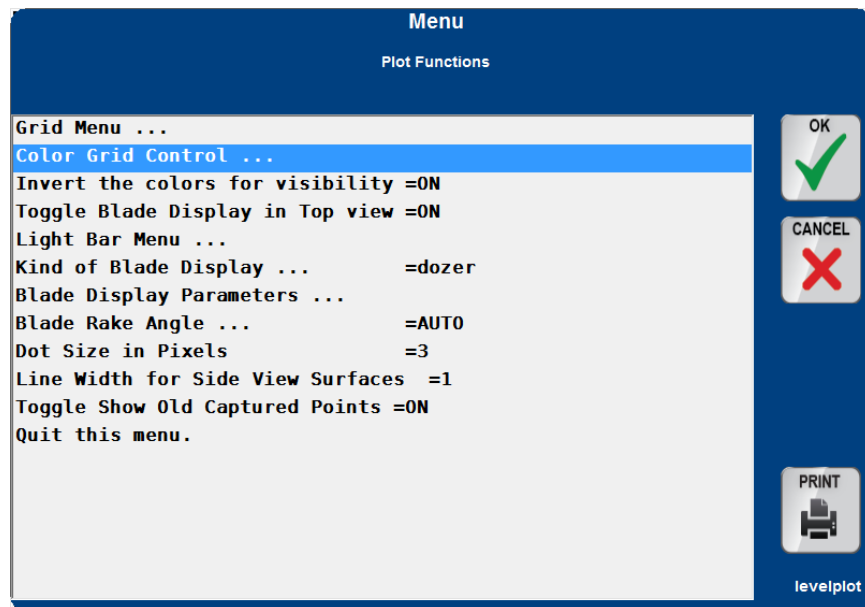


Choose the Type of Instrument	Choose the brand/type of GPS or GPS Simulator the program will use.
Position Settings	Set up the UTM or State Plane of the Instrument. See UTM/State Plane on page 45.
Control the Instrument	Allows you to setup/adjust/troubleshoot the GPS. Please Note: The settings, capabilities and types of data can vary widely between different brands of GPS. Please speak to your GPS Manufacturer with any questions.
Check Setup	Check the setup of the current control point.
Capture a control point	Allows you to capture a control point. See Control Points on page 31.
Edit the control point file	Allows you to edit/adjust the control point file (.ctl). Useful if you need to enter a control point or delete a bad control point.
Normal use Rod Length	Set the 'Normal Use' rod length. The Normal Use rod length will cause the 'current location' icon on the main working screen to display as a square. Using a rod length different than the 'normal use' will display a rectangle.
Current Rod Length	Change the current Rod Length. See Rod Length on page 20
Rod Tip Corrections	Change/adjust the current Rod Tip Corrections.
Rod Length offset	Adjust the amount the rod length is adjusted by pressing the = key.
Min/Max settings	Set Minimum and Maximum distance, speed and slope for the GPS instrument to function.

Offsetting options	Set how the instrument is offset in relation to the blade point.
Tilted Plane Options	Not recommended for use except in rare scenarios benching into a tilted job.
Toggle Earth Curvature	Toggle correction for Earth Curvature.
Direction Change Required	How much direction change must be experienced before the instrument shows a change in direction
Velocity Delay for Smooth	A setting for how the program determines speed.
Parameter value smoothing	Smooths elevation input. Do not use without advice from a AGPS Level(+) [™] Technician first.
Reads to skip after a read error	Allows you to set how many 'reads' are skipped after the instrument sends an error message.
Toggle Asking for Localization	Toggle ON or OFF the program asking you to set special local stretch.
Toggle Do Auto Check	Toggles between asking or not asking you to check a control point after every startup.
Toggle Do UTM only	Toggles between showing or not showing State Plane/Local options in the Instrument-Localization setup screen.
Toggle Show Position Setup	Toggle between showing or not showing the results of a position setup.

Plot Menu

The Plot Menu controls how things are drawn/displayed on the Main Working Screen
From the Main Menu Select the Plot Menu or press '8' on the keyboard.

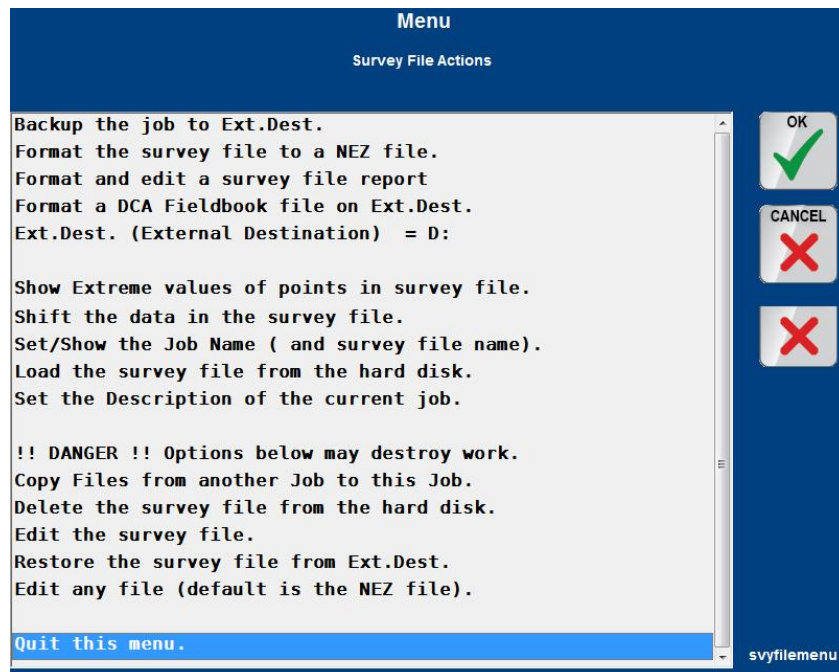


Grid Menu	Takes you to the Grid Menu. See Grid Menu on page 24
Color Grid Control	Takes you to the Color Grid Control Menu. See Setting up the Color Grid on page 27
Invert the colors for Visibility	Toggle between a 'day' color palate and a 'night' color palate.
Toggle Blade Display in Top View	Toggle the blade display in top view
Light Bar Menu	See The Light Bars on page 23

Kind of Blade Display	Icon to use in Blade Display. Options are T, Dozer, Grader, Dozer Solid, Dozer Hollow.
Blade Display Parameters	Sets the Width, Height and Instrument Offset (all in feet) for the blade display in side view
Blade Rake Angle	Allows you to set the horizontal angle (in degrees) that the blade is rotated relative to the machine. If you have a blade controller that sends the rake angle, leave this on auto, otherwise set the blade rake angle here.
Dot size	Change the Pixel size for dots.
Line Width for Side View Surfaces	The width of a line in Side View (1 is standard).
Toggle Show Old Captured Points	Toggle showing old captured points ON or OFF.

Survey File Menu

The Survey File Menu controls how the survey file is saved, export survey file, edit the survey file. From the Main Menu Select the Survey File Menu.

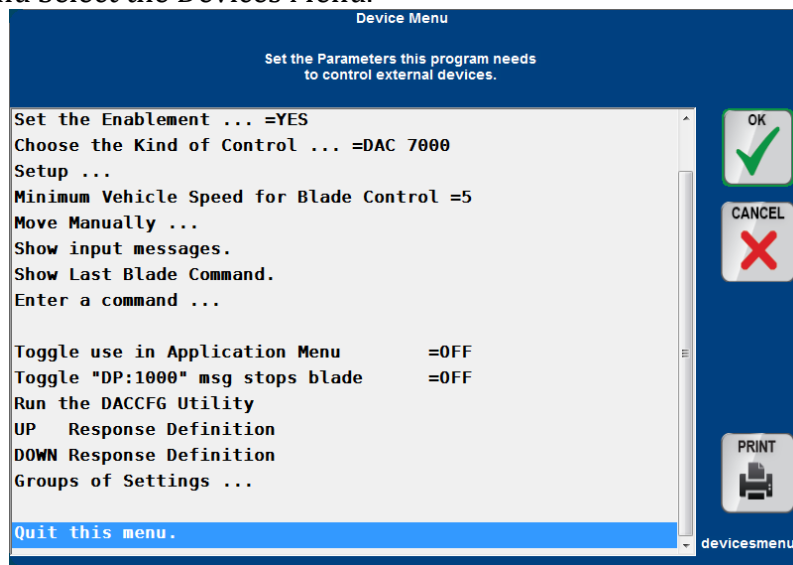


Backup the Job	Backup the current job to the external destination (Typically USB drive).
Format the survey file to a NEZ file	Turns the .svy file into a .nez file and exports it.
Format and edit a survey file report	Turns the .svy file into a .prt file and allows you to edit it.
Format a DCA Fieldbook file	Turns the .svy file into a .dca file
Ext.Dest	External destination (Typically USB Port) used for copying/backing up data.
Show extreme values of points	See a Minimum and Maximum for the survey file.
Shift the Data	Shift the Survey File. Typically used if your control point was slightly off of a known world location.
Set/Show the Job Name	Change the Job Name

Load the Survey File	Reloads the survey file if you have made changes below
Set the Description	Change the description of the current job.
Copy Files	Copy the survey file of a different job to the current job (for instance, if you brought a second machine into a job and wanted to load the data that had been captured to that point)
Delete the Survey File	Deletes the survey file (but keeps the job).
Edit the Survey File	Edit the survey file like a text file (i.e you had a known point you couldn't reach with the machine you wanted to add to a line).
Restore the Survey File	If you backed the survey file to a USB drive and wanted to load it into the computer (usually after a computer failure).
Edit any file	Allows you to choose and edit a file.

Devices Menu

The Devices Menu configures the blade control/machine control device.
From the Main Menu Select the Devices Menu.

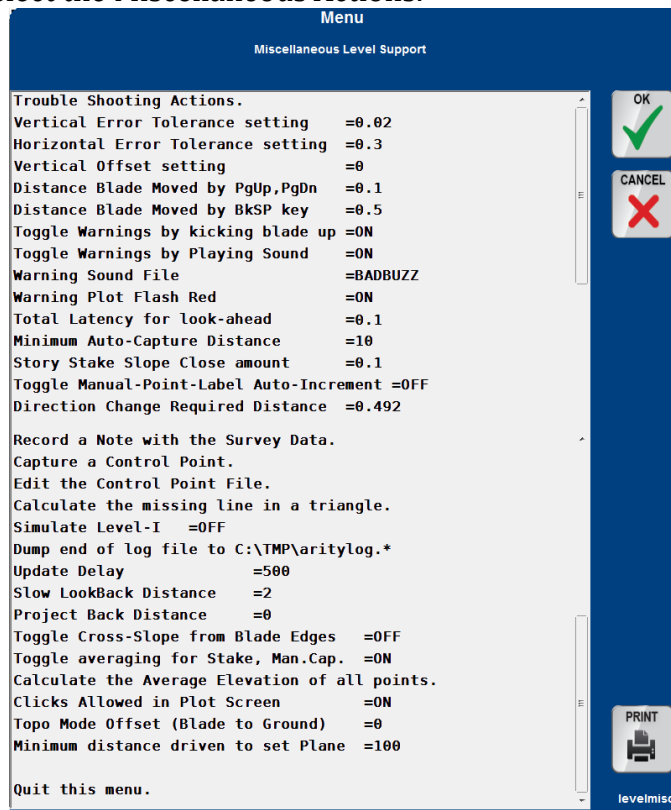


Internal Use	Used to send a command-line to the device or software.
Set the Enablement	Sets Machine Control ON or OFF. Must be =YES for Machine Control to function.
Choose the Kind of Control	Choose the type of Machine Controller. Speak to the manufacturer of the Machine Controller with questions.
Setup	Setup the Machine Controller. Allows you to set COM port and other options. Speak to the manufacturer of the Machine Controller with questions.
Minimum Vehicle Speed	The minimum speed (in feet or meters per minute) the machine must be travelling for Machine Control to function. Often set to a low number so Machine Control will automatically stop when the Machine is motionless.
Move Manually	Used to manually activate the Machine Control. Useful for testing/troubleshooting the Machine Control.
Show Input Messages	Shows the current message strings from the Machine Controller. Useful for testing/troubleshooting.
Show Last Blade Command	Shows the immediately previous command sent from AGPS-Level™ to the Machine Controller. Useful for testing/troubleshooting.
Enter a Command	Allows you to enter a command to send to the Machine Controller. Command must be in the data-string type used by the Machine Controller. Useful for testing/troubleshooting.

Run DACCFG Utility	(If using DAC7000/8000) Will launch the Configuration program.
UP Response Settings	Allows you to adjust the UP response settings of the Machine Control. Please speak to an AGPS Technical Specialist before changing these settings.
DOWN Response Settings	Allows you to adjust the DOWN response settings of the Machine Control. Please speak to an AGPS Technical Specialist before changing these settings.
Groups of Settings	Allows you to save different groups of UP/DOWN Response Settings

Miscellaneous actions

From the Main Menu Select the Miscellaneous Actions.



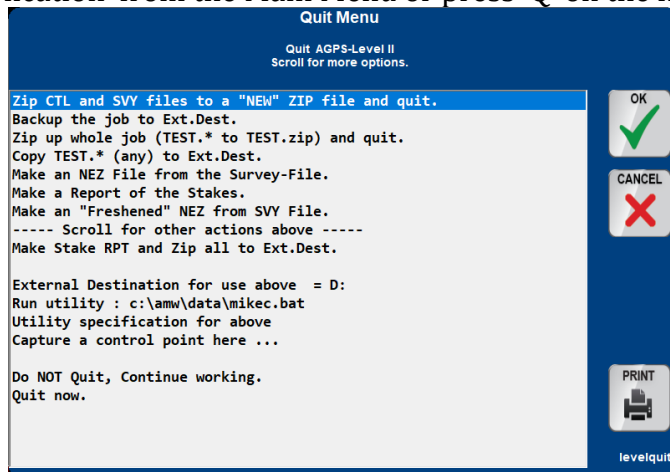
Trouble Shooting Actions	Opens the troubleshooting menu.
Vertical Error Tolerance	Sets the Vertical Difference where the program will show 'good'.
Horizontal Error tolerance	Sets the Horizontal Difference where the program will show 'good'.
Vertical Offset Setting	Sets a Vertical 'Cut/Fill' Offset amount.
Distance Blade Moved by PgUp,PgDn	Sets the Cut/Fill offset amount added/subtracted by pressing Page Up or Page Down on the Keyboard or by pressing the chevrons on the Vertical Light Bar. NOTE: Up Arrow and Down Arrow or inner chevrons are half this value.
Distance Blade Moved by BkSP	Offsets the blade up into a "Riding Mode". Pressing Backspace again will put it back to "Working Mode" and the previous Cut/Fill Offset.
Toggle Warnings by kicking blade up	Automatically raises the blade when there is an error (i.e. bad GPS signal). This helps prevent over-cutting when automatic control stops.
Toggle Warnings by Playing Sound	Toggles a warning sound that plays if there is an error (i.e. bad GPS signal)
Warning Sound File	Change the warning sound file.

Warning Plot Flash Red	Toggles whether or not the screen will flash red if there is a warning.
Total Latency for look-ahead	How quick the Instrument (GPS) responds, so how far ahead the program looks. Most modern GPS systems have a very low latency (10 Hz). Default is 0.1
Minimum Auto-Capture Distance	How often the program will capture a point. A lower number means that the program will capture a point more often. Default is 10
Story Stake Slope Close amount	The difference in slope percentage to consider in reporting as the same slope when making a stake report.
Toggle Manual-Point-Label Auto-Increment	Toggle manually or automatically incrementing the point number when capturing a point or stake.
Direction Change Required Distance	The distance that you need to move in 1 second for the program to recognize a change in direction in movement
Record a Note with the Survey Data	Record a Note that will be saved with the survey data
Capture a control point	Capture a Reference (Control) Point. See Capturing a Reference Point on page 31.
Edit the Control Point File	Edit or manually enter a Reference (Control) Point.
Calculate the Missing line of a triangle	If working with previous topo, will calculate a missing line from a triangle as close as mathematically possible.
Simulate Level-I	Changes Level+ program to behave as if it were only the basic Level program.
Dump end of log file	Saves the end of the program log for sending to a Tech for troubleshooting.
Update Delay	Set the Update Delay, which is the time in milliseconds before the working screen is updated because a lookup was performed.
Slow Look back Distance	A distance back to look when traveling very slowly. It affects how Fore-Slope is calculated.
Project Back Distance	A distance straight back from the GPS antenna you want to project (offset) to.
Toggle Cross Slope from Blade Edges	Toggle calculating slope at blade edges instead of directly under the GPS antenna.
Toggle averaging for Stake, Man.Cap	Toggles the prompt for using several averaged reads for capturing a stake or reference point.
Calculate Average Elevation of All Points	Calculates the average of all captured points.
Clicks Allowed in Plot Screen	Toggles allowing the Click Menu to be displayed when the screen is touched.
Topo Mode Offset	With the blade raised all the way up, measure the distance from the bottom of the blade to the ground. This will be subtracted from the elevation when collecting data in Topo mode, as described on page 30.
Minimum distance driven to set plane.	The distance you must drive when setting up a plane with the A-B Line, as described on page 16

Quit this Application

All of the actions that can be performed before quitting the program.

Select 'Quit this Application' from the Main Menu or press 'Q' on the keyboard.



Backup the job to Ext.Dest	Creates a backup of the data and saves it to the external destination selected.
Zip up whole job	Creates a .zip directory of all of the files pertaining to the current job.
Copy (any) to external destination	Copies any files with the current job name to an external destination.
Make an NEZ file from the Survey-File	Creates a NEZ (northing-easting-elevation) data file from the survey-file.
Make a Report of Stakes	Generates a report of the staking done during work.
Make an 'Freshened' NEZ	Creates an .NEZ file with only the most recent points, ignoring older points within a certain radius.
Make Stake RPT and Zip	Generates a report of the staking done during work, Zip all job files, and Copy to External Destination
External Destination for use above	Sets the drive letter of your external destination. (if there is no drive installed, defaults to the data directory of AGPS.
Capture a Control Point here	The same steps as Collecting a Reference (Control) point, on page 31.
Run Utility	Runs the defined utility. The utility may automate the steps you want to do to quit a job.
Utility Specification	Specifies the Utility to be used in the 'Run Utility' command.
Do not quit, Continue Working	Returns to working Screen
Quit Now	Quits to the AGPS Main Menu.

UTM Zones and State Plane

UTM Zones (Universal Transverse Mercator (UTM) geographic coordinate system) are a coordinate system to help GPS signals be more accurate in the real world. UTM is a world-wide system that takes earth curvature into account.

UTM Zones

